

Functions v2.0 by NOISS COKO

Functions features a pair of simple MIDI and audio devices, mainly designed as control sources for Ableton Live parameters and external instruments or effects. All control values are set from two editable waveforms, played both as an LFO or a complex envelope that is triggered by incoming MIDI notes. Parameters are then distributed at will across five output layers, assigned by individual Map buttons, or linked to other devices using any of the available [MIDI message formats](#).



Easily target any parameter within a

Live set, then use Functions to add expression, precise control and degrees of randomness that result in more interesting sounds and dynamic patterns.

SOURCE SECTION

Function Display

The A and B buttons define which function is currently enabled and accessible for editing. The selected one will be displayed in yellow, while the other remains disabled in the background. Notice that Clear, Rate, Playback Direction, Playback Mode, Fade Time and Trigger Mode are set independently for each function.

Edit Window

This section allows to draw and edit both functions. The A and B buttons define which of the two will be enabled.

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

- **Add a new node** by simply clicking at any point inside the display. Click over a node, then drag it to a different position while holding the selection. Depending on the [grid 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 (Alt on Windows)** while clicking and dragging the mouse up and down, creates different curves over the lines between nodes.



Grid Resolution

Enables fixed grid resolutions. Depending on the current selection, all nodes will be snapped to fixed X/Y points. Left and right arrows are used to navigate between the four available options:

- **Low**, three point resolution for X/Y.
- **Mid**, nine point resolution for X/Y.
- **High**, seventeen point resolution for X/Y.
- **Off**, free editing, with no limited points nor grid snapping.

Playback Direction

Three different playback modes are available for each individual function:

- **Forth** plays the function forward.
- **Back** plays the function backwards.
- **Pong** plays the function back-and-forth.

Rate

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

Rate Mode

Clicking over the Rate caption switches between the two different unit styles that are used to define both functions playback speed:

- **Sync** uses beat divisions to set rate values, representing a specific fraction of Live's global tempo.
- **Free** uses hertz to set rate values, expressing the frequency as cycles per second.

Clear

Deletes the buffers and all previously recorded or saved data for the X/Y positions.

Playback Mode

Switches between three different ways in which these functions operate:

- **LFO**, the function is played as a periodic waveform or a regular low frequency oscillator. Incoming MIDI notes have no effect over the signal.
- **Curve**, the device now works as an envelope, depending on incoming MIDI notes for the function to be triggered. Most similar to a classic envelope, where each function will only play once from start to end, until a new MIDI Note On message is received.
- **Blend**, the device still works as an envelope, but functions will play on a loop as long as one MIDI note is being sustained. Similar to LFO, but opening or closing the signal flow according to incoming MIDI Note On and Off messages.

Notice that **Fade Time and Trigger Mode parameters are only enabled while Curve or Blend are selected.** Depending on how these two are configured, the envelope will slightly change its behavior and adapt to different needs.

Fade Time

Sets the fade in and out time that is applied over each function's gain. The fade in starts when a MIDI Note On message is received and the signal begins to fade out when a note is released.

Trigger Mode

A phase restart option for the Fade Time parameter and both functions too. While Curve is selected, these two options will only set how the Fade Time parameter behaves, always having functions played from the start. If Blend is chosen instead, these options will also affect the function's phase.

- **Legato**, fade in starts from where it was right before receiving a new MIDI Note On message. Its phase is not reset. If Playback Mode is set to Blend, the function's phase will not be reset when a MIDI note is received.
- **Reset**, fade in always starts from zero, no matter where the fade signal was right before receiving a new MIDI Note On message. If Playback Mode is set to Blend, the function's phase will also be reset when a MIDI note is received.



Input Control

Defines which function controls the amplitude and which the panning of Functions Audio Effect's input signal.



Amp

Use function A or B to control the amplitude of Functions Audio Effect's input signal.

Pan

Use function A or B to control the panning of Functions Audio Effect's input signal.

