OODA 1.0.x User Manual

Contents

Introduction

OODA is a semi-generative MIDI step sequencer for iOS and macOS. It can run as a standalone app or an AUv3 plug-in.

What makes OODA unique is that you can connect steps together using “wormholes,” which can be triggered using various conditions. This allows you to create structures and variations within your sequence that span the whole range from highly regular to completely random.

Another special feature of OODA is that the sequencer’s stepper and voices are decoupled. This allows for several exciting ways of interacting with the sequence and creating variation on the fly that will be described later in this manual.

For best results, please check out the tutorials on YouTube. Otherwise, read on.

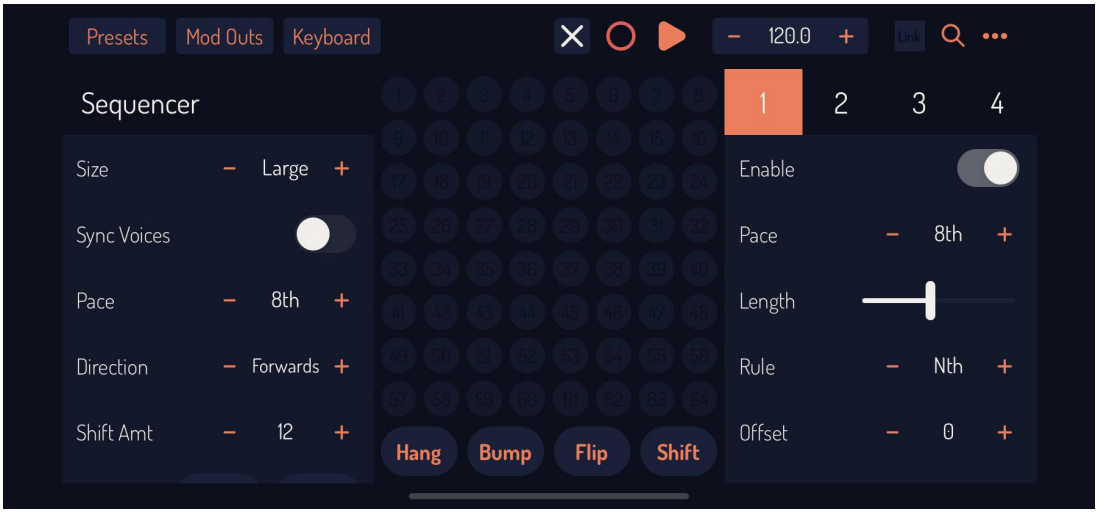
Note:

The standalone app comes with a toggleable “Sidekick Synth” that lets you experiment with OODA right out of the box. You can also send MIDI from the standalone app. The AUv3 version of OODA does not produce sound. Instead, it generates MIDI notes and control signals that can be used to “play” other MIDI-capable instruments, devices, or apps.

