

J74 EnvelopeMap

A customizable MIDI modulation envelope for Ableton Live



User Manual

How to Install the J74 EnvelopeMap device

J74 EnvelopeMap is a modulation device for Ableton Live. It requires a Max for Live license to run (as in Ableton Live Suite) and it will run properly only in Ableton Live 10 or higher (older versions, such as Live 9 or older, are not supported).

Installation of the tool is extremely simple: unzip the download pack and copy the files to your computer hard drive, any place you like. To start it up, drop the plug-in device (.amxd) on a MIDI track in Ableton Live and add your parameter mappings.

J74 EnvelopeMap overview

J74 EnvelopeMap is a MIDI-triggered modulation device based on the use of a customizable envelope. The plug-in uses input MIDI notes (note on and eventually velocity and/or note off) as trigger for its envelope. The envelope is then applied to parameter modulation, on anything which can be modulated in Ableton Live and you explicitly selected for mapping. Up to eight different destinations can be modulated, each one with its own customizable controls. The way the envelope is constructed, timed and customized makes musical and rhythmical results possible, adding life and rhythm to material needing it. Itself being transparent to MIDI (all MIDI events are passed through), the device sets you in control of the triggering via MIDI clip or real-time MIDI input.

Made for modulation and real-time performance

J74 EnvelopeMap has been built with real-time performance in mind. Anything on its user interface (controls, editing functions) can be modified without modulation or audio interruptions. This applies in particular to the use of snapshots: you can jump around through various snapshots in real-time (for instance as a way to remix a track), loading banks, applying edit functions, changing time units and so on and you can quickly revert back to the a known state (a snapshot), at any time, in real time. The undo function can be used for the same purpose, revert back from any free-style modification to a known snapshot state.

Next in this user manual we will look at the plug-in structure, its individual parameters and explain their purpose and meaning and provide tips on their optimal use.

Tip: the device has a built-in *help window*. Use the help window while learning the device work-flow.

EnvelopeMap user interface overview

In EnvelopeMap you have three configuration stages, from left to right: you *design an envelope*, you define its *timing* and you select its *destinations*. Below a screenshot of the device user interface with the three sections highlighted respectively in yellow (envelope design), orange (timing settings) and red (modulation destinations).



- At the *design* stage (yellow in the screenshot) you define the shape of the envelope. This is done by combining envelope modeling (on the top section, see available basic shapes), the parameter controls (in blue at the bottom on the left side, such as [Attack], [Decay], etc.), envelope manual drawing (manually add or delete points in the [Envelope View] area) and envelope operations ([Invert], [Duplicate], [Mutate], etc.). These controls can be freely combined. Keep in mind though that an envelope can have a maximum of 36 points.
- At the *timing* stage (orange in the screenshot) you define the length [Duration] of the envelope (measured in milliseconds): that is, how long it takes for the envelope (once triggered by an input MIDI note) to complete its cycle, from the first point to the last point. To make rhythmical applications easy, the [Duration] can be “linked” to musical time units (such as 1/16, 1/8t, 1/4 etc.), as you can see from the Timing settings options.
- Finally at the *destination* stage (red in the screenshot) you define the destination parameters in the live-set to which envelope modulation is applied. You can map up to eight different destinations and, for each one, you can customize how the envelope is applied (with minimum value, range, velocity sensitivity, note off sensitivity for each destination), so that the modulation has an appropriate behavior for each destination.

Besides these main areas, EnvelopeMap has a few other controls.

There is a *Scope* (a digital oscilloscope) which let’s you monitor the generated envelope signal and the envelope modulation final output for each of the eight destinations (the scope is located on top of the destination stage). And there is *Snapshot* section (at the rightmost side of the device user interface), for capturing, saving and recalling parameters and settings on the fly and for the undo function (revert to a known state).

Now that you are familiar with the basics of the EnvelopeMap user interface, let’s go through all its modeling, parameters and controls in detail, explaining their application and giving tips on how to make best use of them.

Envelope Shape Modeling

Different envelope shapes accommodate different use cases. This is where envelope modeling and shape design make sense. A certain envelope shape can be useful for creating a sharp attack but not to smooth out a sound; or it can be used like a LFO-of-some-sort or as a rhythmic delay-like effect but not for a slow drone-like application.

As each use-case can be quite specific, it is possible but not efficient to have only “a blank canvas” to start with (asking the user to make up the shape in mind first and then, point by point, drawing it out). On the other hand it is limiting to just give “one shape-to-rule-them-all”, as sometimes classic shapes are unsuitable for certain goals.

Note: the common Attack-Decay-Sustain-Release (ADSR) envelope shape, used in most synthesis methods, is an extremely flexible tool (and indeed it is one of the models provided by EnvelopeMap), but for certain use-cases it can be over-killed (“I just want to create an attack...”) while for others it is definitively limiting (“I want the sound to repeat, but I want also descending volumes, like in a delay line...”). Hence more shapes (and shape operations) are required (and provided in EnvelopeMap): some simpler, some more complex than a typical ADSR envelope.

Tip: as a general rule, basic shape models is where you should start from when making an envelope. Even if your goal is complex, a basic shape is a good place to start as it is a simple building block you can “shape” and add complexity to, with modifications such as duplication, mutation, smoothing or even randomization.

The [Shape Model] selector at the very top selects the basic envelope shape model to work with. Different models support different combinations of controls. When a model supports a given feature, the parameter/control is *active* (color blue). When a model does not support a feature, the parameter/control is *inactive* (color gray).



