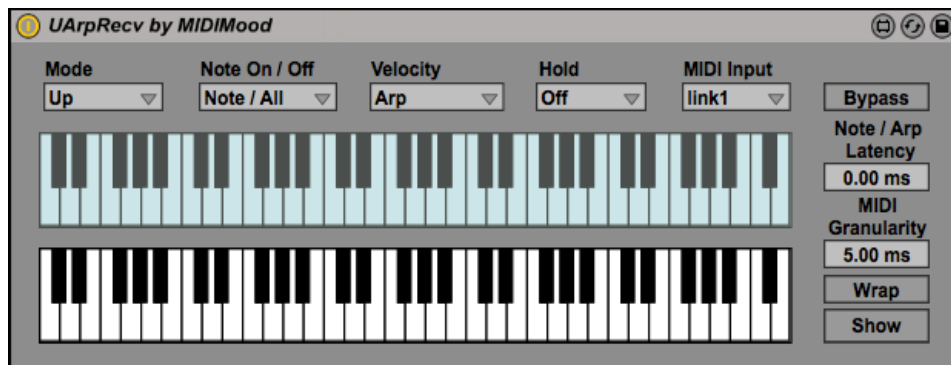


UARP

User Guide

Ver 2.2



UArp is an innovative arpeggiator / sequencer suitable for many applications such as Songwriting, Producing, Live Performance, Jamming, Experimenting, etc.

The idea behind UArp was to create a live instrument that on the one hand uses the power of auto generated midi data, while on the other hand gives enough real time control to make it sound and feel like a legitimate professional musical instrument.

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Overview

UArp has two type of modules:

UArpSend: Sends MIDI data to the UArpRecv module where it will be used as the MIDI-In input to the UArp engine.

- It is possible to send from one UArpSend module to many UArpRecv modules.
- It is possible to send from many UArpSend modules to a single UArpRecv module.

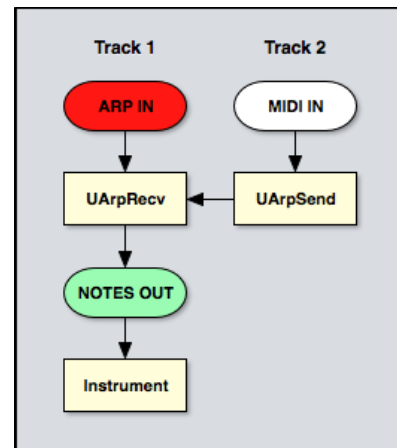
UArpRecv: The UArp engine itself.

- Gets the Arp-In data in real time from the current playing clip of the track it is hosted in.
- Gets the MIDI-In data from one or more UArpSend devices as explained above.
- Outputs notes by processing the incoming MIDI-In and Arp-In. Processing is done based on current device settings.

The UArp engine handles Arp-In notes as arp-parts rather than note-transposes, which makes UArp much more practical in real life situations and much more musical compared to the traditional approach.

Getting the Arp-In notes from Live's clips makes UArp extremely powerful:

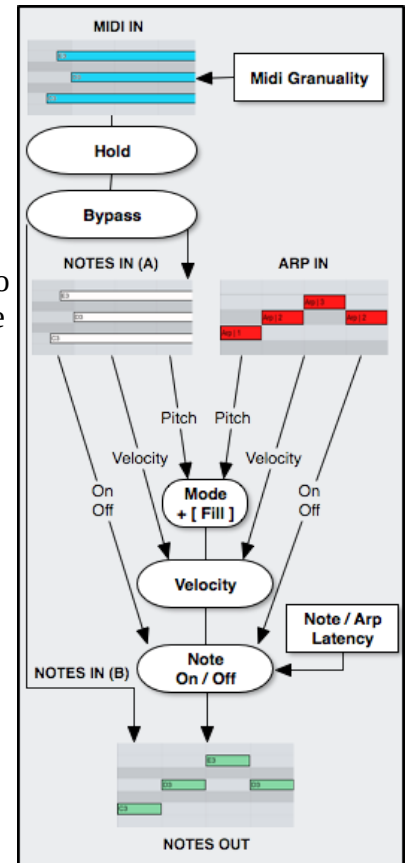
- Unlimited steps/notes.
- Ability to change Arp-In sequence in real time via Live's sophisticated launching mechanism.
- Ability to use Live's groove system for detailed shuffling and beyond.
- Special Arp-In note (Sync) makes it possible to tailor notes' on/off timing.



