VAPolyPro

Polyphonic Synthesizer

User Guide

Version 1.0.2

Table of Contents

Introduction 18

Privacy Settings 18

Main Features 18

System Requirements 18

Use as Stand Alone 19

Use as AudioUnit Extension (AUv3) 19

Factory Preset 19

User Preset 19

State Recovery 19

About MIDI Latency 19

Maximum Number of Touches 19

Basic Operation 20

Using Knobs and Sliders 20

Undo and Redo 20

Pseudo Velocity on Piano Keyboard (iOS) 20

User Interface 21

Tool Bar 23

Controller 25

Analog OSC1 25

Analog OSC2 25

Analog Sub 25

Analog Noise 25

Pan 25

Unison-OSC 26

FM 26

Operator 27

Envelop Generator 27

Wave Fold 27

Lowpass Gate 27

LPF 28
HPF 28
F-EG 28
VCA 29
A-EG 29
EFX 29
P-EG 29
P-LFO 30
PW-LFO 31
PAN-LFO 31
F-LFO 31
A-LFO 31
Pressure 31
Global 31
ARP 31
Pressure (MPE Z) 32
Slide (MPE Y) 32
Pitch (MPE X) 32
Mod Wheel 32
Pedal 32
Delay 32
Chorus / Flanger 32
Reverb 33
EQ and Mixer 33
Compressor 33
Master Output 33
Chorus / Flanger 34
Reverb 34
Mixer 34
Compressor 34

Step Sequencer 35
Modulation 37
Sample & Hold 38
Key Pad 39
Keyboard 40
Visualizer 41
Sequencer (Piano Roll) 43
Clip Editor 44
Piano Roll Editor 45
Parameter Automation Editor 46
Synthesizer 47
Block diagram 47
Control Signal & MIDI Flow 49
VCO 50
Analog OSC1 & OSC2 51
Shape 51
Pan 51
Level 51
Mix 51
F-EG 51
F-LFO 51
Tune 51
Fine 51
PW (Pulse Width) 51
P-EG 51
P-LFO 51
PW-LFO 51
Type 52
Pan 52
Level 52

Type 52
Pan 52
Level 52
Key Follow 52
Spread 52
PAN-LFO 52
Unison OSC 53
Shape 53
Pan 53
Level 53
Mix 53
Detune 53
HP 53
Tune 53
Fine 53
PW (Pulse Width) 53
P-EG 53
P-LFO 53
PW-LFO 53
FM 54
Algorithm 54
Feedback 54
OSC Key Sync 54
Mix 54
F-EG 54
F-LFO 54
Mode 55
Coarse 55
Fine 55
Operator Switch 55

Detune 55
Key Track 55
P-EG 55
P-LFO 55
A-LFO 55
Shape 55
Pan 55
Level 55
Attack 56
Decay 56
Sustain 56
Release 56
Velocity 56
Key Follow 56
Dry/Wet Amount 57
CV Amount 57
CV Source 57
Mode 57
CV Amount 57
CV Source 57
VCF 58
Cascade 59
Cutoff 59
Resonance 59
F-EG 59
F-LFO 59
Key Follow 59
LPF Slope 59
Cutoff 60
Resonance 60

F-EG 60
F-LFO 60
Key Follow 60
Drive 60
Ladder 60
Sallen-Key 60
VCA (Amplifier) 61
Volume 61
A-LFO 61
Key Follow 61
Delay Send 61
C/F Send 61
Reverb Send 61
Delay Pre/Post 61
C/F Pre/Post 61
Reverb Pre/Post 61
ADSR (Envelope Generator) 62
Attack 62
Decay 62
Sustain 62
Release 62
Velocity 62
Key Follow 62
LFO 63
Tune 63
Shape 63
Delay 63
Tempo Sync 63
Key Sync (Key Re-Trigger) 63
Level 63

Global 64
Voice 64
Unison 64
Transpose 64
Portamento Mode 64
Portamento Time 64
Pitch Bend Range 64
ARP 64
Pattern 64
Rate 64
Gate 64
Switch 64
Tempo Sync 64
Velocity 64
MPE 65
Offset 1 65
Offset 2 65
Offset 3 65
Target 1 65
Target 2 65
Target 3 65
PB-Amnt 65
PB-Range 65
PB-Width 65
Mod Wheel 66
Vibrato 66
Tremolo 66
LP CF 66
Pedal 66
Vibrato 66

Tremolo 66
LP CF 66
Pressure 67
Vibrato 67
Tremolo 67
Accent 67
Output Mixer 68
Delay Level 68
C/F Level 68
Reverb Level 68
Master Output 68
Volume 68
Pan 68
Mute 68
Step Sequencer 69
Step Switch 69
Slide Switch 69
Gate 69
CV 69
Play 70
Mode 70
Rate 70
Tempo Sync 70
Quantize 70
Steps 70
Gate 70
KBD Root 70
Root Key 70
Octave Range 70
Clock Division 71

Mod Amount 71
Target 71
Mod Attack 71
Mod Release 71
Sync 71
Hold 72
LFO1/LFO2 72
Pink/White 72
Sync with Transport Control 73
Assignable Controllers 74
Effects 75
Delay 75
Signal Flow 75
Delay Time 75
Regeneration 75
Modulation 75
Chorus / Flanger 76
Signal Flow 76
Input Signal Level 76
Effect Type 76
Modulation Speed 76
Modulation Width 76
LFO Shape 76
Stereo Width 76
Regeneration 76
Filters 77
Reverb 78
Signal Flow 78
Input Filter 78
Pre Delay 78

Modulation Speed 78
Modulation Width 78
Size and Decay 78
Damping 78
Output Filter 78
Early / Late Mix 79
Equalizer 80
Low Shelving 80
Mid Peak / Notch 80
High Shelving 80
Compressor 81
Overview 81
Threshold and Ratio 81
Attack and Release 82
Side Chain High Pass Filter 84
Makeup Gain 84
Gain Reduction Meter 84
Input Gain 84
Dry / Wet 84
Peak Limiter 85
Key Pad 86
Select Key Pad 86
Select Octave 86
Select Pitch Shift 86
Select Preset Type and Bank 86
Select Top and Mid Panel 86
Play Switch for Step Sequencer 87
Panic Button 87
MPE Button 87
Ribbon Controller 87

Keyboard 88
Select Keyboard 88
Select Key Range 88
Use Modulation Wheel 88
Use Pitch Wheel 88
Set Velocity 89
Use Key Hold 89
Top & Mid Panel 89
Play Switch for Step Sequencer 89
Panic Button 89
MPE Button 89
Show Double Keyboard 89
Ribbon Controller 90
Pseudo Velocity on Piano Keyboard (iOS) 90
Clip Editor 91
Load Clip 91
Play/Stop Clip 91
Edit Piano Roll 91
Add edit button 91
Set Loop Mode 91
Auto Select Editor 91
Piano Roll Editor 92
Select Time Range and Loop Length 92
Select Note Range 92
Add Note 92
Delete Note 92
Scale Menu 92
Edit Menu 92
Chromatic Scale 93
Heptatonic Scale 93

Root Key 93
Set Length 94
Quantize 94
Set Velocity 94
Copy 94
Paste 94
Delete 94
Velocity Editor 95
Parameter Automation Editor 96
Play Sequence 97
1. Set host sync 97
2. Set tempo 97
3. Set loop 97
4. Set swing 97
5. Set metronome switch 98
6. Play 98
Record Sequence 98
1. Set recording mode 98
2. Play sequence 98
3. Record notes 98
4. Record parameters automation 98
5. Stop recording 98
Preset 99
File Menu 99
New… 99
Open… 99
Save 99
Preset Browser 100
Load Factory Preset 100
Play Sequence 100

Load User Preset 100
Delete User Preset 100
Save User Preset 100
Backup/Restore User Presets stored in the device 100
Close File Browser 101
Setting Panel 102
General 102
Full Screen 102
Open User Guide 102
Open Host Setting 102
Version 102
Body Color 102
Font Size 102
CVSEQ Play Override 102
Show Wave Shape Diagram 102
Enable Pseudo Velocity 102
Voice Count 102
MIDI Global 103
MIDI Thru 103
MIDI Monitor 103
Musical Typing 103
All Notes Off 103
Map MIDI CC 103
Reset MIDI CC Map 103
MIDI Synth 104
OMNI 104
Input 104
Output 104
MIDI Local 104
MIDI Send 104

MIDI Receive 104
Sustain Pedal 104
Min 104
Max 104
Stand Alone Setting 105
AbletonLink 105
Ableton Link 105
In-app notification 105
Sync Start/Stop 105
Connected Apps 105
Export Audio 106
Save As 106
Location 106
Length (Bars) 106
File Type 106
Sample Rate 106
Bit Depth 106
Export 106
Cancel 106
General 107
Run in Background 107
Resume Headphone Removed 107
Hardware Latency 107
Frame Size 107
MIDI 108
Input 108
Output 108
Bluetooth (BLE) MIDI 109
Central 109
Peripheral 109

Export Audio 110
Prepare for exporting audio 110
1. Stop playback 110
2. Select the first clip to play 110
3. Turn off metronome 110
Adjust export settings 110
1. Save As 110
2. Length 110
3. Location 110
4. File Type 110
5. Sample Rate 110
6. Bit Depth 110
Export Audio File 110
Map MIDI CC 111
MIDI Program Change 111
Use External MIDI Keyboard with Stand Alone 112
Use MIDI Foot Pedal 112
macOS 113
Menu Bar 113
Application 113
File 113
Edit 114
View 114
Export 114
Window 115
Help 115
Preference 116
Enable Help Section 116
Disable State Recovery 116
Touch Bar (MacBook Pro) 117

1. Play / Stop 117
2. Tempo 117
Use Computer Keyboard as MIDI Keyboard 118
Keyboard Shortcut 119
AUv3 on Apple Garage Band (Mac) 120
Load Plug-in 120
Activate Plug-In 122
Offline Renering 122
Known Limitations 122
AUv3 on Apple Garage Band (iOS) 123
Load Plug-in 123
Change Plug-in Window Size 124
Record Notes 125
Edit Notes 125
Save Project 126
Host Sync 126
System Interruptions (iOS) 127
Specification 128
Release Notes 132
What’s new in version 1.0 132
What’s new in version 1.0.1 132
What’s new in version 1.0.2 132

Introduction

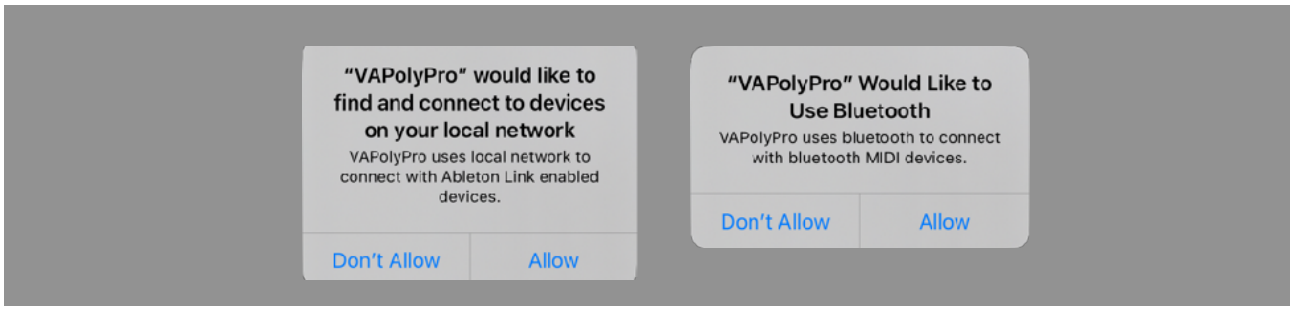
Thank you for purchasing VAPolyPro. To help you get the most out of this product, please read this manual carefully.

VAPolyPro features three types of VCOs and three types of VCFs that can generate a wide range of sounds, from warm analog synths to FM-synthesized acoustic instruments. It also includes a stereo VCF and VCA for spacious sound, and MPE for expressive sound.

VAPolyPro operates as a stand alone or as an AudioUnit Extension (AUv3) for iPhone, iPad and Mac. Stand Alone supports Ableton Link, MIDI and audio file export. Built-in Effects include delay, chorus, flanger, reverb, eq and compressor. Project files can be saved in iCloud Drive, so that the project can be accessed from iPhone, iPad or Mac.

Privacy Settings

VAPolyPro uses local area network to connect Ableton Link enable devices and it uses bluetooth to connect with bluetooth MIDI 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

3 types of VCO includes Analog, Unison and FM.
3 types of VCF includes Cascade, Ladder And Sallen-Key.
Stereo VCF and VCA.
Support MPE through MIDI2.0 MPE Profile.

3 channel analog style step sequencer.
Maximum 8 voice polyphony. it depends on performance of the device it is running.
Built-in effects and piano roll sequencer.
Audio Export. Linear PCM format (AIFF, WAV and CAF) and compressed format (AAC)
Support Audio Unit Extension (AUv3).
Support MIDI 2.0. Support Foot Pedal.
Support Ableton Link, Bluetooth MIDI, MIDI In / Out.
Works on iPhone, iPad and Mac. Support iCloud Drive to share project files between the platforms.

System Requirements

iOS 17.0 or later
macOS 14.0 or later
Devices with Apple Silicon are recommended. A13 Fusion or above is highly 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.

Sound may be distorted if CPU of the device doesn't have enough power. If it happens reduce number of voices.

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)

VAPolyPro supports AudioUnit Extensions. VAPolyPro works with host applications which support AUv3 plug-ins. By enabling host sync mode, VAPolyPro can be synced with tempo and transport state of the host application. VAPolyPro 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. 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 VAPolyPro 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.

Maximum Number of Touches

Maximum number of touches are varied on devices. Number of notes simultaneously playing on built-In-Keyboard are limited to the maximum number of touches.

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* Ableton and Link are trademarks of Ableton AG.
* All products, companies and standard names are trademarks or registered trademarks of their respective holders.

Basic Operation

Using Knobs and Sliders

To adjust a knob or slider, tap (click) and drag up or down. Hold shift key (at computer keyboard on macOS or left top corner of user interface on iOS devices) for fine adjustment. For some of the horizontal sliders and switches, drag left or right to adjust the value. Double taps (clicks) on control to reset value.

Value is displayed in parameter editor in top bar. Use plus and minus button for fine adjustment.

Undo and Redo

1. Tap undo / redo button. Tap undo to undo previous operation. Tap redo to redo previous undo operation.

* Some operation such as play, stop or record are excluded from undo / redo operation.
* On macOS, turn on “Musical Typing” to enable keyboard shortcut, command + z for undo and shift + command + z for redo.

Pseudo Velocity on Piano Keyboard (iOS)

iOS piano keyboard features pseudo velocity and pressure. Velocity / Pressure is computed by size of touch. Initial press on key sends velocity value and continuous press sends after touch / poly pressure value.

User Interface

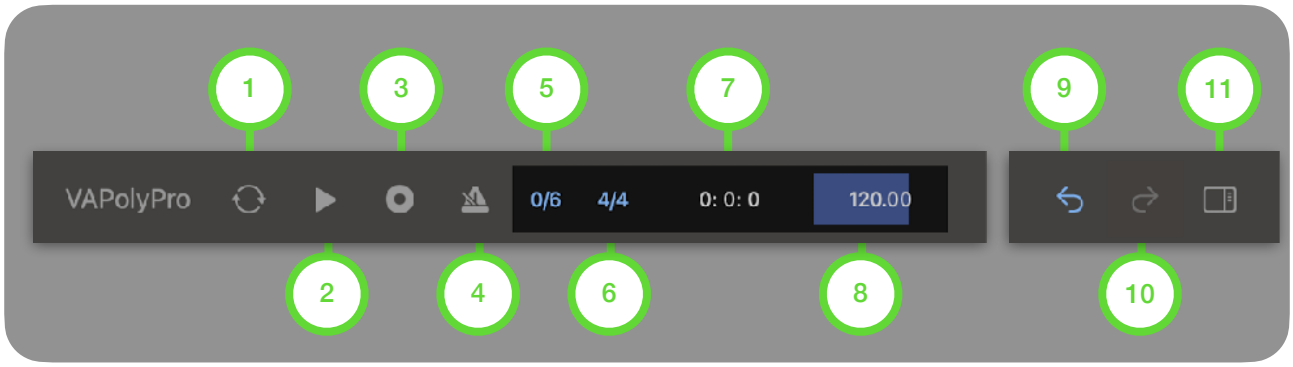
iPhone

iPad

macOS

Tool Bar

Show Piano Roll Sequencer turned on (Setting Panel)



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

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. Swing
Tap this button to show Swing menu.

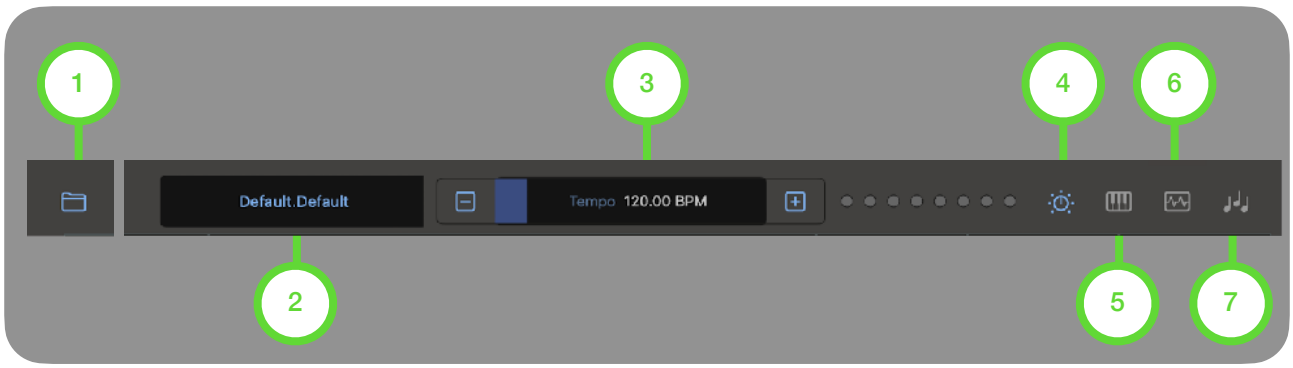
6. Time Signature
Tap this button to show Time Signature menu.

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

8. Tempo
Adjust BPM (Beat Per Minutes).

9. Undo
10. Redo
Tap the button to undo / redo.

11. Setting Panel
Tap this button to open setting panel.

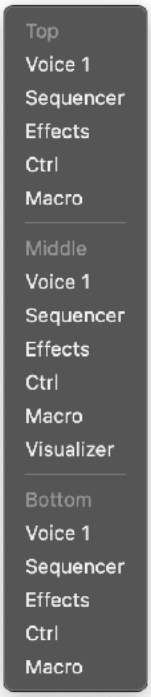


1. File
Tap this button to show file menu.

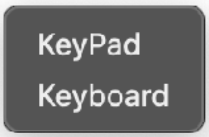
2. Preset
Indicates name of the selected preset. Tap this button to show preset browser.

3. Parameter
Indicates name and value of the selected parameter. Use plus button, minus button and slider to adjust the value. Double tap to enable menu and tap on the name to show parameter list.

4. Synth
Tap this button to show synth menu.



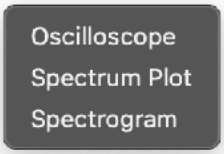
5. Keyboard
Tap this button to show keyboard. Hold this button (right click on macOS) to show keyboard menu.



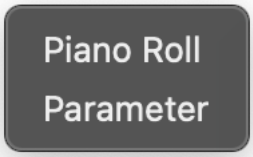
Mac, iPad

iPhone

6. Visualizer
Tap this button to show audio visualization tool. Hold this button (right click on macOS) to show visualizer menu.



7. Sequencer
Tap this button to show sequencer. Hold this button (right click on macOS) to show sequencer menu.



* Content of the menu is dependent on the platform.

Controller

Analog OSC1

1. Shape
Adjust shape of the waveform.

2. Pan
Adjust pan position of the oscillator output.

3. Level
Adjust level of the oscillator output.

4. Mix
Adjust balance of OSC1 output and OSC2 output.

5. F-EG
Adjust amount of F-EG to modulate mix balance.

6. F-LFO
Adjust amount of F-LFO to modulate mix balance.

7. Tune
Adjust tuning in semi tones.

8. Fine
Adjust fine tuning in cents.

9. PW
Adjust pulse width for the pulse wave.

10. P-EG
Adjust amount of envelope to modulate pitch.

11. P-LFO
Adjust amount of LFO1 to modulate pitch.

12. PW-LFO
Adjust amount of LFO1/LFO2 to modulate pulse width.

Analog OSC2

13. Hard Sync
Turn on to enable hard sync of OSC2 by OSC1.

14. XM-Amnt
Adjust amount of OCS1 signal to modulate pitch of OSC2.

15. F-EG
Adjust amount of F-EG to modulate X-Mod amount.

* 13,14, 15 - 24 are same as OSC1.

Analog Sub

25. Type
Select type of sub oscillator. Options are -1 Oct and -2 Oct.

26. Pan
Adjust pan position of sub oscillator output.

27. Level
Adjust level of the sub oscillator output.

Analog Noise

25. Type
Select type of noise oscillator. Options are Pink and White.

26. Pan
Adjust pan position of noise oscillator output.

27. Level
Adjust level of the noise oscillator output.

Pan

28. Key Follow
Adjust amount of KCV to affect pan position of VCO output.

29. Spread
Adjust amount to spread VCO output in stereo field.

30. PAN-LFO
Adjust amount of PAN-LFO to modulate pan position.

Unison-OSC

4. Mix
Adjust balance of seven oscillator output.

5. Detune
Adjust amount of detune.

* 1-3, 7-33 is same as Analog Type.

6. HP
Adjust amount of hp output mixed with dry signal.

FM

1. Algorithm
Select an algorithm.

2. Feedback
Adjust amount of feedback.

3. Key Sync
Turn on to enable oscillator key sync.

4. Mix
Adjust balance of OP Bus1 output and OP Bus2 output.

5. F-EG
Adjust amount of F-EG to modulate mix balance.

6. F-LFO
Adjust amount of F-LFO to modulate mix balance.

Operator

7. Mode
Select a frequency mode. Options are Ratio and Fix.

8. Coarse
Adjust amount of coarse ratio or coarse frequency.

9. Fine
Adjust amount of fine ratio or fine frequency.

10. Operator Switch
Turn on to enable operator.

11. Detune
Adjust amount of detune in cents. Range is from -10.0 to 10.0.

12. Key Track
Adjust amount of KCV to affect level of operator output. Output level is decreased when higher note is played.

13. P-EG
Adjust amount of P-EG to modulate pitch.

14. P-LFO
Adjust amount of P-LFO to modulate pitch.

15. A-LFO
Adjust amount of A-LFO to modulate output level of operator.

16. Shape
Select a wave shape from 8 waveforms.

17. Pan
Adjust pan position of operator output.

18. Level
Adjust level of operator output.

Envelop Generator

13. Attack
Adjust amount of attack time.

14. Decay
Adjust amount of decay time.

15. Key Follow
Adjust amount of KCV to affect time of each stages. Duration of each stages is decreased when higher note is played.

16. Sustain
Adjust amount of sustain level.

17. Release
Adjust amount of sustain time.

18. Velocity
Adjust amount of velocity to control level of envelope.

Wave Fold

19. Dry/Wet
Adjust balance of mix between dry signal and wet signal.

20. CV Amount
Adjust amount of wave fold.

21. CV Source
Select a source of CV signal. Options are Dial, EG1, EG2, EG3 and EG4.

Lowpass Gate

25. Mode
Select a mode of lowpass gate. Options are LP, LP+VCA and VCA.

26. CV Amount
Adjust amount of lowpass gate input.

27. CV Source
Select a source of CV signal. Options are Dial, EG1, EG2, EG3 and EG4.

LPF

13. Cutoff
Adjust cutoff frequency of the filter.

14. F-EG
Adjust amount of envelope to modulate cutoff frequency.

15. Key Follow
Adjust amount of KCV to affect cutoff frequency. When it is 100%, cutoff frequency is equals to note frequency.

16. Resonance
Adjust amount of resonance.

17. F-LFO
Adjust amount of LFO to modulate cutoff frequency. Turn clockwise from center for mono mode, turn counter-clockwise from center for stereo mode.

18. Slope
Select slope of the filter. Options are -12dB Per Octave and -24 dB Per Octave.

HPF

13. Cutoff
Adjust cutoff frequency of the filter.

14. F-Env
Adjust amount of envelope to modulate cutoff frequency.

15. Key Follow
Adjust amount of KCV to affect cutoff frequency. When it is 100%, cutoff frequency is equals to note frequency.

16. Resonance
Adjust amount of resonance.

17. F-LFO
Adjust amount of LFO to modulate cutoff frequency. Turn clockwise from center for mono mode, turn counter-clockwise from center for stereo mode.

18. Drive
Adjust input gain of VCF. Characteristic of resonance changes based on the input signal level.

F-EG

19. Attack
Adjust amount of attack time.

20. Decay
Adjust amount of decay time.

21. Key Follow
Adjust amount of KCV to affect time of each stages. Duration of each stages is decreased when higher note is played.

22. Sustain
Adjust amount of sustain level.

23. Release
Adjust amount of sustain time.

24. Velocity

Adjust amount of velocity to control level of envelope.

VCA

25. Volume
Adjust volume of VCA output.

26. AM LFO
Adjust amount of A-LFO to modulate amplitude. Turn clockwise from center for mono mode, turn counter-clockwise from center for stereo mode.

27. Key Follow
Adjust amount of KCV to affect level of VCA output. Output level is decreased when higher note is played.

A-EG

28. Attack
Adjust amount of attack time.

29. Decay
Adjust amount of decay time.

30. Key Follow
Adjust amount of KCV to affect time of each stages. Duration of each stages is decreased when higher note is played.

31. Sustain
Adjust amount of sustain level.

32. Release
Adjust amount of sustain time.

33. Velocity
Adjust amount of velocity to control level of envelope.

EFX

34. Delay
Adjust level of delay send.

35. C/F
Adjust level of Chorus/Flanger send.

36. Reverb
Adjust level of Reverb send.

37. AUX1 Pre/Post
Select pre/post of aux1 (Delay) send.

38. AUX2 Pre/Post
Select pre/post of aux2 (Chorus/Flanger) send.

39. AUX3 Pre/Post
Select pre/post of aux3 (Reverb) send.

“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.

P-EG

1. Attack
Adjust amount of attack time.

2. Decay
Adjust amount of decay time.

3. Key Follow
Adjust amount of KCV to affect time of each stages. Duration of each stages is decreased when higher note is played.

