sickoLooper1
sickoLooperX
sickoLooper3
sickoLooper5

user manual

Introduction

Thank you for choosing to use sickozell plugin modules, designed and created specifically for the VCV Rack eurorack simulator platform.

In particular, the sickoLooper modules are inspired by the hardware looper devices whose main features they emulate.

sickoLooper1 and sickoLooperX are one track loopers, the second one can be used as a stand-alone module or as an expander to add tracks to sickoLooper1.

sickoLooper3 and sickoLooper 5 are identical to each other in functionality and differ only on the number of tracks available to record loops.

It is therefore possible to use the module you prefer according to your needs, which may depend on the number of tracks available, 1, 3 or 5, or on the space you want to occupy inside the rack, on the CPU resources required to run the individual module, or even on specific needs that will be shown on this manual.

In this manual, visual reference will always be made to sickoLooper3, but any example is replicable on sickoLooper5. For this reason only the generic name sickoLooper will be mentioned, or the specific module when necessary.

I wish you the best possible experience with the sickozell modules, and for that reason you will be able to contact me directly by email at *sickozell@sickozell.org* if you encounter any problems, bug reporting, or for any suggestions.

Fabio Sickozell

Table of contents

1. QUICK START

To start using sickoLooper, the first thing to do is to record a loop.

It can be started mainly in two ways: setting first the tempo or not.

In either case, first of all, you have to connect the *MASTER* output to the input of VCV Rack "AUDIO" module either directly or through a mixer.

For example, you can record loops via a microphone connected to the sound card, but you can of course use any other sound source, even those generated within VCV Rack.

The output of VCV Rack "AUDIO" module, which corresponds to the physical input of the sound card on which the microphone is connected, should be connected to the input of track 1 of sickoLooper.

Turn off the *MUTE* button to activate the input and adjust the recording level using the *LVL* knob while testing the microphone.
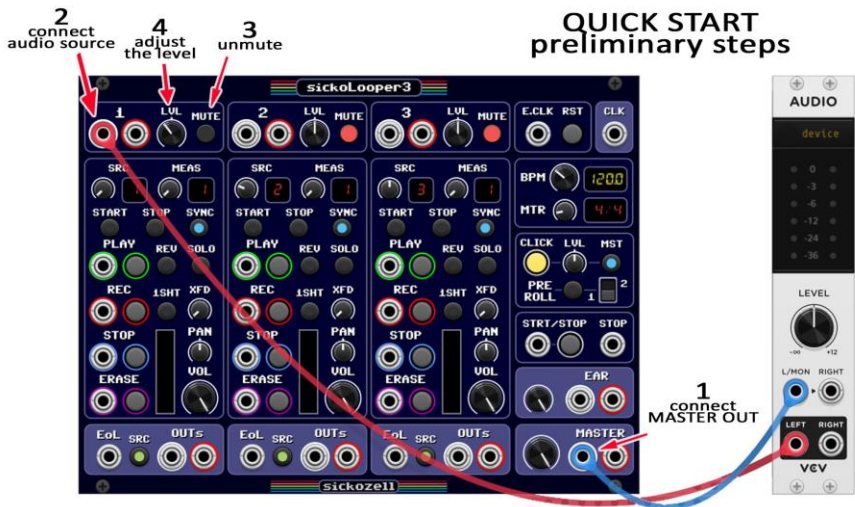
1.1 Recording a loop by first setting the tempo

The fastest way to set the tempo you want to use is to record a blank track, such as the last one, and then adjust the tempo on the fly with the help of the click.

To do this, simply activate the *MST* button to send the click to the *MASTER* output and press the *REC* button on track 3 to record input 3, which is not connected.

At this point the click sound should be audible, so you can experiment by adjusting the *BPM* knob to vary the tempo, and eventually act on the *MTR* knob if you want a time-signature other than 4/4.

Using the *MEAS* knob on track 1, set how many measures you intend to record and, when you are ready, press the *REC* button to start recording, which will begin from the next bar, so the *REC* button should be pressed some time in advance.

During recording, the track display bar turns red, and when the set number of measures has been reached, the track enters play mode and the loop that has been recorded is played back consecutively.

