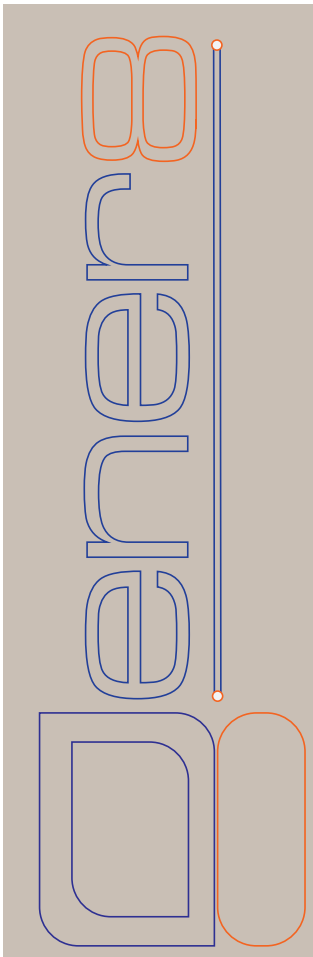
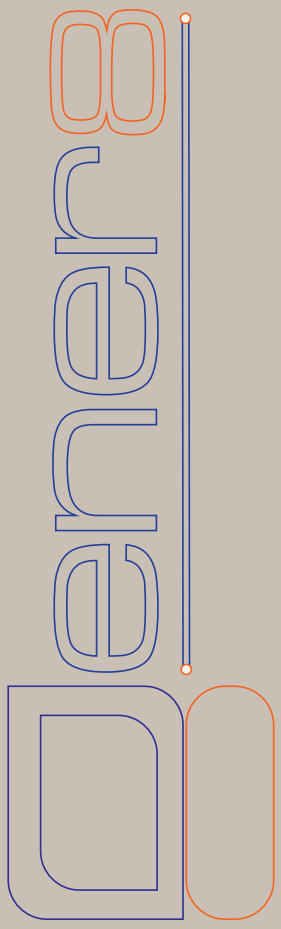
REFERENCE MANUAL

Version 1.0

MODUL8

INDEX





1.0 INTRODUCTION

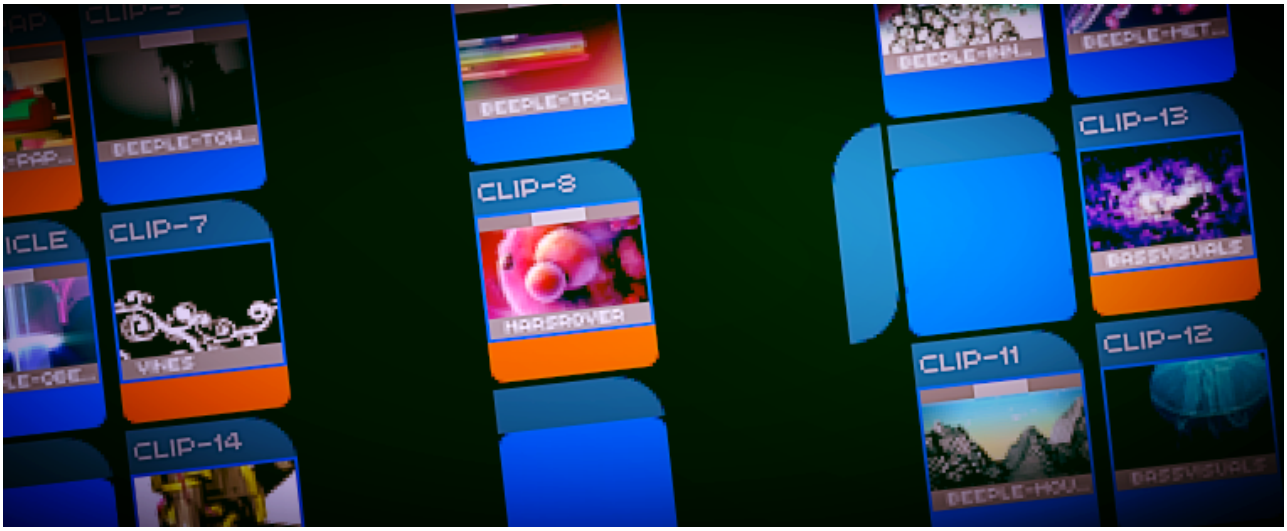
1.1 ABOUT THE MANUAL

This manual aims to cover the functionalities and use of the GENER8 suite of modules which are an add on to the VJ app MODUL8 by GARAGECUBE.

If you are new to MODUL8, or VJ-ing, then it may be wise to brush up on some of the basic concepts with the MODUL8 manual before reading this text as many MODUL8 specific terms and concepts will arise throughout this manual.

If you haven't read the MODUL8 manual then you may be missing out on some functionality of this fantastic software.

1.2 CONCEPTS AND OVERVIEW



GENER8 is a suite of modules (plug-in programs which add functionality) that work together as a family. There are two main modules (Launchpad & Editor) which work as the engine to drive the system, but there are many more which act as satellites and expand the possibilities. GENER8 has been developed in such a way that it is possible to create your own satellite modules.

For information about installing the GENER8 modules, please refer to the installation section of this manual.

In MODUL8 we have 2 banks of video layers - A/B. In each bank we have 5 layers available and can blend them in many magical ways. Each bank also has available 8 Layersets (or 'Groups'),

and so it is possible to store up to 80 layers, each with their own individual media & settings, while only displaying a maximum of 10 at a time.

Layers can become complex set-ups in their own right. Each layer has well over 100 control settings and each layer can also have filter and layer specific module settings too. That's a lot of data per layer, and we can make complex generative visuals with just these tools - even before importing any media!

However, these layer settings are tied to your project. There is no way to export layer settings from one project to another. And this is the core of what GENER8 does. It creates small files (Clips) which act as virtual layers, and allows you to import and export your layer settings. But much more than that - it allows you to perform with these 'Clips' in a way that was previously impossible.

As previously mentioned we have 2 main modules in the system - the **Launchpad** and the **Editor.**..

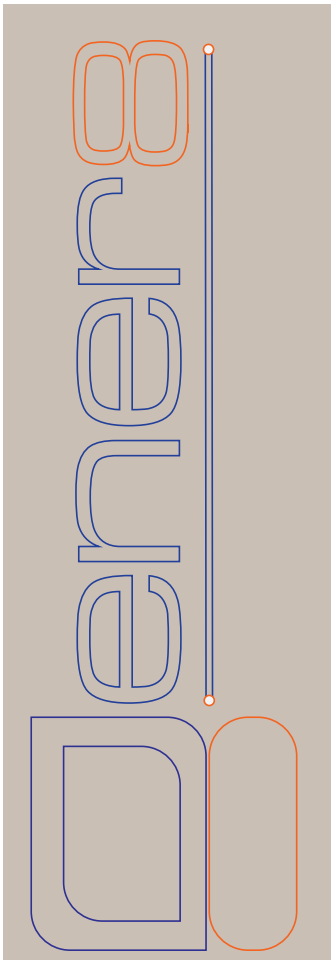
The **Launchpad** acts as your project module. All your Clip data is stored in the Launchpad module. It's where you trigger your Clips and sequence your arrangements, it's also where you save your Clip data and access your Clip Library. The Launchpad can hold up to 1024 Clips per layer (more than you'll ever need). These can be imported and exported between projects. The Launchpad is a 'global' module (non layer specific).

The **Editor** module works as the engine for the system. It collects live controller data from the layer and stores it into the Clip. It takes trigger messages from the Launchpad and updates the controller data on the layer. The Editor is also a great tool for non-destructive editing of your media, allowing you to apply controller envelopes in its timeline display and magically calculate beat timings with its intelligent auto-loop function.

The Editor is a 'layer contextual' module. This means that for each active layer there is an instance of the Editor module active, although you will only ever see one module window, each instance contains layer specific data and runs functions just for that layer. It is important to remember this as the Editor can become quite processor intensive - the more layers, the more load on the processor. However, with the ability to store so many Clips in each layer on the Launchpad you will quickly find that you can do much more with much less layers than before.

As the Editor module holds no data itself, pausing or restarting the module will not lose any of your Clip data. However, the same cannot be said for the Launchpad. The Launchpad holds all of your Clip data and sequence information. Restarting the Launchpad module will delete all Clip and sequence data - *please save your MODUL8 project before restarting the Launchpad module.*

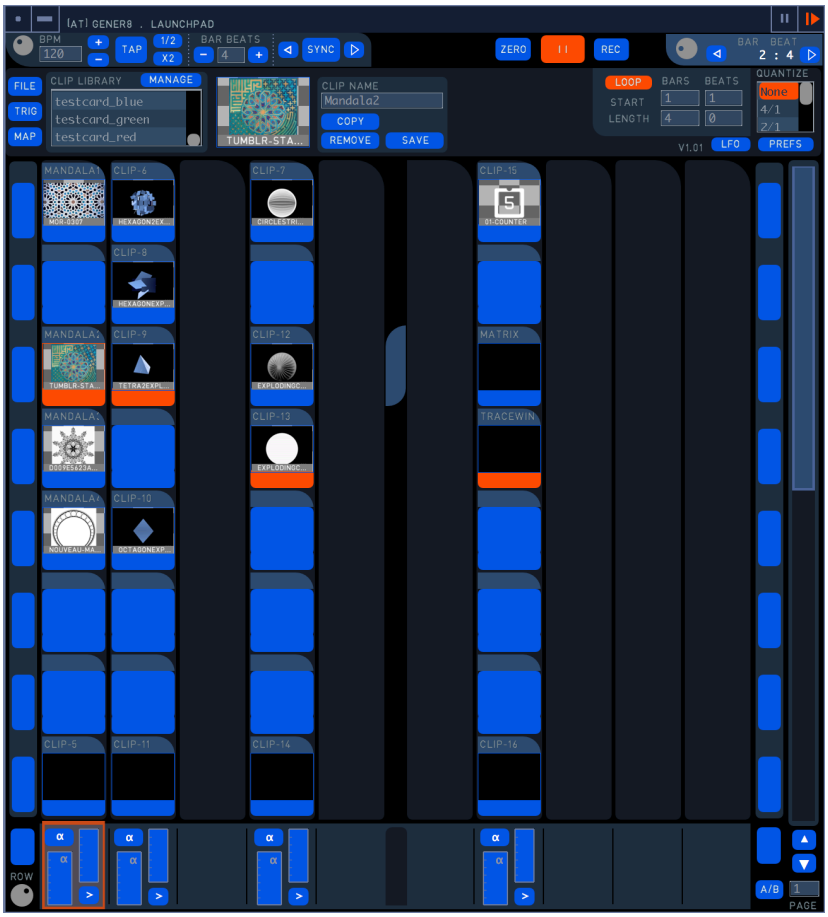
This is a very brief overview of our core modules, now let's delve deeper.



2.0 CORE MODULES

2.1 LAUNCHPAD

2.1.1 OVERVIEW



The Launchpad acts as your project and performance module. It holds your layer data as Clips, generates clock signals (Timecode), gives access to your Clip Library, generates 3 independent LFO signals to modulate controllers throughout your project, and enables you to sequence your Clips or record your arrangements. Clip triggers can also send MIDI or DMX data to external devices.

The module is organised into 2 banks of vertical columns. Each column represents a MODUL8 layer. The 2 banks represent layer groups A & B.

Each layer column is divided into 8 Clip slots, and enables you to store a snapshot of your layer into each slot as a Clip. If your Clips slots get filled you can simply create new pages (each page must contain at least one Clip before creating a new page).

It's possible to create a total of 128 pages per project (that's a ridiculous 81,920 Clips, more than you'll ever use).

When you start up the Launchpad *(you will also need to have the Editor module running)*, the module will show layer columns for each active MODUL8 layer. A Clip will also be created automatically for each layer and all layer data *('ctrl' settings such as scale values, colour modulations, transforms etc.)* will be captured into those Clips. If your layer contains a media, then a preview of that media will be displayed in the Clip slot (special medias such as Testcards do not display a

preview). Any changes made to any controller on the layer are automatically updated in the active Clip.

2.1.2 CLIP CREATION

The Clip slot is divided into 2 sections: the Selector, and the Trigger.

The Selector is the top half of the Clip slot and displays a media preview when one is available. Clicking the media preview selects the Clip for editing.

The Trigger is a button beneath the media preview. An orange trigger button indicates that the Clip is active on the layer.

Creating new Clips is as simple as clicking on the Selector of an empty (*BLUE*) Clip slot. This will create a blank Clip - the equivalent of an empty layer.

2.1.3 TRIGGERING

To make any changes to the new Clip you must first activate it by pressing the Trigger button. Changes made to any layer controls *(e.g. Rotation)* are recorded into the *active* clip (the one with the orange trigger button).

To add media to your new Clip select one from the media panel and it will be applied to the active Clip. If you don't have any media loaded into your media panel you will first need to drag some in. Unfortunately it is not possible to drag & drop media into the Launchpad like we do with the media panel.

It is also possible to trigger whole rows of Clips with the Row Trigger buttons at the side of each row. There are two pairs of row trigger buttons, one for each group, and two modes. The mode selector button is at the base of Group B's row trigger buttons on the bottom right of the module:

- Mode 'A/B' gives row triggers for each bank and pressing a row trigger will launch all Clips in that row for that group.

- Mode 'A+B' removes the second column of row triggers and each row trigger will now launch all Clips in that row.

MIDI MAPPING

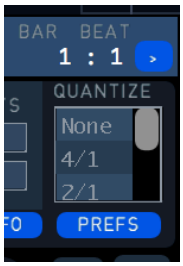
There is a further option available for triggering Clips at the base of each layer column, this is the 'Selected Row Trigger' and is mainly designed for use with a MIDI controller. Once mapped these buttons trigger the Clip on the *selected* row.

For more on this see *Section 2.1.14*.

Individual Clips can also be triggered directly via MIDI or DMX mapping but we will come to this later in *Section 2.1.11*.

2.1.4 QUANTIZING

When triggering a Clip it is subject to quantisation, a process which activates our Clips exactly on the bar (or 1/2 bar, 1/4 bar, etc.). This process is governed by our Timecode. Once a trigger button has been pressed it will start flashing until the next bar is reached, at which point the triggered Clip will become active on the layer.



Quantize settings can be adjusted from the menu under the Clock at the top right of the module.

If you do not like to quantise your performance and would rather trigger Clips instantly, set your Quantize value to 'NONE'.

Menu items are listed in Bars/Beats. A value of 1/1 will trigger the Clip at the next Bar, a value 1/2 will trigger at the next 1/2 bar and a value of 4/1 will trigger in 4 bars time.

> NOTE: Lower Quantize values are relative to the time signature, or 'Bar Beats' value as they are measured in whole beats.

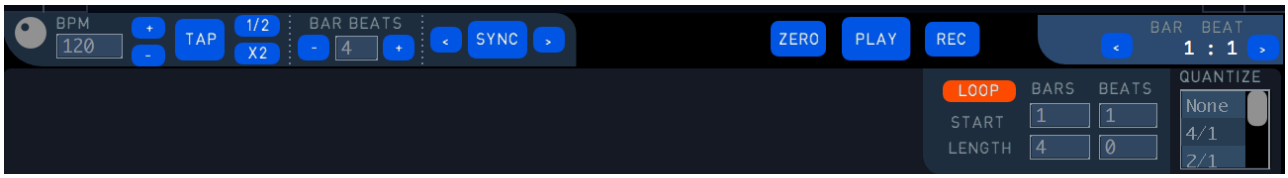
2.1.5 TIMECODE

The Launchpad also creates a clock signal (Timecode). Much like *Garagecube's* own BPM module, this clock signal is broadcast out to other modules through the *sharedDict* library (for more info on this see Section 6.2).

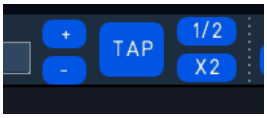
Unlike the clock from the BPM module the Timecode contains more detailed information such as Bars, Beats, Seconds & Time Signature.

It is important to note that while using GENER8 you MUST NOT run any other BPM or TIMECODE module as they will clash and cause either erratic behaviour or crashes. Aside from this unwanted behaviour it is unnecessary as the Launchpad module provides enough clock info for all your other modules.

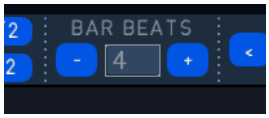
The clock & transport section appears at the top horizontal strip across the Launchpad module, with Loop and Quantize settings appearing below on the right hand side.



The speed of our clock is governed by the BPM (Beats Per Minute) setting on the left. There are a collection of buttons to enable quick adjustments to the BPM, such as half '*1*/2' and double '*X2*' time. These are all MIDI mappable buttons incase you need to make quick adjustments to the tempo of your clock in a performance situation.



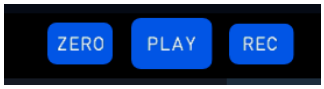
The 'TAP' button sets the BPM by calculating an average time for a set number of taps. The required number of taps is determined by the '*Bar Beats*' value (a Bar Beats value of 5 beats per bar will require 5 taps to set the BPM). It is recommended to map this button to a key on your keyboard or to a MIDI controller via the Mapping menu, as this will likely give you more accurate results over a mouse or trackpad.



The Bar Beats value determines how many beats are contained in a musical bar. The default is set at 4 which works well for most western music.

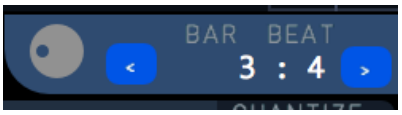
Next we have our SYNC value. The sync is useful if your performance drifts away from the music you are performing to, as it will re-sync not just the clock but also all active Clips. The < and > buttons either side of the SYNC will nudge the clock forward and back by single beats, but do not affect any active Clips.

Centrally we have our transport controls.



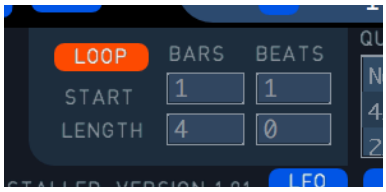
- ZERO - resets clock to 1:1
- PLAY/PAUSE - starts and pauses the clock.
- RECORD - activating the record function records any Clip changes as an arrangement, which can be edited with the TIMELINE module. Once recordings are made a further button *AR* will appear to the right of the *REC* button, this is the ARRANGEMENT button and toggles playback of the recorded arrangement.

A more detailed explanation about recording will be covered in Section 2.1.10.



Finally we have our Timecode display with bar nudge buttons. These nudge buttons work just like the beat nudge buttons next to the SYNC but affect bar values.

The Timecode display here is a simplified version of the actual Timecode data. If you need a full visualisation of Timecode open the Timeline module, which shows values for beat cents and seconds etc. The Timeline module is covered in section 2.3



Beneath the timecode display is our Looping section. By default the clock runs in a short loop of 4 bars. There are options here to offset the start of the loop, adjust it's length and also a toggle button to disable the Loop.

NOTE: Loops are measured in full bars, the length of which is defined by the Bar Beats value - e.g. increasing your Bar Beats value will also increase the Loop length.

It is also possible to run the Timecode from an external MIDI clock source. To activate the MIDI clock press the 'PREFS' button, and an option to turn on MIDI sync will appear.