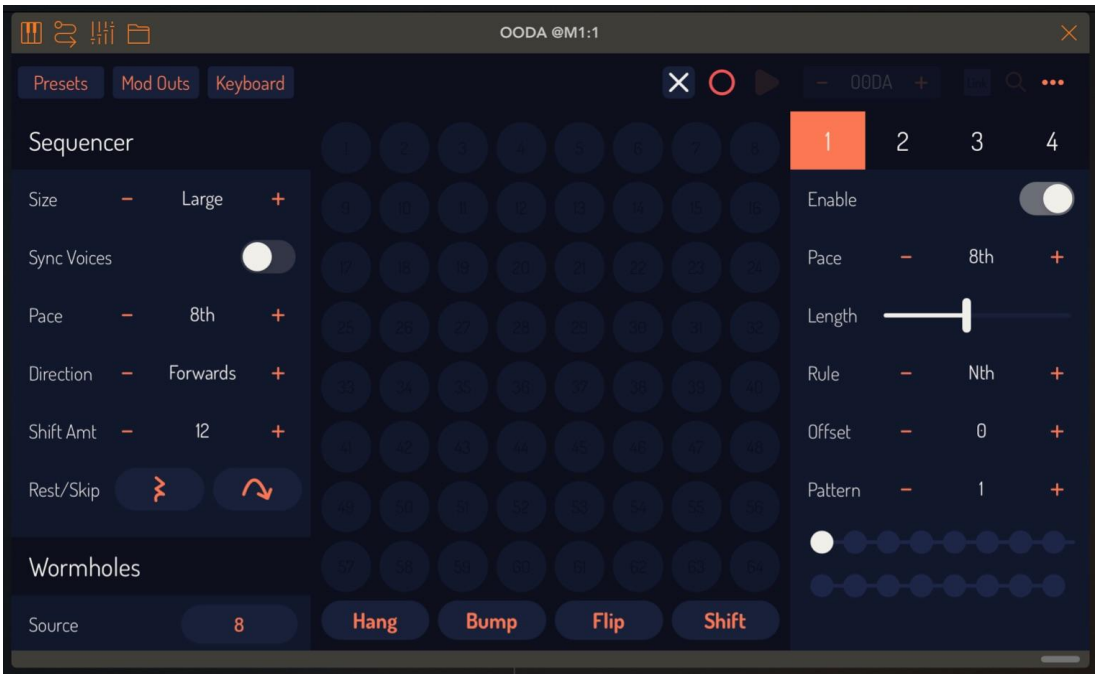
Overview

OODA has four main views, the top bar, the sequencer panel (left), the sequence grid (center), and the voice panel (right).

Standalone on iPhone 11:

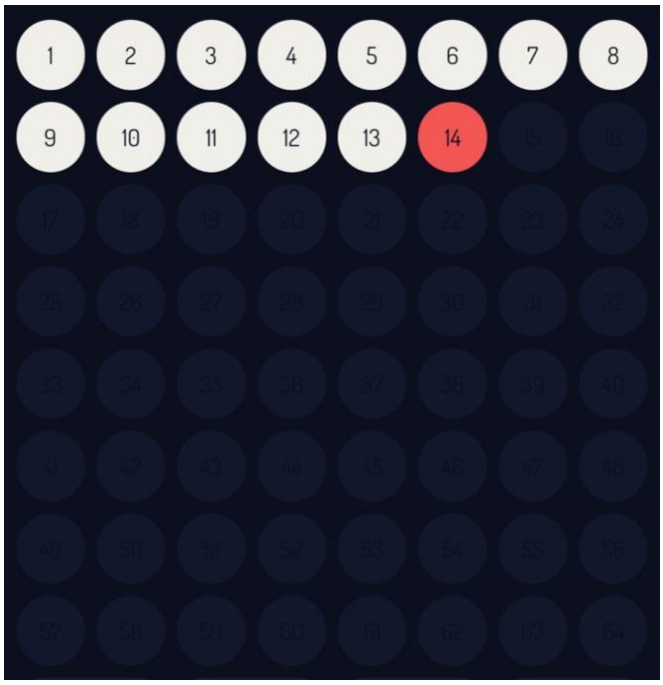


AUv3 on iPad Pro 12.9” in AUM:



Sequence Grid

In the center of OODA's window is a grid of steps.



Each step may contain up to 16 notes. To record into the steps, press the "record" button (top bar) and then send MIDI notes to OODA. You can use the in-app keyboard or an external MIDI device. Since the steps are polyphonic, you can play chords if you want.

You can tap on a step while recording to change the record destination. If you record to a step that already has notes, the new notes will replace the old ones.

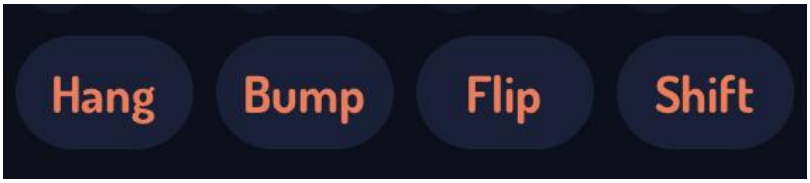
Once you record some notes, press the "play" button to hear your sequence. The active step is orange. If you are using OODA as an AUv3 plug-in, you should start your host transport instead.

Pro Tip: The sequencer can run while in record mode. Try recording over existing notes to create variations on your sequence in real time.

When the sequencer is running (and not recording), you can tap on a step to queue it. The sequencer will go to that step the next time it advances.

Action Buttons

OODA has four action buttons for live interaction with your sequence. By default they are momentary buttons, but they can be configured as latching buttons in the settings menu.