The following shapes models are available in EnvelopeMap:

- Triangle
- Impulse
- Saw
- Square
- 2-Saw
- 2-Square
- 4-Saw
- 4-Square
- Sine
- ADSR

The following are their parameters/controls (all or some active, depending on the chosen model – see next):

- **[Attack]** Sets the attack time, in general the time between the initial point and the second point.
- **[Decay]** Sets the decay time, in general the time between the second point and the next.
- **[Sustain]** Sustain value, in general the amplitude value of the point reached by the [Decay] time
- **[Release]** Release time, in general the time between the penultimate point and the last
- **[Dampening]** Dampen values, which reduces subsequent values over time, proportionally
- **[Shift]** Shifts the envelope key points and highly depends on the model
- **[Tilt]** Tilts the envelope values up or down (increasing / decreasing all values)

The shortcuts commands [Push], [Zero], [Rand] (in the middle of the user interface) can be handy when working with shapes (or even during performance). They instantly inject values in the selected model:



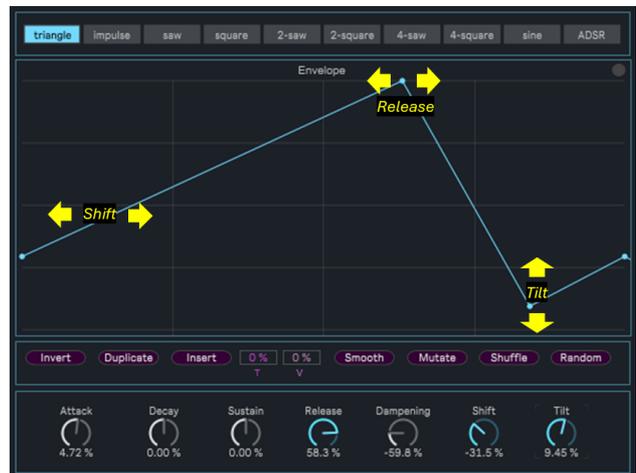
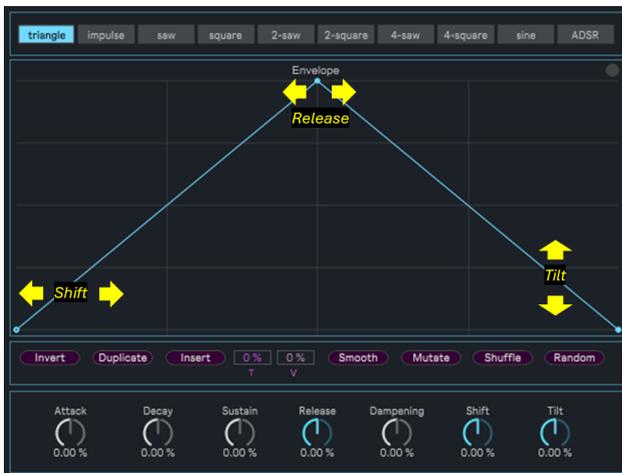
- **[Push]** (re)updates the envelope model with the current parameter values (can be used to reset the shape in case of manual draw actions or other destructive operations – a restore point on its own)
- **[Zero]** Resets all parameters to the defaults for the model (useful in both editing and performance)
- **[Rand]** Randomizes parameters (useful to inject chaos or to come up with unusual combinations)

The following additional controls are also available in the same section:

- **[Auto]** if enabled (as by default), updates the envelope when changing the model parameters, directly. If disabled updates are only sent with the [Push] action (useful to add a sudden change)
- **[Loop]** Always loops the envelope (when the envelope reaches its end it automatically restarts)
- **[Draw]** if disabled, prevents manual drawing actions. It is enabled by default, so any click in the [Envelope View] will be accepted and drive a change: a click on an empty place adds a new point; clicking and dragging an existing point will move it around; Shift+Click on an existing point will remove the point.
- **[Clear]** Clears the entire envelope (nothing left)

Next a summary of each basic shape model and its features.

{Triangle Shape}



Tip: The Triangle shape can be easily morphed. For instance Saw-down [Release]=-100% to Saw-up [Release]=+100%. The Triangle also supports a [Shift] which helps achieving different goals (e.g. [Shift]=-/+100% inverts the shape, other values introduce an attack). Although simple, it is quick to shape and it can be morphed quickly too.

{Impulse Shape}



Tip: The Impulse shape has as its primary purpose to create an attack/decay component by modulation. With a [Sustain] value > 0% it can be used for more subtle effects, eventually combined with a [Tilt] value > 0% too.

{Saw Shape}



Tip: The Saw shape is the simplest possible shape (the Triangle has slightly more complexity due to its [Shift] support). The Saw only has [Attack] and [Tilt] options and use only three (3) points. The latter is the reason why using this shape as basis for duplication is a good option: it can be used to retain timing in repetitions and allows for optimal use of the [Random]/[Mutate]/[Shuffle] functions.

{Square Shape}



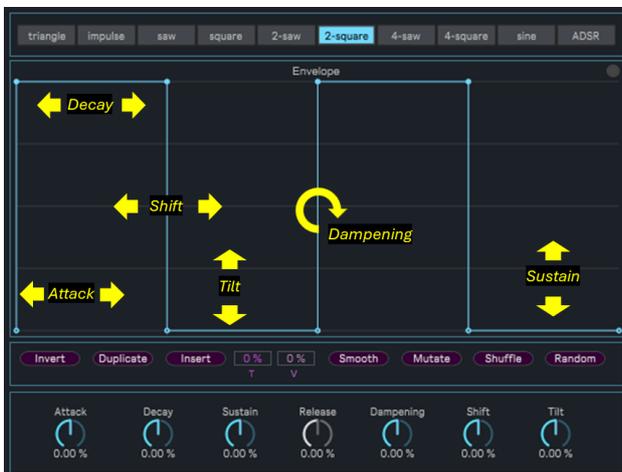
Tip: The Square shape is flexible. It is similar to an ADSR shape (apart from the release stage) but has also a peculiarity, as it supports the [Shift] control, acting as a “pulse width” option. Any variation of trapezoid-like shape can be generated with the Square shape model.