Flow Chart

UArpRecv Inputs

- MIDI-IN**
 Notes from external track(s) sent via the UArpSend device.
- ARP-IN**
 Notes that represent arp runtime information coming from the current playing clip on the local track. The Arp-In notes flows to the UArp core without any modification. The MIDI-In notes are manipulated according to the [Hold](#), [Bypass](#) and [MIDI-Granularity](#) settings before entering the UArp core.
- NOTES-IN**
 These are the modified MIDI-In notes just before entering the UArp core.



UArp Core

The Notes-In and Arp-In notes are combined according to the [Mode](#), [Wrap](#), [Velocity](#), [Note-On/Off](#) and [Note/Arp-Latency](#) settings.

UArp Output

NOTES-OUT: UArpRecv device MIDI output.

ARP-IN Notes

Arp-In notes are interpolated according to the [Mode](#) Settings.

Gate Mode: All Arp-In notes, except the Sync note, are treated as standard notes.

Other Modes: Arp-In notes coming from the lowest octave are treated as follows:

(higher octaves are ignored)

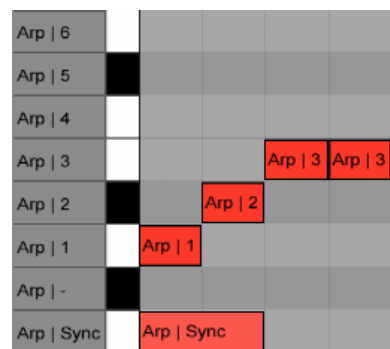
C -2 : Sync (for [Advanced Timing](#))

D -2 : Arp-1 (first part)

D# -2 : Arp-2 (second part)

E -2 : Arp-3 (third part)

etc.



See the [Mode](#) settings page for details about Arp-1, Arp-2, Arp-3, etc. notes mapping.

See the [Note On/Off](#) settings page for details about Arp-1, Arp-2, Arp-3, etc. notes timing.

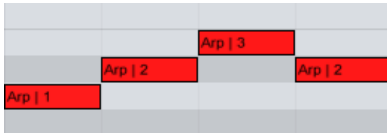
See the [Advanced Timing](#) page for details about the usage of the Sync note.

Mode Settings

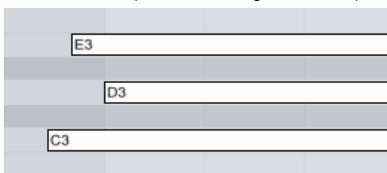
The Mode settings configures the note's pitch mapping algorithm.

The figures below illustrate how the note output differs for each selected mode:

Arp In



Notes In (Shifted by 1 beat)



Notes Out

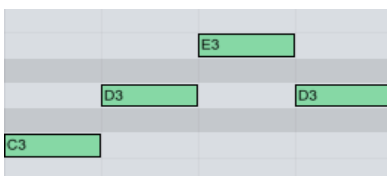
For the "Up", "Down", "Order" and "Reverse" modes, Notes-Out pitch values are defined according to the number of simultaneous Notes-In notes.

If one Notes-In note is on, only Arp-1 notes will be used regardless of the selected mode.

If two or more Notes-In notes are on, Arp-1, Arp-2,... notes will be used according to the selected mode.

The following figures shows the Notes-Out output for a various modes given the above Arp-In and Notes-In inputs:

Mode: Up

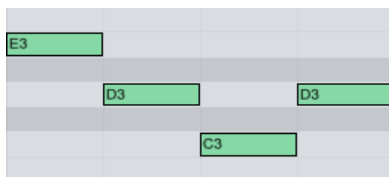


Arp-1 notes are played at the pitch of the **lowest** Notes-In note.

Arp-2 notes are played at the pitch of the next note **up**.

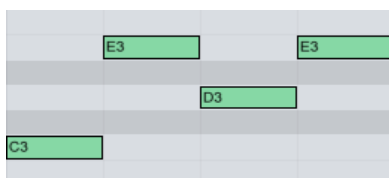
Arp-3 notes are played at the pitch of the **highest** Notes-In note.