4. Sustain
Adjust amount of sustain level in semi tones. Range is from -24 ST to 24 ST.

5. Release
Adjust amount of sustain time.

6. Velocity
Adjust amount of velocity to control level of envelope.

* 1 - 33 are same as Cascade Type

* 1 - 33 are same as Cascade Type

P-LFO

7. Tune
Adjust pitch of the low frequency oscillator.

8. Shape
Select shape of the low frequency oscillator waveform.

9. Delay
Adjust delay time to start the low frequency oscillator.

10. Tempo Sync
Turn it on to enable Tempo Sync.

11. Key Sync
Turn it on to enable Key Sync.

12. Level
Adjust level of LFO signal.

PW-LFO

7 - 12 are same as P-LFO

PAN-LFO

13 - 18 are same as P-LFO

F-LFO

19 - 24 are same as P-LFO

A-LFO

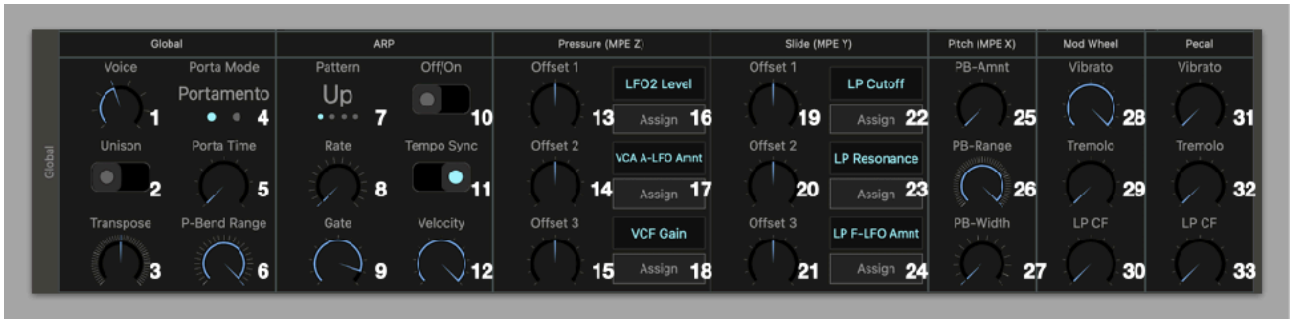
25 - 30 are same as P-LFO

Pressure

1. Vibrato
Adjust amount of key pressure for vibrato.

2. Tremolo
Adjust amount of key pressure for tremolo.

3. Accent
Adjust amount of key pressure to increase gain of oscillator output.



Global

1. Voice
Select number of voices.

2. Unison
Turn on to enable unison mode.

3. Transpose
Adjust amount of transpose. Range is from -24 semitone to 24 semitone.

4. Pitch Modulation Mode
Select a mode. Options are Portamento and Glissando.

5. Portamento Time
Adjust time of portamento. Range is from 0 to 10 seconds.

6. Pitch Bend Range
Adjust range of pitch modulation from 0 to 24 semitones (2 octaves).

ARP

7. Pattern
Select a pattern of arpeggio.

8. Rate
Adjust rate of arpeggio.

9. Gate
Adjust pulse width of gate signal.

10. Off/On
Turn on/off arpeggio.

11. Tempo Sync
Turn on/off tempo sync.

12. Velocity
Adjust velocity of trigger signal.

Pressure (MPE Z)

13. Offset1
Adjust amount of pressure (MPE Z) to modulation (offset) selected target.

14. Offset 2
Adjust amount of pressure (MPE Z) to modulation (offset) selected target.

15. Offset 3
Adjust amount of pressure (MPE Z) to modulation (offset) selected target.

16. Target 1
Tap assign button and tap on control to select a target.

17. Target 2
Tap assign button and tap on control to select a target.

18. Target 3
Tap assign button and tap on control to select a target.

Slide (MPE Y)

19 - 24 are same as Pressure.

Pitch (MPE X)

19. PB-Amnt
Adjust amount of pitch (MPE X) to control pitch bend.

20. PB-Range
Adjust range of pitch bend from 0 to 48 semitones (4 octaves).

21. PB-Width
Adjust number of keys (width) to control pitch bend.

Mod Wheel

1. Vibrato
Adjust amount of mod wheel for vibrato.

2. Tremolo
Adjust amount of mod wheel for tremolo.

3. LP CF
Adjust amount of mod wheel to control VCF cutoff.

Pedal

31 - 33 are same as Pressure.

Delay

1. Delay Time
Adjust delay time.

2. LFO Frequency
Adjust frequency of LFO (low frequency oscillator).

3. HP Frequency
Adjust frequency of high pass filter for the delayed sound.

4. Feedback
Adjust amount of the feedback.

5. LFO intensity
Adjust amount of LFO delay time modulation.

6. LP Frequency
Adjust frequency of low pass filter for the delayed sound.

Sync Switch Tab
Turn it on to enable tempo sync.

Chorus / Flanger

7. LFO Frequency
Adjust frequency of the LFO.

8. LFO intensity
Adjust amount of LFO for delay time modulation.

9. Delay Time
Adjust delay time.

10. Chorus/Flanger
Select Chorus or Flanger.

11. Feedback
Adjust amount of the feedback.

12. Stereo Width
Adjust stereo width.

Sync Switch Tab
Turn it on to enable tempo sync.

Reverb

13. Room Size
Adjust room size of the late reflection.

14. Decay
Adjust decay of the late reflection.

15. Damping
Adjust absorption of high frequency in the late reflection.

16. Auto Size
Turn it on to enable auto size mode.

17. Pre Delay
Adjust pre delay time of the early reflection.

18. Output LP Frequency
Adjust frequency of output low pass filter.

Sync Switch Tab
Turn it on to enable tempo sync.

EQ and Mixer

19. High Frequency
Adjust frequency of high shelving filter.

20. Mid Frequency
Adjust frequency of mid peak / notch filter.

21. Low Frequency
Adjust frequency of low shelving filter.
22. High Gain
Adjust gain of the high shelving filter.

23. Mid Gain
Adjust gain of the mid peak / notch filter.

24. Low Gain
Adjust gain of the low shelving filter.

Compressor

25. Reduction Gain Meter
Indicate amount of gain reduction.

26. Attack
Adjust time to start compression.

27. Threshold
Adjust level of threshold to begin compression.

29. Release
Adjust time to end compression.

30. Makeup
Adjust amount of makeup gain.

Master Output

31. Volume
Adjust amount of master volume.

32. Pan
Adjust amount of master pan.

33. Mute
Turn it on to mute output signal.

Chorus / Flanger

7. Sine/Triangle
Adjust shape of the LFO waveform, Sine or Triangle.

8. HP Frequency
Adjust frequency of high pass filter for the effected sound.

9. LP Frequency
Adjust frequency of high pass filter for the effected sound.

Reverb

13. HP Frequency
Adjust frequency of input high pass filter.

14. LFO Frequency
Adjust frequency of LFO (Low Frequency Oscillator).

15. Early/Late
Adjust amount of the early reflection and amount of the late reflection.

16. LP Frequency
Adjust frequency of input low pass filter.

17. LFO intensity
Adjust amount of LFO for delay time modulation.

18. EFX Input
Adjust amount of input signal from Delay and Chorus/Flanger.

Mixer

19. Delay Level
Adjust level of Delay.

20. C/F Level
Adjust level of Chorus / Flanger.

21. Reverb Level
Adjust level of Reverb.

Compressor

26. Input Gain
Adjust amount of input gain.

27. HP Frequency
Adjust frequency of high pass filter at the input of the compressor.

29. Ratio
Adjust compression ratio.

30. Dry/Wet
Adjust amount of the dry and wet signal.

A. Delay Sync Switch Tab
Turn it on to enable tempo sync.

B. C/F Sync Switch Tab
Turn it on to enable tempo sync.

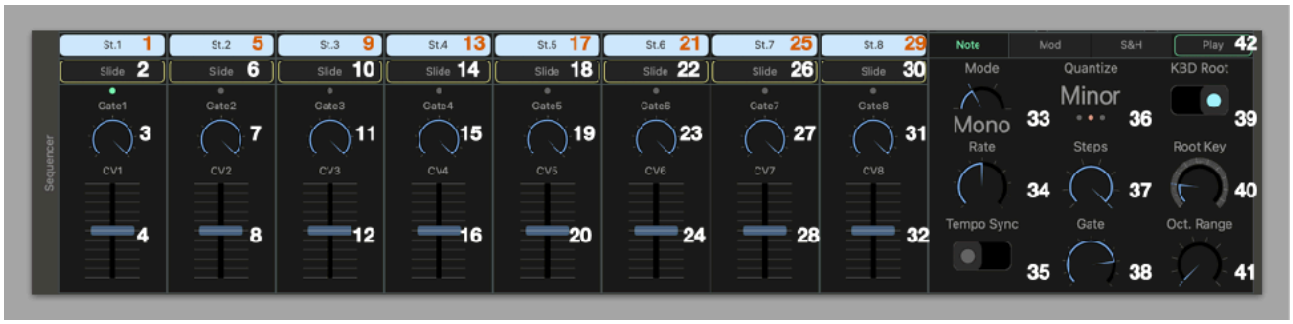
C. Reverb Sync Switch Tab
Turn it on to enable tempo sync.

1. Delay: Delay Time
Adjust delay time in note length.

7. C/F: LFO Frequency
Adjust frequency in note length.

13. Reverb: Room Size
Adjust room size in note length.

14. Reverb: LFO Frequency
Adjust frequency in note length.



Step Sequencer

1. Step1 Switch
Enable / Disable trigger to the step.

2. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

3. Gate1
Adjust amount of Gate signal (Velocity) for the step.

4. CV1
Adjust Amount of CV signal (Pitch) for the step.

5. Step2 Switch
Enable / Disable trigger to the step.

6. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

7. Gate2

Adjust amount of Gate signal (Velocity) for the step.

8. CV2
Adjust Amount of CV signal (Pitch) for the step.

9. Step3 Switch
Enable / Disable trigger to the step.

10. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

11. Gate3
Adjust amount of Gate signal (Velocity) for the step.

12. CV3
Adjust Amount of CV signal (Pitch) for the step.

13. Step4 Switch
Enable / Disable trigger to the step.

14. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

15. Gate4
Adjust amount of Gate signal (Velocity) for the step.

16. CV4
Adjust Amount of CV signal (Pitch) for the step.

17. Step5 Switch
Turn it on to enable the step

18. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

19. Gate5
Enable / Disable trigger to the step.

20. CV5
Adjust Amount of CV signal (Pitch) for the step.

21. Step6 Switch
Enable / Disable trigger to the step.

22. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

23. Gate6
Adjust amount of Gate signal (Velocity) for the step.

24. CV6
Adjust Amount of CV signal (Pitch) for the step.

25. Step7 Switch
Enable / Disable trigger to the step.

26. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

27. Gate7
Adjust amount of Gate signal (Velocity) for the step.

28. CV7
Adjust Amount of CV signal (Pitch) for the step.

29. Step8 Switch
Enable / Disable trigger to the step.

30. Slide Switch
Enable / Disable accent (trigger on) or slide (trigger off).

31. Gate8
Adjust amount of Gate signal (Velocity) for the step.

32. CV8
Adjust Amount of CV signal (Pitch) for the step.

33. Mode
Select operation mode, mono, chord or Unison.

34. Rate
Adjust frequency of clock to drive the sequencer.

35. Tempo Sync
Turn it on to enable Tempo Sync.

36. Quantize
Select a quantize option, Off, Minor or Major.

37. Steps
Select number of steps

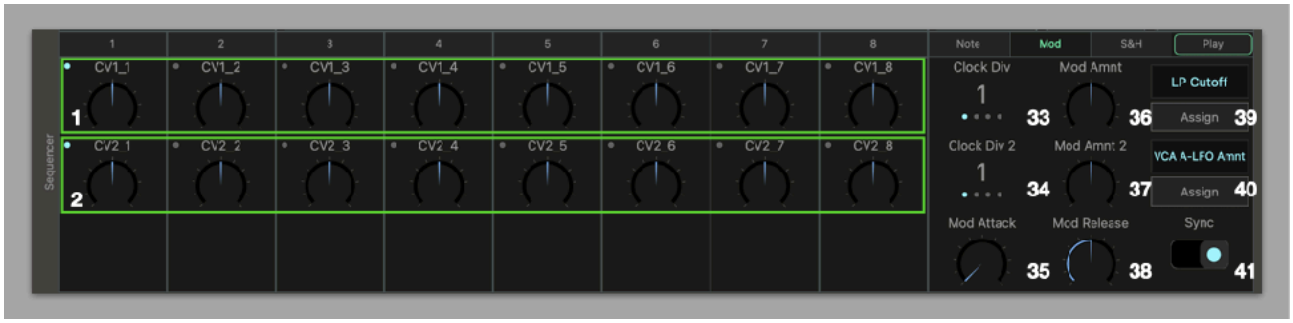
38. Gate
Adjust pulse width of gate signal.

39. KBD Root Key Switch
Enable / Disable pressed key on keyboard to set root key.

40. Root Key
Select a Root Key when KBD Root switch is turned off.

41. Octave Range
Select an Octave Range

42. Stop/Play
Turn it on to enable sequencer for playing. Tap any key on keyboard to start the sequencer.



Modulation

1. CV1_1 … CV1_8
Adjust amount of CV signal for the step.

2. CV2_1 … CV2_8
Adjust amount of CV signal for the step.

33. Clock Div 1
Adjust speed of clock. Options are 1, 1/2, 1/4 and 1/8.

34. Clock Div 2
Adjust speed of clock. Options are 1, 1/2, 1/4 and 1/8.

35. Mod Attack
Adjust attack time of envelope for modulation signal.

36. Mod Amount 1
Adjust amount of modulation.

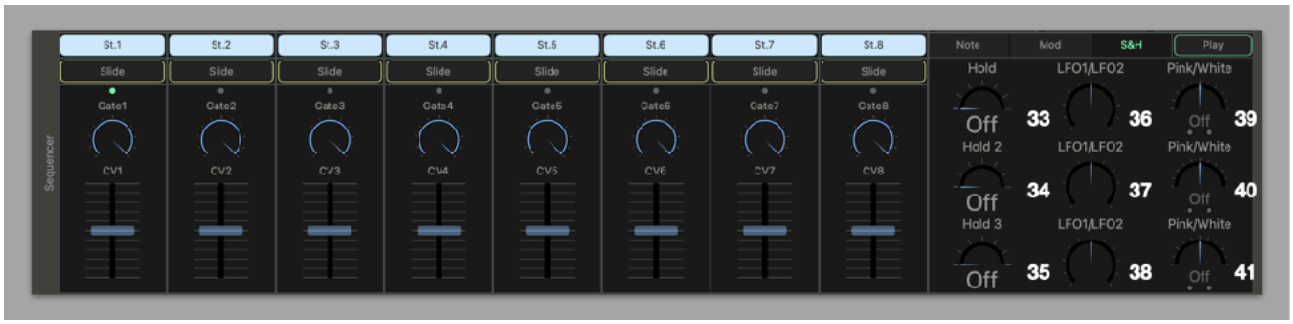
37. Mod Amount 2
Adjust amount of modulation.

38. Mod Release
Adjust release time of envelope for modulation signal.

39. Target 1
Select a target of the modulation. Options are MO (Modulation Operator Level), OP AM, WF, LPG and Delay.

40. Target 2
Select a target of the modulation. Options are MO (Modulation Operator Level), OP AM, WF, LPG and Delay.

41. Sync
Turn is on to sync phase of note sequencer and modulation sequencers.



Sample & Hold

33. Hold
Select number of steps to hold the sampled CV.

34. Hold 2
Select number of steps to hold the sampled CV for mod 1.

35. Hold 3
Select number of steps to hold the sampled CV for mod 2.

36. LFO Amount
Adjust balance of LFO1/LFO2 signal to be sampled.

37. LFO Amount
Adjust balance of LFO1/LFO2 signal to be sampled for mod 1.

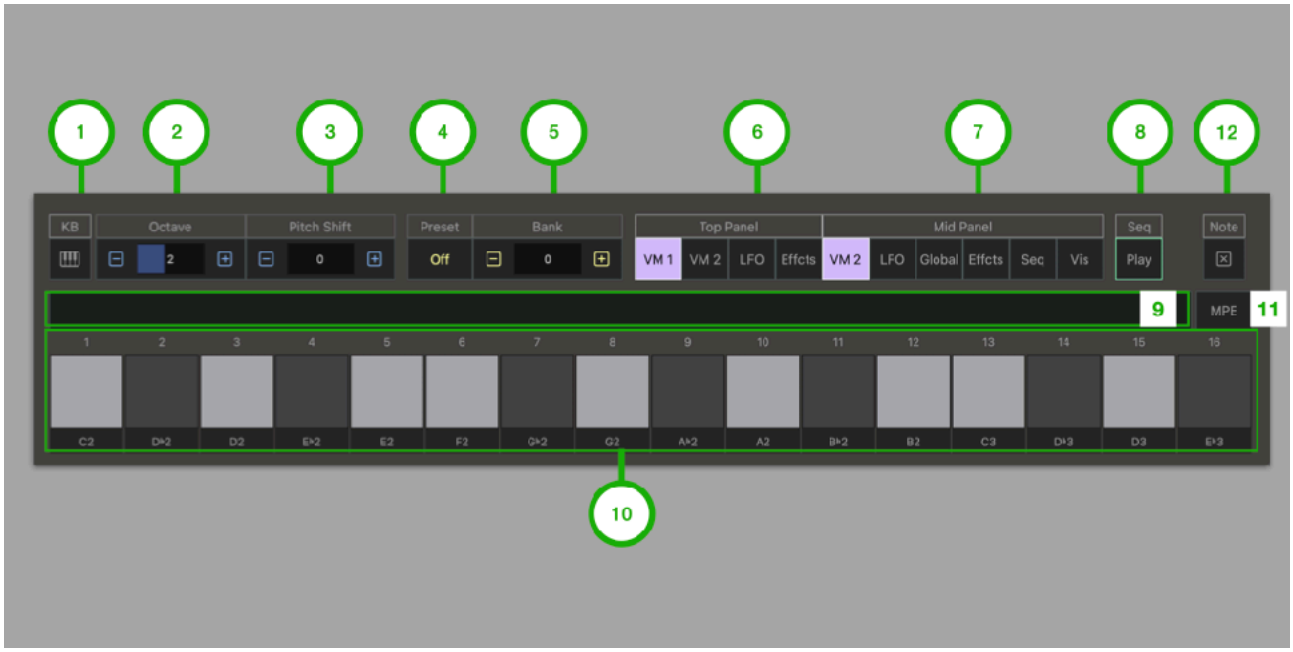
38. LFO Amount
Adjust balance of LFO1/LFO2 signal to be sampled for mod 2.

39. Noise Amount
Adjust amount of pink noise/white noise signal to be sampled.

40. Noise Amount
Adjust amount of pink noise/white noise signal to be sampled for mod 1.

41. Noise Amount
Adjust amount of pink noise/white noise signal to be sampled for mod 2.

Key Pad



1. Keyboard
Turn the button on to show keyboard view. Turn it off to show key pad view.

2. Octave Range
Use plus / minus buttons to adjust octave range of the key pad. Indicator shows octave of the lowest note of the key pad[1]. When “Midi Monitor” is enabled in Setting Panel, the range is automatically set based on the incoming midi note.

3. Pitch Shift
Use plus / minus buttons to adjust note range of the key pad.

4. Preset
Select preset type from the menu. Options are Off, Factory and User. Tap on a key pad to select a preset when factory or user is selected.

5. Bank
Select a preset bank. Preset number is pad number + bank * 16.

6. Top Panel
Select a module for the top panel.

7. Mid Panel
Select a module for the mid panel.

8. Sequencer Play
Turn it on to enable sequencer for playing. Tap any key on key pad to start the sequencer.

9. Ribbon Controller
Drag on the Ribbon to adjust Pitch in linear scale.

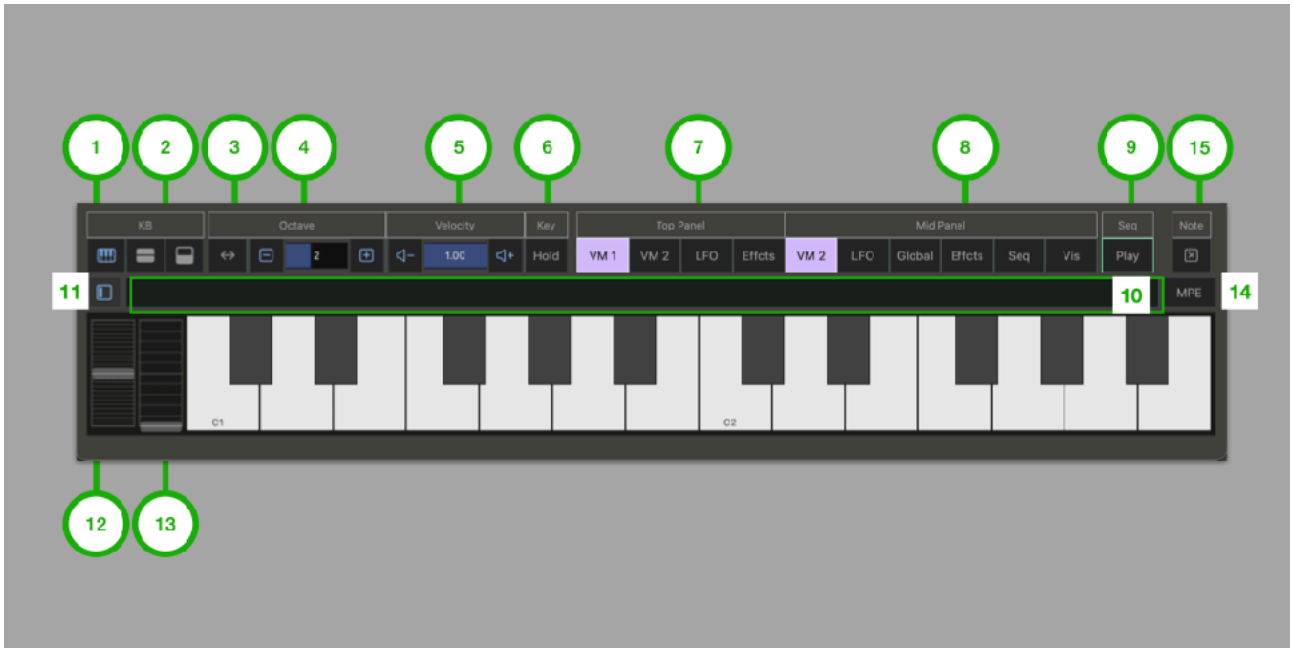
10.Key Pad
Tap on the pad to play note or select preset when preset type is factory or user.

11.MPE
Turn on to enable MPE.

12. Panic Button
Send all note off message.

[1] Middle C (midi note 60) is C3.

Keyboard



1. Keyboard
Turn the button on to show keyboard view. Turn it off to show key pad view.

2. Split & Target
Tap this button to show split keyboard. Tap target button to select a target of control.

3. Keyboard Scroll
Tap on arrow button to enable/disable keyboard scrolling.

4. Octave Range
Use plus / minus buttons to adjust octave range of the keyboard. Indicator shows lowest note of the keyboard[2]. When “Midi Monitor” is enabled, the range is automatically set based on the incoming midi note. Tap on arrow button to enable/disable keyboard scrolling.

5. Velocity
Use plus/minus button to adjust keyboard velocity.

6. Hold
Tap this button to enable /disable key holding.

7. Top Panel
Select a content of top panel.

8. Mid Panel
Select a content of mid panel.

9. Sequencer Play
Turn it on to enable sequencer for playing. Tap any key on keyboard to start sequencer.

10.Ribbon Controller
Drag on the Ribbon to control Pitch or Expression. Targets of the ribbon control can be selected by pitch and expression buttons on the left. Targets of the expression can be selected in KBD Control Routing Panel.

11.Wheel View Switch
Tap this button to show/hide pitch wheel and mod wheel.

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

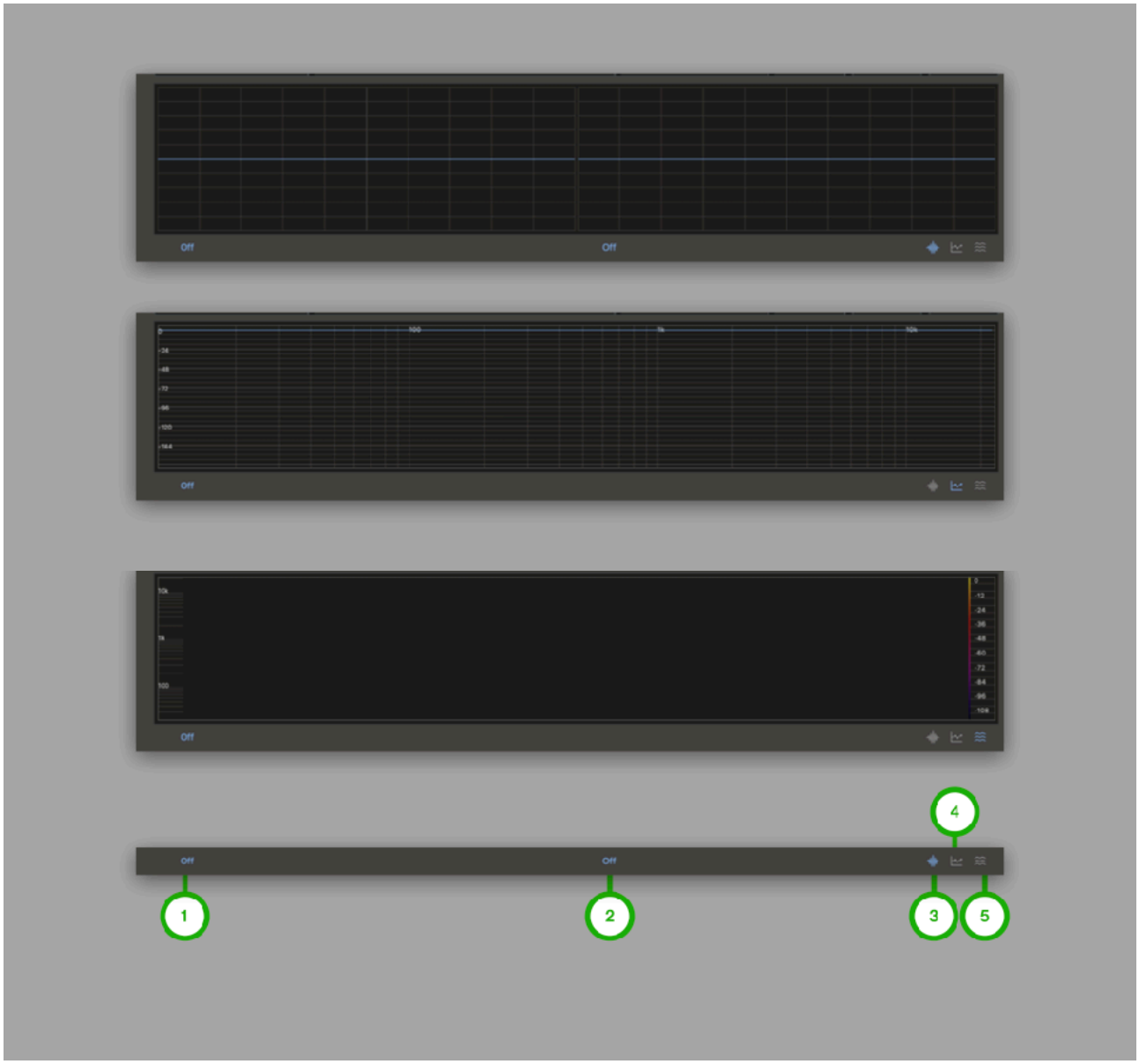
13.Mod Wheel
Adjust amount of the modulation. Targets of the modulation can be selected in KBD Control Routing Panel.

