Gridlock 0.3.911/0.3.55
User Guide

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Thankyou

Hi there, and thanks for your interest in this project.

The purpose of Gridlock is twofold:

1) To make communication to a grid controller (or a number of grid controllers) easier for programmers of MAX/M4L devices by providing a base set of functionality for handling the low level communications. The interface is responsible for updating the controllers to give you a representation of what is happening and providing you with inputs for you to process to provide the functionality of your device (as example of this I have another project underway at www.sigabort.co/m4l_live which is aimed at providing a set of plug-n-play building blocks which will use the LP as one of its sources of control – the link between these projects will be available in a future update).
2) Provide a configurable controller system for musicians which want to be able to work with custom controller setups but have neither the time, expertise, nor inclination to go through the coding process themselves.

I would like to give thanks to beta-testers for their ongoing testing efforts and feedback during the beta cycle for 0.3.911.

Note:

I am currently developing and running against Ableton 9.5.x and MAX 7.1.x on Windows 10/OSX 10.10.5. Whilst there should not be any issues with previous versions, I am no longer routinely testing on these platforms. If you find any issue then let me know and I'll be happy to take a look.

Gridlock 0.3.911 Entry/Standard/Full Highlights

A quick run through of the major updates from 0.3.91.

General
New button handling code
New group handling code
Internal changes to support drum/melodic sequencer and configurable control types (0.3.92)
Internal changes to support 32 buttons (0.3.92)
Internal changes to support direct Live mapping (0.3.92)
Virtual devices no longer show by default, there is a checkbox to display them
Updated de-activation sequence for Launchpad family to free up additional buttons
Moved primary development to Max 7

Arc
Fixed couple of arc display issues
Added scaling factor to push arc implementation controlled by encoder 9

Performance Enhancements
Improved creation speed of each controller instance, particularly when creating multiple instances
HUD grid replaced with new grid - less CPU and faster updates
Number of additional optimisations for resource usage

Arc
Added support for Launchpad Pro
Added support for Launchpad MkII
Added support for Push 2

Gridlock 0.3.91 Entry/Standard/Full Highlights

A quick run through of the major updates from 0.3.91 – this includes all 0.3.55 updates

General
All updates to 0.3.54c-d/0.3.9c-d
Lots of work to reduce resource/memory usage
6 control banks for standard and 8 control banks for full
Velocity processing added

Ableton Live
Added Gridlock_APC40II remote script
New Gridlock KDS device for routing information from/to Keyboard and Drumpad control types

Colour
Full colour support for RGB capable controllers Push/Lemur/APC40II
Lemur colour palette is currently defaulted but will have configuration (0.3.91x)
Colour cycles - these allow buttons to be animated, e.g. glowing effects

Controls
New control type: Push style Keypad
New control type: Drumpad
New draw styles for sliders (gradient, multi-level, meter)

Monome
Number of instances increased to 14 (full)

Push
Sliders now respond to poly pressure for speed of adjustment

APC40II
TDB

Various other fixes/enhancements along the way

Gridlock 0.3.55/0.3.91 monome Highlights

A quick run through of the major updates from 0.3.54

General
Lots of work to reduce resource/memory usage
Humanise added to fixed velocity hits
'Scan' button added for rescanning MIDI devices

Ableton Live
Added Gridlock_Push remote script
Updates to Gridlock MIDI In/Out devices - now possible to filter by bank number

Lemur
Lemur 1.6 script adding slider to rotary/XY controls and providing RGB support

Controls
New button types:
2 way, 3 way
"Has Off" flag added for 2way, 3way, 4way
Dual mode now available for sliders and bends
Double mode now available for sliders, bends and XY

Monome
New config screen - allows only required resources to be used. Also improved load times
VSerialOSC apps now autoconnect on loading through Gridlock
Updates VSerialOSC to oct 2014 version - this can be used as a direct replacement for Max 7 (serialosc has since moved on again, new updates in 0.3.55x)

Push
Arc now natively supported - encoders can be used to control up to 8 arc controls

Repeater

Updates to repeater module:
Can provide "humanise" %age where velocity will be adjusted every now and then
Can provide "ramp" %age to adjust the velocity by a %age at each repeat

Config
New config screen - more expandable and improved load times
Easier selection and configuration
Copying of instances

Various other fixes/enhancements along the way

Gridlock 0.3.54 Highlights

A quick run through of the major updates from 0.3.53

General
Fader banks can now be linked to grid instances as with rotary banks (config screen)
Java components are now load on demand to cut down load times if they're not being used.
New multi-selection mode for groups (option on config screen):
1) When a cell is held down, other cells can be toggled on and off
2) After releasing and multiple cells are selected, selecting an empty cell clears all and selects new cell
3) After releasing and multiple cells are selected, selecting a selected cell allows other cells to be toggled on/off
SHIFT key is now a momentary toggle key set to 200ms - quick tap to toggle, longer press for momentary (existing behaviour)
Updated M4L processing for continuous controllers (faders, touch, rotaries) to throttle output and stop them overloading the system

Launch Control/Launch Control XL
8 banks of matrix are now available to provide a matrix bank per rotary bank
Multi-level feedback is now available for rotary/fader position - each led will dim within +/- 10 of target value
The 4 vertical buttons on the XL now select between rows 1-2,3-4,5-6,7-8 on the matrix giving access to the full 8x8 matrix
Red rectangle added to remote scripts for Live

VSerialOSC
VSerialOSC provided in 2 versions:
vserialosc.maxpat - latest version
vserialosc-d.maxpat - distributed version of VSerialOSC (only works with Gridlock 0.3.9 Full edition) - allows connection to apps running on different computers - requires Java
Support for VSerialOSC version of 7-up - downloadable from the forum
Gridlock no longer has to be running before monome apps in order for them to be recognised

Monome
Refactored monome system to provide faster startup times, and to allow increased number of apps in the future - unfortunately this meant a change to stored settings so these will have been lost

SLM
Allows supported controllers (currently Launchpad, Launch Control/XL) to be used in Max standalone/runtime with all Gridlock functionality

Allows virtual Launchpad to be run on Lemur/TouchOSC
Simplified MIDI mapping in Live
Indicator on control surface when SLM

Live Devices
Gridlock MIDI Out - this can be placed on any tracks and receive the MIDI output from gridlock by instance allowing Gridlock to send MIDI anywhere in Live - this can be filtered by note/CC number. Channel filtering not currently implemented.
Gridlock MIDI In - this can be placed on any tracks to send MIDI data to a specific Gridlock instance - this can be filtered by note/CC number and can also be used to force a MIDI channel number for MIDI processing by Gridlock

Max Patches
Max patches providing functionality of new Live devices

Live Session Gridlink
Gridlink configurations are now linked to Live session view allowing multiple controllers to be linked together for controlling session view and associated native functionality, both in M4L and SLM
Changes to Gridlink setup:
Up to now, new groups have been assumed when an offset of 0,0 is supplied, hence not allowing surfaces with an offset of 0,0
There is a new checkbox that now signifies the creation of a new group so that it is possible to have 0,0 offset

API
First full version of API provided allowing Max patches to interact directly with Gridlock for updating displays, controlling input and providing customised operation for output (0.3.9 only)
Updates to IO config to support remoting of API (eta 0.3.91)
See separate Gridlock Programmer's Reference doc

Fixes
Fixed issue selecting OSC targets on startup
Restoring Live sets will correctly restore all settings for multiple instances
When adding new controllers, controller list and MIDI options are updated correctly
Fixed issue where zeroconf would not work properly across multiple computers
Lots of other bits and pieces

Table of Contents

1 Installation

1.1 Ableton Live

For Ableton you can just insert the `Gridlock.amxd` into your set and you will be good to go.

Gridlock is designed to be used when the grid controller is attached to Ableton as a control surface, so the available surfaces in Gridlock will be those control surfaces that are configured in Midi setup in Ableton.

1.1.1 Remote Scripts

Scripts are provided for the following controllers at this time:

- Launchpad
- Launchpad Mini
- Launchpad MkII
- Launchpad Pro
- Launch Control
- Launch Control XL
- Livid Ohm RGB
- Livid Base
- Push
- Push 2
- APC40 Mk II

To install the scripts, copy the contents of the 'Remote Scripts' directory in the zip file to your Ableton installation directory, e.g.

Windows: C:\Program Data\Ableton\Live 9 Suite\Resources\MIDI Remote Scripts

OSX: /Applications/Live 9 Suite./Contents/App-Resources/MIDI Remote Scripts

Whilst there is still some support for native scripts, this is being phased out as I add more to the remote scripts, so I recommend using these moving forward. All of them include minor performance enhancements and some (e.g. original Launchpad) can be significant.

1.2 MAX

MAX users can load the `Gridlock.mxf` file provided. This can be usable in both the licensed and runtime versions of MAX.

When running as a MAX patch the control surface dropdown will list all available MIDI controllers meet the currently selected set of MIDI devices. Select the appropriate entry from the dropdown list.

1.3 serialosc.maxpat

In order to use VSerialOSC for Monome communication, you will need to use the provided `serialosc.maxpat` file. For this release of Gridlock, serialosc has been updated to the latest monome version (Oct '14) allowing interop with the latest patches.

Also included is a `set_my_offset.js` Javascript patch that should be placed in the same location to support some older patches.