Mode: Down



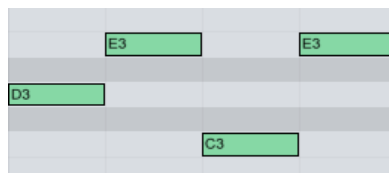
Arp-1 notes are played at the pitch of the **highest** Notes-In note.
 Arp-2 notes are played at the pitch of the next note **down**.
 Arp-3 notes are played at the pitch of the **lowest** Notes-In note.

Mode: Order



Arp-1 notes are played at the pitch of the **earliest** Notes-In note.
 Arp-2 notes are played at the pitch of the next note **after**.
 Arp-3 notes are played at the pitch of the **latest** Notes-In note.

Mode: Reverse



Arp-1 notes are played at the pitch of the **latest** Notes-In note.
 Arp-2 notes are played at the pitch of the **previous**.
 Arp-3 notes are played at the pitch of the **earliest** Notes-In note.

Mode: Gate

This is a special mode where the Notes-Out note pitch is the same as the Arp-In notes.
 In this mode, the Note-In notes acts as a gate for Arp-In notes of the same pitch.
 This is very useful for drum racks.

Mode: Seq

In this mode, UArpRecv acts as a powerful polyphonic sequencer.

Pressing a key will play the ARP-In incoming notes transposed.

When C3 is the base key for the transposing, keys above C3 will transpose up, while keys below it will transpose down according to the distance from C3.

When Wrap is off, the sequencer will be in monophonic mode.

When Wrap is on, the sequencer will be in polyphonic mode.

The last pressed key will act as a transposer for incoming notes.

Mode: Seq-Poly

This mode is similar to the Seq mode, with different behavior when holding down more than one key.

In this mode, the lowest key will act as a transposer, while the other keys will determine the polyphonic level and velocity of the incoming notes.

When Wrap is on, the sequencer will be in full polyphonic mode and the additional keys held will control only the velocities on incoming notes.

Mode: Seq-Multi

This mode is similar to the Seq mode, with different behavior when holding down more than one key.

In this mode, every key pressed will act independently as a transposer for the incoming notes, making the sequencer multiphonic.

Wrap Button

When Wrap is On, all the Arp-In notes are mapped to Notes-In notes in a Round-robin style.

For example, if there are 2 Notes-In notes then the following mapping takes place:

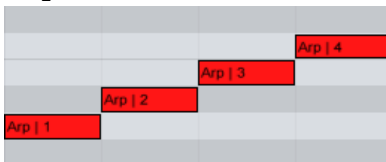
Arp-1, Arp-3, Arp-5, ... - will be mapped to one of the Notes-In notes according to the selected [Mode](#).

Arp-2, Arp-4, Arp-6, ... - will be mapped to the other Notes-In note.

Wrap-On can be used to simulate the traditional arpeggiator’s behavior.

The figures below illustrate the difference between Wrap-On and Wrap-Off when using various Notes-In notes. Mode “Up” is used for simplicity.

Arp In

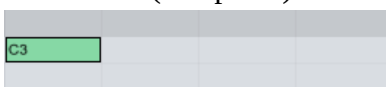


Wrap: One Note

Notes-In



Notes Out (Wrap Off)



Notes Out (Wrap On)



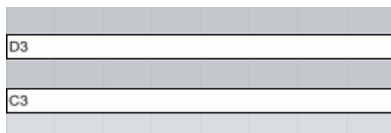
When two or more Arp-In notes are mapped to the same Notes-In note, they are grouped and treated as only one Arp-In note.

The velocity of that Arp-In note will be taken from the first Arp-In mapped note on that group.

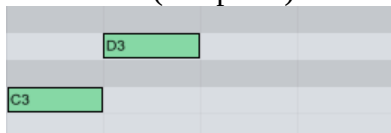
The length of that Arp-In note will be the union of all Arp-In mapped notes in that group.

