

# VAPoly16

## Bitimbral Polyphonic Synthesizer



## User Guide

Version 1.0

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# Introduction

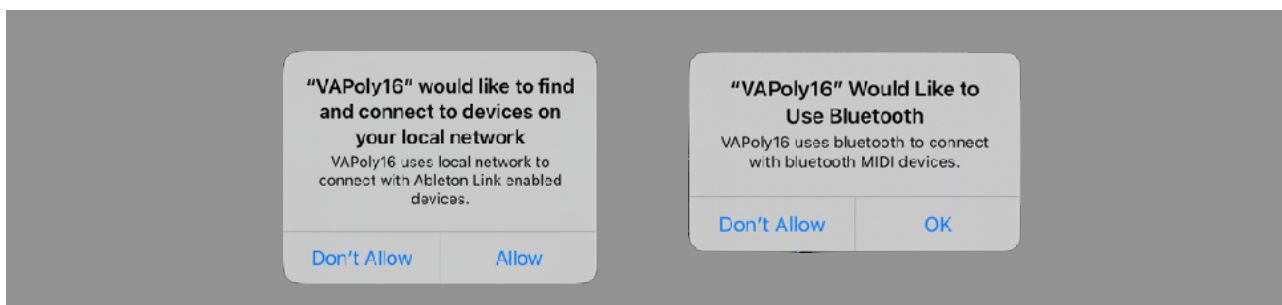
Thank you for purchasing VAPoly16. To help you get the most out of this product, please read this manual carefully.

VAPoly16 is a virtual analog bitimbral polyphonic synthesizer for iPhone, iPad and Mac. It features 16 voice synthesizer, effects, sequencer and audio visualization tools. It operates as a stand alone or as an AudioUnit Extension (AUv3). Stand Alone supports Ableton Link, MIDI and audio file export.

The synthesizer consists of two 8 voice synthesizer, which features two oscillators, two ADSR envelopes, resonant high pass and low pass filter and an amplifier per voice. The oscillators features continuously variable wave shape and wide variety of modulation. The filters are modeled on the Sallen-Key filter circuit for classic analog sound. The Effects include delay, chorus, flanger, reverb, eq and compressor. The sequencer features piano roll and automation editor to program 16 bar pattern per clip. Project files can be saved in iCloud Drive, so that the project can be accessed from iPhone, iPad or Mac.

## Privacy Settings

VAPoly16 uses local area network to connect Ableton Link enable devices and it uses bluetooth to connect with bluetooth keyboard and controllers. When dialogue appears to confirm use of the local network or the bluetooth, tap OK to give a permission to use them. These settings can be edited in Privacy section of the Setting App.



## Main Features

Virtual analog 16 voice bitimbral polyphonic synthesizer

Sequencer

16 bar patterns per clip. Total 16 clips.

Parameter automation.

Audio Export

Linear PCM format (AIFF, WAV and CAF) and compressed format (AAC)

Support Audio Unit Extension (AUv3)

Works on iPhone, iPad and Mac.

Support iCloud Drive.

Support Ableton Link, Bluetooth MIDI, MIDI In / Out.

## System Requirements

iOS 16.4 or later

macOS 13.3 or later

For iOS Devices, A10 Fusion or above is recommended.



AudioUnit Extension (AUv3) requires host application which support AudioUnit Extension. AudioUnit Extension is supported by Apple Logic and Apple Garage Band on iOS and macOS. For any other DAW, it depends on the application and some of them don't support AudioUnit Extension.

## Use as Stand Alone

Stand Alone mode features Audio Export, Ableton Link, MIDI input / output and bluetooth MIDI. Sequencer can be synced with Ableton Link enabled devices and softwares.

## Use as AudioUnit Extension (AUv3)

VAPoly16 supports AudioUnit Extensions. VAPoly16 works with host applications which support AUv3 plug-ins. By enabling host sync mode, VAPoly16 can be synced with tempo and transport state of the host application. VAPoly16 can send and receive MIDI message to/from the host, if the host supports midi in/out of AUv3.

## Factory Preset

Factory presets contains only values of parameters of the synth and the effects. It doesn't contain any sequence data. When loading the preset, it will change the value of the parameters but sequence data remains the same.

## User Preset

User Preset contains values of the synth parameters and the sequence data. When loading a user preset, value of the synth parameters and the sequence data are both changed.

User Presets can be saved in iCloud Drive or in AUv3 plug-in (iOS only). User Presets in iCloud Drive can be accessed from iPhone, iPad or Mac. AUv3 Plug-In Preset is stored on the device and saved preset can be accessed from any host application which support AUv3 User Preset.

## State Recovery

When VAPoly16 is used as a stand alone, it stores state of the app when the app is terminated. Stored data is recovered when it is launched at the next time. macOS version can disable this feature. The state is stored locally on the device.

## About MIDI Latency

Sending or receiving MIDI notes and messages to Software Applications introduces a latency. If you have a problem of latency and DAW or host application has channel delay, adjust the delay time to compensate the latency.

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- \* Ableton and Link are trademarks of Ableton AG.
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# User Interface



# macOS



# Transport Bar



## 1. Tempo (BPM)

Adjust BPM (Beat Per Minutes).

## 2. Play / Stop

Tap this button to play / stop the sequencer.

## 3. Record

Tap this button to enable / disable recording mode.

## 4. Metronome

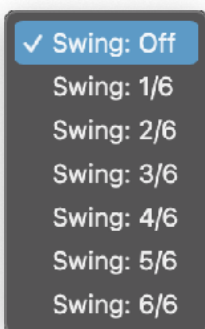
Tap this button to enable / disable metronome.

## 5. Sync

Tap this button to enable / disable host sync. When host sync is enabled, tempo and transport is controlled by the host application.

## 6. Swing

Tap this button to show Swing menu.



## 7. Beat Counter

Indicates current beat time as a format of bar, beat, and sixteenth.

## 8. Loop

Tap this button to open Loop Selector.

## 9. Loop Indicator

Indicate loop start, bar position and loop end.

## 10. Edit

Tap this button to open Bar Selector.

## 11. Editing Bar Indicator

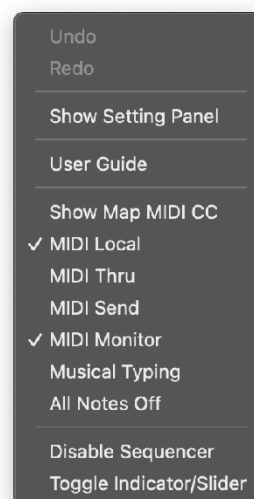
Indicate start and end of the editing bars.

## 12. Clip Indicator

Indicate a loaded clip.

## 13. Setting

Tap this button to show Setting Menu.



## Tempo Slider

Use this slider to adjust tempo. Adjustable range is +/- 20 BPM. Double tap on the slider will reset center position to the current tempo value.



## Loop Selector

Use this selector to select range of the loop.



## Bar Selector

Use this selector to select bar(s) for editing.



# Tool Bar



## 1. File

Tap this button to show file menu.

## 2. Preset Name

Indicates name of the selected preset. Tap this button to show preset list.

## 3. Parameter Name

Indicates name of the selected parameter.

## 4. Parameter Value

Indicates value of the selected parameter. Use plus and minus button to adjust the value.

## 5. Synth Part

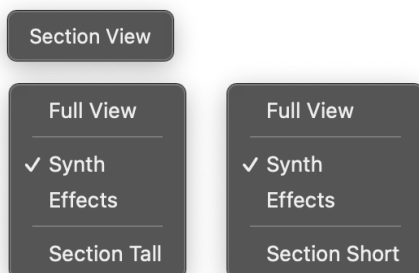
Tap these buttons to select synth part.

## 6. Layer / Split

Tap this button to select layer / split mode.

## 7. Synth

Tap this button to show Synth Menu.



## 8. Keyboard

Tap this button to show keyboard.

## 9. Audio Visualization Tools

Tap this button to show audio visualization tool.

## 10. Sequencer Menu

Tap this button to show sequencer menu.

## 11. Piano Roll

Tap this button to show piano roll editor.

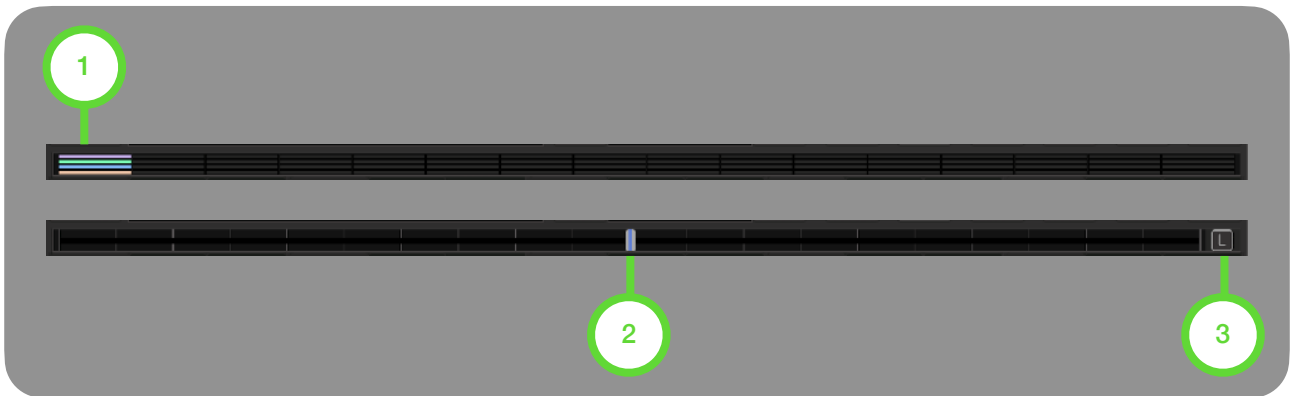
## 12. Automation

Tap this button to show automation editor.

## 13. Clip

Tap this button to show clip editor.

## Position Indicator / Master Slider



### 1. Position Indicator

Indicate position of clip, bar, step and selected steps for editing.

### 2. Master Slider

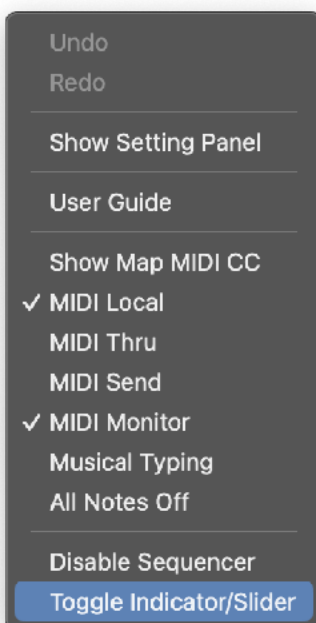
Adjust value of the selected parameter.

### 3. Lock Button

Tap the button to lock the selected parameter to the slider. Tap the button again to unlock.

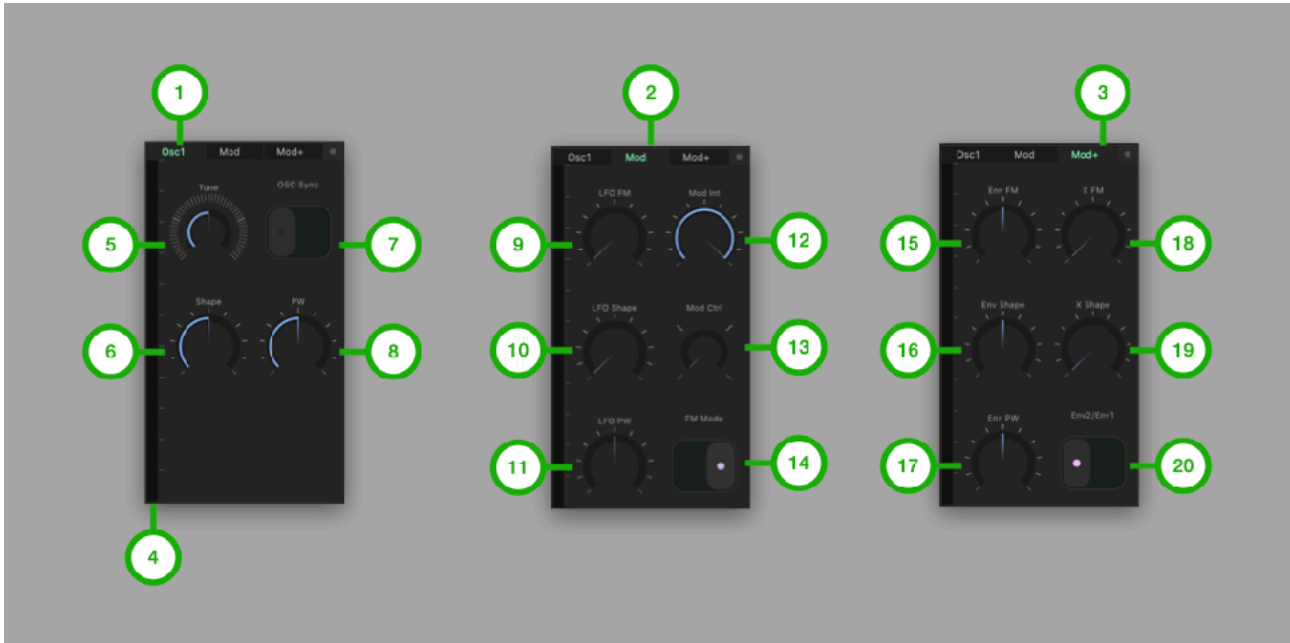
## Toggle Indicator / Slider (iPhone)

- Double tap on the view to toggle between indicator and slider.
- Select “Toggle Indicator/Slider” from the setting menu.



# Synth and Effects

## Oscillator 1



### 1. OSC1 Tab

Tap to Select OSC1 Tab.

### 2. Mod1 Tab

Tap to select Mod Tab.

### 3. Mod2 Tab

Tap to select Mod+ Tab.

### 4. Level Meter

Indicate output level of oscillator 1.

### 5. Tune

Adjust pitch of the oscillator (+/- 24 semitones).

### 6. Shape

Adjust shape of the oscillator waveform.

### 7. OSC Sync

Turn on/off oscillator sync.

### 8. PW

Adjust amount of the pulse width.

### 9. LFO FM Int

Adjust intensity of the LFO frequency modulation.

### 10. LFO Shape Int

Adjust intensity of the LFO shape modulation.

### 11. LFO PW Int

Adjust intensity of the LFO pulse width modulation.

### 12. Mod Int

Adjust intensity of the oscillator 1 modulation.

### 13. Mod Ctrl Source

Select a control to adjust modulation intensity.

### 14. FM Mode

Select frequency modulation mode.

### 15. Env FM Int

Adjust intensity of the envelope frequency modulation.

### 16. Env Shape Int

Adjust intensity of the envelope shape modulation.

### 17. Env PW Int

Adjust intensity of the envelope pulse width modulation.

### 18. XMOD FM Int

Adjust intensity of the XMOD frequency modulation.

### 19. XMOD Shape Int

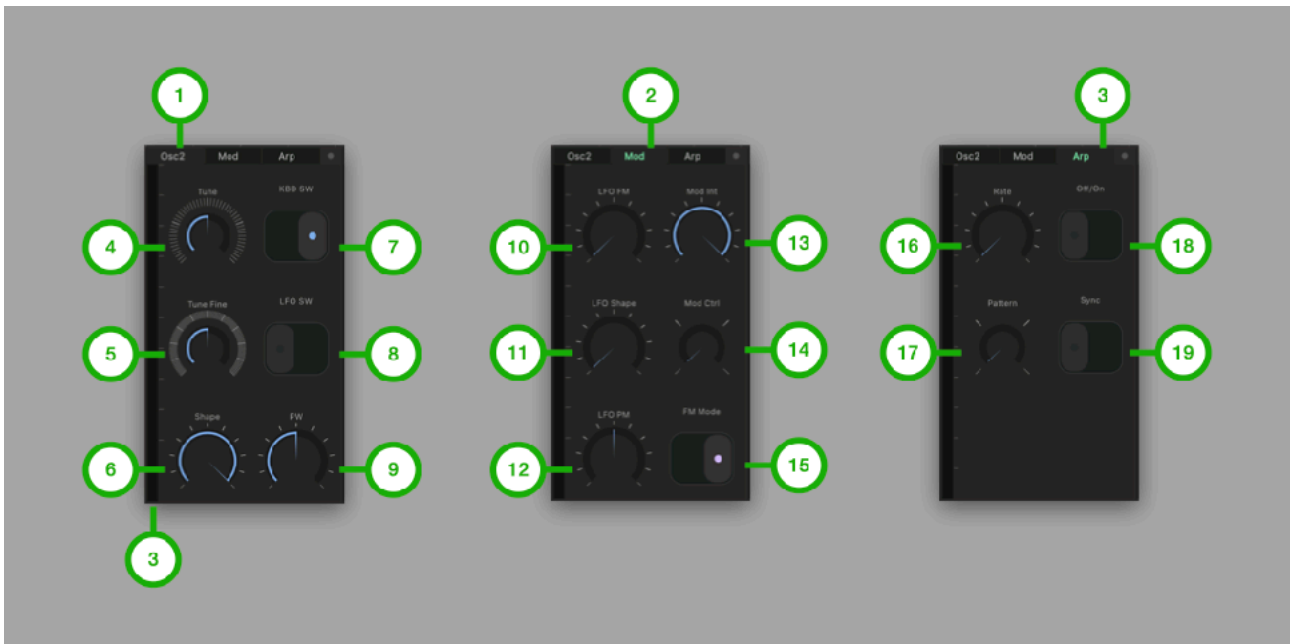
Adjust intensity of the XMOD shape modulation.

### 20. Env Source

Select an env for the env modulation.



## Oscillator 2 and Arpeggio



### 1. OSC2 Tab

Tap to Select OSC2 Tab.

### 2. Mod Tab

Tap to select Mod Tab.

### 3. Arp Tab

Tap to select Arp Tab.

### 4. Level Meter

Indicate output level of oscillator 2.

### 5. Tune

Adjust pitch of the oscillator (+/- 24 semitones).

### 6. Tune Fine

Adjust pitch of the oscillator (+/- 50 cents).

### 7. Shape

Adjust shape of the oscillator waveform.

### 8. KBD SW

Turn on/off keyboard switch.

### 9. LFO SW

Turn on/off low frequency switch.

### 10. PW

Adjust amount of the pulse width.

### 11. LFO FM Int

Adjust intensity of the LFO frequency modulation.

### 12. LFO Shape Int

Adjust intensity of the LFO shape modulation.

### 13. LFO PW Int

Adjust intensity of the LFO pulse width modulation.

### 14. Mod Int

Adjust intensity of the oscillator 2 modulation.

### 15. Mod Ctrl Source

Select a control to adjust modulation intensity.

### 16. FM Mode

Select frequency modulation mode.

### 17. Arp Rate

Adjust frequency of the clock for arpeggio.

### 18. Arp Pattern

Select a pattern of the arpeggio. Options are up, down, up & down and random.

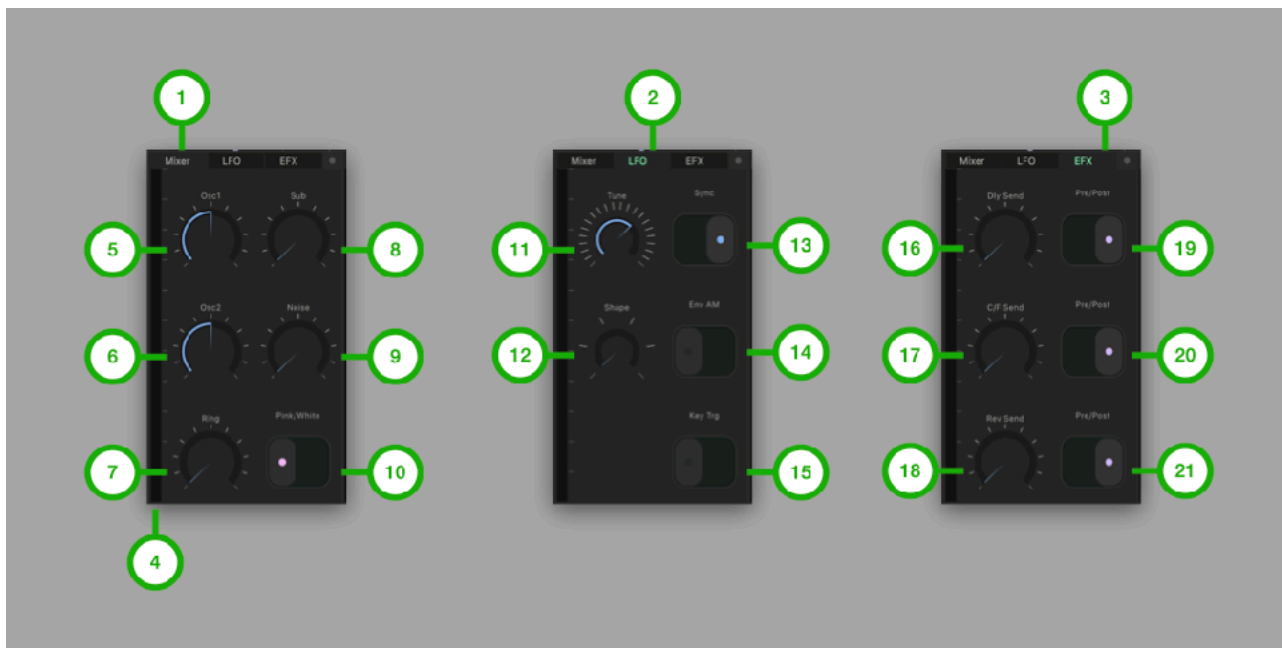
### 19. Arp Switch

Turn on/off arpeggio.

### 20. Arp Sync

Turn on/off tempo sync.

## Mixer, LFO and Effect Send



### 1. Mixer Tab

Tap to Select Mixer Tab.

### 2. LFO Tab

Tap to select LFO Tab.

### 3. EFX Tab

Tap to select EFX Tab.

### 4. Level Meter

Indicate output level of the mixer.

### 5. OSC1 Level

Adjust level of the OSC1.

### 6. OSC2 Level

Adjust level of the OSC2.

### 7. Ring Level

Adjust level of the ring modulation.

### 8. Sub Level

Adjust level of the sub oscillator.

### 9. Noise Level

Adjust level of the noise.

### 10. Noise Type

Select pink noise or white noise.

### 11. Tune

Adjust pitch of the low frequency oscillator.

### 12. Shape

Select shape of the low frequency oscillator waveform.

### 13. Sync

Turn on/off tempo sync switch.

### 14. Env AM

Turn on/off envelope amplitude modulation.

### 15. Key Trg

Turn on/off Key Trigger switch.

### 16. DLY Send

Adjust aux1 (delay) send level.

### 17. C/F Send

Adjust aux2 (chorus / flanger) send level.

### 18. Rev Send

Adjust aux3 (reverb) send level.

### 19. Delay Pre / Post

Select source signal for Delay.

### 20. C/F Pre / Post

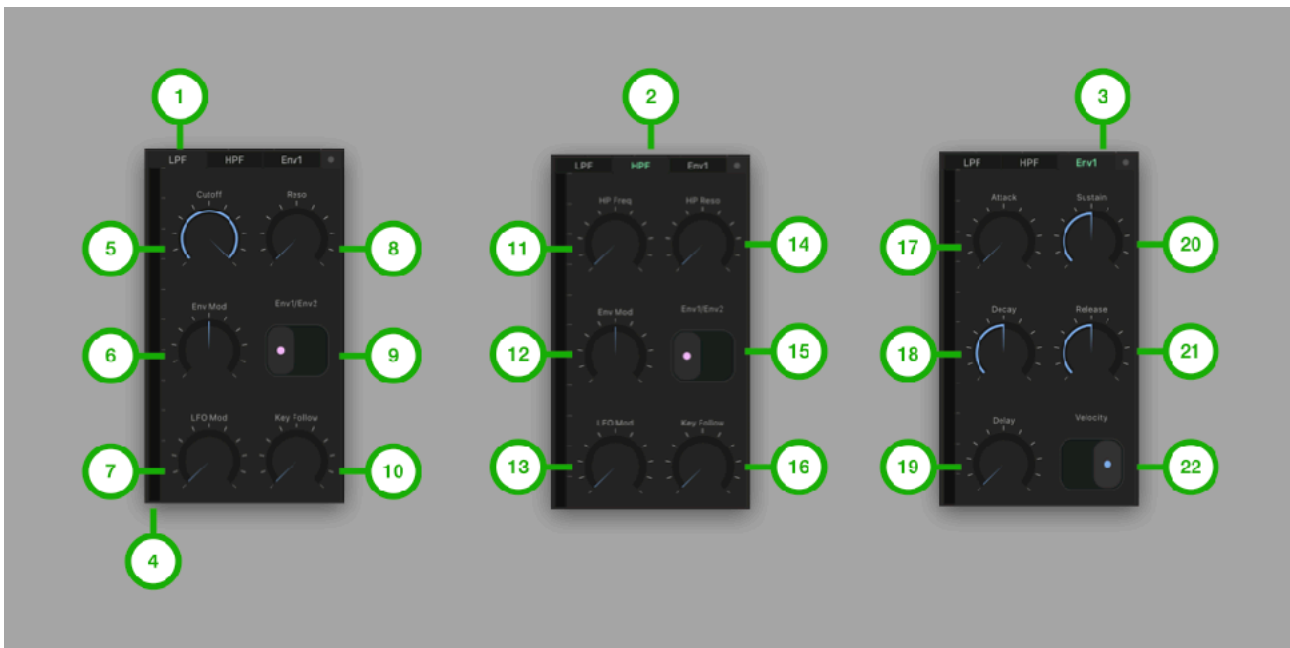
Select source signal for Chorus / Flanger.

### 21. Reverb Pre / Post

Select source signal for Reverb.

“Pre” means pre fader. Signal is taken before volume level is applied to the signal.  
“Post” means post fader. Signal is taken after volume level is applied to the signal.

## Filter and Env1



### 1. LPF Tab

Tap to Select LPF Tab.

### 2. HPF Tab

Tap to select HPF Tab.

### 3. Env1 Tab

Tap to select Env1 Tab.

### 4. Level Meter

Indicate output level of the filter.

### 5. Cutoff

Adjust cutoff of the low pass filter.

### 6. Env Mod Int

Adjust intensity of the envelope modulation.

### 7. LFO Mod Int

Adjust intensity of the LFO modulation.

### 8. Resonance

Adjust resonance of the low pass filter.

### 9. Env1/Env2

Select an envelope for frequency modulation.

### 10. Key Follow

Adjust amount of the key follow.

### 11. HP Freq

Adjust cutoff of the high pass filter.

### 12. Env Mod Int

Adjust intensity of the envelope modulation.

### 13. LFO Mod Int

Adjust intensity of the LFO modulation.

### 14. Resonance

Adjust resonance of the high pass filter.

### 15. Env1/Env2

Select an envelope for modulate cutoff frequency.

### 16. Key Follow

Adjust amount of the key follow.

### 17. Attack

Adjust attack time of the envelope.

### 18. Decay

Adjust decay time of the envelope.

### 19. Delay

Adjust delay time to trigger envelope.

### 20. Sustain

Adjust sustain level of the envelope.

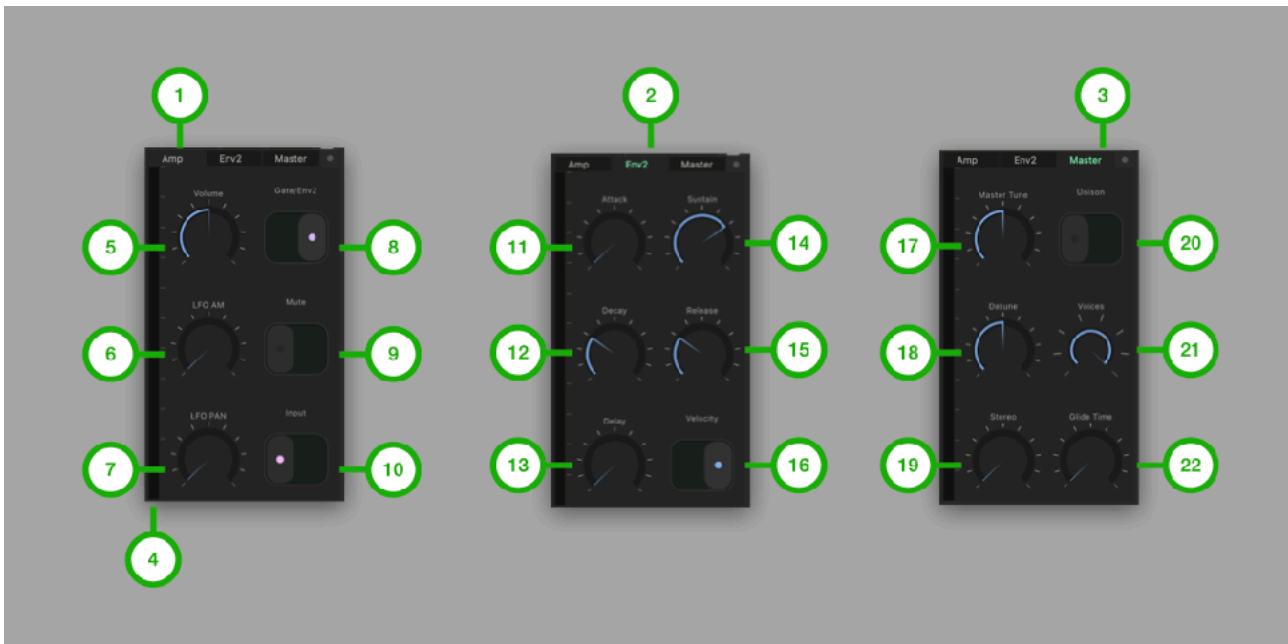
### 21. Release

Adjust release time of the envelope.

### 22. KBD Velocity

Turn on/off keyboard velocity switch.

## Amp, Env2 and Master



### 1. Amp Tab

Tap to Select Amp Tab.

### 2. Env2 Tab

Tap to select Env2 Tab.

### 3. Master Tab

Tap to select Master Tab.

### 4. Level Meter

Indicate output level of the synth.

### 5. Volume

Adjust volume of the amplifier.

### 6. LFO AM Int

Adjust intensity of the LFO amplitude modulation.

### 7. LFO Pan Int

Adjust intensity of the LFO Pan modulation.

### 8. Gate/Env2

Select a volume envelope from Gate or Env2.

### 9. Mute

Turn it on to mute output signal.

### 10. Input

Select input signal for the amplifier. Options are VCF cascade and VCF parallel.

### 11. Attack

Adjust attack time of the envelope.

### 12. Decay

Adjust decay time of the envelope.

### 13. Delay

Adjust delay time to trigger the envelope.

### 14. Sustain

Adjust sustain level of the envelope.

### 15. Release

Adjust release time of the envelope.

### 16. KBD Velocity

Turn on/off keyboard velocity switch.

### 17. Master Tune

Adjust pitch of the all oscillators.

### 18. Detune

Adjust amount of detune of the voices.

### 19. Stereo

Adjust amount of pan of the voices.

### 20. Unison

Turn on/off unison mode.

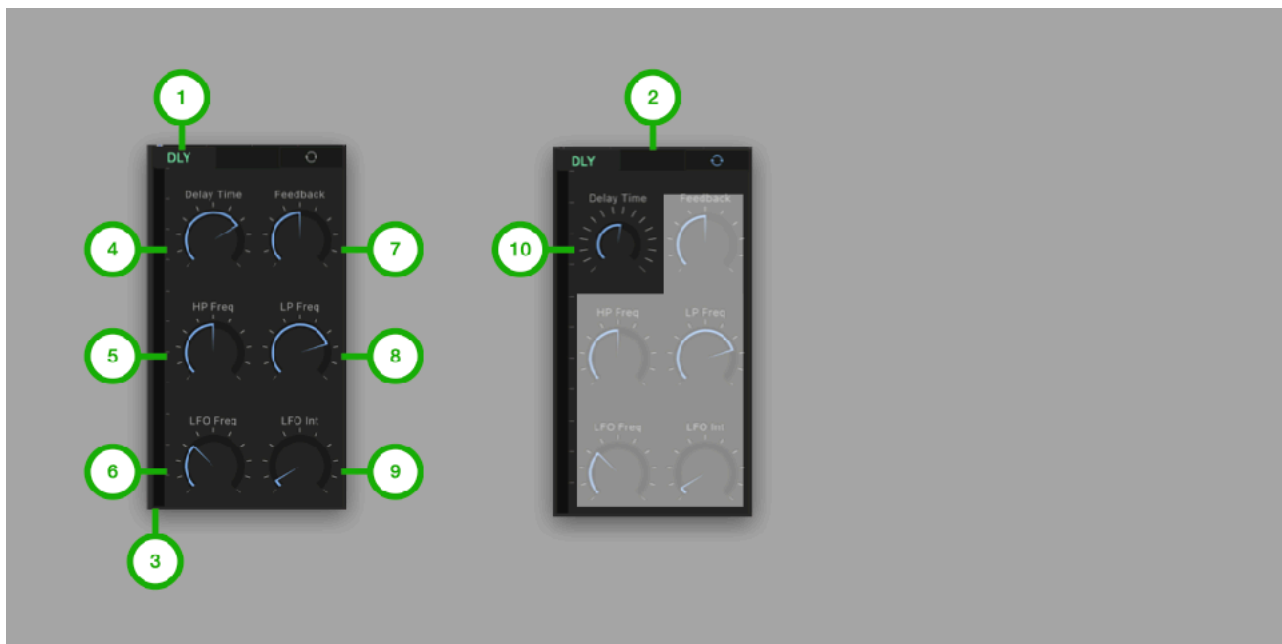
### 21. Voices

Select number of voices for unison.

### 22. Glide Time

Adjust time of the Glide.

## DLY (Delay)



### 1. Main Tab

Tap to Select Main Tab.

### 2. Sync Switch

Tap to enable / disable tempo sync.

### 3. Level Meter

Indicate output level of the delay.

### 4. Delay Time

Adjust delay time.

### 5. HP Frequency

Adjust frequency of high pass filter for the delayed sound.

### 6. LFO Frequency

Adjust frequency of LFO (low frequency oscillator).

### 7. Feedback

Adjust amount of the feedback.

### 8. LP Frequency

Adjust frequency of low pass filter for the delayed sound.

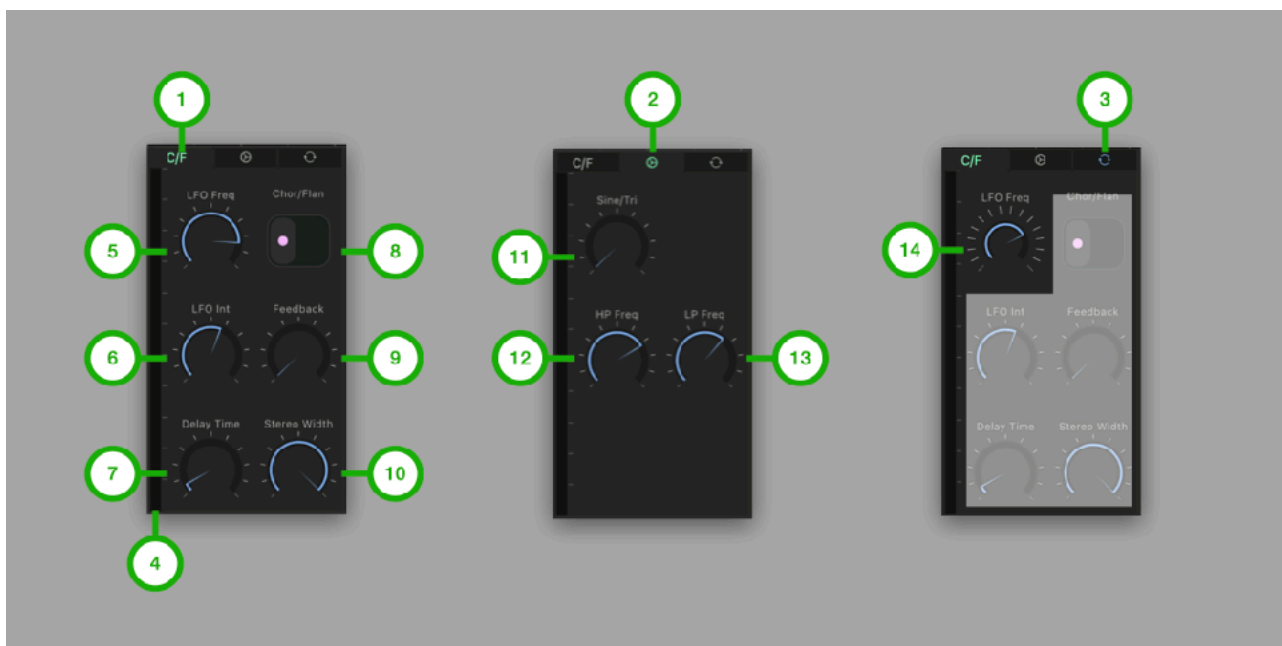
### 9. LFO Int

Adjust amount of LFO delay time modulation.