{2-Saw Shape}



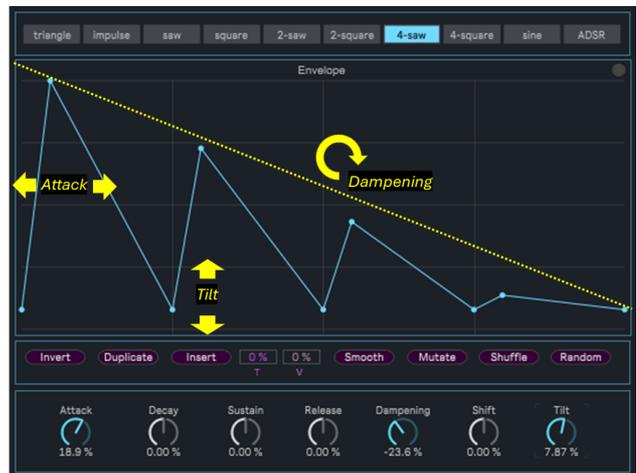
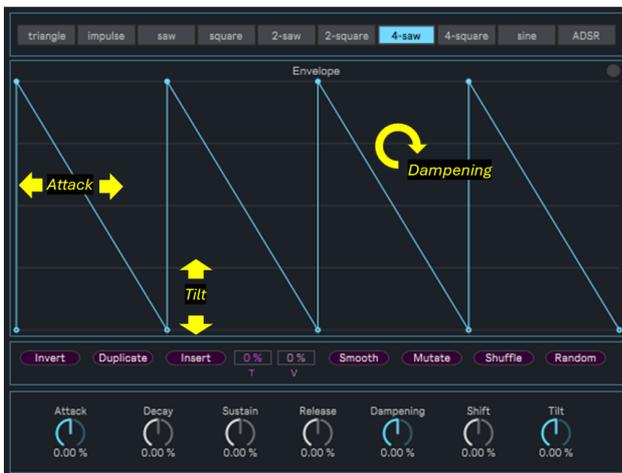
Tip: Same as the Saw shape but repeated twice (in the same cycle, hence twice faster). The main difference is that this version supports the [Dampening] parameter which is extremely useful for various delay-like envelope effects. You might want to adjust the [Time Unit] for a certain rhythmic effect.

{2-Square Shape}



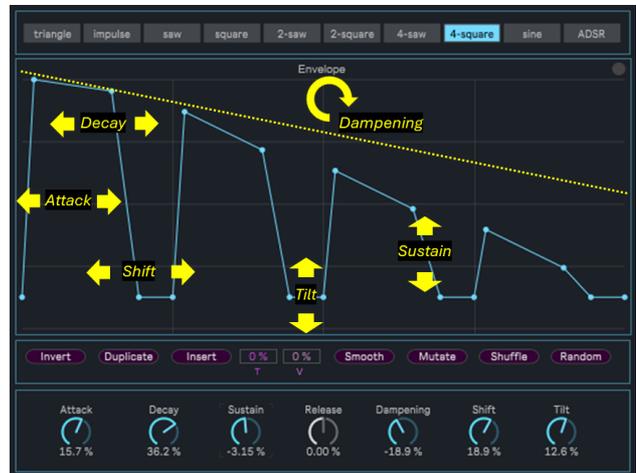
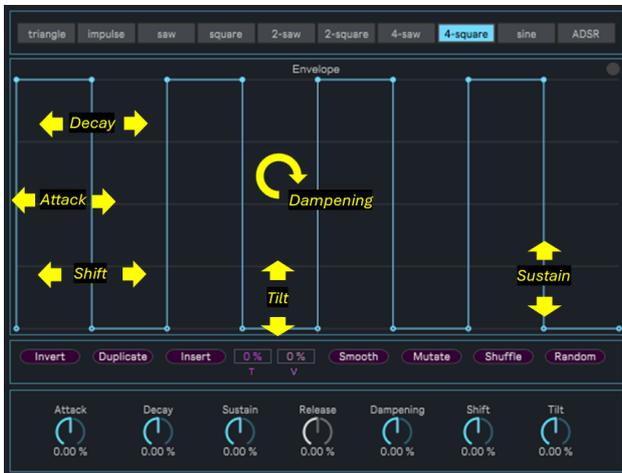
Tip: Same as the Square shape but repeated twice (in the same cycle, hence twice faster). The main difference is that this version supports the [Dampening] parameter which is extremely useful for various delay-like envelope effects. You might want to adjust the [Time Unit] for a certain rhythmic effect.