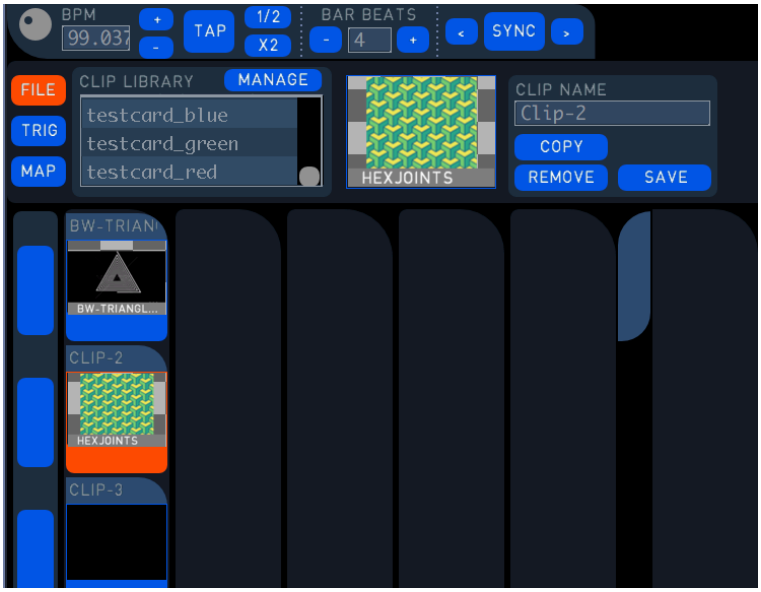
MIDI clock functionality is described in better detail in Section 4.2

2.1.6 FILES

As described earlier, the Clip is essentially a small file containing all the data on a layer (except for the media file itself). The Clip file also contains GENER8 specific data *(e.g. DMX triggers, MIDI maps, modulation envelopes, etc.)*.

When you select a Clip (by pressing the top section of the Clip), an orange square will highlight it to indicate the selection and the Clip Inspector section will open up, allowing you to edit various functions pertaining to that Clip.

It is divided into 3 pages which are selectable by the tabs on the left hand side: FILE, TRIG & MAP.



NOTE: It is possible to select and edit Clips which are not currently active on the layer. While extremely useful, this can sometimes lead to confusion when changing media, so be wary.

EDITING NON-ACTIVE CLIPS

Here we have an example of a non active Clip which has been selected (showing the TRIG page). We can see from the Media Panel that the file 'Hex Joints' is selected and the active Clip (with the orange trigger button) also shows the preview of the 'Hex Joints' media file.

Our selected Clip however is the top Clip in the layer column and is highlighted with an orange square around the preview. This Clip is not active on the layer but we can adjust some of its settings, such as Follow Actions. You can see that the 'Clip Name' correlates to the name above the Clip selector ('BW_Triangles') and its 'Media' value is '1' which is the correct media ID for 'BW_Triangles' (*Modul8 numbers its media files from 0-1023, and so ID 1 is the second position in the media panel*).

NOTE: It is possible to adjust the Media number here to switch the Clips associated media file without first triggering the Clip.

We will be covering the various options of the Clip Inspector in more detail later, but first let's go back to the FILE page.

Here we have access to our Clip Library. The Clip Library is a pool into which you can save your Clips, and remains available across all of your Modul8 projects. This makes it possible to take a Clip from one project, save it to the Clip Library, and open it within any other project.

To Save, Simply choose a descriptive name to give your Clip, then press the SAVE button and your Clip will be added to the Clip Library. *NOTE: Saving Clips is disabled in the Demo version.*

The Clip Library has no limit to how many Clips can be stored.

Opening Clips from the Clip Library is just as simple:

- Create a new Clip (by selecting an empty Clip slot)
- Scroll to the item you wish to open in the Clip Library list, then select it.

If your Clip is active, then the newly loaded Clip will update your layer settings, and do so in a quantised fashion, otherwise you will need to trigger your Clip to see what it looks like.

Saved Clip files contain information about associated media files, such as file location. As long as the media file is still available at that location it will be automatically loaded into your Media Panel when opening Clips from the Clip Library.

NOTE: Saving Clips into the Clip Library does not store your project or any sequencing arrangement you may have recorded. To save a whole GENER8 project you simply need to save your Modul8 project as normal. Upon reopening a saved project file, all of your GENER8 set should be restored.

The right hand section of our FILE page offers us the ability to rename our Clips, Copy, Paste & Save into the Clip Library.

Once a Clip has been copied, a 'PASTE' option will appear next to the 'COPY' button. Simply select an empty Clip slot and press 'PASTE'. This action will not re-trigger the Clip, so make sure to trigger it if you wish to see the result.

Copy/Pasting Clips is a good method for building up subtle changes in your arrangement. Controllers can be tweaked for each successive copy and they can then be put together into sequences with *Follow Actions* (see Section 2.1.8).

2.1.7 CLIP LIBRARY

The Clip Library viewable from within the the Clip Inspector is fine for quickly saving and loading Clips, but your Clip Library can quickly become large. To deal with larger libraries it's time to open up the Clip Manager.

To access the Clip Manager press the 'MANAGE' button above the Clip Library list.

Once clicked an new file dialogue opens up giving us much more space to see what's going on in our library.

The library is organised into 2 sections - TAGS and CLIPS.

Our right hand column contains our CLIPS. Here it is possible to rename, copy and delete Clips from our library. And if for some reason you are feeling particularly reckless you can wipe your whole Clip Library by pressing the 'RESET' button.

To rename a Clip, select it from the list and edit its name in the text box above the list.

To copy a Clip into the Library, simply select it from the list and press 'COPY'. A duplicate of that Clip will be created in the library with an index prefix applied to its name. It is likely that this will be toward the top of your list so you may need to scroll upward to access it.

Once a Clip is selected a 'LOAD' button will appear beneath the Clip list. Pressing the Load button will add the selected Clip to the selected Clip Slot.

To our left we have the TAGS section. Tags are user defined and work a bit like folders, once selected you will only be able to access the Clips associated with that tag. Pressing the '..' or 'VIEW ALL' button will return you to your complete Clip Library.

Tags can be applied to any Clip, and each Clip can have multiple tags. To create a Tag press the 'NEW' button beneath the Tag list, then select the tag to rename it via the text box below.

Once you have some Tags they will need to be applied to your Clips:

- Press the 'TAG CLIP' button at the top of the tag list.
- Select a tag.
- Click on all the Clips you wish to associate with that Tag.
- Either select another tag to continue tagging or press 'TAG CLIP' again to finish tagging.

NOTE: When a tag is selected our Clip list is filtered to show only the Clips associated with that tag - even if the Clip Manager is closed.

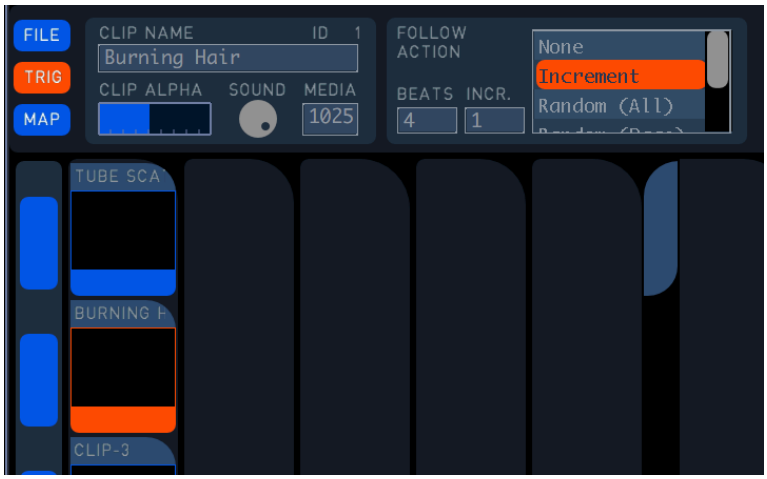
The only way to select or deselect tags is through the Clip Manager.

To leave the Clip Manager press the CLOSE button on the bottom right of the Clip Manager.

2.1.8 SEQUENCING WITH FOLLOW ACTIONS

The Launchpad has a very powerful feature for sequencing your Clips - *FOLLOW ACTIONS*.

A *Follow Action* is a trigger event which is programmed to happen after a Clip has been triggered, for example we can program our Clip to trigger a random Clip on the page 16 beats after our Clip is activated.

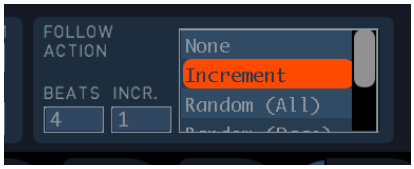


To access the Follow Actions section, select the Clip you wish to work with, then select the TRIG page of the Clip Inspector.
The Follow Actions section appears on the right of the Clip Inspector.

Applying a Follow action to your Clip is as simple as selecting an action from the list and setting the trigger delay (measured in beats). Once a setting is applied you will need to re-trigger your Clip to activate the new settings.

There are lots of different Follow Actions we can apply to our Clip:

- INCREMENT – Triggers to a specific Clip by using a numeric value (positive = move down, negative = move up, zero = re-trigger).
- RANDOM (ALL) – Triggers any Clip on the layer, on any page.
- RANDOM (PAGE) – Triggers any Clip on the same page.
- OTHER (ALL) – Triggers any Clip on any page except itself.
- OTHER (PAGE) – Triggers any Clip on the same page except itself.



Most Follow Actions require only a value for the trigger delay, but the INCREMENT action is special. INCREMENT lets you target specific Clips in the layer column by numeric value.

When you select the INCREMENT action from the list a further setting 'INCR.' appears. This is the value we will use to target our next trigger.

A value of '1' will trigger the next Clip Slot down, a value of '2' will trigger the slot 2 Clips down and so on. A value of '-3' will trigger the Clip 3 slots above our Clip. Minus values move up, positive values move down.

If there is no Clip available in the targeted Clip slot, our Clip will re-trigger itself after the selected beats value.

When working with Follow Actions is is important to remember:

- A Follow Action will only Trigger Clips in the same layer.
- Values of whole beats can only be used to delay the trigger.
- Changes to a Clip's Follow Actions will not take effect until it is re-triggered.

To disable a Clip's Follow Action select *'None'* from the list.

A further tutorial on Follow Actions can be found at:
http://collectedconsciousness.net/tutorial-sequencing-clips-with-follow-actions

2.1.9 MIXING

Mixing with Clips is a somewhat different paradigm than mixing layers in a standard Modul8 set (if there is such a thing), and so we need a new paradigm for mixing.

If for example we had a group of 5 Clips cycling in a sequence on a layer with some follow actions. Imagine that some of the Clips in the sequence required a bit of transparency, while others need to be fully opaque. Now let's say that we want to slowly fade that layer. Adjusting the layer alpha value via the main Modul8 interface would affect each Clip in the sequence and every time the next Clip is activated the alpha value would be reset. In this instance it would be beneficial to set a maximum alpha level for each Clip and then to fade the entire layer with one control. And this is how our level controllers function.

When mixing video and audio from media we are concerned with 2 controllers (*keywords*), the video alpha and the sound level. *('ctrl_layer_alpha', 'ctrl_layer_soundOutLevel')*. We are able to target both of these at the Clip level, but also to group these values at the layer level.

The principles of working with sound levels are the same as working with transparency levels (alpha) with regards to our Clip. Note that by default our sound level is linked to the alpha & crossfader, meaning that changes in alpha also affect sound, and for most situations this is sensible but it may be worth keeping this in mind as you can change this in the main interface.

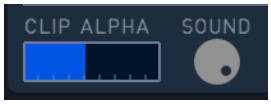
If you do not work with sound outputs in Modul8 it is useful to disable the sound output in Modul8's preferences as this will free up some valuable resources.

It is worth noting that GENER8 handles Alpha values somewhat differently to other controllers as Alpha is a somewhat unique quality.

While all of your other controller (keyword) settings will be saved into the Clip Library, the Alpha value is omitted. And so when loading a Clip from the Clip Library it's Clip alpha value remains unaffected to avoid any conflict with the layer alpha.

To view our options, first select a Clip and then press the TRIG option on the left side of our Clip Inspector. You should now have access to two options for mixing video and audio, plus a numeric 'MEDIA' value input which will be explained in the next section.

Our mixing controls are the 'CLIP ALPHA' & 'SOUND' values and these are related to the faders at the base of each layer column, but specific to each Clip.



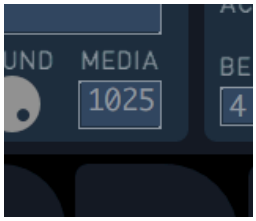
At the base of the layer column are the layer level faders and mutes. These work as master levels for all Clips on that layer. The left fader is your layer alpha and the button above it the mute (layer hide). The right hand fader in this section is the layer sound level. *The button beneath the sound level fader is a Selected Row Trigger - see section.*

Layer levels differ from the levels in the main Modul8 interface in that they are proportional to the Clip levels. If a Clip has an alpha setting of 0.5, setting the layer level to maximum will produce a alpha value of 0.5 *(0.5 x 1.0 = 0.5)*, whereas setting the layer level to 0.5 will produce an alpha value of 0.25 *(0.5 x 0.5 = 0.25)*. This allows you to give your Clips fixed transparency levels.

NOTE: Setting your Alpha or Sound level via the main Modul8 interface will directly adjust your Clip's alpha and sound levels. Clip alpha will be set at 1.0 and Layer alpha will match the alpha value in the main interface.

All of this may sound a little confusing, especially as it is a different way to perform. In essence it is just another tool to sharpen your VJ-ing. The best way to understand is, of course, to play.

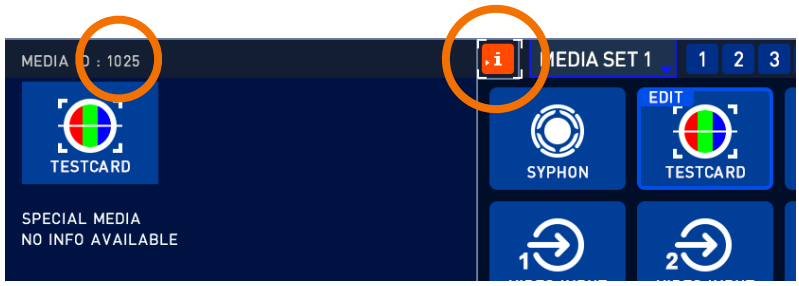
2.1.10 MEDIA TARGETING



As briefly covered before, there is an option for 'MEDIA' in the TRIG pane of the Clip Inspector. This media value relates to the ID of media files in the Media Panel.

Media IDs start at 0 - 1023. Special Media (such as test cards) have IDs in the range 1024 - 1036.

Should you wish to find this number in the Media Panel, first select the [.i] information button on the top left of the Media Panel, then select a media and it's information page will open. The listing for its ID is present in the top left corner.



NOTE: For Modul8 versions below 3.0 the media panel is limited to 128 files with media IDs ranging from 0-135.

The default media value for an empty (*new*) Clip is '9999', this indicates that no media has been assigned to the Clip.

2.1.11 RECORDING

Now that you've got the hang of creating some Clips and triggering them in all kinds of fancy quantized fashion, you may want to lay down an arrangement. Luckily, this is as simple as pressing a button.

Earlier in this manual we briefly discussed recording arrangements via the REC key in the transport section. But before we hit the record button, let's first define what an arrangement actually is:

When recording an arrangement, the Launchpad module creates a log of each Clip trigger you make with a time-stamp and layer reference.

What an arrangement doesn't record are any controller changes made during your performance. Controller changes will be captured into the Clips as normal, but when an arrangement is replayed it will not reset any controller values to their original values.

If you wish to capture a performance with control settings then use the built in record function in Modul8.

So, what is the benefit of recording our arrangement in this manner? Answer: 'Edit-ability'. Yes, unlike the built in record function in Modul8, GENER8 has the ability to edit recordings. This requires a different module however - the Timeline module.

The Timeline module allows us to view and edit our arrangements. In the Timeline module you will be able to shift triggers back and forth, delete triggers, manually add triggers and apply quantize functions to your arrangements. And with thousands of Clips available, each with their own individual timelines for controller envelopes, the possibilities really are endless, and because this is Modul8 it's all non-destructive real-time editing.

To start recording a performance simple press the REC button in the transport section at the top of the module. While recording your arrangement the REC button will flash. To come out of recording, either press the Play/Pause button or hit the REC button a second time.

After recording an arrangement the 'AR' button will be visible and on. This indicates that an arrangement has been recorded and that it will play back as soon as the timecode starts running again. To turn off playback simply toggle the AR button.

NOTE: Be wary of loop settings when recording arrangements. Trigger events will continue to be added to your arrangement as the loop cycles so you may end up with a jumble. To avoid this, turn off the loop.

Recorded arrangements will be saved with your Modul8 project file. On opening a Modul8 project with a recorded arrangement the AR button will be visible to indicate an arrangement is there, but disabled. To play back the arrangement toggle the AR button.

All editing of your arrangement will need to be carried out in the GENER8 Timeline module. The Timeline module is covered in detail in Section 2.3.

2.1.12 LFO

The Launchpad module is equipped with 3 LFO modulator signals, similar to those found in retro analogue synthesis. LFO stands for Low Frequency Oscillator and are usually waveforms which cycle way below audible frequencies.

LFO signals can be used to modulate the various controllers on your layer. With the help of other modules (such as '*LFO to MIDI*') they can be converted to other signal types and sent out of Modul8 to control other devices or softwares.

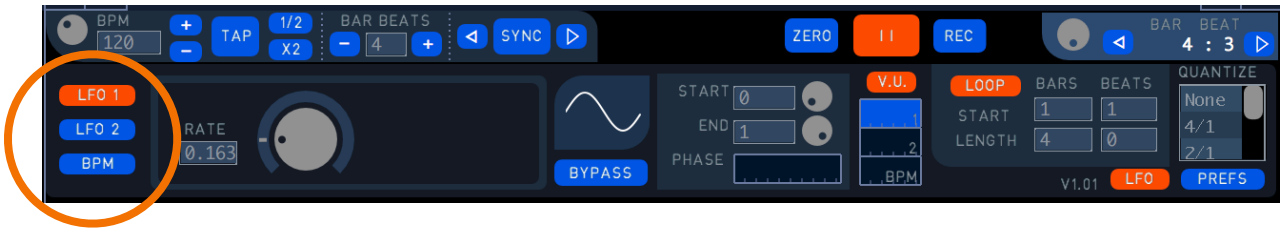
LFO signals can be easily routed to Modul8 your layers controllers through the Editor module. Each Clip can have controller modulation routings which react to the LFO signals in varying amounts. But before you start adding routings let's look at how to make our LFO signals. If you wish to apply modulation to master controllers (eg. *ctrl_master_crossfader*) then use the '*LFO Router (Master)*' module.

The LFO section is basically an embedded version of the LFO module. For those of you familiar with this module the controls and concepts should be quick to grasp.

DO NOT run the LFO module while using the GENER8 Launchpad.
You may still use the LFO Router modules if required.

To access the LFO section press the LFO button on the right hand side beneath the Loop section.

Our LFO section has 3 panes (one for each oscillator). You can access the settings for each oscillator via the buttons on the left side of the LFO section.



LFO1

The first oscillator is the simplest and many settings are identical for each oscillator. From left to right:

- RATE - This controls the frequency (speed) of your LFO signal. There is a V.U. meter to the right of the LFO section which displays the signals of each LFO in realtime, as you adjust the RATE value you will notice the V.U. meter react. You can turn off the V.U. meter to save resources. Setting LFO1 to zero will turn off the oscillator. *TIP: To achieve very slow frequencies it helps to input the value numerically (eg.'000.1').*

- WAVEFORM - In the centre of the LFO section is a button displaying the style of waveform the oscillator will generate. Pressing this button will cycle through the waveforms types. Available wave-shapes are SINE, SQUARE, TRIANGLE, RAMP-UP, RAMP-DOWN & RANDOM.