1.3.1 Max 6

This needs to be placed somewhere in your path (i.e. in those directories listed in file preferences) so that it can be picked up by apps that need it – you may already have one of these installed so take a backup copy and then install this new one over the top.

Note: MAX runtime users will need to place serialosc.maxpat in:

Windows:	32-bit: C:\Program Files(x86)\Cycling '74\Max 6.?\patches or
	64-bit: C:\Program Files\Cycling '74\Max 6.?\patches
OSX:	/Applications/Max6/Cycling '74/patches

1.3.2 Max 7

You can directly overwrite the serialosc.maxpat that comes with Max 7 in the following locations:

Please backup your existing file in case there are any issues.

Windows:	32-bit: C:\Program Files(x86)\Cycling '74\Max 7\resources\packages\Beap
	64-bit: C:\Program Files\Cycling '74\Max 7\ resources\packages\Beap
OSX:	/Applications/Max7/Cycling '74/resources/packages/Beap

You should also see the following in the MAX window:

```
serialosc.maxpat: 2014-oct
serialosc.maxpat: Gridlock VSerialOSC 0.2.0
```

1.3.3 serialosc-d.maxpat

Gridlock 0.3.9 supports distributed control of remote monome apps that use serialosc, thus allowing Gridlock to run on a separate computer from that hosting the apps. In order for this functionality to activated, you should use the serialosc-d.maxpat provided.

1.4 Installing Java Helpers

Three Java helpers are currently provided that allow some operations to be carried out that are not directly supported in MAX/M4L. If you wish to take advantage of these then please install Java on your system (for OSX compatibility at this time, all Java code is developed in Java 6).

Place the provided `lh_gridlock.jar` in:

Windows:	32-bit: C:\Program Files(x86)\Cycling '74\Max 6.?\Cycling '74\java\lib 32-bit: C:\Program Files(x86)\Cycling '74\Max 7\resources\java-classes\lib
	64-bit: C:\Program Files\Cycling '74\Max 6.?\Cycling '74\java\lib 64-bit: C:\Program Files\Cycling '74\Max 7\resources\java-classes\lib
OSX:	/Applications/Max6/Cycling '74/java/lib /Applications/Max6/Cycling '74/resources/java-classes/lib

Java is not enabled by default as it may take a few seconds to load and if people are not using it this can be addition wasted time. You can enable Java by clicking on the toggle switch next to the Java indicator at the bottom of the Gridlock display. If all has been installed correctly, this will turn green as shown.

Figure 1 - Java Indicator

Note that saving your set in Live or saving the config in standalone will save the state of this switch and so Java will not need to be re-enabled on next load.

1.4.1 MIDI Feedback in Ableton Live

If you wish to use MIDI feedback for an external bank of rotary controllers (see section x.x.x) and they can provide feedback which you wish to take advantage of, then you will need to install Java on your machine to provide this functionality.

Note: This is only included in the standard and full editions of Gridlock – for all other versions, please see http://sigabort.co/m4l_tools.html.

You can verify if the Java helper is installed correctly by opening the MAX window (right click on Gridlock device to bring up the menu) and check that the following appears in the window:

```
lmh_m4l_midi: 0.1.6
```

1.4.2 OSC Bundles

In order to improve communication with TouchOSC, OSC bundles are used. This can help to reduce packet loss and generally provide a smoother overall experience.

You can verify if the Java helper is installed correctly by opening the MAX window (right click on Gridlock device to bring up the menu) and check that the following appears in the window:

```
lmh_glc_OSC_util: 0.1.1
```

1.4.3 Repeater

In order to provide more accurate timing for repeat operations (see section x.x.x), Java is used as this is not prone to some of the timing issues present in Javascript.

You can verify if the Java helper is installed correctly by opening the MAX window (right click on Gridlock device to bring up the menu) and check that the following appears in the window:

```
lmh_glc_repeater: 0.1.2
```

2 Supported Platforms

2.1 Hardware

- Launchpad/Launchpad S/Launchpad Mini/Launchpad MkII/Launchpad Pro
- Launch Control/Launch Control XL
- Ableton Push/Push2
- QuNeo (MAX only)
- Livid Base & OhmRGB
- Akai APC40 Mk II

2.2 Software

- Lemur
- TouchOSC

2.3 Future

- QuNeo (Ableton)
- Livid Ohm64
- Livid Block
- Akai APC Mini
- Monome 64/128/256
- Bhoreal
- Mira

If you have a desire for a particular controller to be supported and it's not on this list then please contact gridlock@sigabort.co

3 Activating Gridlock

3.1 MAX

No activation is required in the MAX version – just select a control surface and you are ready to go.

3.2 Ableton

All of the normal functionality of the controller is available by default and you need to 'activate' Gridlock in order to use it.

3.2.1 Launchpad

Select the 'User 2' button.

In order to return to normal Launchpad functionality enter shift mode and press the Session, User 1, or Mixer buttons.

3.2.2 Push

Press the 'User' button. This will start flashing to indicate you are using Gridlock.

In order to return to normal Push functionality, press the User button again.

3.2.3 APC40 II

Press the 'User' button. This will start flashing to indicate you are using Gridlock.

In order to return to normal Push functionality, press the User button again.

3.2.4 QuNeo

QuNeo is only currently supported in the MAX version and cannot (yet) be used in Ableton.

3.2.5 Launch Control, Launch Control XL

Select template User 8.

3.2.6 Lemur, TouchOSC, OhmRGB, Base

These require no activation and are active when selected.

When active the instance will indicate this by changing the background of the 'Active' text from red to green.

4 Main Gridlock View

The main gridlock view consists of a number of expandable panels that deal with the current configuration and state of your controller setup.

When launching Gridlock for the first time, you will be presented with a display similar to the following:

Figure 1 - Initial Gridlock View

Each arrow symbol represents a panel that can be expanded for more information. Expanding both of the panels in the above view gives us the following view:

Figure 2 - Expanded view

This provides additional input/output information that can be viewed when operating the controllers, and in the case of controller itself, a graphical representation of the current state of the controller.

5 Global Configuration

Global configuration (i.e. not tied to a specific controller instance) is presented in the first panel.

Figure 3 - Global Configuration

5.1.1 Load

Load configuration – this is a full setup and includes number of controllers, individual controller configuration, GridLink configuration, MN+ configuration, OSC configuration and Rotary configuration.

When used in Ableton, all of this information is also stored in the set so there is no need to specifically load a configuration when you reload a set. Everything will be as you left it before. You can however use this to load different configurations.

5.1.2 Save

Save configuration.

5.1.3 OSC

OSC configuration – allows up to four OSC devices to be configured as either Lemur or TouchOSC surfaces.

See section 20.

5.1.4 Sync

Sync Max transport to incoming MIDI clock signal.

See section 16

5.1.5 Monome

MN+ configuration – allows 7 Monome apps to be configured for control with Gridlock

See section 18.

5.1.6 Scan

Rescans available MIDI devices if standalone, or control surfaces if in M4L.

5.1.7 Key (Map)

Allow keyboard keys to be used to control Gridlock

See section 15

5.1.8 Monitor

Allows Gridlock's input and outputs to be monitored. Useful for providing debugging information or seeing what each output produces when developing software using the Gridlock core.

5.1.9 (Grid)Link

GridLink configuration – allows GridLink to be configured.

See section 21.

5.1.10 Number of control surfaces

Allows number of control surfaces to be selected, currently between 1 and 8.

Please note that changing the number of control surfaces may take a short time as extra components may be loaded/unloaded. Also, a reset will be performed that will reset the controller to the last loaded state (as best as possible)

5.1.11 Dump

Dumps current Gridlock state to the MAX window to aid in addressing issues.

5.1.12 Reset

Resets Gridlock to last loaded state

5.1.13 Debug

Enables debug output to MAX window

5.1.14 Trace

Enables trace output to MAX window

5.1.15 Load Java

In the latest versions of Gridlock Java is no longer enabled by default, due to the fact that this can cause additional load times when functionality requiring Java is not being used. The Java load state will be saved with a Live set and also with configs saved in Max so that it will be reloaded automatically at next startup.