Hang: Keeps the sequencer from advancing but allows the voices to continue playing.

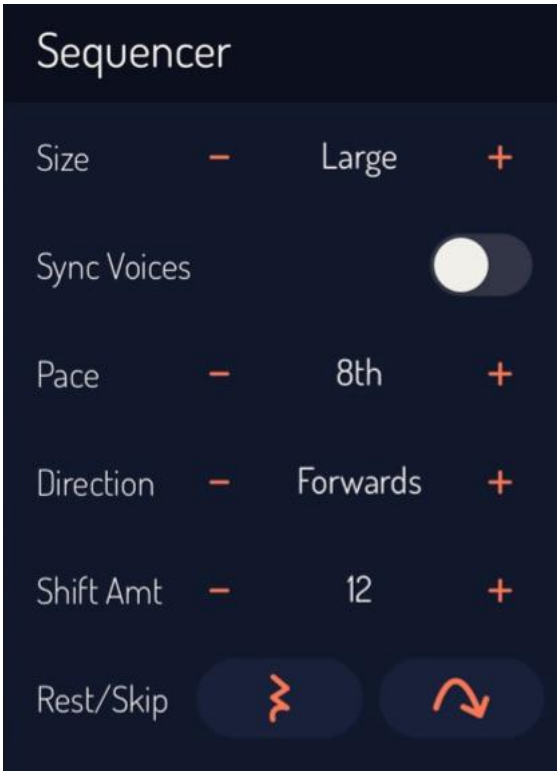
Bump: Inverts the “Sync Voices” setting in the sequencer panel. (The sequencer pace and the voice paces must be different in order for this to make a difference.)

Flip: Inverts the axes of the sequencer. (The sequence must have more than one row of recorded notes in order for this to make a difference.)

Shift: Shifts newly played notes by the “Shift Amt” setting in semitones.

Sequencer Panel

The Sequencer Panel contains the sequencer settings as well as the wormhole patcher.



Sequencer Settings

Size: Sets the size of the sequence grid. *Range: Large (64 steps) to Small (16 steps)*

Sync Voices: With this switch enabled, OODA's voices reset their rhythmic pattern *and* their rule behavior every time the sequencer advances.

Pro Tip: When OODA's sequencer is set to a slow pace (ex. 1 bar) and the voice paces are faster, you can create rhythms and arpeggios that align with the down beat by enabling this switch.

Pace: Sets the speed at which the sequencer advances. This happens in units of beat time based on the host clock. *Range: 16 bars to 32nd T.*

Direction: Sets the rule the sequencer uses to advance. *Range: Forward, Backward, FwdBwd, BwdFwd, Random, Random+ (random but no repeats).*

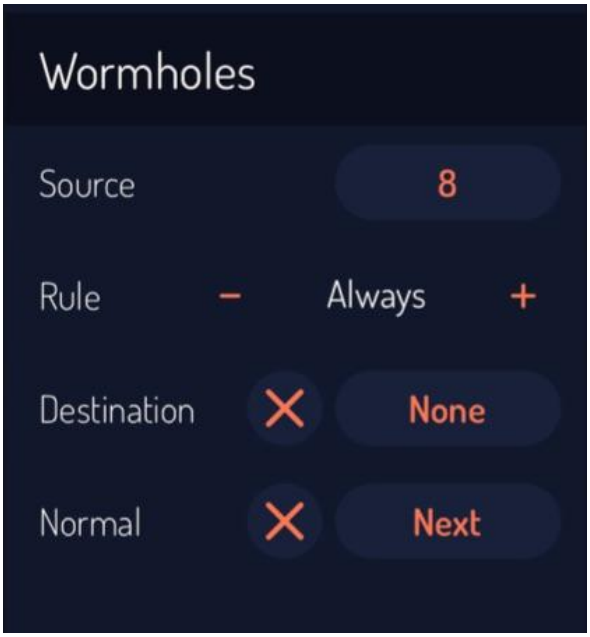
Shift Amt: Sets the offset applied to new notes when the shift action button is held in semitones. *Range: -24 to 24*

Rest/Skip: Press and hold one of these buttons then tap on steps in the sequence grid to toggle whether or not the step is a rest/skip. Steps that are rests are light blue and the sequencer will visit them but no notes will be played. Steps that are skips are dark blue and the sequencer will not visit them.