14.MPE
Turn on to enable MPE.

15.Panic Button
Send all note off message.

[2] Middle C (midi note 60) is C3.

Visualizer



1. Audio Source Selector
Tap this button to show a list. Select audio source for the visualization.

2. Audio Source Selector
Tap this button to show a list. Select audio source for the visualization.

3. Oscilloscope Button
Tap this button to select Oscilloscope.

4. Spectrum Plot Button
Tap this button to select Spectrum Plot.

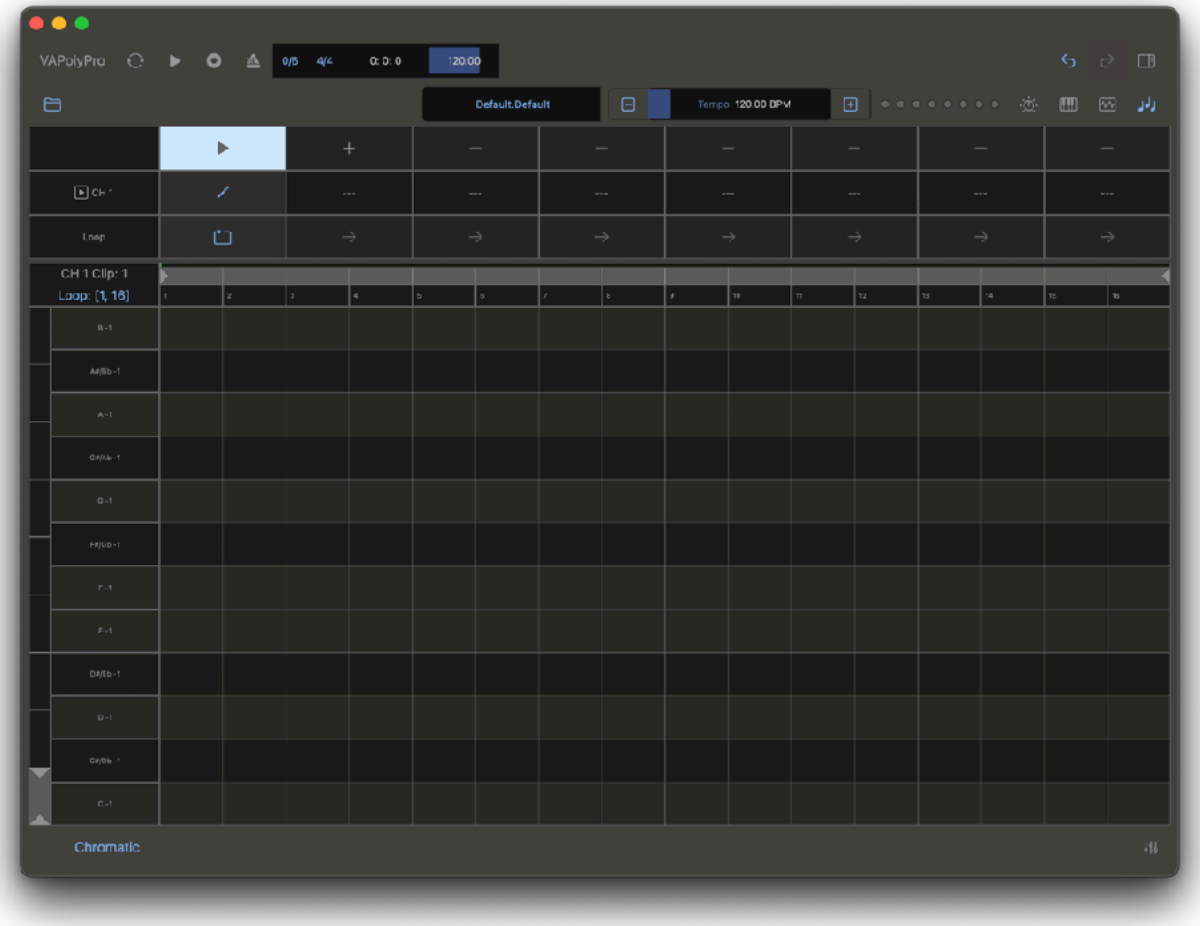
5. Spectrogram Button
Tap this button to select Spectrogram.

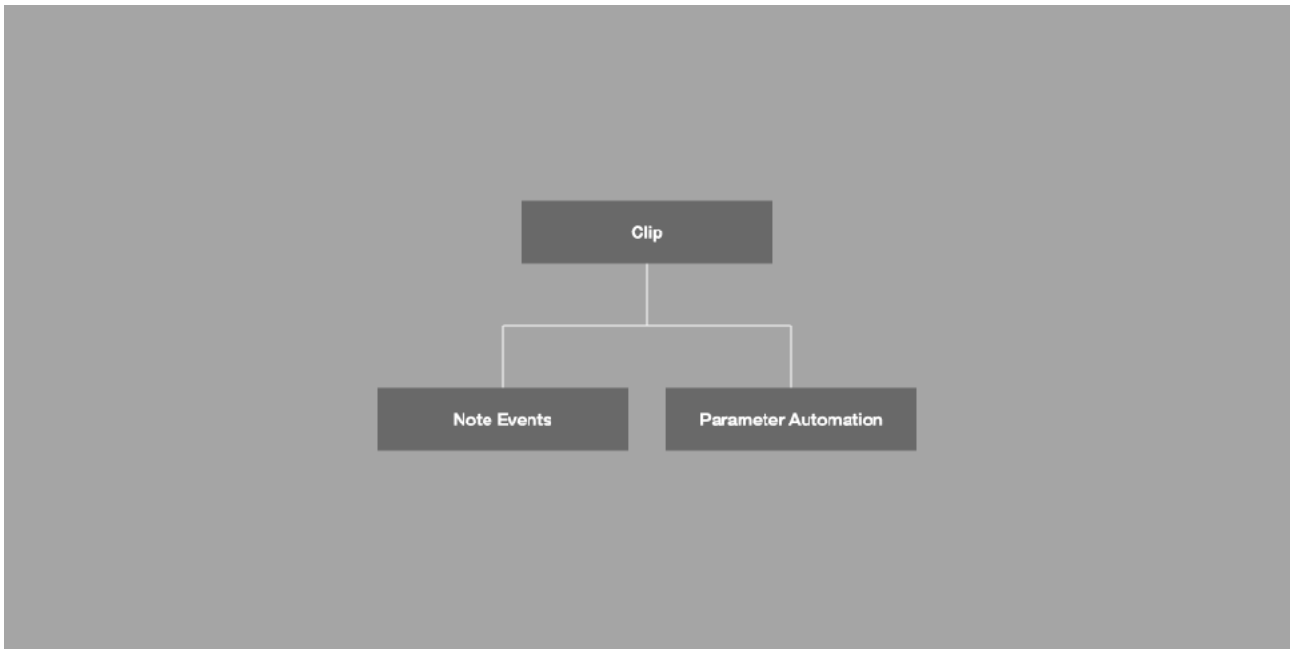
Tap and hold (right click on macOS) to show context menu.

Select a tool for audio visualization. Options are Oscilloscope, Spectrum Plot and Spectrogram.

Select a source of audio for the visualization.

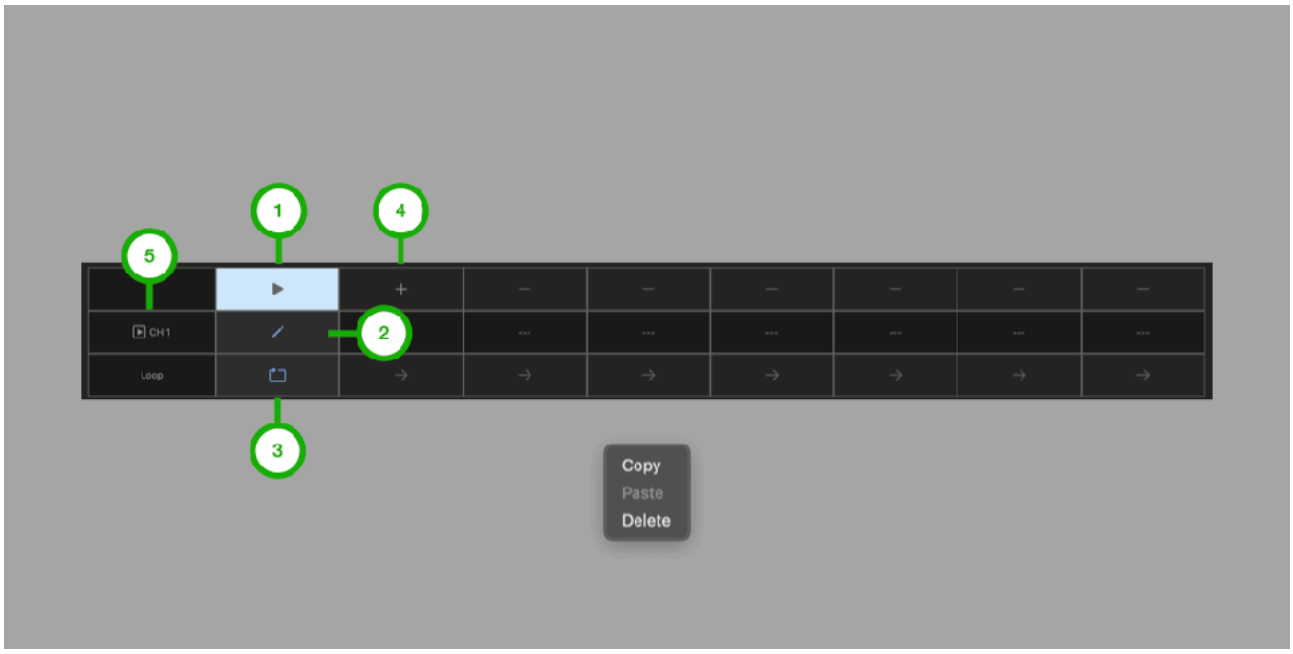
Sequencer (Piano Roll)





Clip contains note events and parameter automation events for each timbral. Maximum length of clip is 16 bars. Maximum number of clips are 8.

Clip Editor



1. Launch Button
Tap this button to play/stop clip.

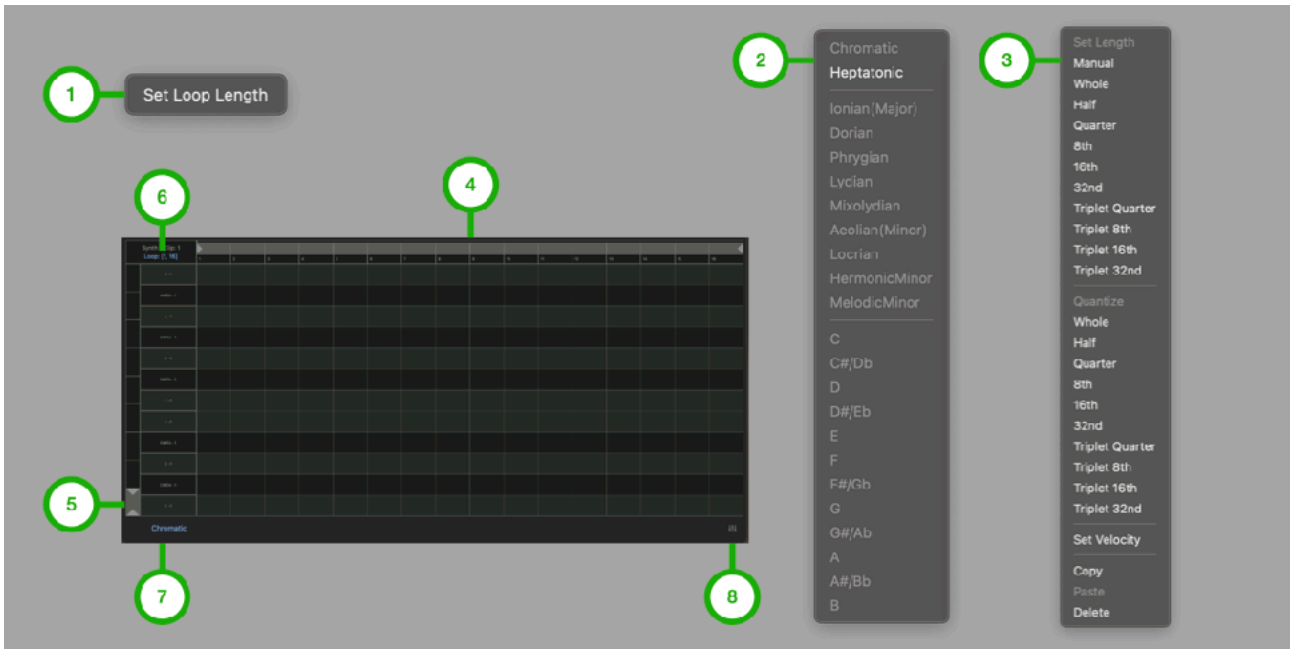
2. Edit Button
Tap this button to open piano roll editor.

3. Loop Selector
Select loop options.

4. Add Button
Tap this button to add edit button.

5. Auto Select Button
Enable/Disable Auto Select to select editor while sequencer is playing.

Piano Roll Editor



1. Loop Menu
Press and hold (right click on macOS) Time Range Selector to show this menu. Tap on “Set Loop Length” to set loop length to current length selected by the Time Range Selector.

2. Scale Menu
Press and hold (right click on macOS) editor to show this menu.

3. Editing Menu
Press and hold (right click on macOS) note to show this menu.

4. Time Range Selector
Select time range for editing and for loop length. On iOS, pinch gesture control zooming and drag gesture control scroll position.

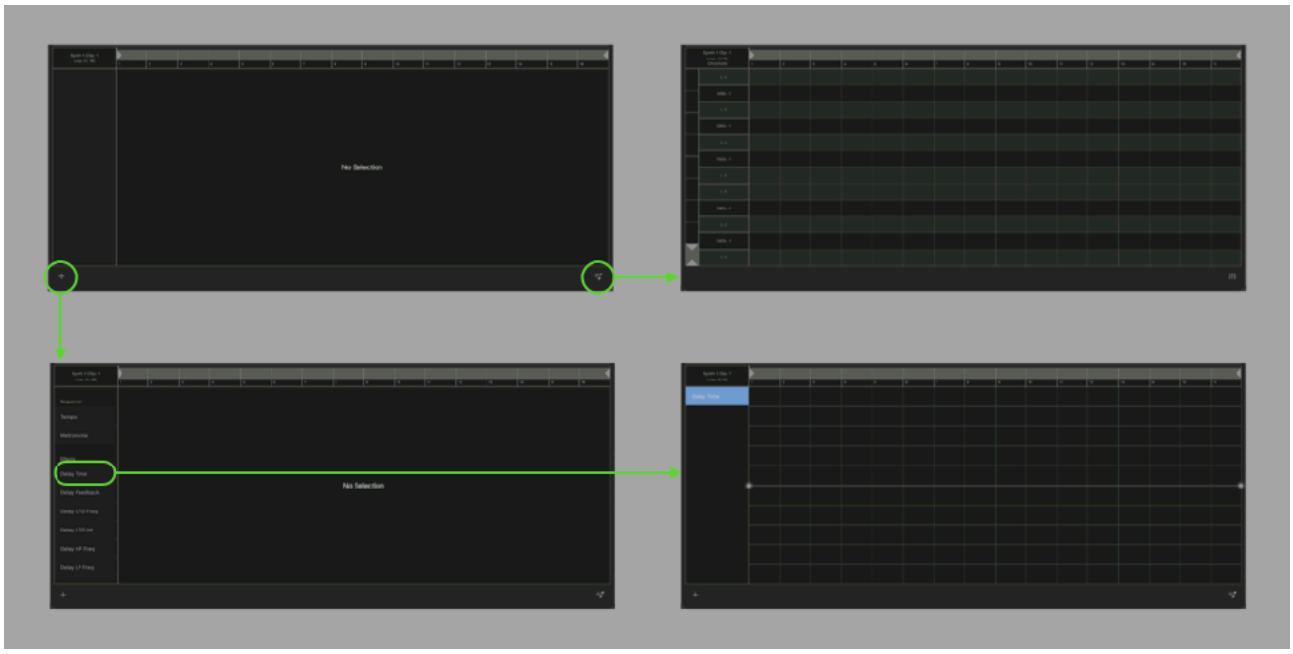
5. Note Range Selector
Select note range for editing. On iOS, pinch gesture control zooming and drag gesture control scroll position.

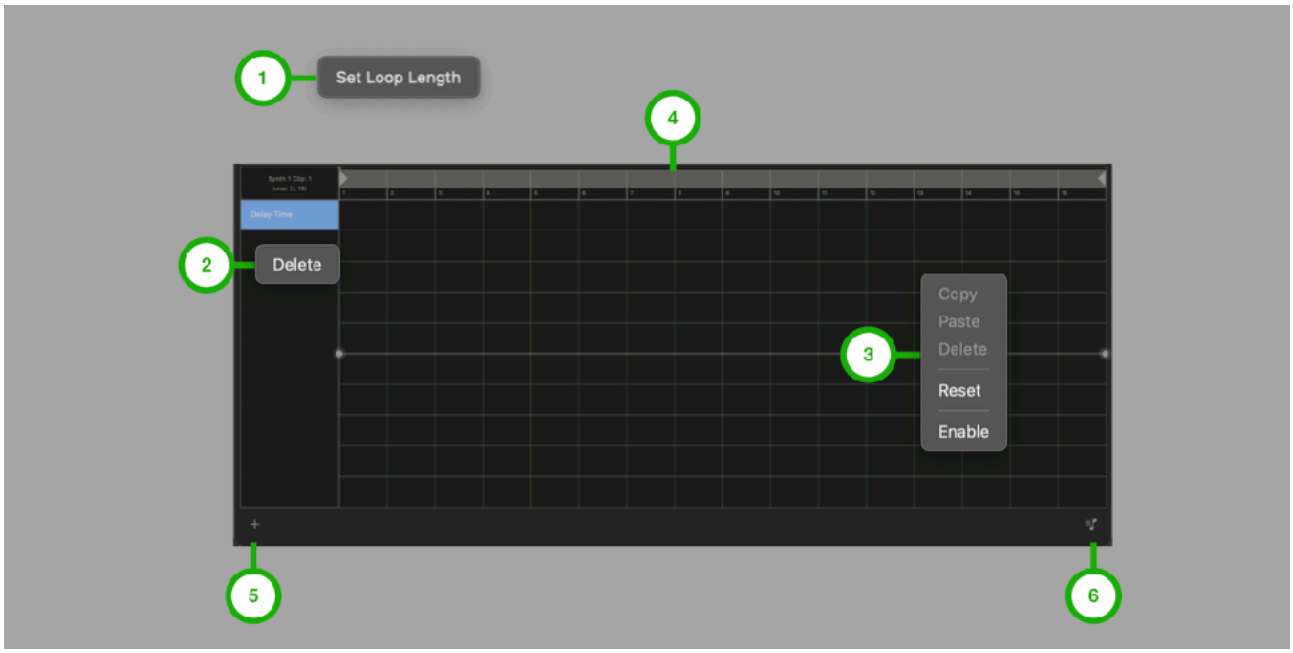
6. Loop Range
Tap this button to show Loop Menu.

7. Scale
Tap this button to show Scale Menu

8. Parameter Automation Button
Tap this button to show Parameter Automation Editor

Parameter Automation Editor





1. Loop Menu
Press and hold (right click on macOS) Time Range Selector to show this menu. Tap on “Set Loop Length” to set loop length to current length selected by the Time Range Selector.

2. List Menu
Press and hold (right click on macOS) item in parameter list to show this menu.

3. Editing Menu
Press and hold (right click on macOS) editor to show this menu.

4. Time Range Selector
Select time range for editing and for loop length.

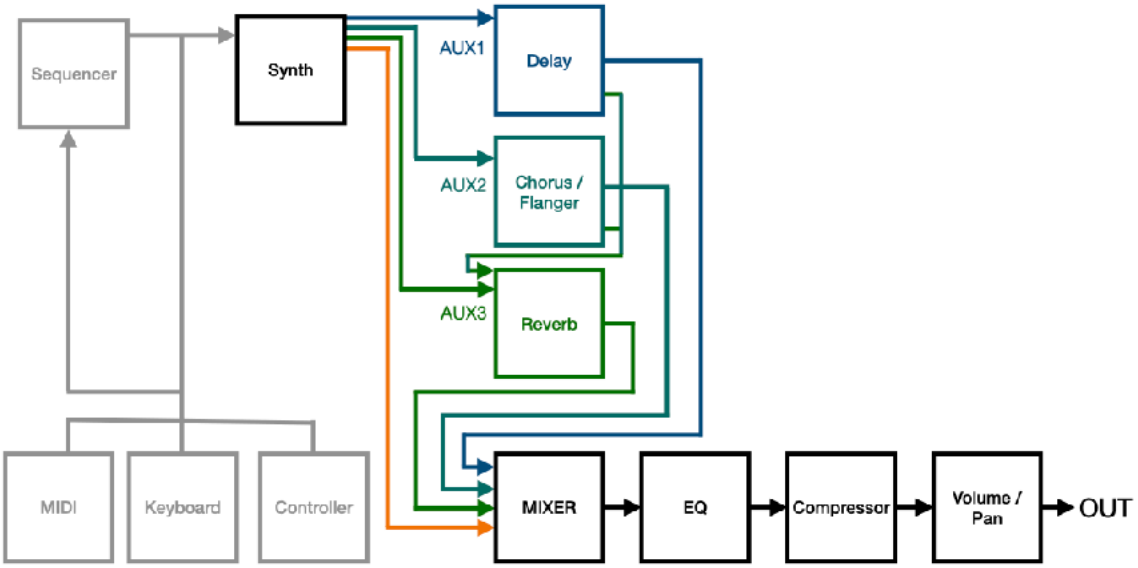
5. Add Button
Tap this button to select parameter to edit.

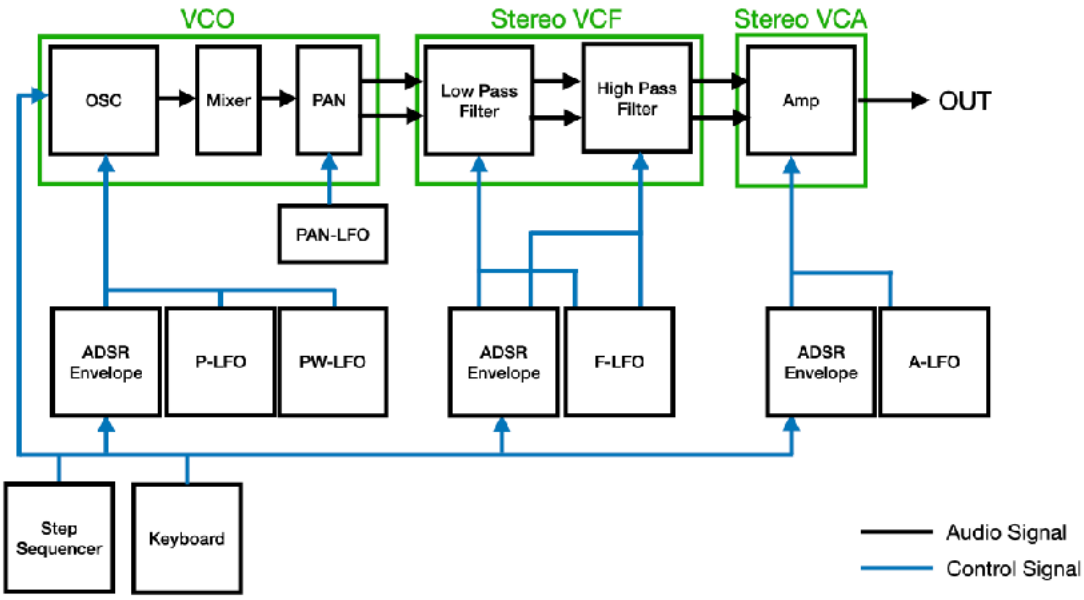
6. Piano Roll Button
Tap this button to show piano roll editor.

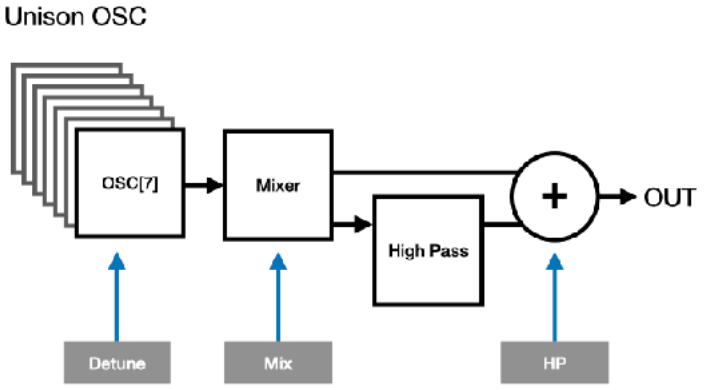
Synthesizer

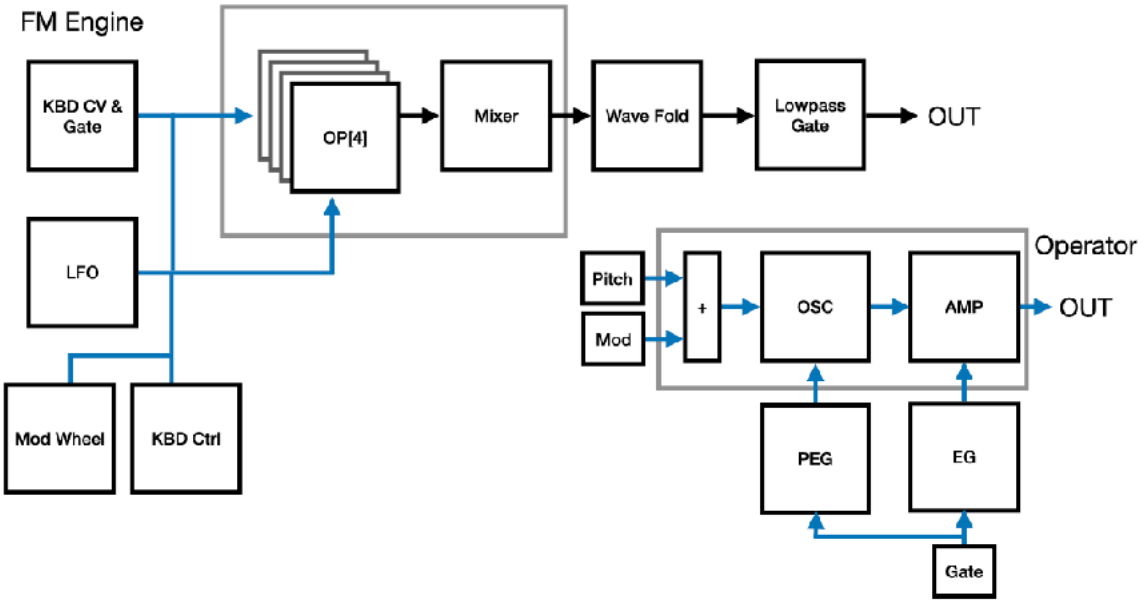
Each voice of synthesizer contains three type of oscillator block, three type of filter block, stereo amplifier and three envelope generators. Output of the synthesizer is routed to effects, mixer, EQ, compressor and main output amplifier.