- START/END - It is possible to limit the range of your wave shapes to avoid unwanted peaks and troughs with the Start & End dials.

- PHASE - The phase fader offsets the start of the wave cycle to allow for accurate syncing of your oscillator.

LFO2

LFO2 is very similar to LFO1 with one exception, LFO2 can itself be modulated by the signal from LFO1. When an LFO1 signal is applied to LFO2 the rate will be multiplied by the level of LFO1's signal, this is called Frequency Modulation.

To apply this modulation:

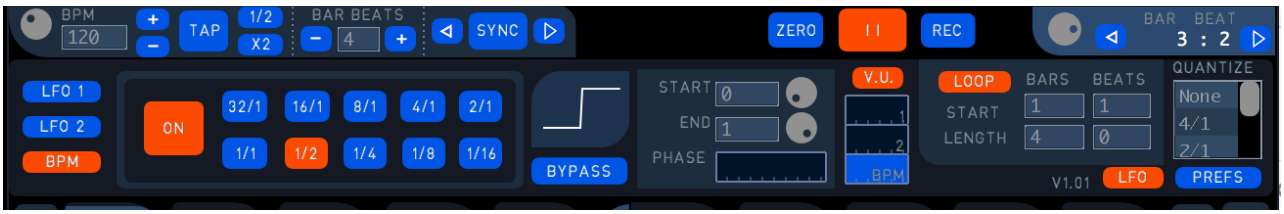
- First ensure that your LFO1 signal is running (*it is useful when testing to start with a fairly low frequency for LFO1 eg. 0.05*).

- Next, press on the LFO to button to access LFO2's settings and set a rate for LFO2 (again, a value of 0.05 will achieve visible results).

- Gradually increase the '*LFO1 IN*' value and you will see your frequency modulation take effect.

All other settings for LFO2 work the same as LFO1, eg. *waveform, phase* etc.

BPM (LFO3)



As with our other LFOs the BPM oscillator can output in various waveform styles (sine, triangle etc.), but this oscillator is governed by our TIMECODE clock signal and is very useful for making modulation signals which are in sync with our performance.

IMPORTANT: Make sure the Clock is running if you wish to use the BPM LFO.

The BPM LFO has an on/off toggle and a number of buttons for setting its rate.

The top row of rate buttons are longer settings and measured in multiples of bars (*a setting of '4/1' will cycle every 4 bars, '32/1' will cycle every 32 bars*).

The bottom row of rate buttons are shorter frequencies and are measure in divisions of bars (*a setting of '1/4' will cycle 4 times every bar*).

NOTE: A full waveform cycle contains both the positive and negative portions of a wave. *eg. a complete square wave cycle will output both a '0' and '1' before repeating, so in a 4 beat bar a rate of '1/2' will switch at every beat.*

BYPASS

Our LFO generator is also equipped with a BYPASS toggle button. This function will turn off all LFOs. LFO settings will be retained while the bypass is active.

The LFO signal is also developer friendly. The Launchpad output the LFO values in a script accessible way. More on this in the developer section.

2.1.13 MIDI / DMX

Every Clip has the ability to produce both a MIDI and DMX signal on activation. More complex MIDI and DMX data can be output from the 'GRiD Sequencer' module, but there is a basic functionality within the Launchpad to assist with triggering external external devices.

For example a Clip can be set to output a MIDI note which can then be mapped to activate a sound in a DAW software. Or a DMX signal can be sent to turn on a strip of LED in your stage installation.

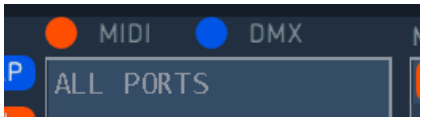
Conversely we can use incoming MIDI and DMX data from another software or some external device to directly trigger by a Clip. Mapping Clips to external DMX or MIDI is simple.

Before attempting MIDI or DMX communication to GENER8 you will first need to ensure Modul8 is set up correctly to receive and send MIDI or DMX data. This can be done through Modul8's preferences (cmd ,). Please refer to Modul8's reference manual if you need help with this.

Our MIDI & DMX settings are accessible through the 'MAP' pane of the Clip inspector (first select the Clip you wish to map by clicking on the top half of the Clip, then press the 'MAP' button on the left of the Clip Inspector).

If you wish to set your Clip to be triggered by an external input signal, the simplest way is through the MAP function. Once in mapping mode the Launchpad will listen to incoming MIDI and DMX data and assign the first signal it hears as the trigger for your Clip. Before using the mapping function turn off all MIDI or DMX signals to isolate the signal you wish to use.

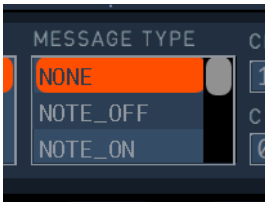
With no incoming MIDI or DMX press the MAP button and then specify which type of signal with the options at the top. Then send your signal (eg. press a button on your MIDI controller) and your done. The Clip Inspector should now



switch to the IN pane and display information about the received signal. Now mapped, the next time you send the signal this Clip will instantly activate.

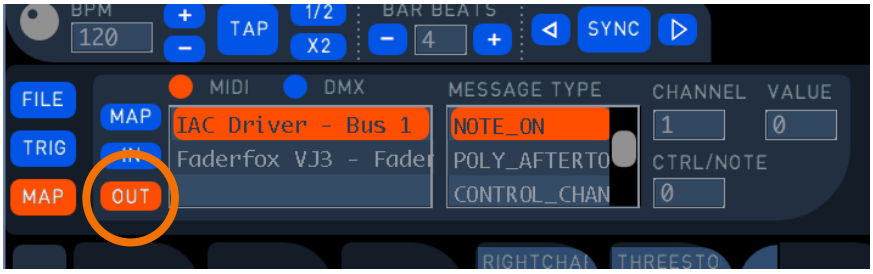
> Clips triggered by mapping external MIDI or DMX signals are not subject to any quantizing and so will be activated *instantaneously*.

If you wish to map signals manually it is easy to do so by entering values into the 'IN' pane. This is useful if you have a lot of data coming in to your system that cannot be turned off as mapping an input requires signals to be isolated.



To remove a MIDI input mapping set the 'Message Type' to 'None'.

APPLYING EXTERNAL TRIGGERS

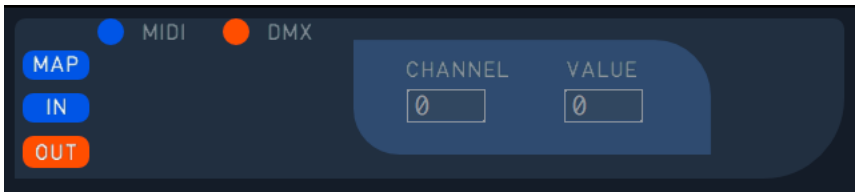


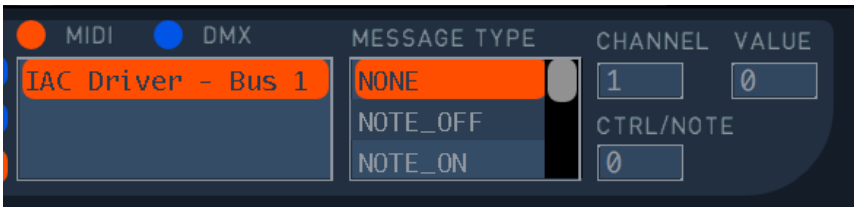
Sending signals out from the Clip is a similar set-up process to the manual input *above*. First determine the precise control values your external equipment is using (eg. DMX channel, MIDI Note value, etc), then select your Clip, open the MAP section of the Clip Inspector and select the 'OUT' option.

At the top you have the message type options. Select the option you require. The Launchpad does not restrict you to sending (*or receiving*) one type of message, it is possible to send & receive both MIDI and DMX signals - if you require both simply toggle between the options to input your settings.

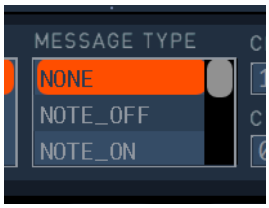
For DMX our values are limited to a single universe. The universe is set within Modul8's preferences which allow you to specify the output device, subnet and universe. If you intend to use other applications with DMX (such as *MadMapper*), it is worth having a dedicated DMX interface for Modul8 as each application tend to steal priority for interfaces as they open - *e.g. you will not be able to address a DMX interface which is already connected to Madmapper.*

DMX channel numbers range between 1 and 512. A channel number of 0 will not output any DMX signal. So, to turn off the DMX trigger set the channel value to 0. The 'value' option allows you to set a level in a range of 256 values (0-255), allowing you to turn a fixture on, off or somewhere in between.





For MIDI outputs the layout and principle is again the same as our MIDI input options with one exception - the *value*. Input signals activate a Clip irrespective of the Value, but with an output the value can be critical. For NOTE type messages the *value = velocity*.



Applying a *Message Type* of 'NONE' will turn off the MIDI output.

NOTE: Clips do not require media to be assigned to be able to send & receive MIDI or DMX signals. Just create an empty Clip then add your signal values.

Empty Clips will take priority on a layer once triggered, cancelling any media already active - you may like to set up a separate layer for your control signals.

2.1.14 MIDI CONTROLLERS

MIDI controllers (and to a lesser extent '*key mappings*') are great for adding a more tactile working surface to Modul8. If you work with MIDI controllers and are used to Modul8's Mapping functions, then it is fairly straight forward to connect up most of the functions in GENER8. Some functions are standard and obvious choices to apply a mapping such as BPM tap, and SYNC, but to map the whole of the Launchpad's trigger buttons would require quite a lot of patience. And so, apart from dedicated mappings for a number of popular controllers I have built in some specific functions to assist the process.

Applying a MIDI mapping is quick and easy in Modul8:

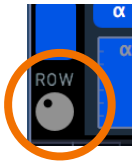
- *Select the MAPPING menu, the 'Edit MIDI Map' (Shift + Command + M).*
- *Select the control you wish to 'Map' to your MIDI controller.*
- *Then press the button (or adjust the dial) on your controller you wish to connect up.*
- *Turn off 'Edit MIDI Map' again through the Mapping Menu*

There is more to mapping than the simple process above, such as saving MIDI maps, but for this info please refer to the Modul8 Reference Manual.

Enter the *ROW SELECTOR.*

The Row Selector is a method which allows you to target all of the the Clip and Row triggers with a minimal amount of buttons.

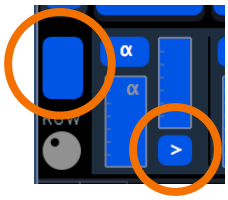
You may have noticed down the centre column of the Launchpad module is a light blue highlight which indicates the selected row. This function is paired to a number of other buttons which trigger the Clips on the selected row.



The *selected* row is set by selecting the position in the centre column of the module *(shown above)* or by adjusting the 'ROW' knob on the bottom left (*shown right*).

You can select the row by:

- *Selecting a Clip on the row.*
- *Clicking on the Row Focus position in the centre column*
- *Using the ROW knob on the bottom left of the module.This knob is for MIDI mapping.*



There are *Selected Row Triggers* at the base of each layer, and a *Selected Row Trigger* at the base of each Row Trigger column. These buttons along with the ROW knob are the designed to be mapped to your controller. Once these 13 functions are mapped you will have fast access to trigger every available Clip in the Launchpad.

MIDI mapping functionality does not stop there though, there are custom mappings integrated into the code for a number of common controllers - *Novation Launchpad, Korg NanoKontrol & TouchOsc for iPad*.

The specifics of these will be covered in the next sections.

2.1.15 NOVATION LAUNCHPAD

As the format of the GENER8 Launchpad follows the style of Ableton's session view, it only seemed logical that attaching an Ableton MIDI controller to would make perfect sense, and for the most part, it has.

Novation's Launchpad controller, a simple and reasonably inexpensive device provides us with a 64 pad grid along with some other navigational buttons. I have included support for the 1st 3 versions (*Launchpad, Launchpad S, Launchpad Mini*). Any users with any other versions please contact me if you'd like me to expand the range.

Novation Launchpad 1

While we like the eternal '8' theme in MODUL8, there are 10 layers (2 banks of 5) which means our Clip view does not quite fit onto a 64 pad device, and so I decided to go with a 2 page set-up which is navigated by the cursor keys enabling to flip between banks A & B. This leaves us with 3 empty columns.

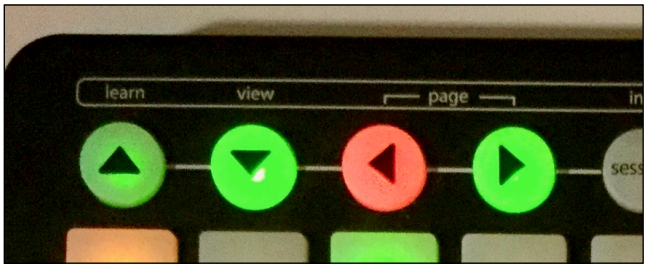
The far right column is utilised for some function buttons, and the other 2 columns are free so you have 16 pads available for assigning to you own favourite midi mappings.

All mapping is done within the *USER 2* mode, so your Novation can still be used with *Ableton Live* while running GENER8.

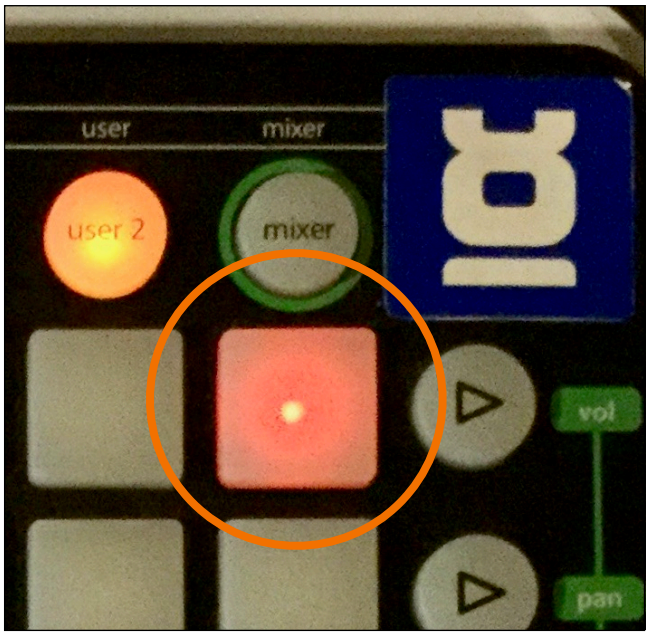
FUNCTIONS

KEY for notation: *Pad number reference for main grid.*
(top left = pad-1) > (top right = pad-8)
(bottom left = pad-57) > (bottom right = pad-64)

- *Works only in 'User 2' mode.*

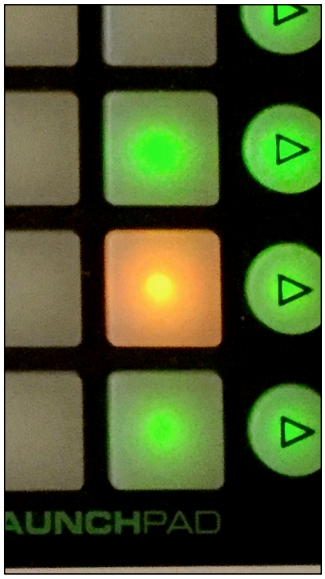


- *View A or B Groups (</>round buttons)*
- *Scroll pages (up/down cursor buttons)*

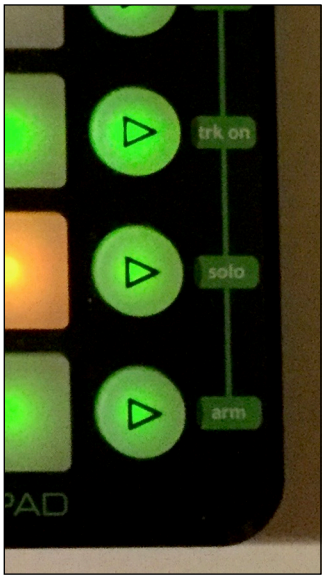


•*Works in three 'modes': Trigger / Select / Media (pad-8 to select mode)*

- *MODE i Trigger Clips (Trigger mode – YELLOW)*
- *MODE ii Select or create Clips & layers (Select mode – RED)*
- *MODE iii Select media from the Media Set. (Media mode – GREEN)*



- *Arm Timeline recording. Red = Armed (pad-48)*
- *Start/Stop Clock. Orange = Running (pad-56)*
- *Tap BPM (pad-64)*



- *Row trigger buttons will trigger rows in trigger mode.*

MEDIA MODE

In media mode, the launchpad becomes a virtual media panel. The central 16 pads will light up indicating which media slots contain media.

- *A BRIGHT GREEN light indicates that there is a media loaded into that slot.*
- *An ORANGE light indicates that the media is active on the layer.*

Press the row trigger buttons on the right to change media pages. Active pages will light up ORANGE.

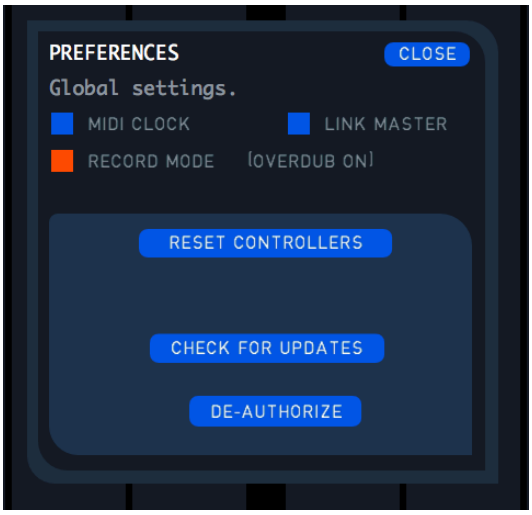
The left column on the grid changes the media set group - ***Modul8 3.0 or higher only.***

To access the Special Media page double tap on the bottom row launch button.

When the Special Media page is active the central grid should mimic the layout of the SP page in the media panel and the bottom row trigger will light up RED.

NOTE: GENER8 checks for MIDI controllers on start-up.

If you forget to attach your controller first, either press any pad on the Novation or open the Launchpad preferences and hit the RESET CONTROLLERS button to refresh the pads.



If pads become unresponsive, or you need to refresh – press 'User 2' button.

2.1.16 KORG NANOKONTROL

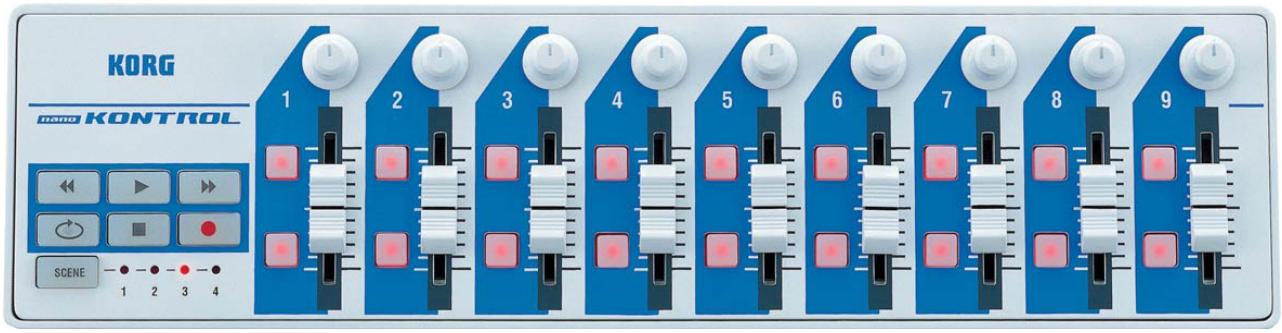
As the Korg nanoKONTROL is such a popular MIDI controller, largely due to its minimal price and the fact that it has often been bundled with softwares, I have integrated some simple mappings for the device.