5.1.16 Java Indicator

Indicates whether Java is available on system and helper classes are correctly installed

6 Button Mapping

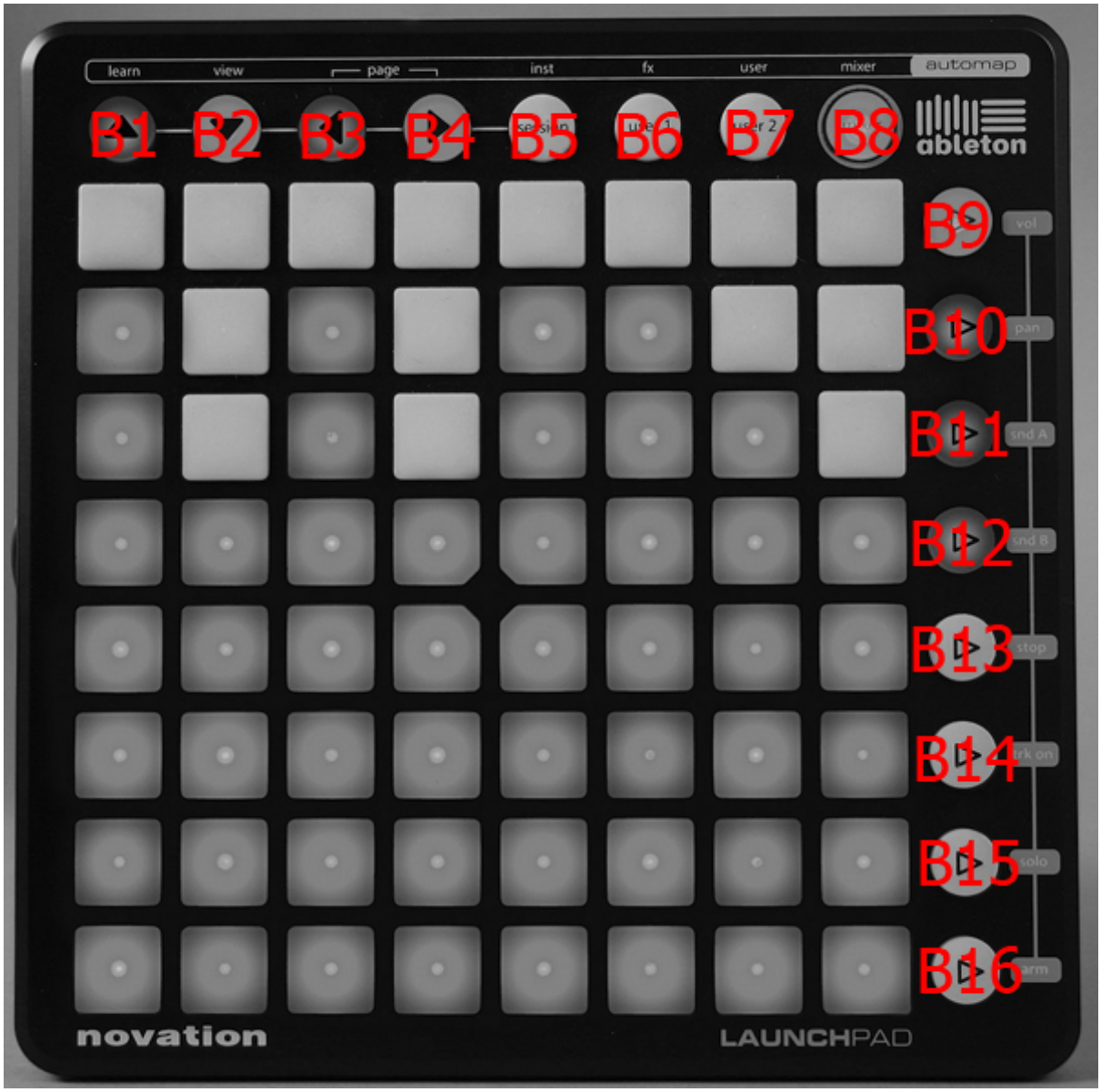
Gridlock by default operates on a model of 13 buttons being available (based on the initial device, the Launchpad).

The reason that it's 13 and not 16 is because the Session, User 1, and Mixer buttons are not natively available when in Live on the Launchpad so they are not currently used (this will be addressed in a future release).

As different devices have different button combinations, these are mapped onto each device as best as possible (there aren't that many devices out there that have an additional 13 buttons on top of the grid!).

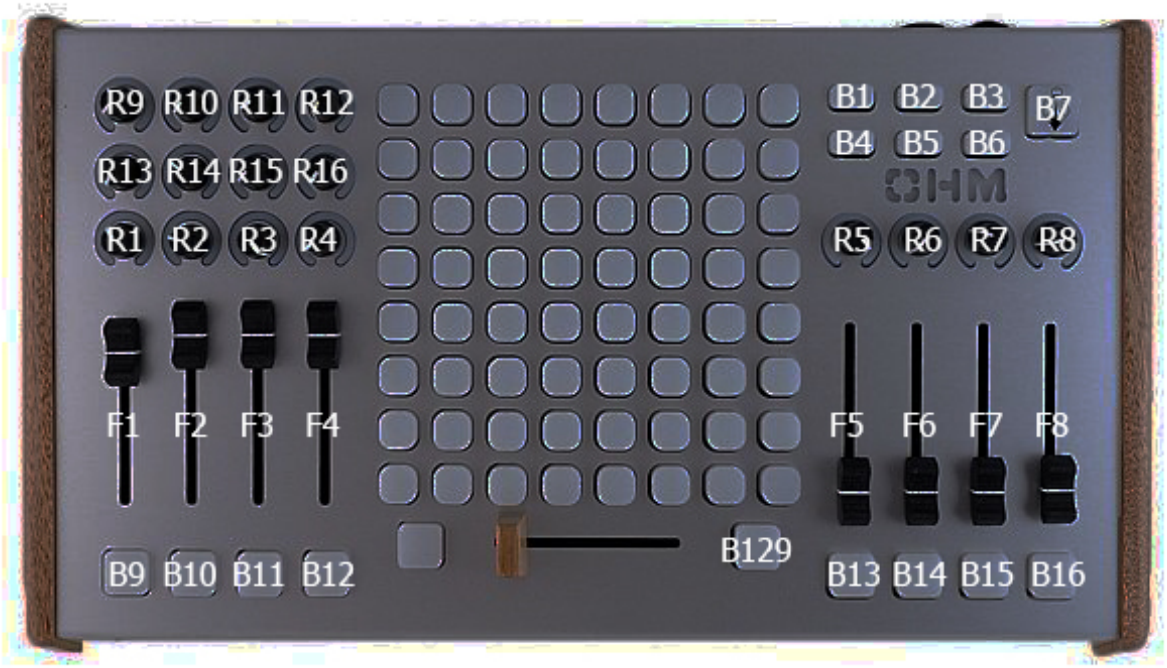
In order to keep the documentation as clear as possible, when talking about buttons I will also refer to the Launchpad setup, specifically top and right buttons, meaning the top row of 8 and side row of 8 buttons.