OUTPUT SECTION

Functions is actually composed by two versions of the same device. Depending on the task, either the MIDI or the audio effect could feel more useful or appropriate. Nonetheless, both present the same characteristics, with the only exception being that no MIDI column is included in the audio effect outputs. A set of Amount values is offered instead.

Jitter

Adds more or less random variations to the original signal. In this case, the amount also defines a specific range between its current position and that selected at random.

Switch Windows

Displays one of the two different sets of parameters available for Functions' main interface. The first window features the Source/Functions section, while the second reshapes these values and defines what Live or external parameters are controlled by Functions.

Lag

Produces a smooth transition between one control value and the next. How long the transition takes is defined by this parameter.

Source

For every individual output, it is possible to choose one of the two available sources, shaped by the main functions integrated in this device.

This allows a unique set of values to be used as a control signal for different external parameters or others within the Live set.

Jitter	15 %					
Route						
Lag	36 ms					
Source	Min	Max	Offset	MIDI	Internal	
A	18 %	91 %	-18 %	PB	Point	
B	80 %	18 %	10 %	OFF	Density	
None	0 %	100 %	0 %	CC 25	Speed	
A	29 %	59 %	38 %	FC	Map	
None	0 %	100 %	0 %	OFF	Map	

Minimum and Maximum

Before they are used as control sources, the Min and Max parameters rescale the functions outputs, restrict their values and force them to stay within a specific range.

Offset

Shifts the currently selected source towards its high or low end. As the source starts falling outside any of both extremes, their values will simply bounce back and be forced to stay within the range.

MIDI

Depending on what instrument or device is receiving the information, control sources can be formatted as:

- **CC** or Control Change. This type of message always feature two different yet simple elements. These are used by the receiver to identify what specific parameter is now being controlled (CC Number) and what is that parameter's new state or position after the message is received (CC Value). In this case, values are defined by the incoming source and the number is determined by the CC X box that is displayed when this format is chosen.

	Source	Min	Max	Offset	MIDI	Internal
Jitter 15 %	◀ A ▶	16 %	91 %	-18 %	◀ PB ▶	Point
A	◀ B ▶	80 %	16 %	10 %	◀ Off ▶	Density
Route	◀ None ▶	0 %	100 %	0 %	◀ CC 25 ▶	Speed
Lag 36 ms	◀ A ▶	29 %	59 %	38 %	◀ FC ▶	Map
	◀ None ▶	0 %	100 %	0 %	◀ Off ▶	Map

- **PB** or Pitch Bend. Generally used to bend an instrument's pitch up and down, but its effect ultimately depends on how the receiver is configured to interpret this specific type of message.

- **MW** or Modulation Wheel.

- **FC** or Foot Control.

- **AT** or Aftertouch.

- **Off** prevents a row's MIDI information from being output. Its Map function still remains independent.

These formats 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.

Amount


Controls the selected source overall range.

Map

Functions allows to map and control parameters inside Live. Click on a Map button, and while it is blinking, select the parameter that is going to be linked. Its name will then be displayed as the new button caption.

To undo these steps, click on a Map button and hold until the previous selection is cleared or press the Internal title in order to clear all of them at once. Buttons' default state will then be restored.

	Source	Min	Max	Offset	MIDI	Internal
Jitter 15 %	◀ A ▶	16 %	91 %	-18 %	◀ PB ▶	Point
A	◀ B ▶	80 %	16 %	10 %	◀ Off ▶	Density
Route	◀ None ▶	0 %	100 %	0 %	◀ CC 25 ▶	Speed
Lag 36 ms	◀ A ▶	29 %	59 %	38 %	◀ FC ▶	Map
	◀ None ▶	0 %	100 %	0 %	◀ Off ▶	Map

GO 

Pitch **48.3** Hz

Drive/OT **22.8 %**

Attack **0.00 %**

Decay **71.2 %**

Env **57.8 %**

Volume **-2.3 dB**

Click

ABOUT DEVICES

Functions v2.0

Developed by Javier Salthú aka NOISS COKO

Published by Isotonik Studios

2024