Press *STOP* to stop playback when the end of the loop is reached.

The initially recorded blank track is no longer needed and can be deleted, first by stopping it with the *STOP* button, and then by double-clicking the *ERASE* button.

If the click is no longer needed it can be deactivated or reactivated later by pressing the *CLICK* button.
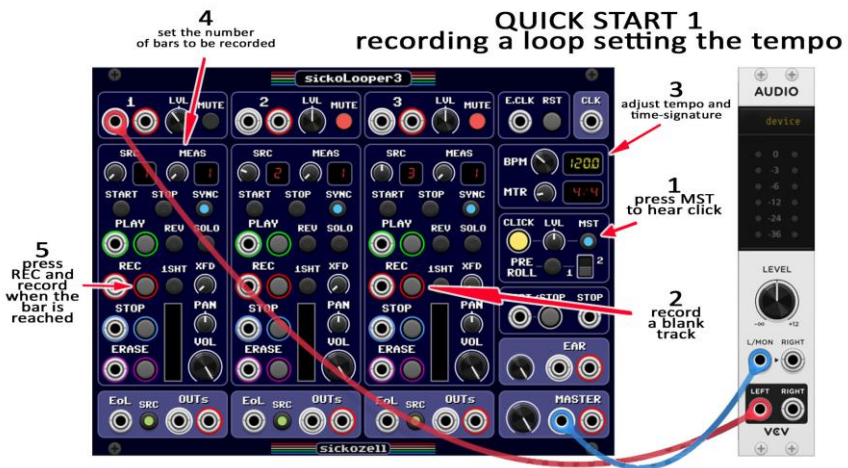
1.2 Recording a loop without setting the tempo

It is possible to record the first loop without setting the tempo in advance, either because this is not necessary or because you want sickoLooper to calculate it automatically.

After performing the preliminary steps outlined above, simply turn off the *SYNC* button on track 1, set the number of beats you want to record with the *MEAS* knob and, when ready, press the *REC* button to start recording.

Recording ends by pressing the *PLAY* button, then the tempo in bpm is immediately calculated and shown on the display, and the loop is played back instantly.

If you want to record more tracks so they all have to be synchronized, the *SYNC* button on the first track must be reactivated.

If you need the click, it can be activated on the *MASTER* output with the *MST* button.

You can record track 2 using the source already connected by acting on the *SRC* knob on track 2, or re-do the preliminary steps on input 2.

Also set for this track how many measures you want to record.

Since loop 1 is still playing, pressing the *REC* button on track 2 will start recording when loop 1 starts again.

Recording of track 2 ends when the measures set with the *MEAS* knob are reached, then loop playback is automatically started.

Press the *STOP* button on individual tracks to stop them at the end of the loop, or the *STRT/STOP* button to stop them all at once at the end of their loops.

QUICK START 2
record a loop without setting the tempo

2
set the nuber of bars
to be recorded

1
deactivate
SYNC

4
press
PLAY
to stop
recording
and playback
the loop

3
press
REC and
record
the loop

Record the 2nd track synced to the first

3
change the
source

4
set bars

5
press REC
to record 2nd track
when the first loop
restarts

1
reactivate
SYNC

2
press MST
to hear
the click

2. SICKOLOOPER SECTIONS

2.1   CLOCK section

In order to perform synchronizations sickoLooper relies on the use of clock, whether generated internally or through the use of an external clock.

Each bar consists of a number of clocks based on the time-signature set by the *MTR* knob (meter), so each bar in 4/4 will consist of 4 clocks, while each bar in 7/4 will consist of 7 clocks.

The available time-signatures are: 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 5/8, 6/8, 7/8, 8/8, 9/8, 10/8, 11/8, 12/8, 13/8, 14/8, 15/8.

With the *BPM* knob you set the clock speed, expressed in beats per minute. By varying the speed, loop recordings remain unchanged and no time-stretching is performed on them.