### 10. Delay Time (sync)

Adjust delay time which is synced to the current tempo.

## C/F (Chorus / Flanger)



### 1. Main Tab

Tap to Select Main Tab.

### 2. Sub Tab

Tap to select Sub Tab.

### 3. Sync Switch

Tap to enable / disable tempo sync.

### 4. Level Meter

Indicate output level of the chorus / flanger.

### 5. LFO Freq

Adjust frequency of the LFO.

### 6. LFO Int

Adjust amount of LFO delay time modulation.

### 7. Delay Time

Adjust delay time.

### 8. Chor/Flan

Select Chorus or Flanger.

### 9. Feedback

Adjust amount of the feedback.

### 10. Stereo Width

Adjust stereo width.

### 11. Sine/Triangle

Adjust shape of the LFO waveform.

### 12. HP Freq

Adjust frequency of high pass filter for the effected sound.

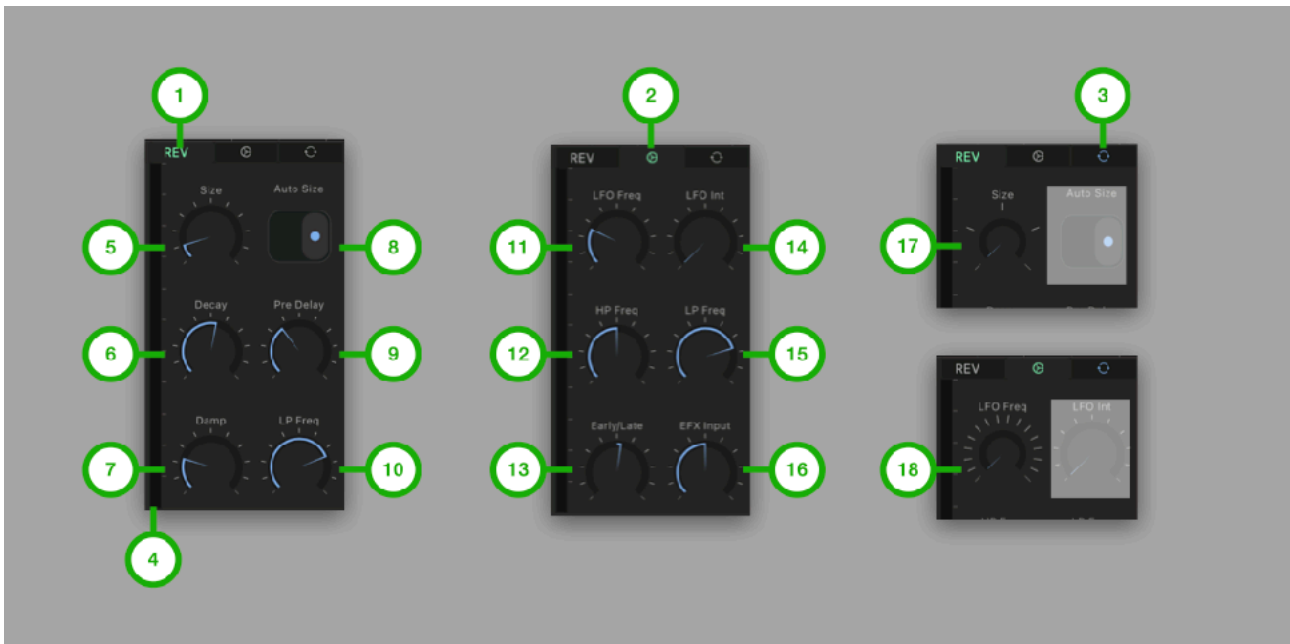
### 13. LP Frequency

Adjust frequency of high pass filter for the effected sound.

### 14. LFO Frequency (sync)

Adjust LFO frequency which is synced to the current tempo.

## REV (Reverb)



### 1. Main Tab

Tap to Select Main Tab.

### 2. Sub Tab

Tap to select Sub Tab.

### 3. Sync Switch

Tap to enable / disable tempo sync.

### 4. Level Meter

Indicate output level of the reverb.

### 5. Size

Adjust room size of the late reflection.

### 6. Decay

Adjust decay of the late reflection.

### 7. Damp

Adjust absorption of high frequency in the late reflection.

### 8. Auto Size

Select to enable / disable auto size mode.

### 9. Pre Delay

Adjust pre delay time of the early reflection.

### 10. LP Frequency

Adjust frequency of output low pass filter.

### 11. LFO Frequency

Adjust frequency of LFO (low Frequency oscillator).

### 12. HP Frequency

Adjust frequency of input high pass filter.

### 13. Early/Late

Adjust amount of the early reflection and amount of the late reflection.

### 14. LFO Int

Adjust amount of LFO delay time modulation.

### 15. LP Frequency

Adjust frequency of input low pass filter.

### 16. EFX Input

Adjust amount of input signal from delay and chorus.

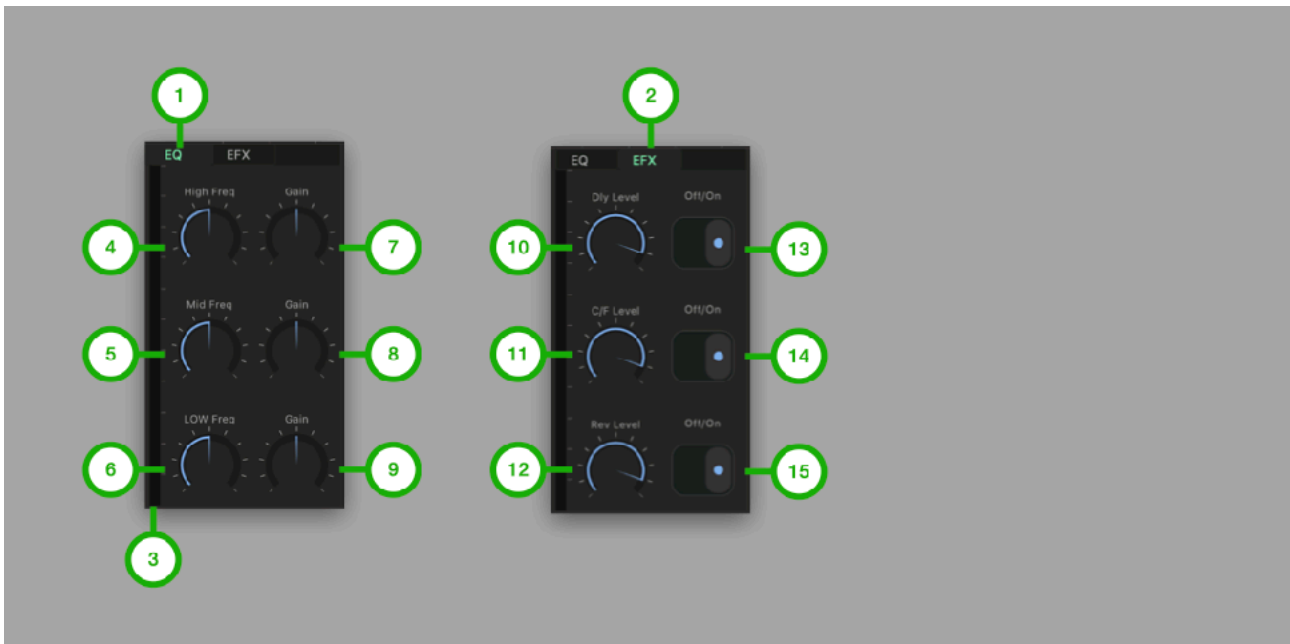
### 17. Size (sync)

Adjust room size which is synced to the current tempo.

### 18. LFO Frequency (sync)

Adjust LFO frequency which is synced to the current tempo.

## EQ (3 Band EQ / Effect Mixer)



### 1. Main Tab

Tap to Select Main Tab.

### 2. EFX Tab

Tap to select EFX Tab.

### 3. Level Meter

Indicate output level of the EQ.

### 4. High Frequency

Adjust frequency of high shelving filter.

### 5. Mid Frequency

Adjust frequency of mid peak / notch filter.

### 6. Low Frequency

Adjust frequency of low shelving filter.

### 7. High Gain

Adjust gain of the high shelving filter.

### 8. Mid Gain

Adjust gain of the mid peak / notch filter.

### 9. Low Gain

Adjust gain of the low shelving filter.

### 10. DLY Level

Adjust level of delay.

### 11. C/F Level

Adjust level of chorus / flanger.

### 12. Rev Level

Adjust level of reverb.

### 13. DLY Power

Turn on/off delay effect.

### 14. C/F Power

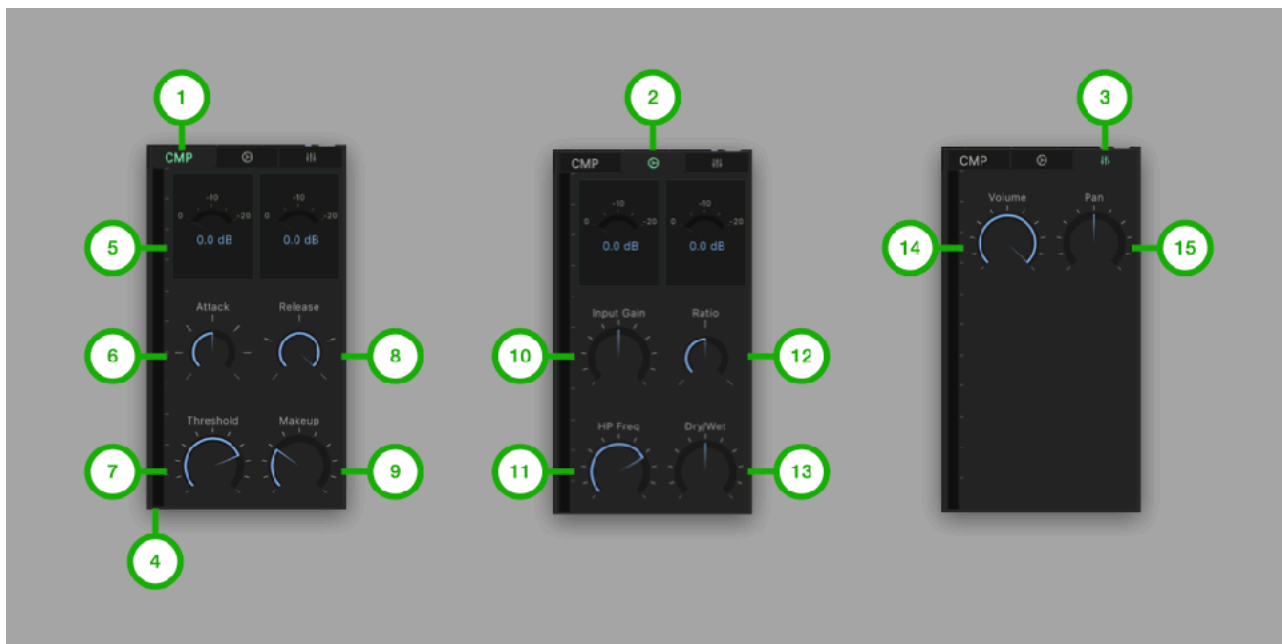
Turn on/off chorus / flanger effect.

### 15. Rev Power

Turn on/off reverb effect.



## CMP (Compressor)



### 1. Main Tab

Tap to Select Main Tab.

### 2. Sub Tab

Tap to select Sub Tab.

### 3. Master Tab

Tap to select Aux Tab.

### 4. Level Meter

Indicate level of the master output.

### 5. Reduction Gain Meter

Indicate amount of gain reduction.

### 6. Attack

Adjust time to start compression.

### 7. Threshold

Adjust level of threshold to begin compression.

### 8. Release

Adjust time to end compression.

### 9. Makeup

Adjust amount of makeup gain.

### 10. Input Gain

Adjust amount of input gain.

### 11. HP Frequency

Adjust frequency of high pass filter at the input of the compressor.

### 12. Ratio

Adjust compression ratio.

### 13. Dry/Wet

Adjust amount of the dry and wet signal.

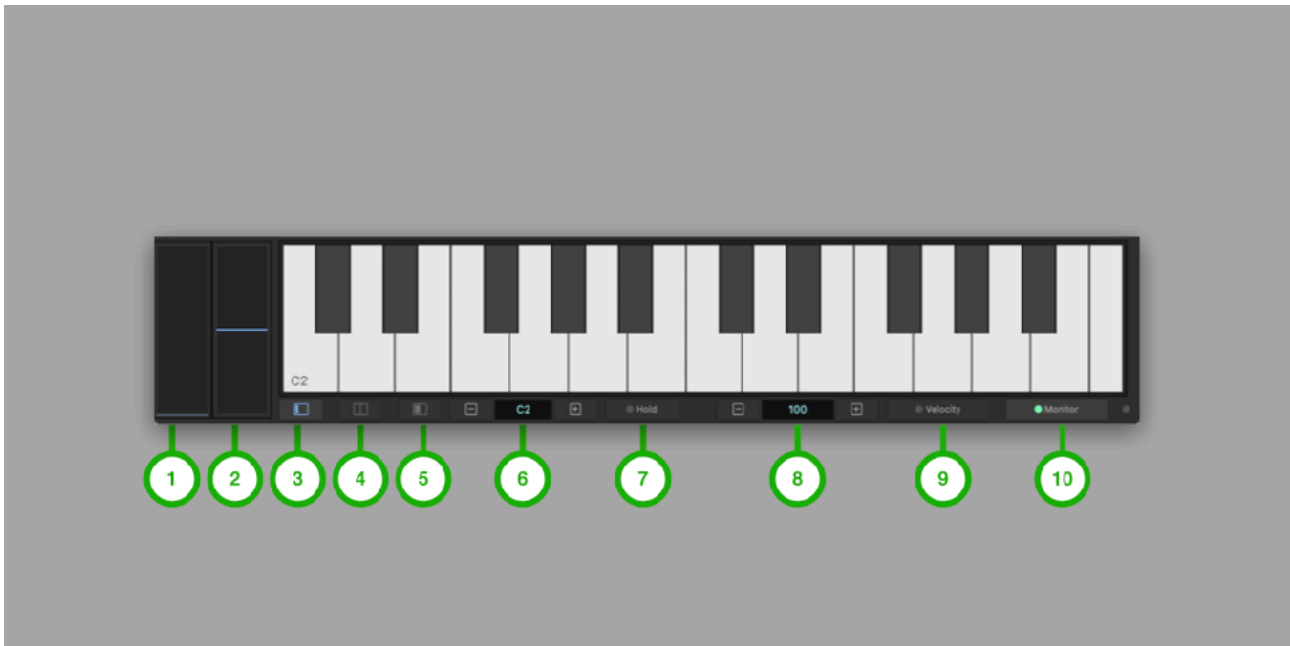
### 14. Volume

Adjust master volume.

### 15. Pan

Adjust master pan.

# Keyboard



## 1. Modulation Wheel

Adjust amount of the modulation.

## 2. Pitch Wheel

Adjust pitch of the oscillators. Range is plus / minus one octave.

## 3. Wheel Button

Tap this button to show / hide Wheel.

## 4. Split Button

Tap this button to split keyboard.

## 5. Part Button

Tap this button to select lower keyboard or upper keyboard.

## 6. Key Range

Use plus / minus buttons to adjust range of the keyboard. Indicator shows lowest note of the keyboard<sup>1</sup>. When “Midi Monitor” is enabled, the range is automatically set based on the incoming midi note.

## 7. Hold

Tap this button to enable /disable key holding.

## 8. Velocity Indicator

Indicate velocity of the pressed key. Use plus/ minus button to adjust default velocity.

## 9. Velocity Switch

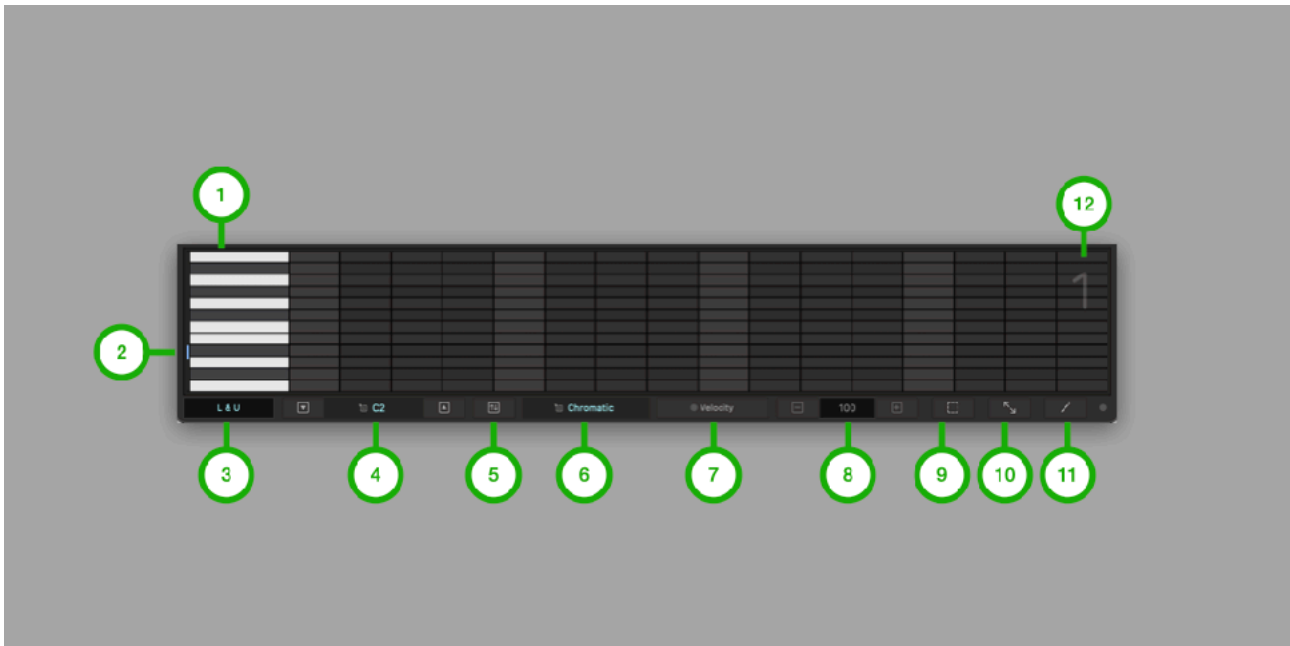
Tap this button to enable / disable velocity mode. When velocity mode is enabled, position in Y axis controls velocity and aftertouch. When aftertouch is selected in modulation source, movement in Y axis controls total amount of the modulation. When velocity mode is disabled, velocity value is fixed to default value.

## 10. Monitor

Tap this button to enable/disable midi monitor.

<sup>1</sup> Key range uses Scientific Pitch Notation. Middle C (midi note 60) is C4. Some other applications use different standard, which indicate middle C as C3.

# Piano Roll Editor



## 1. Keyboard

Tap to select a key for editing velocity. Tap to audition the sound of the select notes when mute is disabled.

## 2. Octave Indicator

Indicates position of octave range.

## 3. Part Indicator

Indicates selected synth part.

## 4. Range

Adjust key range of the editor. When “Midi Monitor” is enabled, the range is automatically set based on the incoming midi note.

## 5. Transpose

Tap to show transpose menu.

## 6. Scale

Tap to show scale menu.

## 7. Velocity Switch

Tap to enable / disable velocity mode.

## 8. Velocity

Adjust velocity of the note.

## 9. Selection

Tap to enable / disable selection mode.

## 10. Overview

Tap to show / hide overview.

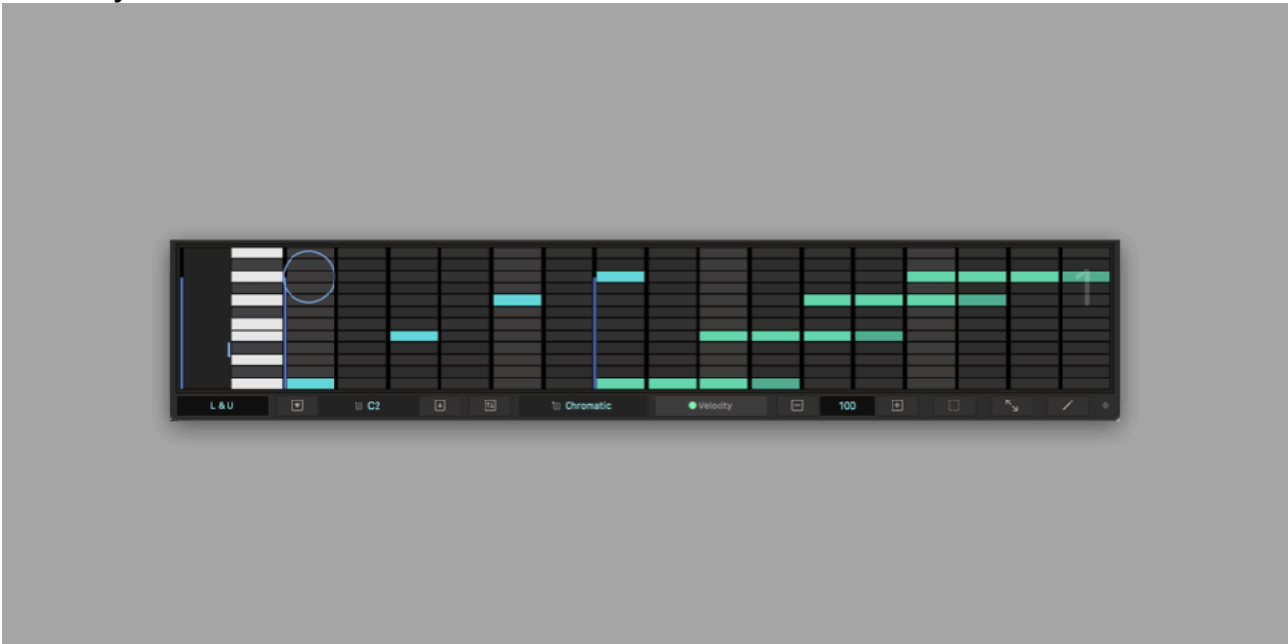
## 11. Edit

Tap to show edit menu.

## 12. Bar Indicator

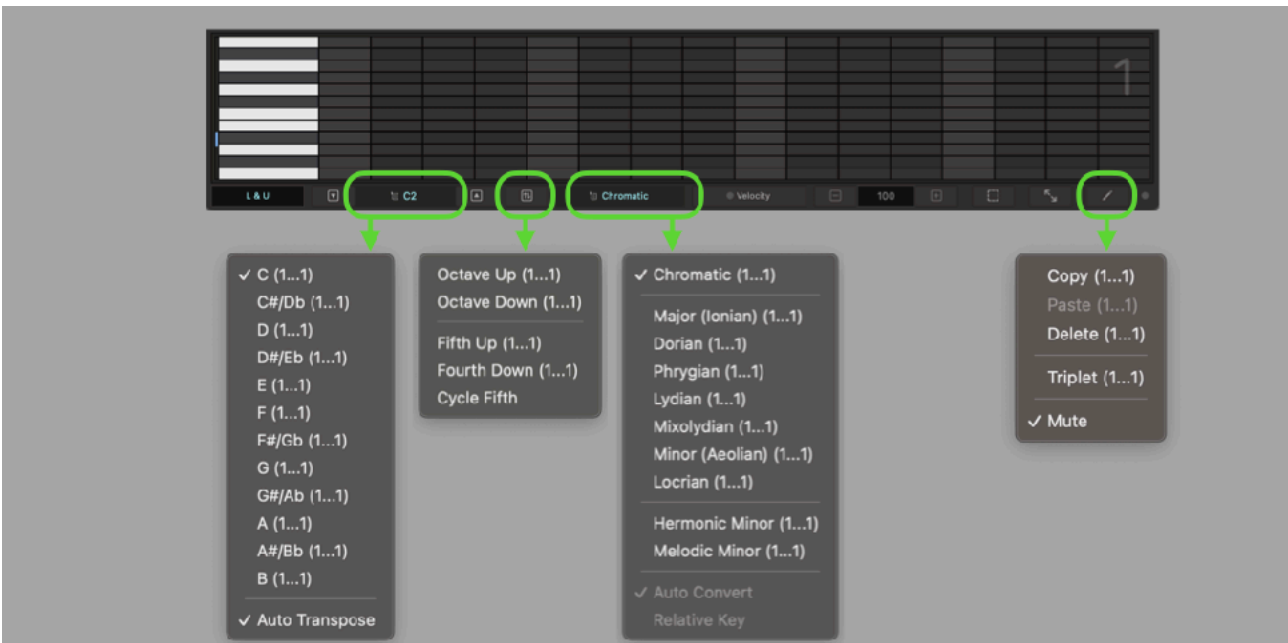
Indicate selected bar for editing.

## Velocity Editor

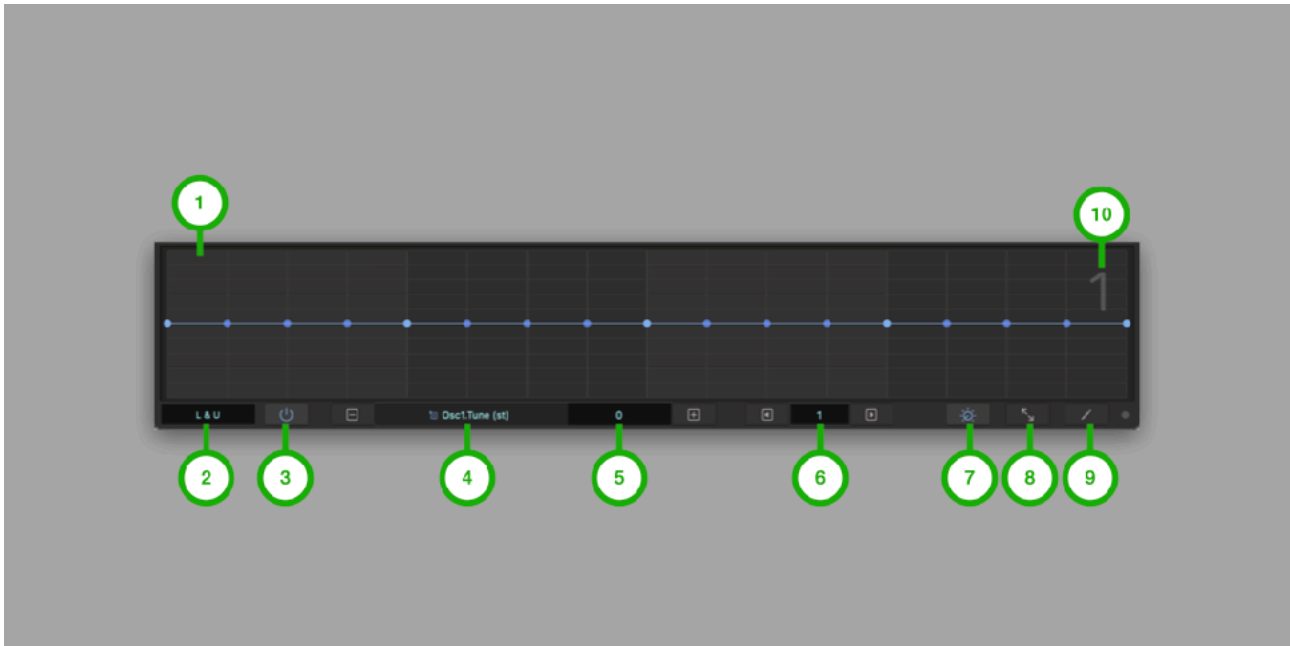


1. Tap velocity switch.
2. Tap on a note to show control.
3. Adjust velocity of the notes.

## Menu



# Automation Editor



## 1. Parameter Value Editor

Adjust value of parameter per step.

## 2. Part Indicator

Indicates selected synth part.

## 3. Activation Switch

Tap to enable / disable automation of the parameter.

## 4. Parameter Name

Indicate name of the parameter. Tap to show parameter list.

## 5. Parameter Value

Indicate value of the selected parameter for editing. Use plus / minus button to adjust the value.

## 6. Step Position

Indicate step position for editing. Use plus / minus button to adjust the position.

## 7. Auto Link

Tap to enable / disable auto link mode. When auto link is enabled, parameter can be selected by tapping on a control (dial or switch).

## 8. Overview

Tap to show / hide overview.

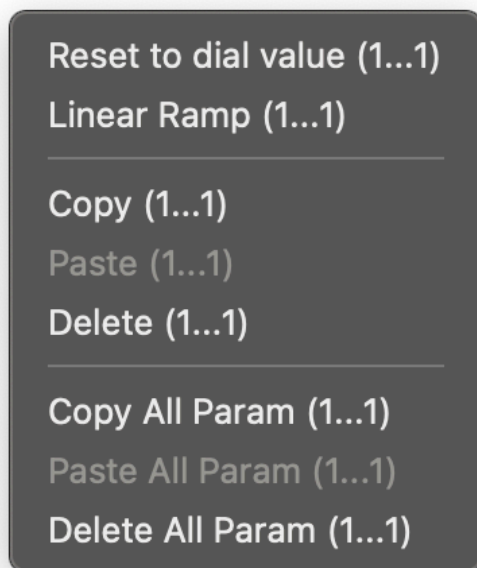
## 9. Edit

Tap to show edit menu.

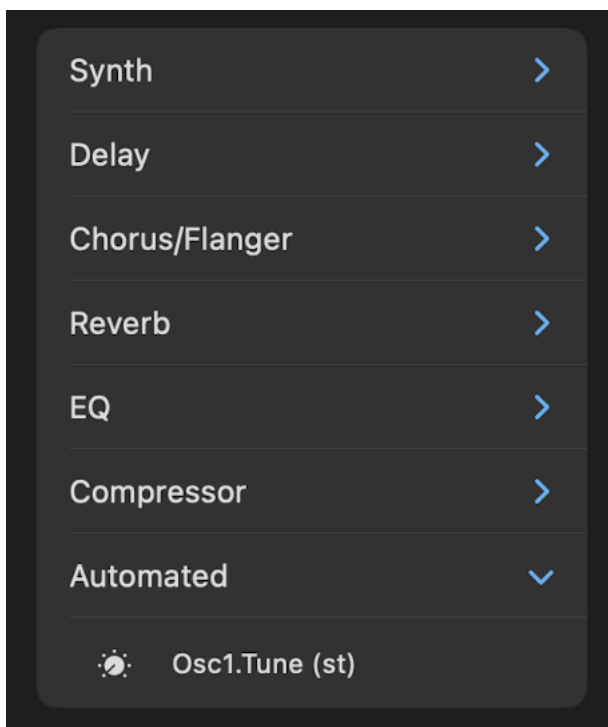
## 10. Bar Indicator

Indicate selected bar for editing.

## Edit Menu

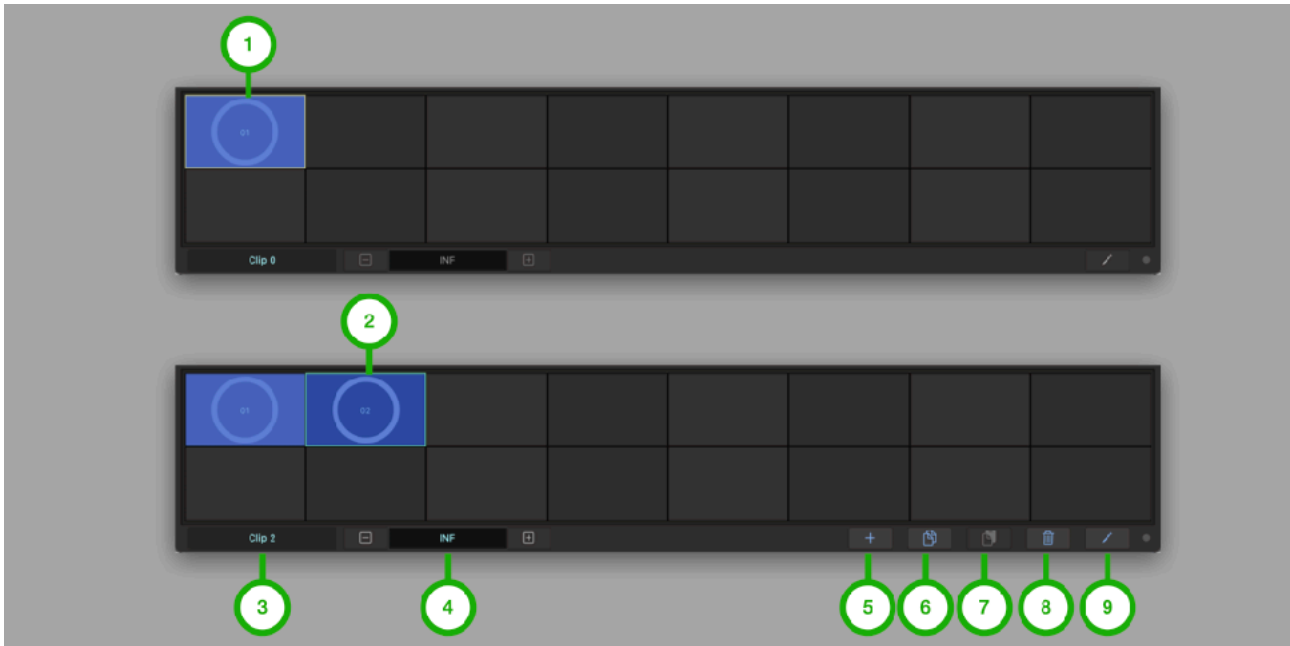


## Parameter List



Automated Parameters are listed in "Automated" category.

# Clip Editor



## 1. Active Clip

Yellow border line indicates active clip which is currently loaded.

## 2. Selected Clip

Green border line indicate selected clip in editing mode.

## 3. Clip Name

Indicate name of the clip.

## 4. Clip Length

Indicate length of the clip.

## 5. Add

Tap to add new clip when editing mode is enabled.

## 6. Copy

Tap to copy selected clip when editing mode is enabled.

## 7. Paste

Tap to paste at the selected location when editing mode is enabled.

## 8. Delete

Tap to delete selected clip when editing mode is enabled.

## 9. Edit

Tap to enable / disable editing mode.

# Scope



Options for the input sources are oscillator 1, oscillator 2, mixer, filter, master output of the synthesizer and Compressor.

## 1. Part Selector

Tap this button to select a part.

## 2. Input Source 1

Select a signal to show on oscilloscope on the left.

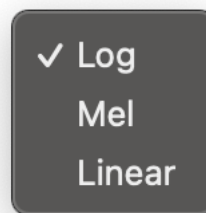
## 3. Spectrum Analyzer

Tap to select spectrum analyzer. Long press on spectrum button (control + click on macOS) shows a menu to enable/disable auto scroll.



## 4. Spectrogram

Tap to select spectrogram. Long press on spectrum button (control + click on macOS) shows a menu to select frequency mode for the spectrogram.



## 5. Part Selector

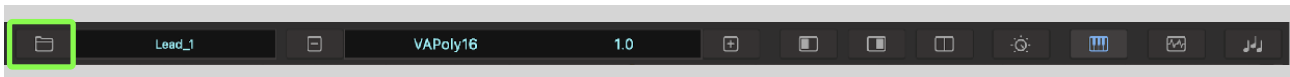
Tap this button to select a part.