Wormhole Patcher

Wormholes allow you to conditionally port between arbitrary steps in the sequence grid to add variation to your sequence. This is perhaps OODA's most special feature.

Every wormhole has a *source*, *destination*, and a *normal*, and uses a *rule* to decide whether or not to pass through the wormhole on each visit.



Source: Every step is the source of exactly one wormhole. Touching a step in the sequence grid will update the Wormhole Patcher with the information for that step.

Rule: Sets the rule the source step uses to determine whether to go to the destination step on each visit.

Range: Always, 1x–7x, 2:2–8:8 , 10%, 25%, 33%, 50%, 67%, 75%, 90%, Last, Not Last

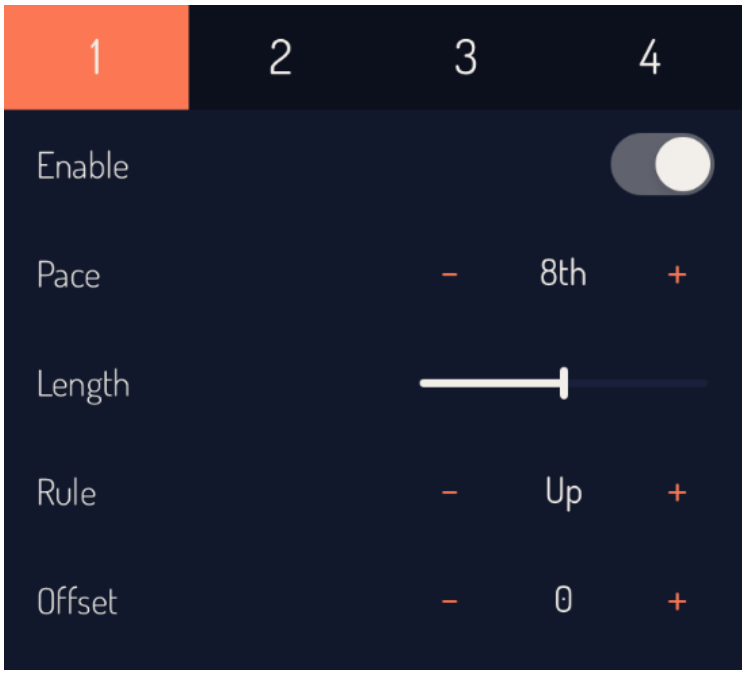
Ex. 3x - succeed three times then fail once.
Ex. 3:3 - succeed on the third of every three visits.
Ex. Last - succeed if the last wormhole succeeded.

Destination: Press and hold on the larger button then tap on a step in the grid to select it as the destination for the current source step. Press the "x" button to clear the destination.

Normal: The normal step is where the source step goes when the wormhole fails to go to the destination. This is set to "next" by default but you can override this behavior. Press and hold on the larger button then tap on a step in the grid to select it as the normal step for the current source step. Press the "x" button to set the normal back to the next step.

Voice Panel

OODA has four voices that can play notes from the active sequencer step. You can select and edit a voice by tapping on its number at the top of the panel.



Enable: Sets whether or not the voice will produce notes.

Pace: Determines the speed at which the voice will play notes. This happens in units of beat time based on the host clock. *Range: 16 bars to 32nd T.*

Pro Tip: OODA has six irrational paces based on the golden ratio: golden whole, golden half, golden quarter, golden 8th, golden 16th, and golden 32nd. The golden notes are longer than their standard note by a factor of ~1.618. This makes them a little slower than dotted notes.

Length: Sets the gate length of played notes as a percentage of the pace. Gate length is how long between “note on” and “note off” events. Moving the slider to the left makes the notes sound shorter and more staccato, moving the slider to the right makes them sound longer and more legato. *Range: 10% to 100%.*

Rule: Sets the rule the voice uses to choose new notes (from the active step).