Block diagram

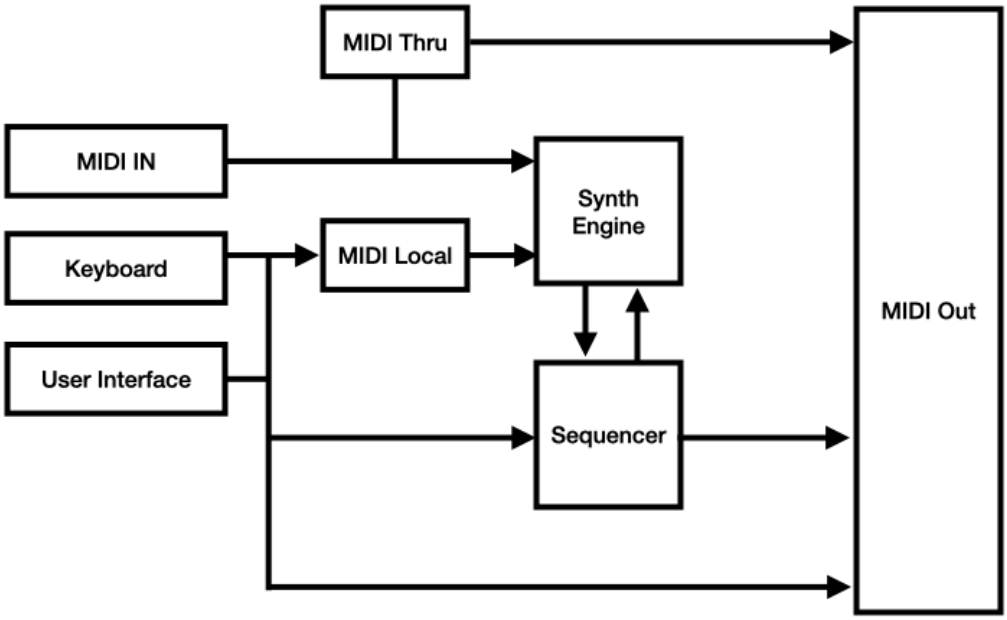





Unison OSC
OSC[7]
Mixer
High Pass
+
OUT
Detune
Mix
HP

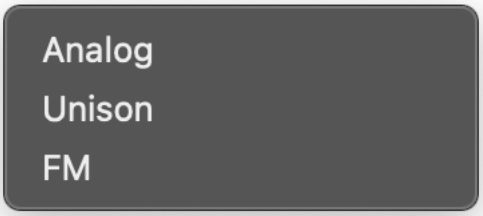

FM Engine
KBD CV & Gate
OP[4]
Mixer
Wave Fold
Lowpass Gate
OUT
LFO
Operator
Pitch
Mod
+
OSC
AMP
OUT
Mod Wheel
KBD Ctrl
PEG
EG
Gate

Control Signal & MIDI Flow



VCO

VCO contains three type of oscillators. Tap on menu to select an oscillator option.



Analog OSC1 & OSC2

Analog VCO contains two classic oscillator that generates continuously variable waveforms, sub oscillator and noise generator.

Shape

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

Pan

Adjust pan position of oscillator output.

Level

Adjust output level of oscillator in dB scale from -60 dB to 0 dB.

Mix

Adjust balance of oscillator1 output and oscillator 2 output.

F-EG

Adjust amount of F-EG to modulate mix amount.

F-LFO

Adjust amount of F-LFO to modulate mix amount.

Tune

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

Fine

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

PW (Pulse Width)

Adjust pulse width of the pulse wave. When Square wave is selected, pulse width of 0% and 100% produce DC signal[3] resulting no audible output.

P-EG

Adjust amount of P-EG to modulate pitch. (maximum +/- 24 semitones)

P-LFO

Adjust amount of P-LFO to modulate pitch. (maximum +/- 24 semitones)

PW-LFO

Adjust amount of PW-LFO to modulate pulse width.

[3] DC Signal is always positive or always negative and produce no sound.

Type

Select sub oscillator type. Options are -1 Oct and -2 Oct.

Pan

Adjust pan position of sub oscillator output.

Level

Adjust output level of sub oscillator in dB scale from -60 dB to 0 dB.

Type

Select noise oscillator type. Options are Pink and White.

Pan

Adjust pan position of noise oscillator output.

Level

Adjust output level of noise oscillator in dB scale from -60 dB to 0 dB.

Key Follow

Adjust amount of KCV to affect pan position of VCO output per voice.

Spread

Adjust stereo width of VCO output.

PAN-LFO

Adjust amount of PAN-LFO to modulate pan position of VCO output.

Unison OSC

Unison oscillator that generate seven continuously variable waveforms.

Shape

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

Pan

Adjust pan position of oscillator output.

Level

Adjust output level of oscillator in dB scale from -60 dB to 0 dB.

Mix

Adjust balance of seven oscillator outputs.

Detune

Adjust amount of detune for seven oscillators.

HP

Adjust balance of high pass output signal and dry signal.

Tune

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

Fine

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

PW (Pulse Width)

Adjust pulse width of the pulse wave. When Square wave is selected, pulse width of 0% and 100% produce DC signal[4] resulting no audible output.

P-EG

Adjust amount of P-EG to modulate pitch. (maximum +/- 24 semitones)

P-LFO

Adjust amount of P-LFO to modulate pitch. (maximum +/- 24 semitones)

PW-LFO

Adjust amount of PW-LFO to modulate pulse width.

[4] DC Signal is always positive or always negative and produce no sound.

FM

FM contains four operators, wave fold and low pass gate.

Operator is a basic building block of FM synthesizer. Operator contains a oscillator and an amplifier. Oscillator can generate 8 wave shapes. Amplifier can be controlled by envelope generator. Operator can be carrier or modulator. Only carrier generates output sound.

Wave Folding is a type of wave shaping to generate complex harmonic rich tones. Lowpass Gate is a key component of west coast synthesis and produces plucked sound similar to acoustic instrument.

Algorithm

Select an Algorithm. Algorithm defines routing of operators, such as which operators are carrier and which operators are modulators.

Feedback

Adjust amount of feedback. Which operator to receive feedback is defined by algorithms.

OSC Key Sync

Turn OSC key Sync on or off. When it is turned on, oscillator reset each time key is pressed.

Mix

Adjust balance of op bus1 output and op bus 2 output.

F-EG

Adjust amount of F-EG to modulate mix amount.

F-LFO

Adjust amount of F-LFO to modulate mix amount.

Mode

Select a frequency mode. Options are ratio and fixed. In ratio mode, frequency of oscillator can be set as harmonic index ratio. In fixed mode, frequency of the oscillator can be set as fixed frequency (Hz).

Coarse

Set coarse frequency of oscillator. When ratio mode is selected, it set integer value of harmonic index ratio from 1/2 to 31. (1/2 is -1 octave.) When fixed mode is selected, it set fixed frequency of midi note frequency from midi note number 1 to 127.

Fine

Set fine frequency of oscillator. When mode is ratio, range is from 0.0 to 1.0. When mode is fixed, range is interval between current and next coarse value.

Operator Switch

Turn operator on or off.

Detune

Adjust fine pitch of the oscillator. (+/- 10 cents)

Key Track

Adjust amount of KCV to affect level of operator output. Output level is decreased when higher note is played.

P-EG

Adjust amount of P-EG to modulate pitch.

P-LFO

Adjust amount of P-LFO to modulate pitch.

A-LFO

Adjust amount of A-LFO to modulate output level of operator.

Shape

Select a wave shape of the oscillator from 8 waveforms.

Pan

Adjust pan position of operator output.

Level

Adjust output level of operator in dB scale from -60 dB to 0 dB.

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

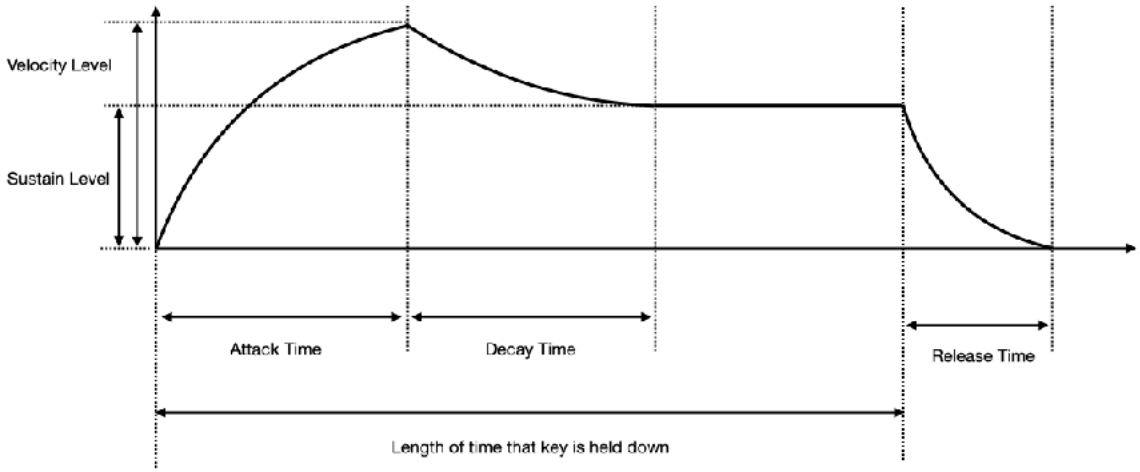
Adjust release time of the ADSR envelope (from 1 ms to 10 sec)

Velocity

Adjust amount that Keyboard velocity affect level of envelope.

Key Follow

Adjust amount that CV affect time of each stages.



Dry/Wet Amount

Adjust amount of dry signal and wet signal for output.

CV Amount

Adjust amount of control signal for wave folding.

CV Source

Select a source of control signal. Options are Dial, EG1, EG2, EG3 and EG4.

Mode

Select a mode. Options are LP. LP+VCA and VCA.

CV Amount

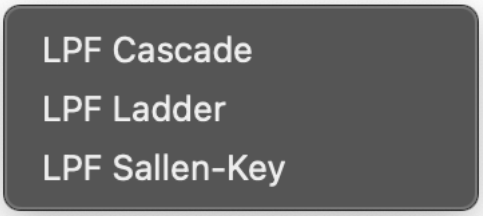
Adjust amount of control signal for lowpass gate.

CV Source

Select a source of control signal. Options are Dial, EG1, EG2, EG3 and EG4.

VCF

VCF contains three type of LPF / HPF. Tap on menu to select a VCF option.



Cascade

Cascade features a resonant filter modeled on cascaded OTA -24dB per octave low pass filter circuit and a resonant high pass filter.

This low pass 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.

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.

Cutoff

Adjusts the cutoff frequency of the filter.

Resonance

Adjusts resonance of the filter.

F-EG

Adjust amount of F-EG signal to modulate cutoff.

F-LFO

Adjust amount of F-LFO signal to modulate cutoff. Turn the dial clockwise from center adjust modulation in mono mode, turn the dial counter-clockwise from center adjust modulation in stereo mode.

Key Follow

Adjust amount of KCV to affect cutoff frequency. When it is 100%, cutoff frequency is equals to keyboard note frequency.

LPF Slope

Select slope of the filter, -12dB Per Octave or -24 dB Per Octave.

Cutoff

Adjusts the cutoff frequency of the filter.

Resonance

Adjusts resonance of the filter.

F-EG

Adjust amount of F-EG signal to modulate cutoff.

F-LFO

Adjust amount of F-LFO signal to modulate cutoff. Turn the dial clockwise from center adjust modulation in mono mode, turn the dial counter-clockwise from center adjust modulation in stereo mode.

Key Follow

Adjust amount of KCV to affect cutoff frequency. When it is 100%, cutoff frequency is equals to keyboard note frequency.

Drive

Adjust input gain of VCF. Characteristic of resonance changes based on the input signal level.

Ladder

Ladder features a resonant filter modeled on Transistor Ladder -24dB per octave low pass filter circuit and a resonant high pass filter.

Sallen-Key

Sallen-Key features a resonant filter modeled on Sallen-Key low pass filter circuit and a resonant high pass filter.

VCA (Amplifier)

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

Volume

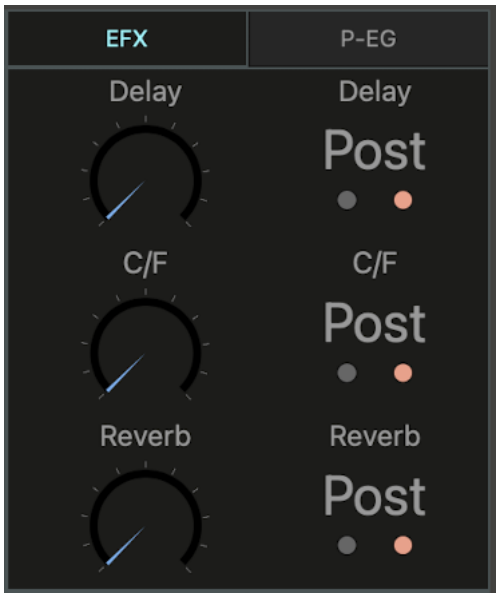
Adjust volume of Output Signal.

A-LFO

Adjust amount of A-LFO signal to modulate amplitude. Turn the dial clockwise from center adjust modulation in mono mode, turn the dial counter-clockwise from center adjust modulation in stereo mode.

Key Follow

Adjust amount of key follow to reduce level of the output when higher note is played.



Delay Send

Adjust level of the signal send to delay effect.

C/F Send

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

Reverb Send

Adjust level of the signal send to reverb effect.

Delay Pre/Post

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

C/F Pre/Post

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

Reverb Pre/Post

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

ADSR (Envelope Generator)

ADSR is an analog style non-linear envelope generator.

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

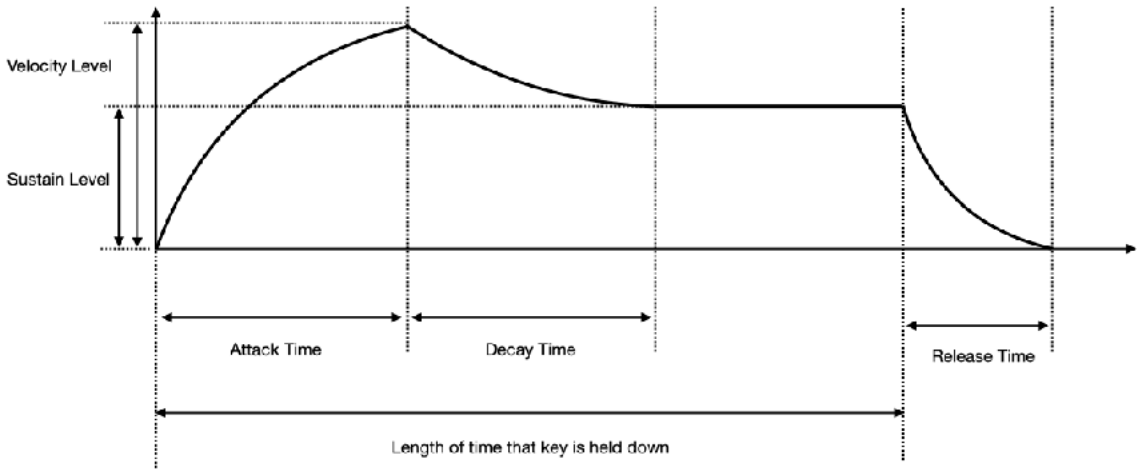
Adjust release time of the ADSR envelope (from 1 ms to 10 sec)

Velocity

Adjust amount that Keyboard velocity affect level of envelope.

Key Follow

Adjust amount that CV affect length of envelope.



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.

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.

Delay

Adjust delay time to start the LFO signal.

Tempo Sync

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

Key Sync (Key Re-Trigger)

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

Level

Adjust level of LFO output in dB scale.

Global

Voice

Select number of voices.

Unison

Turn this switch on to enable unison mode. When Unison mode is enabled, specified number of voices are stacked to generate monophonic sound.

Transpose

Adjust amount of transpose (+/- 24 semi tones).

Portamento Mode

Select a pitch modulation mode. Options are Portamento and Glissando.

Portamento Time

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

Pitch Bend Range

Adjust range of pitch bend from 0 to 24 semitones.

ARP

Pattern

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

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.

Gate

Adjust pulse width of gate signal.

Switch

Turn this switch on to enable arpeggio.

Tempo Sync

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

Velocity

Adjust velocity of trigger signal.

MPE

Offset 1

Adjust amount of MPE Y or Z to modulation (offset) selected target.

Offset 2

Adjust amount of MPE Y or Z to modulation (offset) selected target.

Offset 3

Adjust amount of MPE Y or Z to modulation (offset) selected target.

Target 1

Tap assign button and tap on control to select a target.

Target 2

Tap assign button and tap on control to select a target.

Target 3

Tap assign button and tap on control to select a target.

PB-Amnt

Adjust amount of pitch (MPE X) to control pitch bend.

PB-Range

Adjust range of pitch bend from 0 to 48 semitones (4 octaves).

PB-Width

Adjust number of keys (width) to control pitch bend.

Mod Wheel

Vibrato

Adjust amount of mod wheel to control vibrato.

Tremolo

Adjust amount of mod wheel to control tremolo.

LP CF

Adjust amount of mod wheel to control Low pass filter cutoff frequency.

Pedal

Vibrato

Adjust amount of expression to control vibrato.

Tremolo

Adjust amount of expression to control tremolo.

LP CF

Adjust amount of expression to control Low pass filter cutoff frequency.

Pressure

Vibrato

Adjust amount of pressure to control vibrato.

Tremolo

Adjust amount of pressure to control tremolo.

Accent

Adjust amount of pressure to control gain of VCO output.

Output Mixer

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

Delay Level

Adjust level of delay signal to EQ.

C/F Level

Adjust level of Chorus / Flanger signal to EQ.

Reverb Level

Adjust level of Reverb Signal to EQ.

Master Output

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

Volume

Adjust level of the master output.

Pan

Adjust pan of the master output.

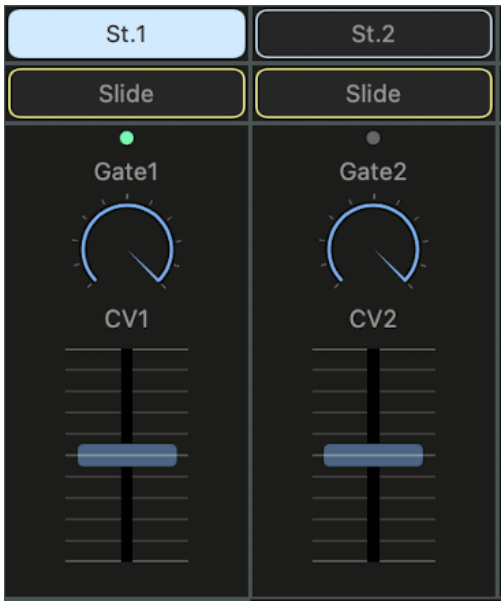
Mute

Turn on to mute master output.

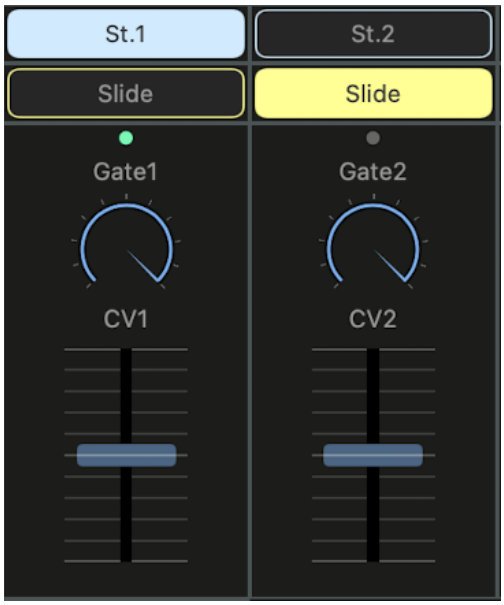
Step Sequencer

3 channel Analog Style 8 Step Sequencer to play notes and modulate parameters.

Step



Slide is off



Slide is on

Step Switch

Enable / Disable trigger to the step.

Slide Switch

Enable / Disable slide (when trigger is off).

Gate

Adjust amount of Gate signal (Velocity) for the step. Rage is from 0% to 100%.

CV

Adjust Amount of CV signal (Pitch) for the step. Range is one octave. Note value varies by setting of Root Key and Octave Range.

Sequencer Options

Play

Turn it on to enable sequencer for playing. Tap any key on keyboard to start the sequencer.

Mode

Select an operation mode. Options are Mono, Chord, Unison and Off. When chord is selected, use Quantize option to select Minor or Major.

Rate

Adjust frequency of clock to drive the sequencer.

Tempo Sync

Turn it on to enable Tempo Sync.

Quantize

Select a quantize option for CV signal. Options are Minor, Major and Off.

Steps

Select number of steps for the loop.

Gate

Adjust pulse width of gate signal.

KBD Root

Enable / Disable pressed note on keyboard to set root key.

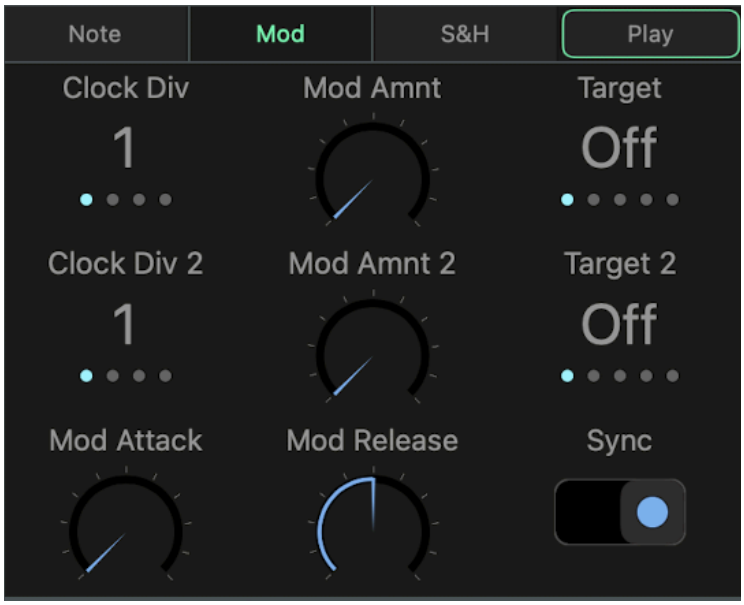
Root Key

Select a Root Key of CV signal. Range is from C-2 to C8 (MIDI 0 … 127).

Octave Range

Select an Octave Range of CV slider. Range is from 1 octave to 10 octaves.

Modulation



Clock Division

Adjust speed of sequencer for modulation signal. Options are 1, 1/2. 1/4 and 1/8.

Mod Amount

Adjust amount of modulation.

Target

Select a target of modulation. Options are Off, LPF, HPF, VCA and Delay.

Mod Attack

Adjust attack time of envelope for modulation signal.

Mod Release

Adjust release time of envelope for modulation signal.

Sync

Enable this option to sync phase of note sequencer and modulation sequencers.

S&H

Hold

Select number of steps to hold the sampled CV sequences. Options are 8, 16, 32, 64, 128, 256 and off. When the value is 256, 8 steps are repeated 32 times. Length of the loop is depended on the Clock Rate.

LFO1/LFO2

Adjust balance of LFO1/LFO2 signal to be sampled on active step.

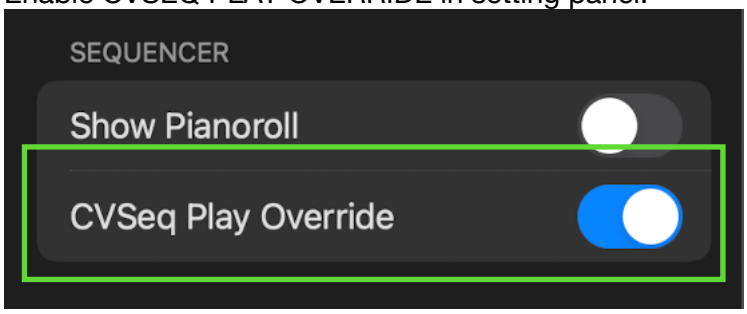
Pink/White

Adjust amount of pink noise / white noise signal to be mixed with LFO signal to be sampled on the active step.

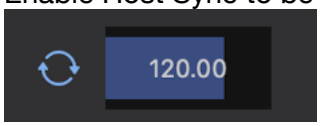
Sync with Transport Control

Play/Stop button of build-in piano roll sequencer or host application can start and stop step sequencer.

Enable CVSEQ PLAY OVERRIDE in setting panel.



Enable Host Sync to be control by the host application.



Press Play Button of build-in piano roll sequencer or host application starts step sequencer and it is indicated by the play button of the step sequencer.

Assignable Controllers

Tap “Assign” button and tap on a control to assign the parameter to the control.

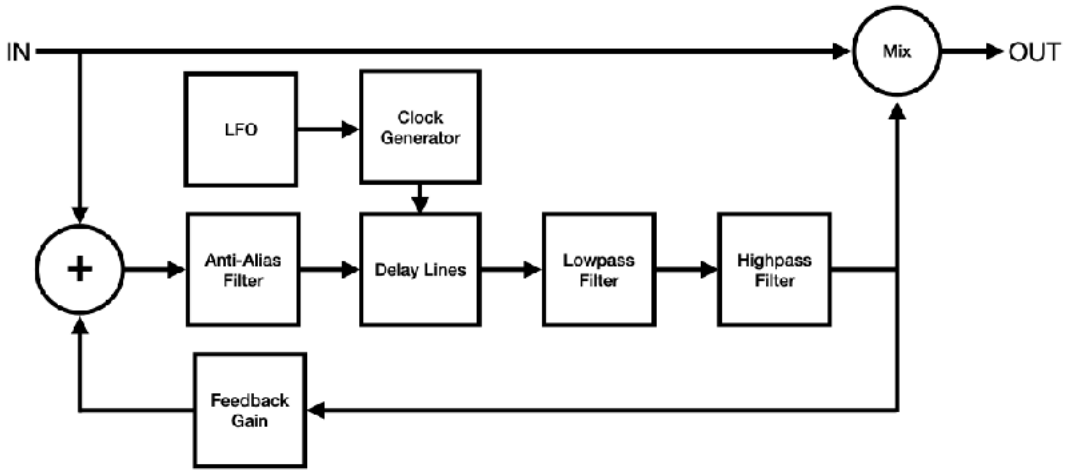
Macro Factory Presets

Five factory presets, Mixer_VCF, VCA&EFX, F-EG&A-EG, ChannelStrip and Effects can be used to set parameters to Assignable Controllers.