6.1 Launchpad/S/Mini/Mk2/Pro

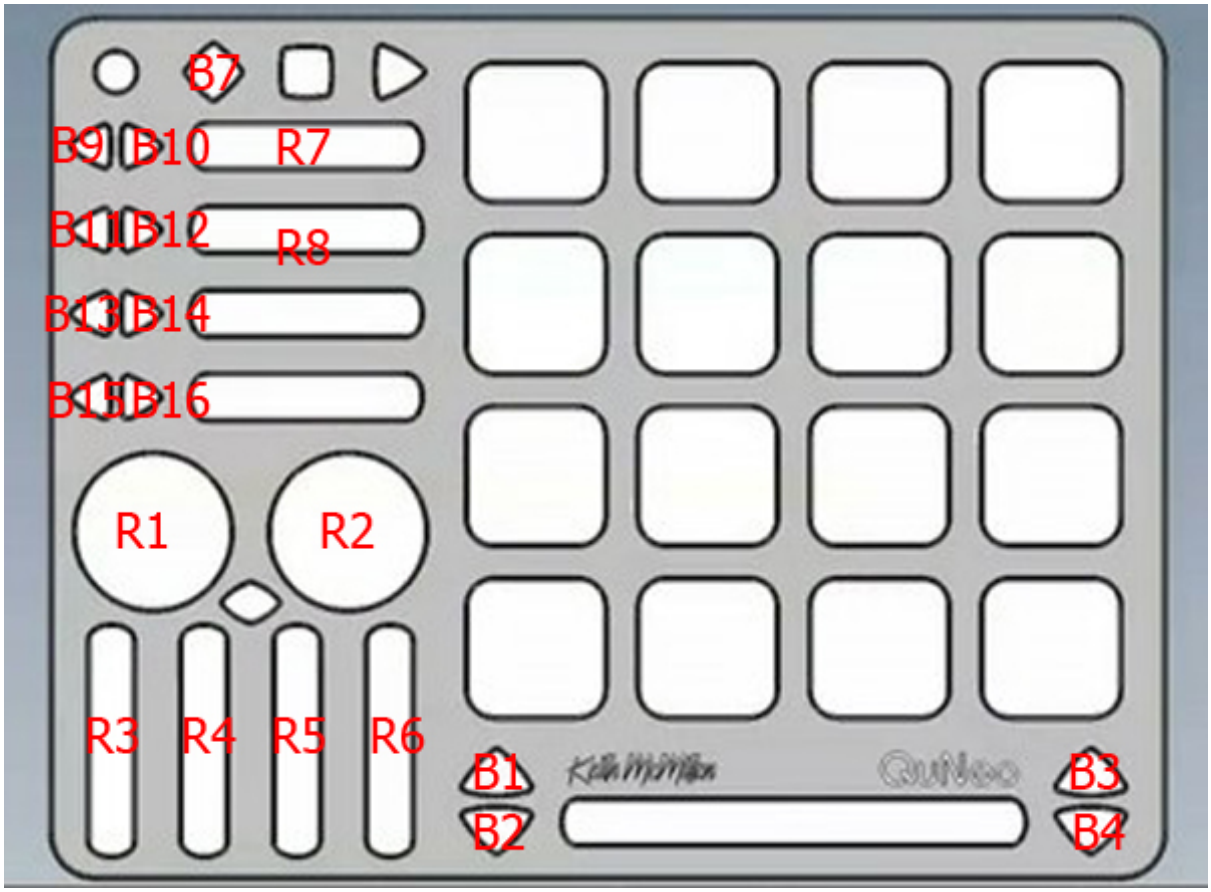


6.2 Push

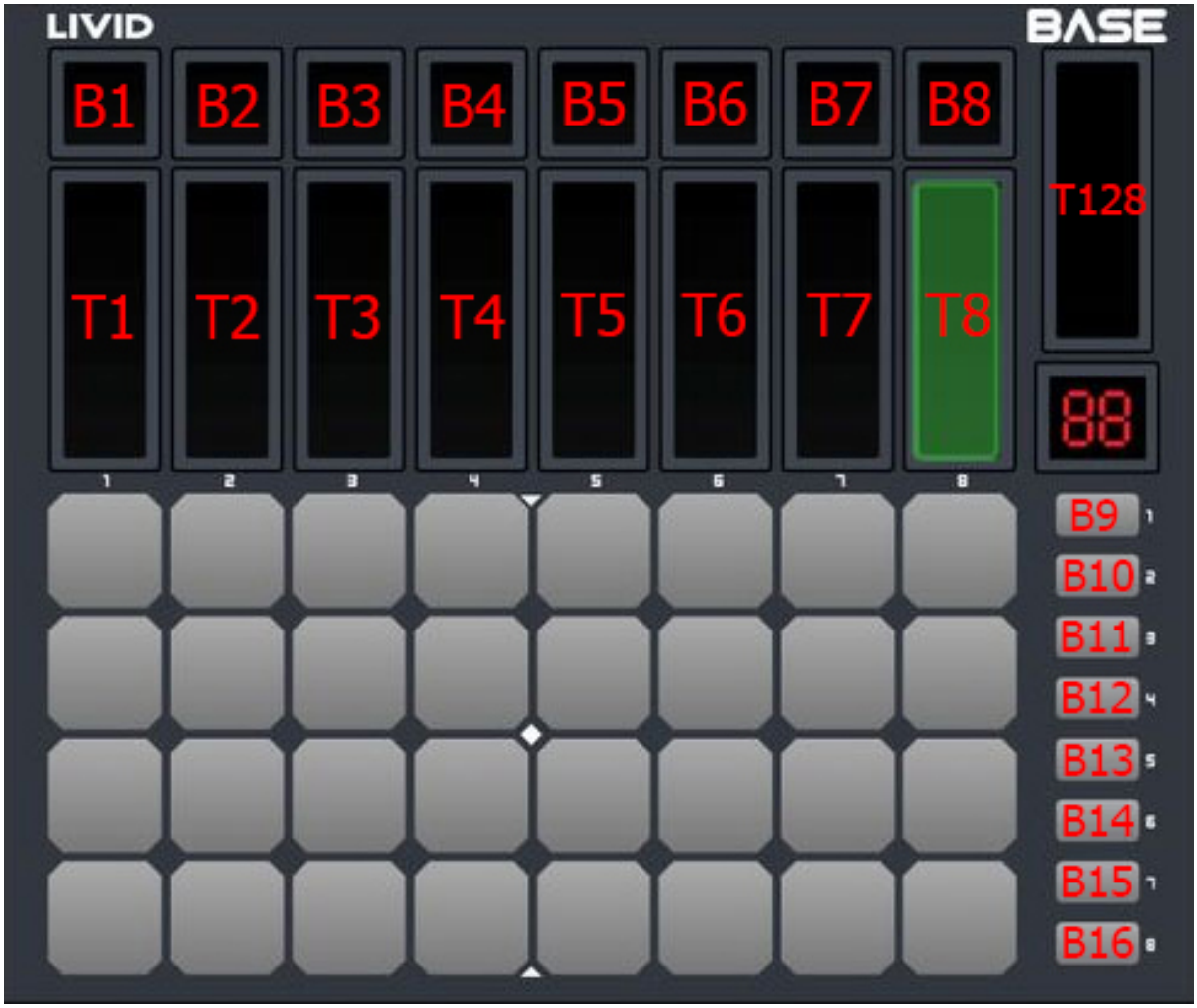
6.3 OhmRGB



6.4 QuNeo



6.5 Livid Base



See section 23 for Base specific notes.

6.6 Launch Control

See section 24.2 for Launch Control specific notes.

6.7 Launch Control XL

See section 24.3 for Launch Control specific notes.

6.8 AKAI APC40 Mk II

See section 25.4 for APC40 specific notes.

6.9 Shift

The shift key allows access to additional functionality and configuration.

The shift key is currently hard coded as B7.

For the latest Gridlock release this is now a true momentary control (set to 200ms) – pressing and holding the shift key will behave as usual, but a quick tap will allow shift mode to be entered until tapped again.

7 Modes

Gridlock currently operates in one of four modes:

- Matrix
- Slider
- Bend
- XY
- Keypad (0.3.91 entry/standard/full)
- Drumpad (0.3.91 entry/standard/full)
- Monome Emulation

7.1 Matrix Mode

In Matrix Mode the following button types are currently available for building up the user interface:

7.1.1 Momentary

A momentary switch will be active for as long as it is held down and will deactivate when it is released. The state of the switch toggles for the duration it is held down.

7.1.2 Toggle

A toggle switch toggles its state upon each time the switch is pressed down – no action is taken upon release, unless a momentary timeout is configured in which case the state is returned to its pre-pressed state upon release.

7.1.3 2-Way/3-Way/4-Way

A switch counts from 0/1 to n then back to 0/1 with each press of the button. The direction of counting can be modified by using the 'decrement' modifier (B9).

7.2 Slider Mode

In slider mode the matrix is turned into a number of sliders (or faders) which output a value between 0 and the specified velocity of the slider depending on how far the slider is 'moved'. This starts at 1 at the bottom of the matrix and 8 at the top. It is possible to set the slider to a value of 0 by selecting the topmost lit button – utilising this it is possible to cut and restore a slider value by repeatedly hitting the same button.

Sliders also respond to momentary presses by changing the value of the slider whilst the new button is held down and returning it to the pre-press value once the button is released.

Sliders can be horizontal, vertical, or inverted to that they correspond visually in the most natural way to the adjustments that you are making.

Additionally, sliders can be placed into a 'fine control' mode whereby they can be adjusted at a much finder grained level. In this mode, the top 4 buttons of the grid increase the value in a +ve way, and the bottom four in a –ve way.

If the controller supports PP (poly-pressure, also called polyphonic after touch) then the pressure used on the pad will determine the rate of increase/decrease of the slider (currently, only Push supports this mode, though it will also be available on LP Pro). Additionally, this mode allows a double click on the slider to set the value immediately.

For all other controllers. values are updated continuously as the buttons are held down and require transport to be running in Live (Max is independent).

The amount each button modified the current value is fixed at the moment, but will be configurable in a future release:

- Row 0: +4
- Row 1: +3
- Row 2: +2
- Row 3: +1
- Row 4: -1
- Row 5: -2
- Row 6: -3
- Row 7: -4

Depending upon the version of Gridlock being used, either 2, 4, 6 or 8 banks of sliders are provided in this version which can be switched by using the four buttons on the left of the top row of buttons.

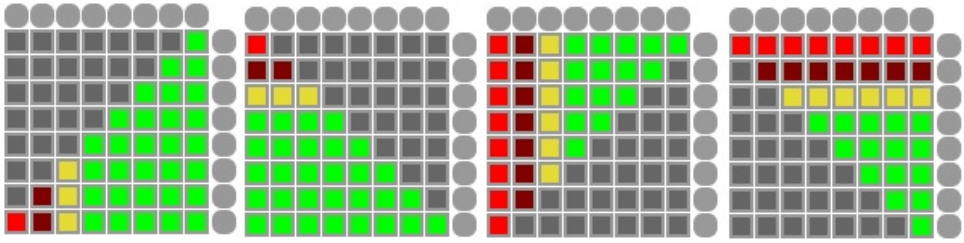


Figure 4 – Sliders: Normal, Horizontal, Inverted, Horizontal & Inverted

7.2.1 Options

When slider mode is active, the right hand buttons provide additional options

Button	Operations
B9	Switch mode: course, fine, double
B10	Switch orientation: Normal, Horizontal, Inverted, Horizontal & Inverted
B11	Switch auto-zero mode: Off, On, Latch
B12	Toggle dual mode
B13	Toggle set all to max
B14	Toggle set all to min
B15	Switch group mode: Off, Abs, Rel

7.2.1.1 Double Mode

When double mode is engaged the number of output levels for each slider is increased from 8 to 16, with an initial button press representing a half step and a second press indicating a full step. Continuing to press the same button will toggle between the 2 values.

7.2.1.2 Auto-Zero Mode

When auto-zero mode is activated, the slider will return to its minimum value when released.

When in latch mode, if a slider is being held down and another slider is selected, then the one being held down will not return to zero and will stay at the value it was at when the 2nd slider was selected.

7.2.1.3 Dual Mode

Dual mode allows 16 slider to be displayed per bank (each being 4 units high instead of 8. Each step is 25% rather than 12.5%. If a slider is assigned a CC control value in configuration, then the 2nd row of sliders will add 8 to the defined CC number.

7.2.1.4 Group Mode

It is possible to define a number of sliders per bank that will operate as a group if required.

