# Functions v1.0 by NOISS COKO

DESCRIPTION

Functions is a versatile control device, designed as a dynamic modulation source for both Live and external parameters. Integrated by two editable waveforms, it could be played both as a classic LFO, or a complex envelope, being triggered by incoming MIDI notes. These modulation sources are distributed at will between five output layers, each assigned either by individual Map buttons, or by sending out any of the available MIDI message formats: Control Change, Pitch Bend, Modulation Wheel, Foot Control or Aftertouch.
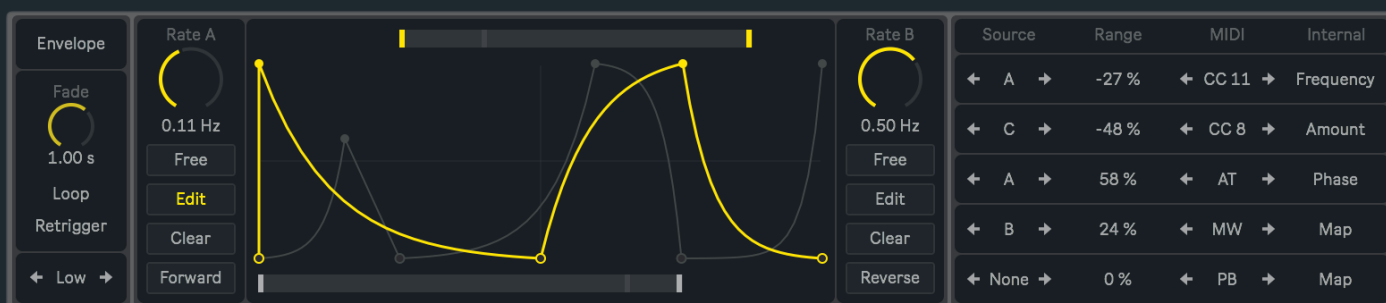
Easily target single parameters from instruments, effects or others inside the Live set, then use these modulation sources to add expression and make sounds even more interesting. Some of these options are particularly useful when working with instruments like **Sampler**, **Operator** or even **Wavetable**, all of which offer a versatile modulation section for very specific parameters that otherwise would not support MIDI mapping nor clip automation.

FEATURES AND FUNCTIONS

MODE PANEL

LFO/Envelope Switch

Switches between the two different ways in which this device operates:

• **LFO**: Both functions are played as periodic waveforms, just as a regular low frequency oscillator will do. Here, incoming MIDI notes have no effect over any parameter.

• **Envelope**: The device now works as an envelope, depending on incoming MIDI notes for the functions to be triggered. Notice that **Fade, Envelope Mode and Trigger Mode parameters are only enabled while this option is selected.** Depending on how these three options are configured, the envelope will slightly change its behavior and adapt to different needs.

Fade

Sets the in and out fade time that affects the gain amount of both functions. Fade in starts when a MIDI note on message is received, signal begins to fade out when a note is released. This could be also presented as a first Attack time, then followed by a Release instance.

Envelope Mode

While the LFO/Envelope switch is set to Envelope, two different modes define its behavior:

• **Loop**: In spite of the device working as an envelope, functions will play on a loop or as a periodic waveform, as long as the MIDI notes are held down. Similar to the LFO mode, but here opening and closing the signal flow according to incoming MIDI note messages. Also a fade in and out time will be applied over the signal.

• **One-Shot**: Most similar to a classic envelope, where each function will only play from start to end once, until a new MIDI note on message is received. Fade time is still applied.

Fade Trigger Mode

Could be thought as a phase restart enabling option for the Fade parameter and eventually both functions as well. While the One-Shot Envelope Mode is selected, these two options will only define how the Fade parameter behaves, always having both functions played from the start, regardless of the current selection. However, this toggle will also affect the functions phase if the Envelope Mode is set to Loop.

- **Legato**: Fade in starts from where it was right before receiving a new MIDI note on message. If Envelope Mode is set to Loop, functions starting point will be detached from MIDI notes.

- **Retrigger**: Fade in starts from cero, no matter where the fade signal was right before receiving a new MIDI note on message. If Envelope Mode is set to Loop, functions phase will also be reset every time a MIDI note is received.