Options:

- **Nth,** play the note that corresponds to the current voice.
    - (ex. Voice two plays the second note, sorted from lowest to highest.)
- **Lowest,** always play the lowest note.
- **Highest,** always play the highest note.
- **Random,** choose a random note from the step.
- **Up,** start at the lowest note, play higher notes, restart from the bottom.
- **Down,** start at the highest note, play lower notes, restart from the top.
- **UpDown,** start at the lowest note, do Up until the top, then do Down.
- **DownUp,** start at the highest note, do Down until the bottom, then do Up.
- **UpDown+,** same as UpDown, but the top and bottom notes get repeated.
- **DownUp+,** same as DownUp, but the bottom and top notes get repeated.
- **Rise,** start at the lowest note, follow pattern up 2, down 1.
- **Fall,** start at the highest note, follow pattern down 2, up 1.

Note:

The rule reset behavior depends on the “Sync Voices” setting in the sequencer panel. With the “Sync Voices” setting enabled, the rules reset to their starting note with each change in active step. With “Sync Voices” disabled, the rules don’t reset to their starting note until transport is stopped.

To hear this in action, record chords into OODA, set voice 1’s pace faster than the sequencer, change its rule to “Up,” and then toggle “Sync Voices” with the sequencer running.

Offset: Sets the pitch offset of the notes played by the voice in semitones. *Range: -24 to +24.*

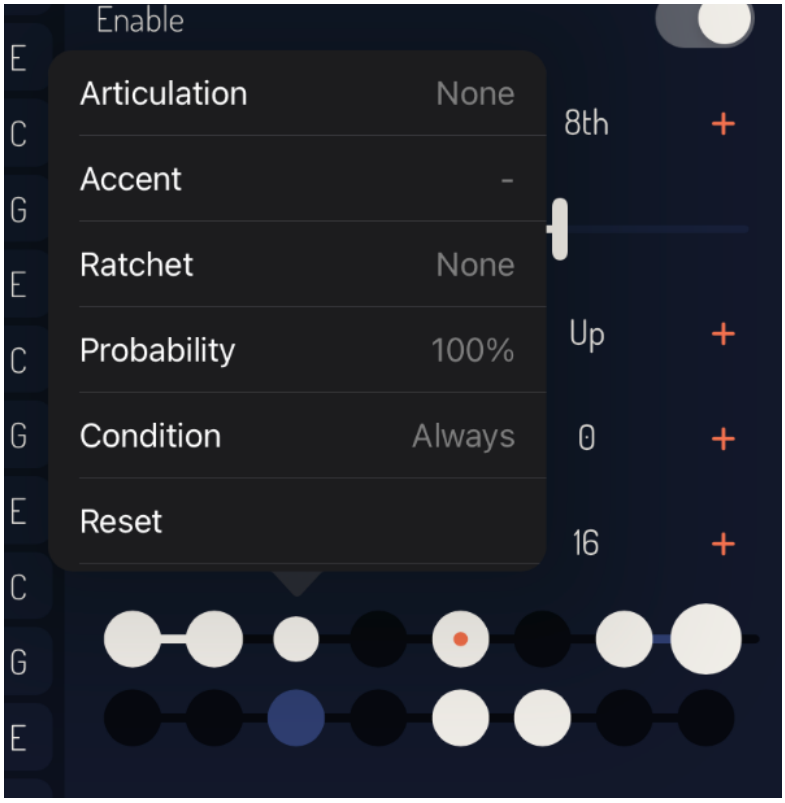
Pattern: Sets the voice's rhythmic pattern. The stepper sets the pattern length from one to sixteen steps, and tapping the circles toggles whether the voice plays or rests on that step. Long press on a step to access its step options menu. Tap to cycle through options. *See next page for details.*

Pro Tip: Use patterns of different lengths for each voice to create complex, evolving polymeters.

Velocity: Sets the velocity of the notes played by the voice. *Range: 1 to 127.*

Channel: Sets the MIDI channel the voice sends its notes on. *Range: 1 to 16.*

Pattern Control



OODA features a unique pattern control that supports “step options” for increased expression and deeper rhythmic variation. The step options are: articulation, accent, ratchet, probability and condition. Long press on a step to reveal its step options. Tap on any cell in the revealed menu to cycle through the values for the step options.

- Articulation: none, hold, tie.
- Accent: none, +, -.
    - The amount of the accent is determined by the value in the settings menu.
- Ratchet: none, 2x, 3x, 4x.
- Probability: 100%, 10%, 25%, 33%, 50%, 67%, 75%, 90%.
- Condition:
    - Always, 2:2 (second of two), 3:3 (third of three), 4:4 (fourth of four),
      1x (once on, once off), 2x (twice on, once off), 3x (three on, once off),
      Last (Did the previous condition/probability succeed?),
      Not Last (Did the previous condition/probability fail?)