{4-Saw Shape}



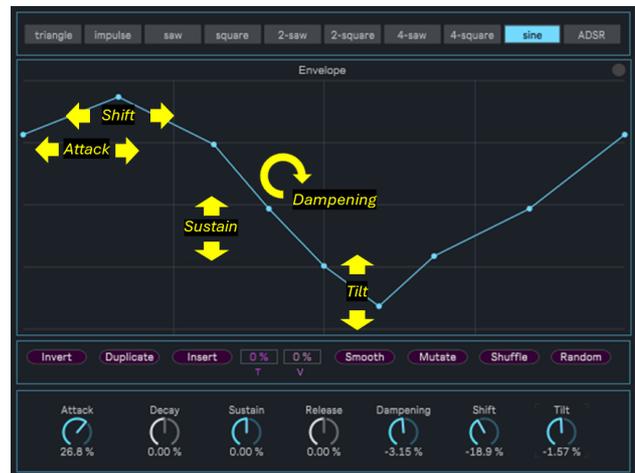
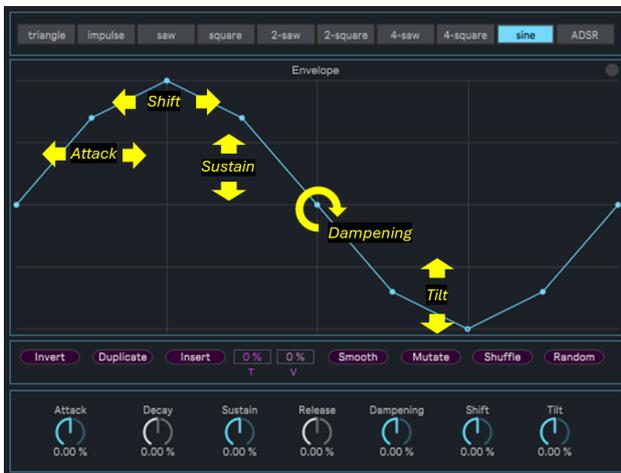
Tip: Same as the 2-Saw shape but repeated again twice (four times faster than a single basic shape). The main difference is that this version supports the [Dampening] parameter which is extremely useful for various delay-like envelope effects. You might want to adjust the [Time Unit] for a certain rhythmic effect.

{4-Square Shape}



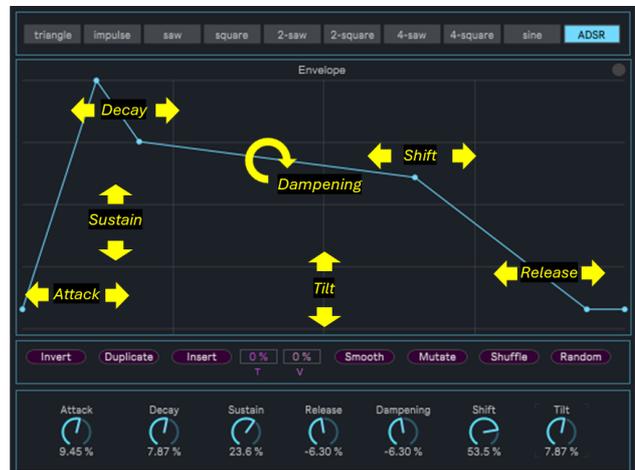
Tip: Same as the 2-Square shape but repeated again twice (four times faster than a single basic shape). The main difference is that this version supports the [Dampening] parameter which is extremely useful for various delay-like envelope effects. You might want to adjust the [Time Unit] for a certain rhythmic effect.

{Sine Shape}



Tip: The Sine shape is meant for repetition, in a LFO-like fashion. You can easily achieve the LFO effect by adding a periodic MIDI note trigger in input (at the periodic restart of the sine), activating [Loop] or using [Duplicate]. The [Shift] control in the Sine shape model acts as the phase with [Shift] = 0% for a perfect sine, [Shift] = -25% for the equivalent of 90 degrees phase shift (useful as starting on a “high” value). See notes on LFO use next in this document.

{ADSR Shape}



Tip: The classic ADSR envelope shape, with all its flexibility and added [Dampening], [Shift] and [Tilt] controls. Besides the classic ADSR controls, the latter respectively add a second decay with [Dampening], a length time for the sustain with [Shift] and a value floor with [Tilt]. Slightly more complex than all other envelopes, but indeed flexible.

Manual Draw mode

Manual Draw mode is an alternative mode of operation which handles envelopes as *lists of points* (instead of a mathematical model, as previously described). It is a “manual” mode of operation, essentially unlimited (apart from the maximum number of 36 points). There are two ways to enter to this mode and both relate to actions which takes results outside of the rules of modeling.

[a] The first is to make a manual change in the [Envelope View], any manual draw action, such as:

- Moving an existing point (click on a point and move it somewhere else)
- Adding a new point (click on an empty spot and release the click and a new point is added)
- Deleting a point (shift+click on a point and release the click and the selected point is deleted).

Once you make such a change the modeling rules do not apply anymore and the envelope is converted to a list of points with no mathematical relation to any model. Consequently the modeling controls (A/D/S/R/Dmp/Sht/Tlt) are grayed out and set as inactive, as modeling does not apply anymore.

[b] The other way to enter Manual Draw mode is to perform one of the envelope operations presented as “purple buttons” ([Invert]/[Insert]/[Duplicate]/etc. - see further below). These operations are numerical, modify and shift points around and therefore also leave the mathematical modeling and move to the concept of a list of points.

Note: You can always go back to modeling, using the [Push] button or selecting a basic shape from the [Shape Model] selector. This will reset the envelope to the model shape. Below a little table which tries to clarify the differences.

Mode of operation / Visual clue	Shape Modeling (ADSR/Dmp/Sht/Tlt)	Shape Shortcut actions (Push/Zero/Rand)	Envelope Operations (Invert/Duplicate/etc.)	Manual Draw of points (add/move/delete)
Shape Modeling / Envelope is cyan/blue	Active	Active	Supported, moves to Manual Draw mode	Supported, moves to Manual Draw mode
Manual Draw / Envelope is purple	Disabled (temporary)	Reverts to the shape (other editing is lost)	Supported, stay in Manual Draw mode	Supported, stay in Manual Draw mode
Snapshot (recall) / Envelope is green	Depends on snapshot	Depends on snapshot	Supported, moves to Manual Draw mode	Supported, moves to Manual Draw mode



Note: the **purple** color is used when in Manual Draw mode.