Grid Resolution

Enables different fixed grid resolutions, depending on what fits better for editing. Depending on the current resolution, all nodes will be snapped to fixed X and Y points along the display.

Left and right arrows are used to navigate between the four available options:

- **Low**: Three point resolution for X and Y.

- **Mid**: Nine point resolution for X and Y.

- **High**: Seventeen point resolution for X and Y.

- **Off**: Free editing, with no limited points nor grid snapping.

FUNCTIONS PANEL

Source Shape Display

This section allows to draw and edit both functions. Edit buttons define which of the two will be enabled for editing.

Here is a list of the three available **editing shortcuts or actions**:

- **Add a new node** by simply clicking at any point inside the display. Click over a node and then drag it to a different position while holding the selection. Depending on its current resolution, all nodes will be automatically snapped to the grid, unless this option is turned off.

- **Shift+Click** deletes an individual node.

- **Holding down the Option Key (Ctrl on Windows)** while clicking and dragging the mouse up and down, creates different curves over the lines between nodes.

Fragment selectors

It is easy to create new shapes by simply extracting a small fragment from the original function. Each layer has its own brace, defined by the starting and ending point markers. The top one corresponds to Function A, while the one at the bottom is reserved for Function B.

Rate

Controls each function playback speed or frequency, using hertz or beat divisions, depending on the current Rate Mode.

Rate Mode

This button switches between the two unit styles available for the Rate Dials, which basically control each source running speed or frequency.

Rate A

0.11 Hz

Free

Edit

Clear

Forward

- **Sync**: rate values are displayed as beat divisions, representing a specific fraction of Live's global tempo. In this case, functions become active only after Live's global transport starts running.

- **Free**: rate values are displayed as hertz, expressing the signal frequency.

Layer Edit
These buttons select which of both functions is currently enabled for editing. The selected function will be displayed in yellow, while the other remains disabled in the background.

Layer Clear
Clears that individual function.

Playback Mode
Two different playback modes are available for each individual function:

- **Forward**: played from left to right.

- **Reverse**: played from right to left.

OUTPUT PANEL

Source
For each one of the five output instances, it is possible to individually choose between one of the two sources or functions available. This will only allow a specific set of values to be used as a control signal for that output, defining both the mapped Live parameter and the MIDI message.

Range
Negative Range percentages will shrink all control values towards their minimum, scaling the original values while keeping some relative difference between them. Positive percentages will do exactly the opposite, leaning all control values towards their maximum range.

MIDI
Besides being able to map and control Live parameters, control values can also be sent as different kind of MIDI messages.

Depending on what instrument or effect is receiving the information, MIDI messages could be formatted as:

- **CC:** MIDI messages are sent as Control Change. This value assigns a unique and exclusive Control Change Number to the message. It will not determine the parameter modulation, but it will be used to associate a specific Control Change message with the external parameter that wants to be modulated. With this control number, the receiver knows that this and no other parameter has to be changed.

- **PB:** MIDI messages are sent as Pitch Bend. By default most devices reserve this type of message for pitch modulation, but the effect will ultimately depend on how the receiving device is configured.

- **MW:** MIDI messages are sent as Modulation Wheel.

- **FC:** MIDI messages are sent as Foot Control.

- **AT:** MIDI messages are sent as Aftertouch.

- **Off:** No MIDI information is sent through. This remains independent from the Map function.

Source	Range	MIDI	Internal
← A →	-27 %	← CC 11 →	Frequency
← C →	-48 %	← CC 8 →	Amount
← A →	58 %	← AT →	Phase
← B →	24 %	← MW →	Map
← None →	0 %	← PB →	Map

Some of these options are particularly useful when working with instruments like **Sampler**, **Operator** or even **Wavetable**, all of which offer a versatile modulation section for very specific parameters that otherwise would not support MIDI mapping nor clip automation.

Map

Besides controlling external devices, Functions allows to map and modulate any parameter inside Live. In order to perform a new selection, click over Map, and while the button is blinking, select the parameter that wants to be controlled by Functions. When this action is done, the button will show the name of the recent selection.

To undo this action click over Map once again and wait five seconds. After this time the previous parameter will be cleared and the Map button default state restored. The current parameter will also be displaced and released every time a new one is assigned.

CREDITS

ABOUT

DEVICES

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