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.

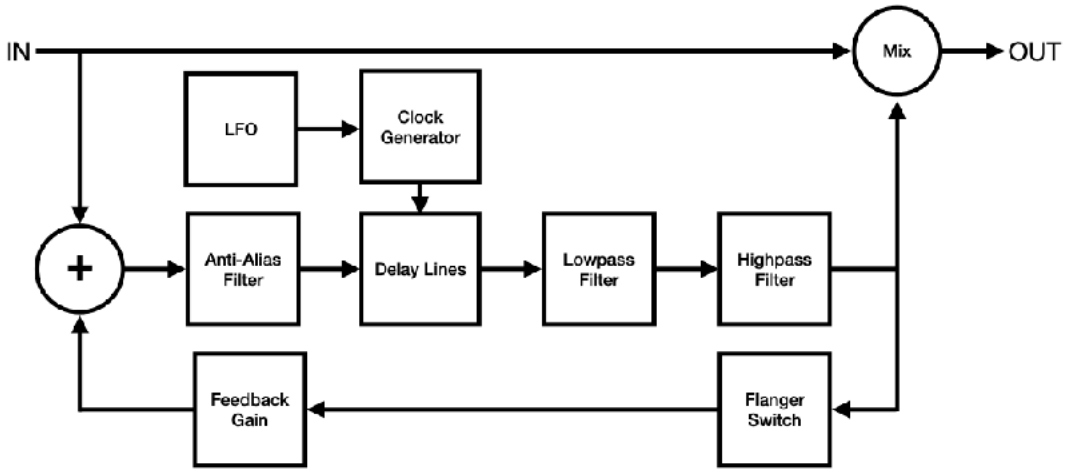
Modulation

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.[5]

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.

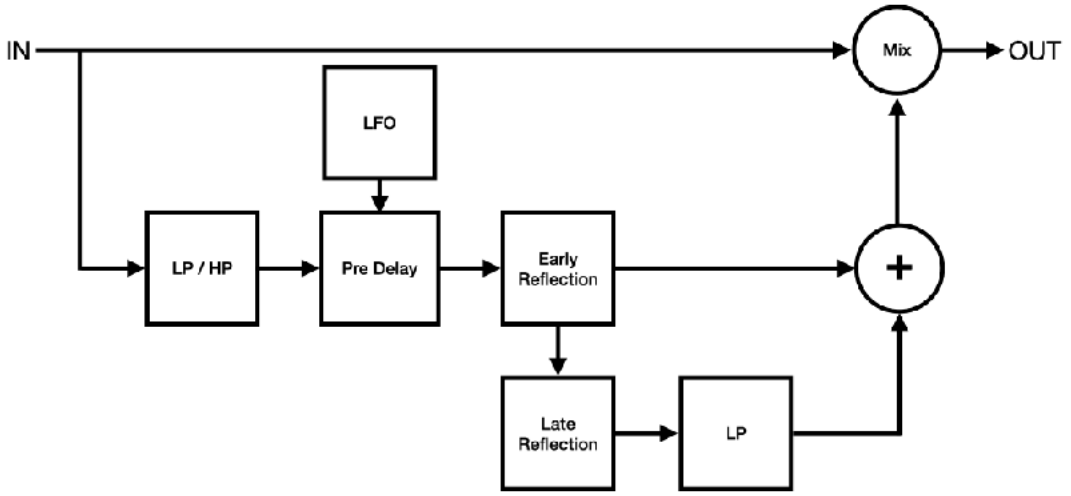
[5] If compared with manual knob of the analog flanger guitar pedal, emphasized frequency moves reverse direction.

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

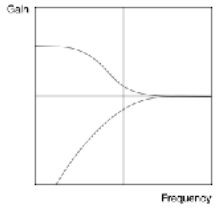
Use lowpass filter to cut high frequency of the reverb signal.

Early / Late Mix

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

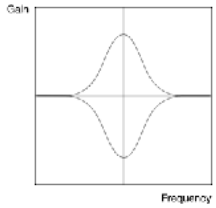
Equalizer

Low Shelving



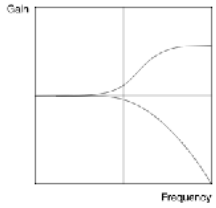
Adjust frequency of the filter from 21 Hz to 1092 Hz.
Adjust gain from minus infinity to +12 dB
When gain is turned fully anti clock wise, the filer becomes high pass filter.

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

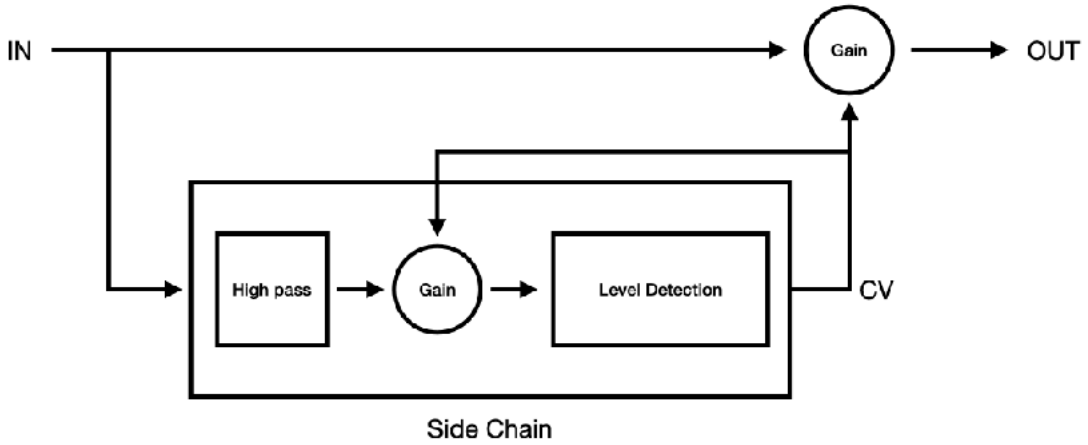


Adjust frequency of the filter from 296 Hz to 21096 Hz.
Adjust gain from minus infinity to +12 dB
When gain is turned fully anti clock wise, the filer becomes low pass filter.

Compressor

Overview

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

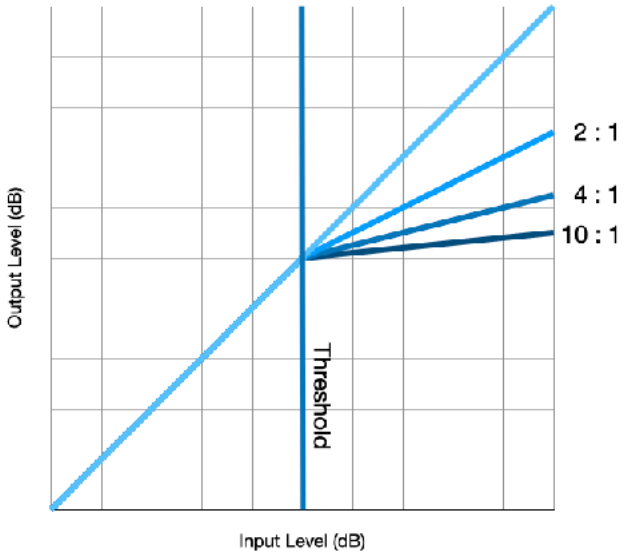


High pass filter is applied to the input of the side chain and the signal is routed to the gain stage in the side chain. The output of the gain stage is routed to the level detection. The level detector detects level of the input signal and generates control signal based on the level of the gain reduction 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.

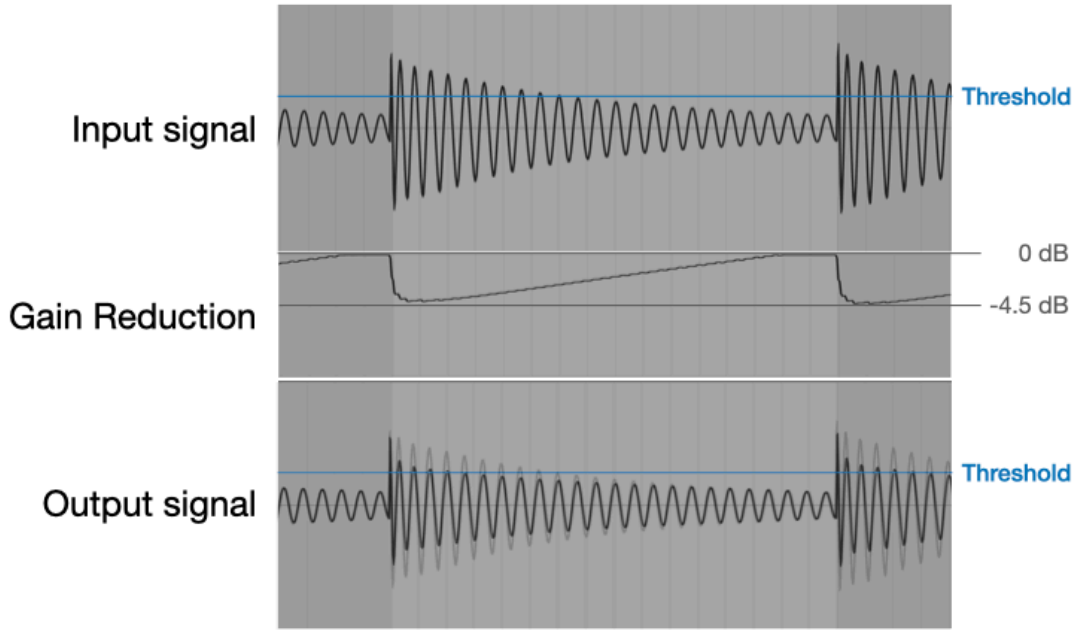
Threshold and Ratio

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

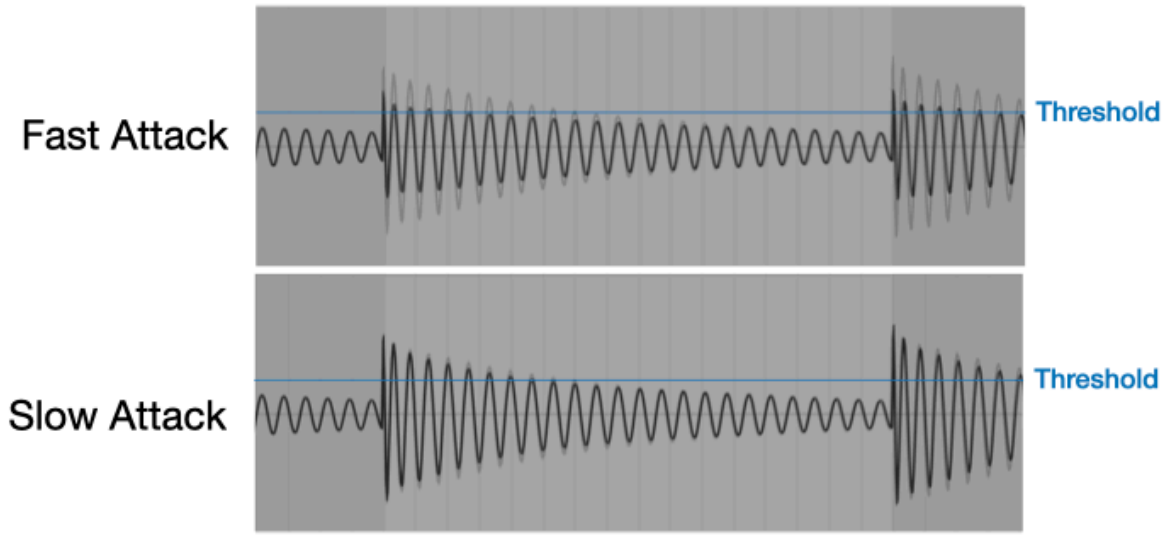


Attack and Release

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.

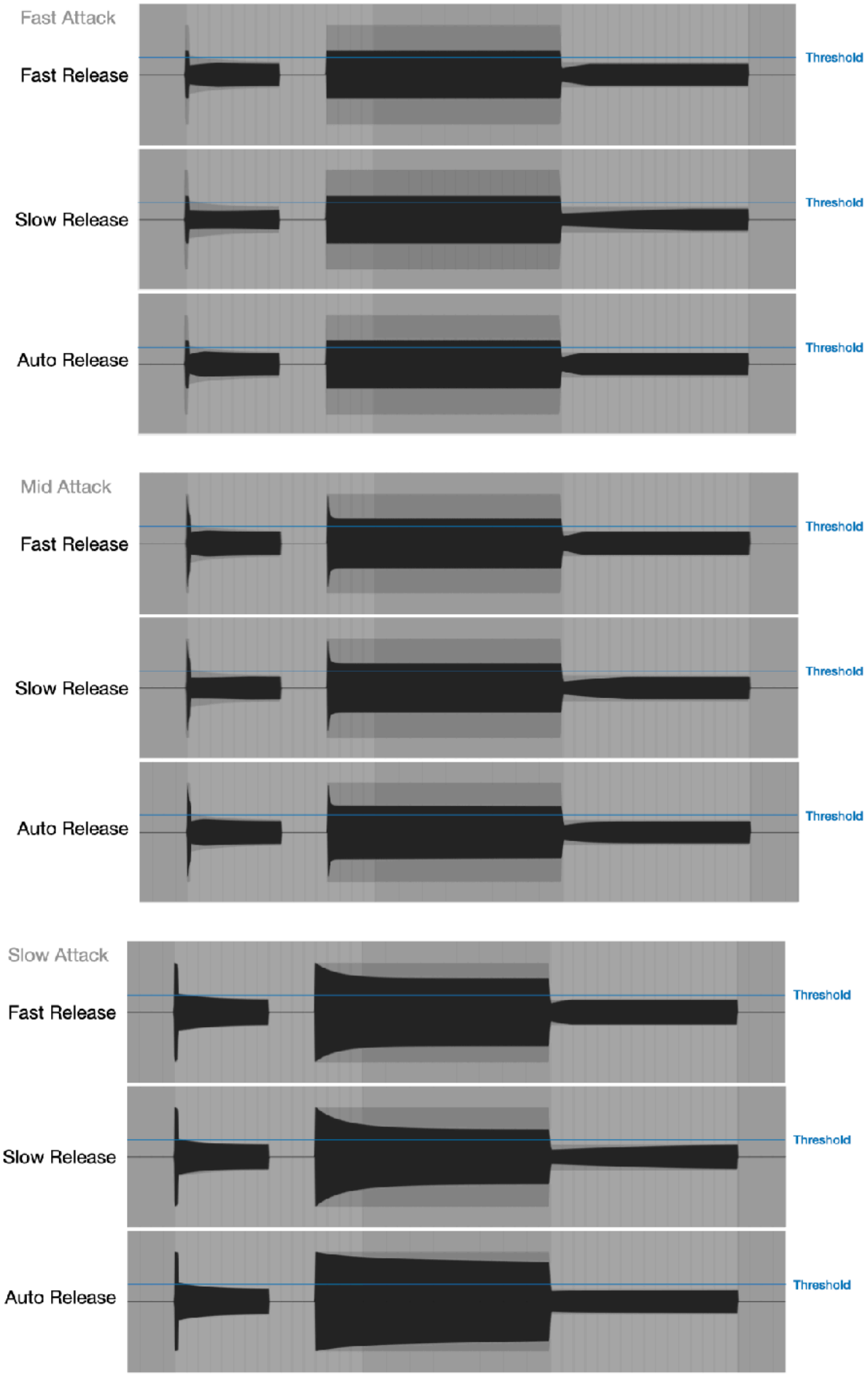


In this example, attack is 1 ms and release is 0.6 s. The initial transient pass through the compressor without gain reduction. It takes a while for the gain reduction to return to 0 dB after the input signal goes below the threshold.



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.


Fast Attack
Fast Release
Threshold
Slow Release
Threshold
Auto Release
Threshold
Mid Attack
Fast Release
Threshold
Slow Release
Threshold
Auto Release
Threshold
Slow Attack
Fast Release
Threshold
Slow Release
Threshold
Auto Release
Threshold

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.

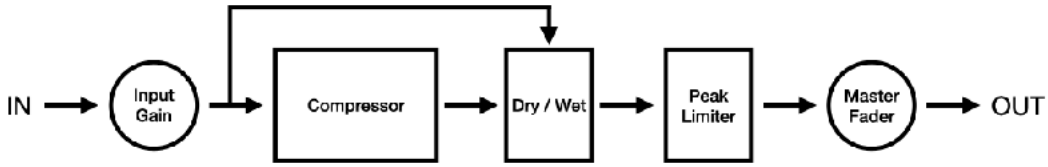
Makeup Gain

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 used 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.

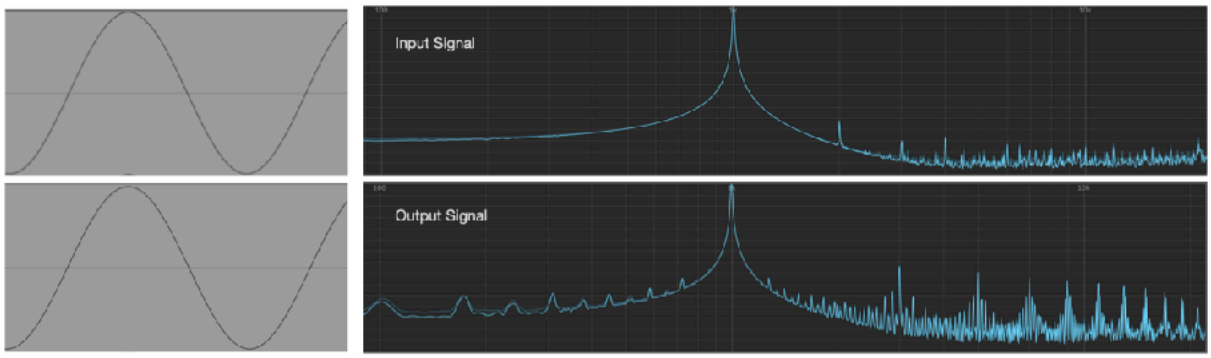
Dry / Wet

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.

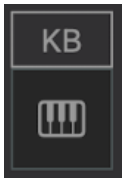
Peak Limiter

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.



Key Pad



Select Key Pad

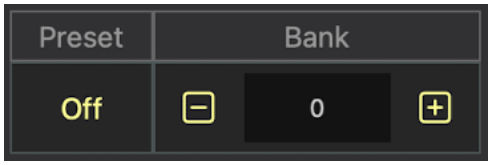
Turn Keyboard Button off to show key pad.

Select Octave

Use plus / minus buttons to adjust octave range of the key pad. Indicator shows octave of the lowest note of the key pad.

Select Pitch Shift

Use plus / minus buttons to adjust pitch range of the key pad.

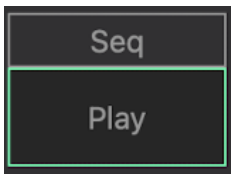


Select Preset Type and Bank

Select a preset type. Options are Off, Factory and User. When factory or user is selected, tap on key pad to select a preset.
Use plus / minus buttons to select a preset bank. Preset number is sum of the key pad number and bank number * 16. When triggered from external keyboard or sequencer, pitch also changes. This feature is ignored when exporting audio.

Select Top and Mid Panel

Select a module for the top panel and mid panel.

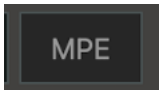


Play Switch for Step Sequencer

Turn it on to enable step sequencer for playing. Tap any key on keyboard to start sequencer. Override this parameter in setting panel to play sequencer by transport command.

Panic Button

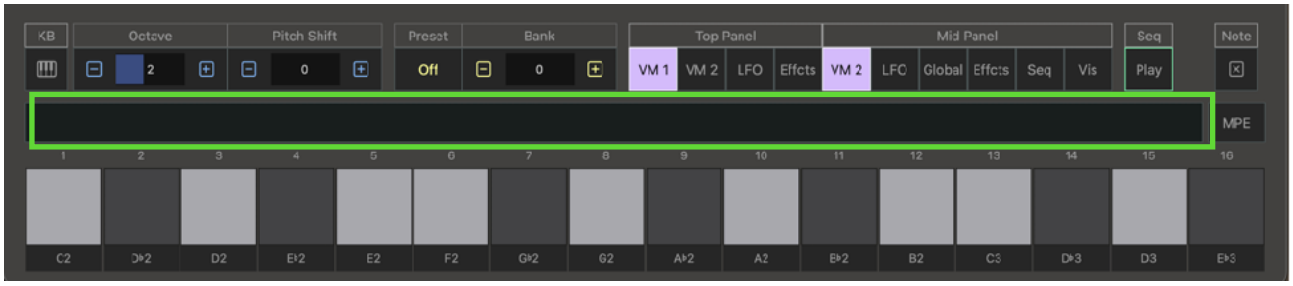
Send note off message to all notes.



MPE Button

Turn this button on to enable MPE mode.

Ribbon Controller



Dragging the Ribbon Controller applies linear pitch bend.

Keyboard

Select Keyboard

Turn Keyboard Button on to show keyboard.

Select Key Range

Use plus / minus buttons to adjust range of the keyboard. Indicator shows octave of lowest note of the keyboard. Tap on arrow button to enable keyboard scrolling.

Use Modulation Wheel

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

Use Pitch Wheel

Adjust pitch of the oscillators. Range is +/- 1, 2, or 4 octave can be adjusted by FM range option.

Set Velocity

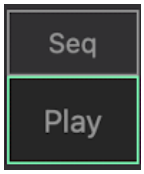
Use plus / minus buttons to adjust velocity.

Use Key Hold

Tap to Enable/Disable Key Hold.

Top & Mid Panel

Select a content of top panel and mid panel.



Play Switch for Step Sequencer

Turn it on to enable step sequencer for playing. Tap any key on keyboard to start sequencer. Override this parameter in setting panel to play sequencer by transport command.

Panic Button

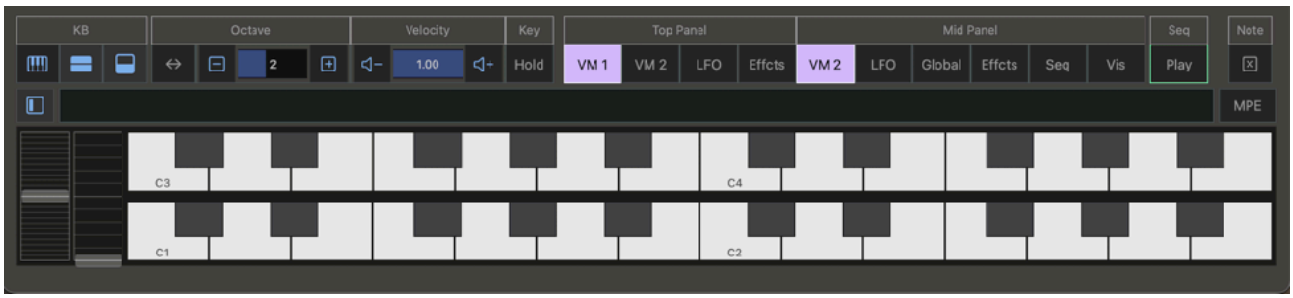
Send note off message to all notes.

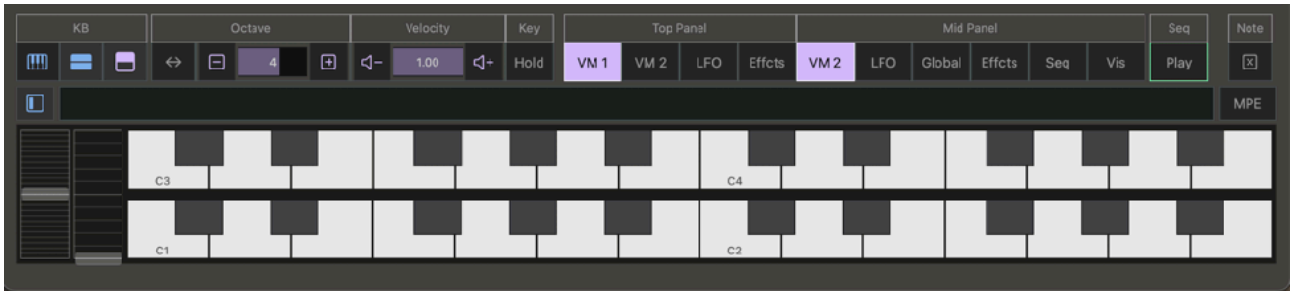
MPE Button

Turn this button on to enable MPE mode.

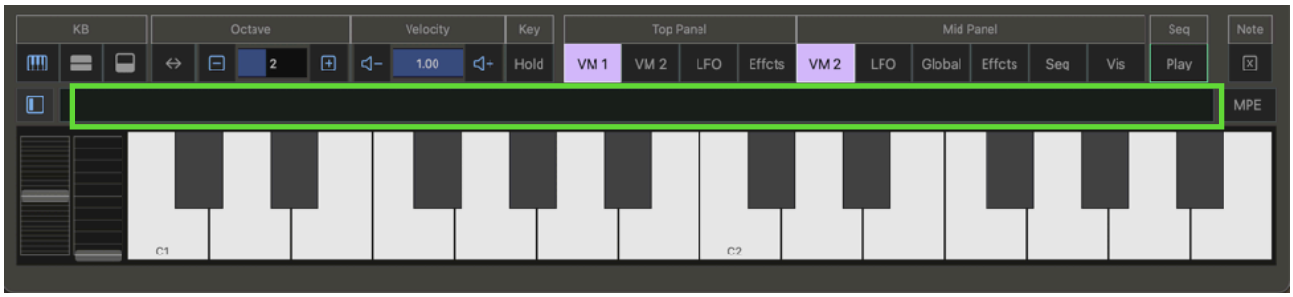
Show Double Keyboard

Tap a button on left to show Double Keyboard. Tap a button on right to select a keyboard to control.