Wrap: Two Notes

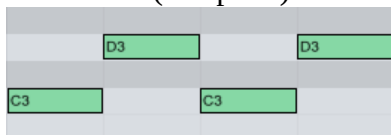
Notes-In



Notes Out (Wrap Off)

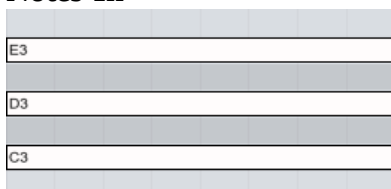


Notes Out (Wrap On)



Wrap: Three Notes

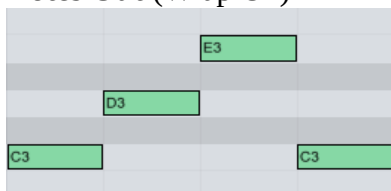
Notes-In



Notes Out (Wrap Off)



Notes Out (Wrap On)



Note On/Off Settings

The Note On/Off Settings defines the algorithm to be used for note timing and duration as follows:

Timing (Note On)

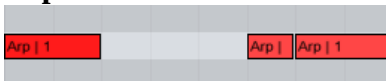
- **Note:** When a Notes-In note is triggered, it will trigger a Notes-Out note if the relevant Arp-In note is already on. When Arp-In note is triggered, it will trigger a Notes-Out note if the relevant Notes-In note is already on.
- **Arp:** When Arp-In note is triggered, it will trigger a Notes-Out note if the relevant Notes-In note is already on.

Duration (Note Off)

- **Note:** Notes-Out note will stay on until it gets a Notes-In note-off.
- **Arp:** Notes-Out note will stay on until it gets an Arp-In note-off.
- **All:** Notes-Out note will stay on until it gets a Notes-In or an Arp-In note-off.

The following figures shows how Note On/Off Settings affects Notes-Out notes output:

Arp In

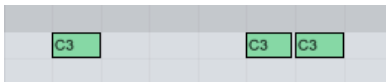


Notes In

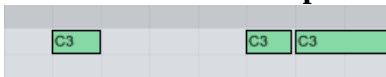


Notes Out

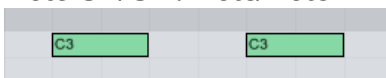
Note On/Off: Note/All

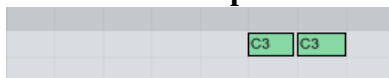
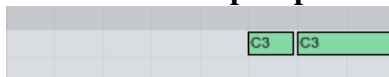
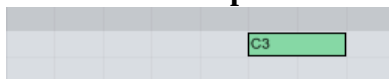


Note On/Off: Note/Arp



Note On/Off: Note/Note



Note On/Off: Arp/All**Note On/Off: Arp/Arp****Note On/Off: Arp/Note****Advanced Timing Using the Sync Note**

Arp-In has a special note called Sync, which is dedicated for timing.

- Sync Notes force immediate recalculation of the Note-Out notes to be played.
- Sync Notes immediately release all waiting MIDI-In notes when the [MIDI Granularity](#) value is greater than 0.

Sync Notes have different usages according to the Note-On configuration as follows:

Note On: Arp

Adding note-on triggers in the middle of long Arp-In notes.

Note On: Note

Replacing the MIDI/Arp triggers with freely defined notes.

See the [Advanced Timing](#) page for more information.

Note/Arp Latency

The Note/Arp Latency value tells the UArp core to expect that the Notes-In will be delayed by this value or less.

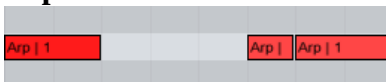
The latency might be caused by hardware and/or software, or even human limitations.

When using one of the “Arp” Note-On configurations found in the [Note On/Off](#) settings the note-on timing is determined as follows:

- If the Arp-In note was later than the Note-In note, then the Arp-In note will be used for note-on timing.
- If the Arp-In note was prior to the Note-In note at the Note/Arp Latency value or less, then the Note-In note will be used for note-on timing.

The following figures illustrate this behaviour:

Arp In



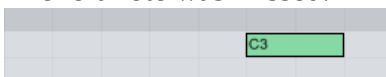
Note In



Notes Out when Note On/Off is set to Arp/Note:

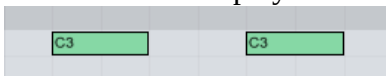
Note/Arp Latency = 0

The left note was missed.



Note/Arp Latency = 500 ms

The left note was played at the Note-In timing rather than at the Arp-In timing.



In such cases, increasing the Note/Arp value reduces the probability of missing the first note. On the other hand, it allows playing of the first note with looser timing. This trade-off should be considered when setting the Note/Arp value.

MIDI Granularity

MIDI Granularity sets a MIDI-In time interval to be used by UArp.