It should be noted that to avoid confusion and complications of use with external clock sources, it has been determined that time-signatures in eighths do not affect bpm, so a beat in 4/4 at 120bpm will have the same duration as a beat in 8/8 at 120bpm, despite the fact that there are twice as many beats in a minute in 8/8 as in 4/4.

If you don't want to use the internal clock generator, external clock sources can be used, connected to the *EXT CLK* input.

The internal clock is activated only when at least one track is running, while using an external clock forces sickoLooper to consider the clock always on, so if the click is activated it will always be audible.

The *RST* button resets the beat counter, so the next clock generated or received will be considered a bar clock, with the consequences on loop playback/recording.

The *CLK OUT* output sends a 1ms trigger on each generated clock or received.

2.1.1 From clocks to loops

We have seen that each bar consists of a certain number of clocks according to the time-signature.

With sickoLooper you can record loops composed of one or more bars (measures), from 1 to 16, which are set on each track using the *MEAS* knob.

For example, a loop recorded in 4/4 for 1 measure has a duration of 4 clocks, while a loop recorded in 3/4 for two measures has a duration of 6 clocks.

Regarding time-signatures in octaves, confirming the above, a loop recorded in 7/8 for one measure will have a duration of 3.5 clocks. The loop in 7/8 recorded for two measures will have a duration of 7 clocks.

2.2 CLICK section

If the *CLICK* button is enabled, the click is sent to the *EAR* output.

The volume of the click can be adjusted using the *LVL* knob with a range of 0-200%.

The *MST* button also enables the click to be sent to the *MASTER* output.

The *PREROLL* button enables prerolling, which can be set by the switch to 1 or 2 bars.

By enabling prerolling, it will take effect only when all tracks are stopped.

During the prerolling phase, it is possible to cancel the start of the tracks by acting on the corresponding playback or recording controls.

2.3 ALL TRACKS section

The *STRT/STOP* button, or a trigger on the corresponding trig input, starts playback of all recorded tracks.

If at least one track is already playing, recording, or overdubbing, pressing the *STRT/STOP* button, or a trigger on the corresponding input, will cause all tracks to stop.

If the *STOP* input is connected, all tracks will be stopped upon receiving a trigger on it, and the *STRT/STOP* input can only be used to start tracks.

[10]

2.4   SOURCES section

There are up to 5 separate stereo inputs, each with its own *LVL* level knob and *MUTE* button.

If only the LEFT input is connected, it is duplicated on the other channel.

The input level range is from 0 to 200% in order to amplify rather low signals. The knob set in the center therefore indicates a level of 100%.

Polyphonic sources can be used and will be summed in one single audio signal per channel.

2.5   TRACK section

Each track can be connected internally to any source by acting on the *SRC* knob.

The *MEAS* knob sets the duration of the loop expressed in bars or measures, from 1 up to 16.

Each track can assume the following states:

- EMPTY: the track is empty and can only be recorded.
- IDLE: the loop has been recorded but the track is not running.
- PLAYING: the track is running and is playing the loop.
- RECORDING: the track is running and is recording the loop for the first time.
- OVERDUBBING: the track is running and is overdubbing the previously recorded loop.

[11]

2.5.1 PLAY, REC, STOP, ERASE buttons

The *PLAY* button, or a trigger on its input, starts playback of the previously recorded loop.

The *REC* button, or a trigger on its input, starts recording if the track is empty, or overdubbing if a loop has already been recorded on that track, taking the source input set by the *SRC* knob.

The *STOP* button, or a trigger on its input, stops playback, recording or overdubbing of the loop.

The *ERASE* button pressed with a double click, or a single trigger on its input, deletes the previously recorded loop, emptying the track. Only loops whose tracks are idle can be deleted.

The following describes the behavior of the LEDs of the *PLAY* and *REC* buttons according to the state of the track:

- empty: LEDs are off

- idle (recorded and stopped): the *PLAY* button is lit steady green.

- playback in progress: the *PLAY* button is flashing

- recording in progress: the *REC* button is flashing

- overdubbing in progress: both the *PLAY* and *REC* buttons are flashinig

If a track command has been sent to sickoLooper that is waiting for the end of the loop, the button LEDs flash quickly to indicate that the command is pending.