For each bank of sliders, the group can be selected by entering shift config mode and using the 3rd row of buttons to add/remove that slider from the group, e.g. sliders 1, 2 and 4 in the following setup are in the group.

Figure 5 - Slider group selection

This can also be achieved by using buttons B16-B23 on Push.

Group mode can be engaged by using B15 and has the following modes:

- Off – no group actions take place
- Abs – absolute mode – pressing and slider in the group will set each of the other sliders in the group to the same absolute value
- Rel – relative mode – pressing any slider in the group will adjust each of the other sliders in the group the relative amount of change in the selected slider

On Push, the touchstrip is used to control the group changes rather than pressing a slider in the group.

7.2.2 Slider Behaviour

Sliders can operate in one of two modes (selectable from the shift-grid)

7.2.2.1 Normal

The bottom cell indicates a 0 value and there are 7 steps available at xyz at 15%, 29%, 43%, 57%, 71%, 85%, 100%

7.2.2.2 Toggle 1 & 2

No cells lit indicated a 0 value and there are 8 steps available at 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5%, 100%

In order to select the 0 value, the slider's current level should be selected – this will set it back to 0. For Toggle 2 selecting and current level will reset the slider value to 0, in Toggle 1 (default) only pressing the minimum level will toggle back to 0. Using double mode on the slider implicitly selects Toggle 1 mode.

7.3 Bend Mode

Bend mode is similar to slider mode, but allows +ve and –ve values to be selected around a centre point. Whereas the slider outputs a velocity value from 0 to velocity max, and level from 0 to 8, the bend controller will output a velocity from –velocity max to +velocity max, and a level from -4 to +4. The 0 centre point can be moved to enable the output range to be shifted, e.g. setting the velocity max to 127 and the centre point to 64 will allow a value to be sent out in the range -64 to +63.

As with sliders, the control can be put into fine mode where the current value can be incremented or decremented in smaller steps.

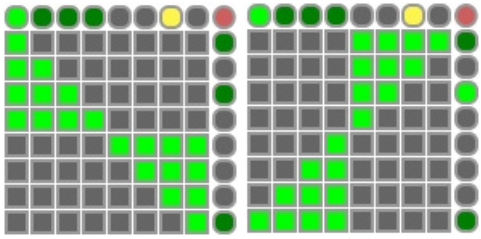


Figure 6 - Bend Controls

7.3.1 Options

When bend mode is active, the right hand buttons provide additional options

Button	Operations
B9	Switch mode: course, fine, double
B10	Toggle horizontal mode
B11	Toggle auto-zero mode
B12	Toggle centre all
B13	Toggle dual mode

7.3.2 Bend Behaviour

The bend controls currently only work in toggle mode (see section 7.2.2.2).

7.4 XY Mode

XY mode mimics an X-Y controller (X along the horizontal axis, Y along the vertical) where each button press on the grid sends out a dual pair of updates in relation to the position pressed on the grid.

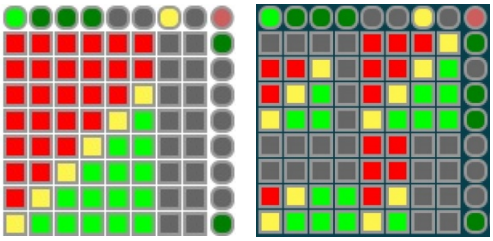


Figure 7 - Full surface XY and Quad XY control

7.4.1 Options

When bend mode is active, the right hand buttons provide additional options

Button	Operations
B9	Switch mode: course, fine, double
B10	Display mode: Quad, XY1, XY2, XY3, XY4
B11	Toggle auto-zero mode
B12	Anchor: BotL, BotR, TopR, TopL

7.4.1.1 Display Mode

The XY has 5 display modes: Quad (displays all 4 XYs for the page), XY1 (top left), XY2 (top right), XY3 (bottom left), XY4 (bottom right). This button sequences through the modes.

7.4.1.2 Anchor

Each XY can have one of four anchor points – this is where the rest point is set to be and where the control will return to if in auto-zero mode. Other than that, the anchor point only affects the way the control is displayed and certain anchor points may be more visually appropriate for certain actions (e.g. an anchor point top right will be more natural for a hi-pass filter as opposed to the bottom left for a lo-pass).

7.5 Keypad Mode

Keypad mode provides a way of configuring the matrix in a way suitable for playing melodic content.

The keypad is based on the now familiar Push style layout

Using the provided Live device it is possible to route the output of different keypad instances to single or multiple locations in your Live set.

7.5.1 Options

When bend mode is active, the right hand buttons provide additional options

Button	Operations
B9	Toggle split mode
B10	Octave Up
B11	Octave Down

When in split mode the options (B10,B11) and shift grid options will operate on the top portion of the grid, otherwise operation will be on the main grid.

7.5.1.1 Split

Engaging split modes turns the matrix into 2 independently controlled grids of 4 rows each that can be configured and played independently.

7.5.1.2 Octave Up

Increase octave of root note

7.5.1.3 Octave Down

Decrease octave of root note

7.5.2 Shift Grid Options

7.5.2.1 Velocity

4 fixed velocity values are provided for when keys are pressed which are configurable via the config screen.

Additionally, if the controller is velocity sensitive, then the group can have its selection turned off and the velocity value of the pad press will be used instead.

7.5.2.2 Humanise

4 levels of humanise %age are available for subtly/dramatically changing the velocity of each successive hit. These can be configured in the configuration screen.

7.5.2.3 Root Note

The note of the bottom left pad.

7.5.2.4 Scale

The scale of the keyboard layout.

7.5.2.5 Chord

A chord to be played when a single key is pressed.

7.6 Drumpad Mode

Drumpad mode provides a way of configuring the matrix in a way suitable for controlling drum setups.

Each drumpad is split into 4 quadrants that can be independently configured.

A drumpad has a root note (located bottom left) and is then laid out in a 4x4 grid whereby the note number increases to the left and upwards. This is a standard layout for drumpad and will fit nicely with Live drumpads.

It is possible to set the velocity of each individual hit and also set them to be velocity sensitive if available for the controller. Additionally, each hit can have repeat effects applied to it for variation. So, for instance, you could actually configure 2 of the drumpads to play from the same root note and send to the same MIDI channel, but have different velocities and some subtle repeat effects to add variation.

Configuration is only available from the config screen at this time, but will be extended in the next version.

Using the provided Live device it is possible to route the output of different drumpad instances to single or multiple locations in your Live set.

7.6.1 Shift Grid Options

7.6.1.1 Velocity

3 fixed velocity values are provided for when keys are pressed which are configurable via the config screen. There is also an option for engaging the velocity map configured in the configuration screen which allows each cell to be configured independently.

Additionally, if the controller is velocity sensitive, then the group can have its selection turned off and the velocity value of the pad press will be used instead.

7.6.1.2 Humanise

4 levels of humanise %age are available for subtly/dramatically changing the velocity of each successive hit. These can be configured in the configuration screen.

7.7 Monome Emulation

See section 18.

8 Grouping

It is possible to group buttons together to provide single selection semantics for a number of buttons (e.g. for choosing some menu item from the button rows, or providing selection functionality on the grid – e.g. chain selection).

When a button is selected that is in a group, all of the other buttons in the group are turned off so only the 1 remains lit. Any command associated with the selected button is sent out. The group can also be declared as having to have at least one button active, or enabling all to be turned off.

Figure 8 - Cell Grouping

In this example, these buttons have been grouped together on group 2 – depending whether multi-selection has been enabled or not, 1 or many of these cells can be active at one time. They have been set to send a MIDI CC1 message when pressed, and the velocity indicates the output value – 0 for the left button, 3 for the right. You can now map CC1 to something in Live (e.g. chain selector) to have the chosen button select the chain you want to access. The grouping is not limited to a single CC or Note, they can obviously be configured to whatever you need.

8.1 Configuration

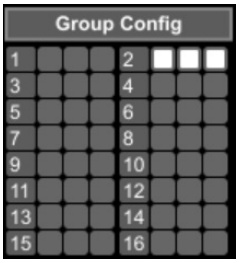


Figure 9 - Group Config Options

The options for a particular group become available once a cell has been configured to use that group.

8.1.1 Send off

When this is checked an off command (e.g. MIDI message) will be sent by any items in the group when they are turned off (i.e. when selecting another member of the group).

8.1.2 Allow no selection

When this is checked, it is possible to have no group member selected (by toggling the currently active member off). If not checked, one member of the group must always be selected.

8.1.3 Multi Selection

When this is checked it is possible to select multiple cells in the group.

- When an initial selection is made, click on other cells to toggle them in/out of the group
- When a selection exists, click on an empty cell to disable all existing cells and start creating a new group
- When a selection exists, click on a highlighted cell and then click on other cells to toggle them in/out of the group

9 Double Click

This latest version of Gridlock supports double click which can be enabled or disabled via a setting on the instance configuration (see …..)

Currently, this is only used for secondary functions and need not be used – I'm awaiting user feedback to how effective this is. On the Launchpad I'm realistically using times of approx 150ms to effectively register a double click accurately, which (see below) can be a long time to wait…

9.1 Pros

Gives more options in a given grid without having to resort to button presses or 'shift'

9.2 Cons

A button press cannot be registered until the double-click time has passed when dealing with a single button.