If this interval is greater than zero, UArp groups all MIDI-In notes that have at least a one note start before them, at this interval or less.

All notes in a group are handled as if they were played at the same time (which is the time of the last note in the group plus the MIDI Granularity value).

Low MIDI Granularity is very useful to eliminate any unwanted notes and to tighten timing when playing chords.

Because the nature of UArp, even the smallest change in note timing can have unexpected results.

For example: In “UP” mode, pressing the E3 note will map Arp-1 notes to this pitch, adding C3 will change mapping immediately sending Arp-1 notes to C3 and Arp-2 notes to E3. This is the expected behavior and is one of the reasons why UArp is so powerful.

But, what if this wasn't the intention?

What if the player, from his point of view, pressed C3 and E3 at the same time, but in reality, there was an interval of 5 ms between the notes?

UArp has a near zero latency, so 5 ms is not considered to be the same time from a UArp point of view.

The solution for this issue is to set the MIDI granularity value according to the player's ability to play chord notes at the same time.

This value adds latency to the Notes-In incoming notes, so it should be set to the minimum possible.

There is also a special usage of the UArp MIDI Granularity at its maximum possible value. See the [Advanced Timing](#) page for details.

Advanced Timing

Starting a note at Note-In timing or Arp-In timing is great, but limited.

In order to have more control over Note-Out timing, a special Arp-In note named “Sync” was added.

The Sync note can control timing on its own when using the *Note On/Off “Note/X”* settings.

The Sync note can add In-Note timing points when using the *Note On/Off “Arp/X”* settings.

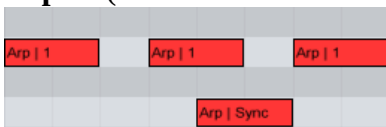
The following explains and demonstrates both options.

Note On/Off: Note/X

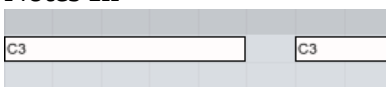
In this case, the timing is defined by the Note-In notes. In order to effectively disable this behaviour, the [MIDI Granularity](#) should be set to its maximum value.

In this case, only Sync notes will control the timing, which gives total freedom to define note triggering points that are not influenced by Arp-In and Note-In notes.

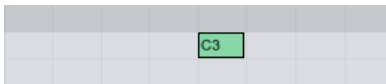
Arp In (Note On/Off - Note/All)



Notes In

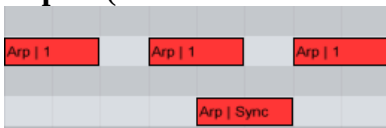


Notes Out



Note starts only at the point that both Sync Notes-In and Arp-In exist.

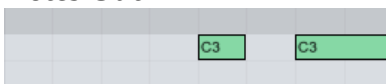
Arp In (Note On/Off - Note/All)



Notes In



Notes Out



While keeping the Notes-In note on after a Sync note triggers the Notes-Out notes, the following Arp-In notes will also act as Sync notes.

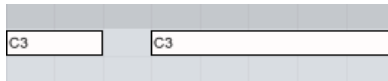
Note On/Off: Arp/X

In this case, a Sync note can be used to add additional starting points to the Arp-In notes. This can also be achieved by setting the Note/Arp latency value, but in that case, it will influence all Arp-In notes the same way, without the ability to set different values to different UArp-In notes as can be achieved by using the Sync notes. Moreover, the starting of late notes will be on the Note-In timing rather than on an accurate well-defined one.

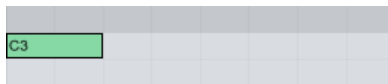
Arp In (Note On/Off – Arp/All)



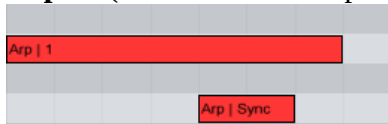
Note In



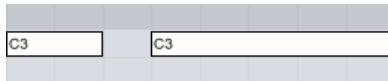
Notes Out



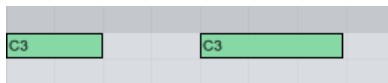
Arp In (Note On/Off – Arp/All)



Notes In



Notes Out



Using Sync as the Arp-In note starts can be useful to replace the Note/Arp Latency functionality, without adding any new note triggering points.

This allows us to define Note-In grace time for each Arp-In note separately.