Envelope operations (the “purple” buttons)

Envelope operations offer numerical ways to manipulate an envelope shape. The following operations are available:



- **[Invert]** Inverts the envelope shape
- **[Duplicate]** Duplicates the envelope shape
- **[Insert]** Inserts a point using [T] (time) & [V] (value)
- **[Smooth]** Smooths transitions
- **[Mutate]** Alters values around the current value
- **[Shuffle]** Scrambles points in the shape
- **[Random]** Generates random values

When using this operations the envelope turns purple as it moves into manual draw mode (list of points).

Note: these operations are “destructive”, meaning that the resulting shape leaves shape modeling. To signify this change in the way of handling the envelope color turns **purple** (manual draw mode).

Tip: [Mutate], [Shuffle] and [Randomize] retain timing and only change values. This is useful to keep the same rhythmic cadence to modulation while (dramatically) altering values.

Tip: [Duplicate] will duplicate the shape in the same window of time, hence doubling the speed. You can apply [Duplicate] & half the [Timing Unit] to duplicate the envelope shape without altering the time cadence.

Note: The [Shape Points] indicator at the center/top section of the interface displays the number of points in the current envelope. Remember that the maximum number of points is 36, so any operation will be allowed only if the projected result will remain within this boundary.

Use EnvelopeMap as an LFO

You can use the envelope as an LFO by looping it with a periodic MIDI trigger or activating [Loop]. Suggestions:

- Sine LFO: use the {Sine Shape}, with [Shift] acting as phase shift, [Shift] = -25% for 90 degrees shift
- Triangle LFO: use the {Triangle Shape}, with [Shift] acting as phase shift, [Shift] = +/-100% for 90 degrees shift
- Square LFO: use the {Square Shape}, with [Shift] acting as pulse width controls

In alternative you can morph the {Sine Shape} into the main forms of these shapes as well:

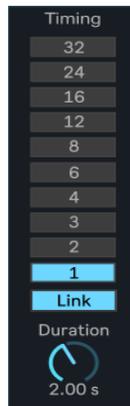
- Sine LFO: trivial as the defaults of the shape provide you the sine
- Triangle LFO: UP [Attack]=-100, [Sustain]=-100, [Shift]=+15%; DOWN [Attack]=-100, [Sustain]=100, [Shift]=-25%
- Square LFO: use [Tilt]=100 and add the [Off] option

Note: If you use a MIDI note trigger set the [Time Unit] appropriately. For example: four cycles per bar implies one MIDI trigger at each 1/4 note and [Time Unit] = 4; two cycles per bar implies one MIDI trigger at each 1/2 note and [Time Unit] = 2 and so on.

Tip: Using [Loop] can be quicker to set up (the envelope will just loop itself) but re-triggering using MIDI notes may offer additional freedom, as you can restart the envelope / LFO in creative ways.

Timing Controls

This is where you define the envelope *cycle time*, its duration from the moment of triggering (MIDI note on, first point) to the last segment (envelope completed). As rhythmic goals are often the intention of EnvelopeMap use-cases, timing can be easily linked to musical beat units (like 1/16th or similar) – and it is so by default – as [Link] is on by default.



The following applies:

- **[Duration]** Sets the Envelope cycle time duration (which is also the size of the display area, in milliseconds).
- **[Timing Unit]** If [Link] is enabled, allows you to set the duration as a musical unit relative to the tempo
- **[Link]** Links [Timing Unit] & [Duration]. It is on by default.

Note: [Timing Unit] lengths are relative to Ableton Live tempo. If for instance the tempo is 120bpm a 1/16th unit has a duration of 125ms. If you change the tempo to 128bpm the same 1/16th will become a 117ms duration.

Tip: If you want to create *extreme* envelope duration try to disable [Link] and work directly with the [Duration] parameter. For extremely quick envelopes (let's say less than 100ms, as fast as 10ms) set the [Duration] extremely short and use MIDI input notes as fast as you like. Eventually enable note [Off] support on the modulation to make the envelope release also very tight. For extremely slow envelopes (drone-like, more than 10 seconds, as slow as 30 seconds) set the [Duration] extremely long and use very sparse MIDI input notes.

Note: The [Envelope Length] indicator at the bottom / leftmost side shows the Envelope duration in milliseconds

The following applies to timing:

- Only an input MIDI note to EnvelopeMap triggers the envelope (independently from the pitch of the note)
- You can see when a trigger is received with the [Trigger] led on the right/top corner of the [Envelope View]
- MIDI note off do not trigger the envelope and by default they do not have any effect on the envelope, the envelope continues its course till it reaches the last point. Anyway you can modify this latter aspect of the behavior by enabling note [Off] support on each destination. When note [Off] support is enabled, a note off message resets the envelope to the minimum value immediately. This can have a dramatic effect if used well
- MIDI velocity can also be supported on a per destination basis if [Velocity] support is enabled (and for the amount specified in [Velocity Amount], see next for all the options).

Modulation Destinations

The destination stage is where you define the mappings to destination parameters in the live-set, where envelope modulation is applied. You can map up to eight different destinations and, for each one, you can customize how the envelope is applied (with minimum value, range, velocity sensitivity, note off sensitivity for each destination), so that the modulation has an appropriate behavior for each destination.