9.3 Multiple Selection

As double-click is keyed to the rapid pressing of a single cell, as soon as another cell is selected, double-click processing is disabled and all cells will revert to being processed immediately. Thus, rapid operation of the controller should not be affected

9.4 Current Implementation

9.4.1 Matrix Mode

No effect currently.

9.4.2 Slider, Bend, XY Mode

When in any of these modes, double clicking a cell will act as if fine mode wasn't engaged, i.e. the control will take on the course value of the cell pressed.

9.4.3 MN+

No effect currently.

10 Navigation

Navigation between modes is currently hard coded, but will be configurable in future versions.

From all modes, the bottom right hand button at the bottom of the Launchpad will switch between the main mode and Monome emulation.

To switch between the main modes (Matrix, Slider, Bend, XY) hold down the SHIFT key and use the right hand buttons (B9-B12) to change mode.

Note: It is now possible to switch the shifted behaviour of the buttons so that you use the un-shifted switches to switch between modes and use the shifted operation for options. This can be enabled using the shift config (see section x.x.x).

11 Controller Instances

Gridlock currently supports up to 6 grid controllers, depending on which edition you have. Each controller can be configured individually or can load the same config file if required.

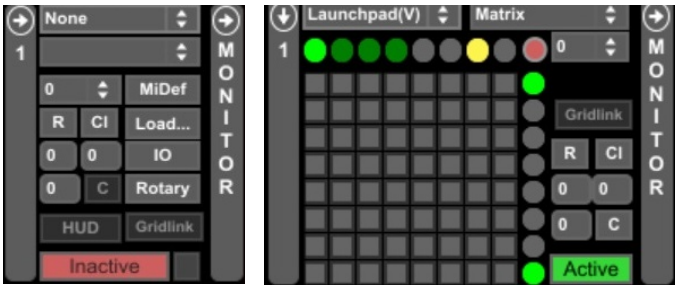


Figure 10 – Controller Instance, maximised & minimised

11.1 Selections & Buttons

For both the minimised and maximised views, most of the following controls exist, but some exist only in the minimised view.

11.1.1 Control Surface

List of all surfaces currently available – if you have plugged in additional controllers since starting Gridlock then hitting 'scan' on the main controller will refresh this list.

11.1.2 Mode

Which mode (Matrix, Slider, Bend, XY, Drumpad, Keypad, MN+) is being used.

11.1.3 Rotation

Rotation of the matrix (and buttons on the MAX version when using Launchpad) in 90 degree steps.

11.1.4 MiDef – Midi Defaults

Pressing this button will automatically provide a default MIDI mapping that can be used to get going straight away without having to define your own in the configuration screen.

- The defaults currently applied are:
- Rotaries banks 1-4 send cc 1-32 on channel 16
- Sliders send cc 1-32 on channel 15
- Bends send cc 65-96 on channel 15
- XYs send 1/2, 17/18, 33/34, 49/50 on channel 14
- Matrix bank 1 sends note on/off 1-64 on channel 13
    - Bottom 2 rows send cc n 127 every press rather than alternate cc x 127, cc n 0
    - They are also grouped into groups 1 & 2 & have colour changes on them
- Monome shift grid: top 2 rows of configurable buttons (rows 4 & 5 on grid) send 1-16, 17-32, 33-48, etc on channel 12

11.1.5 (R)efresh

Refresh the grid and buttons.

11.1.6 (Cl)ear

Clear the grid.

11.1.7 Load

Load configuration without having to bring up the configuration screen.

11.1.8 Momentary Time

Number * 10 of milliseconds that pass from the push of a button to when it is classed as being momentary.

11.1.9 Double-click Time

Number of milliseconds for a push/release/push cycle to be completed in in order for it to register as a double click.

11.1.10 IO

General IO configuration – this allows MIDI and OSC input/output to be configured.

See section 13.

11.1.11 Refresh Time

Particularly when using certain Monome apps, the controller can become flooded with messages that are too many to handle in the time available – this is partly due to the Momome uses OSC to communicate (effectively unlimited bandwith) whereas when talking othe Launchpad and Push, MIDI is used (~1000 updates/s), and partly due to the MIDI implementation of the device (Launchpad has very slow MIDI comms, whereas Launchpad S and Push are much faster).

The result of this is that the controller can become 'laggy' and unresponsive due to the backlog of messages. This is the default case when refresh time is set to 0.

Increasing this value will batch updates and send them to the device every x milliseconds, where x is the value selected here. This will most likely have the effect of making the device updates less fluid, but will mean it remains responsive. This will be improved once I move to C++ in the future.

11.1.12 (C)onfiguration

Launch configuration screen (see section 11.2).

11.1.13 Rotary

Rotary configuration – allows an external bank of 8 encoders to be configuration for use with Gridlock.

See section 14.

11.1.14 HUD

Launch the HUD (see section 17).

11.1.15 GridLink

Activate/deactivate GridLink (see section 21).

11.1.16 Active/Inactive

`This indicator shows whether Gridlock is currently processing messages from the selected control surface. All controllers are always active in standalone mode and some are in M4L (e.g. OhmRGB, Lemur) – others need to be activated first (e.g. Launchpad needs to be put into User 2 mode).

11.2 Configuration

A configuration screen is provided for easy configuration of the controller. This is launched by hitting the ‘C’ button on the controller instance.

The config screen is split into 3 main section:

Top – Top Row Display – this section is used to perform button and support configuration (rotaries, faders)

Main – this section is used to perform configuration on the main grid. This is bordered at the left and bottom by row/column/all selection buttons

Right – common config across different modes and also additional mode specific config. Also view controls for what is being viewed and controlled.

11.2.1 Info Bar

Figure 11 - Info Bar

The panel at the top contains the following information:

- Zoom level
- Controller instance that is being edited
- The name of the control surface being configured (note that a config file is not tied to a particular control surface – you can have one config file and load it onto multiple surfaces – this is just the surface that was selected when you hit the configure button)
- Configuration file for this instance (if used – if not specified, the instance will load with default setup)
- Controller sync (0.3.92)
- Live sync (0.3.92)

11.2.2 Top Row Display

The Top Row Display is a multi-function display for configuring all aspects of the controller apart from the main grid.

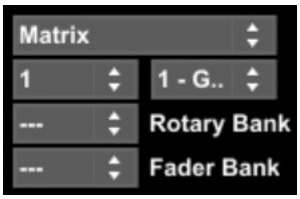
From top to bottom, left to right:

- Controller Type – fixed when config is loaded
- Display Type – Buttons/Rotaries/Faders
- Bank Number
- Row Number

11.2.3 Main Grid

The main grid allows configuration of the main grid control of the controller (or other ancillary buttons, e.g. Launch Control XL).

The configuration information is split into four different pages which are selectable by the view control.

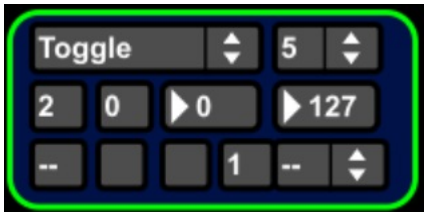


From top to bottom, left to right:

- Control Type – List of controls supported by the version of Gridlock in use
- Bank Number
- Page Number – 1) General, 2) Press, 3) AfterTouch (0.3.92), 4) Repeat
- Linked rotary bank – when selecting the control instance, which rotary bank to load
- Linked fader bank – when selecting the control instance, which fader bank to load

11.2.3.1 General Config

This is general configuration for the cell. Different controls will be available depending upon control type being configured and Gridlock version being used.



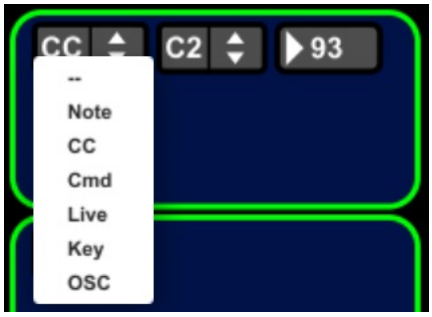
From top to bottom, left to right:

- Cell Type – List of cell types by the version of Gridlock in use

- Flash/cycle Rate – determines the flash rate of the cell (if flash enabled) or the cycle rate if colour cycle is enabled (standard/full only)
- On Colour – on colour of the cell (visible on the cell border)
- Off Colour
- Off/Minimum velocity (see section xxx)
- On/Full velocity
- Group (see section xxx)
- Velocity sensitive – if supported by the controller uses incoming velocity data rather than the fixed data
- Flash – whether cell flashes when pressed
- Cycle type
- Cycle sequence – if available for controller

11.2.3.2 Press Config

This configures what messages are generated when a cell is pressed/released.



From top to bottom, left to right:

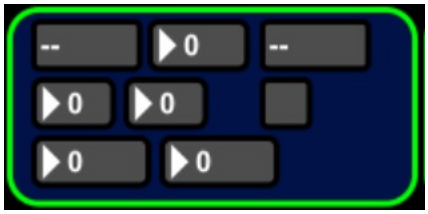
- Param Type – Only Note and CC are supported currently, all other types 0.3.92
- Param Channel – MIDI channel for note/cc message
- Param Value – MIDI param value for note/cc message

11.2.3.3 After Touch Config

Available 0.3.92

11.2.3.4 Repeat, Attack/Decay Config

This configures what repeat is set up for the cell when in Matrix or Drumpad (standard/full) modes.