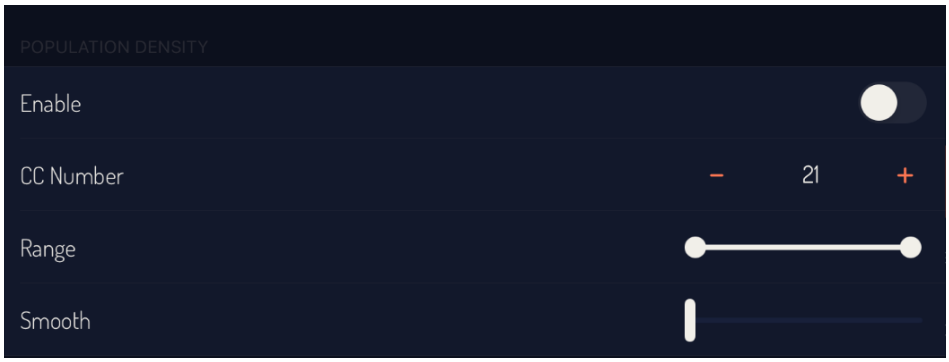
Note: The probability and condition options are both evaluated on each step and both must succeed in order for the voice to play.

Top Bar

Presets button: Displays a simple menu for saving, loading, and deleting presets. Tap the “save button” to save. Tap on a preset to load. Swipe left on a preset to delete.

Note: User presets are shared between the standalone and the audio unit, this means that if you save a preset from a host like AUM, it will be visible in the standalone. Likewise, if you delete a preset in the standalone, it will no longer be visible to host apps like AUM.

Mod Outs button: Displays the modulation outputs menu. OODA can send MIDI CC messages derived from its sequencer model. Each output has its own enable, CC number, output range, and smoothing parameters.

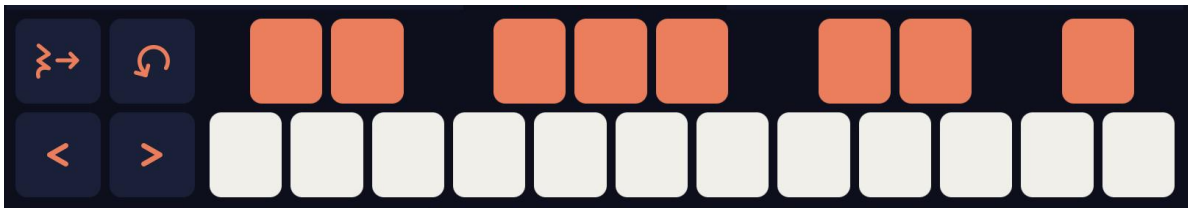


- Sequencer X
    - The sequencer’s x index as a fraction of the greatest recorded x index.
- Sequencer Y
    - The sequencer’s y index as a fraction of the greatest recorded y index.
    - The top is low, the bottom is high.
- Sequencer Phase
    - The active step index as a fraction of the greatest recorded step index.
- Action OR
    - High when any of the four action buttons is held.
- Voice 1–4 Random
    - New random value each time the corresponding voice plays a note.

Note: Don’t send two modulation outputs to the same CC number! This will result in strange behavior at the destination.

In-app Keyboard

Press the “Keyboard” button in the top bar to display the in-app keyboard.



You can use the “rest and advance” button to add a rest on the current step. If you make a mistake or record too many steps, you can use the “go back and clear” button to go back a step. Change the octave with the octave left/right buttons.

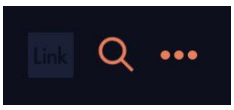
Clear button: Gives options for clearing OODA’s sequence and wormholes.

Record button: Arms OODA for recording into the sequence grid.

Transport button: Start and stop OODA’s internal clock. (Standalone only.)

Tempo control: Set the tempo of OODA’s internal clock. Touch and drag to set quickly. Tap “+” and “-” to increment by 0.1. Double tap to round. Long press to type in a value. (Standalone only.)