## 6. Input Source 2

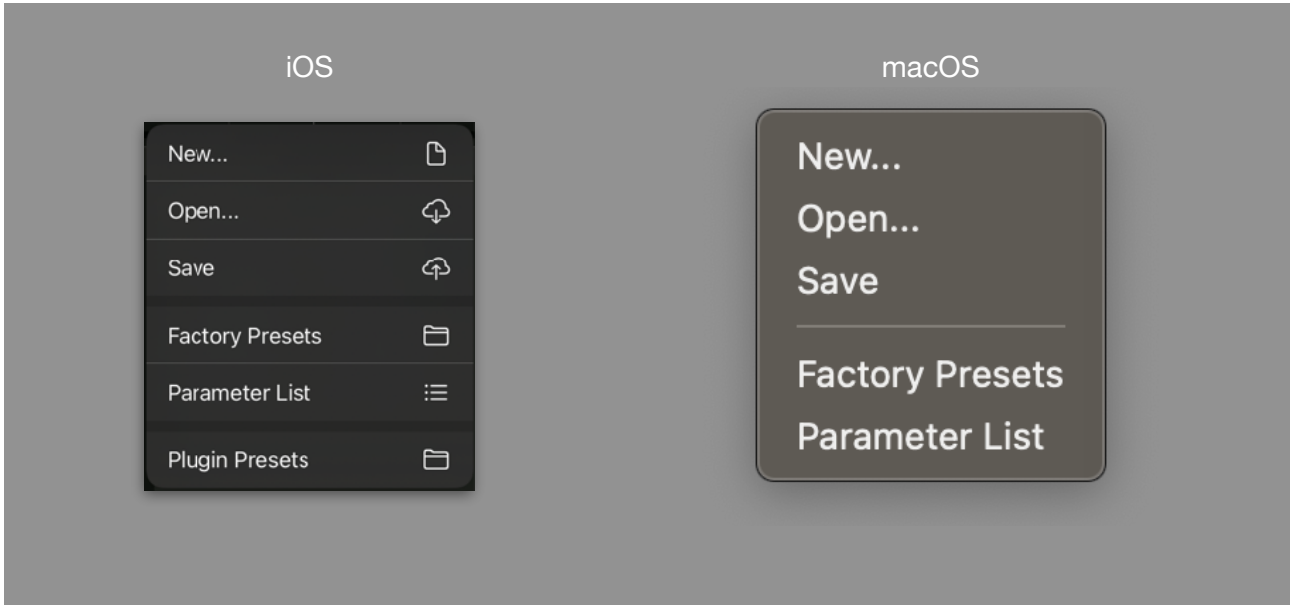
Select a signal to show on oscilloscope on the right.



# File Menu



Tap file button to show file menu.



---

## New...

Reset parameters and sequence data.

---

## Open...

Open a preset from iCloud drive.

---

## Save

Save a preset to iCloud drive.

---

## Factory Presets

Show / hide a list of the factory presets.

---

## Parameter List

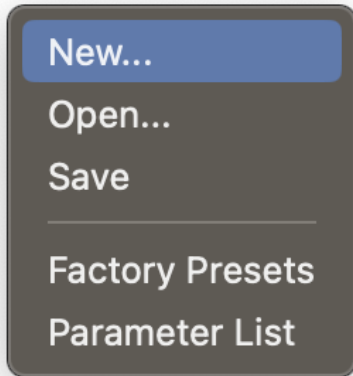
Show / hide a list of the parameters.

---

## Plugin Preset

Show / hide a list of the plugin presets.

## New...



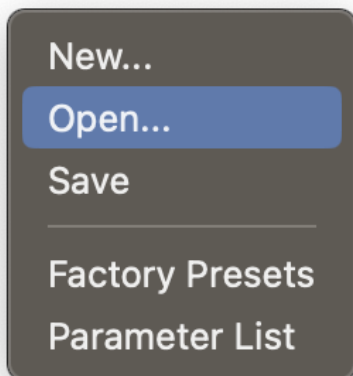
Select “New...” from file menu.  
Reset all parameters and sequence data.

## iCloud Preset

iCloud presets are stored in iCloud Drive. Saved presets can be accessed from iPhone, iPad and Mac.

---

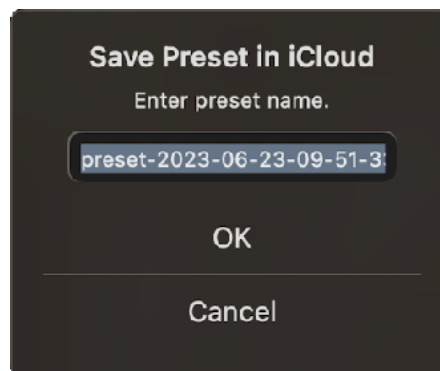
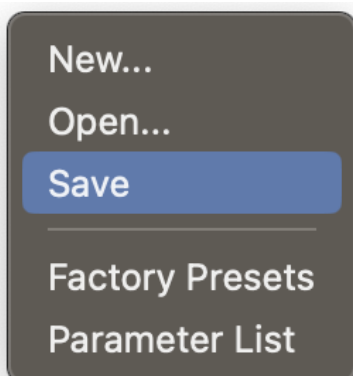
### Load a preset from iCloud



1. Select “Open...” from file menu.
2. Select a file in the file browser.
3. Tap Open to open the preset.

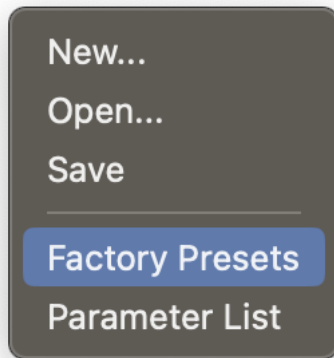
---

### Save a preset in iCloud



1. Select “Save” from file menu
2. Type file name in the “Save Preset in iCloud” window.
3. Tap OK to save the preset in iCloud Drive.

## Factory Presets



1. Tap Factory Presets in File Menu to open Factory Preset List.
2. Select a preset name from the list to load the preset.

Factory preset contains only values of the synth parameters. It doesn't contain any sequence data. When loading the preset, it will change the value of the synth parameters but sequence data remains the same.

Factory preset list consists of layer/split presets, part presets and effect presets.

---

### Layer/Split Preset

These presets contains parameter values for both lower part and upper part.

---

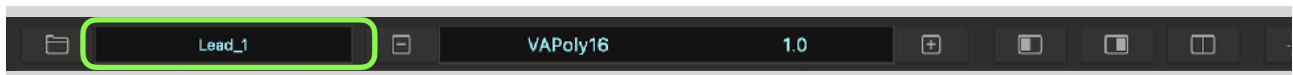
### Part Preset

These presets contains parameter values for single part. Use Part button in the title bar to specify the part to load the preset.

---

### Effect Preset

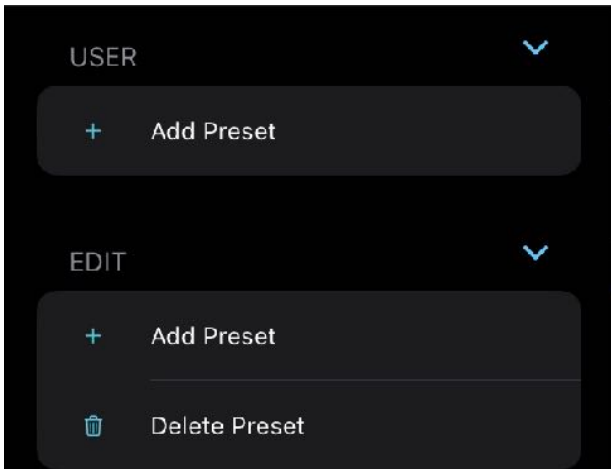
These preset contains parameter values for effect units.



Tap Preset Name also open the Factory Preset List.

## Plugin Preset (iOS)

Plugin presets are stored in plugin on the device. Saved preset can be accessed from any host application which support AUv3 User Preset on the device.



---

### Add Preset

Save a user preset in AUv3 plug-in on the device.

---

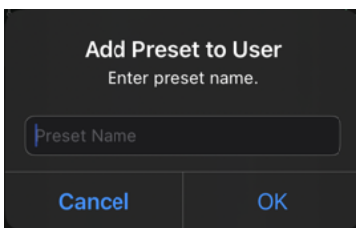
### Delete Preset

Enable edit mode to delete presets.

---

## Save plugin preset

Select "Add Preset" from menu.



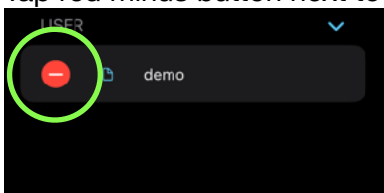
Type name then tap OK to save the preset. The preset is saved to the selected bank.

---

## Delete plugin preset

Select "Delete Preset" from menu to enable edit mode.

Tap red minus button next to the name of the preset.



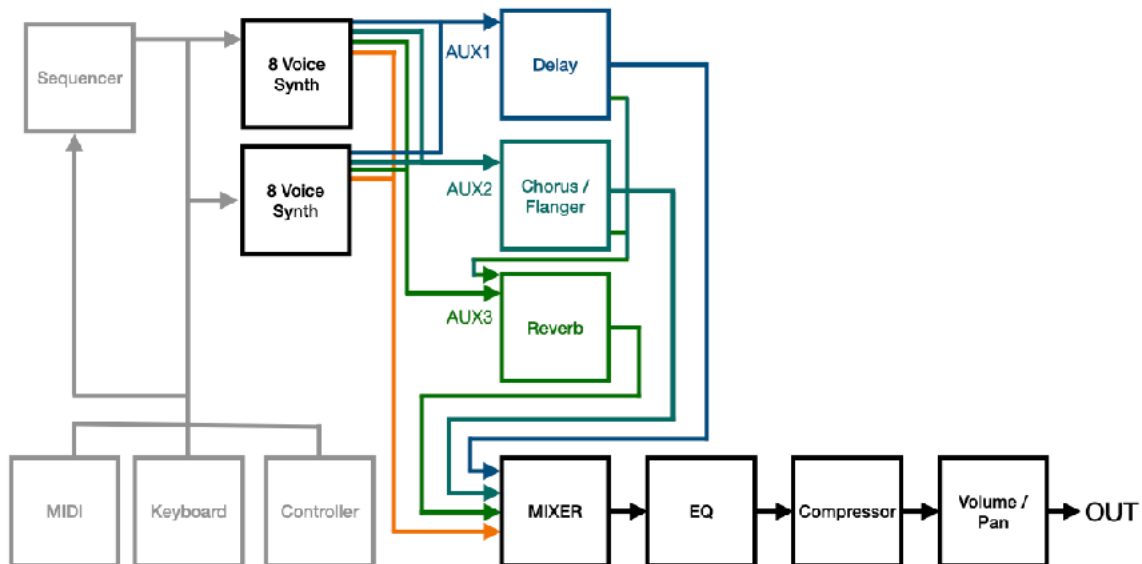
Tap red trash icon to confirm the action.



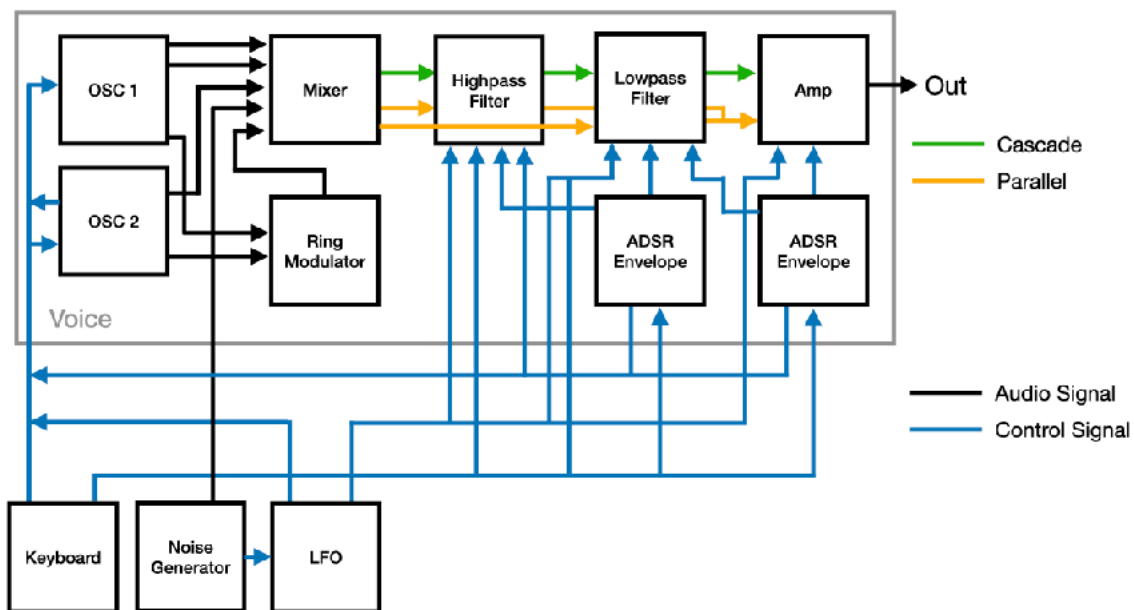
# Synthesizer

VAPoly16 features two 8 voice polyphonic synthesizer. Each voice contains oscillators, filters and amplifier to produce sound for the single note.

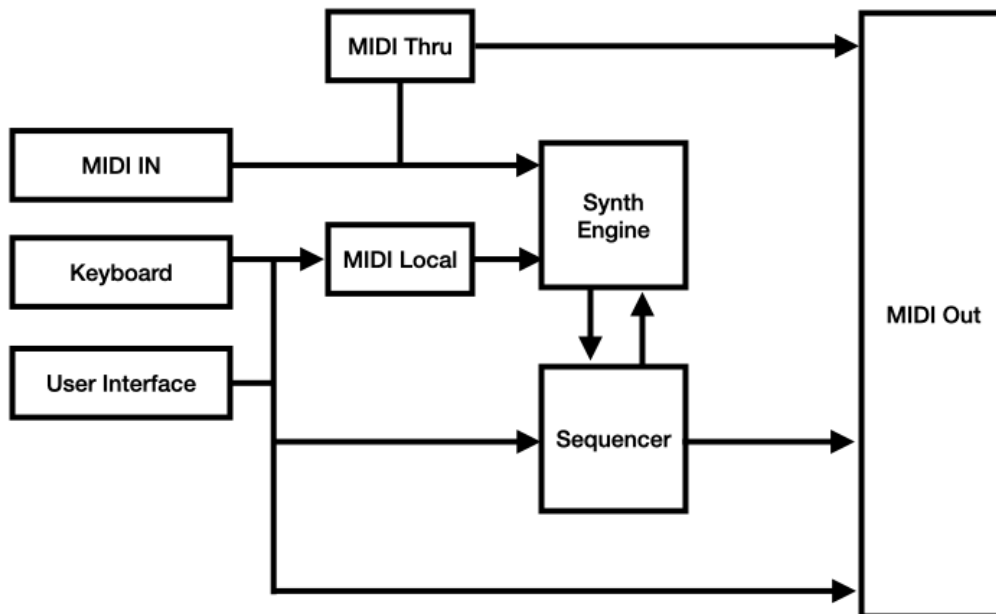
## Block diagram



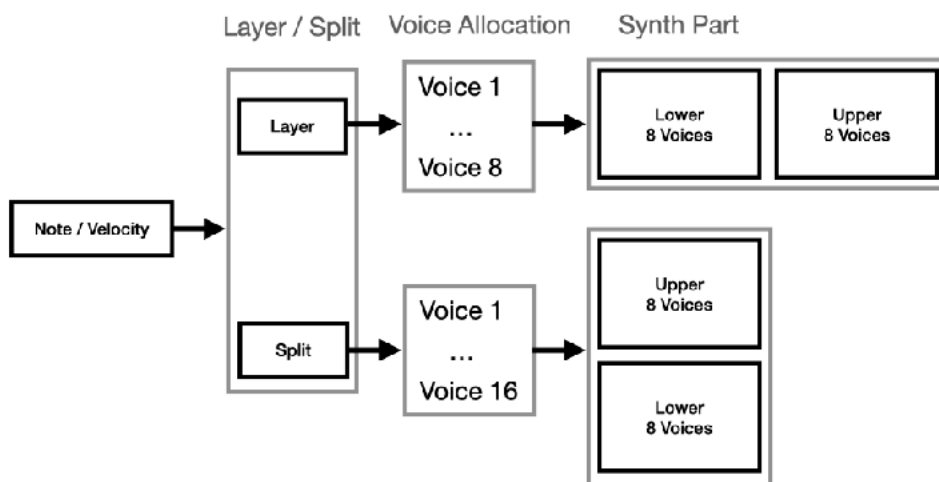
## Block diagram (Single Voice)



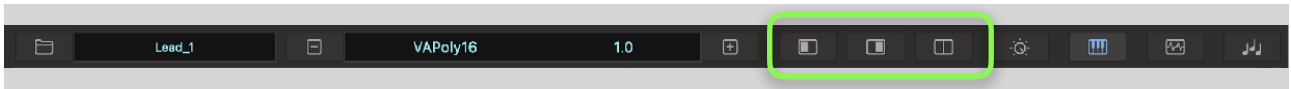
## Control Signal & MIDI Flow



## Bitimbral (Layer / Split)



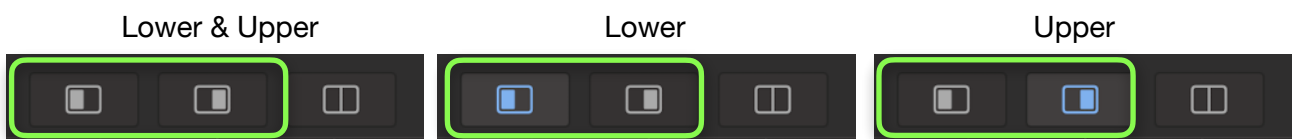
# Bitimbral



## Select Synth Part



Use these buttons to select lower part, upper part or both for editing parameters, loading preset and program sequence.



## Select Layer / Split



Use this button to select layer mode or split mode.

### Layer Mode

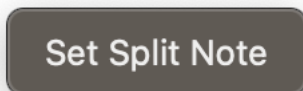
Turn this button off to select layer mode, which makes lower voice and upper voice to receive and play same MIDI note.

### Split Mode

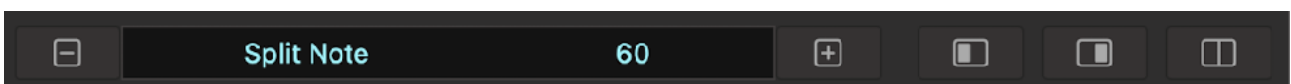
Turn this button on to select split mode, which makes lower voice and upper voice to receive and play different MIDI note based on the Split Note Settings. Default value of the split note is 60 (C4).

## Set Split Note

Press and hold Split button (control + click or right mouse click on Mac) to show a menu.



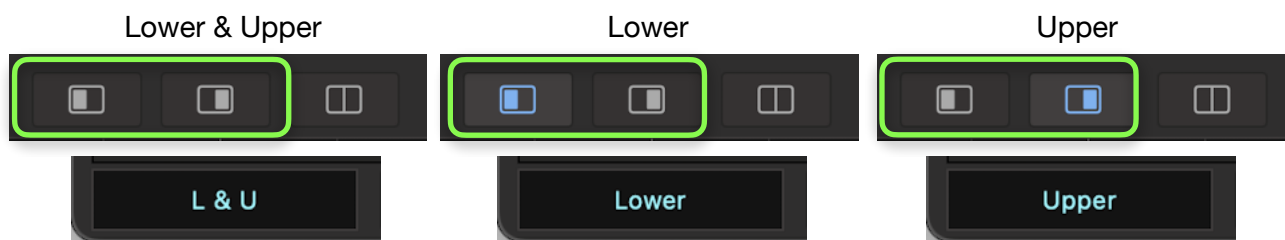
Tap on the menu item to show Split Note Parameter for editing



Use - / + buttons to adjust value of the Split Note.

## Select Part For Sequencer

Each lower & upper synth has independent sequencer. Use Synth Part buttons to select lower or upper sequencer to program or to edit sequences.



	Lower & Upper	Lower	Upper
Piano Roll Editor	Program, Copy, Paste, and Delete Lower & Upper Part	Program, Copy, Paste, and Delete Lower Part	Program, Copy, Paste, and Delete Upper Part
Automation Editor	Program, Copy, Paste, and Delete Lower & Upper Part	Program, Copy, Paste, and Delete Lower Part	Program, Copy, Paste, and Delete Upper Part
Clip Editor	Copy and Paste sequence data for Lower & Upper Part	Copy and Paste sequence data for Lower Part	Copy and Paste sequence data for Upper Part



# Oscillator 1

Oscillator 1 generates continuously variable wave shape, from triangle wave to saw wave and from the saw wave to square wave. Pulse width can be adjusted for triangle and square wave. Oscillator 1 also generate sub, which is a square wave and its frequency is one octave below of the main pitch. Oscillator 1 can be synchronized to oscillator 2. Total amount of modulation to the oscillator can be control by mod int, mod wheel, after touch or poly aftertouch. Pitch bend can be used to shift frequency of the oscillator +/- one octave.



---

## Tune

Adjust pitch of the oscillator. (maximum +/- 24 semitones)

---

## Shape

Adjust shape of the waveform. Fully counter clockwise position is Triangle, center is Saw, and fully clockwise position is Square.

---

## PW (Pulse Width)

Adjust pulse width of the triangle wave and the square wave.

When Square wave is selected, pulse width of 0% and 100% produce DC signal<sup>2</sup> resulting no audible output.

---

## Sync

Turn this switch on to sync OSC1 to OSC2. (OSC2 is a master.)

It forces OSC1 to follow frequency of the OSC2 in "hard" synchronization. Adjusting Tune of OSC1 produces unusual wave shapes resulting unusual timber. Typical use of Sync is modulate frequency of OSC1 by envelope. It will produce classic Sync Sound.

When OSC1 waveform is Square and Tune of OSC1 is lower than OSC2, it produces DC signal resulting no audible output.

---

<sup>2</sup> DC Signal is always positive or always negative and produce no sound.

## Oscillator 2

Oscillator 2 generate continuously variable wave shape, from triangle wave to saw wave and from the saw wave to square wave. Pulse width can be adjusted for square wave. Oscillator 2 can be used for modulation source. When KBD switch is off, keyboard is disconnected from the oscillator 2, and the pitch of the oscillator 2 can be controlled by tune dial. When Low switch is on, the oscillator 2 can be used as LFO<sup>3</sup>. Total amount of modulation to the oscillators can be control by mod int, mod wheel aftertouch or poly aftertouch. Pitch bend can be used to shift frequency of the oscillator +/- one octave.



---

### Tune

Adjust pitch of the oscillator (+/- 24 semitones). When KBD switch is turned off, the pitch can be adjusted by MIDI note value. When KBD switch is turned off and Low switch is turned on, the frequency can be adjusted from 0.04Hz to 42.2Hz.

---

### Fine (Fine Tune)

Adjust pitch of the oscillator. (+/- 50 cents)  
Use Fine Tune to detuning OSC2 relative to OSC1.

---

### Shape

Adjust shape of the waveform. Fully counter clockwise position is Triangle, center is Saw, and fully clockwise position is Square.

---

### PW (Pulse Width)

Adjust pulse width of the square wave.  
Pulse width of 0% and 100% produce DC signal resulting no audible output.

---

### KBD (Keyboard) SW

Turn this switch on to control pitch of the oscillator by keyboard. When this switch is turned off, OSC2 is disconnected from keyboard and pitch of the oscillator can be adjusted by Tune dial. This is useful to modulate frequency or shape of the OSC1 by XMOD<sup>4</sup> in audio range.

---

### LFO SW

When this switch is turned on, OSC2 can be used as a LFO. (from 0.04Hz to 42.2Hz). This is useful to modulate frequency or shape of the OSC1 by XMOD in low frequency range.

---

<sup>3</sup> Low Frequency Oscillator

<sup>4</sup> Cross Modulation

# Mixer

Level of oscillator 1, oscillator 2, sub, ring and noise can be adjusted in the mixer section. Ring is output of ring modulator, which ring modulate output of the oscillator 1 and output of the oscillator 2. Noise is output of the noise generator.



---

## OSC1 (Oscillator 1 Level)

Adjust level of the oscillator 1.

---

## OSC2 (Oscillator 2 Level)

Adjust level of the oscillator 2.

---

## Ring (Ring Modulation Level)

Adjust level of the ring modulator. (The output is ring modulation of Oscillator 1 and Oscillator 2)

Ring Modulator produces signal which contains sums and differences of the two oscillator frequency. Adjust frequency of the oscillators to experiment with the sounds. Ring Modulator tends to produce metallic or percussive sounds such as bell, chimes or gongs.

---

## Sub (Sub Oscillator Level)

Adjust level of the sub waveform. The sub is a square wave and generated by Oscillator 1. It is one octave lower than the waveform of the Oscillator 1.

---

## Noise (Noise Level)

Adjust level of the noise.

---

## Noise Type

Select pink noise or white noise. White noise consists of equal energy per frequency and pink noise consists of equal energy per octave.

## Low Pass Filter

This low pass filter is modeled on the Sallen-Key -12dB per octave low pass filter circuit. The filter is capable of self oscillation when resonance is at the maximum position. Cutoff frequency of the low pass filter can be modulated by an ADSR envelope and a LFO. Also the cutoff frequency can be controlled by keyboard with the amount adjusted by key follow parameter.



---

### Cutoff

Adjusts the cutoff frequency of the low pass filter.

---

### Resonance

Adjusts amount of the resonance of the low pass filter.

---

### Env Mod Int (Envelope Modulation Intensity)

Adjusts amount that the filter envelope modulates the cutoff frequency of the low pass filter.

---

### Env1/Env2

Select envelope to modulate the cutoff frequency.

---

### LFO Mod Int (LFO Modulation Intensity)

Adjusts amount that the LFO modulates the cutoff frequency of the low pass filter.

---

### Key Follow

Adjust amount that the keyboard controls the cutoff frequency of the low pass filter.

# High Pass filter

This high pass filter is modeled on The Sallen-Key -12dB per octave high pass filter circuit. The filter is capable of self oscillation when resonance is at the maximum position. Cutoff frequency of the high pass filter can be modulated by an ADSR envelope and a LFO. Also the cutoff frequency can be controlled by keyboard with the amount adjusted by key follow parameter.



---

## HP Freq

Adjusts the cutoff frequency of the high pass filter.

---

## Resonance

Adjusts amount of the resonance of the high pass filter.

---

## Env Mod Int (Envelope Modulation Intensity)

Adjusts amount that the filter envelope modulates the cutoff frequency of the high pass filter.

---

## Env1/Env2

Select envelope to modulate the cutoff frequency.

---

## LFO Mod Int (LFO Modulation Intensity)

Adjusts amount that the LFO modulates the cutoff frequency of the high pass filter.

---

## Key Follow

Adjust amount that the keyboard controls the cutoff frequency of the high pass filter.

# AMP (Amplifier)

The output signal of the filter is routed to the amplifier. The signal is shaped by gate signal or ADSR envelope. The audio signal can be modulated by LFO. The output level can be adjusted by volume parameter.



---

## Volume

Adjust volume of the output signal.

---

## LFO AM (Amplitude Modulation Intensity)

Adjust amount that LFO modulates amplitude of the output signal.

---

## LFO PAN (Pan Modulation Intensity)

Adjust amount that LFO modulates amount of the pan of the output signal.

---

## Gate/Env2

Select a volume envelope for the amplifier. The envelope can be chosen from gate or env2.

---

## Mute

Turn it on to mute output signal.

---

## Input

Select input signal of the amplifier. Options are VCF cascade (HP -> LP) and VCF parallel (HP + LP).

# ADSR (Envelope Generator)

ADSR is an analog style non-linear envelope generator. When velocity switch is on, amplitude of the envelope is controlled by MIDI velocity.



---

## Attack

Adjust the attack time of the ADSR envelope (from 1 ms to 6 sec)

---

## Decay

Adjust the decay time of the ADSR envelope (from 1 ms to 10 sec)

---

## Sustain

Adjust sustain amount of the ADSR envelope (from 0% to 100%)

---

## Release

Adjust release time of the ADSR envelope (from 1 ms to 10 sec)

---

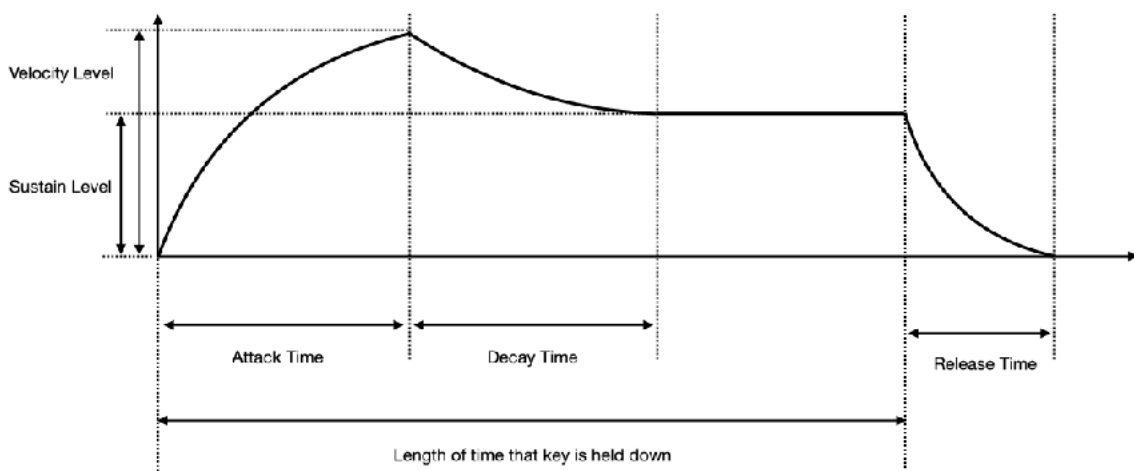
## KBD Velocity

When velocity switch is turned on, amplitude of the envelope is controlled by MIDI velocity. When velocity is turned off, amplitude of envelope is set to maximum value. (midi velocity 127)

---

## Delay

Adjust delay time to trigger the ADSR envelope (from 0 ms to 10 sec)



# Oscillator Modulation

Amount of modulation to frequency, shape and pulse width of the oscillators can be adjusted in modulation section. There are three sources, envelope, LFO and XMOD. Targets of envelope are frequency, shape and pulse width of the oscillator 1. Targets of LFO are frequency and shape, and pulse width of the oscillator 1 and the oscillator 2. Targets of XMOD are frequency and shape of the oscillator 1. There are two mode for frequency modulation. The frequency is modulated by volts per octave basis (+/- 4 octaves) in exponential mode and the frequency is modulated by hertz per volt basis (+/- 2.25 octaves) in linear mode.

## Oscillator 1 Modulation



---

### LFO FM (LFO to Frequency)

Adjust amount that LFO modulates frequency of the oscillator.

---

### LFO Shape (LFO to Shape)

Adjust amount that LFO modulates shape the oscillator.

---

### LFO PW (LFO to Pulse Width)

Adjust amount that LFO modulates pulse width of the oscillator.

---

### Mod Int (Modulation Intensity)

Adjust total amount of modulation.

---

### Modulation Control Source

Select a source to adjust total modulation amount. Options are Mod Int, Mod Wheel, Aftertouch and Poly Aftertouch. When built-in keyboard is used, amount of the Aftertouch is controlled by position of Y axis in each key pad.

---

### Frequency Modulation Type

Select frequency modulation type, linear or exponential. The frequency is modulated by volts per octave basis (+/- 4 octaves) in exponential mode and the frequency is modulated by hertz per volt basis (+/- 2.25 octaves) in linear mode.





---

### Env FM (Envelope to Frequency)

Adjust amount that envelope modulates frequency of the oscillator.

---

### Env Shape (Envelope to Shape)

Adjust amount that envelope modulates shape of the oscillator.

---

### Env PW (Envelope to Pulse Width)

Adjust amount that envelope modulates pulse width of the oscillator.

---

### XMOD FM (XMOD to Frequency)

Adjust amount that oscillator 2 modulates frequency of the oscillator.

---

### XMOD Shape (XMOD to Shape)

Adjust amount that oscillator 2 modulates shape of the oscillator.

---

### Env Source

Select an envelope for the envelope modulation. Options are Env2 and Env1.

# Oscillator 2 Modulation



---

## LFO FM (LFO to Frequency)

Adjust amount that LFO modulates frequency of the oscillator.

---

## LFO Shape (LFO to Shape)

Adjust amount that LFO modulates shape the oscillator.

---

## LFO PW (LFO to Pulse Width)

Adjust amount that LFO modulates pulse width of the oscillator.

---

## Mod Int (Modulation Intensity)

Adjust total amount of modulation.

---

## Modulation Control Source

Select a source to adjust total modulation amount. Options are Mod Int, Mod Wheel, Aftertouch and Poly Aftertouch. When built-in keyboard is used, amount of the Aftertouch is controlled by position of Y axis in each key pad.

---

## Frequency Modulation Type

Select frequency modulation type, linear or exponential. The frequency is modulated by volts per octave basis (+/- 4 octaves) in exponential mode and the frequency is modulated by hertz per volt basis (+/- 2.25 octaves) in linear mode.

# LFO

LFO (Low Frequency Oscillator) can generate 6 wave shapes and the frequency of the LFO can be set by Hz or note value when LFO is synchronized to tempo. Amplitude of the LFO can be modulated by ADSR envelope.



---

## Tune

Adjust frequency of the LFO. When sync is off, range of the frequency is from 0.04Hz to 42.2Hz. When sync is on, range of the rate is from 1/64 to 8 bars.

---

## Shape

Select shape of the LFO waveform. Wave shapes are sine, saw, down saw, square, triangle and random.

---

## Sync

Turn this switch on to sync the rate of the LFO with tempo.

---

## Env AM (Envelope to Amplitude)

Turn this switch on to modulate amplitude of LFO by the amplifier envelope.

---

## Key Trg (Key Re-Trigger)

Turn this switch on to restart the LFO cycle every time a new note is played.

## EFX (Effect Send)

Adjust send level and pre / post options for signal routed to delay, chorus/flanger and reverb effects.



---

### Delay Send

Adjust level of the signal send to delay effect.

---

### Delay Pre/Post

Select Pre (pre fader) or post (post fader) to specify source of the signal for delay.

---

### C/F Send

Adjust level of the signal send to chorus / flanger effect.

---

### C/F Pre/Post

Select Pre (pre fader) or post (post fader) to specify source of the signal for chorus/flanger.

---

### Rev Send

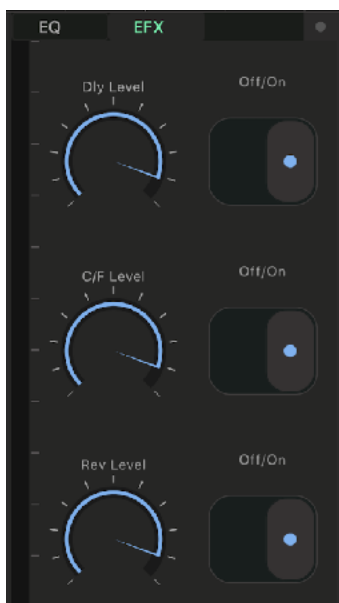
Adjust level of the signal send to reverb effect.

---

### Rev Pre/Post

Select Pre (pre fader) or post (post fader) to specify source of the signal for reverb.

Output Signals from the effects can be adjusted by effect mixer.



### Delay Level

Adjust level of delay signal to EQ.

### Delay Power

Turn off to bypass delay.

### C/F Level

Adjust level of Chorus / Flanger signal to EQ.

### C/F Power

Turn off to bypass Chorus / Flanger.

### Rev Level

Adjust level of Reverb Signal to EQ.

### Rev Power

Turn off to bypass Reverb.

# ARP (Arpeggio)

Adjust parameters for Arpeggio.



---

## Arp Rate

Adjust frequency of the clock for arpeggio. When tempo sync is off, range of the frequency is from 1 Hz to 20 Hz. When tempo sync is on, range of the rate is from 1/32 to 1 bars.

---

## Arp Pattern

Select a pattern of the arpeggio. Options are up, down, up & down and random.

---

## Arp Switch

Turn this switch on to enable arpeggio.

---

## Arp Sync

Turn this switch on to sync the rate of the clock with tempo.

# Master

Adjust parameters for global options



---

## Master Tune

Adjust pitch of the all oscillators. (+/- 50 cents)

---

## Detune

Adjust amount of detune. Pitch of the oscillators are varied from a voice to another. (+/- 50 cents)

---

## Stereo

Adjust amount of pan for each voices.

---

## Unison

Turn this switch on to enable unison mode. Unison mode make 8 voices to be used for a single note.

---

## Voices

Select number of voices for unison.

---

## Glide Time

Adjust time of the glide from 10 ms to 10 second. Glide is applied in polyphonic and unison when notes are played in legato.

Level and Pan of the master output can be adjusted in master tab of compressor.



## Volume

Adjust level of the master output.

## Pan

Adjust pan of the master output.