Pending track commands can be canceled by pressing the corresponding button again.

2.5.2 Track display bar

A vertical bar display placed on each track colors differently depending on the status of the track and progressively indicates the position of the loop relative to the total duration of the recorded loop.

The colors the display can take are as follows:

- black: the track is empty

- red: the track is recording for the first time

- blue: the track is idle

- evolving green: the track is playing

- evolving yellow: the track is overdubbing

If the track that is playing or overdubbing has been set to a lower measure than its initial recording, when the bar reaches its visible maximum, it turns dark green or dark yellow respectively, to indicate this particular situation.

On the other hand, if the track has been set to a higher measure than its initial recording, when the loop is played or overdubbed the bar starts over again without having reached its maximum.

2.5.3 Track context menu

Right-clicking on the display bar of each track opens the track context menu with the following options:

- **Fade IN on playback**

  When a loop starts playback or overdub from the idle state, a fade-in will be performed according to what is set on the *XFD* knob.

- **Play Full Tail on Stop**

  With this option ticked, when a loop stops at its natural end, the entire tail will be played back without fadeout except for a fadeout of 8ms before its final stop, otherwise the tail will be played back with a fadeout of the value set by the *XFD* knob.

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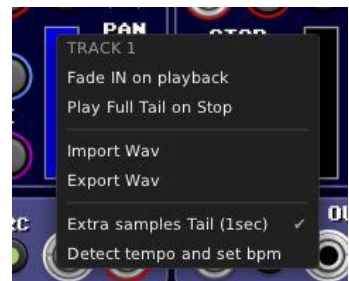
In case a track is set for a measure less than the initial loop recording, the tail is still full played back.

- **Import Wav**

  Loads a wav file into the track.

- **Export Wav**

  This option is active only if the track is not empty and saves the loop in a wav file, including the second of extra samples tail (see par. 3.1).

- **Extra samples Tail (1sec)**

  Ticking this option tells sickoLooper whether the loop recorded on a track includes the second of recording tail (see par. 3.1).
  If the loop was recorded with sickoLooper this option should remain enabled, but if imported loops are used it should usually be disabled.
  This information is used to synchronize loops and perform necessary fades or crossfades or when you want to correctly calculate the tempo from an imported loop (see *Detect tempo*).

- **Detect tempo and set bpm**

  Clicking on this function sickoLooper calculates the loop recorded tempo in the track and updates the display and the BPM knob. It is important to know that the tempo is calculated on the length of the loop, the number of measures or bars set, and whether or not the extra samples tail option is checked.

2.5.4 Other track controls

The small LED buttons *START immediately* and *STOP immediately* start or stop playback or overdubbing without waiting for the natural end of the loop, as explained later.

The *SYNC* button activates loop synchronization.

The *REV* button, sets reverse playback or overdub of the loop. The direction changes only when the loop reaches its end.

It is worth pointing out that reverse playback or overdub does not perform crossfades when the end of the loop is reached,

because there is no recording tail at the beginning of the loop to be able to perform a fade (see Section 3.1)

The *1SHOT* button plays, records or overdubs the loop only once, and then stops the track by bringing it to idle state.

The *SOLO* button allows playback, recording or overdubbing for only one track at once from those selected as solo. The setting of the *SOLO* button can be changed only if the track is empty or inactive.

The *XFD* knob sets the crossfade time between the end of the loop and the restart of it. It can be set from 0 up to 1000ms. The default value is 8ms. The set duration is also used in other cases described in other parts of this manual.

The *PAN* knob performs a stereo pan on the track output. Note that the panning is done on the input source only on the individual track output, but not on the *MASTER* or *EAR* main outputs, so what is recorded or overdubbed is not immediately affected by panning on the main outputs until it is played back.

The *VOL* knob sets the volume of the track.

2.5.5 Track output

The *EoL* output sends a 1ms trigger when the end of the loop is reached, and also when loop stop is forced if the "*Eol pulse on stop*" option is checked in the general context menu.

The *SRC* button on sends the source signal to the track output. If the *SRC* button is off, the source is sent only to *MASTER* out if the option "*SOURCEs to MASTER out*" is checked in the general context menu.