In this case, late Note-In notes will be played at their own timing as long as the Sync note is on.

Velocity Settings

Velocity Settings determine the velocity source to be used for Notes-Out notes as follows:

Arp: The velocity will be taken from the Arp-In notes.

Note: The velocity will be taken from the Note-In notes.

Arp + Note: The velocity will be the sum of Arp-In and Note-In notes velocities, divided by two.

Hold Settings

Hold Settings define the note hold method to be used.

Hold: Off

MIDI-In notes are routed as is to the UArp core (Notes-In notes).

Hold: On

Classical note hold. Releasing notes will not send note-off messages. Pressing a new note will send notes-off messages to match all the currently pressed notes.

The following figures illustrate this behavior:

MIDI In



Notes In



Releasing G2 key



Notes-In stays the same



Pressing a new key(s): A2



Notes-In matched to the current pressed notes



Releasing all notes



Notes-In stays the same



Hold: Toggle

Pressing a note will toggle between note-on and note-off according to the current note state.

The following figures illustrate this behavior:

MIDI In



Notes In



Pressing C3 key



C3 is added to Notes-In notes



Pressing E2 key



E2 is removed form Notes-In notes



Hold: Anchor

This mode works just like “Hold: On” with one exception. As long as at least one note is still being pressed, all released notes are kept on. Releasing the last note will release all hold notes including the last one.

The following figures illustrate this behavior:

MIDI In



Notes In



Releasing E2 and G2 keys



Notes-In stays the same



Pressing a new key(s): E2 and A2



Notes-In matched to the current pressed notes



Releasing all notes



Notes-In notes are also released



Hold: Ghost

This is a special mode which is only relevant when [Bypass](#) is Off.

As long as one of the MIDI-In notes is still pressed in this mode, other MIDI-In notes released will send note-off messages, but the UArp core will treat them as still being pressed when mapping Notes-Out notes according to the [Mode](#) settings.

The following figures illustrate this behavior:

MIDI In



Notes In



Releasing E2 key



Notes-In acts as if the note is still on, although not heard (velocity 0).



Pressing new key (F2) between C2 and A2



Notes-In note E2 is replaced by F2



Show/Hide Button

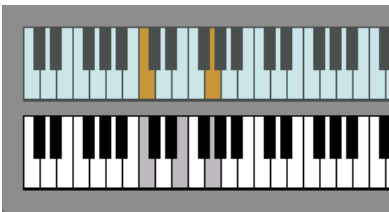
When Show is pressed, a popup window appears.

This window contains a live copy of the UArpRecv keyboards and is always on top.

The popup window can be closed by pressing 'Hide' on the UArpRecv device or by pressing the close-window ("X") button on the upper right corner of the popup window.

The upper keyboard shows the Notes-Out notes.

The lower keyboard shows the Note-In notes.



The Note-In notes might differ from the actual MIDI-In notes depending on the [MIDI Granularity](#), [Hold](#) and [Bypass](#) states.

See the [Flow Chart](#) page for a broader view.

Bypass Button

When the Bypass is On, the UArp-In notes will be ignored.

The Notes-Out notes will be an exact copy of Notes-In notes.

This means that even when Bypass is On, [Hold](#) and [MIDI Granularity](#) will still work.

See the [Flow Chart](#) page for a broader view.

Retriggering Clips

When Retrig button is On, UArpRecv will retrigger the playing MIDI clip according to the Retrig Mode.

Mode 0 : Retrigger Clips on first held MIDI-In key with velocity greater than zero.

Mode 1 : Retrigger Clips on any new MIDI-In key with velocity greater than zero.

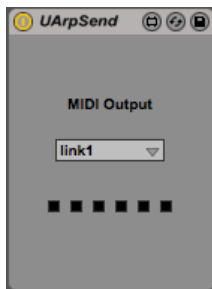
MIDI Input and UArpSend

UArpRecv's MIDI Input selection defines a virtual link to be used for receiving MIDI-In data. There are 16 options to choose from.

UArpSend Device

The UArpSend device captures all MIDI data from the track it is hosted in. It then sends the captured MIDI data through a virtual link as defined on the MIDI Output selection. All the UArpRecv devices that have been configured to use that specific link will receive this data as MIDI-In notes.

For more information see the [Overview](#) page.



The small squares indicate the number of notes currently held.