Ribbon Controller



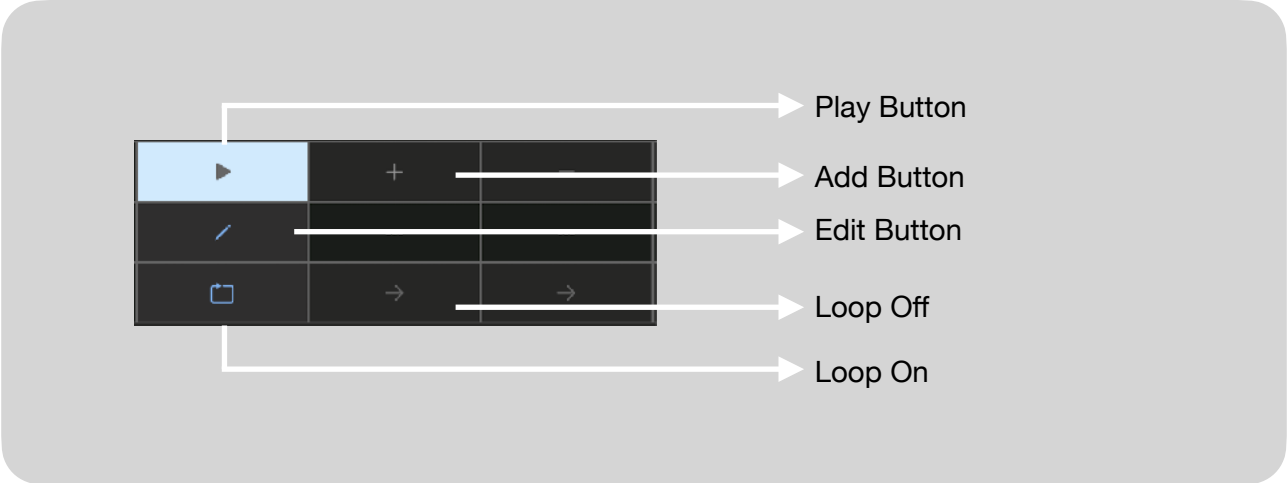
Dragging the Ribbon Controller applies linear pitch bend.

Pseudo Velocity on Piano Keyboard (iOS)

iOS piano keyboard features pseudo velocity and pressure. Velocity / Pressure is computed by size of touch. Initial press on key sends velocity value and continuous press sends after touch / poly pressure value. This feature can be enable / disable in setting panel.

Clip Editor

Each clip contains note event and parameter automation events for length of 16 bars. Maximum number of clips are 8.



Load Clip

Tap load button to load clip to make it active.

Play/Stop Clip

Tap play button to play/stop clip.

Edit Piano Roll

Tap edit button to open piano roll editor.

Add edit button

Tap plus button to add edit button.

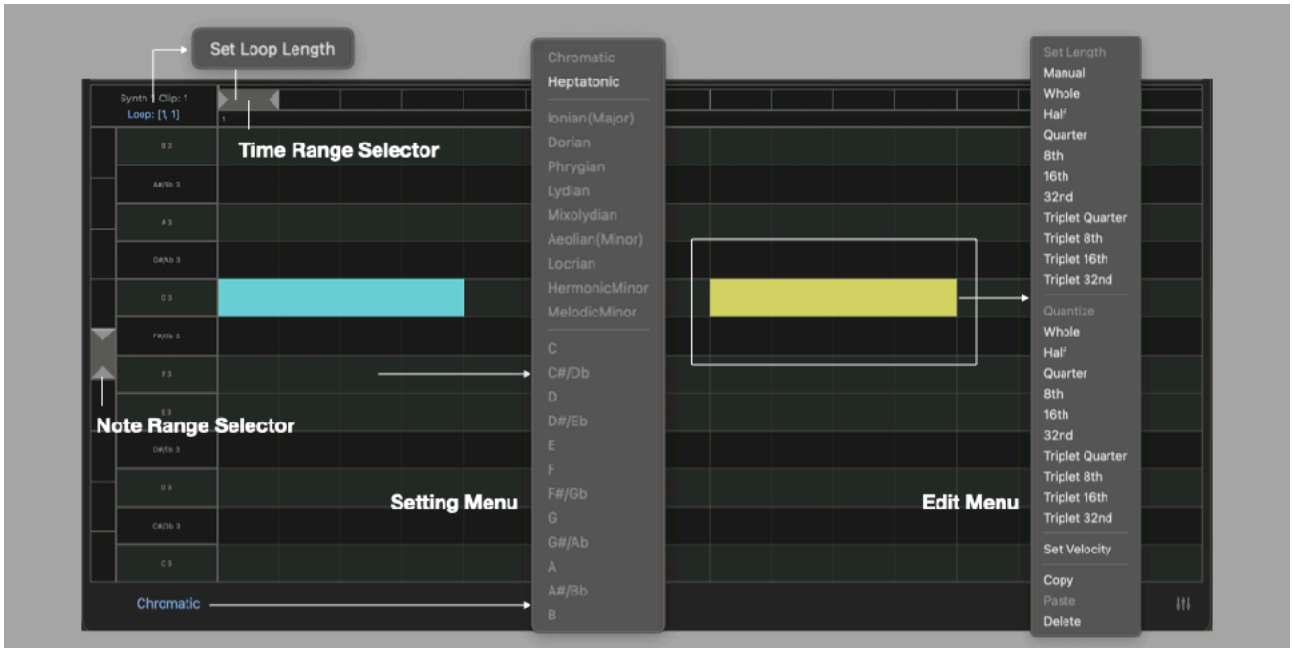
Set Loop Mode

Tap this button to enable/disable loop mode. When loop is off, tap square icon to select a clip to play next.

Auto Select Editor

Tap Synth Row Label to toggle Auto Select Editor Switch. When Auto Select is enabled, editor changes while playing sequence.

Piano Roll Editor



Select Time Range and Loop Length

Use “Time Range Selector” to select Time Range for editing and Loop Length. On iOS, pinch gesture control zooming and drag gesture control scroll position.
To set Loop Length, tap on Loop Length button to show menu and select “Set Loop Length”.
Right click on selector on Mac also show the menu.

Select Note Range

Use “Note Range Selector” to select note range for editing. On iOS, pinch gesture control zooming and drag gesture control scroll position.

Add Note

Double tap to add a note.

Delete Note

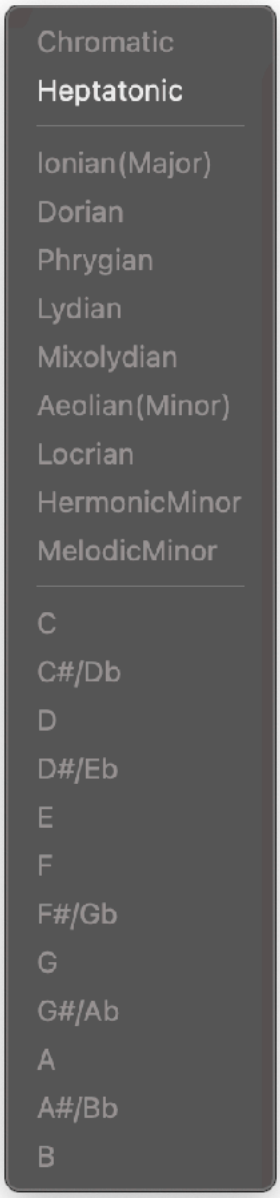
Select note and select Delete from context menu.

Scale Menu

Press and hold (right click on macOS) editor to show scale menu. Tap on scale button also shows the menu.

Edit Menu

Press and hold (right click on macOS) selected note to show edit menu.



Chromatic Scale

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

Heptatonic Scale

Select Heptatonic to edit notes in Diatonic Scale, Harmonic Minor Scale or Melodic Minor Scale (7 degrees).

Root Key

Select a root key, when editing note in Diatonic Scale, Harmonica Minor or Melodic Minor Scale.

Set Length

Select an option to set note length.

Quantize

Select an option to quantize note.

Set Velocity

Open velocity editor to edit note velocity.

Copy

Copy selected notes.

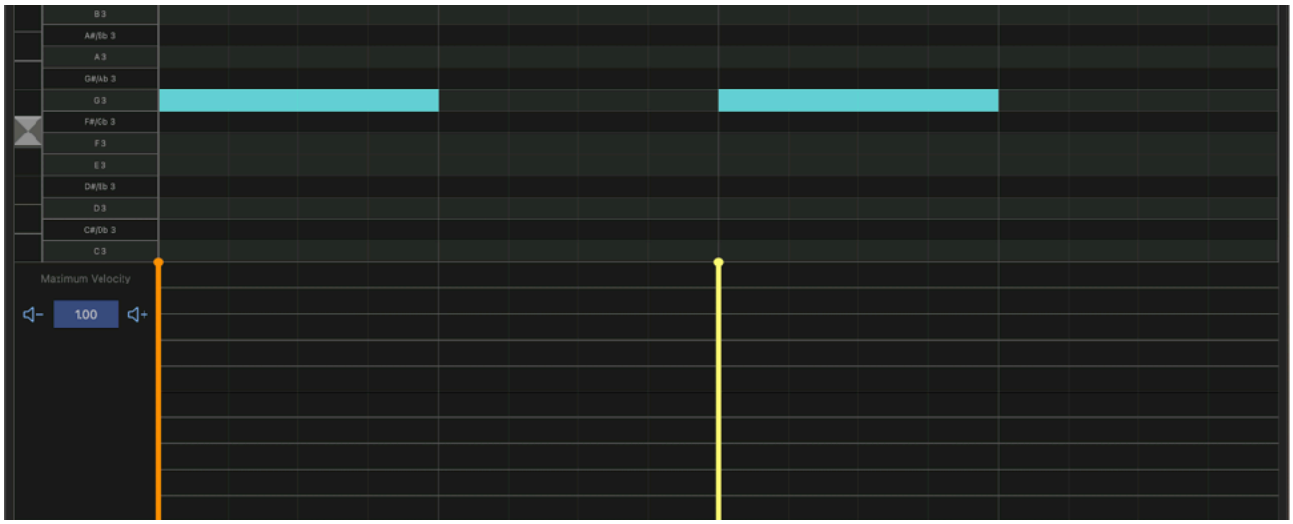
Paste

Paste notes.

Delete

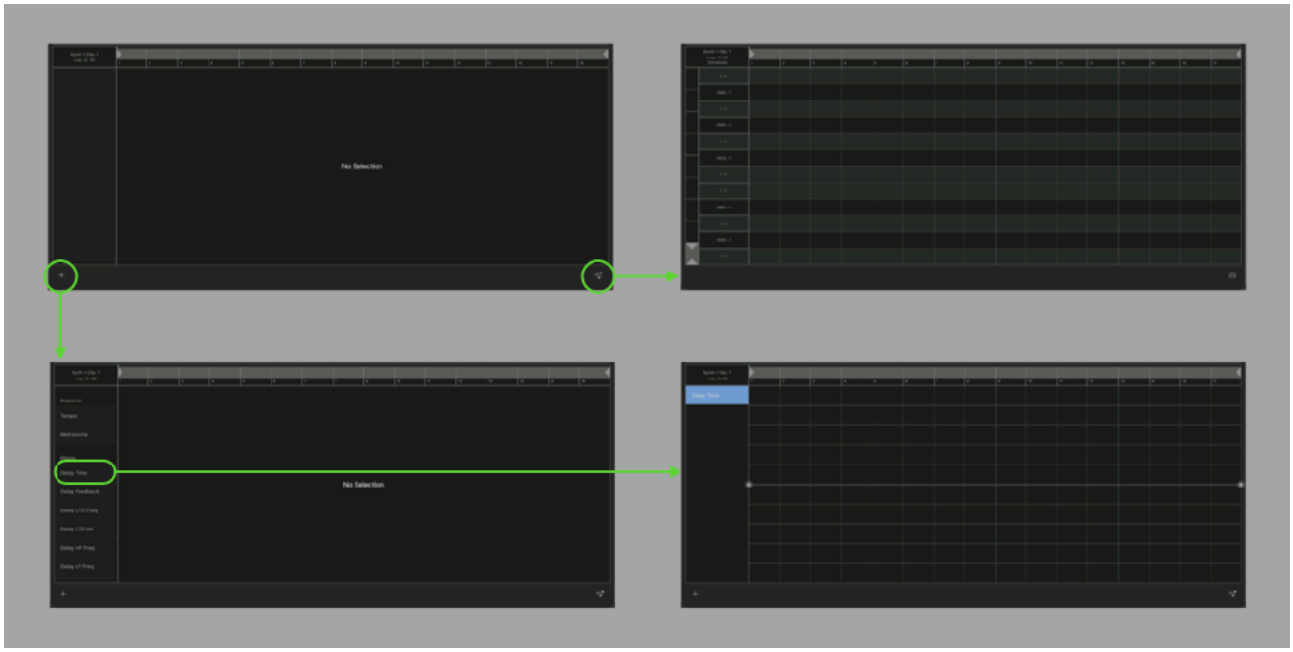
Delete selected notes.

Velocity Editor

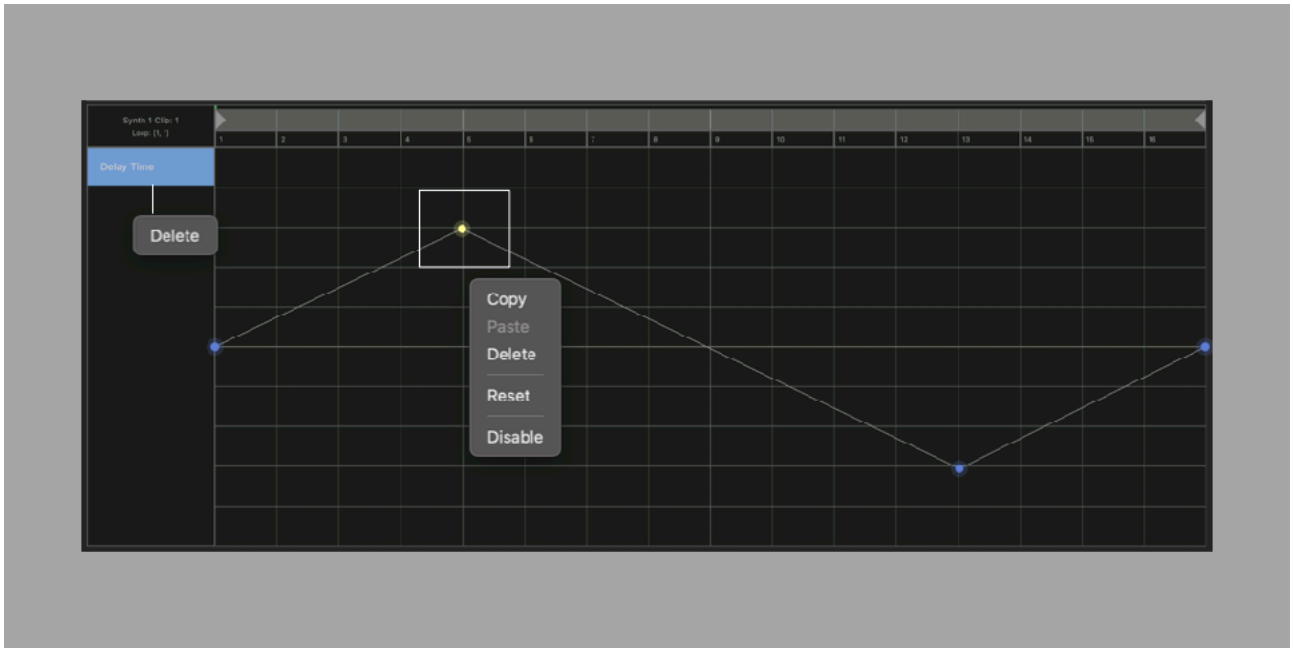


1. Select a note and open context menu.
2. Select “Set Velocity” in context menu
3. Select velocity sliders and adjust the velocity. Indicator in side bar shows maximum velocity in the selection. Maximum velocity value can be adjusted by plus and minus button and slider of the indicator.

Parameter Automation Editor



1. Tap plus button to show parameter list.
2. Select a parameter to edit.
3. Press and hold (right click on macOS) on parameter name to show context menu. Tap Delete to delete the parameter form editor.



4. Double tap to add an edit point.
5. Select edit points and press and hold (right click on macOS) on editor to show context menu.
6. Select Reset from context menu to reset the parameter.
7. Select Disable to inactivate automation.

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

Use Time Range Selector to set loop length.

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 recoding 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.

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 on the device.

To save user preset in iCloud drive, select Save in File Menu. User Presets in iCloud Drive can be accessed from iPhone, iPad or Mac.

To save user preset in plug-in, tap Add button in Preset Browser. Plug-In Preset is stored on the device and can be accessed from any host application which support AUv3 User 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.

To load factory presets, select a preset in Preset Browser.

File Menu

New…

Reset parameters and sequence data.

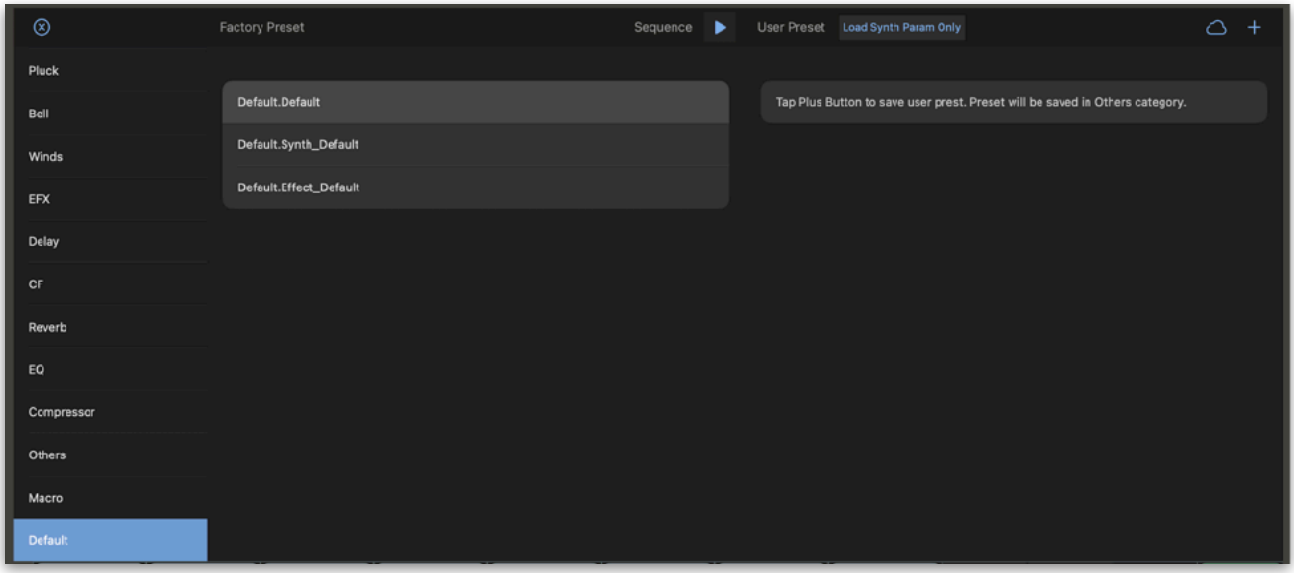
Open…

Open a preset from iCloud drive.

Save

Save a preset in iCloud drive.

Preset Browser



Load Factory Preset

Select a category from a list in the side bar. Tap on the name of the preset in Factory Preset Section to load.

Play Sequence

Tap on play button to over ride play setting and play sequence when key is pressed.

Load User Preset

Select a category from a list in the side bar. Tap on the name of the preset in User Preset Section to load. If “Load Synth Param Only” is on, only synth parameters will be loaded. If the option is off, synth param and sequencer data will be loaded.

Delete User Preset

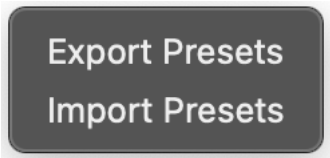
Tap and hold (right click on macOS) on the name of the preset in User Preset Section to show context menu and select Delete.

Save User Preset

Select a category from a list in the side bar. Tap on plus button to add a user preset.

Backup/Restore User Presets stored in the device

To back up or restore all user presets, tap on the iCloud icon to show export menu.



Select Export Presets to back up all of the user presets to iCloud.

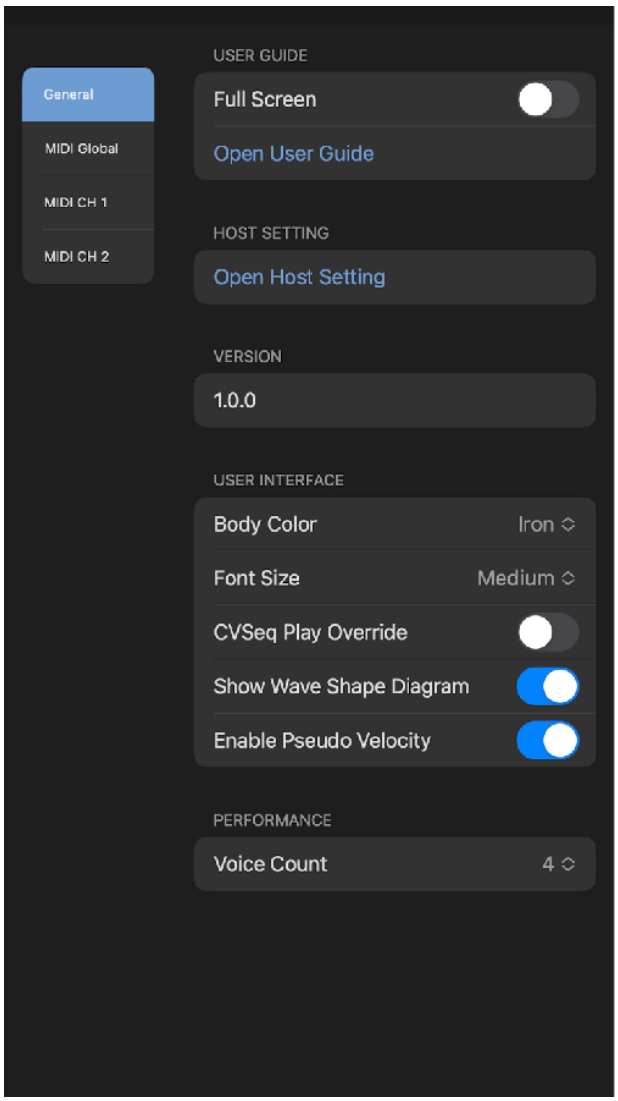
Select Import Presets to import saved presets from iCloud.

Close File Browser

Tap on X icon to close the browser.

Setting Panel

General



Full Screen

Enable this option to open User Guide in full screen (full window size on macOS).

Open User Guide

Tap this button to open User Guide

Open Host Setting

Tap this button to open Stand Alone Settings

Version

Indicate version number of the installed app.

Body Color

Select color. Options are black, navy and gray.

Font Size

Select text size of control title. Options are Small, Medium and Large.

CVSEQ Play Override

Enable CVSEQ Play override option.

Show Wave Shape Diagram

Enable to show wave shape diagram control.

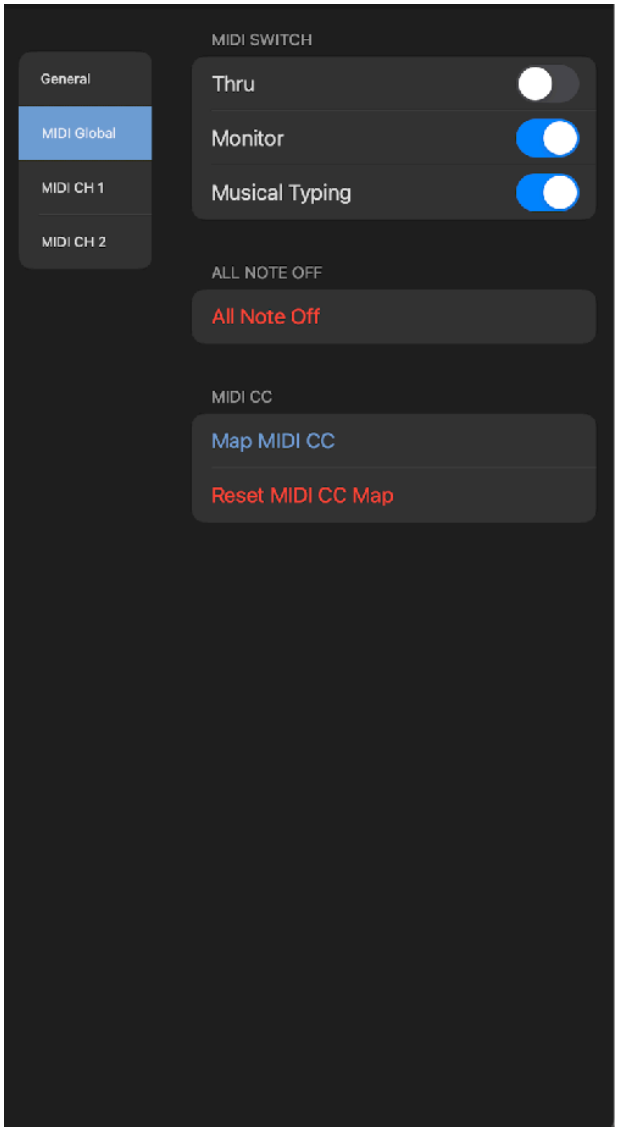
Enable Pseudo Velocity

Enable pseudo velocity on iOS piano keyboard.

Voice Count

Set voice count.

MIDI Global



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 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.

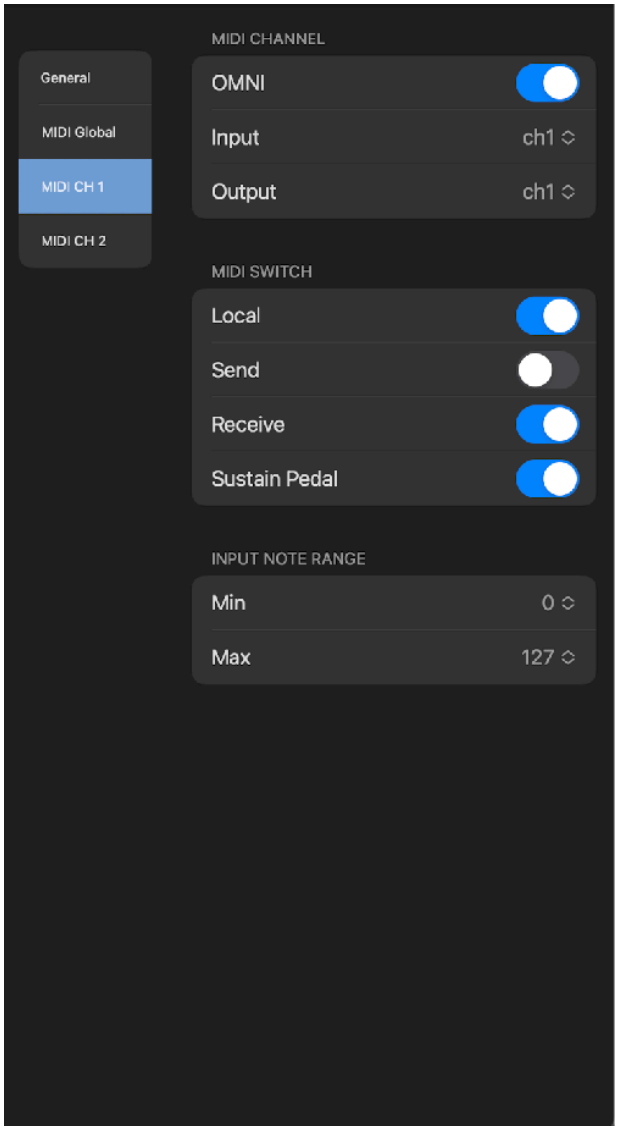
Map MIDI CC

Open or Close Map MIDI CC view.