The *OUTs* are the stereo outputs of the track.

2.6 MAIN OUTS section

There are two separate stereo main outputs called *EAR* and *MASTER*.

Normally these outputs are the total mix of all tracks and sources, but it depends on whether the "*Only Click on EAR"* and "*SOURCE to MASTER out*" options are checked (see par. 4).

On the *EAR* output the click is ever added if enabled, and it is just meant to be connected to headphones.

The *MASTER* output is normally connected to the speakers, but if you want to add click on this output as well, simply turn on the *MST* button in the click section of sickoLooper.

If the track outputs are used for separate routing and processing, it is good to remember that their signal is also sent to the main outputs, so care should be taken not to duplicate their signal, unless intentionally.

3. SICKOLOOPER IN DEPTH

3.1 The recording tail

To avoid annoying clicks between the end and restart of loops, they are recorded or overdubbed for an additional second, called the *recording tail*, and its duration of 1000ms corresponds to the maximum crossfade time setting.

By properly adjusting the *XFD* knob, it is possible to attenuate the clicks as much as possible without losing too much loop attack.

To maintain synchronization with tempo and time-signature, sickoLooper starts the loop crossfade from the beginning of the tail, just as the loop is restarting.

When using imported loops, however, it is possible that clicks will still occur, because, as mentioned earlier, using them would involve disabling the checkmark on "*Extra samples Tail (1sec)"* in the track context menu, so in this case sickoLooper cannot use any tail to crossfade.

However it is still possible to attenuate this problem by ticking "*Extra samples Tail (1sec)"* and setting the *XFD* knob appropriately, but be aware that the loop will be considered by sickoLooper to be one second shorter.

It should be noted that when playbacks or overdubs start from an idle state of the track, a default fade-in is not performed, but it is useful to remember that there is the "*Fade IN on playback*" option in the track context menu for this purpose (see par. 2.5.3).

Furthermore, when overdubing a track without the "*Extra Samples Tail (1sec)*" option checked, the missing second of recording tail will be recorded and added to the loop, and the "*Extra Samples Tail (1sec)"* option will automatically be checked*.

3.2 SYNCed tracks

SYNCed tracks are those tracks that have the *SYNC* button turned on.

When all tracks are stopped, the first track to receive any playback, recording or overdub command will activate the internal clock and the command will be executed immediately. On the other hand, if an external clock source is being used, that command will have to wait until the next bar is detected to take effect.

If at least one track is running, any command on a SYNCed track will remain pending until the next bar. As described above, while pending, the LEDs on the *PLAY* and/or *REC* buttons will flash rapidly depending on the command received.

3.2.1 START immediately button

The behavior of a track when the *START immediately* button is on is described below.

If there are other tracks running, an idle track receiving a playback or overdub command will immediately execute the command, starting not from the beginning of the loop, but from the same position of the other tracks, i.e. from the relative position reached within the bar.

It should be pointed out that if the loop is longer than one bar, it will always start from the relative position within its <u>first</u> bar, so care must be taken as to the right time to give commands on that particular track.

When a loop is already playing or overdubbing, you can immediately switch to the other state by pressing the *REC* or *PLAY* button respectively with an 8ms fade-out.

3.2.2 STOP immediately button

The following describes the behavior of the track if the *STOP immediately* button is on.

When the loop is playing or overdubbing, it can be stopped immediately by bringing the track status to idle by pressing the *PLAY* or *STOP* button.

When the loop is overdubbing, it can be brought directly into playback by pressing the *REC* button, which is to be understood as stopping the overdubbing.

These state changes take effect with a fade-out of 8ms.

Note that if the *STOP immediately* button is on and *START immediately* is off, when the loop is overdubbing and the *PLAY* button is pressed, the state will change to playback only when the end of the loop is reached, since pressing the *PLAY* button should be understood as starting playback and not stopping overdubbing.

If a track is set to *SOLO*, the *START immediately* and *STOP immediately* buttons have no effect if the other *SOLO* tracks are currently playing, recording or overdubbing.