Both n*anoKONTROL* and n*anoKONTROL 2* are supported.

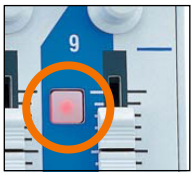
With the nanoKONTROL, we follow the Selected Row Trigger method for mapping, but there are other useful functions mapped in too.

To leave your controller open for use with other apps, GENER8 mappings are available in SCENE 3.

Our channels are banked as 2 separate groups of 5 (for *layer groups A & B*) and are switched with a toggle button on channel 9. This leaves channels 6 > 8 free to use for your own mappings.

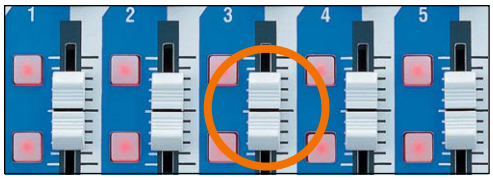


Works in SCENE 3, leaving you plenty of space to map your own controls.



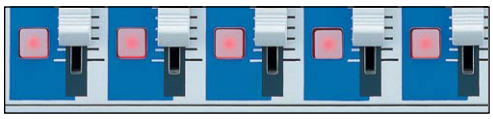
Toggle between A/B layers (top push button 9)

Select active row (knob 9)

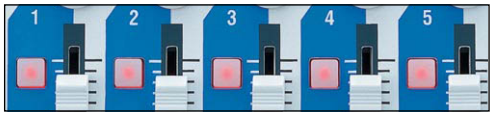


Adjust layer transparency/alpha values (faders 1-5)

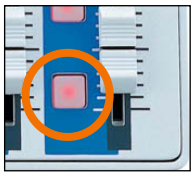
Adjust layer audio volume (knobs 1-5)



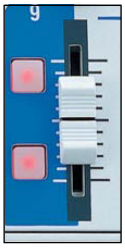
Trigger clip on active row (bottom buttons 1-5)



Show/Hide layers (top push buttons 1-5)



Trigger entire active rows (bottom button 9)



Dedicated crossfader slider (fader 9)

Transport controls trigger various Timecode functions. Play/Pause, Stop, Record, Loop On/Off, Sync <, Sync >

Pressing Stop will reset the clock to 1:1

Korg nanoKONTROL 2 is also supported. *Refer to the above mappings.*

2.1.17 TouchOSC

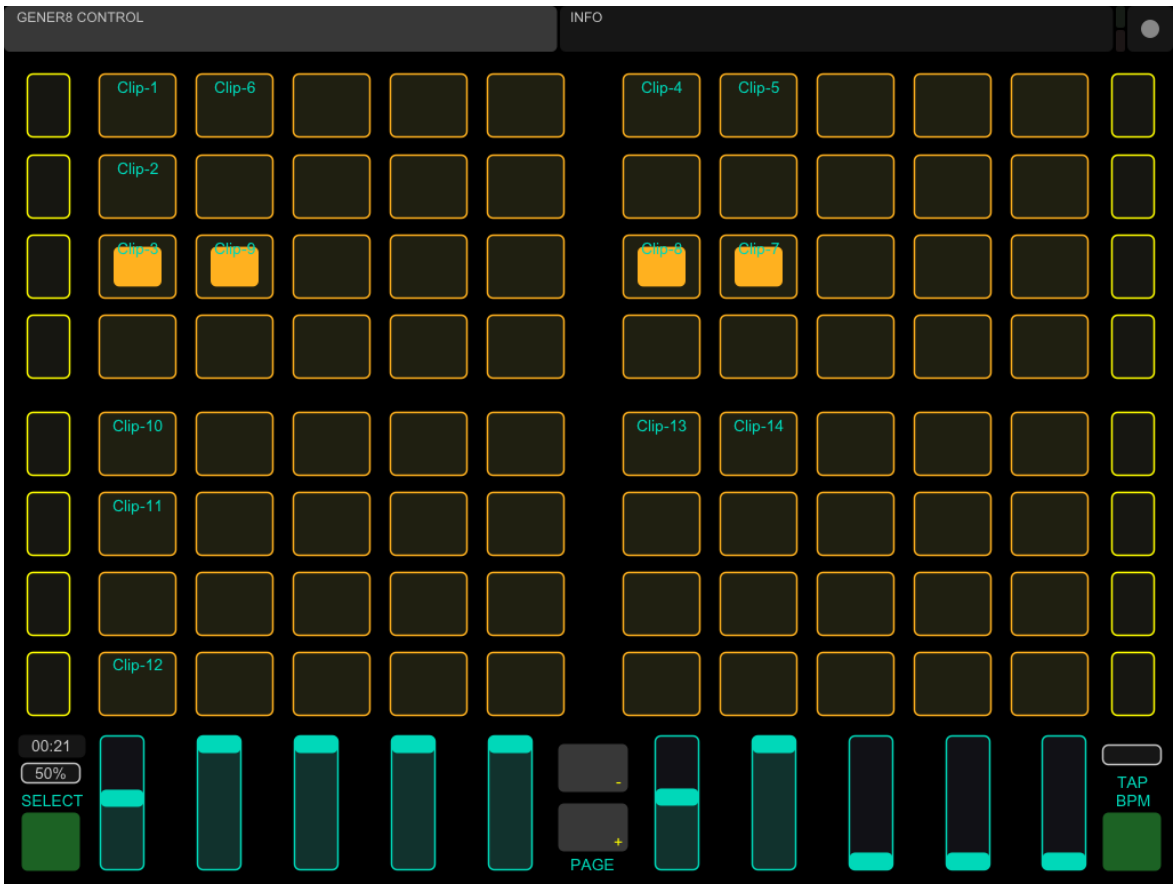
With Modul8 3.0 the powerful new feature of integrated OSC communication (*Open Sound Control*) is available, and so I have created a rudimentary iPad patch for for the popular OSC control app TouchOSC.

TouchOSC is available as an app for iOS and Android devices. On the developer's website (http://www.hexler.net) you can find information about how to purchase TouchOSC for your device and download the free TouchOSC editor that allows you to create your own interfaces and upload patches. TouchOSC is also a great way to revive near obsolete devices as it will run happily on very early os versions.

To download the TouchOSC patch for GENER8 visit the downloads section of our website: http://collectedconsciousness.net/downloads/

Once you have downloaded the patch you will need to load it into the TouchOSC Editor and connect your tablet. Follow TouchOSCs instructions on how to sync your tablet and snd a patch to TouchOSC.

Our patch is a single page controller which works as a basic Clip launcher with a layout that closely matches the Launchpad module.



The functions are as follows:

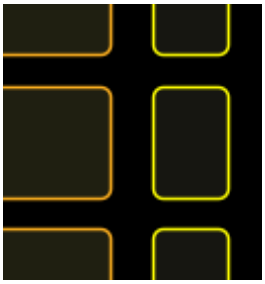
CLIP LAUNCH BUTTONS

The position of the orange launch buttons relates directly to the layout of the Clips in the Launchpad module.

The name of the Clip is displayed on the button. Buttons without names are empty Clip slots.

When SELECT is pressed the launch button will select a Clip or create a new Clip if none is present in that slot. Selecting an empty Clip on an inactive layer will NOT create a new layer.

ROW TRIGGER BUTTONS



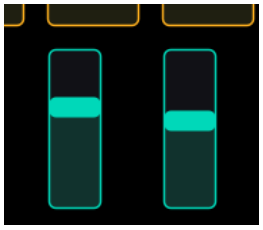
We have two groups of Row Triggers, which will trigger all Clips in that row for that layer group. Row triggers on the left trigger 'A' group layers 1-5, and row triggers on the right trigger 'B' group layers 6-10.

When SELECT is pressed the row triggers behave in A+B mode (ie. they will trigger both banks of layers). This applies to both A and B row triggers.

PAGE UP + DOWN

The page buttons scroll between Launchpad pages. They are also useful for refreshing the screen.

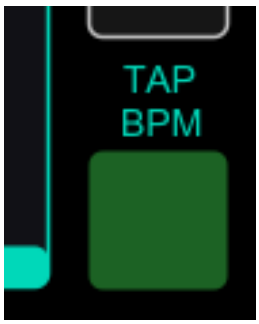
LAYER ALPHA FADERS



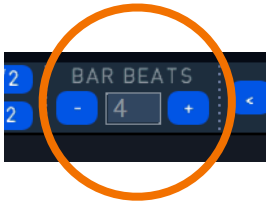
The blue faders across the bottom affect the Layer Alpha value for the Launchpad module.

For an explanation of Layer Alpha principles see Section 2.1.9

TAP BPM



Tap rhythmically to set the BPM tempo. Tap at every beat for a complete bar. The number of beats in a bar is displayed and set in the BAR BEATS value on the top left of the Launchpad module. For a bar beats value of 8 you would need to tap 8 times to update the BPM.



The OSC for this layout is built into the GENER8 Launchpad. You do not need to run any other OSC modules, but ***it does require Modul8 V3.0 or higher.***

DEVELOPER

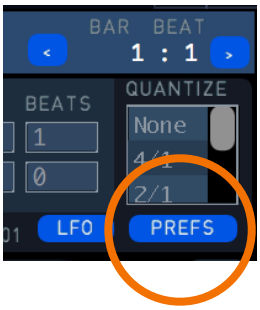
If you wish to develop your own OSC layouts via *TouchOSC* or other popular OSC apps *e.g. Lemur,* it is possible to send (*and receive*) direct control to the GENER8 Launchpad with these keywords:

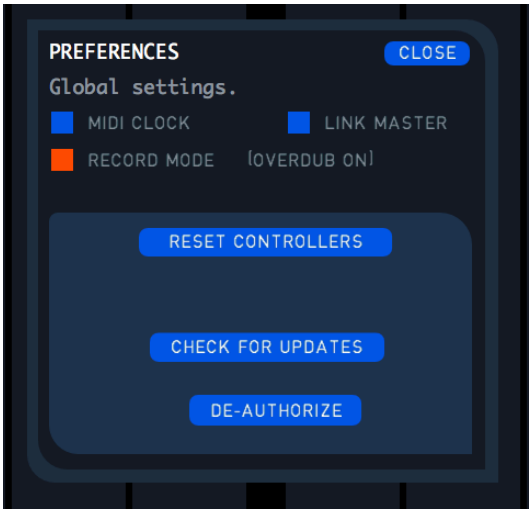
All keys are in the form: /prefix/keyword/layer/row - Our prefix is 'g8key'.

/g8key/clip/1/4	The 'clip' command triggers a clip. *Here we are targeting the Clip on layer 1, row 4.*
/g8key/clipLabel/2/7	READ ONLY. Addresses the name tag for your Clips. *Here we target the label on layer 2, row 7.*
/g8key/row/1	The 'row' keyword triggers the entire row. Here our layer value indicates layer group (1 = group A, 2 = group B).
/g8key/layer_alpha/4	'layer_alpha' affects the Layer Alpha value for the Launchpad. For an explanation of Layer Alpha principles see Section 2.1.9.
/g8key/pageDown/0	Move down a page. Layer value should be 0.
/g8key/pageUp/0	Move up a page. Layer value should be 0.
/g8key/tapBPM/0	Tap rhythmically for a complete bar (default = 4 beats), to set the BPM tempo.
/g8key/select/0	The 'select' function works similar to a shift key in that it modifies other commands. Converts a 'clip' function to a *select/create* Clip function.

2.1.18 PREFERENCES

Beneath the QUANTIZE section on the top right of the Launchpad module lies the 'PREFS' button. Clicking here will open the preferences dialogue, giving you access to a few more features, but only those that are relevant to the Launchpad module - there are further preference settings accessible through the other GENER8 modules (e.g. Editor, Timeline, etc.).



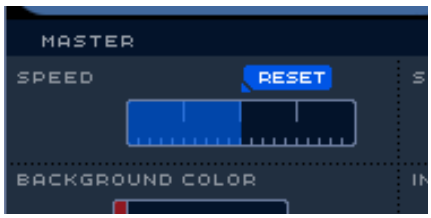


MIDI CLOCK

The timecode can be set to run from an external MIDI clock source. When turned on, the timecode will look for an external MIDI clock source. To learn more about this function see *Section 4.2*.

LINK MASTER

When LINK MASTER is activated the tempo of the TIMECODE directly affects the global Master Speed of Modul8.



At the default tempo of 120 bpm, the Master Speed will be at centre.

RECORD MODE

Timeline recording can be set to work in 2 modes - *Overdub* and *Overwrite*. While in Overdub, any trigger events recorded will be added to the timeline, but Overwrite will clear the timeline before commencing record.

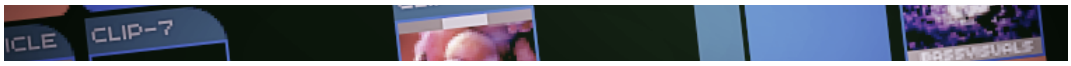
RESET CONTROLLERS

A useful button to look for any MIDI controllers which have been added since the Launchpad was started. GENER8 only looks for MIDI devices on start-up rather than constantly listening which helps save resources.

AUTHORISE / DE-AUTHORISE

For licensing your copy of GENER8 or for removing a license to transfer it to another machine. Licensing of all GENER8 modules is handled through the Launchpad module only.

More about this process in *Section 5*.



And that pretty much covers the Launchpad module. You should now have a good understanding about working with Clips and their basic functions.

We can now delve into the powerful Editor module to see what GENER8 is really capable of…

2.2 EDITOR

2.2.1 OVERVIEW

The Editor module is the main workhorse of the GENER8 system. While the Launchpad handles our clock, project files and sequencing, it is the Editor which is responsible for gathering & updating controller information.

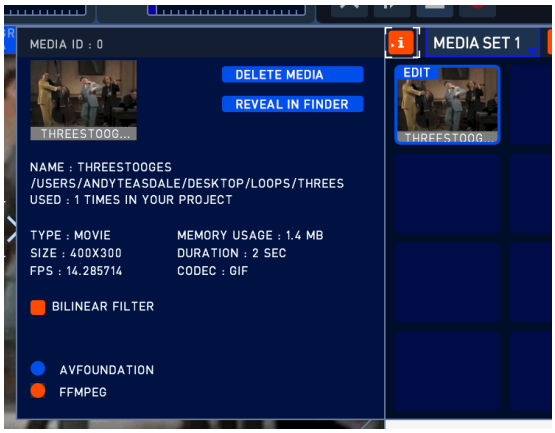
Some of the tasks the Editor manages:

- Recording controller changes to Clip.
- Loading triggered Clips onto the layer.
- Governing media speed to match the BPM with intelligent Auto-Loop function.
- A timeline display for easy visual cropping and editing.
- Making and editing envelopes for keyword controllers.
- Applying LFO modulation routings to controllers.
- Media speed warping.

> Unlike the Launchpad which shows us all Clips, the Editor displays only the *active* Clip on the selected layer, regardless of which Clip is selected in the Launchpad.

2.2.2 HANDLING DIFFERENT MEDIA TYPES

The visual layout of the Editor is dependant on the type of media loaded into the layer. Certain functions will only be available for certain media types (*e.g. Auto-Loop functions are not available for static media such as a still image or video input as they have no frame rate*). All media however is given a timeline onto which we can build modulation envelopes.



Modul8 is fantastic at dealing with many different media formats - *gif, mp4, syphon*, etc. Some of these media types have a time dimension (movie files) while others are considered as only a static frame (*jpg, video inputs, etc.*).

IMAGE LEFT: Here the information pane on the Media Panel displaying info on media types (*in this instance a .gif codec*).

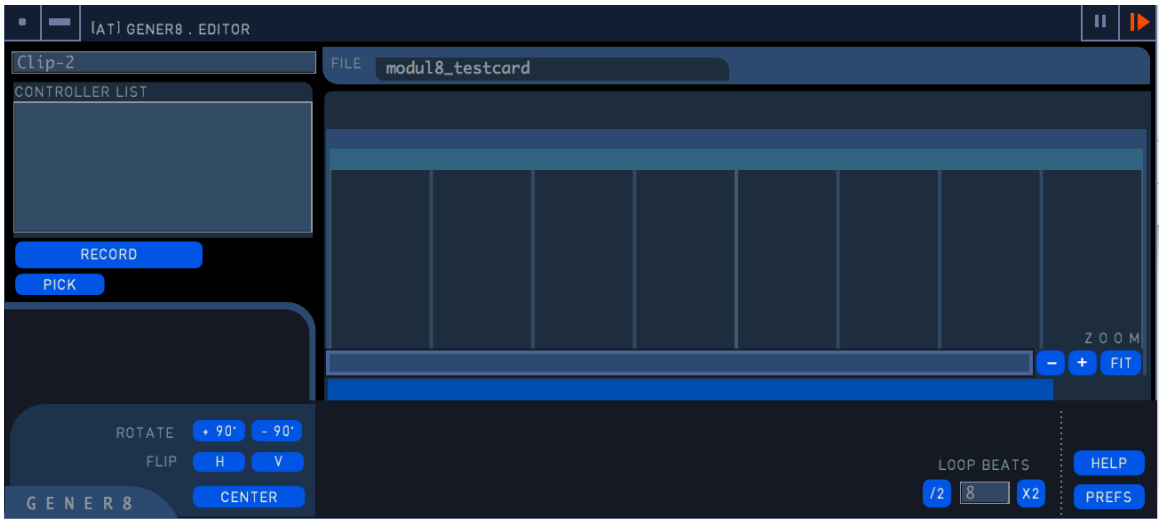
ANIMATIONS

One of the major components of the Editor is the ability to manipulate controller (*keyword*) information over time. Animated media with its own timebase (*movie files, gif animations, image folders*) have a timing which is governed by a frame rate (FPS). Timelines for these media types are linked directly to the media itself. Visually, the Editor gives a representation in beats & bars and shows functions beneath the Timeline to control the media's playback speed.

Example of a gif file loaded into the Editor, showing the SPEED and AUTO-LOOP functions. The media's speed value is adjusted automatically to fit the media into 4 beats.

STATIC MEDIA

When a media type does not contain its own timebase an arbitrary one is applied. This gives us the power to apply controller envelopes to static media so that we can animate them. This new timeline is linked directly to the Timecode signal generated by the Launchpad module, and so does not have a speed value. Visually this is measured in bars & beats. You will notice that the speed controls are now missing and are replaced by a *LOOP BEATS* value.

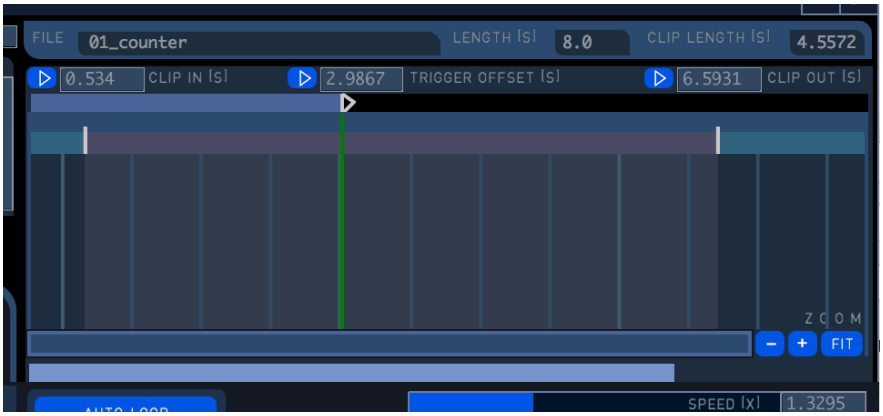


Example of the testcard loaded into the Editor.
The length of the Timeline is now set by the LOOP BEATS value.