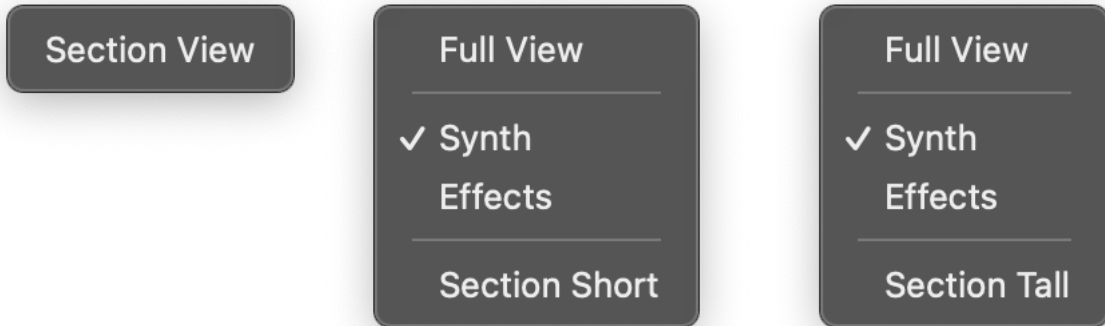
# Adjust Panel Height

Tap Synth Button in the title bar to show synth menu.

Select "Full View" to show synth and effect panels.

Select "Section Tall" to show single panel in tall height.

Select "Section Short" to show single panel in short height.







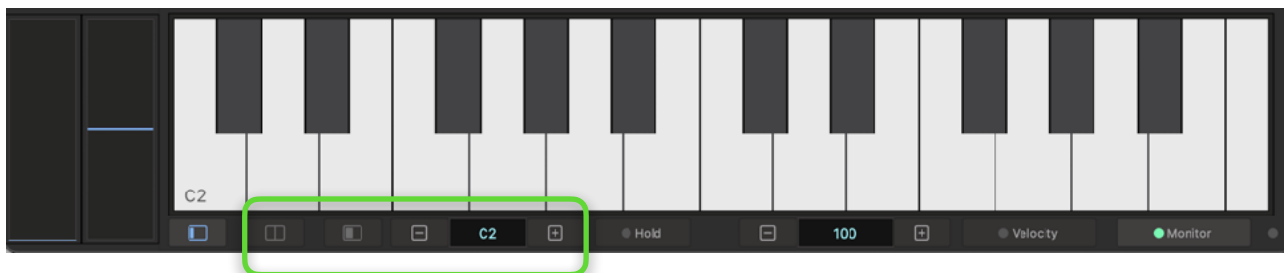
# Keyboard

## 1. Select Keyboard



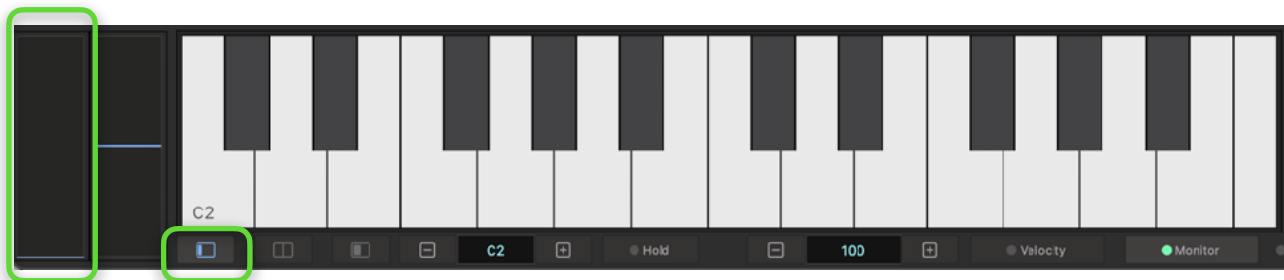
Tap keyboard button on title bar to show keyboard.

## 2. Select Key Range



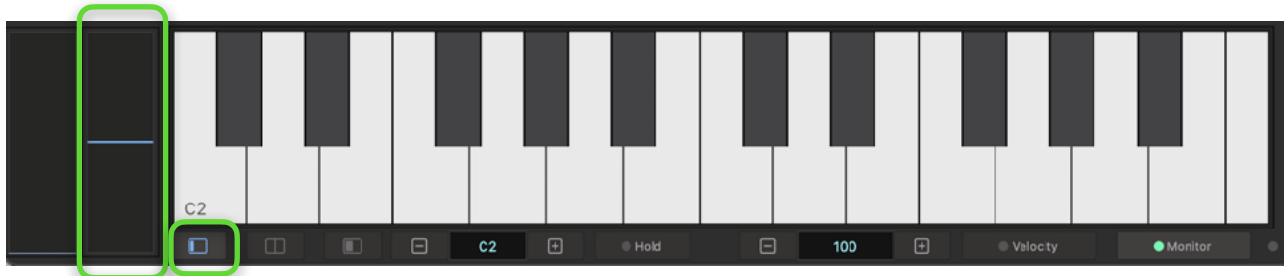
Use plus / minus buttons to adjust range of the keyboard. Indicator shows lowest note of the keyboard.

## 3. Use Modulation Wheel



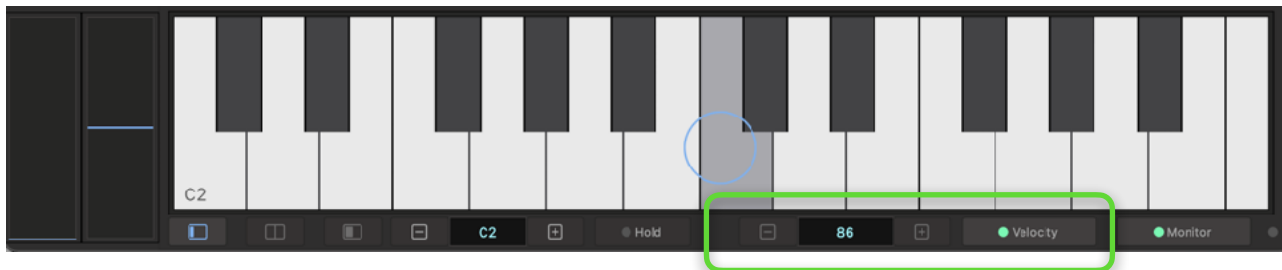
Adjust amount of the modulation when Mod Wheel is selected in modulation source.

## 4. Use Pitch Wheel



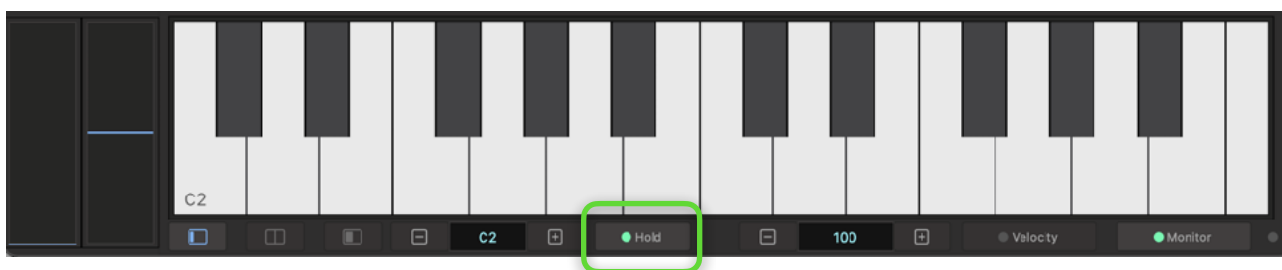
Adjust pitch of the oscillators. Range is plus / minus one octave.

## 5. Use Velocity



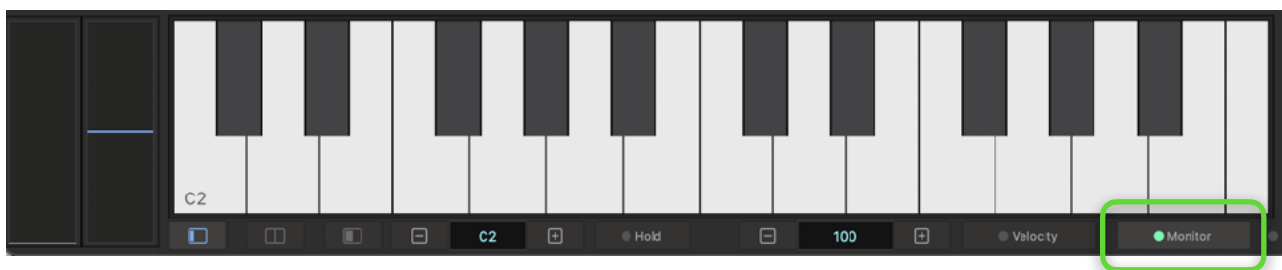
Tap velocity button to enable / disable velocity mode. When velocity mode is enabled, position in Y axis on a keypad controls velocity and aftertouch. When aftertouch is selected in modulation source, movement in Y axis controls total amount of the modulation. When velocity mode is disabled, velocity can be adjusted by plus/minus button. Default value of the velocity is 100.

## 6. Use Key Hold



Tap this button to enable /disable key holding. When key holding is enabled, press key to turn on / off the note.

## 7. Use Monitor



Tap this button to enable / disable MIDI key input monitoring. When monitor is enabled, Key Range of keyboard and sequencer is automatically adjusted based on the input note. Disable monitor to adjust key range freely when playing sequence or recording.

## 8. Use Split Keyboard



Tap Split button to show split keyboard. Split Keyboard is available when split mode is selected in the title bar.

Use Part button to select lower keyboard or upper keyboard to edit octave range and key hold.

Select Lower Keyboard

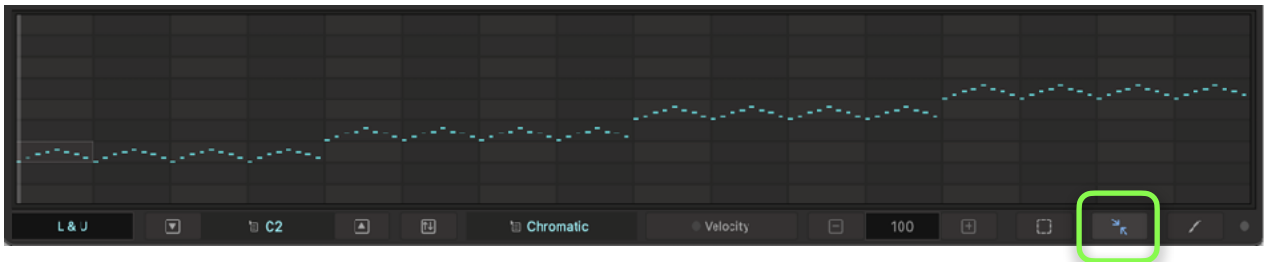


Select Upper Keyboard



# Piano Roll Editor

## Show / Hide Overview



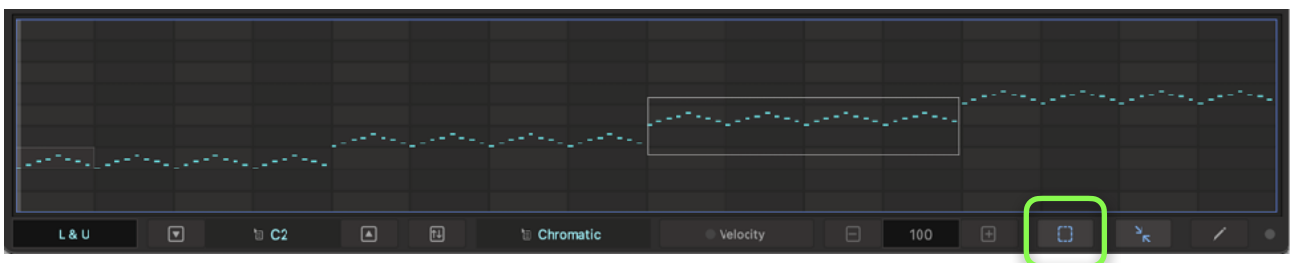
Tap overview button to show / hide overview.

## Select section for editing



Tap a cell to select a section (bar and octave) for editing. Double tap to open an editor.

## Editing Notes in Overview



Tap selection button and use selection rectangle to select notes for ...

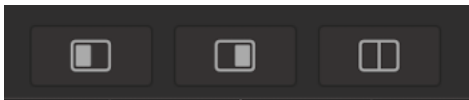
- Move selected notes.
- Copy, paste and delete the selected notes.

## Select Synth Part

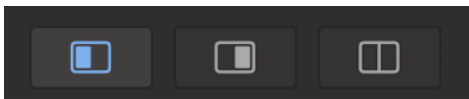
Sequence for Lower Synth and Upper Synth can be programmed independently. Select the synth part by using Part Buttons in Title Bar.



## Select Lower & Upper



## Select Lower



## Select Upper



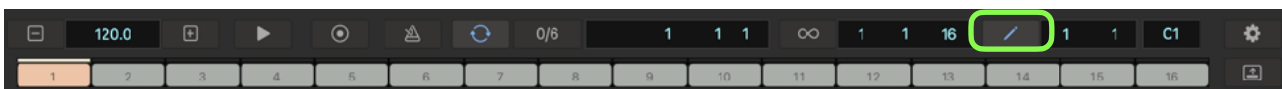
# Program Notes and Velocity

## 1. Select loop length



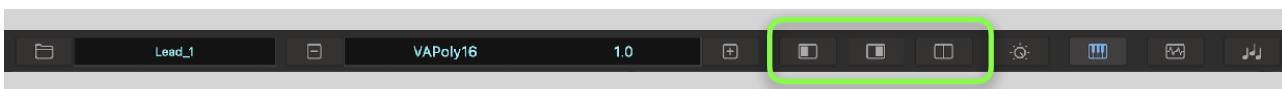
Tap loop button in transport bar to open loop selector. Use 16 pads to select loop length.

## 2. Select bar

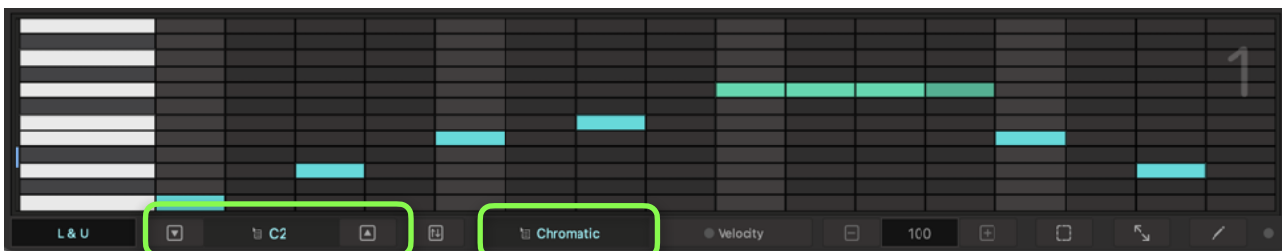


Tap edit button in transport bar to open bar selector. Use 16 pads to select a bar for editing.

## 3. Select Synth Part

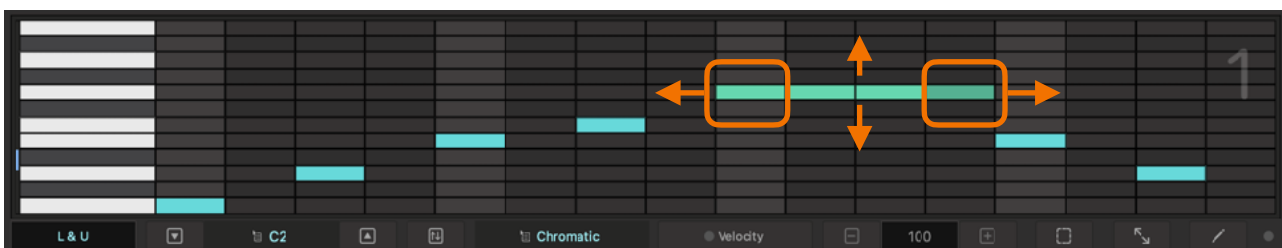


## 4. Select Scale and Key Range



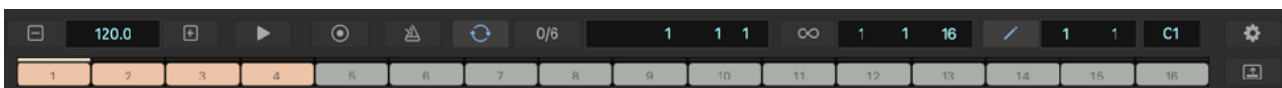
Select scale from scale menu and select key range.

## 5. Program Notes

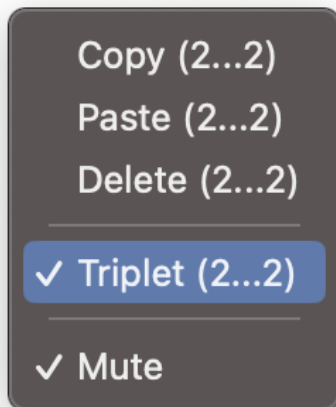


Tap on grids to program notes. Tap and drag to the right to program sustained note. Drag the end of the note to adjust its length. Drag the note vertically to adjust pitch of the note. Drag the note to left to move the note. Double tap on the note to delete the note.

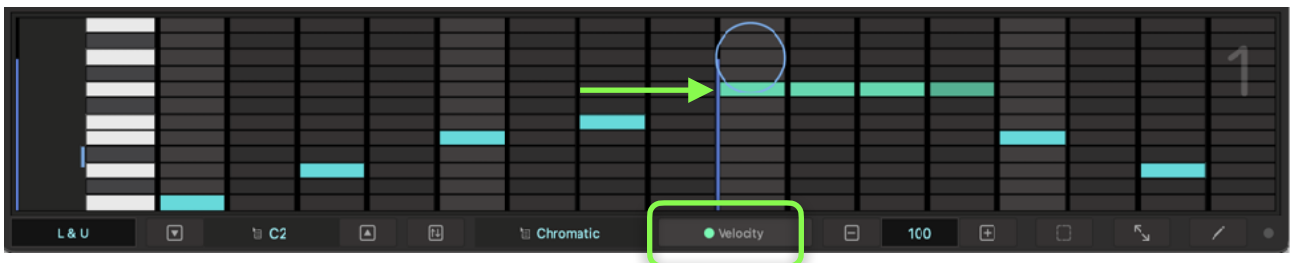
To program same notes in multiple bars, select bars in bar selector and program notes.



To program triplet for the bar, select Triplet from the edit menu. (Triplet notes do not support swing.)

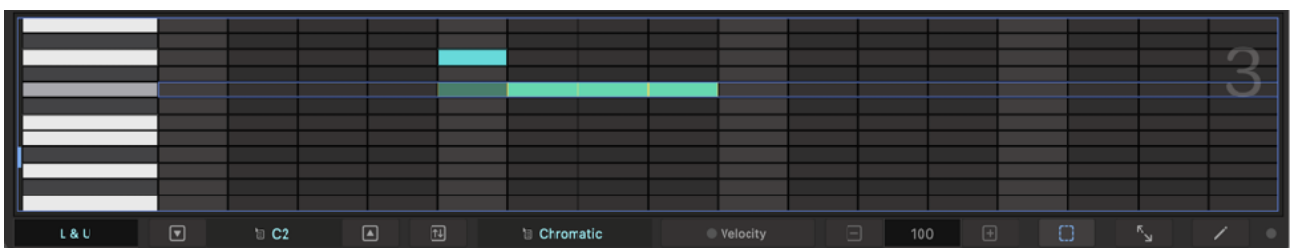


## 6. Adjust velocity



Tap on velocity switch to enable velocity mode. Tap a key on keyboard to select a voice. Tap on the note to show control. Drag the blue control to adjust velocity of the note. Value of the velocity is shown in the indicator at the bottom. Use plus / minus button to make fine adjustment.

## 7. Program notes in selection mode

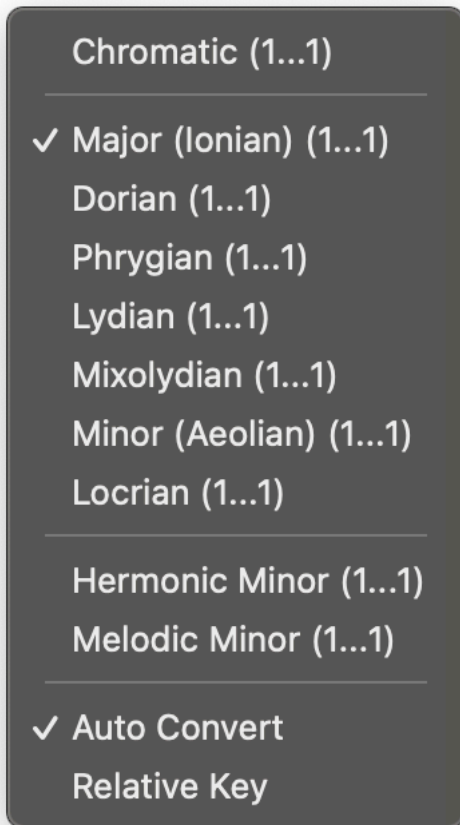


Double tap to add a note.  
Tap the note to select and double tap the selected note to adjust length.  
Tap and drag to move the note.

# Scale, Root Key and Transpose



## Scale



Select Chromatic to edit notes in Chromatic Scale (12 tones).

Select one of the other scale to edit notes in Diatonic Scale, Harmonic Minor Scale or Melodic Minor Scale<sup>5</sup> (7 degrees).

When Diatonic Scale, Harmonic Minor Scale or Melodic Minor Scale is selected, notes are displayed as degrees of the scale. Off-keys are indicated by changing color of scale menu button label to Red.

### Auto Convert<sup>6</sup>

When Diatonic Scale, Harmonic Minor or Melodic Minor Scale is selected, by enabling Auto Convert automatically convert notes to the selected scale.

### Relative Key (Auto Convert Option)

Modulating to a Relative Key

Enable Relative Key option to modulate to a relative key when changing scale from one to another. (e.g. C Major -> A Minor)

Modulating to a parallel key

Disable Relative Key option to modulate to a parallel key when changing scale from one to another. (e.g. C Major -> C Minor)

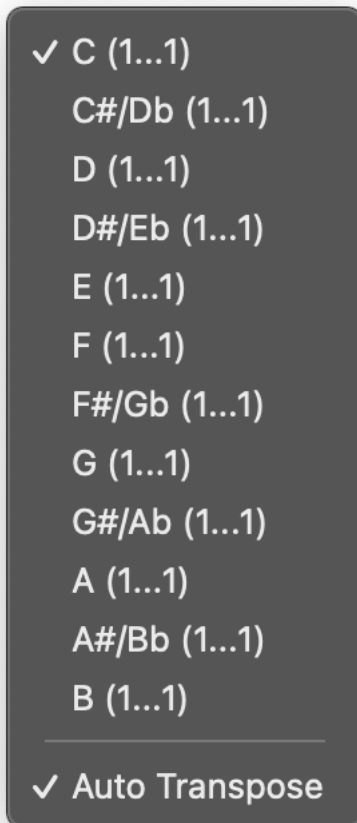
<sup>5</sup> Melodic Minor is Ascending Melodic Minor (Jazz Minor Scale)

<sup>6</sup> Notes programmed in Chromatic Scale can't be converted automatically. Also off-keys can't be converted automatically.



---

## Key Range



Use plus / minus buttons to adjust range of the keypads. Indicator shows lowest note of the keypads.<sup>7</sup>

Tap on the indicator shows Key Menu. Select a key, when using Diatonic Scale, Harmonica Minor or Melodic Minor Scale to edit notes.

When Auto Transpose is enabled, notes are transposed automatically to the selected key.

---

## Transpose



Select Octave Up to transpose key one octave up from current key.

Select Octave Down to transpose key one octave down from current key.

Select Fifth Up to cycle key 5th up from current key when Cycle Fifth option is enabled or transpose key 5th up from current key when Cycle Fifth option is disabled.

Select Fifth Down to cycle key 5th down from current key when Cycle Fifth option is enabled or transpose key 5th down from current key when Cycle Fifth option is disabled.

Toggle Cycle Fifth option.

---

<sup>7</sup> Key range uses Scientific Pitch Notation. Middle C (midi note 60) is C4. Some other applications use different standard, which indicate middle C as C3.

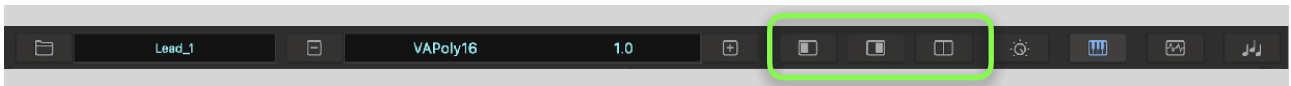
# Edit Selected Notes

## 1. Select bar

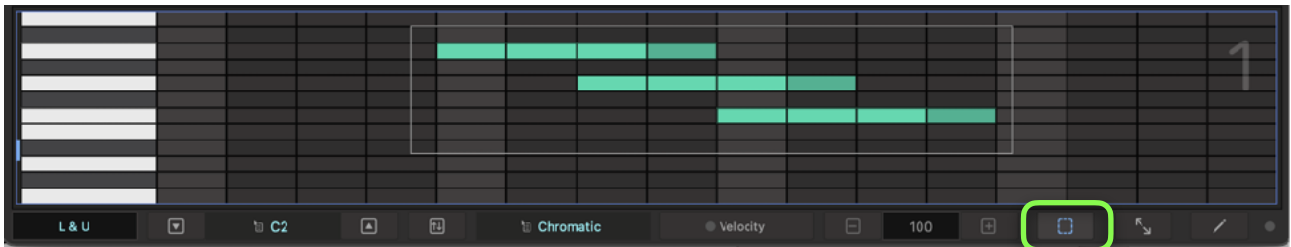


Tap edit button in transport bar to open bar selector. Select a bar to edit.

## 2. Select Synth Part

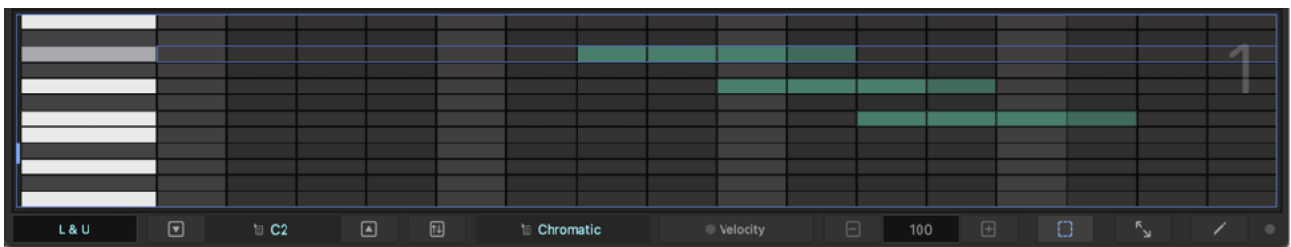
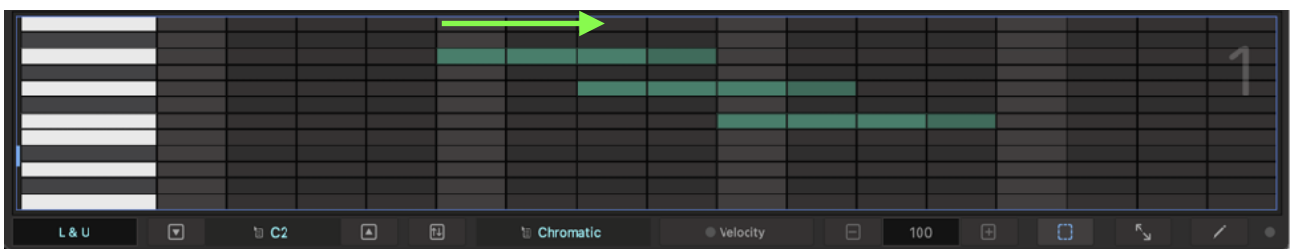


## 3. Select Notes



Tap select button to enable selection mode. Drag selection rectangle to select notes.

## Move Selected Notes



Drag and move the selected notes.

---

## Copy Selected Notes



Tap edit button in piano roll editor to open edit menu. Select “Copy” from the menu.

---

## Paste Selected Notes



Drag selection rectangle to specify location to paste. Tap edit button in piano roll editor to open edit menu. Select “Paste” from the menu.

---

## Delete Selected Notes



Tap edit button in piano roll editor to open edit menu and select “Delete” from the menu.

## Copy all notes in the selected bar

### 1. Select Synth Part



### 2. Select range (bars)



Tap edit button to open bar selector. Select range to copy.

### 3. Select Copy



Tap edit button in piano roll editor to open edit menu. Select "Copy" from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Paste all notes in the selected bar

### 1. Select Synth Part

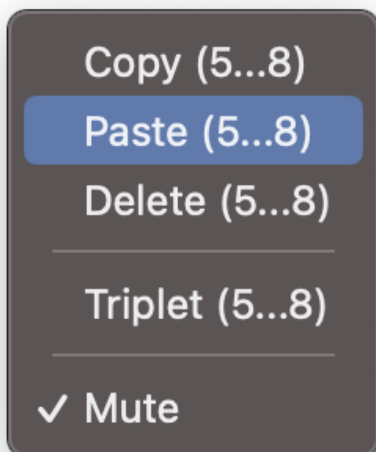


### 2. Select range (bars)



Tap edit button to open bar selector. Select range to paste.

### 3. Select Paste



Tap edit button in piano roll editor to open edit menu. Select “Paste” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

#### Note:

When selected range for the paste is larger than the range of the copied data, the data is pasted repeatedly to fill the specified range. For example, if copy buffer contains 2 bars of data (bar 1 and 2) and 8 bars (from bar 3 to bar 10) are specified as the paste range, data will be pasted 4 times. (bar 1 and 2) -> [(bar 3 and 4) (bar 5 and 6) (bar 7 and 8) (bar 9 and 10)]  
This behavior applies to all copy and paste functions.

## Delete all notes in the selected bar

### 1. Select Synth Part

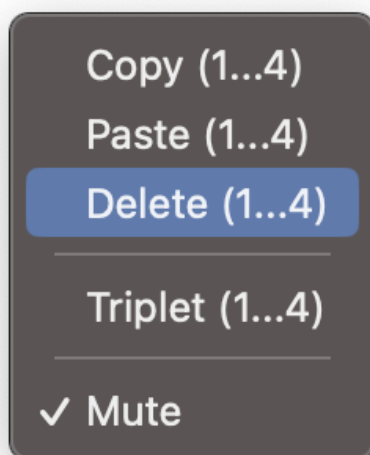


### 2. Select range (bars)



Tap edit button to open bar selector. Select range to delete.

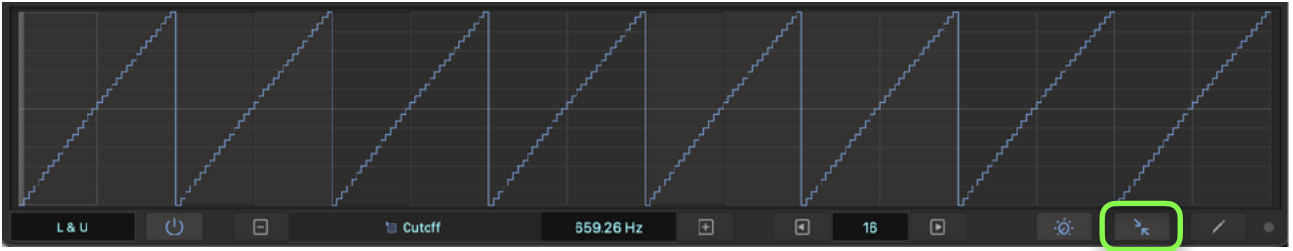
### 3. Select Delete



Tap edit button in piano roll editor to open edit menu and select "Delete" from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

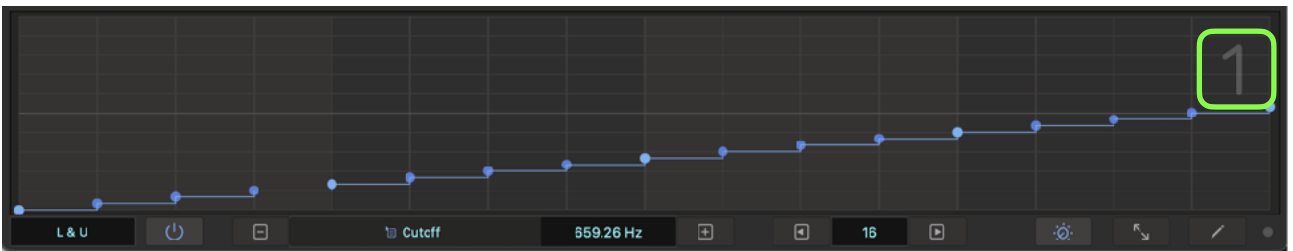
# Automation Editor

## Show / Hide Overview



Tap overview button to show / hide overview.

## Select section for editing



Tap a cell to select a section (bar and octave) for editing. Double tap to open an editor.

## Select Synth Part

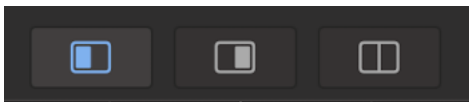
Parameters for Lower Synth and Upper Synth can be programmed independently. Select the synth part by using Part Buttons in Title Bar.



## Select Lower & Upper



## Select Lower



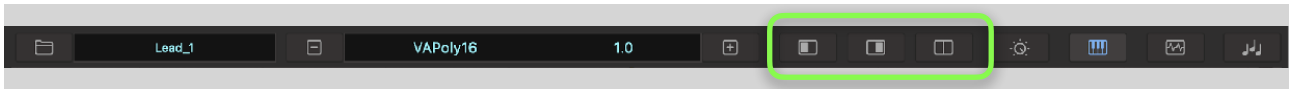
## Select Upper



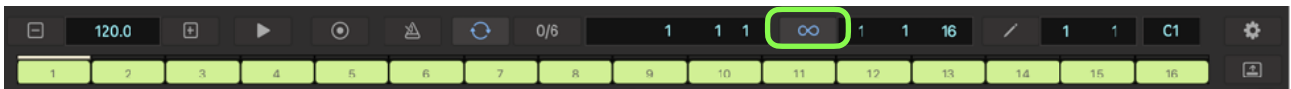


# Program parameter automation

## 1. Select Synth Part



## 2. Select loop range



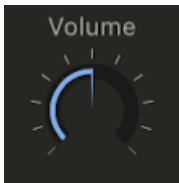
Tap loop button in transport bar to open loop selector. Use 16 pads to select loop length.

## 3. Select a bar



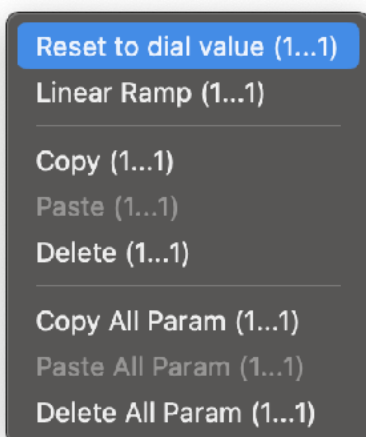
Tap edit button in transport bar to open bar selector. Use 16 pads to select a bar for editing.

## 4. Select a parameter



Tap a dial or a switch to select a parameter to automate value. Alternatively, tap parameter name to show parameter list and select a parameter from the list. Automated parameters are listed at the end of the list.

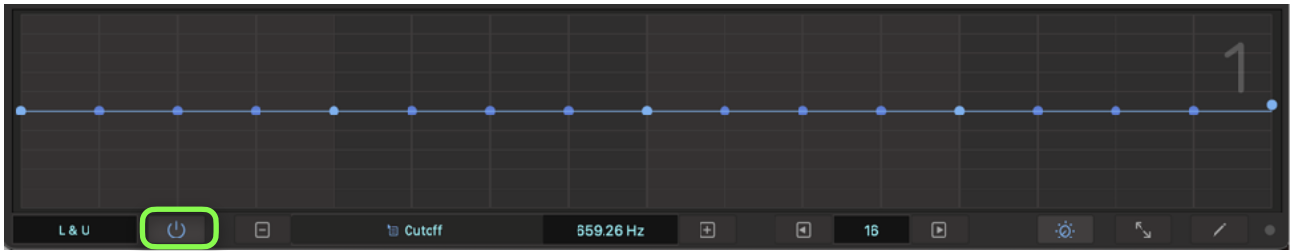
## 5. Reset to dial value



Tap edit button in automation editor to open edit menu. Select "Reset to dial value" from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

---

## 6. Activate automation



Tap power button in automation editor to activate automation of the parameter.

---

## 7. Program automation



Adjust value of the parameter per step.

To program multiple bars in automation editor, select bars in bar selector.

## Automation of the effect parameters

Parameters of the effect units are automated when the units are processing sound. If the effect unit has no input signal, parameters of the unit are not automated.