3.3   NON-SYNCed tracks

On NON-SYNCed tracks, which are those which *SYNC* button is off, the *MEAS* knob is ignored for recording, playback or overdubbing purposes, but it is important to indicate this information correctly when you want to calculate the BPM of the loop with the "*Detect tempo*" function in the track context menu.

NON-SYNCed idle tracks go running instantly when the *PLAY* or *REC* button is pressed, with no synchronization with bars or other tracks, but they do start the internal clock.

The first recording starts by pressing the *REC* button and is stopped by pressing the *STOP* button, or the loop can enter playback immediately by pressing the *PLAY* button, or enter overdub immediately by pressing the *REC* button again.

The same rules for SYNCed tracks apply to the *START immediately* and *STOP immediately* buttons.

3.4   Miscellaneous

If the first recorded track is not synchronized (*SYNC* button is off), the tempo in BPM will be automatically calculated at the end of recording, and if you are using the internal clock, a reset is made on it, to allow immediate synchronization on other tracks to be recorded. This function is useful if you want to start recording loops without setting the tempo in advance (see Quick Start par. 1.2).

Normally the *1SHOT* option stops the loop when the first loop end is detected, but if a playback or overdub command has been given before it is reached, the stop is postponed until the next loop end.

If both synchronized and non-synchronized *SOLO* tracks are present, the pending synchronized ones will start on the first useful bar after the non-synchronized ones have reached the loop end.

Any pending command due to synchronization or during prerolling can be canceled by pressing the same corresponding button. Commands given to *SOLO* tracks are automatically cancelled by those given to other *SOLO* tracks.

4. GENERAL CONTEXT MENU

The general context menu opens by right-clicking anywhere on the sickoLooper panel.

It includes general options that can be evaluated and set before using sickoLooper, or changed later to improve the user experience.

- **SOURCEs to MASTER out** (ticked by default)
  This option routes all audio sources to *MASTER* out. If disabled, the *MASTER* output will only receive track playback.
- **Only Click on EAR**
  Enabling this option only click is sento to the *EAR* output.
- **EOL pulse on STOP**
  With this option enabled, the *EoL* track outputs will send a trigger even when the loop is forced to stop.
- **PLAY Button Sequence**
  The *PLAY* button and its trig input can be set for for different behaviors as needed or to replicate the functionalities of other kind of loopers.

  There are three modes available:

  - ➢ *Play -> Stop* (default): the *PLAY* button starts or stops the loop.
  - ➢ *Rec -> Play -> Overdub*: when a track is empty, the loop is recorded. If the loop is recorded and track is idle, it goes to playback and a subsequent press of the *PLAY* button will overdub. Only the *STOP* button stops the loop.
  - ➢ *Rec -> Overdub -> Play*: when a track is empty, the loop is recorded. If the loop is recorded and track is idle, it goes to overdub and a subsequent press of the *PLAY* button will playback. Only the *STOP* button stops the loop.