Reset MIDI CC Map

Remove all MIDI CC Map assignments.

MIDI Synth



OMNI

Turn this on to connect all channel.

Input

Select input channel

Output

Select output channel

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 Send

Enable / disable MIDI output.

MIDI Receive

Enable / disable MIDI input.

Sustain Pedal

Enable / disable to receive Damper Pedal message (MIDI CC #64).

Min

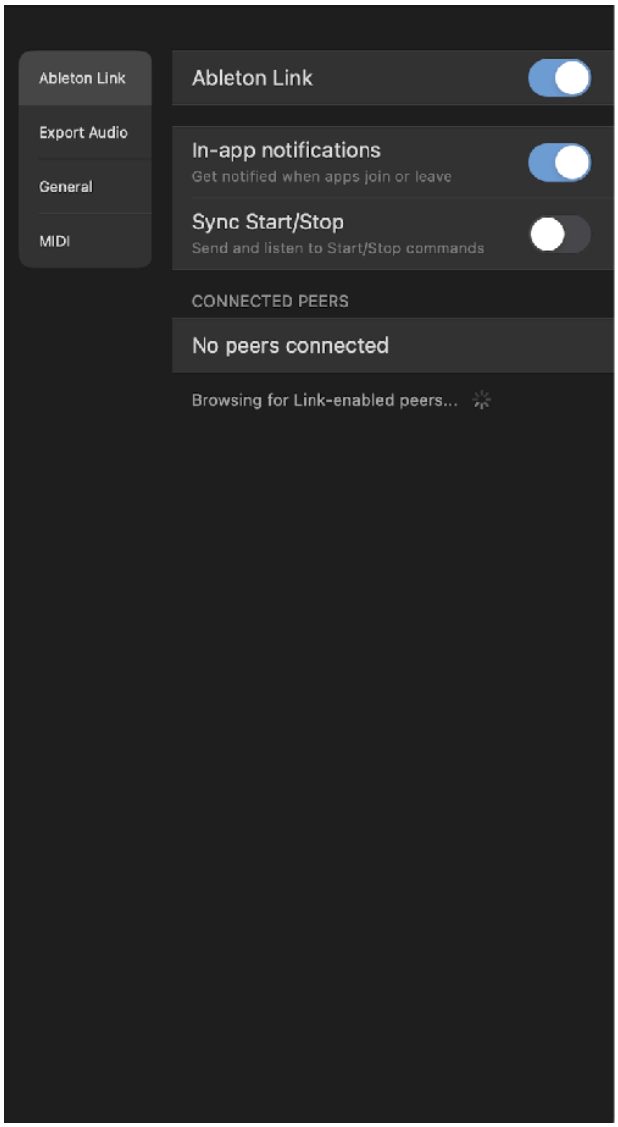
Set min value of MIDI note input.

Max

Set max value of MIDI note input.

Stand Alone Setting

AbletonLink



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

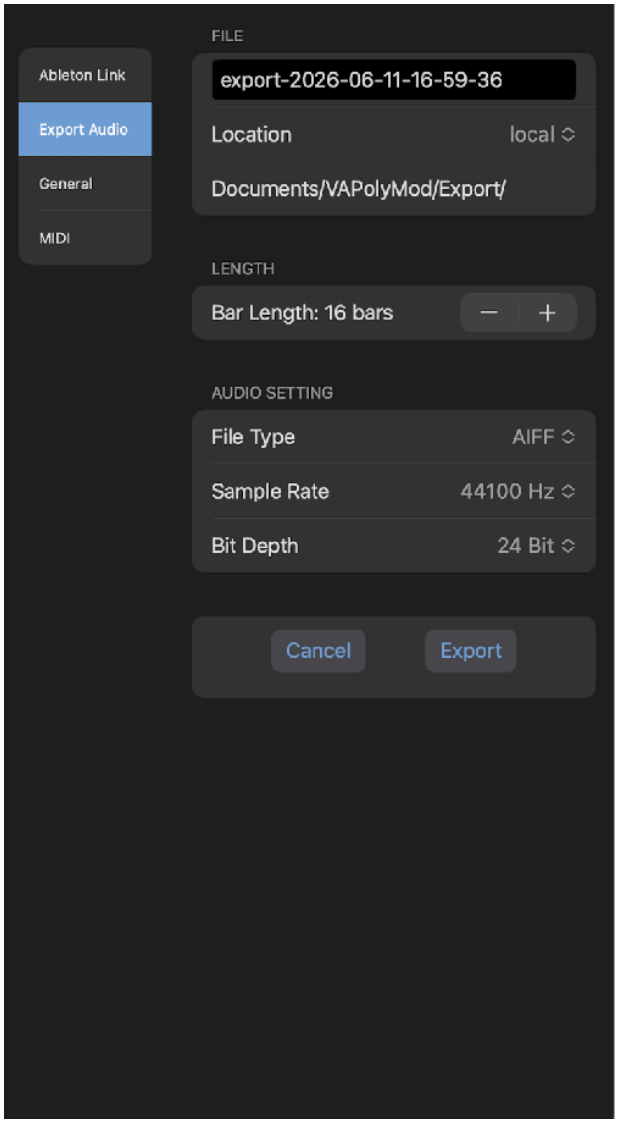
Switch on to synchronize start and stop with connected apps.

Connected Apps

Indicate number of currently connected apps.

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

Export Audio



Save As

Specify name of the audio file to export.

Location

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

Length (Bars)

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

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.

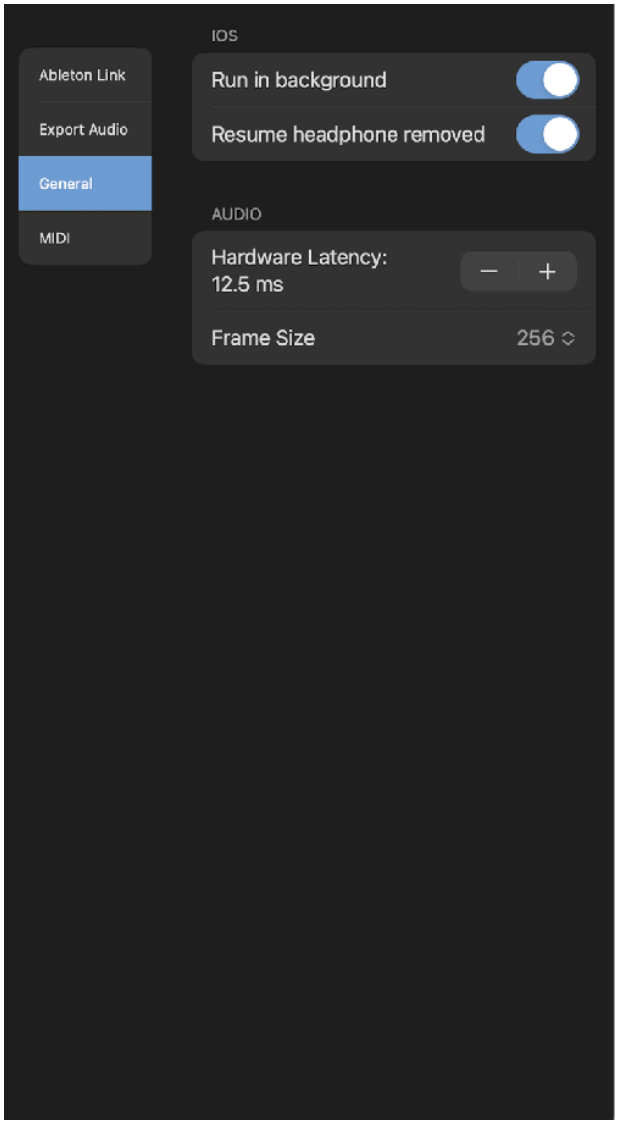
Export

Tap export to export audio file.

Cancel

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

General



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.

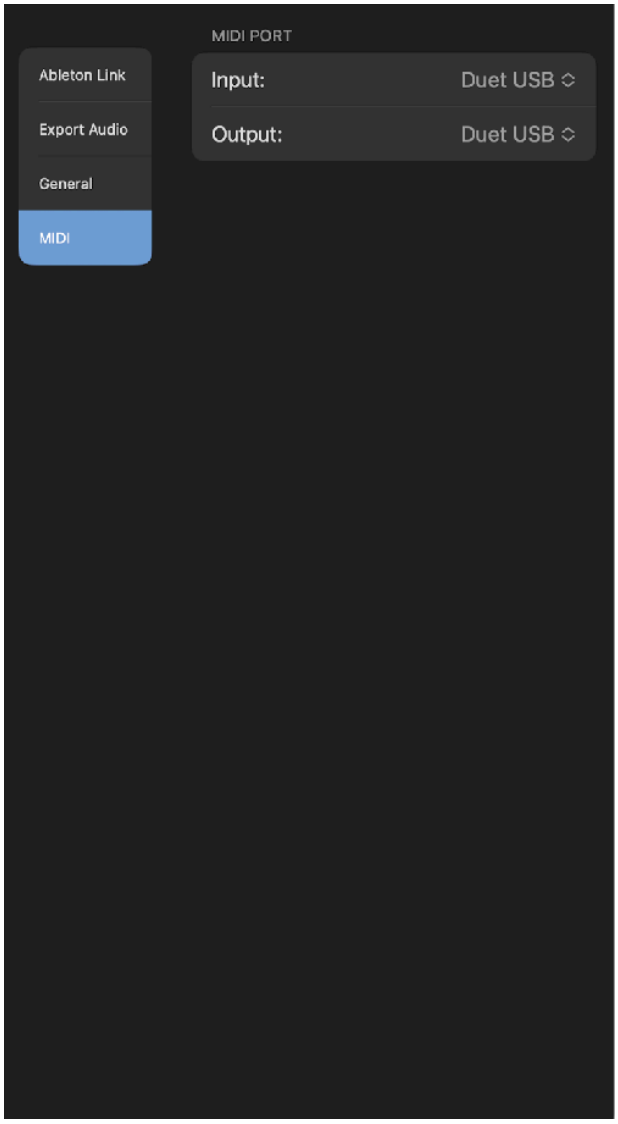
In order to adjust the latency, set time in milliseconds in Hardware Latency. This value is used to compensate the latency of the output signal.

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



Input

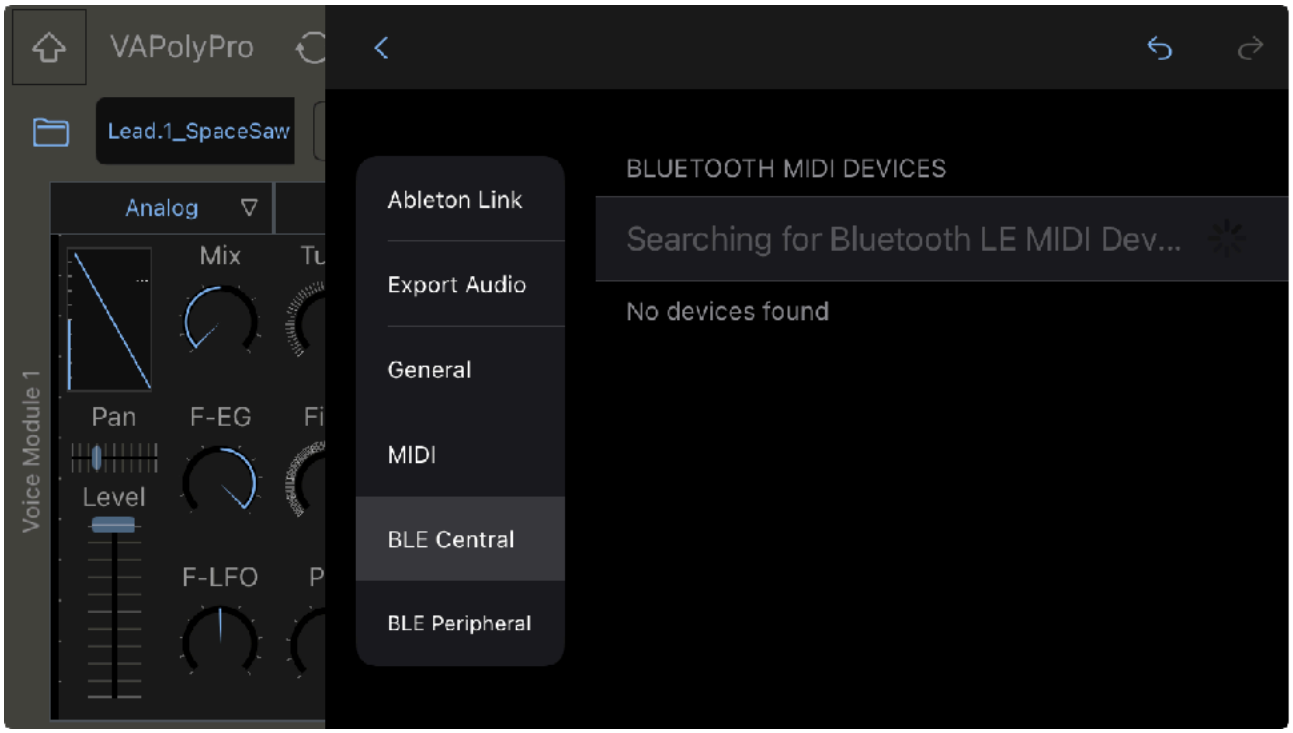
Select MIDI input port

Output

Select MIDI output port

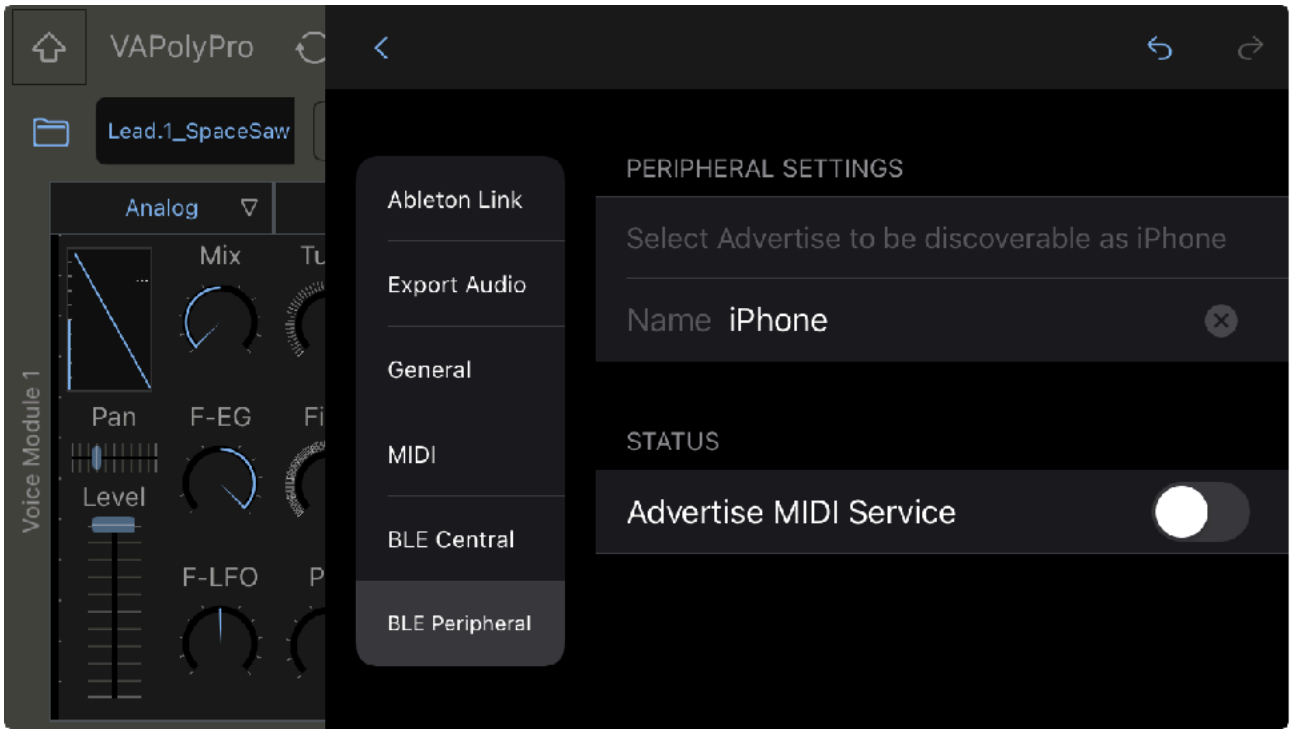
Bluetooth (BLE) MIDI

Central



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

Peripheral



Open Bluetooth MIDI Peripheral. Turn Advertise MIDI Service switch on to makes the device to be discoverable from the other Bluetooth MIDI devices.

Export Audio

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

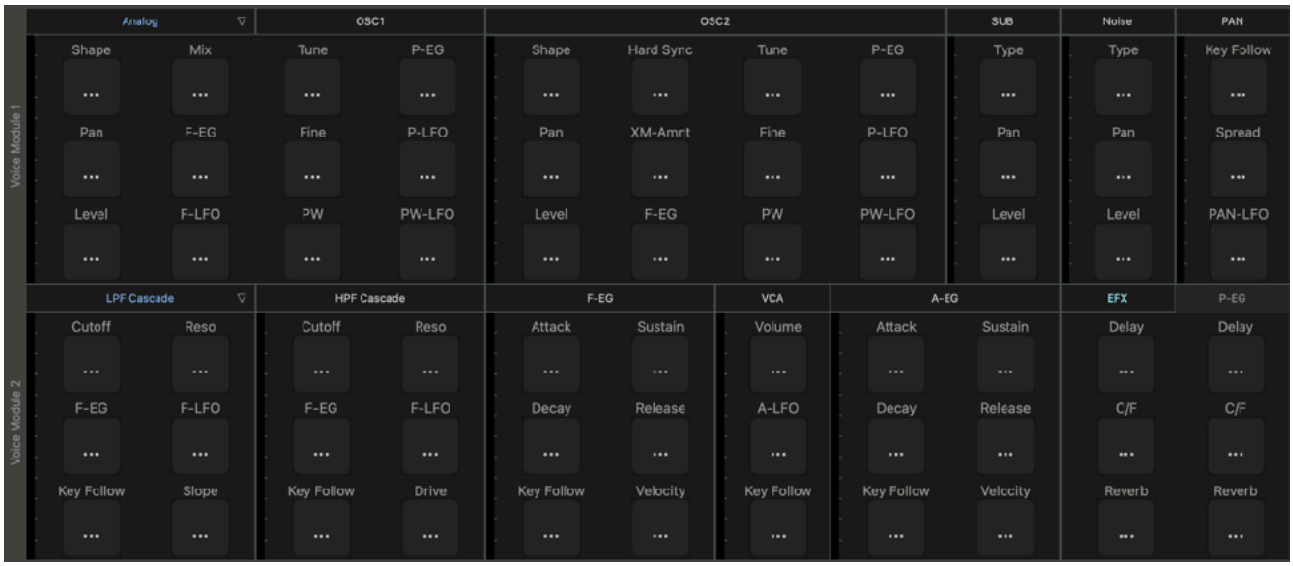
Select bit depth. Options are 16 bit, 24 bit and 32 bit. Higher number results in better quality.
If the exported file is going to be used in a different application, make sure that the which bit depth of the selected file type is supported by the application. (* 32 bit may not be supported in some applications).

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.

Map MIDI CC

Tap “Map MIDI CC” in “MIDI Global” of the setting panel to show MIDI CC Map View. Use “Synth” button in tool bar to select a synth section or effects to map MIDI CC. Tap “Hide MIDI CC” in “MIDI Global” of setting panel 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.

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

To remove all assignments, select “Rest MIDI CC Map” in MIDI Global of the setting panel.

All the MIDI CC assignments are restored when app is launched in the next time.

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.

MIDI Program Change

Program Change is received as following.

Factory: Bank (CC#0) = 0, Sub (CC#32) , Preset Number = Sub * 128 + Program
Plugin: Bank (CC#0) = 1, Sub (CC#32) , Preset Number = Sub * 128 + Program

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

Use External MIDI Keyboard with Stand Alone

1. Open host setting
2. Select MIDI from side bar menu. Set input MIDI port and output MIDI port.
3. Close host setting
4. Select MIDI Synth1 from side bar menu. Make sure “Receive” switch is turned on. Adjust channel and note range.
5. To stop hanging note, select MIDI Global from side bar menu, Tap on “All Note Off”.

Use MIDI Foot Pedal

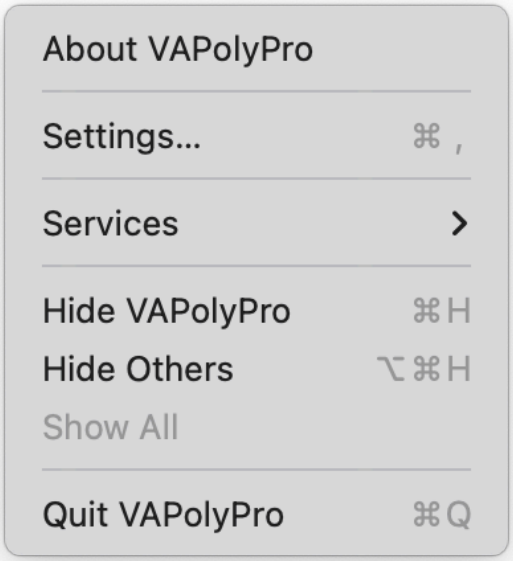
CC#11 and CC#64 are supported for MIDI Foot Pedal. Targets of Expression can be selected in KBD Control Routing Panel. Sustain switch can be used to sustain currently played note.

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

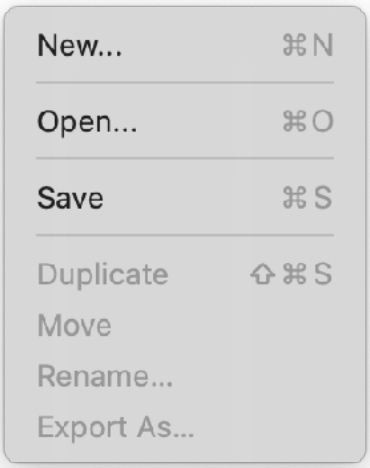


Open a window to display version information.

Open Preference window.

Quit this application.

File

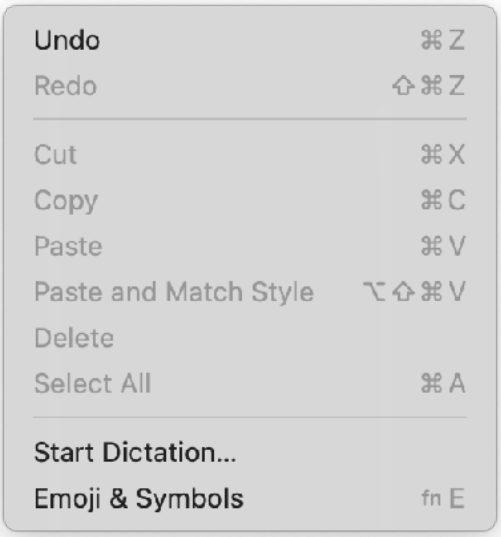


Reset all parameters and sequence data.

Open a preset from iCloud drive.

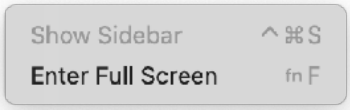
Save a preset to iCloud drive.

Edit



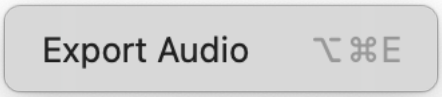
Edit Commands are enabled when typing text.

View



Enable/disable full screen mode.

Export

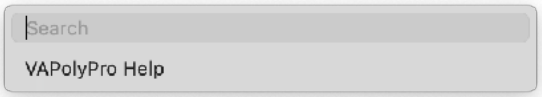


Open Export Audio Page in Setting Panel.

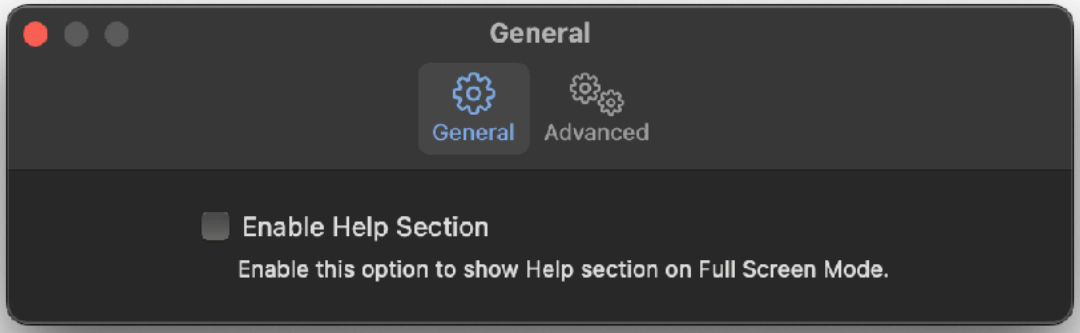
Window

Minimize
⌘M
Zoom
Tile Window to Left of Screen
Tile Window to Right of Screen
Replace Tiled Window
Remove Window from Set
Move to
iPad
Bring All to Front
✓ VAPolyPro

Help

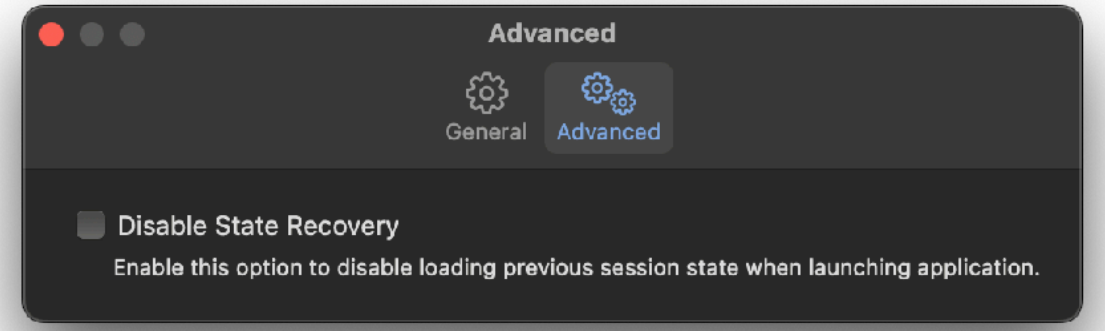

Search
VAPolyPro Help

Preference



Enable Help Section

Enable this option to show Help Section on Full Screen Mode.



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.