# Edit parameter automation

## Copy

1. Select Synth Part

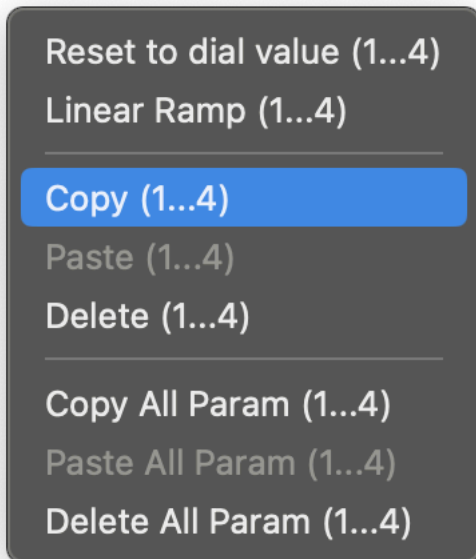


2. Select Range (bars)



Tap edit button to open bar selector. Select range to copy.

3. Select Copy



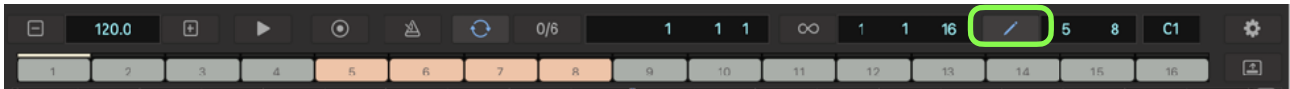
Tap edit button in automation editor to open edit menu. Select “Copy” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Paste

### 1. Select Synth Part

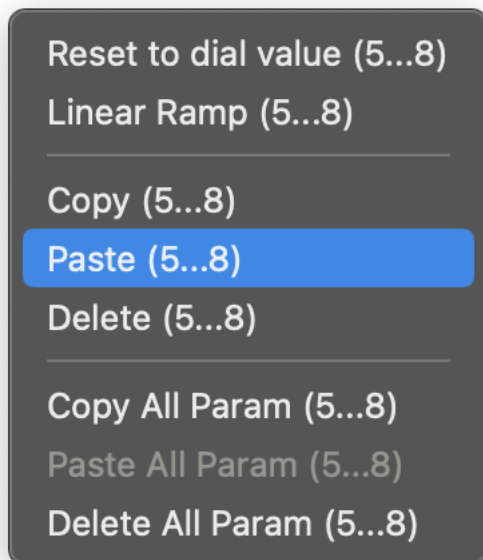


### 2. Select Range (bars)



Tap edit button to open bar selector. Select range to paste.

### 3. Select Paste



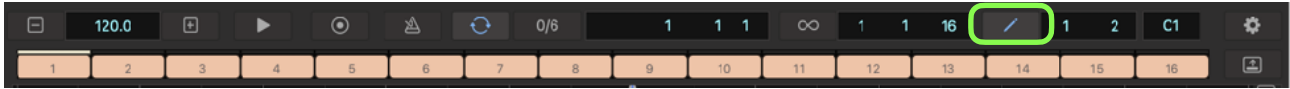
Tap edit button in automation editor to open edit menu. Select "Paste" from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Reset to dial value

1. Select Synth Part

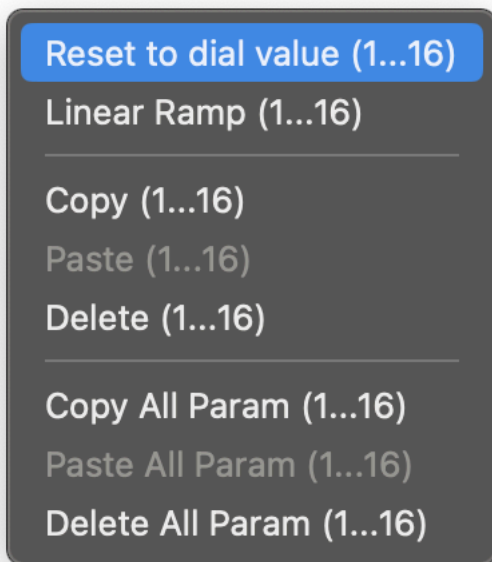


2. Select range (bars)



Tap edit button to open bar selector. Select range for editing.

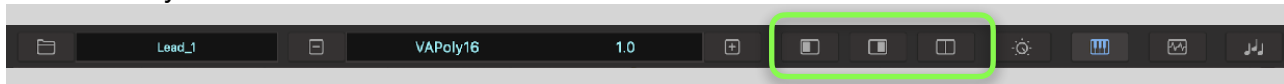
3. Select “Reset to dial value”



Tap edit button in automation editor to open edit menu. Select “Reset to dial value” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Convert to linear ramp

### 1. Select Synth Part

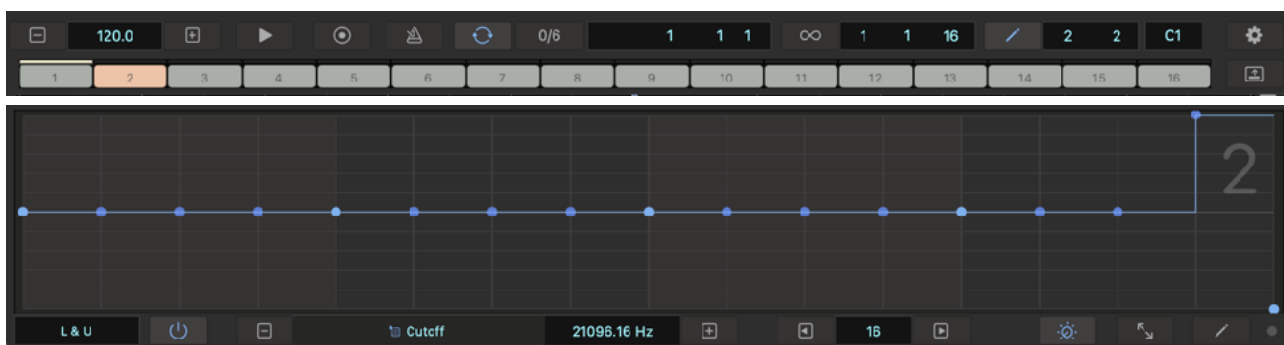


### 2. Set start value



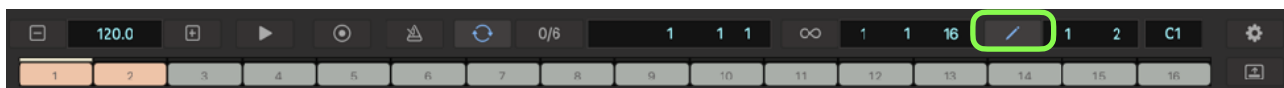
Tap edit button in transport bar to open bar selector. Select a starting bar for the ramp. Adjust start value of the ramp in automation editor.

### 3. Set end value



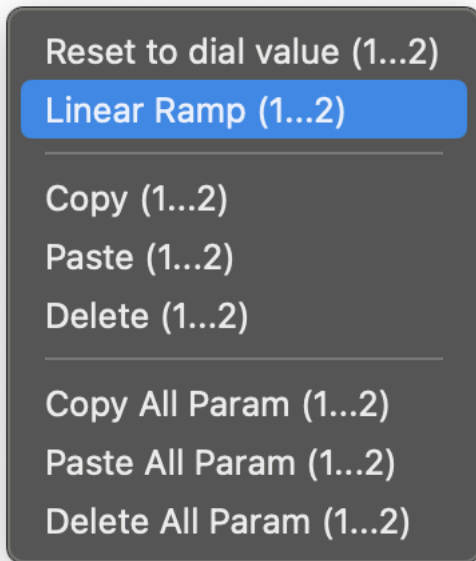
Tap edit button in transport bar to open bar selector. Select an ending bar for the ramp. Adjust end value of the ramp in automation editor.

### 4. Select range (bars)

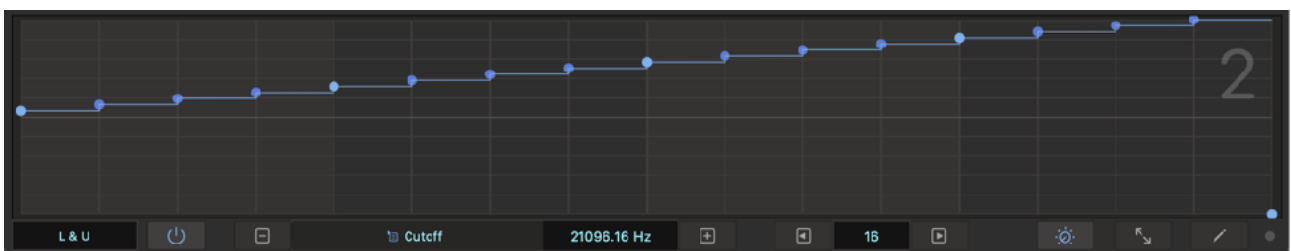
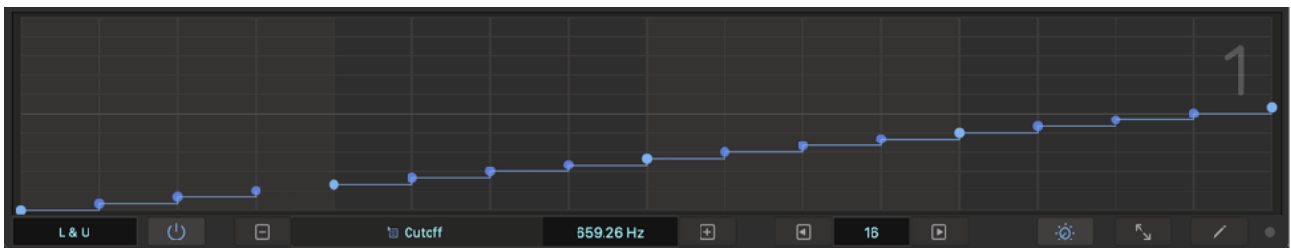


Tap edit button to open bar selector. Select range for editing.

5. Select “Linear Ramp”



Tap edit button in automation editor to open edit menu. Select “Linear Ramp” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

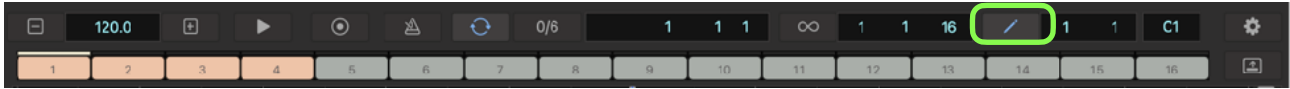


## Delete values for the selected parameter

1. Select Synth Part

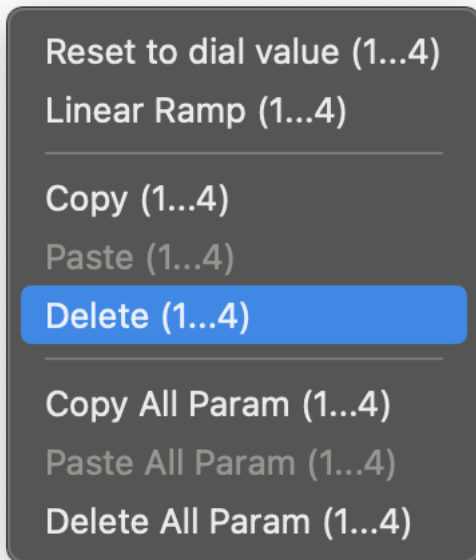


2. Select range (bars)



Tap edit button to open bar selector. Select range to delete.

3. Select “Delete”

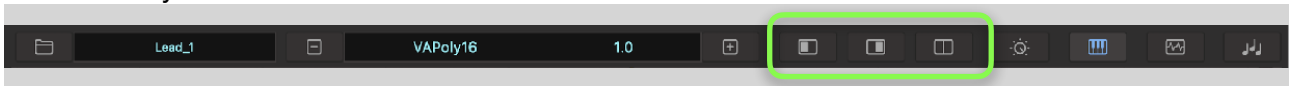


Tap edit button in automation editor to open edit menu. Select “Delete This Parameter” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

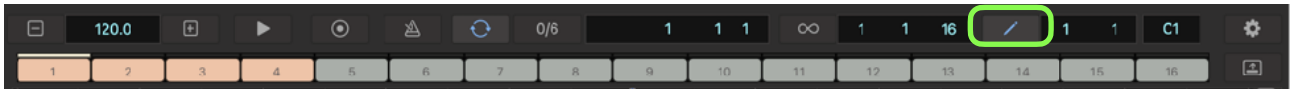


## Copy All Parameters

### 1. Select Synth Part

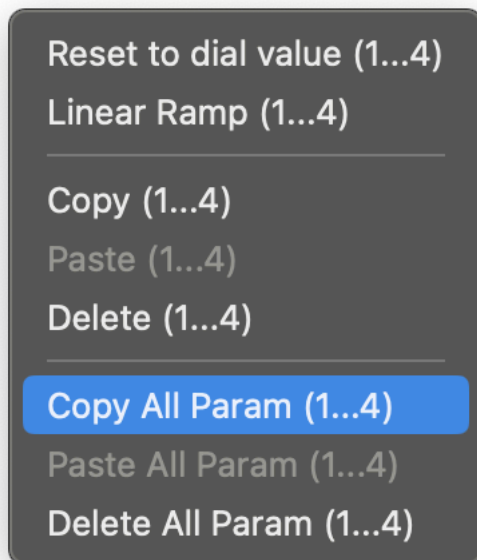


### 1. Select Range (bars)



Tap edit button to open bar selector. Select range to copy.

### 2. Select Copy



Tap edit button in automation editor to open edit menu. Select “Copy All” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Paste All Parameters

### 1. Select Synth Part

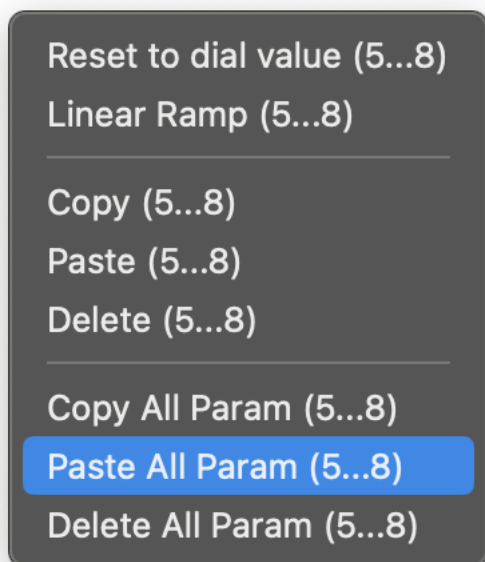


### 1. Select Range (bars)



Tap edit button to open bar selector. Select range to paste.

### 2. Select Paste



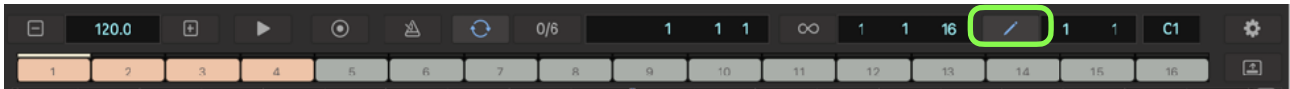
Tap edit button in automation editor to open edit menu. Select “Paste All” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

## Delete values for the all parameters

1. Select Synth Part

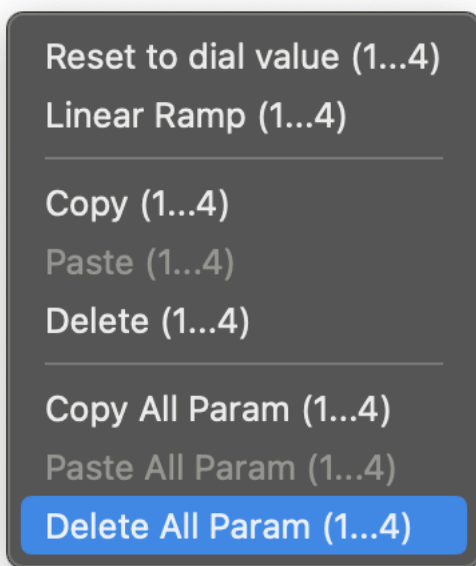


1. Select range (bars)



Tap edit button to open bar selector. Select range to delete.

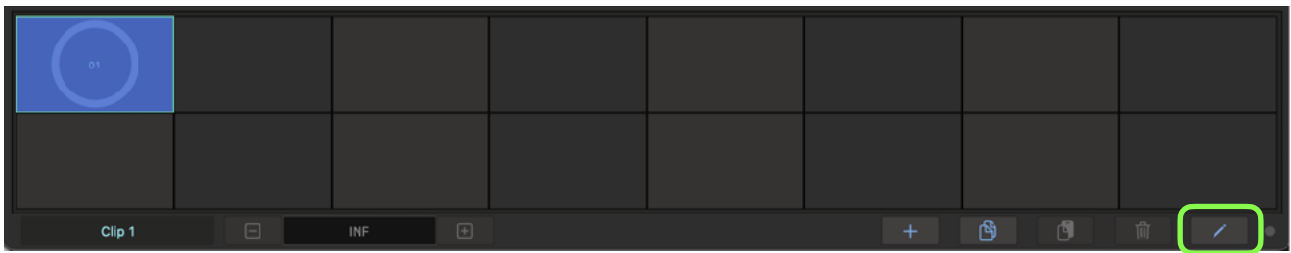
2. Select “Delete All”



Tap edit button in automation editor to open edit menu. Select “Delete All Parameters” from the menu. Numbers in Parentheses indicates the specified range. (start ... end)

# Clips

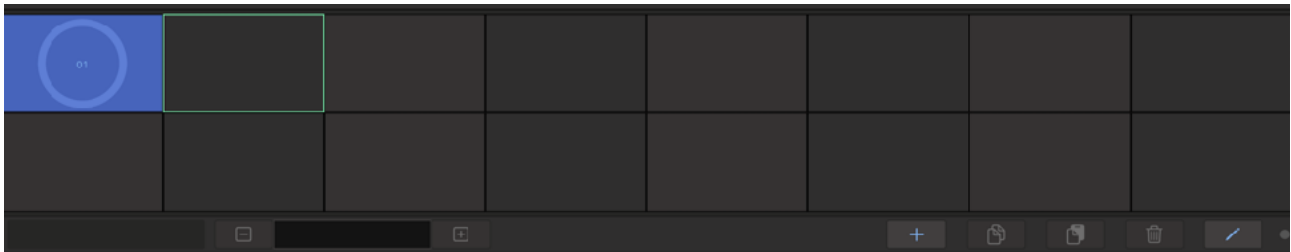
## Edit Clips



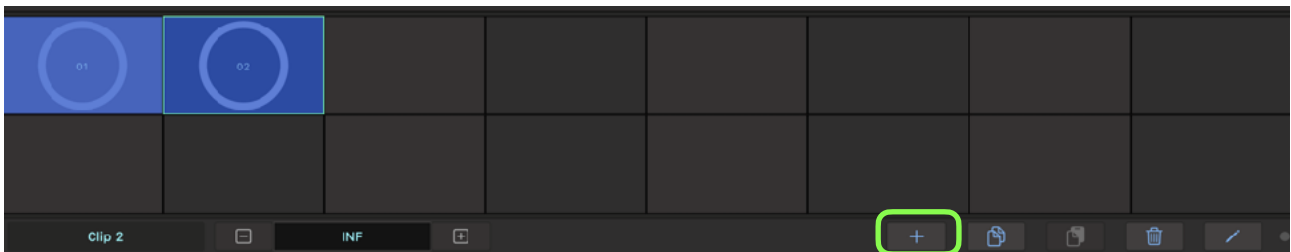
Tap edit button in clip editor to show edit tool buttons.

---

## Add



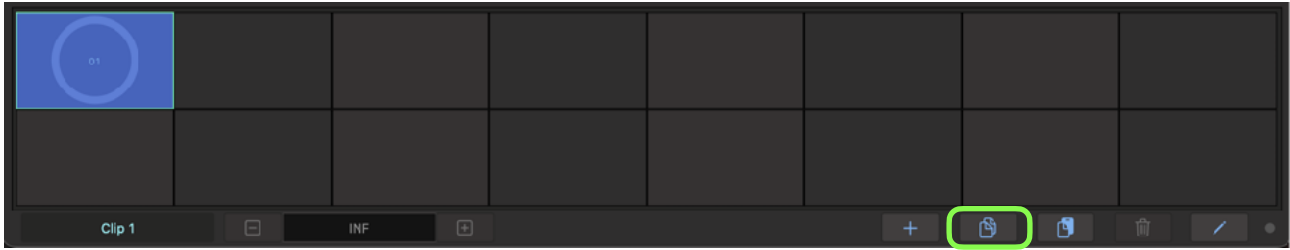
Select a grid to add a new clip.



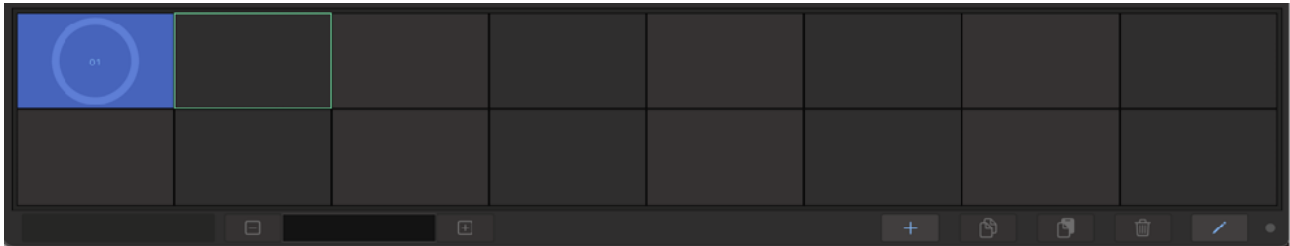
Tap plus button to add a new clip.

---

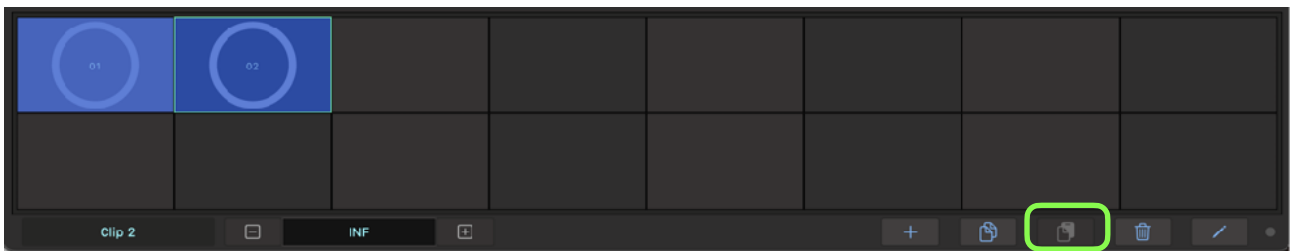
## Copy and Paste



Select a clip to copy and tap copy button.



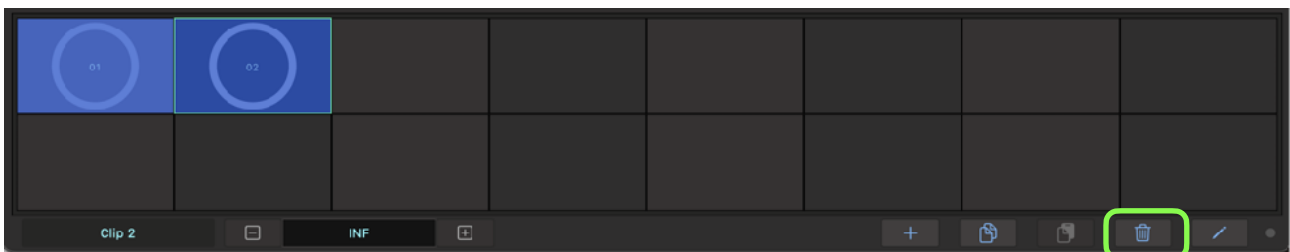
Select a grid to paste the clip.



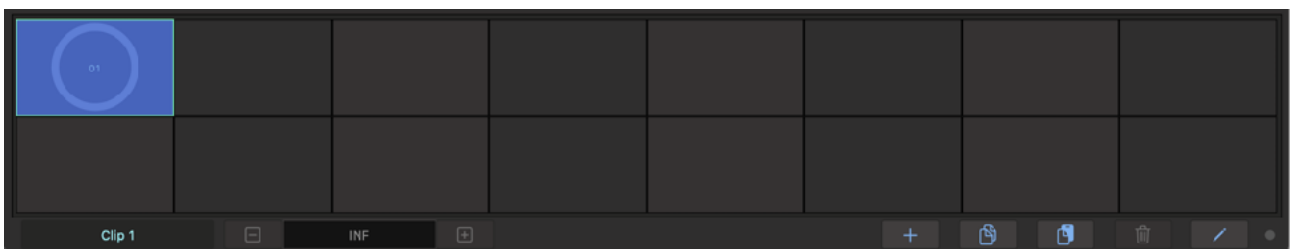
Tap paste button to paste the clip.

---

## Delete



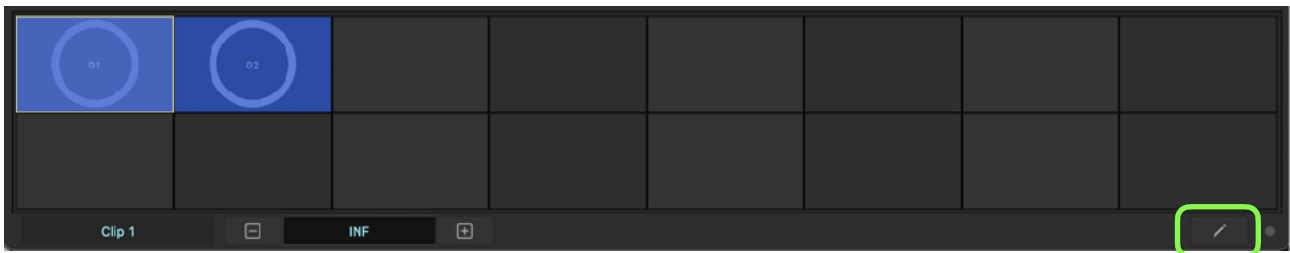
Select a clip to delete.



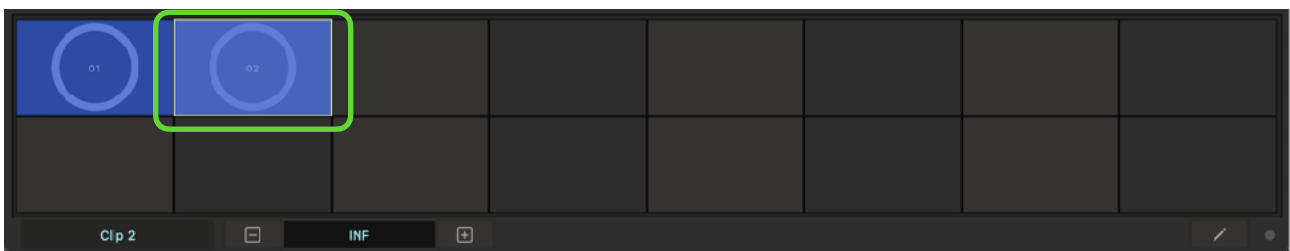
Tap delete button to delete the clip.

# Launch Clips

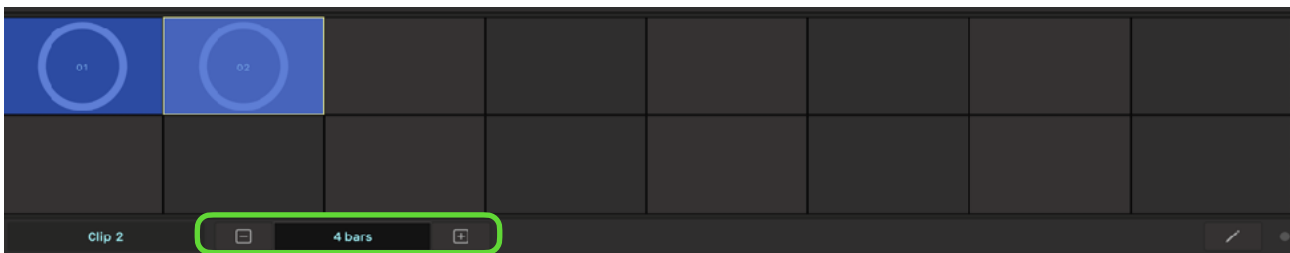
## Clip Editor



Turn off edit button to enable launch mode. Yellow border color indicates a loaded clip.



Select a clip to launch.



Adjust length of the clip by using a plus button and a minus button.

# Play and Record Sequence

## Play Sequence

---

### 1. Set host sync

Tap sync button in transport bar to enable / disable sync mode.

When sync mode is enabled,

#### Stand Alone

Sequencer is synced to the clock provided by container application. The container application can use Ableton Link to synchronized with the Link enabled devices. Use buttons in transport bar to play / stop sequence and change tempo.

#### Plugin

Sequencer is synced to the clock provided by the host application. Use transport switches of the host application to play / stop the sequence and change tempo.

When sync mode is disabled,

Sequencer is driven by internal clock. Use buttons in transport bar to play / stop the sequence and change tempo.

---

### 2. Set tempo

Tap plus / minus button at the tempo section in the transport bar to open tempo slider. Tempo can be adjusted by the plus / minus buttons and the tempo slider. Tempo slider can adjust tempo by range of plus/minus 20 BPM. Double tap on the slider set center position to the current tempo value. Alternatively tapping on tempo indicator allows you to type in tempo value by computer keyboard.

---

### 3. Set loop

Tap loop button in transport bar to open loop selector. Set loop length by using 16 pads.

---

### 4. Set swing

Tap swing button in transport bar to show swing menu. Select an option from the menu to apply the swing.

Swing Type	Delay time	Duration (Ratio)	Note
Swing 0/6	0 (no swing)	50%	Straight
Swing 1/6	1/6 of 16th note	54%	Soft swing
Swing 2/6	2/6 of 16th note	58%	Soft swing
Swing 3/6	3/6 of 16th note	62%	Soft swing
Swing 4/6	4/6 of 16th note	66%	Triplet swing
Swing 5/6	5/6 of 16th note	70%	Hard swing
Swing 6/6	16th note	75%	Dotted hard swing

Delay time is an amount of delay applied to the third 16th note when a beat is divided by four 16th notes.

Duration (ratio) is a ratio of duration from the first 16th note to the third 16th note when a beat is divided by four 16th notes.

Amount of delay for the notes in a beat changes proportionally.

---

## 5. Set metronome switch

Tap metronome button in transport bar to enable / disable metronome.

---

## 6. Play

Tap play / stop button in transport bar or transport switches of the host application to play / stop the sequence.

# Record Sequence

---

## 1. Set recording mode

Tap record button in transport bar to enable recording mode.

---

## 2. Play sequence

Play the sequence by following the steps described above. Recording will start after count-in. When tap recording button while playing, recording start without count-in. To start recording without count-in, play sequence first then tap record button.

---

## 3. Record notes

Play keypads or MIDI keyboard to record notes. Notes are automatically quantized at 16 step position.

---

## 4. Record parameters automation

Before recording parameter values, use edit command "Reset to Dial Value" to reset values of the parameter to the rest position.

Turn a dial or switch to record the parameter values. The color of the control changes to green to indicate the parameter is recorded. The control won't move automatically until disabling the recording mode in order to move the control freely during the recording.

If the synth or the effects is not producing sound, parameter value will not be recorded.

---

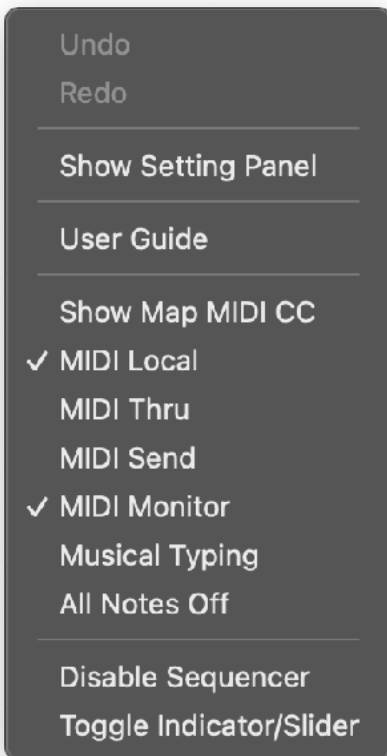
## 5. Stop recording

Tap record button in transport bar to disable recording mode or tap play button to stop playback.



# Settings

Tap setting button to show Setting Menu.



---

## Undo

Undo previous operation.

---

## Redo

Redo previous undo operation.

---

## Show Setting Panel

Open setting panel (Stand Alone.)

---

## User Guide

Open this user guide.

---

## Show/Hide Map MIDI CC

Open or Close Map MIDI CC view.

---

## MIDI Local

When sending and receiving MIDI, connected device may send back the MIDI. This causes each notes to play twice. If this problem occurs, turn MIDI Local Switch OFF to disconnect User Interface from the audio engine.

---

## MIDI Thru

When MIDI thru is turned on, MIDI messages received in MIDI input will be send out from MIDI output. This setting is required when connected device's local switch is turned off.

---

## MIDI Send

Enable / disable MIDI output.

---

## MIDI Monitor

Enable / disable MIDI key input monitoring. Key Range of keyboard and sequencer is automatically adjusted based on the input note.

---

## Musical Typing

Enable / disable computer keyboard to play MIDI notes.

---

## All Notes Off

Send note off message to all notes.

---

## Disable Sequencer

Enable / disable sequencer.

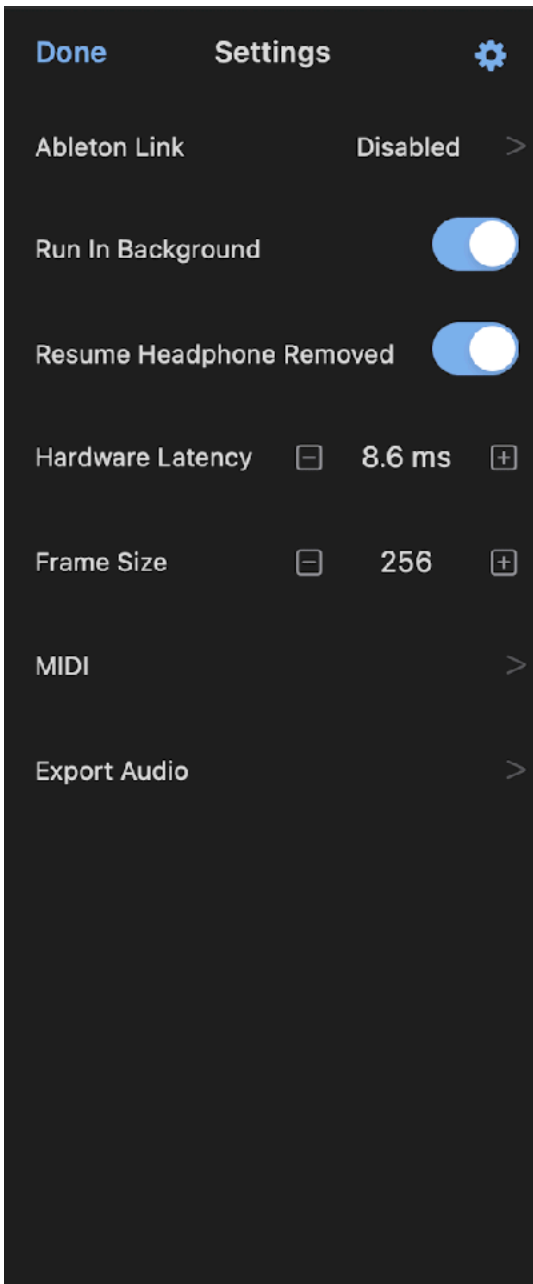
---

## Toggle Indicator/Slider

Toggle between indicator and slider in sub-title bar.

## Setting Panel (Stand Alone)

Select Show Setting Panel from setting menu to show the Setting Panel to edit settings for Stand Alone.



---

### Ableton Link

Open Ableton Link Settings.

---

### Run in Background

Turn this switch on to allow app to play continuously when the app enters in the background.

---

### Resume Headphone Removed

Turn this switch on to allow app to play continuously when headphone is disconnected.

---

### Hardware Latency

When Ableton Link is enabled, playback is synchronized to the Link-enabled devices. If there is a latency, output signal may not be aligned with the beginning of the each step.

In order to adjust the latency, set time in milliseconds in Hardware Latency. This value is used to compensate the latency of the output signal.