E	Destination	X	Min	Range	Vel	100 %	O	I
1	Map	X	0 %	50 %	Vel	100 %	O	I
2	Map	X	0 %	50 %	Vel	100 %	O	I
3	Map	X	0 %	50 %	Vel	100 %	O	I
4	Map	X	0 %	50 %	Vel	100 %	O	I
5	Map	X	0 %	50 %	Vel	100 %	O	I
6	Map	X	0 %	50 %	Vel	100 %	O	I
7	Map	X	0 %	50 %	Vel	100 %	O	I
8	Map	X	0 %	50 %	Vel	100 %	O	I

To map a parameter destination:

- Press [Map] on one of the destination (1..8)
- Click on the target parameter of the modulation, anywhere in Ableton Live and the mapping will be created

Note: destinations stay mapped as long as a mapping is held in the EnvelopeMap destination table. These mappings are saved with the Ableton Live project, so if you reopen the project, mappings are intact.

Note: destination mappings are NOT part of the Snapshot function, although [Min]/[Range]/[Velocity]/[Velocity Amount]/[Off] settings per destination ARE part of the Snapshot function. This is necessary to keep snapshot non-intrusive to audio generation (avoid drop-outs).

The destination section provides the following controls:

- [Map]** When enabled, the next parameter clicked in Ableton Live will be mapped for envelope modulation.
- [Un-map]** Releases the parameter mapping.
- [Min]** Minimum modulation value
- [Range]** Range/Maximum modulation value
- [Velocity]** If enabled, the envelope level is also modulated with the input MIDI Note On velocity
- [Velocity Amount]** MIDI Note On velocity amount of input modulation to the envelope level
- [O]** If enabled, level is also modulated with MIDI Note Off to [Min] value (reset to minimum modulation value)
- [I]** If enabled, modulation direction is inverted (adjust [Min] accordingly, e.g. from 0% to 100%)

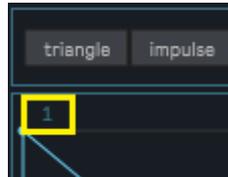
Anything in Ableton Live can be modulated, as long as this parameter is MIDI mappable in Ableton Live. Examples are audio effect parameters, mixer sends, master parameters and so on. The [Min] and [Range] controls are useful to define the *range for modulation*, in percentage of the target parameter range.

The [Velocity] and [Velocity Amount] offer a specific touch for each destination, so that velocity (in the MIDI clip notes or when input interactively) can be used for expression in modulation (input modulation to the envelope level).

Finally note [Off] support offers an additional level of envelope control on each destination. When note [Off] support is enabled, a note off message resets the envelope to the minimum value for the destination, immediately when received. This can have a dramatic effect if used well (e.g. rhythmic release following the length of input MIDI notes).

Slide (transition smoothing)

By default the envelope signal is not smoothed in any way in order to allow extremely snappy transitions. In case your modulations create unwanted “clicks” due to extreme settings (e.g. due to [Velocity], sharp [Attack], [Decay] or Note [Off] settings) you can dial transitions a little bit back by using the [Slide] coefficient: the more you increase this value the smoother envelope transitions will be (at the cost of loosing some snappiness).

**The Scope view**

When analyzing the effect that an envelope has on each specific destination it is useful to be able to monitor the generated envelope signal for that specific destination. For instance to see if the envelope reaches its end too quickly or too slowly, to see how much MIDI velocity has an effect on peak amounts or for the effect of note [Off], if enabled.



This monitoring is possible using the [Scope] area, on top of the destination mappings (and right from the [Envelope View]). This is a digital oscilloscope with a number of samples (20 by default) shown and a [Scope Selector] for selection of the specific destination output.

The following applies:

- **[Scope Display]** Digital oscilloscope showing the generated envelope
- **[Scope Selector]** Selects the output for a specific destination (1..8) or the envelope before processing (ENV).

Snapshots

The EnvelopeMap device provides a snapshot functionality *aimed to performance*. In fact snapshots in EnvelopeMap include only a specific sub-selection of parameters so that, at performance time, become possible to quickly jump around different behaviors, make dramatic changes, revert back to a known state without causing audio drop-outs.

In the picture below highlighted in orange are the sections of the EnvelopeMap device which are *snapshot-enabled*. Their choice has been made so that transitions from snapshot to snapshot (and bank to bank) are *smooth for audio*.



How the snapshot function works:

- **SHIFT + CLICK** on a slot to create a new snapshot (or replace an existing one)
- **CLICK** on a slot to recall a stored snapshot
- **SHIFT + {ALT|OPTION} + CLICK** on a slot to delete a stored snapshot
- Snapshots banks can be exported using the **[Write]** operation.
- Snapshots banks can be imported back using the **[Read]** operation.
- All Snapshots from the current bank can be erased using the **[Erase]** operation.
- On the top/right corner you can also find a MIDI mappable **[Snapshot Number]** for recalling snapshots

Important: the file extension for snapshot files MUST be “.maxpresets” in order for the files to be readable.

Note: Please note that the complete state of the device (every parameter, including mappings) is saved with the Ableton Live project. This also applies to the mapped modulation destination. Keep in mind that, in order to save snapshots in the Ableton Live project as well, the snapshots need to be saved upfront using the **[Write]** operation (snapshot banks must be saved with the “.maxpresets” file extension). See also the next paragraphs about recording and playback of recordings which involve snapshots.

Recording automation and snapshot changes with EnvelopeMap: the [Snapshot Automation] toggle

Let's say you prepared some carefully crafted snapshot and wish to record a performance which moves through those snapshots while also tweaking other parameters in EnvelopeMap. For instance: select a snapshot, then perform something with [Attack] / [Decay] / or anything, then move on to another snapshot and do a similar tweak, and so on.