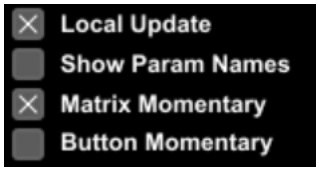
From top to bottom, left to right:

- Repeat Interval
- Repeat Count – 0 to repeat until cell is released
- Repeat Type – 1) Send Note On at each repeat, 2) Send Note Off, Note On at each repeat, 3) Send Note On, Note Off at each repeat
- Humanise - %age to adjust each velocity hit by for humanised feel for repeats and also general velocity hits

- Ramp - %age to increase/decrease each velocity hit by when repeating
- Repeat Velocity PP – if supported by the controller using Poly Pressure to determine the velocity of each repeat hit
- Attack – Increase velocity from min to max over time period
- Decay – Decrease velocity from max to min over time period

Please Note: There is no undo functionality at the moment – please be aware when making bulk changes!

11.2.4 Additional Configuration



Local update – Normal operation is for this to be on (default) which means that when a button is pressed Gridlock is responsible for updating the button. In some circumstances, this may not be desirable, e.g. you may be sending a MIDI message to an external app which in turn sends a response to turn the lighting of the button on/off. Note, this is not selectable for monome grids and is always implicitly off.

Show param names – Display and allow user provided parameter names to be entered.

Matrix momentary – whether the momentary timer is effective for the currently selected matrix (default is off for monome, on for everything else)

Button momentary – whether the momentary timer is effective for the currently selected bank (default is off)

Shift – Monome shift grid configuration – when configuring the Monome emulator, pressing this button which switch to configuring the shift grid. The bottom 1-5 rows of the grid can be configured to send out MIDI messages as per usual (depending upon Gridlock version). These are accessible by pressing the shift button when in Monome emulation mode on the controller.

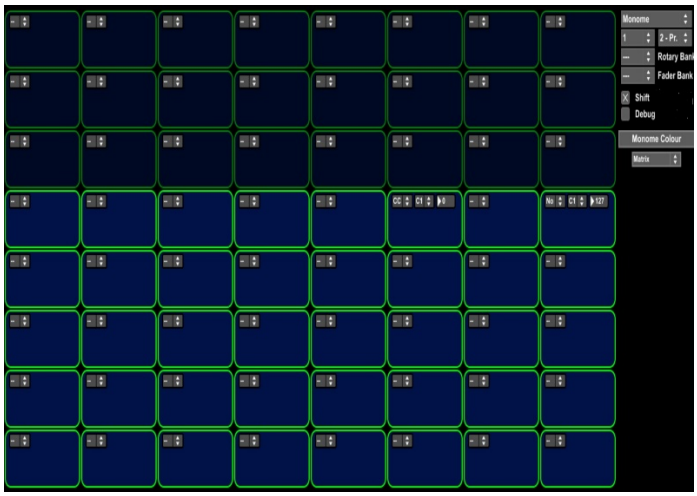


Figure 12 - Monome Shift Grid Configuration

11.2.4.1 Top-Right

11.2.5 Sliders & Bends

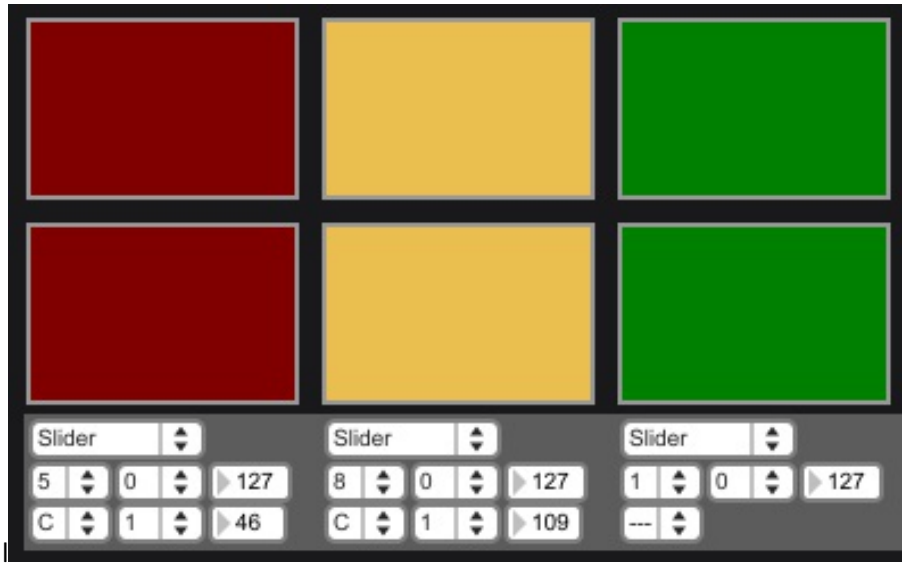


Figure 13 - Slider Config

When configuring the sliders and bends, you will need to use the grey controls at the bottom of the screen – all grid cell controls are removed.

11.3 Colour Cycles

Colour cycles are currently hard coded and editing is disabled.

11.4 Monome Colour Schemes

Figure 14 - Monome Quad Colour Scheme

Figure 15 - Monome Intensity Colour Map

When configuring the setup for Monome, an extra section will appear on the right hand side of the screen allowing you to set the colour scheme for the monome.

The colour scheme for each Monome instance can be:

- Matrix – normal matrix colouring applies and each cell can have its colour set independently
- Quad – each quad of a 256 can have a different colour set
- Intensity – a user selected colour can be mapped to each intensity level for use with intensity enabled apps

It is worth noting that some Monome apps (e.g. 7up) support intensity and non-intensity mode. In the case of 7Up, the number of updates it sends out per second is vastly reduces in intensity mode due to the fact that it can use two intensities to show state, rather than flashing the buttons. This, this will perform much better (I would always advice running 7Up in this mode – you will not need to set a refresh rate in this case, you will if you use standard mode).

12 Shift Grid Settings

Shift grid settings are available when pressing the Shift button (B6) and allows access to more transitive controller settings. This information is displayed on the HUD if used and will be used to detail the options currently available:

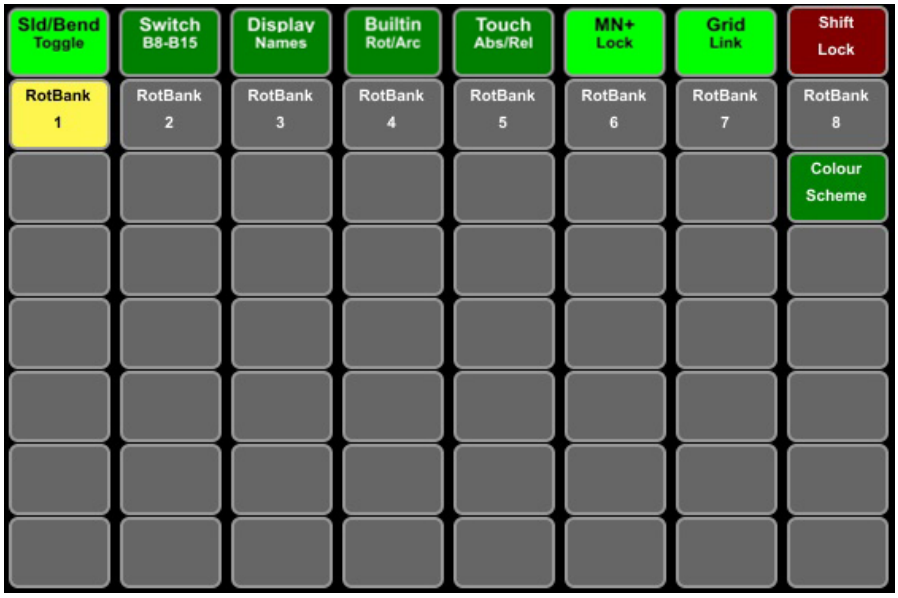


Figure 16 - Shift Grid Settings (Normal)

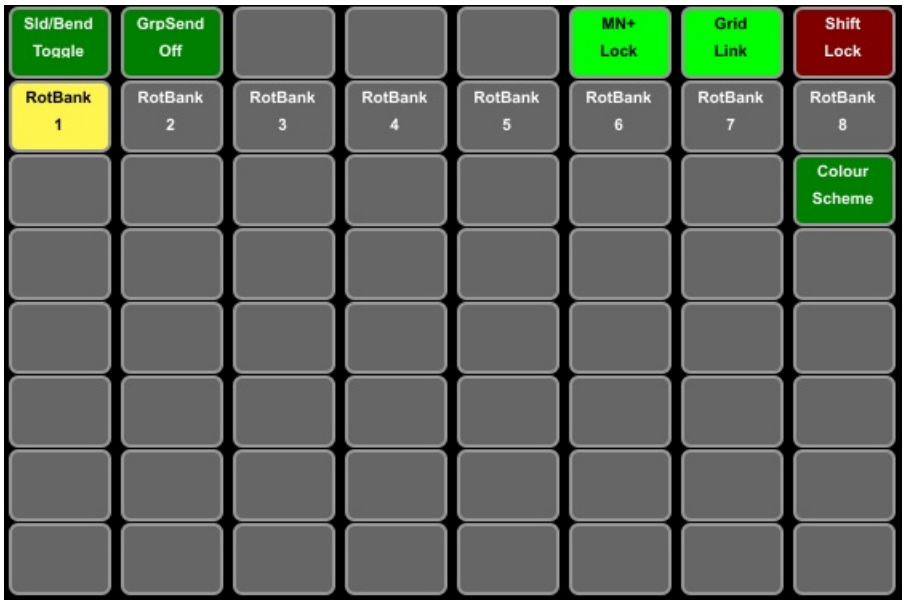


Figure 17 - Shift Grid Settings (Monome)

Sld/Bend Toggle: Changes the behaviour of the sliders and bends to either enable or disable toggle mode. If toggle mode is enabled, pressing the currently selected level of the control will cause it to toggle to 0 and back again

Switch B8-B15: Changes the behaviour of B8-B15 when shift mode is enabled. Normally B8-B15 activate mode specific options and shift B8-B15 are used for mode selection. If this option is activated then B8-B15 are used for mode selection and shift B8-B15 are used for mode specific options – i.e. the two operations are reversed

Display Names: Toggles display between showing configured parameter (e.g. CC 1/15) and any configured display name (e.g. Track1 Volume)

Builtin Rot/Arc: For controllers with built in rotaries that support Arc emulation (e.g. Push), this switch will toggle the rotaries between normal operation and controlling the Arc emulation.