Each Timeline function will be discussed in detail later, for now it is important to notice the difference between the two media types and how they change the functionality of the Editor.

2.2.3 NAVIGATING THE TIMELINE

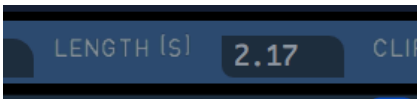
Understanding the Timeline is key to getting the most out of GENER8. With envelope control it is possible to create some truly wonderful animation and effects, and with the beauty of Modul8 all of this processing can be done live and none destructively.



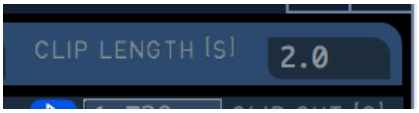
The Timeline shows a lot of data. Some is fixed (eg. Media length), but most is editable. As mentioned in the previous chapter, what the timeline shows is dependant on the media type (*animated* or *static* media).

Let's break this down into the different elements:

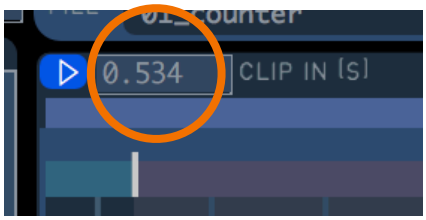
• **FILE** - This is the file name of the media. (*Read only. All media types)*



• **LENGTH** - The original length of the media file in seconds. (*Read only. Animated media types only)*

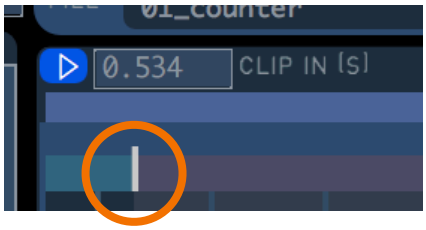


• **CLIP LENGTH** - This is the adjusted length of the Clip in seconds, after any cropping of speed adjustment. (*Read only. Animated media types only)*



• **CLIP IN / CLIP OUT** - The points at which playback starts & finishes in the media file. (*Animated media types only)* There are 3 ways to set this value - *numerically*, *click & drag* or *snap to playhead*.

You can set the Clip I/O points numerically by editing the CLIP IN value or the CLIP OUT value. Useful if you need an exact value. Measured in seconds.



The horizontal bar directly above the envelope area is where you can click & drag to set the I/O handles. The I/O handles are visible as white lines and our playable region will appear greyed out.

Another useful function is the *Snap To Playhead* button. The snap button appears next to the numerical value and has a white triangle outline. When pressed this function will set your I/O point to the current play position - when used in conjunction with the Pause & Frame Nudge buttons this is excellent for creating seamless loops.

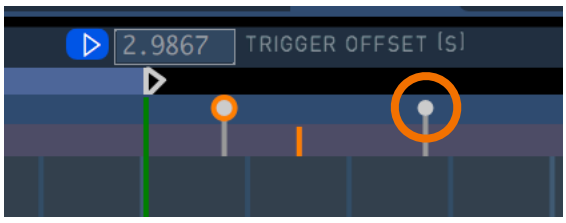
NOTE: While adjusting the I/O values the playhead will move to match the new value so that you can visually see the resulting frame.

- **TRIGGER OFFSET** - Offset the start point of your loop with this marker. The trigger offset is visible as a vertical green line with a triangle at the top.

Trigger offset values can be set by dragging the triangle at the top of the timeline, by adjusting the numerical value, or by clicking the snap to playhead button option next to the numerical input.

By default the the Trigger Offset will be set match the Clip-In point, and will stick to this until it is adjusted.

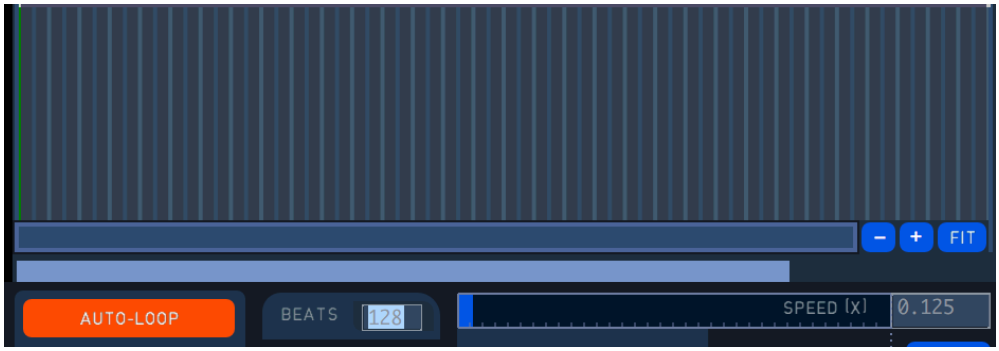
While adjusting the Trigger Offset value the playhead will move to match it so that you can visually see the result.



- **WARP MARKER AREA** - Warp markers allow us to displace the timing of our media by fixing and dragging markers within the 2nd top horizontal bar. Clip warping is a technique for setting a precise timing within our media and will be covered in Section 2.1.11.

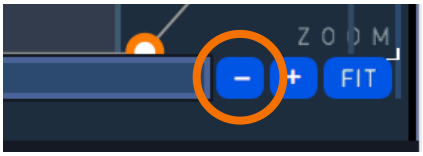
- **BEAT & BAR MARKERS** - Vertical lines to indicate the position of beats. Beat markers are less defined than the Bar markers.

On very long media (greater than 64 beats in length), the number of visible beat markers is reduced to improve visual clarity until zoomed in.

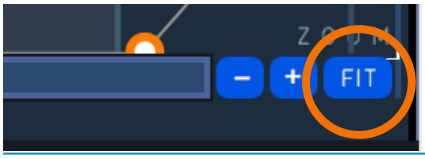


- **SCROLL BAR** - Click and drag to navigate within the Timeline. Drag vertically to zoom in and horizontally to scroll left or right.

- **ZOOM IN** - Incremental zoom in.



- **ZOOM OUT** - Incremental zoom out.



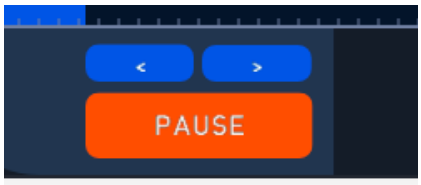
- **ZOOM TO FIT** - Zooms in to fit the loop range.

- **SCRUB BAR / PLAYHEAD** - Clicking and dragging the playhead will scrub (*scratch*) the playback of your media. While scrubbing the playhead GENER8 pauses playback by temporarily setting the speed value to zero for a smooth scratch effect. NOTE: The scale and visibility of the playhead is relative to the timeline's zoom level. *Animated media types only - for static media the playhead is currently read only.*

- **PAUSE / FRAME ADVANCE** - Beneath the Speed slider is a handy PAUSE button. This function will temporarily set your media's speed value to zero, pausing the playback. When deactivated the speed will be restored back to its previous value.

You may notice that the Speed slider above the Pause button is not affected while the Speed in the main Modul8's interface is zeroed. It is possible to adjust the speed value in the Editor while playback is paused, when pause is de-activated playback will resume at the new speed.

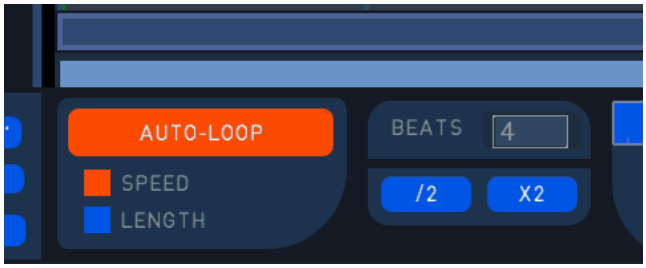
NOTE: Adjusting the speed value in the editor will deactivate the Auto-Loop function if it is set to Speed Mode.



While Pause is active, a further couple of buttons will become visible above it, these are the *Frame Advance* buttons and when clicked will increment the play position by single frames. This becomes very useful when using the many *snap to playhead* buttons.

2.2.4 AUTO-LOOP

One of the most powerful features of the Editor module is its ability to beat match Clips to the current clock tempo by governing the speed or length of a Clip.



This function is called the Auto-Loop and is set via the controls at the base of the Timeline.

When Auto-Loop is active the Editor monitors the BPM and dynamically compresses the Clip so that it will fit exactly into the nearest musical bar. Auto-Loop reacts to any BPM changes and will re-calculate the compression automatically. Auto-Loop is enabled by default when an animated media is added to a layer. It can be deactivated easily by pressing the *AUTO-LOOP* button beneath the Timeline.

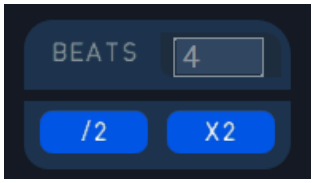
Auto-Loop works in two different modes. The modes are selected by the switches beneath the *AUTO-LOOP* button:

- **SPEED -** The Editor will adjusts the Clips speed value to stretch of compress the Clip so that it's cropped length matches the nearest musical bar. Speed is the *default* setting and will work well for most situations.

- **LENGTH -** In *Length* mode the Editor will trim the end of the Clip to match the nearest musical bar. Length mode does not affect the speed of the Clip.

NOTE: While Auto-Loop is active, changes made to the keywords *ctrl_layer_movie_speedFactor* (Speed Mode) or *ctrl_layer_movie_positionOut* (Length Mode) will be immediately over-ridden.

Changes made to the speed slider or the movie-out position in the Editor however, will deactivate the Auto-Loop function.



While Auto-Loop does its best to predict a useful beat length, sometimes we need to set our own. Adjusting the central BEATS value will force Auto-Loop to compress the Clip to your desired number of beats. Any value can be entered, even fractions (eg. 0.25) so long as it is within the limits of the speed range *(Modul8 can only multiply the*

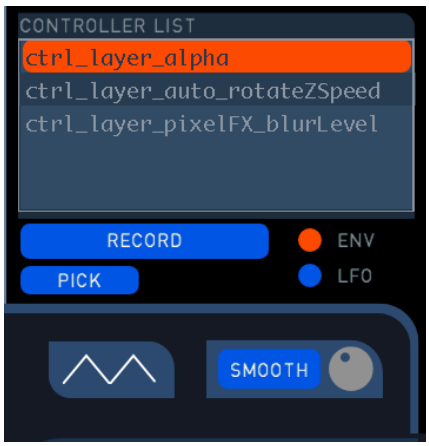
playback speed by a factor of 4). Beneath the beats value are a couple of multiplier buttons for fast editing.

When Auto-Loop is de-activated no changes are made to the speed value or the out position. When Auto-Loop is re-activated it will return to full auto mode and predict its own beat length.

NOTE: If your media naturally fits to a perfect bar, Auto-Loop will not adjust its timing but will maintain it should the BPM be updated.

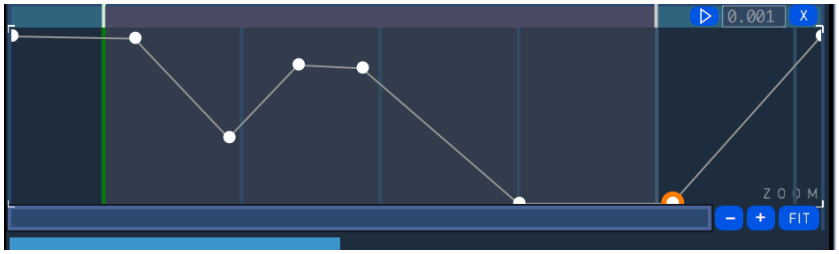
AUTO-LOOP is not available for static media types such as still images or video inputs. Only media with it's own timebase can be controlled by the Auto-Loop. For the static media types, the Auto-Loop controls will not be visible.

2.2.5 AUTOMATION



Another powerful feature of the Editor module is its ability to record and generate control signals to modulate any of Modul8's keyword controllers. Each keyword can have it's own specific modulation envelope, or be governed by master control signals such as the LFO's generated by the Launchpad module. The Editor can capture live recordings of controller changes which can then be edited.

There are two types of control signal: *Envelopes* and *LFO*.



- **ENVELOPES** are editable modulation waveforms which can be drawn directly onto the Timeline. The envelope affects the level of a controller (keyword) in the main Modul8 interface. Each keyword has its own unique envelope, and it is possible to make an envelope for every controller on the layer.

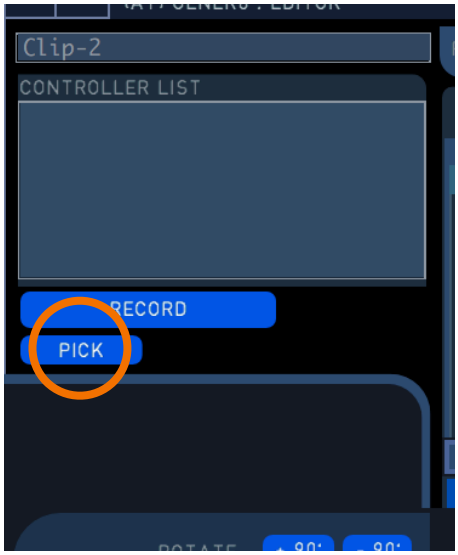
- **LFO** routings create a blend of the different LFO signals generated by the Launchpad and apply it to a controller's levels.

NOTE: A keyword can be controlled by either an Envelope or an LFO, but cannot be controlled by both.

Automation is Clip specific, so you can set up different envelopes or LFO routings for different Clips.

To add automation to a Clip, first you will need to activate the Clip you wish to apply the automation to (ie. Click the Clip's play button in the Launchpad).

NOTE: You will need to assign a media to your Clip before any automation can be added.



Next you will need to tell the Editor which controller you wish to modulate. This is done by the following process:

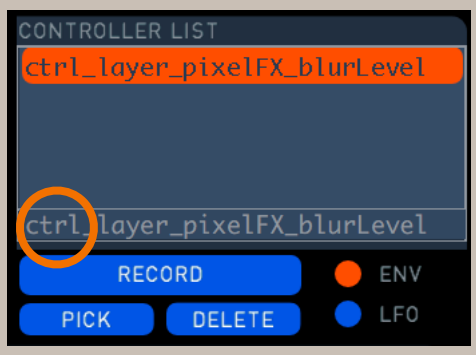
1. Press the PICK button on the left of the Editor module.
2. Select or adjust a control in the main Modul8 interface.

The keyword for that control will immediately be listed in the Editors Controller List, and by default an Envelope modulation will be applied. At this point you can decide which type of automation you wish to apply (*LFO* or *Envelope*), and then start adding control data points or set up your LFO mix. *(Specific detail about the different modulation types will be covered in the next few sections.)*

Selecting an item in the Controller List will bring up the properties for that controller, and display the editable envelope in the Timeline.

The Editor can also record live controller changes and store them as envelopes (see Section 2.2.8).

NOTE: It is possible to re-assign a *keyword* by selecting it in the Controller List and then editing the text field at the base of the Controller List.

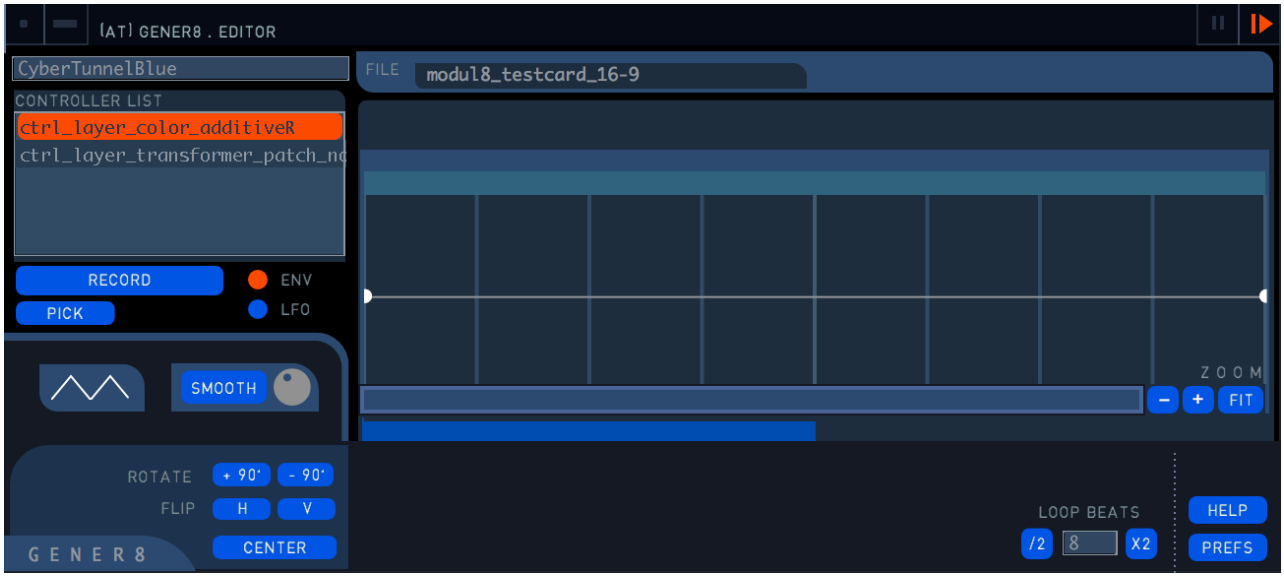


This is useful for assigning automation to keywords which cannot be selected in the main interface such as *ctrl_layer_position_y*.

For a full reference to available keywords refer to the *Keywords Browser* (alt-command-B) found under the *Modules* menu. Only '*ctrl_layer_*' type keywords can be assigned.

2.2.6 ENVELOPES

After assigning an controller to create an Envelope (see the previous Automation Section) you will see a white line appear across the Timeline. This is our Envelope.

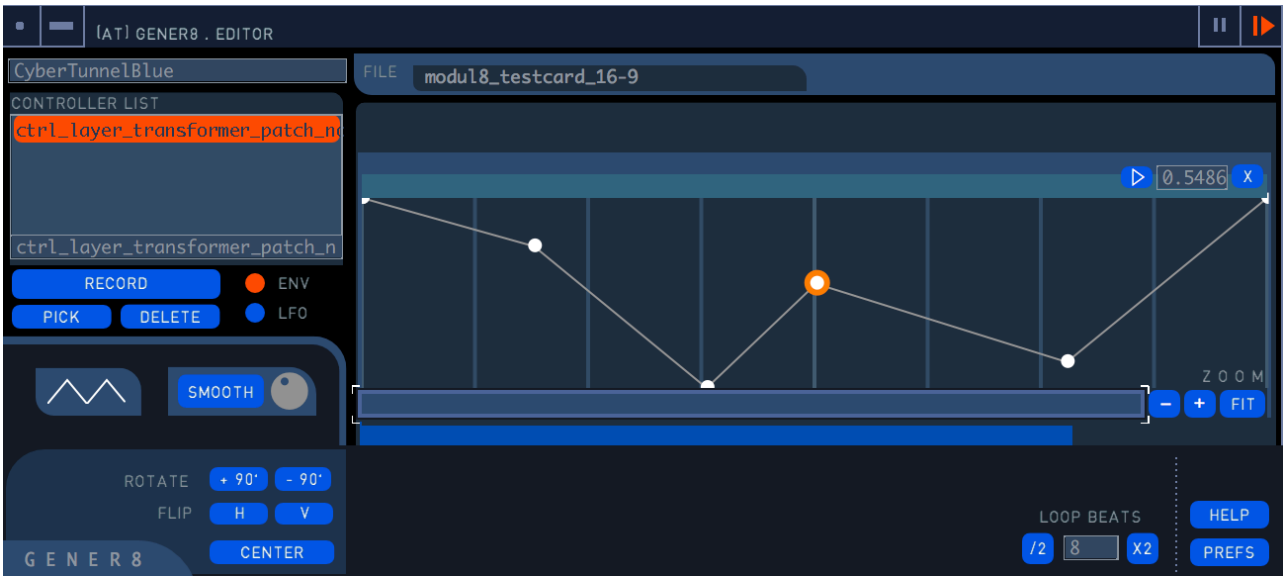


The Envelope consists of data points (events) in the Timeline. The vertical position of these points is relative to the output value of the modulation produced by the envelope. To begin with a new envelope will have 2 events, one at each end of the timeline, the height of these new events will be equal to the current level of the controller setting. Events are displayed as white circles on the envelope line.