Touch Bar (MacBook Pro)

1. Play / Stop

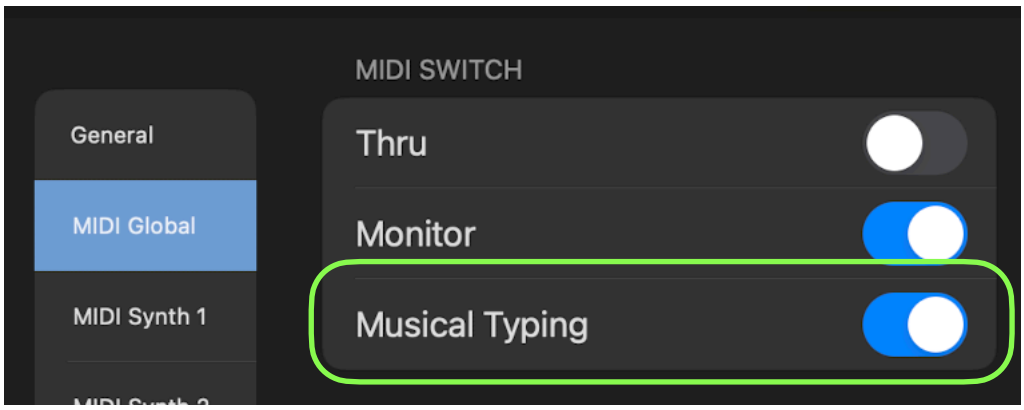
Tap to play / stop sequencer

2. Tempo

Adjust tempo. Range of the slider is from 20 BPM to 240 BPM.

Use Computer Keyboard as MIDI Keyboard

Enable Musical Typing option in setting.



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.

Set Timbral

[T1] Press B key to select Layer.
[T2] Press N key to select Synth1.
[T3] Press M key to select Synth2.

Keyboard Shortcut

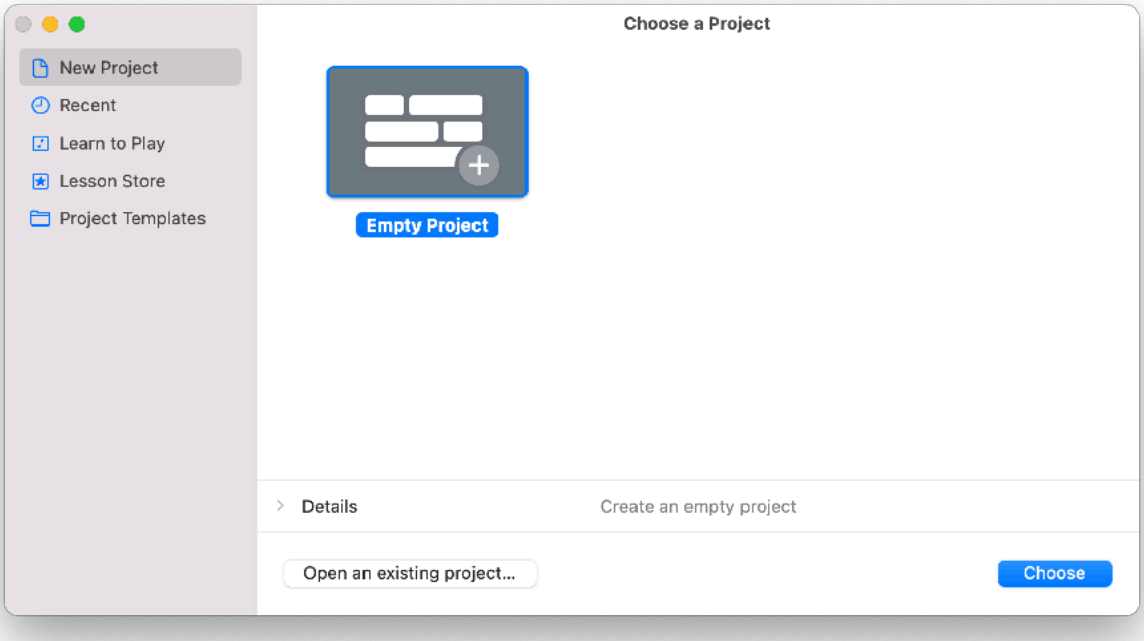
Command	Key	AUv3	Note
New	Command-N	N/A	
Open	Command-O	N/A	
Save	Command-S	N/A	
Undo	Command-Z	✓	
Redo	Shift-Command-Z	✓	
Cut	Command-X	✓	Available for Text Input
Copy	Command-C	?	
Paste	Command-V	?	
Delete	Command-Delete	?	
Select All	Command-A	?	
Enter/Exit Full Screen	fn-F	N/A	
Play/Stop	Space	?	
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.
* Some of the keyboard shortcut will be available in the future version update.

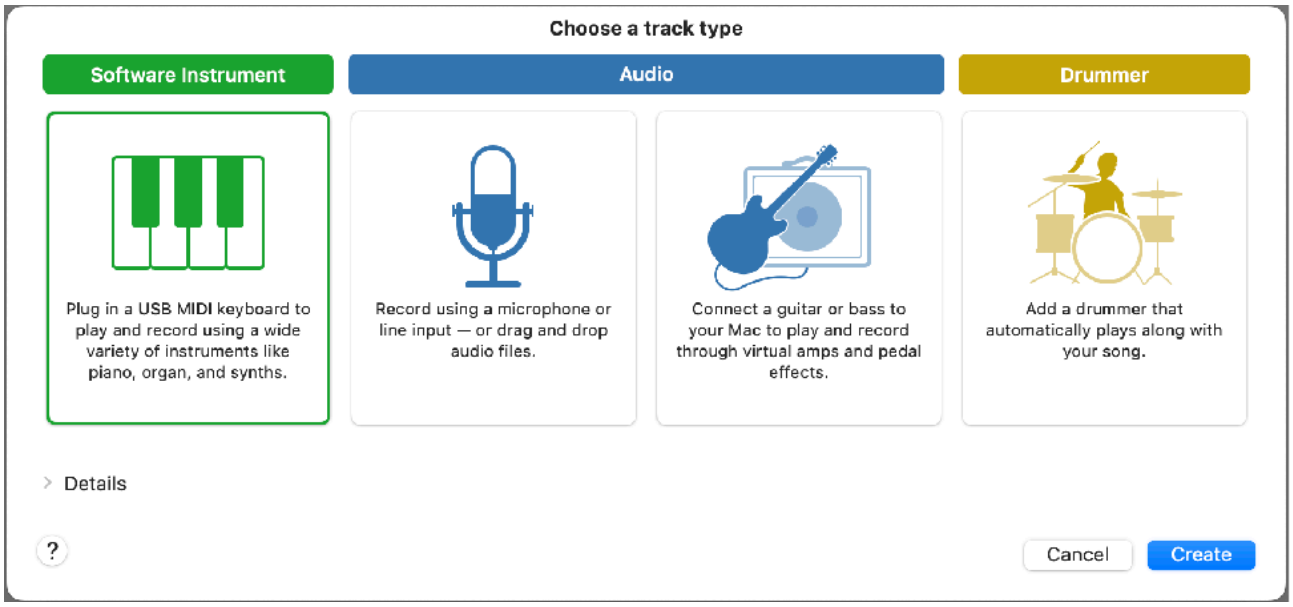
AUv3 on Apple Garage Band (Mac)

Load Plug-in

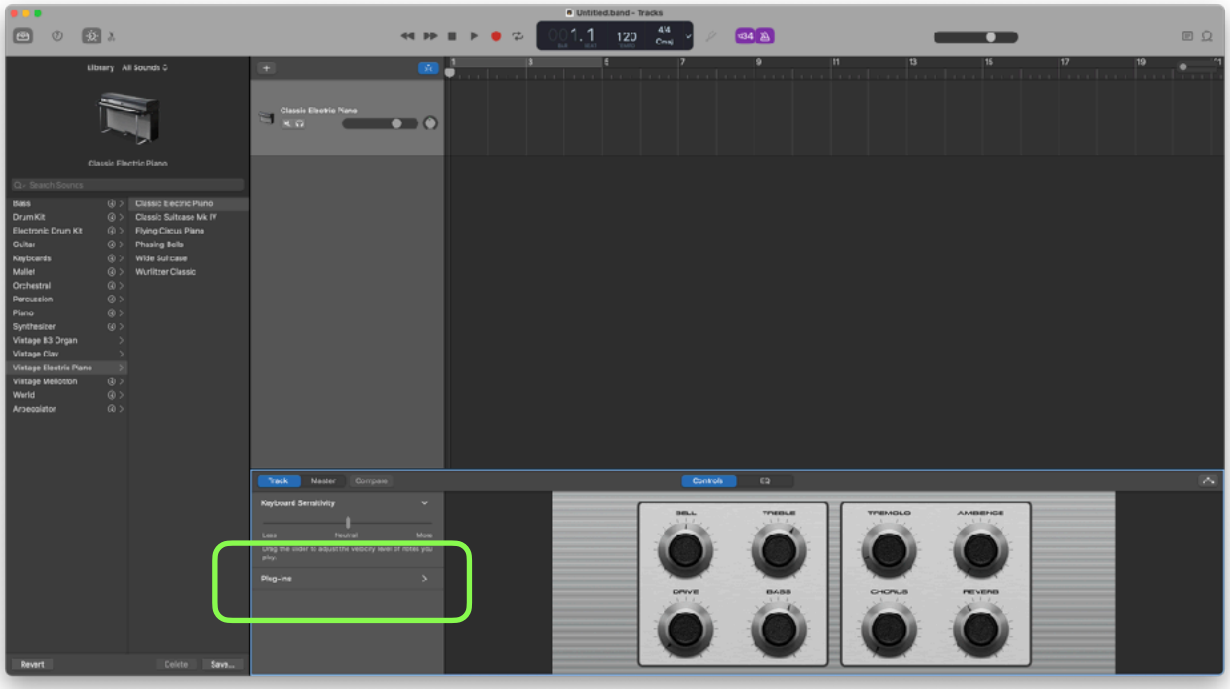
1. Launch GarageBand.
2. Choose a project dialogue window appears. Select a project and click on Choose.



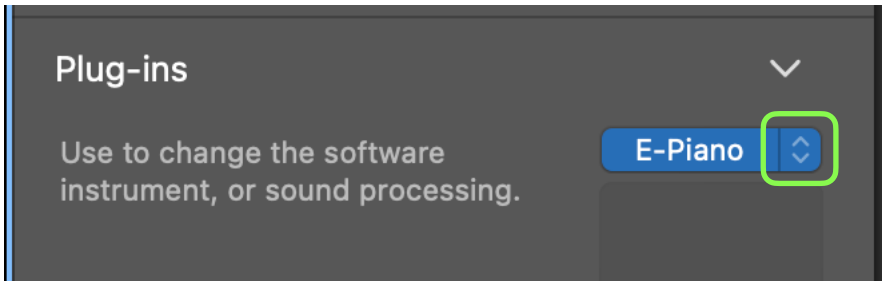
3. Choose a track type dialogue appears. Select Software Instrument and click Create.



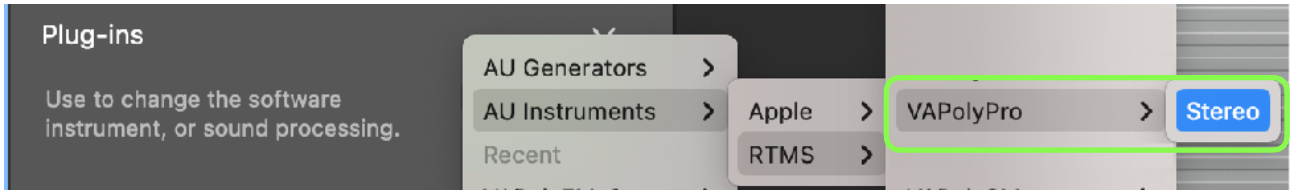
4. Click Plug-ins in Track Section.



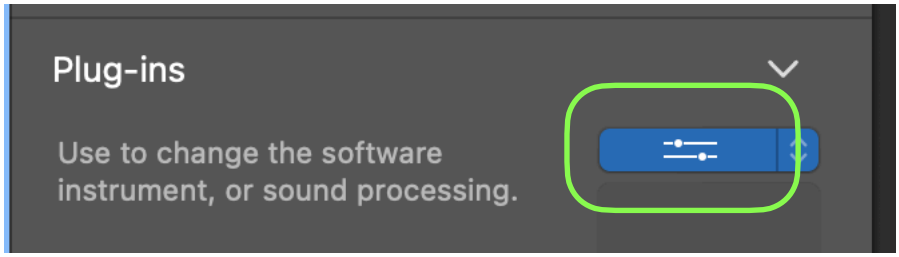
5. Click arrows at the right side of the blue button “E-Piano”.



6. Select AU Instruments > RTMS > VAPolyPro



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



Activate Plug-In

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

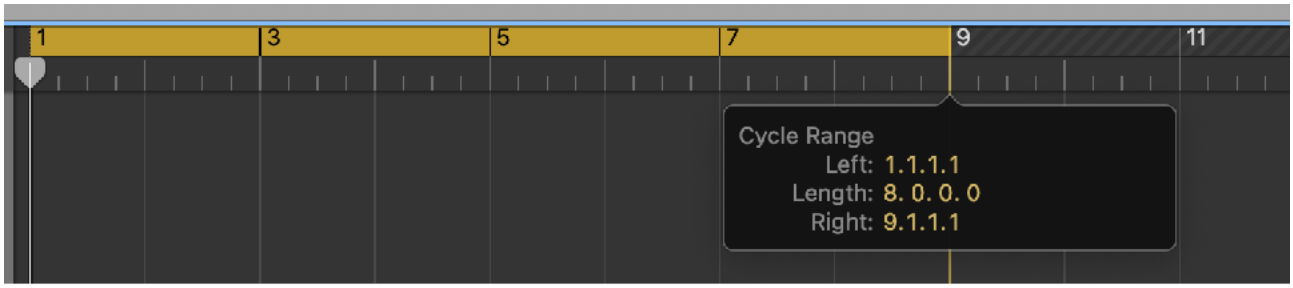
In order to start the DSP engine, please do one of the followings.

- 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 VAPolyPro 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

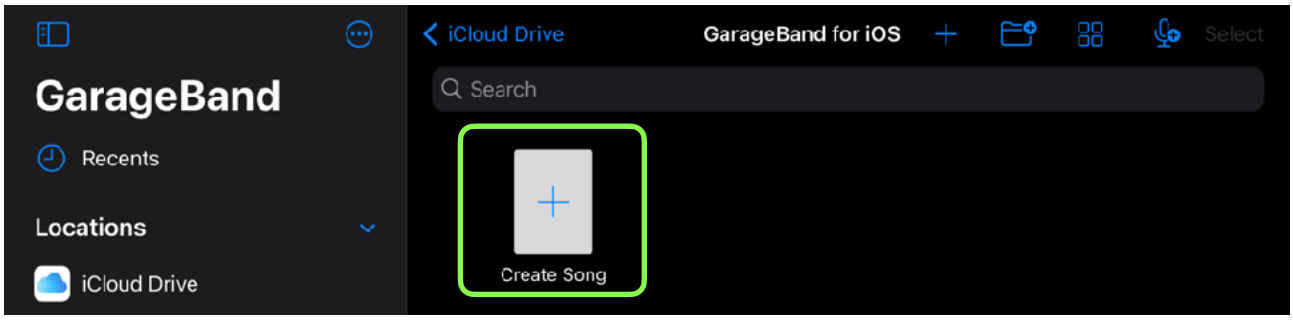
- DSP Engine doesn’t start until a user presses play button or play MIDI notes on GarageBand.
- Touch Bar shows blanc screen when showing button menu or context menu.
- GarageBand doesn’t record MIDI notes from keyboards or sequencer of the VAPolyPro plugin.

AUv3 on Apple Garage Band (iOS)

Load Plug-in

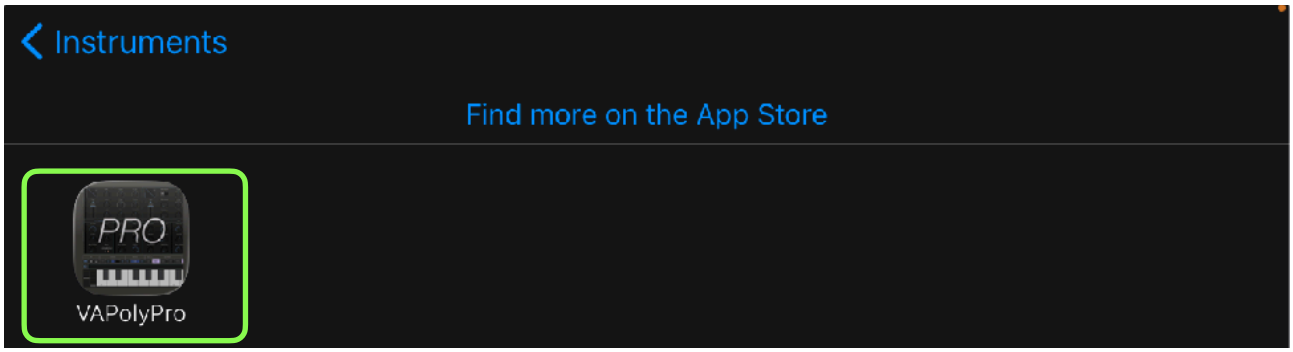
1. Launch Garage Band

2. Create a new song



3. Select External > Audio Unit Extension

4. Select VAPolyPro



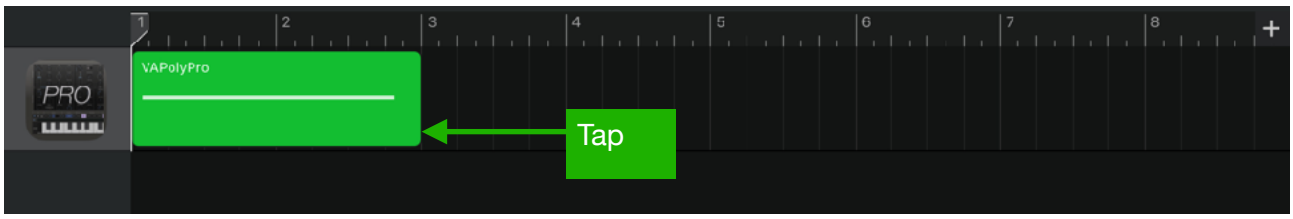
Change Plug-in Window Size

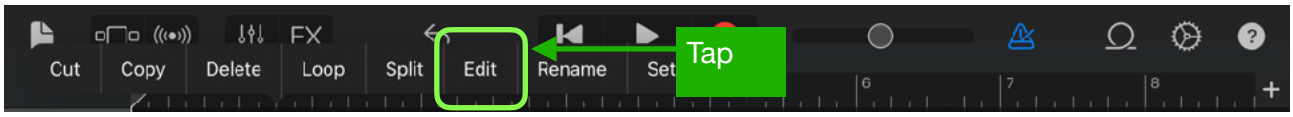
Tap arrow icon to resize the plug-in window.

Record Notes

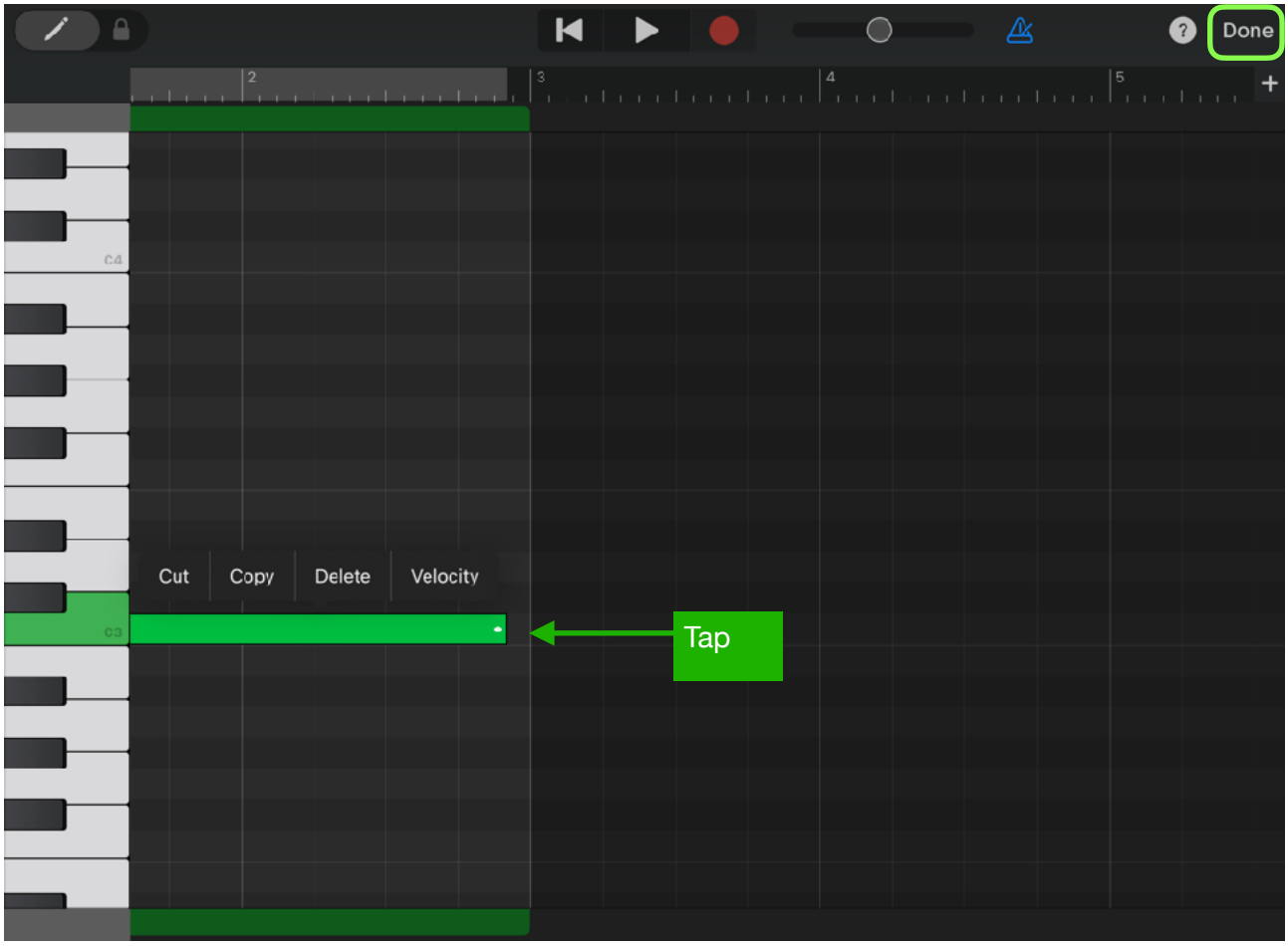
Tap record button and play keyboard.

Edit Notes



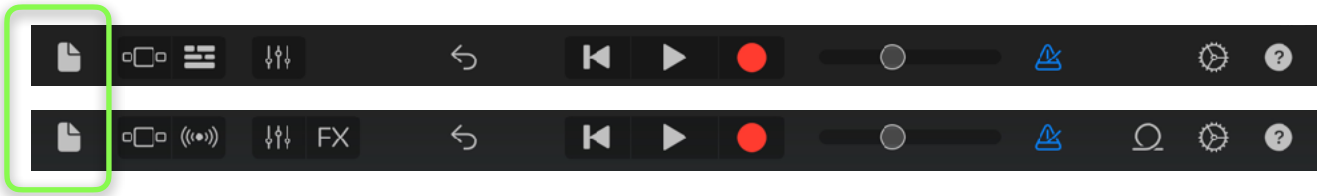


Select Edit from menu and edit notes. Tap “Done” to close the window.



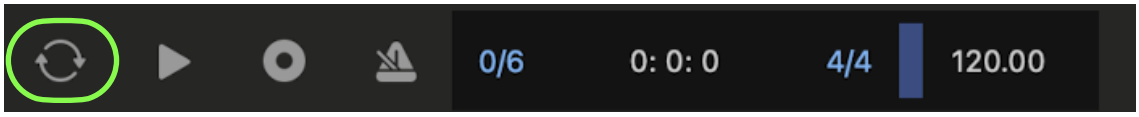
Save Project

Tap document icon to save the song.

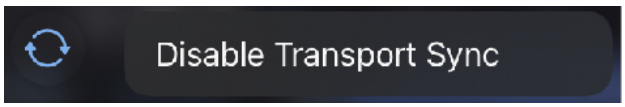


Host Sync

Tap Host Sync button to sync transport and tempo to host application.



To disable transport sync, tap and hold sync button and select “Disable Transport Sync” from menu.



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[6] 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.

[6] Digital to Analog Converter

Specification

Synthesizer
- Polyphonic Synthesizer

Analog Oscillator
- Continuously variable wave shape (triangle, sawtooth, square)
- Pulse width for square
- Tuning +/- 24 semitones
- Fine tuning +/- 50 cents
- Frequency Modulation (Exponential) +/- 4 octaves
- Pulse Width Modulation
- Hard Sync
- Cross Modulation (TZFM)

Unison Oscillator
- Seven continuously variable wave shape (triangle, sawtooth, square)
- Pulse width for square
- Tuning +/- 24 semitones
- Fine tuning +/- 50 cents
- Frequency Modulation (Exponential) +/- 4 octaves
- Pulse Width Modulation
- Detune of seven oscillators
- Mix of seven oscillator outputs
- Mix of high pass output signal and dry signal.

FM Engine
- 4 Operators
- 8 Wave Shapes
- 8 Algorithm
- Feedback
- 4 Amplifier Envelope
- Pitch Modulation Amount
- Amplifier Modulation Amount

PAN
- Key Follow: Low Note (Left) High Note (Right) from 0% to 100%
- Spread: Stereo Width from 0% to 100%
- Pan modulation: LFO

Stereo Filter
- Filter Type: Cascade, Ladder, Sallen-Key
- Low pass filter: -12 dB per octave, -24 dB per octave
- High pass filter: -12 dB per octave
- Frequency modulation: ADSR, LFO, Key Follow

Stereo Amplifier
- Envelope: ADSR
- Amplitude modulation: LFO

LFO
- Wave shape: sine, saw, down saw, square, triangle, random
- Frequency Range: From 0.04Hz to 42.2Hz

ADSR Envelope
- Attack time: From1ms 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
- Key Follow: From 100% to 25% (envelope length)

Global
- Transpose: +/- 24 semi tones.
- Key Sync: On/Off

Portamento (Glide)
- Time: From 10 ms to 10 second

Step Sequencer (Analog Style)
- 8 Steps
- Sample & Hold
- Clock Frequency: From 1 Hz to 20 Hz

Controllers
- Modulation Wheel, Pitch Bend Wheel, Ribbon Control

Effects
- Delay, Chorus, Flanger, Reverb, EQ and Compressor

Sequencer (Piano Roll)
- Steps: 16 steps per bar
- Loop Length: from 1 bar to 16 bars
- Clip: 8 clips
- Tempo: from 20 BPM to 999 BPM
- Host Sync: On and Off

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 from1KHz 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 from1KHz 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 to1092Hz
	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
Relese	0.1s, 0.3s, 0.6s, 1.2s, Auto
Dry / Wet	Range from 0% to 100%

*Appearance and specification of the product 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

- Version 1.0.1 contains bug fixes and improvements.
- Fixed a problem of Y-axis key modulation for unison detune.

What's new in version 1.0.2

- Version 1.0.2 contains bug fixes and improvements.
- Fixed a problem of high pitch sound from oscillators after loading a project in GarageBand.