If you have Ableton Live recording (Arrangement or Clip) turned on, everything will be indeed recorded. But there is one catch at playback time: by default Ableton Live behavior, each time a snapshot is recalled, the "jump" in the parameter's state caused by a snapshot recall will be seen by Ableton Live in the same way of a change to the device. As usual, Ableton Live will react to this by *suspending automation playback of the device*. This way the reproduction of modulation at playback time will not be identical to the original modulation performance at recording time.

Fortunately there is a workaround for this in EnvelopeMap: this is what the [Snapshot Automation] toggle does (if enabled). You can find this toggle on the device track view (labeled "Snap Auto"), in yellow in the picture below.



When enabled (as by default in EnvelopeMap), this option will make the device auto-sense a snapshot recall and automatically re-enable Ableton Live recorded automation (see orange arrow, in the picture above) each time an EnvelopeMap snapshot is recalled. This way, at playback time, both snapshot changes *and* parameter automation (see red in the picture) will be reproduced correctly, as they were recorded.

Side-Note: Why then leave the option to possibly turn off [Snapshot Automation]? This option can be useful if you do not need to EnvelopeMap automation playback and wish the rest of the Ableton live set to behave as by default (= changes to a device to override device automation). So, depending on your application you may want to do that or not, hence the option. In general, for EnvelopeMap, as for recording, production and playback of automation, it is recommended to leave [Snapshot Automation] enabled as by default. Be free to disable it as you feel the need.

Note: If you do not use Snapshots in EnvelopeMap recordings and playback, all the above becomes irrelevant. Recording and playback always work as by default Ableton Live behavior if you do not use Snapshots.

Bouncing EnvelopeMap modulation to audio

Any modulation (such as EnvelopeMap modulations or other devices modulation) requires CPU cycles and has a little bit of latency (see next chapter for details). So at a certain point you may want to commit the modulation into audio, in particular when finalizing the track for mixing, latency or CPU usage optimization. This is possible by recording the modulated tracks as audio material. The following procedure shows one way to do that. Please note that this does not only apply to EnvelopeMap, but to any modulation device (for instance also to Ableton Live own LFO device).

Preparations: create additional (audio) tracks for recording of modulated audio results

1. Create an empty audio track for each target track having modulated parameters by EnvelopeMap
2. On these tracks select the "Audio From" routing to select the original modulated track
3. On these tracks select the "Audio To" routing to "Send Only" (otherwise you will hear the audio output twice)
4. Arm these track for recording

The screenshot illustrates the Ableton Live interface during the process of bouncing EnvelopeMap modulation to audio. The track list at the top shows four tracks: '1 EnvelopeMap', '2 Wavetable', 'Recording of 2', and 'Recording of Sen'. The 'Recording of 2' track is highlighted with a red box and a '1' in a red circle, indicating the creation of an empty audio track. The 'EnvelopeMap' device window is open, showing a triangle envelope with a duration of 124 ms. The mixer section shows the routing for the 'Recording of 2' track, with 'Audio From' set to '2-Wavetable' and 'Audio To' set to 'Sends Only'. The 'Recording of 2' track is armed for recording, indicated by a red 'A' in a red circle. The 'Recording of Sen' track is also armed for recording, indicated by a red 'A' in a red circle. The 'Wavetable' device window is visible at the bottom, showing the 'Amp' section with a 'Time Slope' graph.

Recording: perform the modulation (with Snapshots and parameter control/automation) and record it in audio clips

5. A good idea is to use audio clip(s) recording in the Session View and not record in the Arrangement View, as it is more flexible and prevents any Arrangement View automation recording. To record audio into clips activate the clip recording button(s) [see picture below, with this numbered tag]
6. When done with performing, stop the clip recording. You can stop recording with the global transport stop button, with the stop-all-clips button or with specific clip stop buttons (what is better for you).



Producing: now that you have recorded audio, use the recorded audio for further production

7. After recording is completed, change "Audio output" routing on the recorded tracks to "Monitor = Auto" and disable Arm for recording on these tracks.
8. You have recorded all the modulations as audio and you are now able to proceed by using that audio for further production. You can trigger the just recorded clips in the Session View or move them as you like into the Arrangement View, for further cuts&edits. Standard production rules apply here.
9. Now you do not need EnvelopeMap modulation so you should mute (or even remove) the original tracks being modulated (as their sound with modulation has been recorded into audio) and you should disable (or even remove) EnvelopeMap itself (as its modulations have been embedded in the audio material).

The screenshot displays the Ableton Live software interface with several key elements highlighted by yellow boxes and numbers:

- Box 1:** Points to the 'Sends' section of the 'EnvelopeMap' track.
- Box 2:** Points to the 'Sends' section of the '2 Wavetable' track.
- Box 3:** Points to the 'Sends' section of the 'Recording of 2' track.
- Box 4:** Points to the 'Sends' section of the 'Recording of 5' track.
- Box 7:** Points to the 'Audio To' routing dropdown menu for the 'Recording of 2' track, which is set to 'Master'.
- Box 8:** Points to the 'Recording of 2' track in the Session View, which is highlighted in yellow.

The interface also shows the 'MIDI From' and 'Monitor' settings for each track, and the 'Audio To' routing for the 'Master' track. The 'Recording of 2' track is currently in a recording state, as indicated by the red 'Recording' indicator in the top right corner of the track's clip slot.