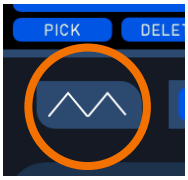
Positioning and creating new events is a simple matter of clicking and dragging the event handles.

- Clicking in a space where there are no events will **create a new event**.
- Clicking on an event handle will **select** it. Selected events will be highlighted with an orange outline.
- To **move an event** click and drag it left to right. Dragging across existing events will delete them.
- To **de-select an event**, click in an empty space on the timeline.

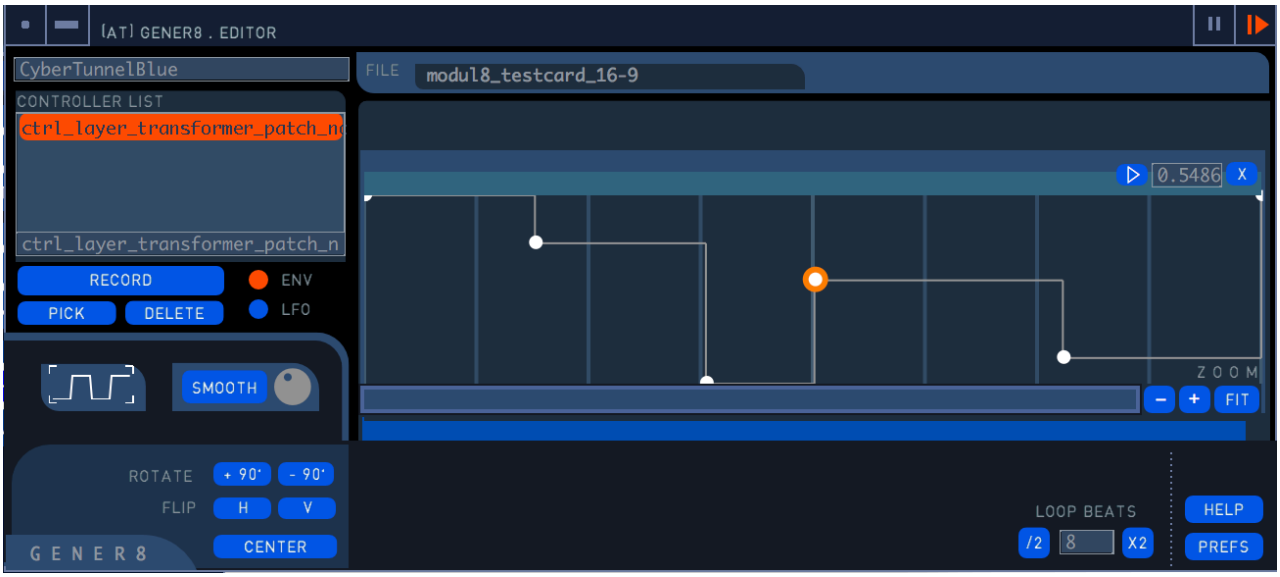
> NOTE: When dragging events close to the beat markers, they will snap into position on the beat. If you wish to override this snapping, zoom in for accuracy with the scroll bar.



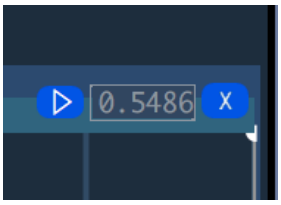
Depending on the type of controller a different envelope waveform will be assigned. For sliders and knobs a TRIANGLE wave type is assigned, and for buttons and switches a SQUARE wave type is assigned.



You can alter the wave type by toggling the Wave Mode button.



Here is the same envelope expressed as a Square wave type.



When an envelope event is selected, the point data will appear at the top right of the Timeline.

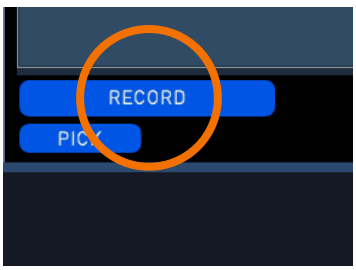
It is possible to set numeric values for your envelope event here and there is also a *Snap-to-playhead* button and a *Delete* button to remove the event.

The Editor is sensitive to value ranges for the different keywords, so some values will be limited to point values and others in 10s.

2.2.7 RECORDING ENVELOPES

It is also possible to capture automation by recording live controller changes. The recordings will be converted into editable envelopes.

Capturing controller changes is a simple process. Hit the RECORD button and any adjustments made to the controllers in the main interface will be create an envelope. You can record adjustments to multiple controllers at the same time.



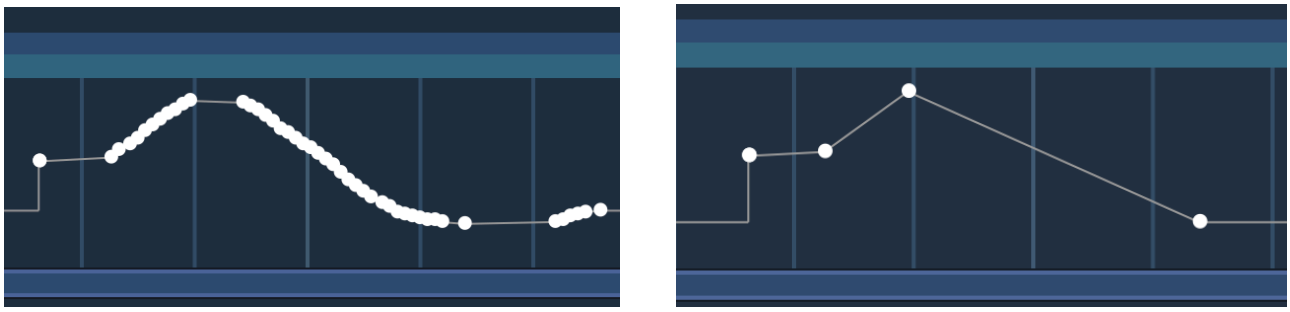
Recordings can last as long as the loop length - any adjustments made after the loop has cycled will be added on top of the original recording.

As soon as the RECORD button is de-activated the *Controller List* will be populated with a list of keywords adjusted during the recording and playback of the new envelopes will begin. You should notice a replay of the controller changes you have just made.

You can now select a keyword to display the recorded envelope in the Timeline by clicking on it's name in the list. Editing recorded envelopes is no different from manually created envelopes.

SMOOTHING EVENTS

Recorded envelopes often contain far too many control points. This is where the SMOOTH function comes into play. Pressing the SMOOTH button will attempt to reduce unnecessary envelope points. The knob next to the SMOOTH button sets how aggressive the function behaves. Be careful though as there is no undo.



A recorded envelope before and after the Smooth function has been applied.

2.2.8 LFO ROUTING

An LFO routing is very simple to set-up, and if you are have worked with the 'LFO Router' module then all should be very familiar.

Firstly, ensure you have an LFO signal being generated in the Launchpad module (see Section 2.1.12). Then you will need to activate the Clip you wish to apply the LFO modulation to.

Using the same process as above, pick a controller in the main interface, and then switch to LFO type.

When using an LFO routing we are not concerned with the Timeline. All settings for the routing are available in the section beneath the Controller List.

- **LFO 1** - This knob adds modulation from the oscillator LFO 1.
- **LFO 2** - This knob adds modulation from the oscillator LFO 2.
- **BPM** - This knob adds modulation from the BPM oscillator.
- **INV** - This setting will invert the modulation.

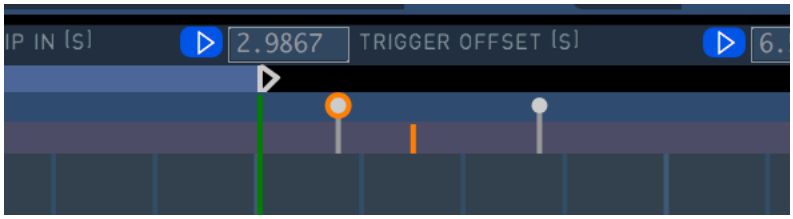
As soon as any of the knobs are adjusted you will notice your controller begins to react to the LFO signal.

> TIP: Switching an Envelope to *LFO* works as a bypass switch (*only if all LFO values are left at zero*). Switching back to *ENV* mode will restore and reactivate the Envelope automation.

2.2.9 WARPING

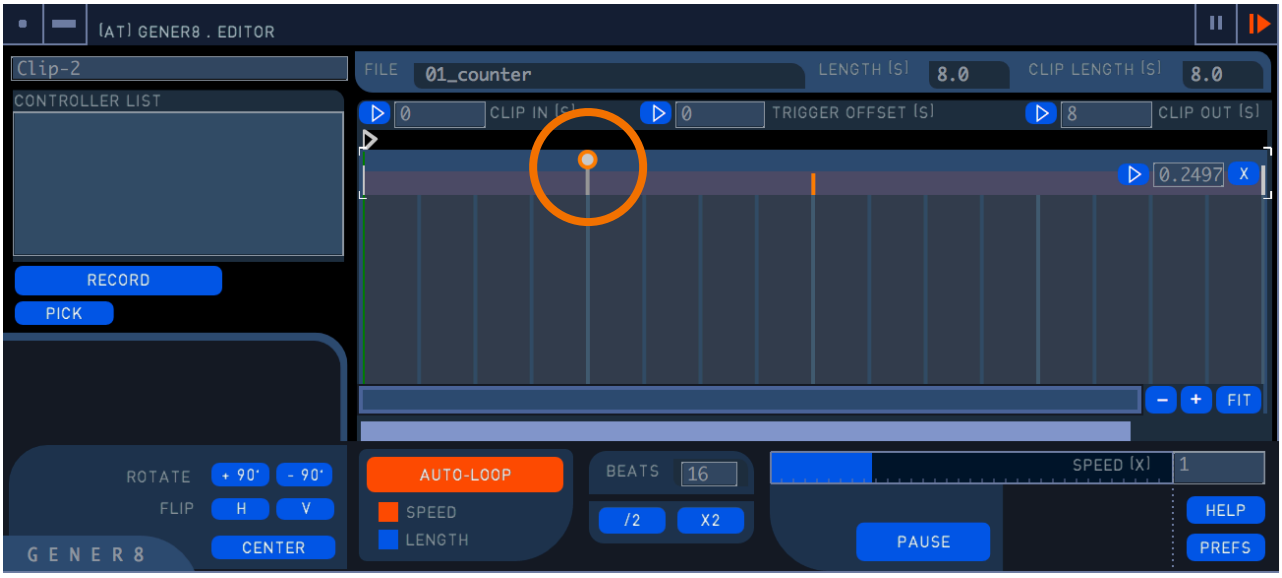
Clip warping is a technique to bend the timing of a movie so that its frame rate change over time. This is a useful effect which you will have seen being applied to films of dancers to re-sync their movements to fit different music.

Warping is a method to adjusting the *direct_layer_media_timePosition* keyword.



To create this effect the Editor allows us to add Warp Markers to the Timeline, which can be dragged left to right. *NOTE: it is only possible to apply warp markers to animated type media such as movie files.*

Let's apply a simple warp marker to explain how this works.



A good media to test this effect with is the file '*01_counter.mov*' which is supplied as part of the Basics Tutorial with your Modul8 installer. Above we have the media loaded into the Editor with a single Warp Marker applied.

To create a Warp Marker, click on the top blue horizontal bar directly above the I/O area. When we set a Warp Marker we are fixing its anchor point. The anchor point defines which frame you wish to bend. In the above example an anchor point has been set on the 8th beat, directly in the centre of the Timeline.

To select a Warp Marker click on the white circle in the Warp Marker Area, then drag it to the new position. You will see the anchor point remains visible as an orange vertical line. In the above example our Warp Marker has been dragged to beat 4 in the Timeline.

When the Clip is played you should notice that the first 8 beats in the movie will play at double speed (now 4 beats), and the remaining 8 beats will play at 0.75 of their original speed (taking 12 beats to play). The total time of the Clip is unaffected, but every frame has now been shifted out of place.

Once a Warp Marker is applied, its anchor point cannot be adjusted. For accuracy when placing Warp Markers consider zooming in with the navigation bar.

The offset position of the marker can be adjusted numerically, or set with the *snap-to-playhead* button next to the numerical input.

When warping Clips you may need to set anchor points to fix positions where you don't want to warp the whole Clip.

SKIPPING FRAMES

Offset points can also be dragged beyond their neighbouring Warp Markers to *Skip Frames* entirely.

In this example an anchor point is set at beat 8 and another marker fixed at beat 12 and offset to beat 7.

Frames between beat 1 to 8 will be played at a normal rate. Frames between beats 9 to 12 will be completely skipped and frames between beats 13 to 16 will be played at half speed.

TIP: Keep it simple. Adding lots of warp markers can get confusing fast.

NOTE: Warping media adds pressure to your processor. If you have accidentally added Warp Markers it is prudent to select and delete them.

2.2.10 PREFERENCES

The Editor has its own User Preferences section giving access to a couple of setting to help with how a Clip reacts on triggering.

- *OUTPUT SCREEN RESOLUTION* - This setting helps if you need precise control when using envelopes for screen positioning. For the most part it can be ignored.

- *FADE CLIPS* - This setting enables the fade transition effect which is also accessible from the layer, but it will stop the effect being turned off after a Clip change.

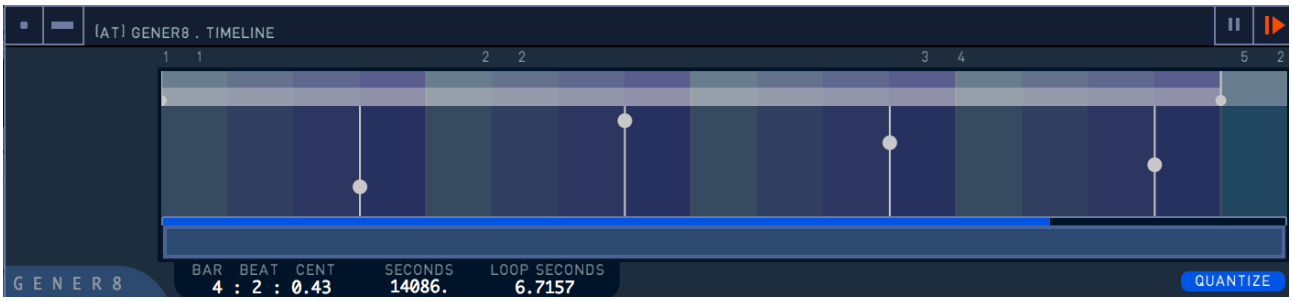
- *BYPASS AUTO-LOOP* - When doing a logical render, Modul8 takes its sweet time to render the frames. This results in false values being calculated by the Auto-Loop. Best thing is to bypass it.

- *LATENCY* - If you need to sync up to some other software or hardware you can play with the latency setting to get everything frame perfect.

2.3 TIMELINE

2.3.1 OVERVIEW

The Timeline module is where you can view and edit your recorded Launchpad arrangements. It also gives detailed visual feedback on the Timecode and offers an alternative means for setting up loop ranges.



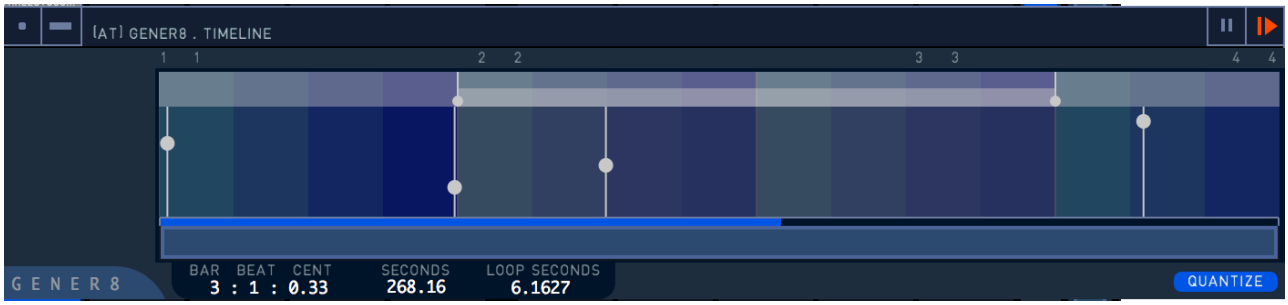
The Timeline module is not essential to the running of GENER8 but does provide extra editing features unavailable in the Launchpad such as manipulating & deleting recorded events. It is also possible to build an entire arrangements manually.

The Timeline module is a layer contextual module like the Editor module. This means that it will show only the data relevant to the currently selected layer.

To use the Timeline module your copy of GENER8 must be authorised.

2.3.2 NAVIGATING THE TIMELINE

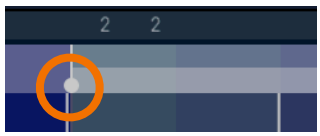
The Timeline module creates a visual depiction of the Timecode clock generated by the Launchpad module.



The main timeline grid is divided into 2 sections - the *I/O Section* and the *Event Area*.

THE I/O SECTION

The top bar of the timeline area is dedicated to the control of loop settings. The numerals on the top of the timeline indicate bars and beats, and the lighter area below shows our loop range.



It is possible to click and drag the loop I/O handles by selecting the white circles at either end of the loop area and dragging them left or right.

THE EVENT AREA

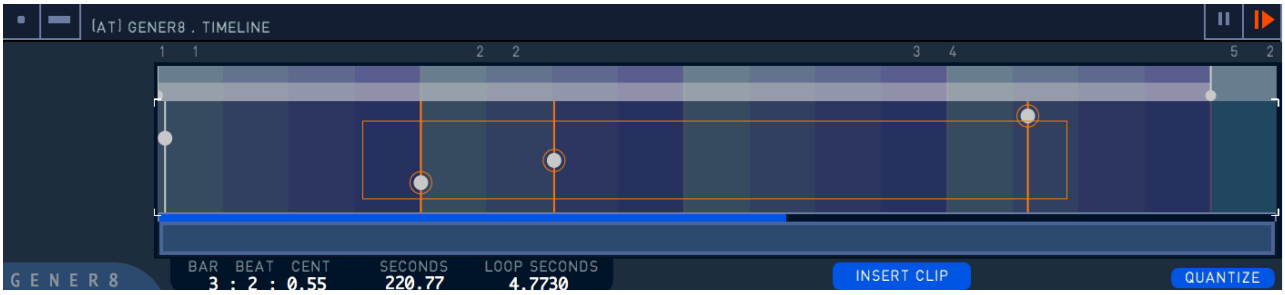
The main middle section of the timeline shows the recorded arrangement events. Events appear as vertical white lines with dots on them. The height of the dots is relative to the placement of the Clips in the layer.