The latency varies on audio Interface and sample rate. Default value is 12.5 millisecond (sample rate is 44.1KHz)

---

### Frame Size

Frame Size (Buffer Size) is a number of samples contained in an audio buffer. Higher frame size increases system performance but increases latency. Lower frame size decrease latency but decreases system performance. If you experience a problem with system performance, set higher frame size to improve the performance. Default setting is 256.

---

### MIDI

Open MIDI settings.

---

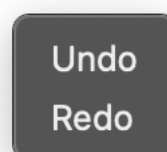
### Export Audio

Open export audio settings.

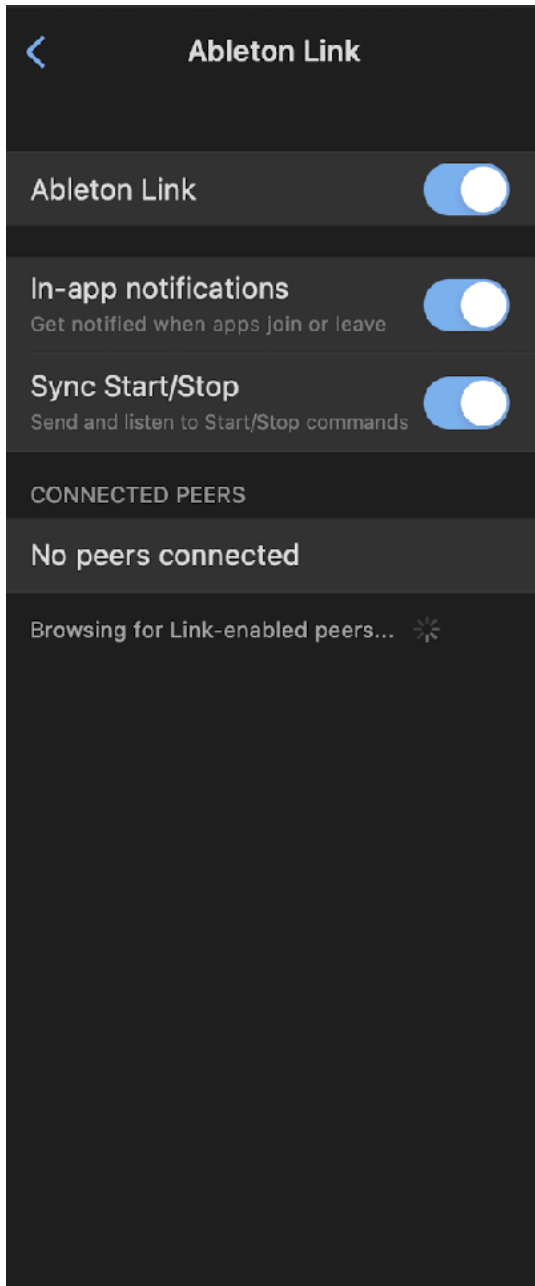
---

### Menu

Tap gear icon to show a menu.



# Ableton Link



Ableton Link is a new technology that synchronizes beat, phase and tempo of Ableton Live and Link-enabled iOS apps over a wireless network. It lets you play devices together with the freedom of a live band. Anyone can start and stop their part while others keep playing, and anyone can adjust the tempo and the rest will follow. You can use Link to play with several instances of Ableton Live, with Live and iOS apps, or even without Live in your setup: using Link-enabled apps on multiple devices, or multiple apps on the same device.

## **Ableton Link**

Switch on to enable Ableton Link.

## **In-app notification**

Switch on to displays a message when an Ableton Link enabled app is connected.

## **Sync Start/Stop**

Switch on to synchronize start and stop with connected apps.

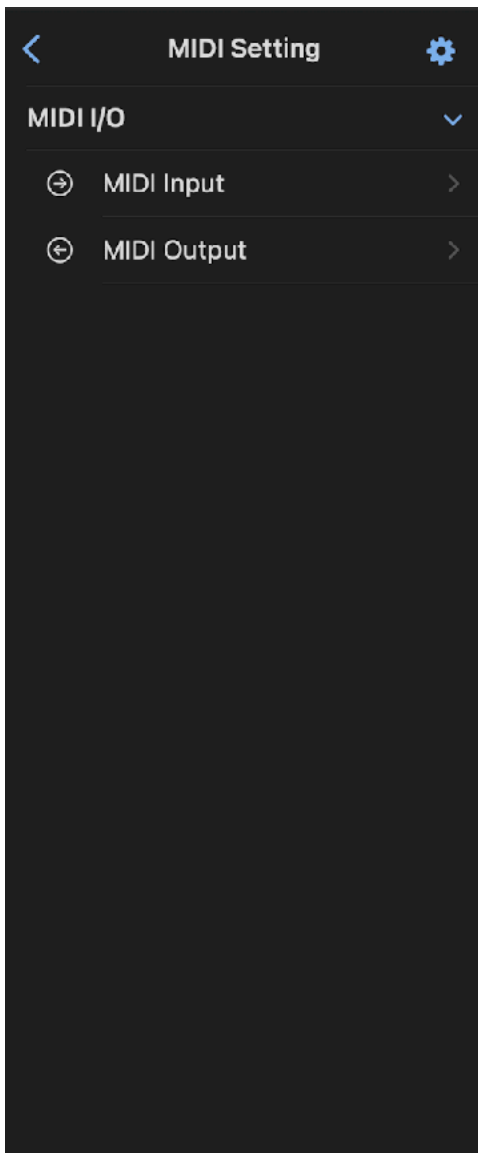
## **Connected Apps**

Indicate number of currently connected apps.

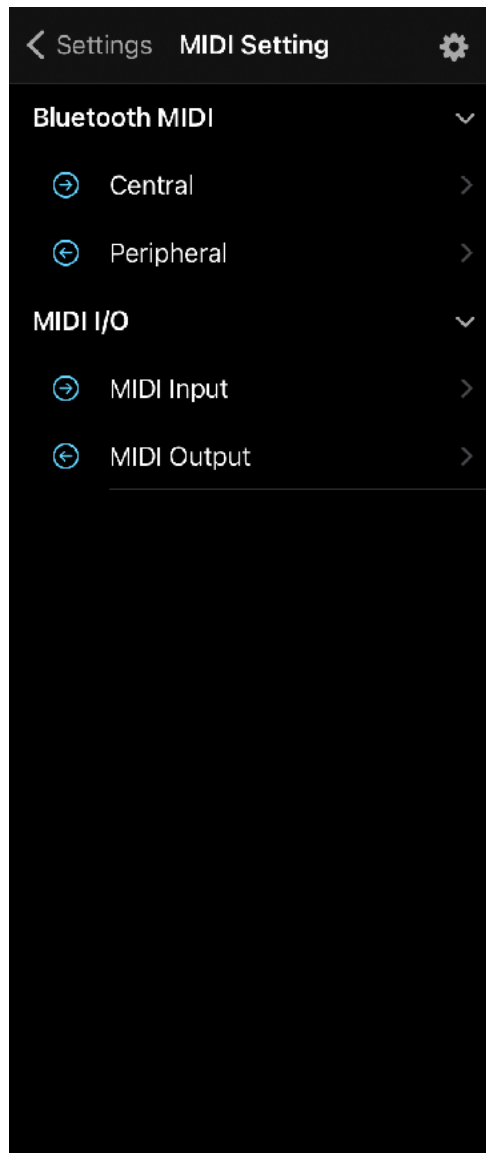
Ableton Link requires Wireless Local Network Connections. Your device and other Link-enabled devices must be connected to the same local network.

# MIDI Setting

## macOS



## iOS



---

### Bluetooth MIDI Central

Open Bluetooth MIDI Devices Page, which list available bluetooth devices. Select a name to connect to the device.

---

### Bluetooth MIDI Peripheral

Open Local MIDI Service Page. If Advertise MIDI Service switch is turned on, it makes the device to be discoverable from the other Bluetooth MIDI devices.

---

### MIDI Input

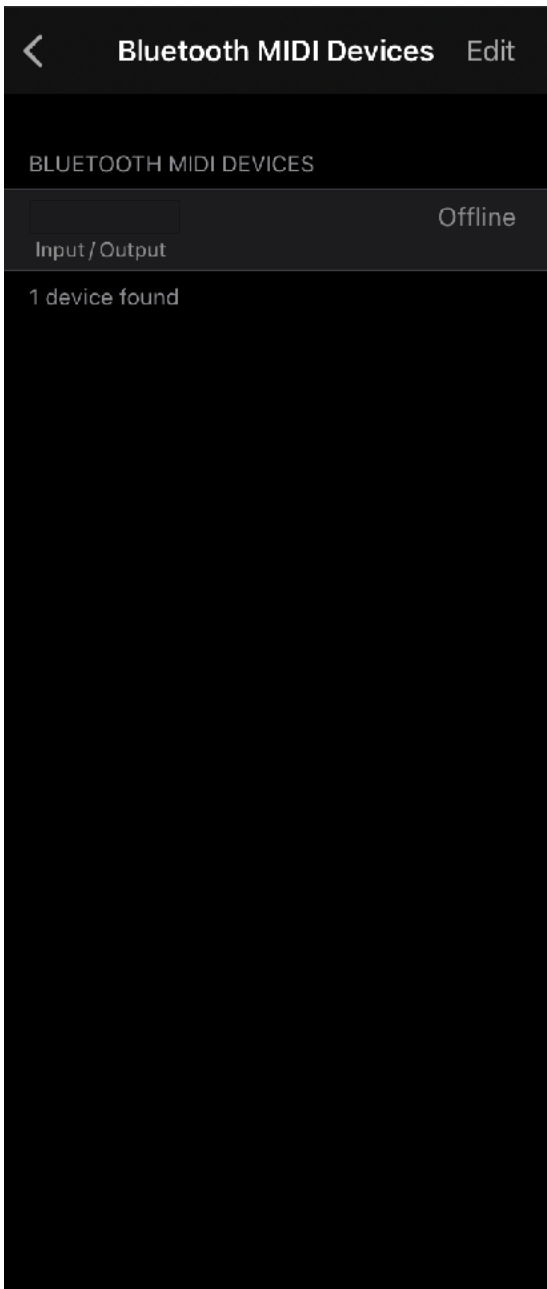
Open MIDI Input Page. This page shows a list of MIDI input services and devices. Tap on gear button to show MIDI Input Menu.

---

### MIDI Output

Open MIDI Output Page. This page shows a list of MIDI output services and devices. Tap on name to connect to the device. Tap on gear button to show MIDI Input Menu.

# Bluetooth MIDI Central

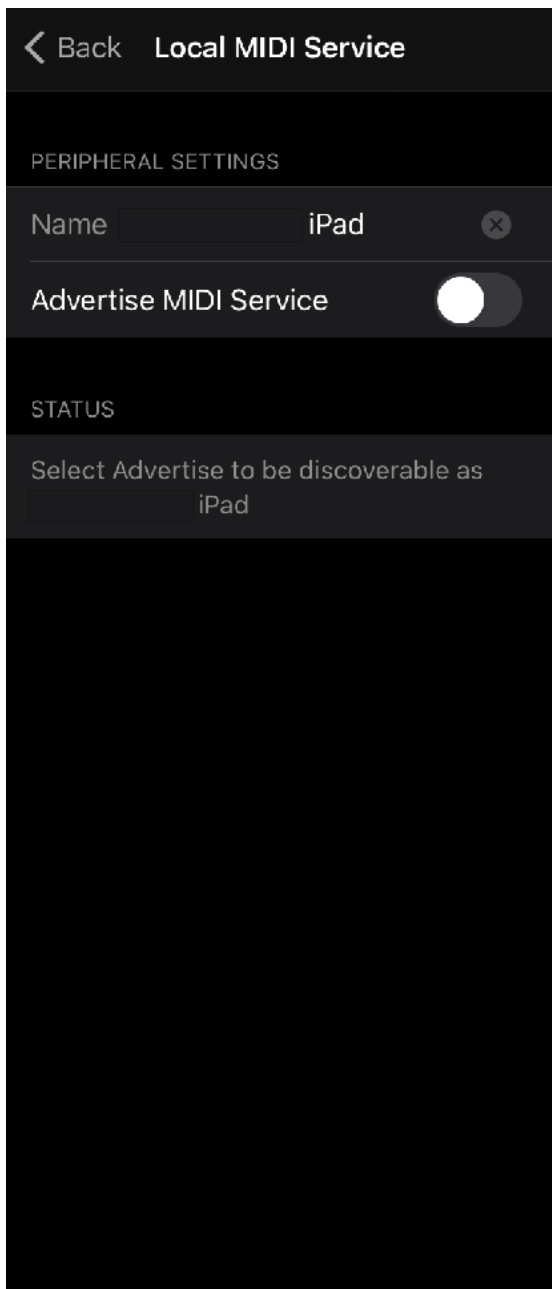


---

## Bluetooth MIDI Devices

Select a name to connect to the device.

# Bluetooth MIDI Peripheral



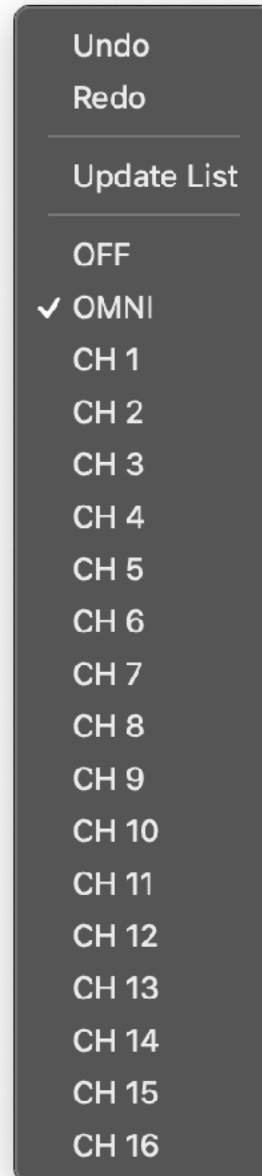
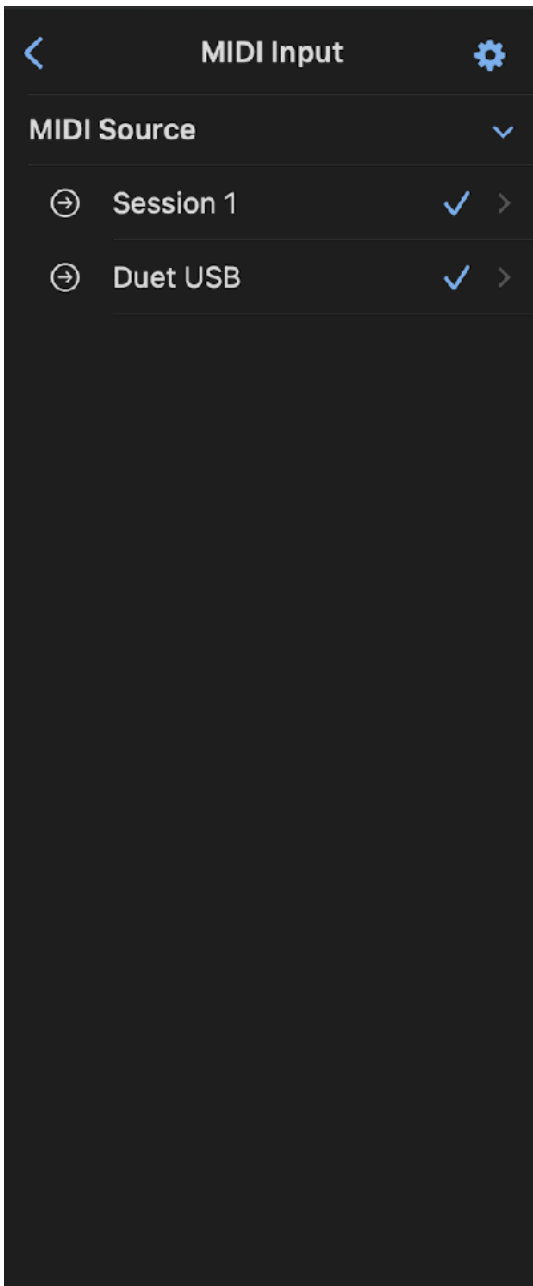
---

## Advertise MIDI Service

Turn on to make the device to be discoverable from the other Bluetooth MIDI devices.

## MIDI Input

This page shows a list of connected MIDI input sources. Select a name of the source to connect. Tap gear icon to show a menu.



---

### Update List

Select this menu to update MIDI input list.

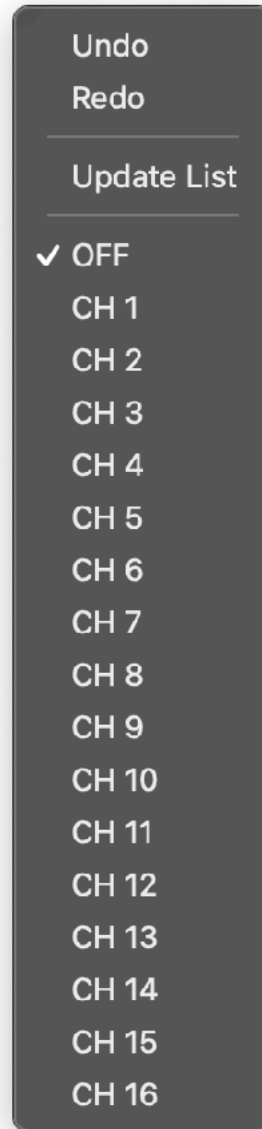
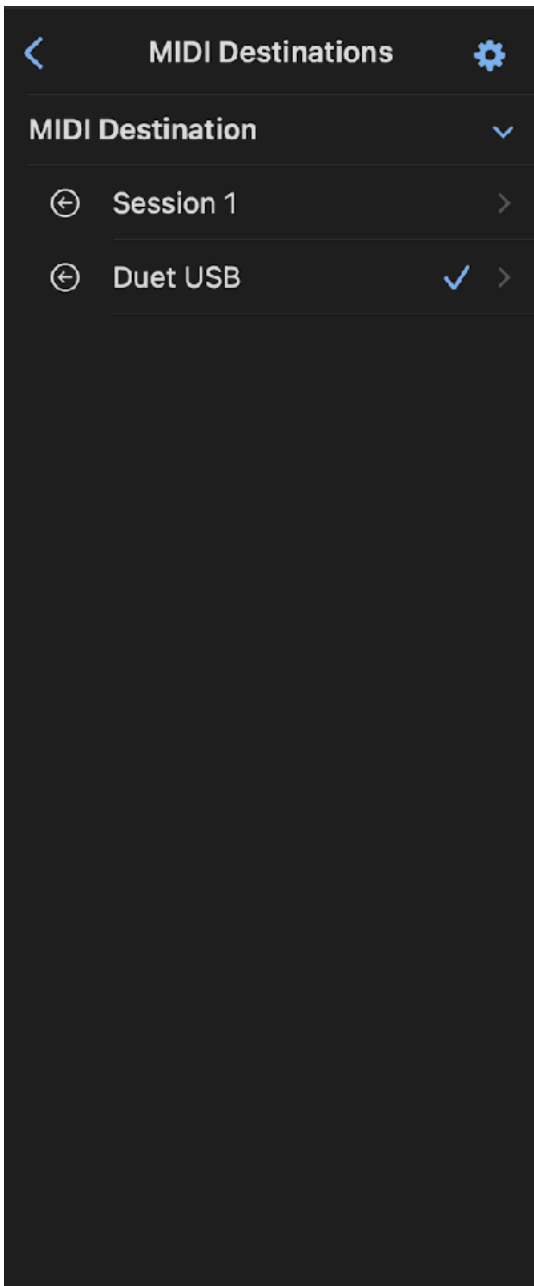
---

### MIDI Channel

Select MIDI Channel.  
Select OFF to disable MIDI input.  
Select OMNI to connect all channel.

# MIDI Output

This page shows a list of available MIDI output devices. Select a name of the device to connect. Tap gear icon to show a menu.



---

## Select MIDI Output Destination

Tap name of the device to connect MIDI output to the device. Selected device shows check mark on the right.

---

## MIDI Channel

Select MIDI Channel.  
Select OFF to disable MIDI output.

---

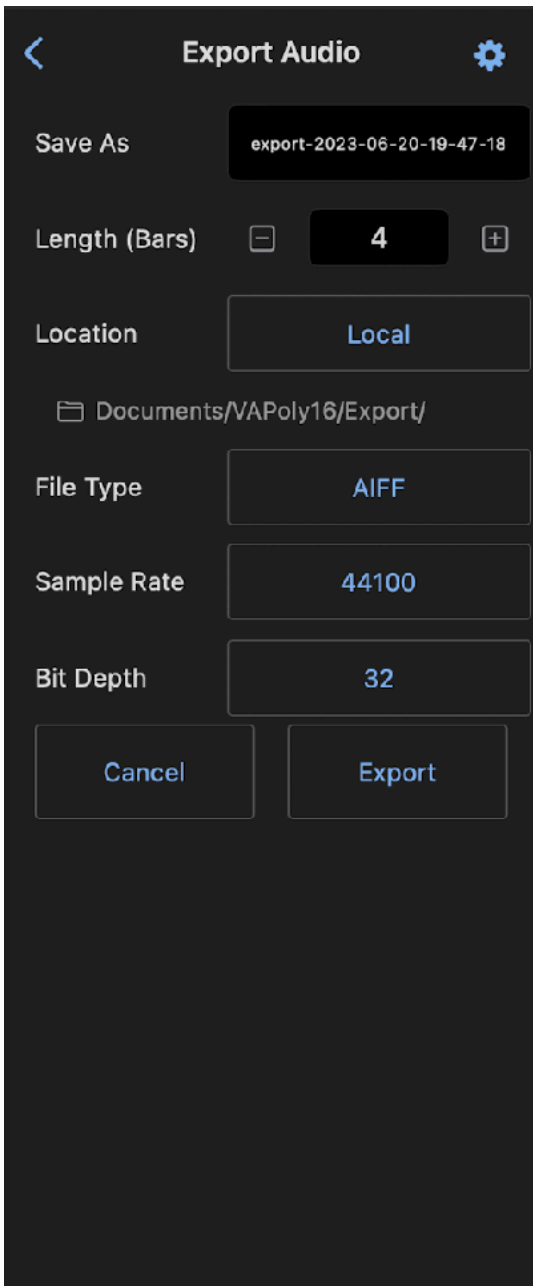
## Update List

Select this menu to update MIDI output list.



# Export Audio

Export audio file to iCloud drive or local drive.



---

## Save As

Specify name of the audio file to export.

---

## Length (Bars)

Length of the audio to be recorded. Specify the length by number of bars.

---

## Location

Select location for the audio file to be stored. Options are Local or iCloud.

---

## File Type

Select file type of the audio file. Options are AIFF, WAV, CAF and ACC.

---

## Sample Rate

Select a sample rate of the audio file. Options are 44.1KHz, 48KHz, 88.2KHz and 96KHz.

---

## Bit Depth

Specify bit depth of the audio file. Options are 16 bit, 24 bit and 32 bit.

---

## Export

Tap export to export audio file.

---

## Cancel

Tap cancel to return to the home page of the setting panel.

## Prepare for exporting audio

---

### 1. Stop playback

Make sure the playback is stopped.

---

### 2. Select the first clip to play

Open clip editor and select a clip which should be played at first.

---

### 3. Turn off metronome

Make sure that metronome is turned off.

---

## Adjust export settings

---

### 1. Save As

Type in file name if necessary.

---

### 2. Length

Set total length of the recordings by number of bars. This length should include the length of the delay or reverb tail.

---

### 3. Location

Select location to save the file. Options are local and iCloud.

---

### 4. File Type

Select a file type. Options for linear PCM format are AIFF, WAV or CAF. For compressed audio file, choose AAC. If the exported audio file is going to be edited in a different application, it is recommended to choose linear PCM format.

---

### 5. Sample Rate

Select sample rate. Options are 44.1KHz, 48KHz, 88.2KHz and 96KHz.

---

### 6. Bit Depth

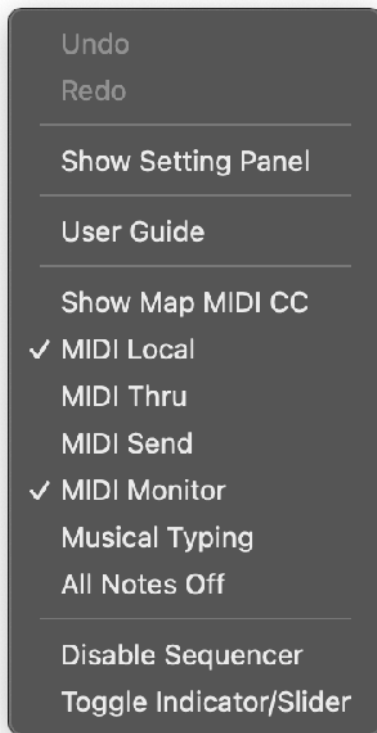
Select bit depth. Options are 16 bit, 24 bit and 32 bit. Higher number results in better quality. If the exported file is going to be used in a different application, make sure that the which bit depth of the selected file type is supported by the application. (\* 32 bit may not be supported in some applications).

---

## Export Audio File

Tap export button to generate audio file and save the file in the specified location. When exporting the file is completed, browser can be open to audition the exported file.

## Undo / Redo



1. Tap “Setting” button to open menu.
  2. Select Undo / Redo from the menu.
- Select Undo to undo previous operation.
  - Select Redo to redo previous undo operation.
- \* Some operation such as play, stop or record are excluded from undo / redo operation.

## MIDI CC Map

Select Show Map MIDI CC from setting menu to show MIDI CC Map View.  
Use synth button on tool bar to select synth or effect to map MIDI CC to the parameters.  
Select Hide Map MIDI CC from setting menu to close MIDI CC Map View.



To make a MIDI CC (Continuous Controller) assignment, Tap a button then turn a knob on MIDI controller. The first MIDI CC number detected will be assigned to the parameter.

When CC is assigned, the button shows the CC number. Alternatively, double tap on a button to type in CC number.

To cancel the assignment or to remove the mapping, tap the button.

## Override Automation

When a parameter is controlled by MIDI controller, it is not possible to automatically override automation. To override, turn off automation switch of the parameter or turn the dial of the parameter on screen that will stop the automation and the parameter can be controlled freely by MIDI controller.

## Program Change

Program Change is received as following.

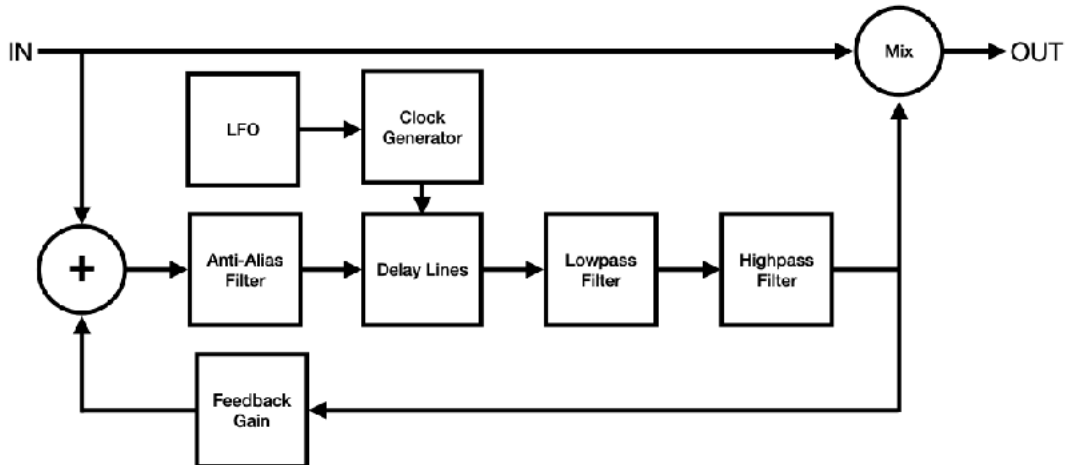
Factory: Bank (CC#0) = 0, Sub (CC#32) = [0, 1], Program = [0, 127] => preset [0, 255]  
Plugin: Bank (CC#0) = 1, Sub (CC#32) = 0, Program = [0, 127] => Preset Number

Presets stored in iCloud Drive can't be selected by the MIDI program change.

# Effects

## Delay

### Signal Flow



### Delay Time

Adjust delay time from 20 ms to 1200 ms. When sync switch is turned on, delay time can be set as note value which is synchronized to the tempo. Valid range of the note value is automatically adjusted base on the current tempo.

### Regeneration

Adjust feedback from 0 % to 100 %. You can change sound of the feedback by adjusting frequency of the high-pass filter and the low-pass filter.

### Modulation

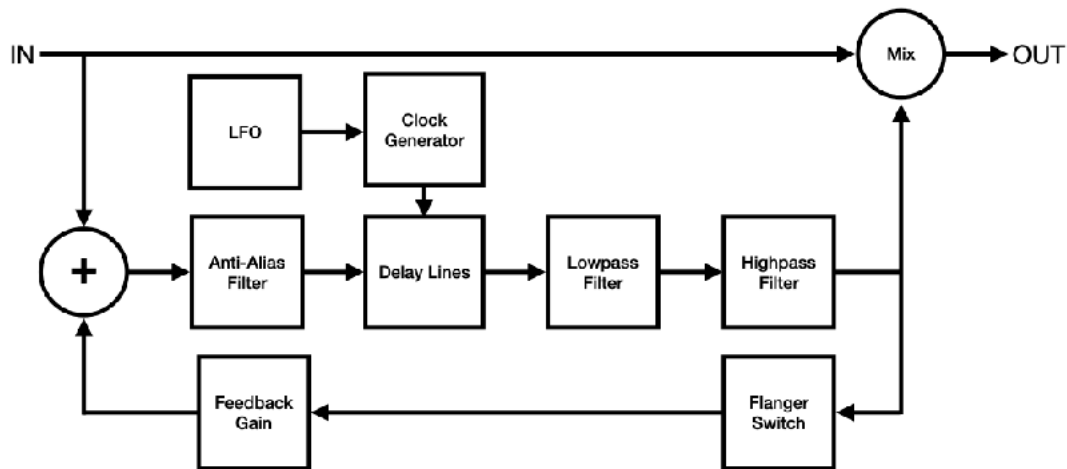
Modulation can be applied to the delayed signal. LFO (Low Frequency Oscillator) generates sine wave for the modulation.

Adjust LFO frequency from 0.01 Hz to 10 Hz.

Adjust LFO Intensity from 0 to 1.0, which adjust modulation width from 0 ms to +/- 10 ms.

# Chorus / Flanger

## Signal Flow



## Input Signal Level

Level of input signal should be about -6dB or less. If the input signal is too hot, it will cause distortion in output signal.

## Effect Type

Select effect type from chorus or flanger. Ranges of the delay time and the LFO Intensity change based on the selected effect type.

## Modulation Speed

LFO Frequency dial controls speed of the modulation. When sync switch is turned on, LFO Frequency can be set as note value which is synchronized to the tempo. Valid range of the note value is automatically adjusted base on the current tempo.

## Modulation Width

LFO Intensity dial controls width of the modulation and delay time dial controls center position of the modulation.

When chorus effect is selected, range of the LFO intensity is from 0 ms to 1 ms and range of the delay time is from 1 ms to 40 ms.

When flanger effect is selected, range of the LFO intensity is from 0 ms to 12 ms and range of the delay time is from 1 ms to 13 ms.

Rotate delay time dial counterclockwise to emphasize higher frequency or clockwise to emphasize lower frequency.<sup>8</sup>

## LFO Shape

LFO shape dial controls shape of the LFO waveform. When the dial is rotated fully counterclockwise, shape of the waveform is sine wave. When the dial is rotated fully clockwise, shape of the waveform is triangle wave.

## Stereo Width

Stereo Width dial controls phase offset of the LFO. When the dial is rotated fully counterclockwise, stereo width is 0%. (phase offset is 0 degree) When the dial is rotated fully clockwise, stereo width is 100%. (phase offset is 180 degree)

## Regeneration

Feedback dial controls amount of regeneration from 0 % to 100 %. Turning the feedback dial clockwise enhances amount of the feedback effect.

<sup>8</sup> If compared with manual knob of the analog flanger guitar pedal, emphasized frequency moves reverse direction.

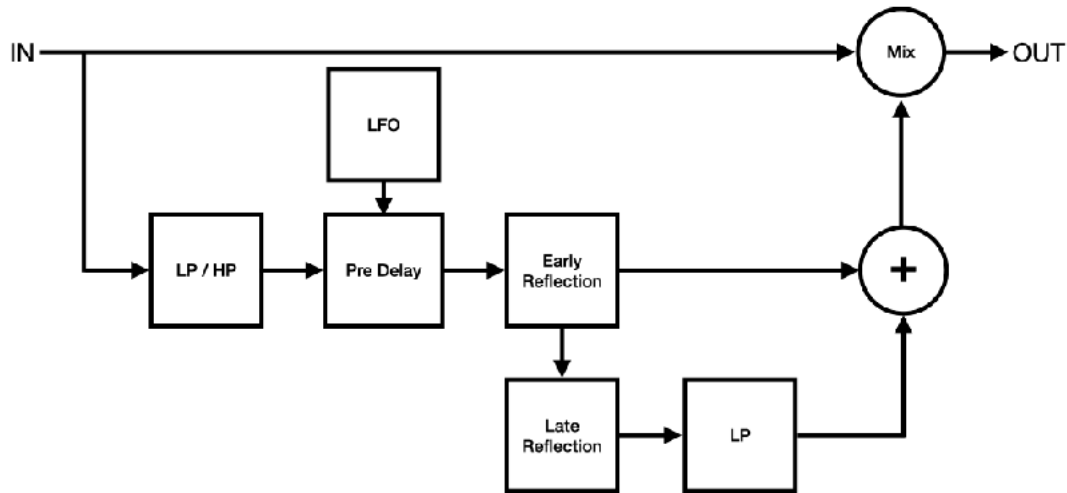
---

## Filters

Delayed signal is routed to high-pass filter and low-pass filter before mixed with dry signal. HP frequency controls frequency of the high-pass filter. LP frequency controls frequency of the low-pass filter.

# Reverb

## Signal Flow



## Input Filter

Use Lowpass filter and high-pass filter to attenuate high frequency and low frequency of the input signal.

## Pre Delay

Use pre delay to adjust amount of the time between the direct signal and beginning of the early reflection signal. This parameter can be used to express size of the space. Reflection takes short time to bounce back in small room and it takes long time in large room. Also this parameter can be used to separate dry signal and reverb signal in the mix.

## Modulation Speed

LFO Frequency dial controls speed of the modulation. When sync switch is turned on, LFO Frequency can be set as note value which is synchronized to the tempo. Valid range of the note value is automatically adjusted base on the current tempo.

## Modulation Width

LFO Intensity dial controls width of the modulation and pre delay time dial controls center position of the modulation. Range of the LFO intensity is from 0 ms to +/- 10 ms.

## Size and Decay

Size dial controls reverb time of late reflection and decay dial controls length of the reverb tail. Decay time can be used to express size of the space and material of the surface. Reflective materials, such as concrete or hardwood, gives longer decay time.

When auto size switch is turned on, size dial controls value of the parameters including size, pre delay, decay, damp, output LP frequency and early/late mix.

When sync switch is turned on in auto size mode, total reverb length, which can be controlled by pre delay, size and decay, is adjusted by note value which is synchronized to the tempo.

## Damping

Damp dial controls amount of high frequency absorption for the late reflection signal. Low damping values produce brighter reverb sound and high damping values produces darker reverb sound.

## Output Filter

Use lowpass filter to cut high frequency of the reverb signal.



---

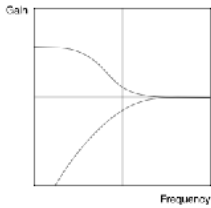
## Early / Late Mix

Adjust balance of the early reflection signal and late reflection signal from 0% (early reflection ) to 100% (late reflection).

# Equalizer

---

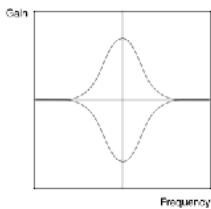
## Low Shelving



Adjust frequency of the filter from 21 Hz to 1092 Hz.  
Adjust gain from minus infinity to +12 dB  
When gain is turned fully anti clock wise, the filer becomes high pass filter.

---

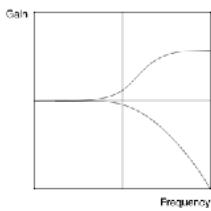
## Mid Peak / Notch



Adjust frequency of the filter from 151 Hz to 2389 Hz.  
Adjust gain from -14 dB to +14 dB  
Bandwidth is fixed to one octave.