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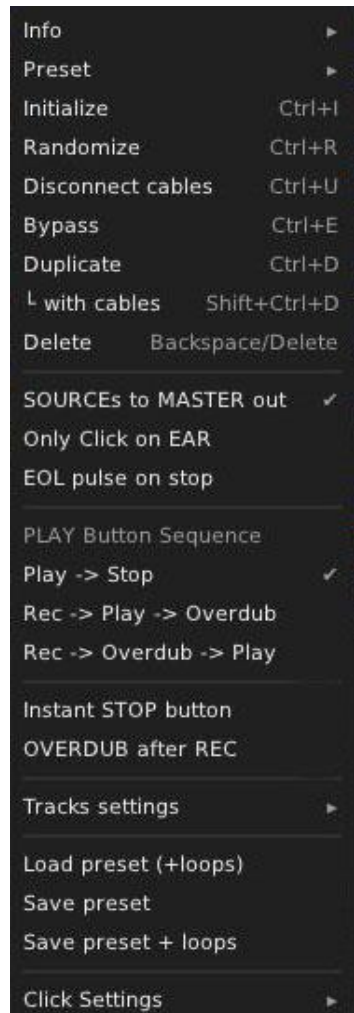
- **Instant STOP button**
  If this option is enabled, when the *STOP* button is pressed, the track will immediately stop and set to idle state. It has no effect only on the first recording of SYNCed tracks, because they must necessarily be fully recorded.
- **OVERDUB after REC**
  If this option is enabled, at the end of the first recording of a track, and if no other control is pending, the track automatically switches to overdub.
- **TRACK settings**
  This submenu fully replicates the track context menu for each individual track (see par. 2.5.3).
- **Load preset(+loops)**
  This function loads a ".slp" preset file where all sickoLooper settings are stored. If loop audio files are detected, they are loaded into the module too.
- **Save preset**
  This function saves a ".slp" preset file with all sickoLooper settings.
- **Save preset + loops**
  This function saves a ".slp" preset file with all sickoLooper settings and all recorded loops in separate wav files.
- **Internal Clock Always ON**
  If internal clock is used, it will run also even if all tracks are idle, just like when using external clock.
- **Click Settings**
  - ➢ **Click Preset.** Three preset types of audio clicks are available in the submenu, each with a beat and a bar sound.
  - ➢ **Load BEAT click / Load BAR click.** The audio click can be customized by loading mono samples in wav format using the *Load BEAT click* and *Load BAR click* functions.

5. sickoLooper1 / sickoLooperX

sickoLooper1 and sickoLooperX modules, hereafter abbreviated SL1 and SLX, are single-track loopers and follow basically the same operation as the other sickoLooper3/5.

5.1 sickoLooper1 (SL1)

SL1 has a CLOCK/CLICK/ALL section and a TRACK section like the others sickoLooper3/5. There is no EAR and no MAIN sections and the click is routed to the specific CLICK output.

CV VOLUME and CV PAN inputs are added as well as a triggerable REV input.

The CV PAN input range can be selected in the right-click menu and can be chosen from: 0-10v, ± 5v, ±10v

There is no SOLO functionality on this module as on sickoLooper3/5.

A v/oct input (v.o) has been added for playing the loop at a different speed from the original resulting in a pitch change.

Using SYNCed loops and the v/oct input is connected and differs from 0v, SL1 is not able to play the loop exactly to measure, so with pitches greater than C4 the loop will be played entirely and there will be a period of silence before restarting, whereas with pitches less than C4 the loop is truncated when the clock-controlled bar is reached.

The ALL section is the same to sickoLooper 3/5 and it's used to start or stop loop playback also to its connected SLX expanders.

[22]

5.1.1 Reset

If internal clock is used, with a RESET buttonpress or by a trig detection on its input, the clock is reset, the bar restarts and, if the track is running, the only SYNCed loops start over.

If an external clock is used, when a trigger is detected on the reset input, the beat counter will be reset and, if in playback, only the loops of the SYNCed tracks will start over. On the other hand, if the RESET button is pressed manually, the only result will be that the next clock signal will be considered the bar one.

5.2 sickoLooperX (SLX)

The SLX module is a reproduction of SL1 without the clock section and can be used either as an unsynced stand-alone looper module or as an expander of SL1 by placing it to its right.

With the latter configuration, you can add to SL1 as many tracks you want, always placing other SLX modules to the right, and they will be synchronized and controlled by the SL1 master, which will be the first on the left.

When used as a stand-alone module SLX always records and plays unsynced loops, even if the SYNC button is on. The ability to synchronize the loop will be restored as soon as the connection with an SL1 master module is detected.

6. CREDITS

SickoCV is the name of the plugin project for the VCV Rack platform that groups together all modules created by Sickozell, including sickoLooper3 and sickoLooper5.

SickoCV is open source and distributed under the GPL-3.0-or-later license. It's available for free on gitHub and on the official VCV Rack library.

Some of the graphic components of the SickoCV modules are © VCV under creative commons license CC BY-NC-4.0

Sickozell would like to thank Andrew Belt and all the VCV Rack staff for creating and making this platform available, open source and free of charge.

Best thanks to all the entire VCV Rack forum community for their help in the development of these plugins.

A big thank to Omri Cohen for his teachings and support.

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