Considerations on latency & modulation

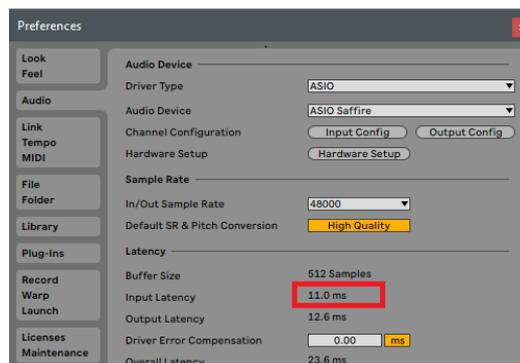
Ableton Live does not automatically compensate for parameter modulation latency. So when you use **any** Max for Live modulation device (**any**, even Ableton Live stock Max for Live modulators such as LFO), modulation will be slightly off (late) of a very small amount, related to your system audio latency and in particular to your audio buffer settings.

In most situations, for a modulation application, this is not a big deal: latencies of 5 to 20 ms are not particularly noticeable in modulation territory - please note that we are talking modulation of parameters, which is below the audible spectrum (like a typical LFO) and not "cross modulation" in the audible rate (as in sound synthesis). In practice these latencies are almost impossible to spot and you can decide to live happily ignoring them.

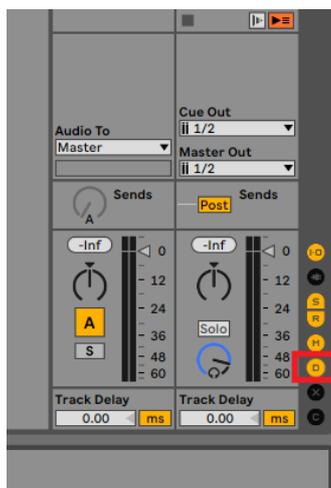
Anyway, if you really want to tight things up, you can in a few ways. Below for instance a procedure to achieve tight modulation for any modulation device at modulation time. The trick for compensating latency in modulation is to use Ableton Live so called "*Track Delay*" settings. Please note that this applies to any modulation device (not only to J74 EnvelopeMap, but any Max for Live modulation device, even Ableton stock modulators).

Procedure in a nutshell:

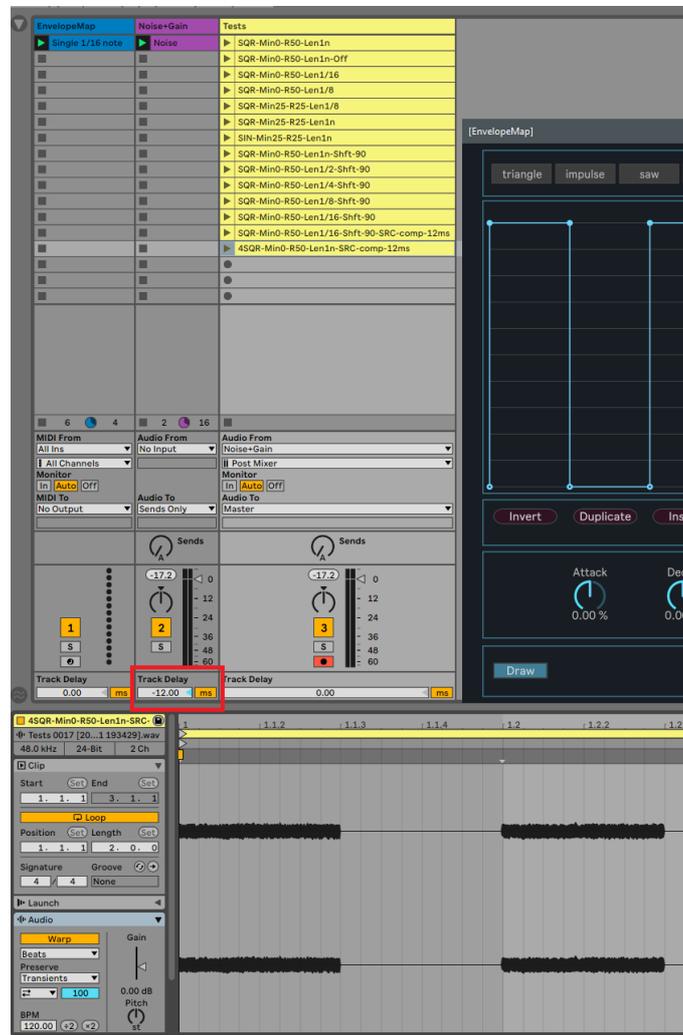
1. First, identify the latency (in ms) of your system: Go to "Preferences" > "Audio" > "Buffer Size" and look for the value reported, in ms (e.g. 512 samples @48Khz = 12ms)



2. Then, enable "Track Delay" [= press the (D) icon on the rightmost side of Ableton Live, next to the Master Track, so it becomes yellow. Under each track a value for Track Delay becomes configurable]



- Finally, on the audio or instrument track being the *destination of the modulation* (= having an instrument or audio devices with parameter mapped, being modulated) set the Track Delay to exactly the *negative* value of the latency (in ms) of your system (e.g. -12ms).



Result: the audio will be aligned to the modulation at the "cost" of a little latency added to the master track.

Note: An alternative workaround is possible in the specific case of EnvelopeMap (but not for some other device, such as Ableton Live stock LFO device), because of the use of MIDI notes as triggers. Simply “move” MIDI notes a bit earlier so that also modulation starts earlier and lands perfectly on time. This approach is generally not particularly easy to manage (it is tricky to create rhythmic results in MIDI clips not aligning to the grid), but you should try it out as this has a major benefit: it does not add additional latency to the master track or change inter-track alignment.

Note: If your goal is just alignment for production (recording), probably the easiest approach is to ignore all the above and bounce to audio (with no latency being compensated). After bouncing to audio it will be usually sufficient (and very easy) to just move the audio recordings earlier for just the amount given by your system latency (in ms).

Questions?

If you still have questions or issues, please send an email to: [info \[at\] fabriziopoce.com](mailto:info@fabriziopoce.com)