Link button: You can sync OODA’s clock to other devices and apps using Ableton Link. Tap on this icon to display the Link settings. Orange when enabled, dark blue when disabled. (Standalone only.)

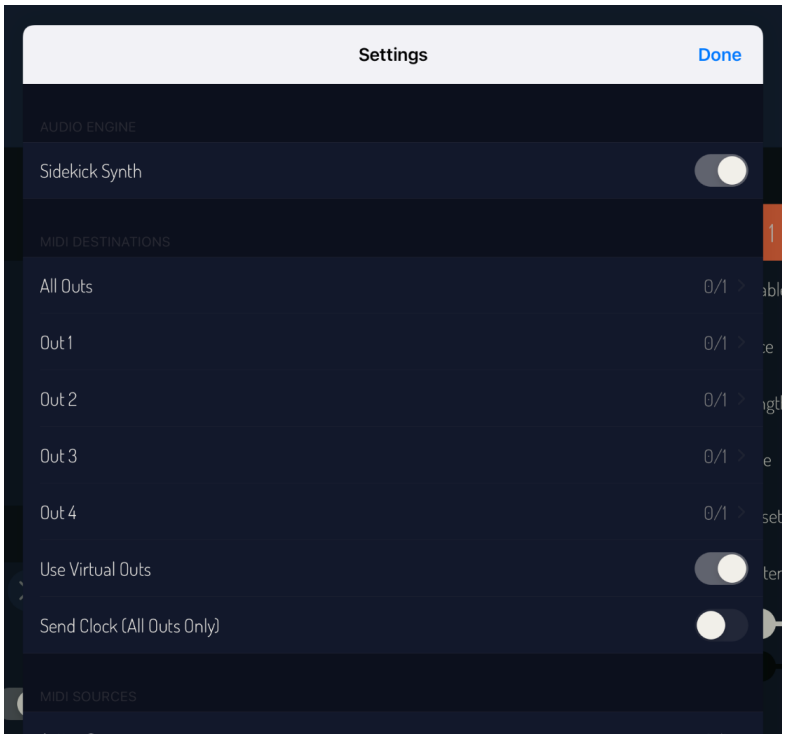


Important: OODA’s audio engine will stay on in the background whenever Ableton Link is enabled AND the “Sync Start/Stop” switch is enabled. This will cause increased battery usage! It is recommended only to enable Ableton Link when you are using it.

Bluetooth MIDI button: Displays a menu for connecting to Bluetooth MIDI devices. You will still need to activate the device in the settings menu after connecting. (Standalone only.)

Settings button: Displays the settings menu.

Settings



Audio Engine:

You can enable and disable the bundled synth with the “Sidekick Synth” switch. OODA’s MIDI engine will still work when this switch is turned off. (Standalone only.)

MIDI Destinations:

OODA has five MIDI outputs. One for all the voices together, and one for each voice by itself. You can set the MIDI destinations for each output by tapping on the appropriate cell and selecting where you want the MIDI to go.

The “Use Virtual Outs” switch determines whether OODA sends MIDI on its virtual output ports.

The “Send Clock” switch determines whether OODA sends MIDI clock on its “All Outs” output. *Note: this feature is still somewhat experimental, your mileage may vary.*

(Standalone only. Use your host for MIDI routing when using OODA as an audio unit.)

MIDI Sources:

You can select a MIDI input for OODA by tapping on the “Active Sources” cell and choosing an input.

Note: Currently MIDI receive is limited to recording into the sequencer.

You can sync OODA’s internal clock to an external MIDI clock by enabling the “Receive Clock” switch. *Note: OODA can only sync to whole BPMs as of version 1.0.x.*

Set the MIDI receive channel with the channel stepper. Infinity is omni mode.

(Standalone only. Use your host for MIDI routing when using OODA as an audio unit.)

Other:

Set the accent amount using the “Accent Amount” stepper.

Enabling the “Persist Menus & Modifiers” switch makes it so:

- The parameter selection menus stay visible after you release your finger.
- The rest, skip, source, destination, and normal buttons behave as a group of mutually exclusive latching buttons.

Pro Tip: Enabling this setting is useful if you’re using OODA on macOS or want to be able to use OODA with one hand.

Enabling the “Latch Action Buttons” causes the four action buttons to behave as latching buttons instead of momentary buttons. The action buttons are not mutually exclusive.