---

## High Shelving

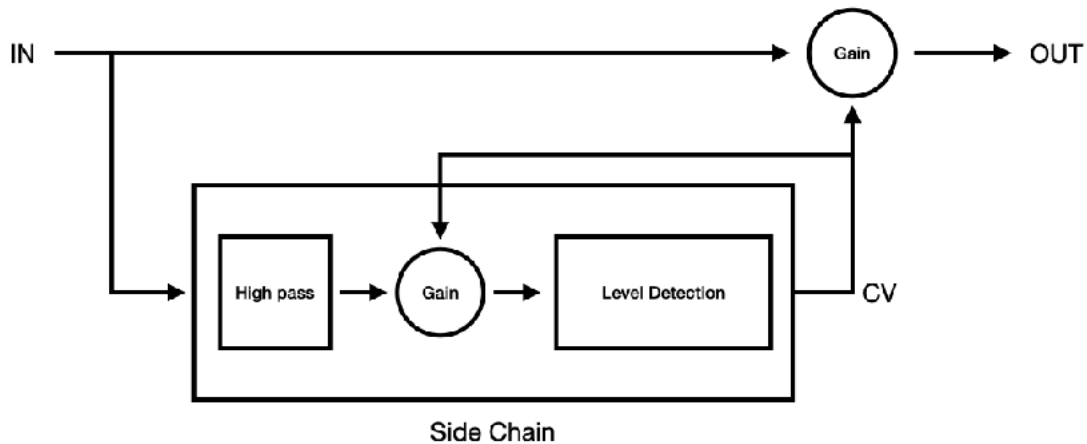


Adjust frequency of the filter from 296 Hz to 21096 Hz.  
Adjust gain from minus infinity to +12 dB  
When gain is turned fully anti clock wise, the filer becomes low pass filter.

# Compressor

## Overview

The compressor reduces dynamic range of audio signal. This is achieved by feedback topology as shown in the diagram below.

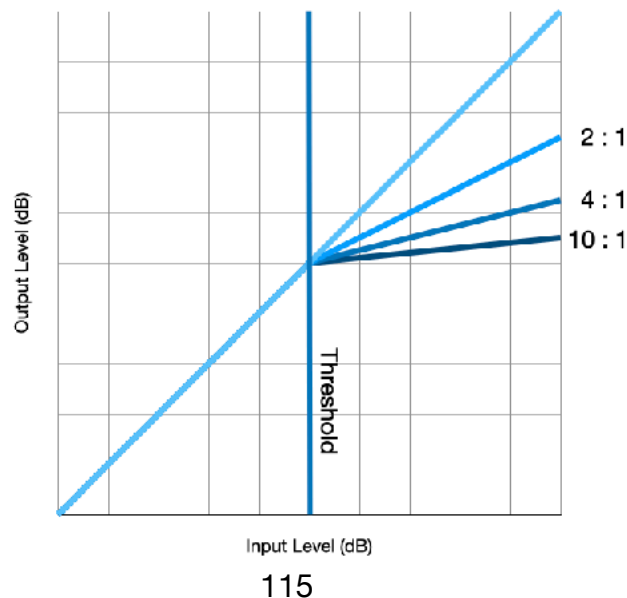


High pass filter is applied to the input of the side chain and the signal is routed to the gain stage in the side chain. The output of the gain stage is routed to the level detection. The level detector detects level of the input signal and generates control signal based on the level of the gain reduction required. The control signal is routed to the amplifier in the gain stage in the side chain to adjust level of the input signal from the high pass filter. The same control signal is also routed to the amplifier of the main gain stage to adjust level of the input signal.

The feedback topology is common in early analog compressors. Although there are several disadvantages to this topology, it is considered more musical than feed-forward design used in modern compressors. The feedback loop is implemented without unit delay to emulate behavior of the analog circuit.

## Threshold and Ratio

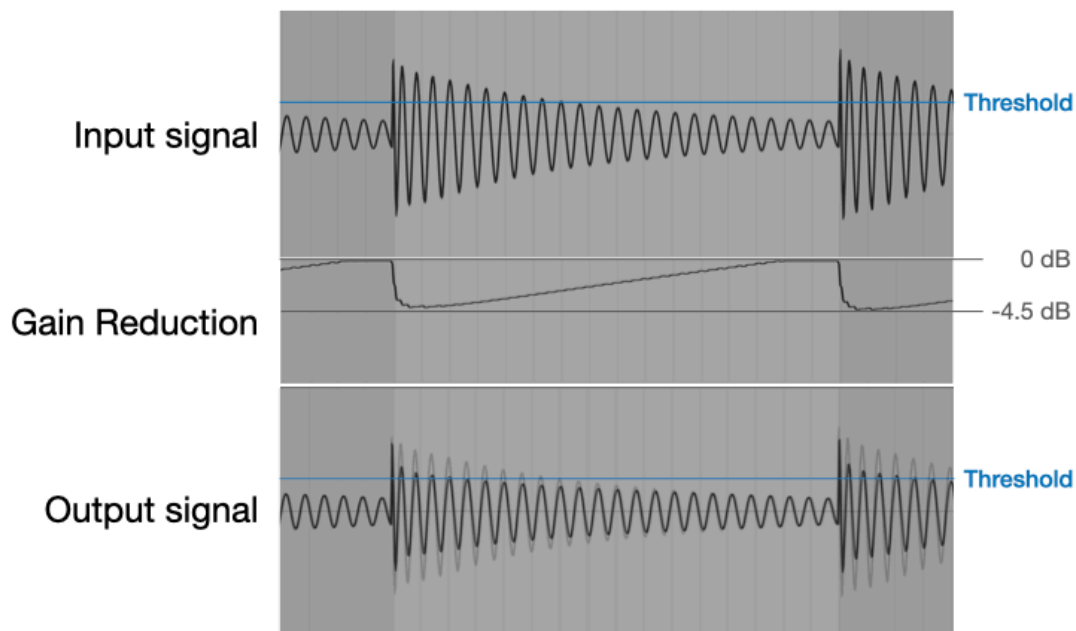
When level of the input signal passes above the threshold, the input signal is compressed by the ratio.



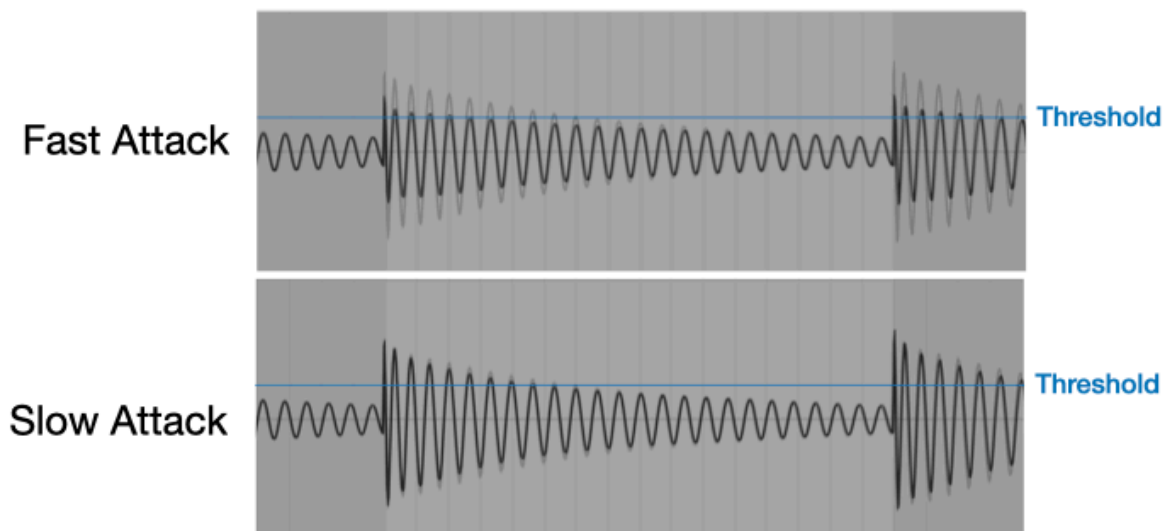
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## Attack and Release

Attack is the time it takes for the signal to be compressed by the given ratio. Release is the time it takes the gain reduction to return to zero.

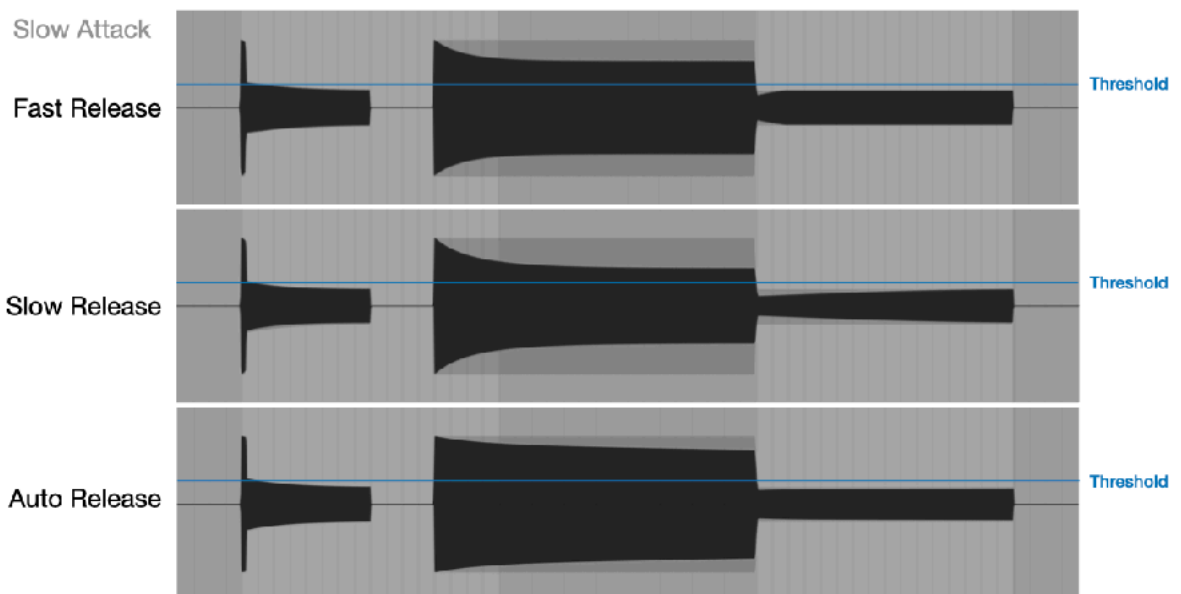
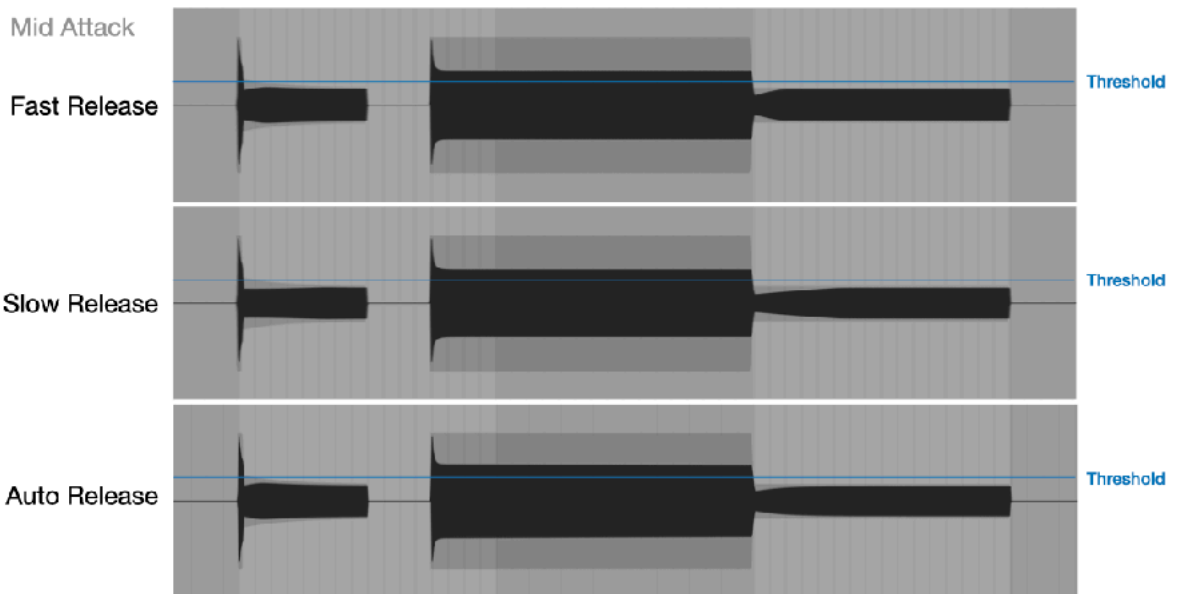
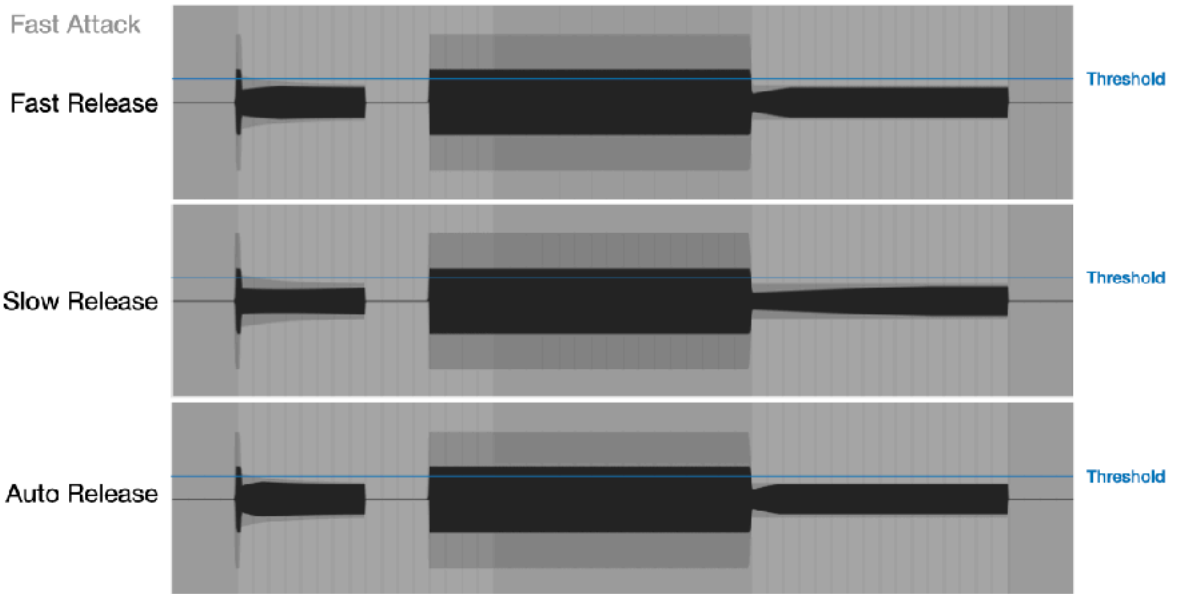


In this example, attack is 1 ms and release is 0.6 s. The initial transient pass through the compressor without gain reduction. It takes a while for the gain reduction to return to 0 dB after the input signal goes below the threshold.



Fast attack makes compressor to start gain reduction immediately after the input signal passes above the threshold. Slow attack, on the other hand, allows many of the transients to pass through compressor without gain reduction.

The figures below illustrate characteristic of the attack and the release. 1KHz Sine wave is used as an input signal (shown as transparent background images). It shows how compressor reacts with various combination of the attack and release settings.



Auto Release uses two time constants for the peak detector. It will react differently for the short transients and the long sustained sound.

Fast attack reduces the level of the transients and make sound soft, slow attack allows transients to pass through and gives a punch to the sound.

Fast release causes pumping and breathing effects. Slow release continues to reduce level for a long period of time after compressing louder part of the sound.

---

## Side Chain High Pass Filter

-6 dB / octave high pass filter is applied to the input signal of the side chain. Frequency range is from 20 Hz to 185 Hz. This filter removes low frequency information from the input signal for the level detector to control excessive gain reduction and pumping effect.

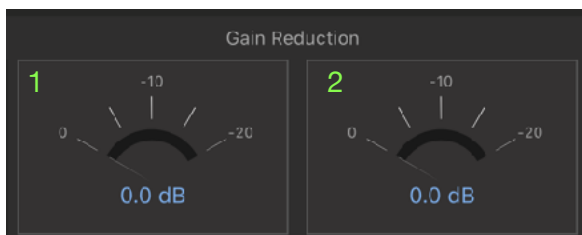
---

## Makeup Gain

Use Makeup to compensate the gain reduced by the compressor. The range is from 0 dB to 20 dB. Gain reduction meters show the amount of the gain reduction. You can use the information to adjust level of the makeup gain.

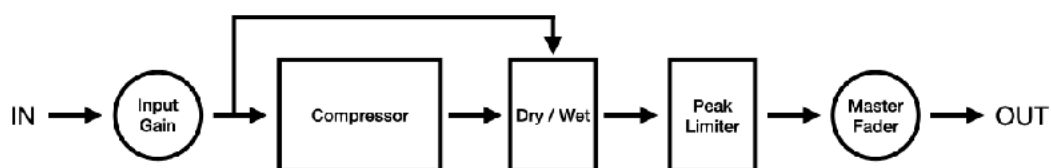
---

## Gain Reduction Meter



Gain reduction meters shows peak level of the gain reductions in dB.

1. Gain reduction for the left channel
2. Gain reduction for the right channel



---

## Input Gain

Adjust gain of the input signal routed to the compressor. The range is from -20 dB to 20 dB. When level of input signal is increased, GR meters show gain reductions even if threshold is set to 0 dB.

---

## Dry / Wet

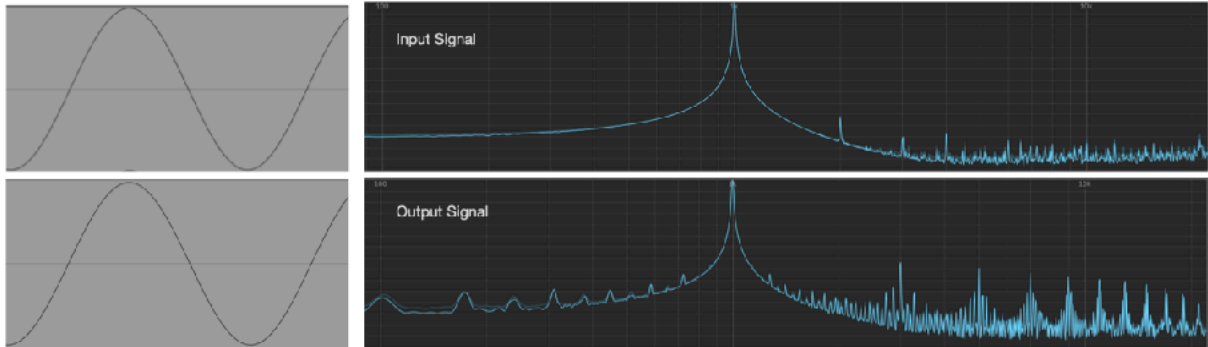
Use Dry / Wet to mix uncompressed signal (dry) and compressed signal (wet). Parallel compression technique, also known as New York compression can be achieved by adjusting amount of the wet signal mixed with the dry signal. When set to 0%, output is the dry signal. When set to 100%, output is the wet signal. When set to 50%, equal amount of the dry and the wet signal are mixed for the output.

---

## Peak Limiter

Peak Limiter is an analog style limiter and provides clean sounding output signal. This limiter is not a lookahead brick wall limiter, so that it can't offer brick wall limiting. However it does not introduced any latency to the output signal.

Frequency response of the peak limiter is illustrated in the figure below. Output signal shows the result of 1 dB gain reduction.



# macOS

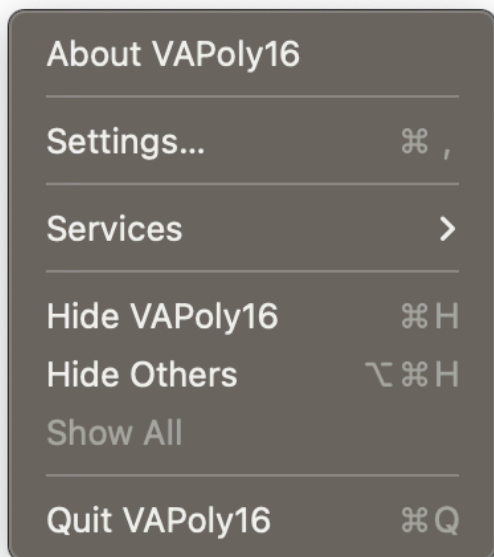
Stand Alone on macOS supports menu bar, keyboard shortcuts, context menu and touch bar. AUv3 plug-in on macOS supports keyboard shortcuts and context menu.

## Menu Bar



---

## Application



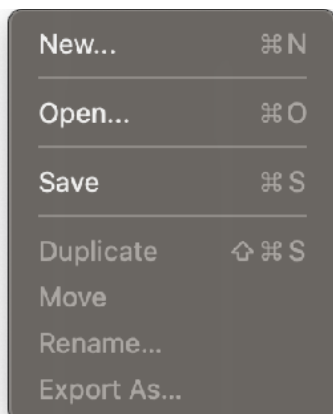
Open a window to display version information.

Open Preference window.

Quit this application.

---

## File



Reset all parameters and sequence data.

Open a preset from iCloud drive.

Save a preset to iCloud drive.



---

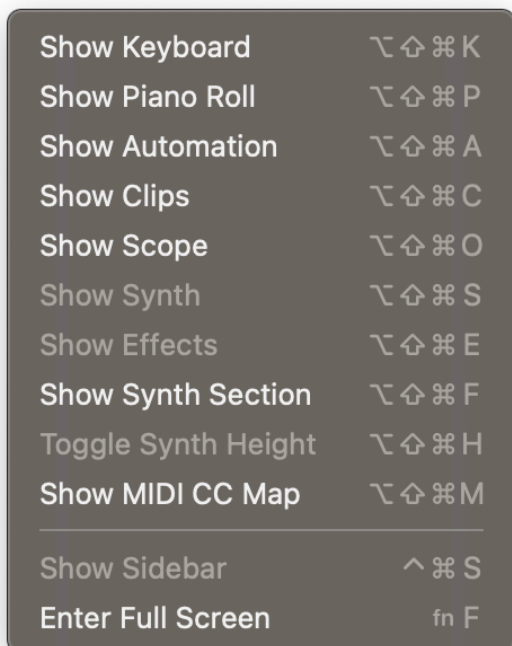
## Edit



Edit Commands are enabled when typing text to specify file name.

---

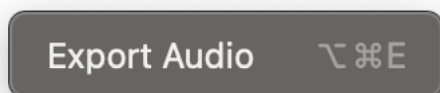
## View



Show/Hide Commands are enabled/disabled based on the current view mode.

---

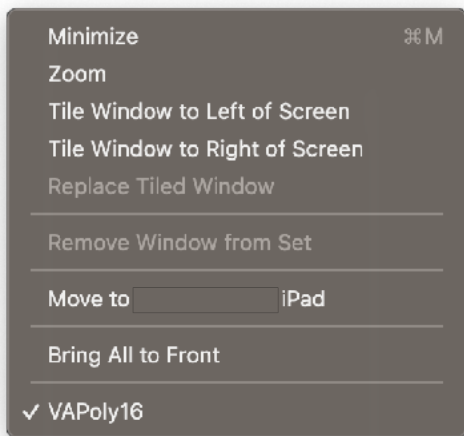
## Export



Open Export Audio Page in Setting Panel.

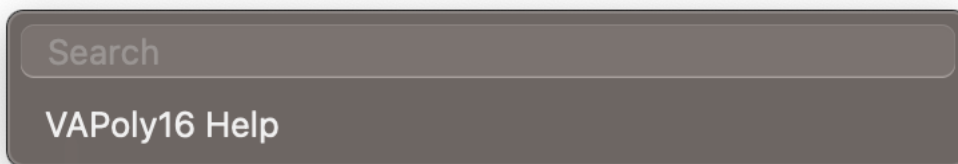
---

## Window

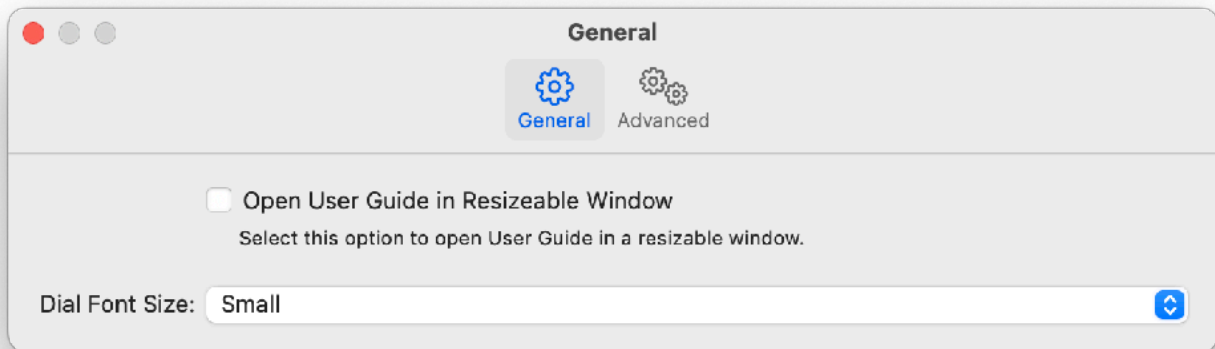


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## Help



## Preference



---

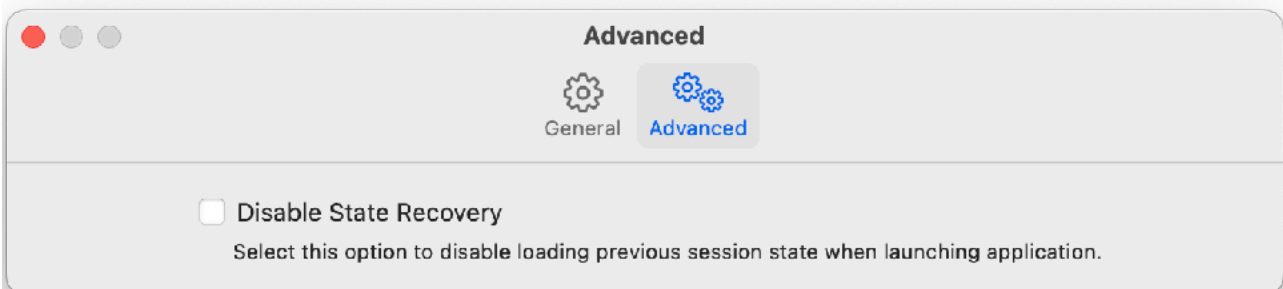
### Open User Guide in Resizable Window

Enable this option to open User Guide in Application Window so that you can resize the window. When this option is disabled, User Guide is displayed on Application Window with fixed size.

---

### Dial Font Size

Adjust font size of title label of the dials in Synthesizer View. Because font size is automatically adjusted based on the size of window. If the window is small, selecting Large Font Size may not show visual difference.



---

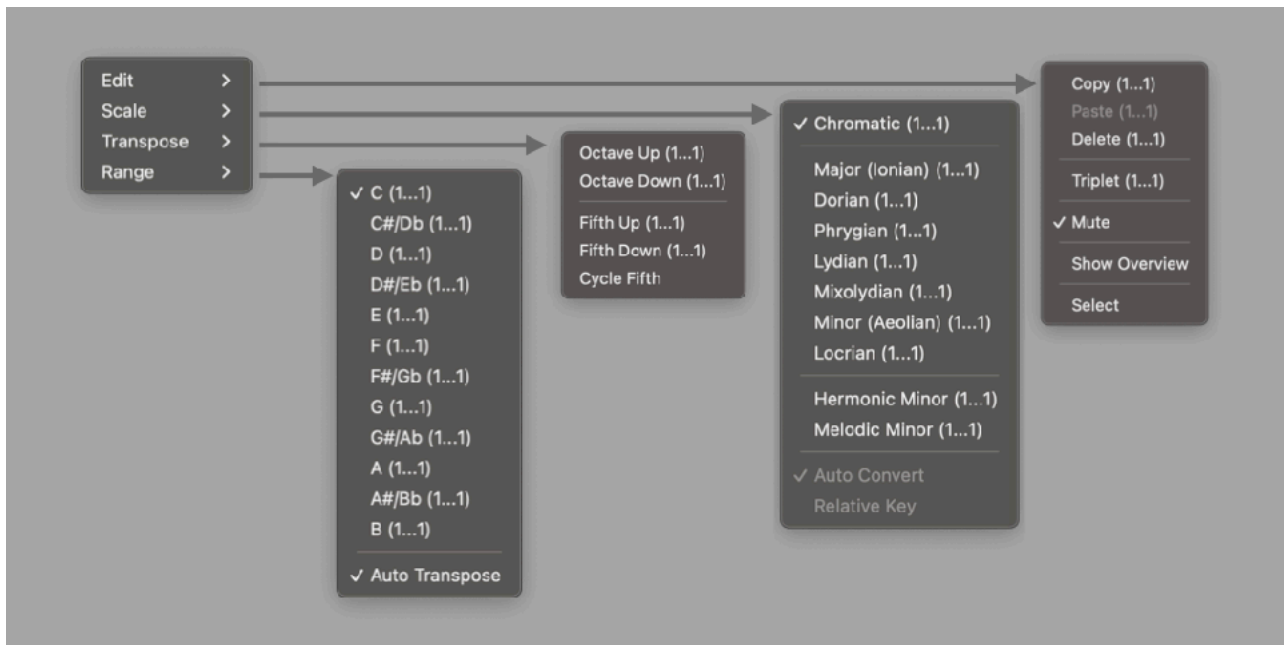
### Disable State Recovery

When application is launched, state of the previous session is automatically loaded by default. Check this option to disable state recovery, so the application always start in default state.

## Context Menu

Right Mouse Click or Command-Click to show context menus. Context menu contains all commands for the view.

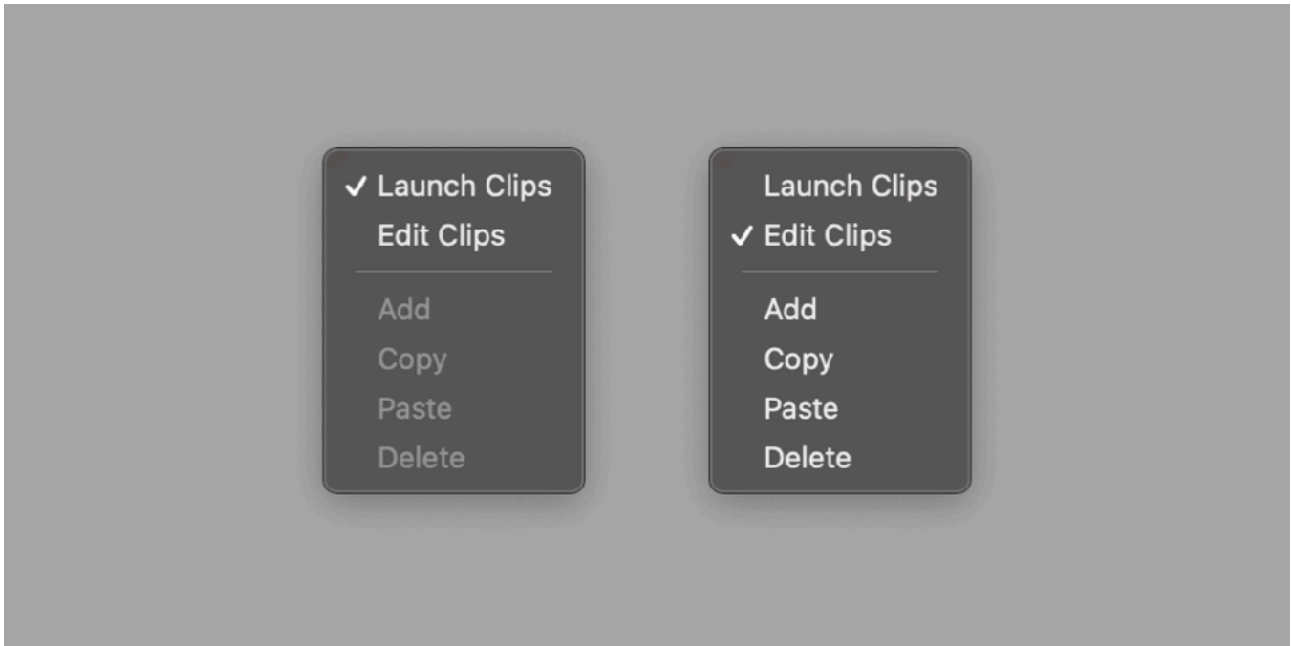
### Piano Roll Editor Context Menu



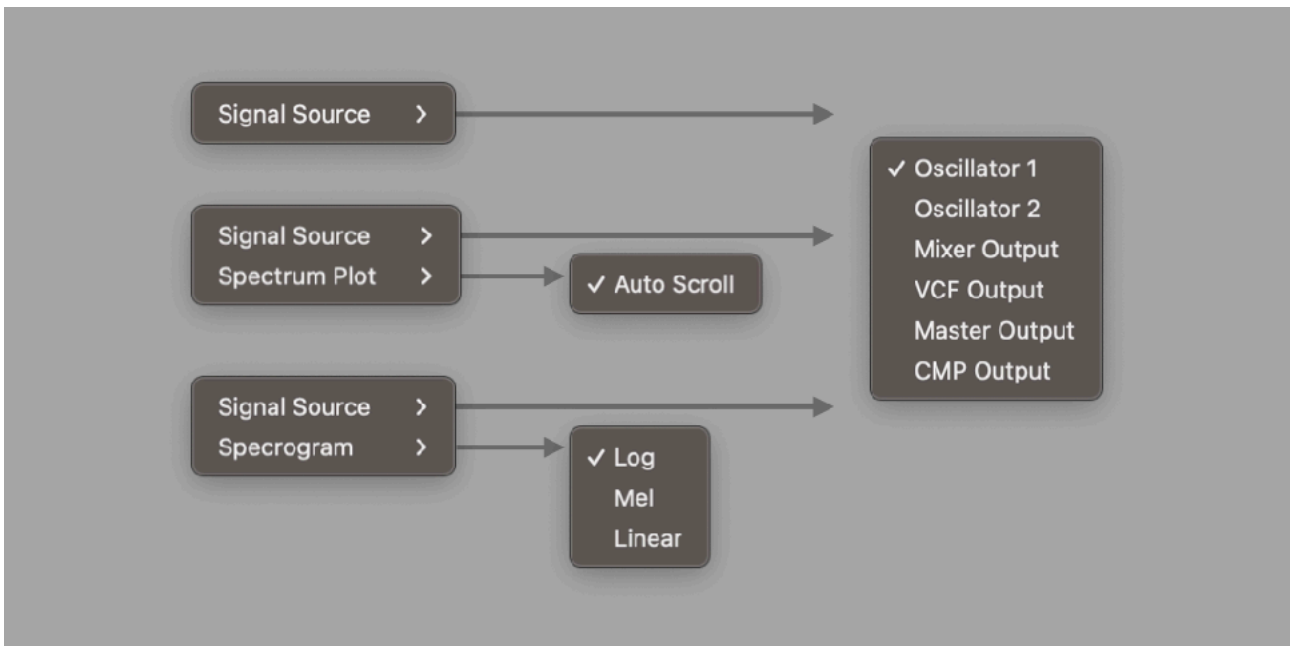
### Automation Editor Context Menu



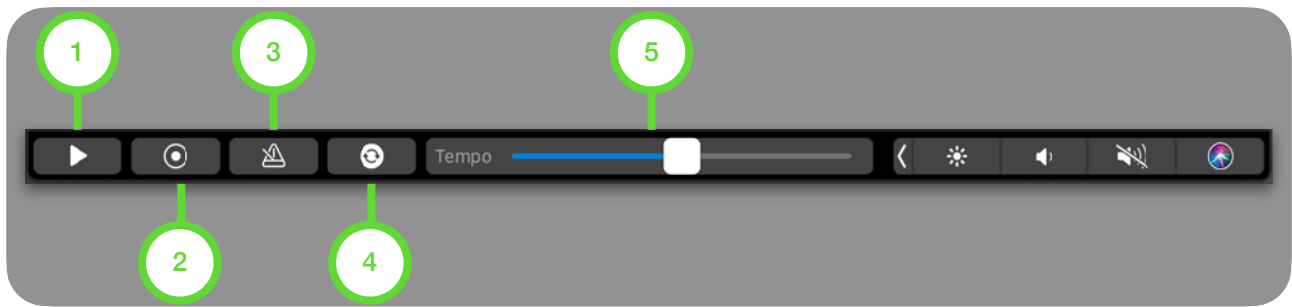
## Clip Editor Context Menu



## Scope Context Menu



## Touch Bar (MacBook Pro)



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### 1. Play / Stop

Tap to play / stop sequencer

---

### 2. Record

Tap to enable / disable recording mode.