Beneath the Event Area is a playhead indicator and a scroll/zoom bar which works in the same manner as the scroll bar in the Editor module.

2.3.3 EDITING EVENTS

You can select and drag Clip Trigger Event around the timeline to reposition them in your arrangement. Events will snap to beats, so zoom in with the scroll bar if you need more accuracy.

Multiple events can selected for dragging whole sections, or to quantize a small range of events.



Selecting a trigger event will open up a small preview of the Clip and display specific info about its timing. There is also a delete button so that you can remove the trigger event.

ADDING TRIGGER EVENTS

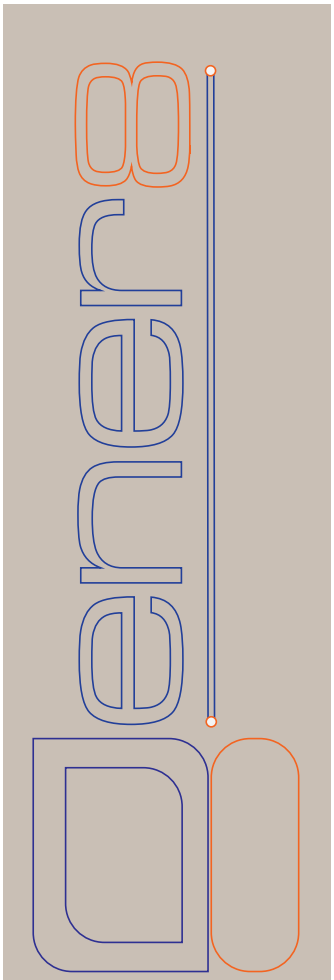
You can manually add trigger events into the timeline:

- Click on a position in the event area.
- Select the desired Clip in the Launchpad module.
- Click on the INSERT CLIP button in the Timeline module.

2.3.4 QUANTIZING

Quantizing is a process for aligning your trigger events to rhythmic positions on the timeline.

You can quantize all events, a selected range or even an individual event. Just open up the quantize dialogue and set the beat Definition, then press QUANTIZE. Your events will then be moved to the closest bar or beat.



3.0 OTHER MODULES

3.1 OVERVIEW

Layer contextual modules can be adapted to work at Clip level so that their settings react to Clip changes in the Launchpad, and their settings will also be stored in Clip Library files.

Modifying your own modules to react to Clip changes is covered in the Developer Section of this manual, but there are already a whole array of useful modules which work with GENER8 Clips.

3.2 FILTER MODULE

The Filter Module is a Garagecube module which applies image filters to the layer output. This version of the module incorporates GENER8 Clip level control, plus a few other features such as a *Sound Input* and *LFO* modulation.

For reference to using the Filter Module please see the *Modul8 Reference Manual*.

BPM and LFO signals will be generated by the GENER8 Launchpad module.

GENER8 must be active to use this version as all data is stored by the Launchpad.
DO NOT run the BPM Module alongside GENER8.

3.3 SOUND ROUTER

The Sound Router is a module which allows you to modulate any controller with the computers audio input source.

The Sound Router has been around for a number of years although this version integrates GENER8 Clip level control which means that the settings you make in the module relate only to the active Clip in the Launchpad module, and each Clip can have its own unique Sound Router settings.

GENER8 must be active for this module to work correctly.

To add a control to the Sound Router press the 'PICK' button at the top of the module and then adjust a control in the main Modul8 interface. The keyword for that control will then be added to the list at the top of the module.

The various functions are as follows:

- **START** - This is an ON/OFF toggle specific to the selected keyword.
- **LEVEL** - The amount of modulation applied to the keyword.
- **THRESHOLD** - Modulation will begin when the sound input level reaches the threshold volume. There is a visual indication for the threshold level beneath the VU bar at the base of the module (*it is advised to deactivate the VU Level Check when not in use to save on resources*)
- **INVERT** - This setting inverts the output of the modulation.
- **FREQUENCY RANGE** - This setting specifies which frequency range affects the modulation. Frequencey ranges are set-up in Modul8's 'Sound Analysis' set-up (*alt-command-a*).

Each controller (keyword) added to the Sound Router can have its own individual settings. But the INPUT and GAIN settings are global.

3.4 BPM ROUTER

Everyone should be familiar with the Garagecube 'BPM Router' module, and it should be in your arsenal of VJ tools. The GENER8 version of this module simply adds Clip level control so that each of your Clips can have it's own BPM router settings. There is also an added random wave.

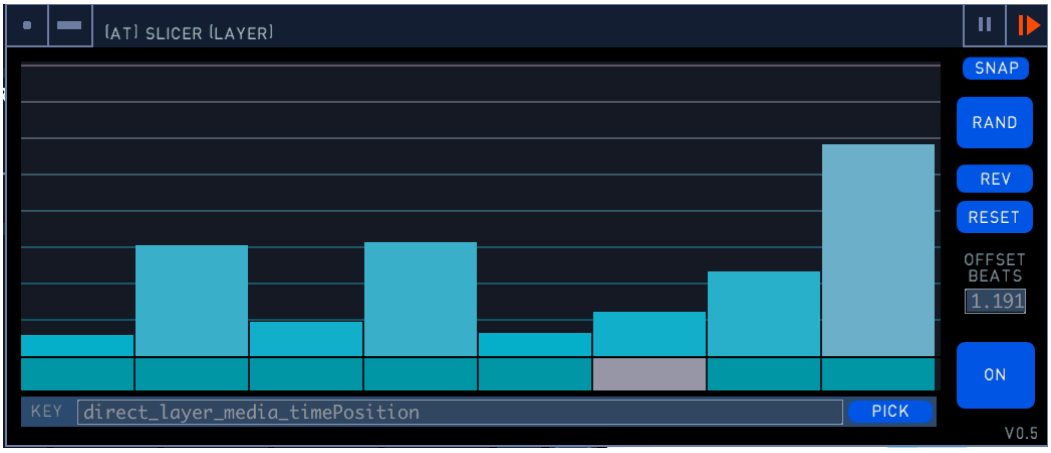
The module works by generating a modulation waveform similar to that produced by the Launchpads LFO BPM output. The benefit to using the BPM Router is that each keyword can have its own individual wave shape and frequency settings, whereas the Launchpad's LFO generator produces a global waveform.

Keywords are added to the BPM Router in the standard PICK fashion. Please refer to the *Modul8 Reference Manual* for more detailed instruction on using this module.

GENER8 must be active to use this version as all data is stored by the Launchpad.
DO NOT run the BPM Module alongside GENER8.

3.5 SLICER

While the Slicer is not technically a Clip level module, it is included here as an example of a layer level module which works in conjunction with the GENER8 Timecode clock.



Slicer provides a fun way to step sequence levels of controller keywords, and synchronises to the Timecode.

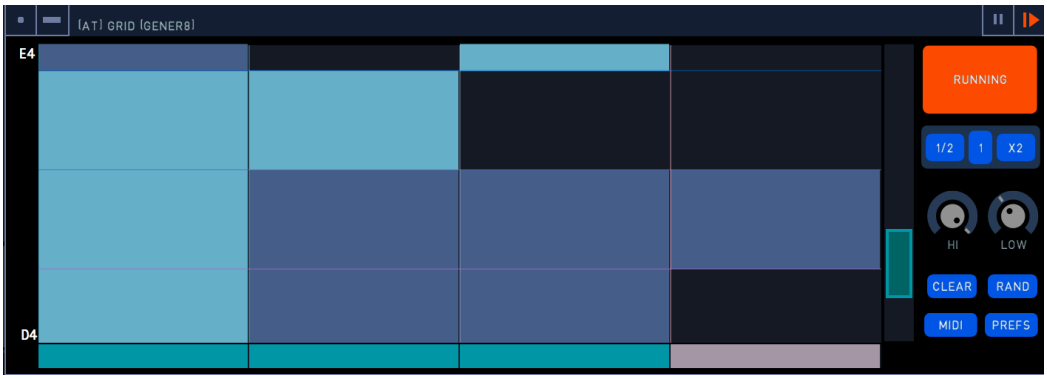
Each position on the Slicer grid relates to a beat in the Timecode bar. The number of bar beats and tempo is set in the Launchpad module. The vertical bars are draggable level controls for the set controller keyword.

To change the keyword either edit the text at the base of the module or press the PICK button then adjust a control in the main Modul8 interface.

By default the Slicer is set-up to affect the *direct_layer_media_timePosition*. This effect allows you to rhythmically scratch the timing of your media. It will not affect still image medias or video inputs.

Look out for a GENER8 Clip level version of this module, coming soon…

3.6 GRiD SEQUENCER



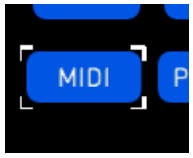
GRiD Sequencer is a simple MIDI and DMX step sequencer for controlling external devices or software. GRiD is a Clip level module which means that sequences set up in the GRiD are specific to the currently active GENER8 Clip, and each Clip in the Launchpad module can have its own sequence data.

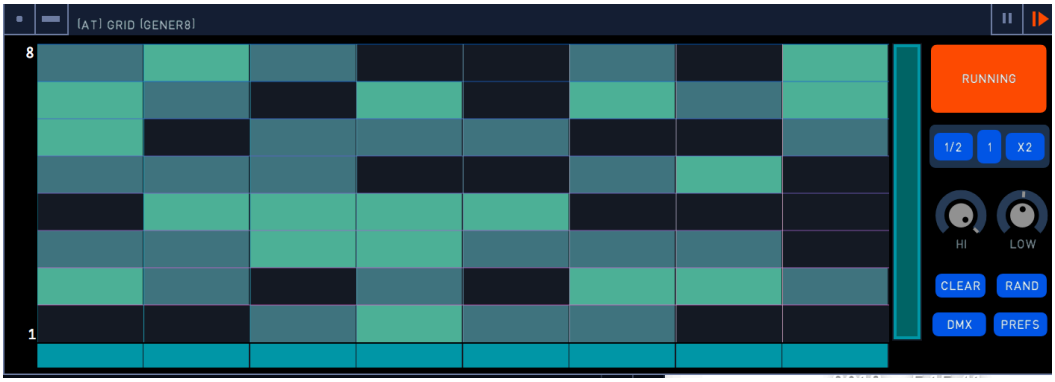
The GRiD Sequencer is dependant on the Timecode (*which is produced by the Launchpad module*) for its clock source and allows for you to lay out a step sequence for the length of a one bar. Bar Length and tempo are set by the Launchpad module.

Steps are entered by clicking into the grid. Events can have 2 levels which are set by the HI and LOW values. Clicking in the grid toggles between HI, LOW and OFF values. The colour of the steps in the grid is dependant on the level - higher values will have lighter colours. A numeric value for the level settings will be shown at bottom right of the module during adjustment of the knobs.

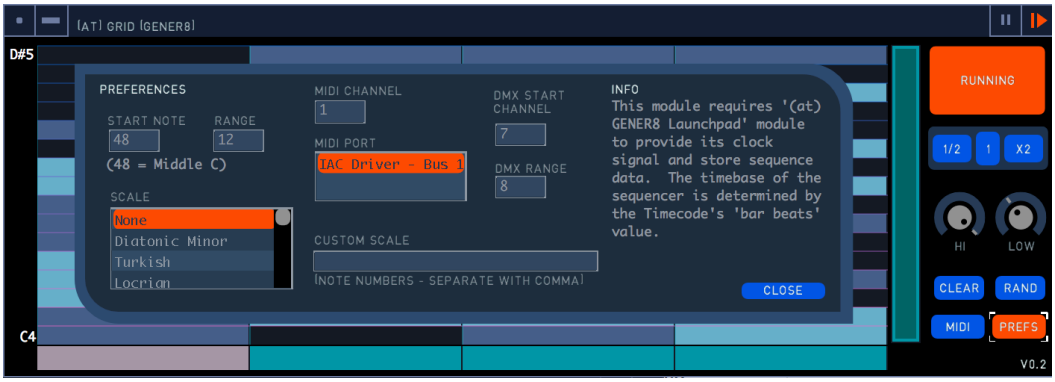
Sequences can run at multiple speeds by pressing the '1/2' and 'X2' buttons.

The GRiD module is capable of running both MIDI and DMX outputs. You can toggle between the 2 pages by pressing the mode switch. MIDI steps are shown in BLUE while DMX steps are displayed as GREEN.





Set-up for the grid is handled in the preference pane, where you can set the grid ranges MIDI output channels and note scales.



GRiD is currently under development. Some features may produce unexpected results. Check for current updates. Do not use for performance.

4.0 EXTERNAL CONTROL

4.1 OVERVIEW

GENER8 has many methods to communicate with external devices, and we have already covered a few of these in earlier sections, particularly *Section 2.1.13* on the Launchpad's MIDI & DMX Output. There is also options available to send MIDI and DMX sequences via the *GRiD Sequencer* module.

In this section we will look at some of the other options available for direct control.

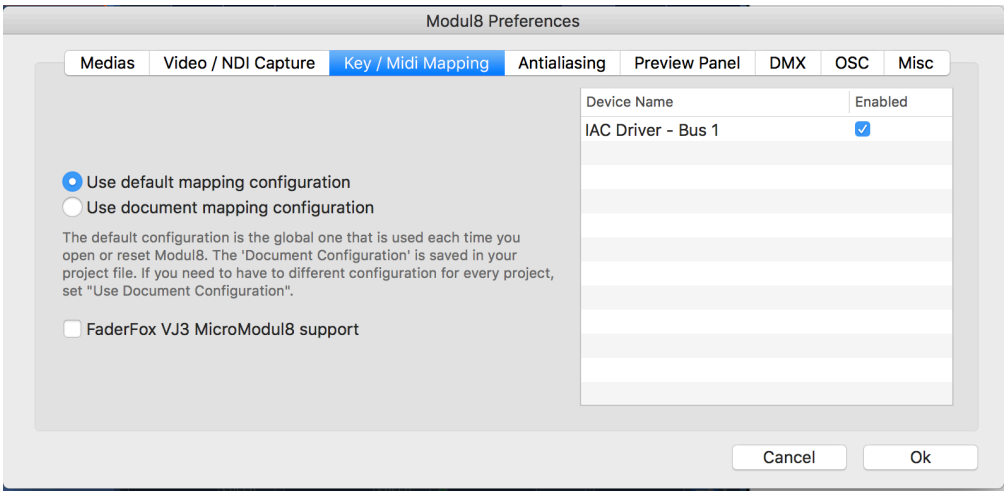
4.2 SYNCING TO MIDI CLOCK

GENER8 can be synchronised to other applications or devices which produce a MIDI clock (eg. *Ableton, Traktor, Logic, Reason, etc.*).

Unfortunately, due to the restrictions of the Modul8 modules framework it is not possible to generate MIDI Clock data at a high enough resolution, so to synchronise GENER8 with other devices via MIDI Clock we need to GENER8 to become a MIDI slave.

Each software or device is different so here we will focus on how GENER8 receives MIDI data. Please refer to your device or software's user manual if you need help understanding how to send MIDI clock data.

MODUL8 receives MIDI through the IAC (Inter Application Communication) Driver, so make sure you are sending your MIDI clock signals to IAC. Open the Modul8 preference (command-,) and make sure the IAC driver is enabled.



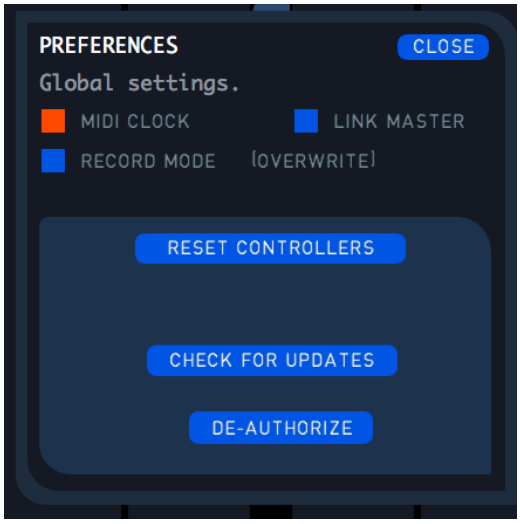
Also, be sure to check the IAC driver is enabled in the operating system before starting up MODUL8. You can access your system MIDI settings with the '*Audio MIDI Setup*' OSX app.

We'll begin by assuming you can get a MIDI clock signal into MODUL8.

- Open up MODUL8, and get the GENER8 modules running. You'll need a minimum of the Launchpad and Editor modules.

- Start your MIDI clock running in your Audio app, and output it to the IAC driver.

- Activate the MIDI clock option in GENER8.



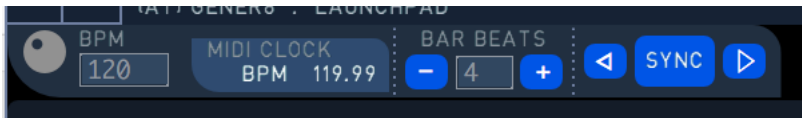
Open up the Preferences in the Launchpad.

You'll notice the 'MIDI CLOCK' button. This toggles between external MIDI clock and GENER8's internal Timecode.

Set the 'MIDI CLOCK' to the ON position.

Your clock section will now look like one of the following:

In this image, the Launchpad is listening for incoming MIDI clock signals, but cannot find any, and gives the 'PAUSED' message. If you see this message, double check you are sending your MIDI clock correctly, and if in doubt: Restart MODUL8. (A great way to troubleshoot is by using the 'Direct Event' module which lists all incoming signals.)



In this image, the Launchpad has found a MIDI clock signal and tells us that its running at 'BPM : 119.99'.

(You may notice small fluctuations in the incoming BPM, but do not despair – GENER8 will even this out to give you a steady beat).

If you can see this BPM reading, then you are receiving a clock signal, but we are still paused…

A MIDI clock consists of 2 messages, the CLOCK message (which runs at 24 counts per beat), and the START/STOP message. So, although GENER8 is receiving a MIDI clock signal, it's still waiting to be told when to Start.

Before you restart your DAW's clock, now is a good time to check your Time Signature is correct. The time signature of a piece of music is defined by the number of beats played in each bar. In most modern dance and western music this will likely be 4 beats per bar (GENER8's default value), but if you happen to be performing to a Waltz you'll want to adjust your 'BAR BEATS' value to '3' (for 3/4 time).

Adjusting the Bar Beats value will also adjust your possible Quantize values too.

When you are quite happy, restart the Clock in your audio app. Once this is done, GENER8's clock should now look something like this:

Your performance should now be in perfect Sync with your audio app. Also note that any Clips using the Editors 'Auto-Loop' function will magically adjust to any changes made to the clock timing from your audio app.

4.3 LFO to MIDI / DMX

The LFO signals produced by the Launchpad module can be converted to other control signals and then delivered to external devices or softwares. We do this by employing one to two different modules.

LFO to MIDI

The LFO to MIDI module takes the LFO output of the Launchpad module and converts it to MIDI Ctrl data signals. MIDI Ctrl data is useful for sending continuous data with its definition of 128 values (0-127).

On opening the LFO to MIDI you will be presented with the set-up page. Here you can set the MIDI channel to something unique, and also the output port (if you are communicating to other software on your system then you will likely need to use the IAC Driver (*Inter Application Communication*)).