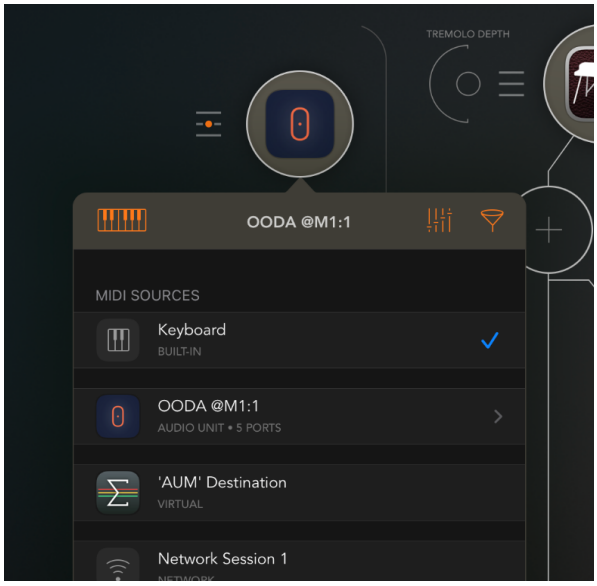
The manual cell displays this manual.

MIDI Behavior (Audio Unit)

OODA comes with a MIDI Processor type audio unit. It must be loaded on a track that is able to load MIDI Processors. (Ex. OODA must be on a MIDI track in AUM.)

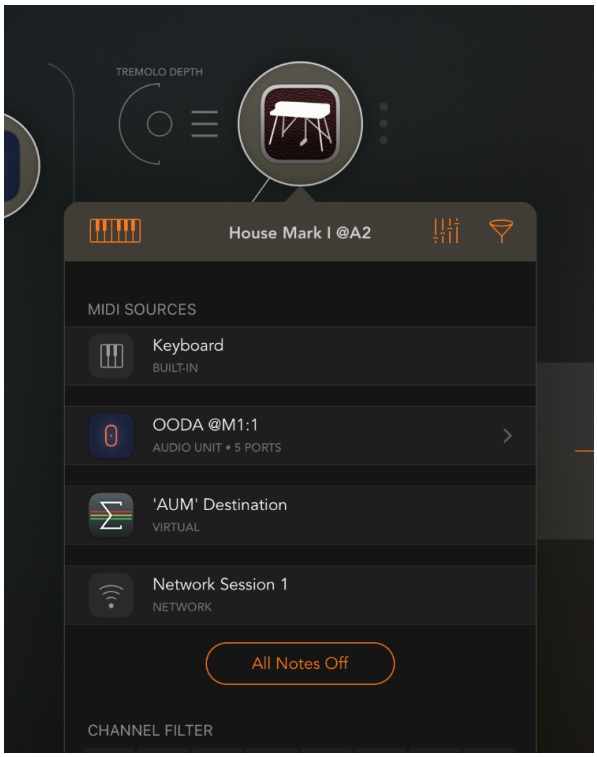
Once loaded in your host, OODA can both receive and send MIDI.

MIDI Receive



Currently MIDI receive is limited to note messages, which are used to record into the sequence grid.

MIDI Send



OODA has five MIDI outputs for sending note and CC messages. One for all the voices together and one for each voice alone. This allows you to use OODA to play multiple instruments simultaneously.

Note that OODA's "All Out" output has additional logic so that the note stream will be unambiguous to MIDI receivers.

How it works:

- If two voices attempt to play the same note (same channel and note number) at the same time, only one "note on" event will be sent.
- If a voice plays a note that is already being held (same channel and note number), then an implicit "note off" message is sent immediately prior to playing the new note.
- When multiple voices are holding the same note, the final "note off" message is not sent until the last voice releases the note.

This shouldn't result in any audible difference to the user, but it should make OODA play more nicely with external synths and MIDI recorders.

Thanks

OODA makes use of the open-source library AudioKit. Just want to give a huge thanks to all the developers who maintain it and their supportive online community!

Design advice and several of OODA's factory presets were provided by friend and Portland-based artist, Soulyft. Check out his music on Instagram, @soulyftmusic! We've partnered up before to make the drum app SDS-x. Search for it on the App Store!