---

### 3. Metronome

Tap to enable / disable metronome.

---

### 4. Sync

Tap to enable / disable host sync.

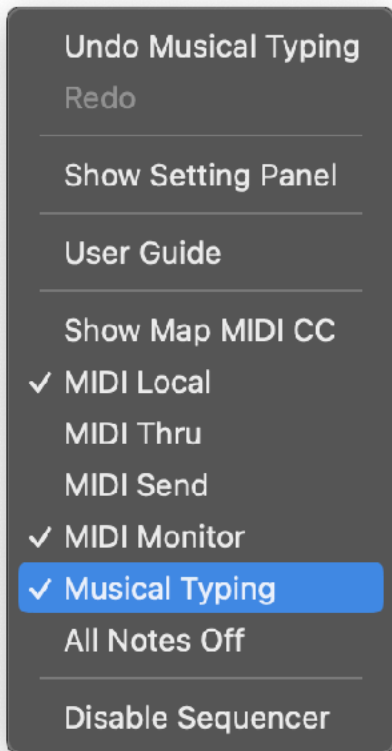
---

### 5. Tempo

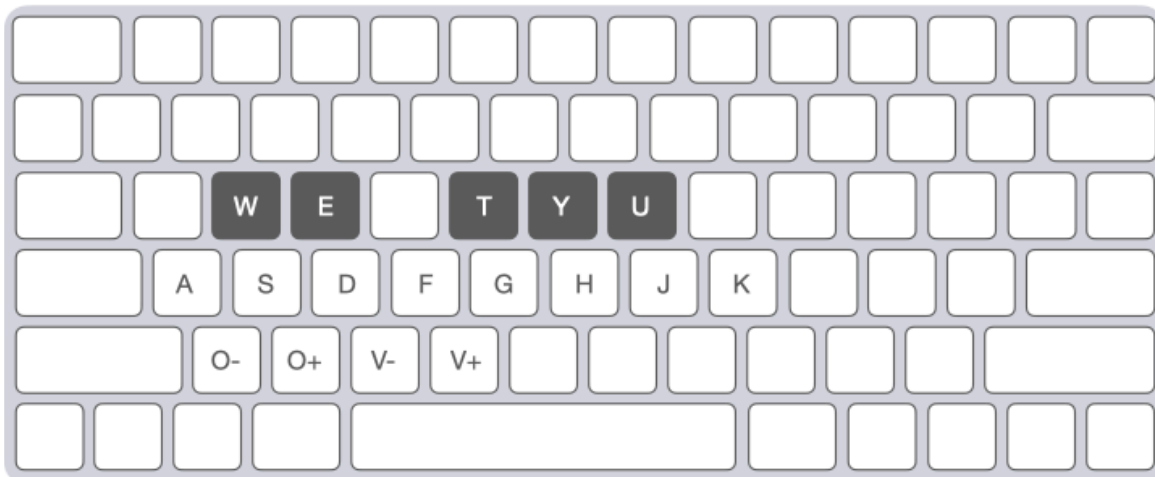
Adjust tempo. Range of the slider is from 80 BPM to 160 BPM.

## Use Computer Keyboard as MIDI Keyboard

Enable Musical Typing option from setting menu.



Keys are mapped as shown in the figure below.



### Change Octave

[O-] Press Z key to select one octave below.  
[O+] Press X key to select one octave above.

### Change Velocity

[V-] Press C key to decrease velocity.  
[V+] Press V key to increase velocity.

## Keyboard Shortcut

Command	Key	AUv3	Note
New	Command-N	N/A	
Open	Command-O	N/A	
Save	Command-S	N/A	
Undo	Command-Z	✓	
Redo	Shift-Command-Z	✓	
Cut	Command-X	✓	Available for Text Input
Copy	Command-C	?	
Paste	Command-V	?	
Delete	Command-Delete	?	
Select All	Command-A	?	
Show/Hide Keyboard	Option-Shift-Command-K	?	
Show/Hide Pianoroll	Option-Shift-Command-P	?	
Show/Hide Automation	Option-Shift-Command-A	?	
Show/Hide Synth	Option-Shift-Command-S	?	
Show/Hide Clips	Option-Shift-Command-C	?	
Show/Hide MIDI CC Map	Option-Shift-Command-M	?	
Enter/Exit Full Screen	Control-Command-F	N/A	
Play/Stop	Space	?	
Record	Option-Shift-Command-R	?	
Change Focus	Tab	?	
List Up	Arrow-Up	?	
List Down	Arrow-Down	?	
List Select	Enter	?	

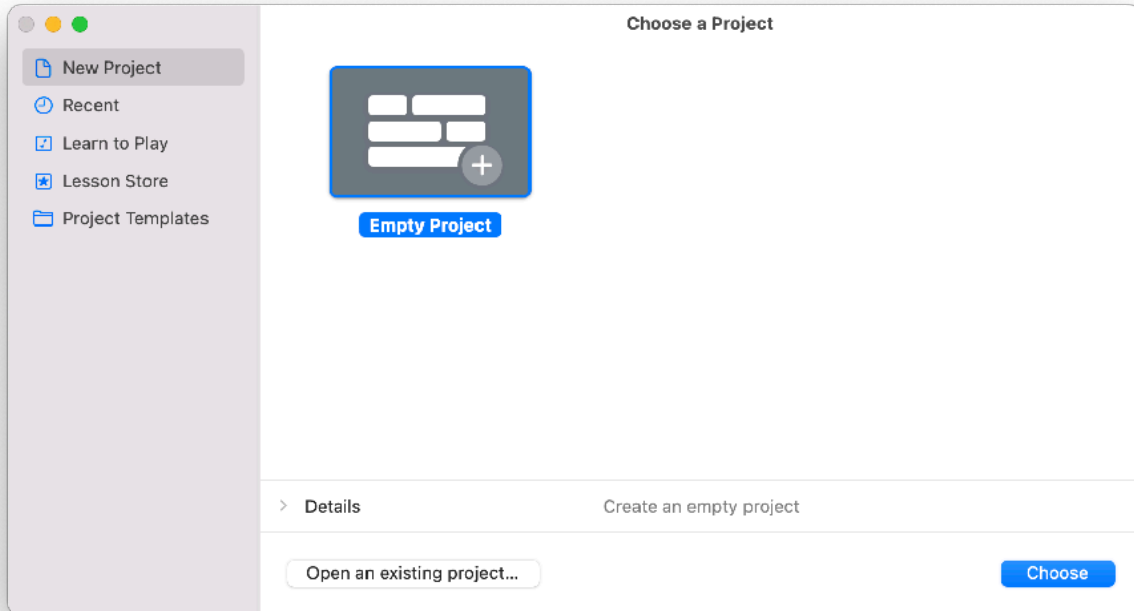
? : (AUv3) Availability is depends on the host application, which can disable these functions.



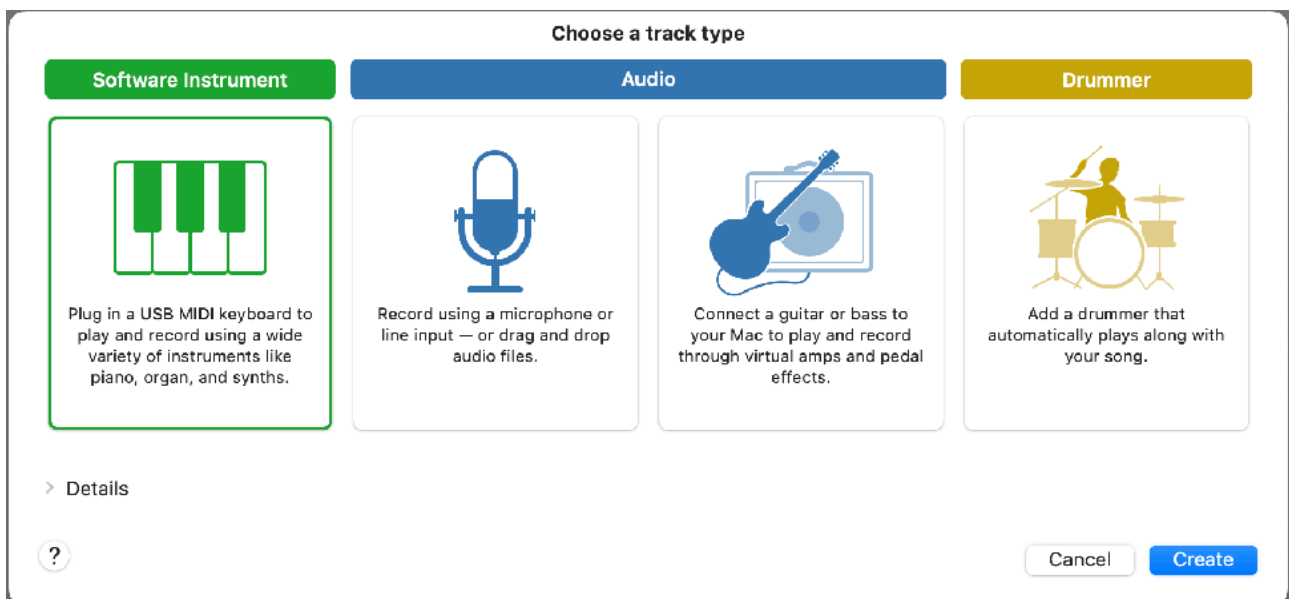
# AUv3 on Apple Garage Band (Mac)

## Load Plug-in

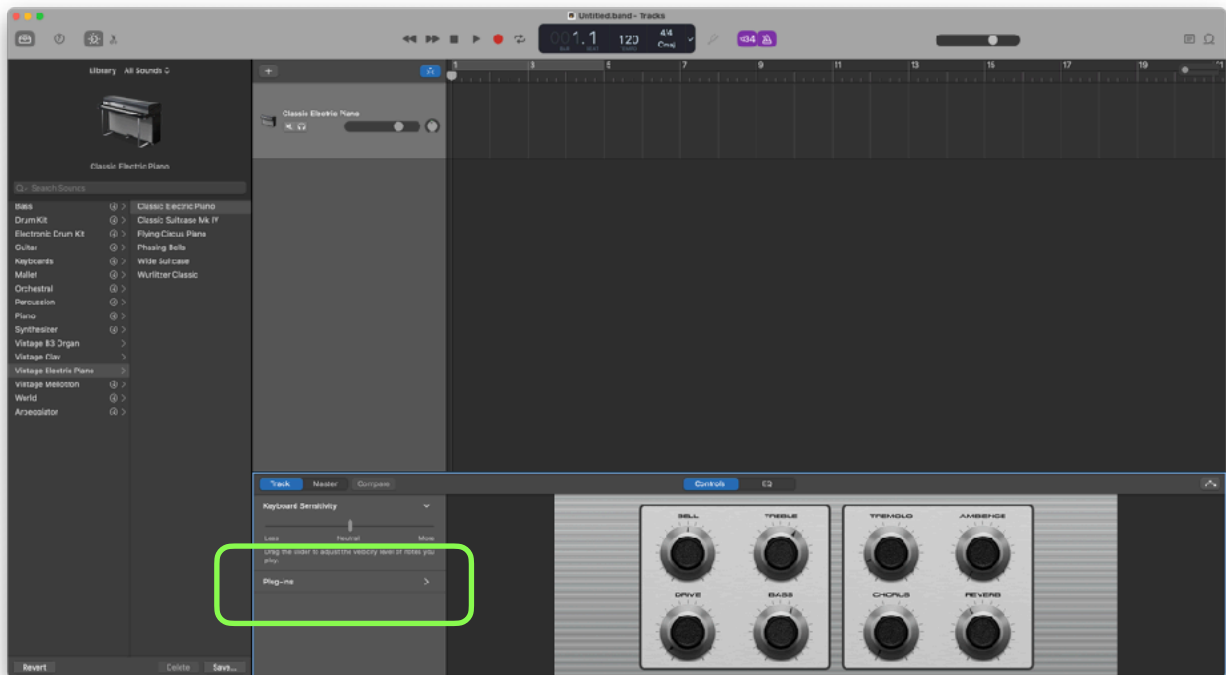
1. Launch GarageBand.
2. Choose a project dialogue window appears. Select a project and click on Choose.



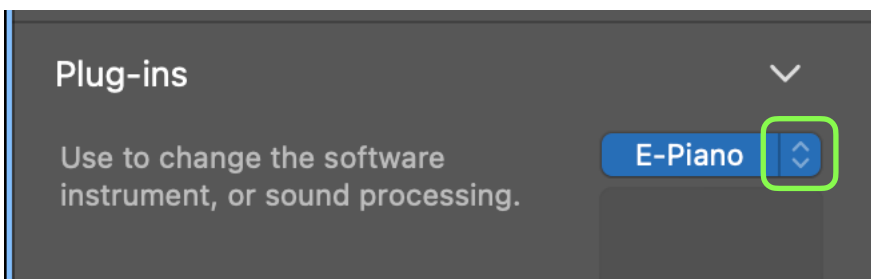
3. Choose a track type dialogue appears. Select Software Instrument and click Create.



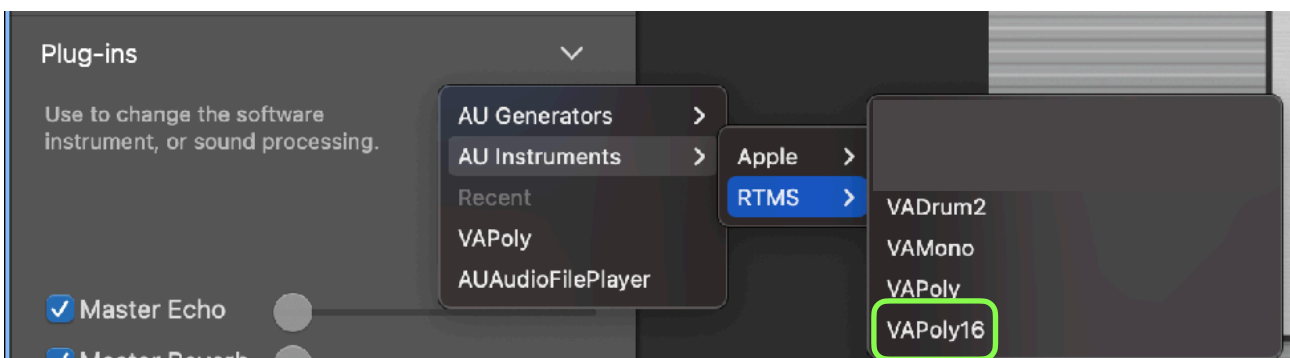
4. Click Plug-ins in Track Section.



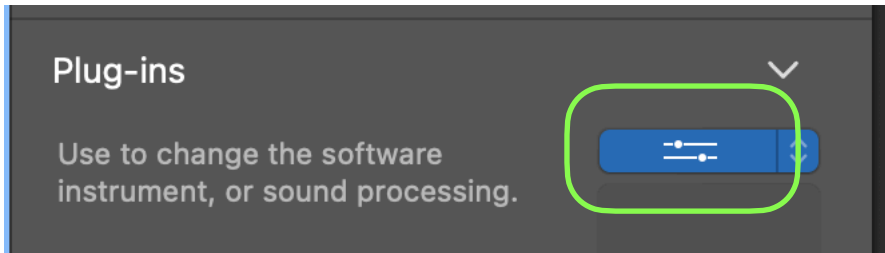
5. Click arrows at the right side of the blue button “E-Piano”.



6. Select AU Instruments > RTMS > VAPoly16



7. If plug-in window doesn't displayed. Tap blue button.



## Activate Plug-In

After loading VAPoly16 or opening a project file, DSP engine of VAPoly16 may not be running.

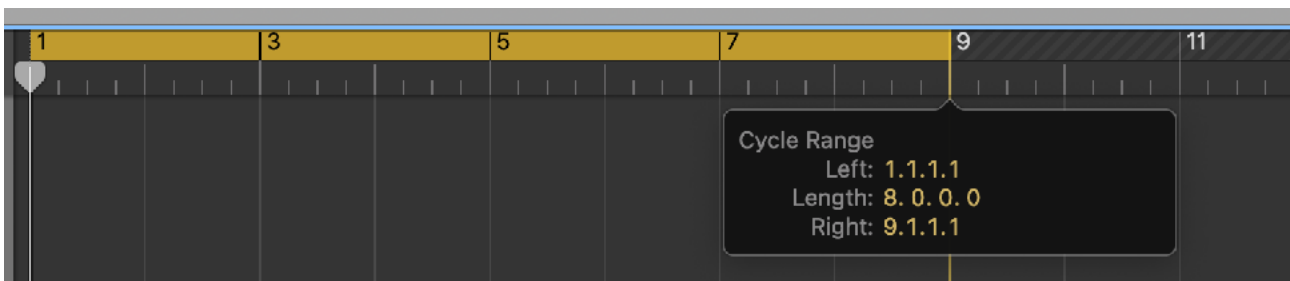
In order to start the DSP engine, please do one of the followings.

- Press Play button on GarageBand.
- Play MIDI notes from GarageBand.

To play midi note by computer keyboard, select “Window > Show Musical Typing” from menu bar of the Garage Band. While the Musical Typing window is displayed, type A for note C.

## Offline Renering

To start Offline Rendering on Apple Garage Band, select Cycle Range and select “Share > Export Song to Disk” from menu bar of the Garage Band. Selected Cycle Range will be rendered.



The followings are a few tips for offline rendering on Apple Garage Band.

- Make sure to save your project before performing offline rendering.
- Audition before initiating offline rendering. In order to perform offline rendering, DSP engine of VAPoly16 needs to be running. Please press play on GarageBand and make sure that DSP engine is running.
- If you are using clips, add an empty clip at the end and set the length to INF. Garage Band will stop rendering when audio level is dropped to inaudible level. This helps to record tail of the delay or reverb effect.

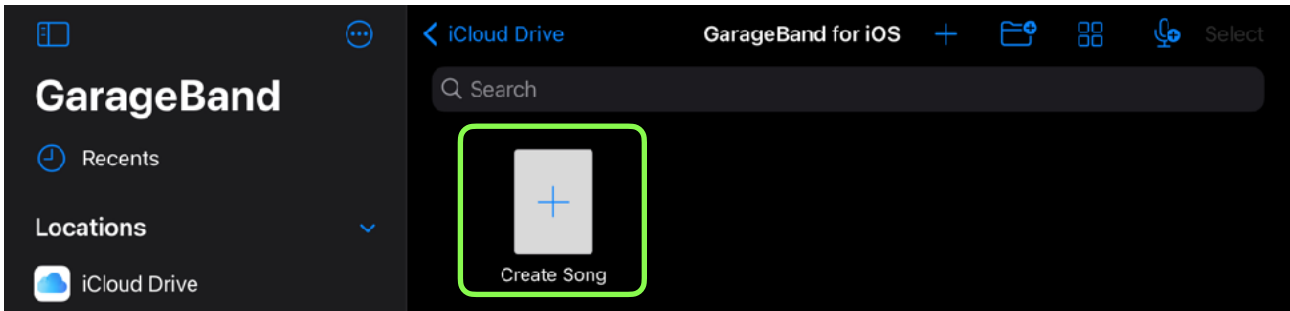
## Known Limitations

- DSP Engine doesn't start until a user presses play button or play MIDI notes on GarageBand.
- Touch Bar shows blank screen when showing button menu or context menu.
- GarageBand doesn't record MIDI notes from keyboards or sequencer of the VAPoly16 plugin.

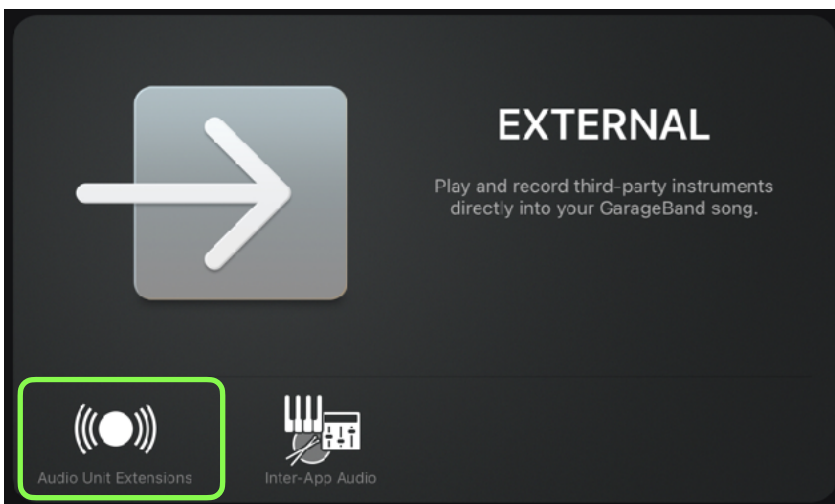
# AUv3 on Apple Garage Band (iOS)

## Load Plug-in

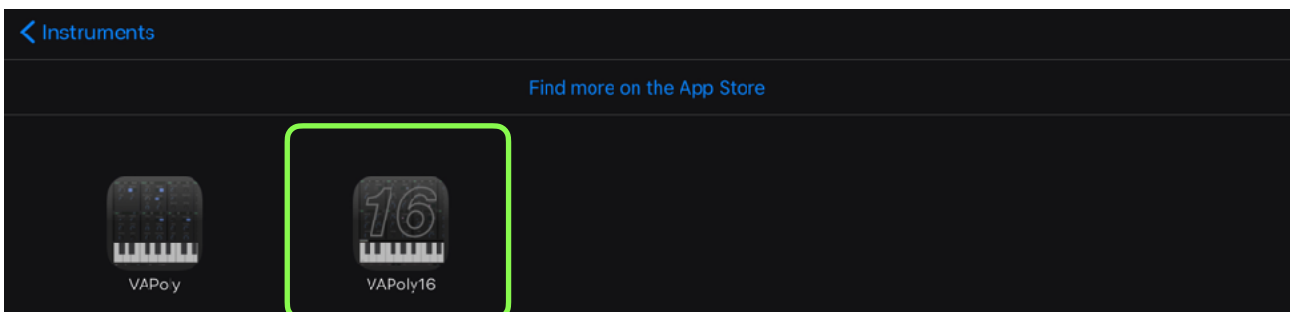
1. Launch Garage Band
2. Create a new song



3. Select External > Audio Unit Extension



4. Select VAPoly16



# Change Plug-in Window Size

Tap arrow icon to resize the plug-in window.

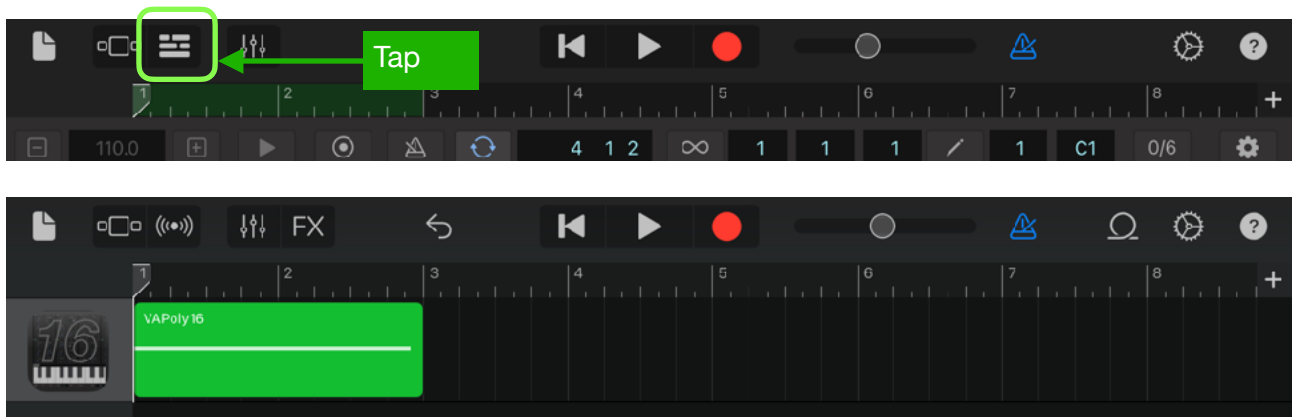


## Record Notes

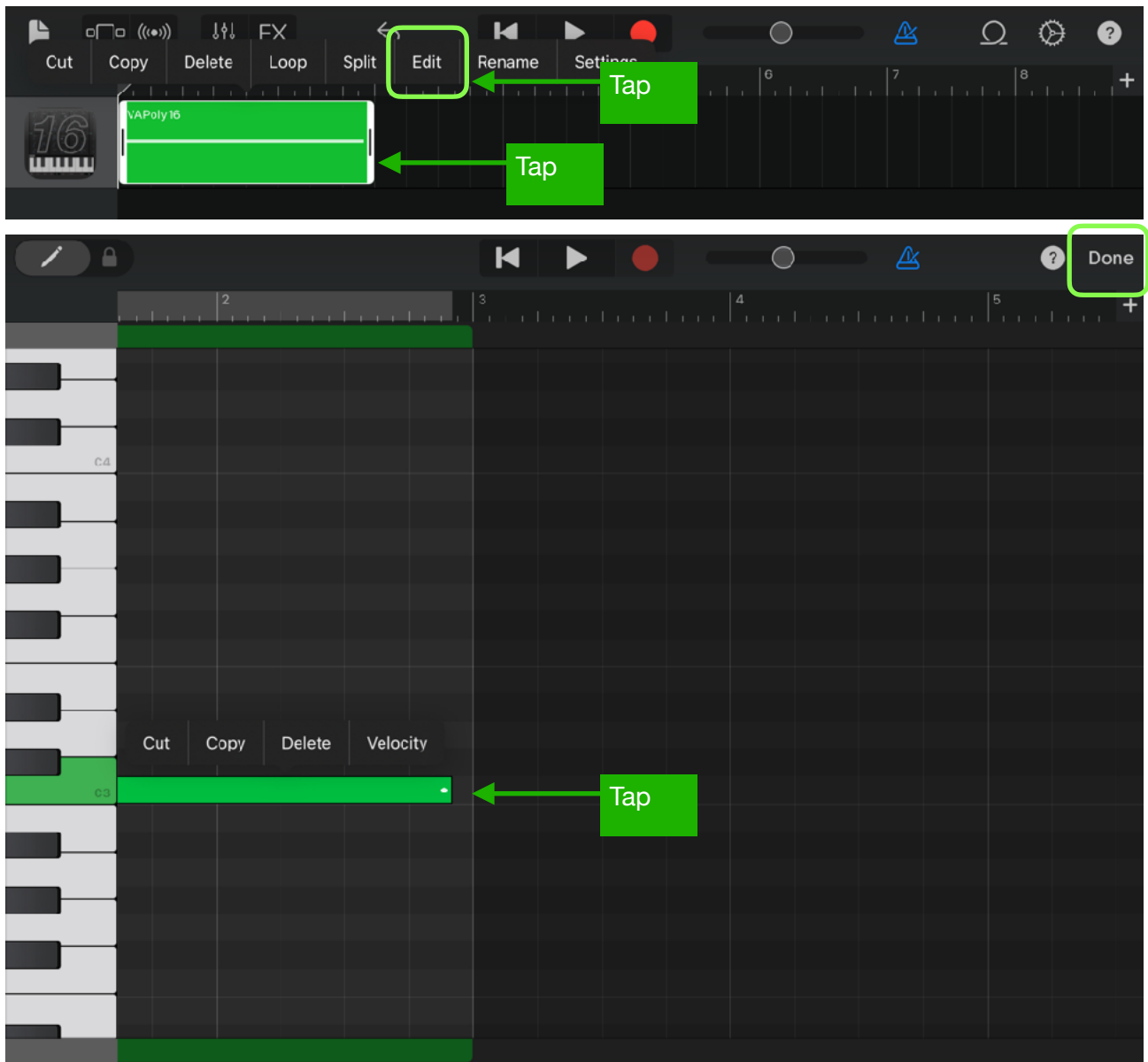
Tap record button and play keyboard.



## Edit Notes

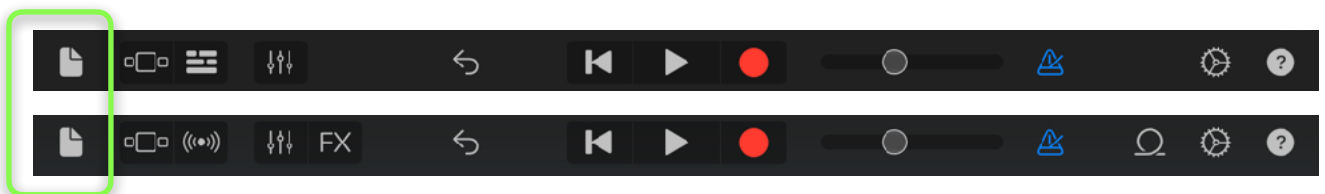


Select Edit from menu and edit notes. Tap “Done” to close the window.



## Save Project

Tap document icon to save the song.





# System Interruptions (iOS)

It is important to aware that system may interrupt playback in the following situations. Please make sure to test and make a plan to handle the situations.

## 1. Incoming calls or activating Siri

When receiving an incoming call or when activating Siri, it interrupts playback and send App to background. In order to avoid it occurs, turn off the followings in the Setting App.

- Do Not Disturb > Do Not Disturb > turn on.
- Siri & Search > Listen for “Hey Siri” > turn off.
- Siri & Search > Press Home for “Siri” > turn off.

## 2. Connecting or disconnecting a headphone

Headphone output has own DAC<sup>9</sup> and own sample rate. The sample rate may be different form the sample rate of the audio engine. What will happens when connecting or disconnecting a headphone depends on the sample rates.

If the sample rates are same, playback continues when headphone is connected. When headphone is unplugged, playback will stop. You can change this behavior by turn Resume when headphone is unplugged on in Settings.

If sample rates are different, when connecting headphone or when disconnecting headphone stops playback and system will re-configure audio engine for the new sample rate.

The sample rate of the audio engine is set by an application or an audio interface. For example, when connecting an iOS device to Mac using a cable that came with your device, Inter Device Audio and MIDI on macOS uses 44.1KHz but Quicktime player app on macOS uses 48KHz.

If you are planning to connecting or disconnecting headphone for monitoring during playback, please make sure to test and learn what will occurs.

## 3. Changing sample rate setting

As described above, if sample rate of the audio engine is changed for any reasons, playback stops.

## 4. Media Reset

Under rare circumstances, the system terminates and restarts its media services daemon. When it occurs playback stops.

## 5. Pressing the Home button or sending App to background

When app is sent to background by pressing home button, showing notification center or any other reasons, playback stops. You can change this behavior by turn Run in Background on in Settings.

## Additional Settings

Followings are other settings in the Settings App which you may want to adjusted.

- Display & Brightness > Auto-Lock > set to Never
- Sounds > turn off all system sound
- Notifications > Show Previews > set to Never
- Home Screen & Dock > Multitasking > Gestures > turn off

If you have installed apps that may send you a notifications or may interrupt playback, make sure to adjust settings of the apps to disable the functions.

If you are using Ableton Link, make sure that Local Network in Privacy is turned on. If you are using Bluetooth MIDI, make sure that Bluetooth in Privacy is turned on.

---

<sup>9</sup> Digital to Analog Converter

# Specification

## Synthesizer

16 voice virtual analog bitimbral polyphonic synthesizer

## Oscillators

Continuously variable wave shape (triangle, sawtooth, square)

Sub: Square, one octave lower (oscillator 1)

Pulse width for triangle and square (oscillator 1)

Pulse width for square (oscillator 2)

Hard Sync (oscillator 1 to oscillator 2)

Keyboard on/off (oscillator 2)

Low frequency mode (oscillator 2)

Tuning +/- 24 semitones

Fine tuning +/- 50 cents (oscillator 2)

## LFO

Wave shape: sine, saw, down saw, square, triangle, random

Frequency Range: From 0.04Hz to 42.2Hz

Amplitude modulation by ADSR envelope (Env2)

## ADSR Envelope

Attack time: From 1ms to 6 sec

Decay time: From 1ms to 10 sec

Sustain level: From 0 to 100%

Release time: From 1ms to 10 sec

Delay time: From 0ms to 10 sec

## Oscillator Modulation

LFO: frequency, shape, pulse width

Env: frequency, shape, pulse width

Xmod: frequency and shape

Ring: oscillator 1 output and oscillator 2 output

Frequency modulation mode: linear / exponential

## Filter

High pass filter: -12 dB per octave

Low pass filter: -12 dB per octave

Envelope: ADSR (Env1 / Env2)

Frequency modulation by LFO

Key Follow

Routing: Cascade / Parallel

## Amplifier

Envelope: ADSR (Env2) / Gate

Amplitude modulation by LFO

Pan modulation by LFO

Mute: On / Off

## Controllers

Modulation Wheel, Pitch Bend Wheel

## Arpeggio

Type: Up, Down, Up&Down, Random

Frequency: From 1 Hz to 20 Hz

## Portamento (Glide)

Time: From 10 ms to 10 second

## Sequencer

Steps: 16 steps per bar  
Loop Length: from 1 bar to 16 bars  
Clip: 16 clips  
Tempo: from 20 BPM to 999 BPM  
Host Sync: On and Off

## Effects

Delay, Chorus, Flanger, Reverb, EQ and Compressor

### Delay

Delay Time	Range from 20ms to 1200ms
Feedback	Range from 0% to 100%
Highpass Filter	Range from 20Hz to 500Hz
Lowpass Filter	Range from 1000Hz to 20000Hz
LFO Frequency	Range from 0.01Hz to 10Hz
LFO Intensity	Range from 0.0 to 1.0 (from 0ms to +/- 10ms)
Effect Switch	ON or OFF
Sync Switch	ON or OFF
Frequency Range	From 0Hz to 22.05KHz (effect)

### Chorus / Flanger

Delay Time	Range from 1ms to 40ms (chorus), from 1ms to 13ms / 20ms (flanger)
Feedback	Range from 0% to 100% (flanger)
Highpass Filter	Range from 20Hz to 500Hz
Lowpass Filter	Range from 1000Hz to 20000Hz
LFO Frequency	Range from 0.01Hz to 10Hz
LFO Intensity	Range from 0.0 to 1.0 Chorus: from 0ms to +/- 1ms Flanger: from 0ms to 12ms / 19ms / 39ms
Effect Switch	ON or OFF
Sync Switch	ON or OFF
Effect Selector	Chorus or Flanger
Frequency Range	From 0Hz to 22.05KHz (effect)

## Reverb

Input lowpass filter	Range from 1KHz to 20KHz
Input high-pass filter	Range from 20Hz to 500Hz
LFO Frequency	Range from 0.01Hz to 10Hz
LFO Intensity	Range from 0.0 to 1.0
Pre Delay	Range from 1ms to 100ms
Size	Range from 0% to 100%
Auto Size Mode	ON or OFF
Decay	Range from 0% to 100%
Damp	Range from 0% to 100%
Output Lowpass Filter	Range from 1KHz to 20KHz
Early/Late Mix	Range from 0% to 100%
Tempo Sync	ON or OFF
Effect Switch	ON or OFF

## Equalizer

Low Shelving	Frequency Range	Range from 21Hz to 1092Hz
	Gain	Range from -INF to +12dB
	High Pass Filter response	12dB / Oct
Mid Peak / Notch	Frequency Range	Range from 151Hz to 2389Hz
	Gain	Range from -14dB to +14dB
	Bandwidth	1 octave
High Shelving	Frequency Range	Range from 296Hz to 21096Hz
	Gain	Range from -INF to +12dB
	Low Pass Filter response	12dB / Oct

## Compressor

Input Gain	Range from -20dB to 20dB
Input High Pass Frequency	Range from 20Hz to 185Hz
Threshold	Range from -40dB to 0dB
Makeup Gain	Range from 0dB to 20dB
Ratio	2, 4, 10
Attack	0.01ms, 0.1ms, 0.3ms, 1ms, 3ms, 10ms, 30ms
Release	0.1s, 0.3s, 0.6s, 1.2s, Auto
Dry / Wet	Range from 0% to 100%

\*Appearance and specification of products are subject to change without notice.

# Release Notes

## What's new in version 1.0

- Initial release

## What's new in version 1.0.1

- Fixed a problem that value of mod wheel when controlled by external device is incorrect.
- Support iOS 17 / iPadOS 17.
- Support macOS Sonoma 14.