If you are happy with your output settings, pick a CC Channel. Selected a CC Channel brings up the LFO output settings for that channel. The options are as follows:

- **PLAY** - Toggle the output for the channel.
- **LFO 1** - Output of mix level of the LFO 1 oscillator.
- **LFO 2** - Output of mix level of the LFO 2 oscillator.
- **BPM** - Output of mix level of the BPM oscillator.
- **LIMIT HI** - Caps the output to this value.
- **LIMIT LO** - Raises the base level of the output.
- **INVERT** - Inverts the output value.
- **FILTER** - Filters the list of channels to the active ones. Disable the filter to access all channels.
- **REMOVE** - Deletes a channels settings. Deleted channels can be reactivated by selecting them from the channel list again.
- **KILL ALL** - Sends out zero values on all active channels.

LFO to DMX

Very similar in functionality to the LFO to MIDI module with the exception that our output channels are DMX not MIDI.

The LFO to DMX module has fewer options than the MIDI version as DMX output settings are set within the Modul8 preferences.

Controls are the same as the LFO to MIDI module except for the level range for DMX being 256 values (0-255).

- **PLAY** - Toggle the output for the channel.
- **LFO 1** - Output of mix level of the LFO 1 oscillator.
- **LFO 2** - Output of mix level of the LFO 2 oscillator.
- **BPM** - Output of mix level of the BPM oscillator.
- **LIMIT HI** - Caps the output to this value.
- **LIMIT LO** - Raises the base level of the output.
- **INVERT** - Inverts the output value.
- **FILTER** - Filters the list of channels to the active ones. Disable the filter to access all channels.
- **REMOVE** - Deletes a channels settings. Deleted channels can be reactivated by selecting them from the channel list again.

NOTE: The LFO to DMX module is not compatible with 16 bit DMX systems.

5.0 INSTALLATION & REGISTRATION

5.1 INSTALLING THE MODULES

GENER8 can be downloaded from the Online Modules Library accessible from the Modules menu in the Modul8 application (for information about how to use the *Online Modules Library* please refer to your *Modul8 Reference Manual*).

Once you have opened the Online Modules Library search under the PUBLIC LIBRARY section for GENER8 and download the latest version of all files.

The core modules **'GENER8 - LAUNCHPAD'** and **'GENER8 - EDITOR'** are required. All other modules work as optional satellites.

Beware that there may be other versions of GENER8 uploaded by other users.
Be careful to check for the latest versions.

Alternatively you can download the modules from the GENER8 website and install them manually by dragging the files into your Modules folder and restarting Modul8.

http://collectedconsciousness.net/downloads

Installation is as follows:

- *Copy all .m8m files to your Applications/Modul8/Modules folder*
- *Re-start Modul8 so that it can see your new modules.*
- *The Launchpad and Editor modules may need to be restarted (Both modules will give error messages until they are correctly initialised.) To restart a module, select it, then go to the 'Modules' menu and press 'Restart'.*
- *Do not run with previous version of GENER8.*
- *Do not use any BPM modules along side GENER8 (it is okay to run 'BPM Router' as it does not make BPM signals).*
- *Likewise, LFO (Global) is now built into the Launchpad module and it is therefore not advised to run both together.*

ESSENTIAL INSTALLS

These modules are vital to running the GENER8 system.

(at) GENER8 (Editor)

Records and updates Clip keywords. Provides editing functions for Clips.

(at) GENER8 (Launchpad)

- *Create and trigger your Clips.*
- *Record Clip changes onto a Timeline (requires the Timeline module to view & edit recorded events).*
- *Save Clips into a Library accessible from any project.*

OPTIONAL INSTALLS

These modules are non-vital to the GENER8 system but will add extra functionality.

(at) GENER8 (Timeline)

- *View and edit your recorded performance.*
- *Visually adjust Timeline loop ranges.*
- *View Timecode in bars, beats, percent, and seconds.*

(at) BPM Router (GENER8)

- *An update of Garagecube's BPM Router module which responds to GENER8 clip changes. The Router settings will be saved into the Clip library.*

(at) Filter (GENER8)

- *An update of Garagecube's Filter module which responds to GENER8 clip changes. Filter settings will be saved into the Clip library.*

(at) Sound Router (GENER8)

- *Provides external sound input modulation to all controllers. Sound Router settings will be saved into the Clip library.*

(at) GRiD (GENER8)

- *MIDI and DMX step sequencer for external devices*

GENER8 is free to download and use, but extended features require license activation. Commercial use is not covered for un-licensed installations of the modules.

5.2 DEMO / TRIAL MODE

GENER8 is now a commercial software. This was never the original intent, it was simply an idea which grew too big. So much time has been invested into developing these modules and offering support that I could no longer justify doing it for free, and so I attempted to offer this software as donation-ware. Unfortunately little ever came from that so I decided to introduce a small license fee for extended features, and leave the main functionality open for anyone to use. Version 1.0 is the first version to require a license.

After downloading the modules you will be greeted will a 'welcome' dialogue in the Launchpad module and a request to authorise the software. If this is your first run of GENER8 I highly recommend running it as a Demo to get the feel of the software before purchasing a license.

On the bottom right of the welcome dialogue is an option to 'RUN AS DEMO', click this so that you can begin to get to know the many features.

5.2.1 LIMITATIONS OF DEMO MODE

As with all trial versions of software there are limitations, and these are:-

- Saving project data is disabled (Clips, sequences, etc.)
- Saving Clips to the Clip Library is disabled.
- Launchpad Pages are limited to 2 pages of Clips *(this is still 1280 available Clips)*.
- Timeline module is restricted to licensed versions only.
- Use of the modules for commercial applications is not permitted.

Although saving your data is disabled, you will still be able to save your Modul8 project as normal. While inactive Clips and envelope data will be lost, the state of any controllers in the main interface will be saved into your project file.

Authorising the modules will remove any limitations to the software and will also support and encourage further development.

5.3 BUYING A LICENSE

Obtaining a license for GENER8 is simple either follow the link here:

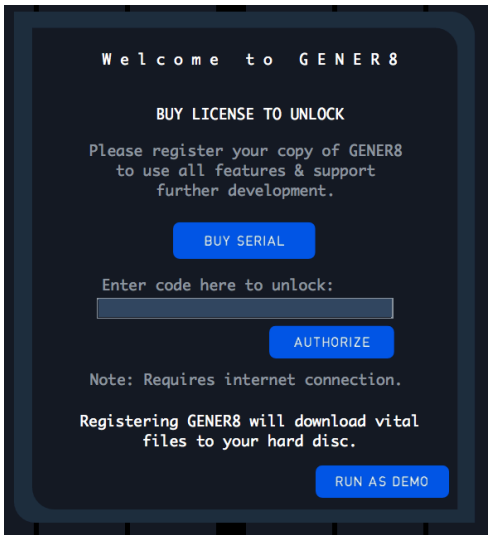
http://collectedconsciousness.net/buy/

…or follow the instructions in the registration dialogue on start-up of the Launchpad.

After you have received your license you can authorise GENER8 through the Launchpad module, either on start-up or from the *Preferences* section.

Buying software licenses makes developers very happy and ensures continued support and development for your softwares.

5.4 AUTHORISING



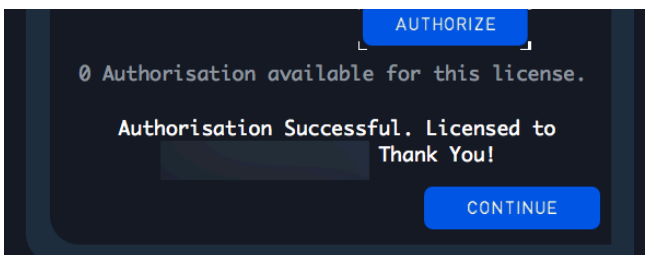
On starting up the Launchpad a welcome screen will load if the machine is not yet authorised.

If you have purchased a license you will have received your serial number via your email.

If you have not received an email from us with a serial number first check your Junk email folders before contacting support.

Copy & paste your serial number into the text box in the centre and press the AUTHORISE button. *The authorisation process requires an internet connection so please make sure you are online while doing this.*

After a few seconds the authorisation process should be complete and you will see this message:



One license will enable you to authorise up to 2 machines. This message will inform you how many authorisations you have left.

Click ‘Continue’ and you’re done.

Thank you and enjoy using GENER8 :)

NOTE: it is also possible to access the Registration dialogue from the Launchpad preferences.

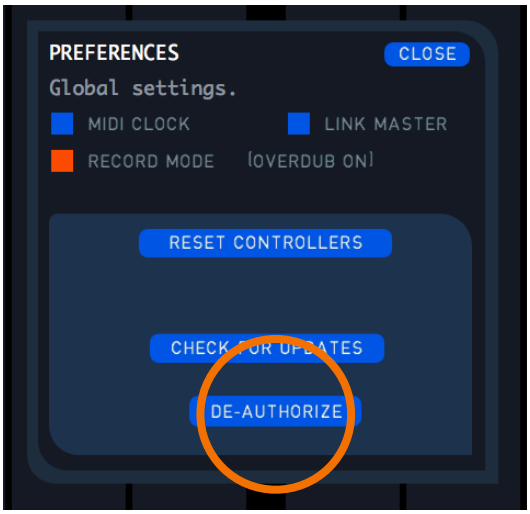
5.5 DE-AUTHORISING

GENER8 can be de-authorised so you can transfer your license to another machine.

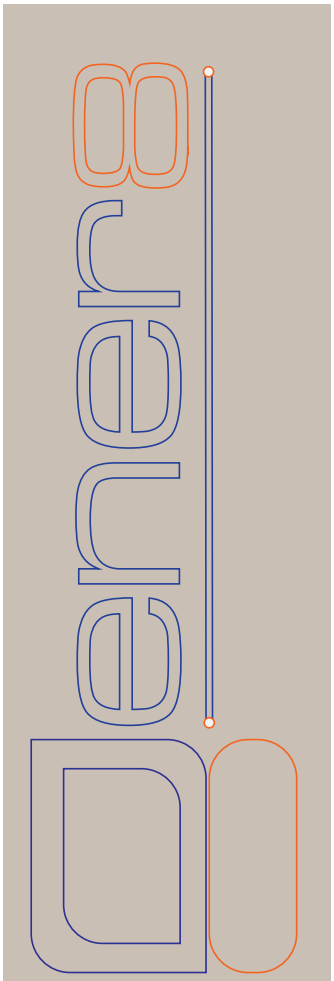
To do so you will need to open up the Launchpad Preferences and select the DE-AUTHORISE option.

Then simply follow the instructions.

NOTE: One license will allow you to authorise 2 machines at once.



5.6 LICENSE



6.0 DEVELOPER

6.1 OPEN SOURCE

As with all modules developed for Modul8, the code is open for editing, and this has lead to a strong community of module creators who share and build resources & skills via the Garagecube forum and through workshops at many of the VJ meet ups such as LPM and the Mapping Festival in Geneva.

The GENER8 modules are no exception to this trend, and while some software security has been added, the vast majority of the code is still open to view.

While I do not recommend editing GENER8's code for stability reasons you are more than welcome to copy and use sections in your own projects so long you conform to the license restrictions.

I am always happy to help anyone wishing to adapt any of the GENER8 coding so do not hesitate to contact support at gener8@collectedconsciousness.net.

Aside from adapting the original code, GENER8 has been created specifically with community development in mind. There are many features built in to GENER8 to help other modules plug-in to the GENER8 eco-system via shared libraries. The rest of this section will explain how to add GENER8 features to your own modules.

6.2 TIMECODE

One of the core features of GENER8 is the clock, or TIMECODE. This timecode is a multi-use clock signal and can be accessed from any module through the sharedDict library *sharedDict['TIMECODE']*.

The functions of TIMECODE are as follows:

- *sharedDict['TIMECODE']['BPM']* – The number of beats per minute.
- *sharedDict['TIMECODE']['BAR_BEATS']* – The number of beats in a bar.
- *sharedDict['TIMECODE']['BEATS']* – The number of elapsed beats. This value is in the form of a list with values for Bar, Beat, Percent of Beat. (ie, *sharedDict['TIMECODE']['BEATS'][0]* = Bars, *sharedDict['TIMECODE']['BEATS'][1]* = Beats, *sharedDict['TIMECODE']['BEATS'][2]* = Cents,)
- *sharedDict['TIMECODE']['SEC']* – Elapsed time in Seconds (This could be used to calculate SMPTE values if required). This is the total elapsed time since play is started.
- *sharedDict['TIMECODE']['START']* – Boolean value to indicate if Clock is running. 0 = Off
- *sharedDict['TIMECODE']['LOOP_ON']* – The Timecode can also work in a looped form, this is a Boolean value to indicate if the loop is in effect.
- *sharedDict['TIMECODE']['LOOP_START']* – An offset value for the loop in beats. Do not use values of 0, a start value of 1 indicates there is no offset.
- *sharedDict['TIMECODE']['LOOP_LENGTH']* – Length of the loop in beats.
- *sharedDict['TIMECODE']['LOOP_SEC']* – Elapsed time in Seconds. Resets to zero at the start of each loop cycle.

For a visual example of these values the Timeline module has a more explicit clock display showing the timecode data in real-time.

The Launchpad module also outputs the classic *sharedDict['BPM_POSITION']* as used by *BPM Router* etc.

To access TIMECODE in your scripts first insert this code in your *init* script:

```
sharedDict = module.getSharedDictionary()
sharedKeys = []
for key in module.getSharedDictionary():
        sharedKeys.append(key)

try: x = sharedKeys.index('BPM_POSITION')
except: sharedDict['BPM_POSITION'] = 0.0

try: x = sharedKeys.index('TIMECODE')
except: sharedDict['TIMECODE'] = {'BPM':120.0, 'SEC':0, 'BEATS':[1,1,0.00],
'BAR_BEATS':4, 'LOOP_START':1, 'LOOP_LENGTH':1, 'LOOP_ON':0, 'START':0,
'BPS':2.0, 'LOOP_SEC':0.0}
```

Once this code is entered in your *init* script you can start referencing the Timecode sharedDict library data.

Ensure the Launchpad module is open and the Clock is running to use Timecode data.

NOTE: Timecode values will be output even when clock is controlled via external MIDI clock.

6.3 LFO FOR DEVELOPERS

Similar to our TIMECODE library, the Launchpad's LFO generator also outputs a sharedDict library which is available to be added as a modulation source for your modules. The library is titled *sharedDict['LFO']*.

While the LFO generator has many options for controlling the 3 independent oscillators, the shared library it outputs is really very simple triplet of the 3 LFO signal values.

The functions of TIMECODE are as follows:

- *sharedDict['LFO']['LFO1']* – LFO 1 output. This of type float in the range of 0.0 - 1.0
- *sharedDict['LFO]['LFO2']* – LFO 2 output. This of type float in the range of 0.0 - 1.0
- *sharedDict['LFO]['LFO3']* – BPM LFO output. This of type float in the range of 0.0 - 1.0

To access LFO signals in your scripts first insert this code in your *init* script:

```
sharedDict = module.getSharedDictionary()
sharedKeys = []
for key in module.getSharedDictionary():
        sharedKeys.append(key)

try: x = sharedKeys.index('LFO')
except: sharedDict['LFO'] = [0.0, 0.0, 0.0]
```

Once this code is entered in your *init* script you can start referencing the LFO sharedDict library data in your code.

There is no way to modify the qualities of LFO via external coding, but the various LFO controls in the Launchpad module should be MIDI mappable, with the exception of waveform type.

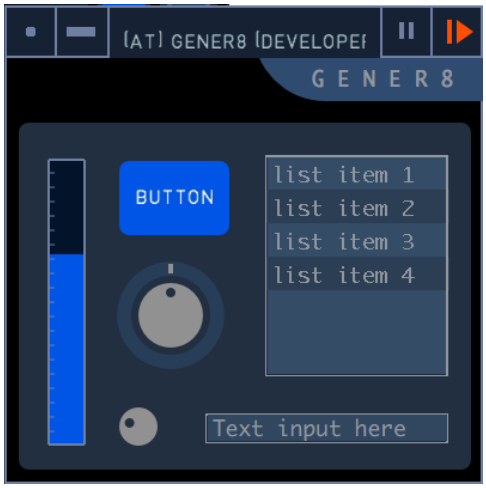
6.4 ADDING GENER8 CLIP CONTROL TO MODULES

Clip control adds another level to Modul8, and it is possible to develop or adapt your own modules to react to Clip changes. The process involves adding a couple of functions to your scripts to capture the data and update it when a new Clip is triggered from the Launchpad.

To help with this development process I have made a Developer module which will works as a basis for developing your own Clip level modules. Start out small while you are learning with a

test piece to make sure you understand the process - module development can get complicated fast so it will be invaluable to understand this new concept before diving in the deep end.

6.5 DEVELOPER MODULE



The Developer module is a small module written to show some simple examples how to integrate GENER8 Clip targeting into your own modules.

It contains various styles of buttons, sliders and knobs which are all linked to GENER8 dictionaries.

With the module loaded and the Launchpad running try creating a few blank Clips then changing the values of the controls in the Developer module to see how they react when you trigger through your Clips.

You can use this module as a template to begin developing your own Clip level modules.

- *Load up the Developer module in the Module Editor.*
- ***Duplicate** it and rename the copy to something useful.*
- *Start hacking away at the code.*

The code in the script will show examples of how to reference the different styles of data at Clip level, with plenty of explanatory notes. Be sure to view all scripts in the module (*Init, Message, Periodical, etc.*).

If you are confident to start making Clip level modules from scratch, or wish to adapt something which already exists, you can copy & paste the code from this module into your own modules and adapt it to suit.

As ever we are always happy to help if you need assistance. See the *Support Section* for how to get in touch.

7.0 SUPPORT

7.1 CONTACT & SUPPORT

If you are experiencing a problem with GENER8, or perhaps wondering about the best way to integrate GENER8 into your project, here are some simple procedures you may step through to help get your questions answered.

WEBSITE

The GENER8 website is a great source of help, with many tutorials and help files available.

http://collectedconsciousness.net

FORUMS

Forums are an excellent source of help and information. You may not be the first person to experience a your problem, and there may be a helpful thread on something very similar. If you cannot find help on your particular issue then write a post about it. The Modul8 community is vibrant and many experienced people will try to offer help.

Our support forums are located at:

http://collectedconsciousness.net/forums/

Or try the main forum for Modul8 where you will find active threads for GENER8 in the Modules section:

http://forum.garagecube.com

EMAIL SUPPORT

If none of these options yield satisfactory results or if you have a potential bug report you can contact us at:

gener8@collectedconsciousness.net

When sending us email please include your serial number and a detailed description of your problem along with the model of your computer, video card and the amount of RAM you have installed along with any other information relevant to your problem.

We are familiar with the pressures of getting projects working on an event deadline and will try to respond swiftly so we can get you up and running again.

Email support is not just for the boring things like system failures, we'd also love to hear about your projects. So please send links to any shows you have been involved with using GENER8 and perhaps we can help with a little promo for you.

7.2 GARAGECUBE RESOURCES

GENER8 is of course a plug-in software for Modul8 by Garagecube, so please be aware that some things are beyond my scope and you may need support from the big boys. I also advise reading up with the Modul8 reference manual as this is a deep software and no matter how well you think you know it, there is likely some more tricks you are unaware of.

WEBSITE

Find out more about Modul8 and other softwares and products produced by Garagecube.

http://www.garagecube.com

FORUM

Get involved in the great Modul8 community:

http://forum.garagecube.com

MODUL8 MANUAL

Included with your Modul8 download is a Reference Manual, but you can also grab an online copy here:

http://www.modul8.ch/documentation/manual/modul8_manual_EN_web_1.2.0.pdf

ONLINE MODULES MANUAL

If you wish to get deeper into developing your own modules for Modul8, or just want to hack someone else's, here's the bible:

http://www.modul8.ch/documentation/modules_manual/

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and written by Andy Teasdale