Touch Abs/Rel (Livid Base only): Switches touchstrips between absolute and relative operation (two speeds, 1 and 3).

Gridlink: Enables/disables Gridlink for the unit (and potentially others)

RotBank 1-8: Selected the rotary bank currently being controlled – this can also be selected by the 9th rotary on Push, or an additional 9th external rotary controller (if configured).

Colour scheme (Monone only) – switches the currently selected colour scheme between Matrix (dark green), Quad (green) and Intensity (red)

12.1 Monome Emulation

When in the Monome emulator, the bottom 1-5 rows of the grid can be assigned to parameters of your choosing (see section 11.2.4).

13 Input/Output Configuration

This panel allows the global input and output of Gridlock to be configured.

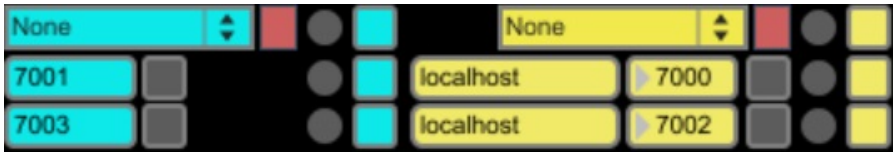


Figure 18 - IO Configuration

From left to right, top to bottom :

Control	Values	Description
MIDI input		MAX: MIDI inputs M4L: In order for this list to be populated, you will need to install M4L-Midi – this is documented in section **Error! Reference source not found.**). You can also choose standard track input.
MIDI input open		Turns green when the MIDI input has been opened successfully
MIDI input indicator		Flashes when MIDI is received
Log MIDI input		Enables logging of MIDI input messages to MAX window
MIDI output		MAX: MIDI outputs M4L: In order for this list to be populated, you will need to install M4L-Midi – this is documented in section **Error! Reference source not found.**). You can also choose standard track output.
MIDI output open		Turns green when the MIDI output has been opened successfully
MIDI output indicator		Flashes when MIDI is sent
Log MIDI output		Enables logging of MIDI output messages to MAX window
OSC UDP input port	1024->	Port for receiving OSC over UDP
OSC input enable	On|Off	Enables/disables OSC input over UDP
OSC UDP output host	w.x.y.z	Host for sending out OSC over UDP
OSC UDP output port	1024->	Port for sending out OSC over UDP

OSC UDP output enable	On|Off	Enables/disables OSC output over UDP
Log OSC output		Enables logging of OSC output messages to MAX window
MIDI UDP input port	1024->	Port for receiving MIDI over UDP
MIDI nput enable	On|Off	Enables/disables MIDI input over UDP
MIDI UDP output host	w.x.y.z	Host for sending out MIDI over UDP
MIDI UDP output port	1024->	Port for sending out MIDI over UDP
MIDI UDP output enable	On|Off	Enables/disables MIDI output over UDP
Log MIDI output		Enables logging of MIDI output messages to MAX window

14 Rotary Configuration

Gridlock now supports the addition of a rotary controller to extend its functionality.

In order to configure the encoders click on the rotary conf button at the top left of the GUI.

Note: Native support is provided for Push, OhmRGB, Launch Control, Launch Control XL, APC40-II

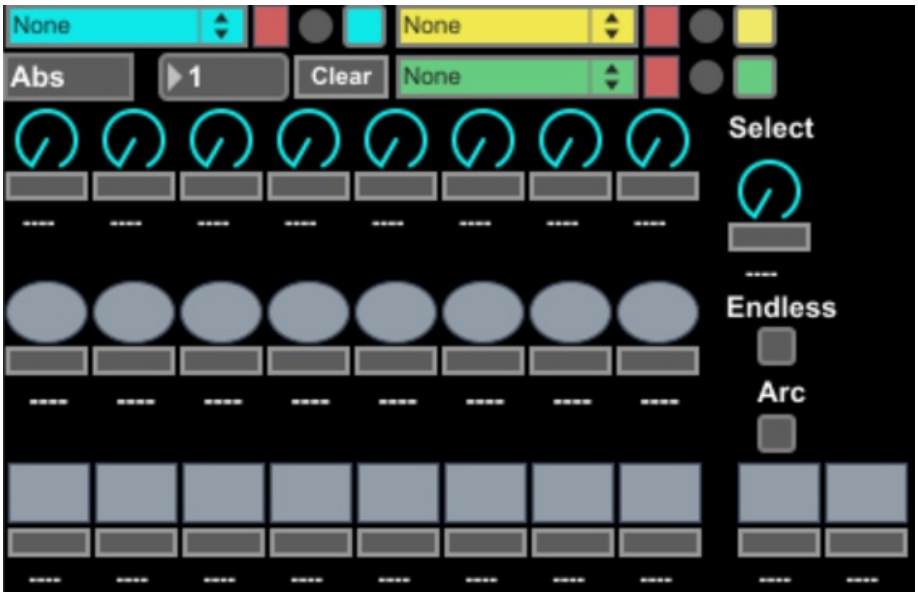


Figure 19 - External Rotary Configuration

From left to right, top to bottom :

Control	Values	Description
MIDI input		
MIDI input indicator		Flashes when MIDI is received
Trace MIDI input		
MIDI output		
MIDI output indicator		Flashes when MIDI is sent
Trace MIDI output		
Mode	Abs, +/-, Ableton 7-bit, 2s Comp, Bin Offset, AbsRel	Whether the controller sends absolute (Abs mode) or relative values (all other modes). The other modes are different ways of encoding a relative value that are commonly in use
Relative multiplier	1-10	Multiplier applied to received relative values
Clear		Clear assignments

MIDI thru		If specified, all incoming MIDI messages that are not mapped will be sent out of this MIDI port. Please note it will not duplicate mapped messages
MIDI thru indicator		
Trace MIDI thru		
Rotary bank		8 Encoders that can be mapped to the controller
Rotary bank selector		Encoder that can be mapped to the controller to change the current rotary bank
Arc Buttons		8 buttons that can be mapped to the controller to send out Arc button presses
Rotary bank select		8 buttons that can be mapped to the controller to change the current rotary bank
Arc	On – Arc, Off – non-Arc	Whether the controller knobs are being used for Arc emulation or not
Endless/Non-endless	On – endless, Off – non-endless	Whether the controller knobs are endless or not

14.1 Input & Output in MAX

For MAX select the input and output and output MIDI channels. The output channel only needs to be provided if your controller supports feedback and/or it only supports absolute values.

14.2 Input & Output in Live

In Live, the input is fixed to be the channel input that Gridlock resides on and can be configured as normal in Live. If Java is installed then you can have access to other MIDI devices.

NOTE: Live opens all MIDI devices upon startup (somewhat annoying) so unless the device has a multi-port MIDI driver you will only be able to access any virtual MIDI ports that have been created.

To provide feedback from Live to an external controller currently requires a small Java application to be used (see section **Error! Reference source not found.**) – this means that you will need Java installed on your machine. If the 2nd menu selector contains no entries then you probably don't have Java installed as it cannot be used to populate available MIDI output devices. When selecting a device, the red indicator should turn green – if not, pull up the MAX Window (right click on the Gridlock toolbar and select Open MAX Window) and check for any red entries in the window.

14.3 Configuring Encoders/Buttons

To configure an encoder/button, click on the button below the encoder (which will turn red) and then move the encoder that you wish to assign. The assign mode will be disabled and the midi channel/CC will be displayed beneath the encoder. Repeat for each encoder.

For buttons it is also possible to assign a keyboard key to the control.

The 9th encoder on the right hand side can be used to select the rotary bank being used if you have another spare somewhere.

14.4 Non-endless Rotary Support

Non-endless rotaries can be supported by enabling the appropriate check box. The knobs will operate in a ‘pick-up’ mode, i.e. when a bank is changed, moving the rotary will not have any effect until the value moves through the value of the rotary in that bank. The HUD can be used to visualise this.

15 Key Map

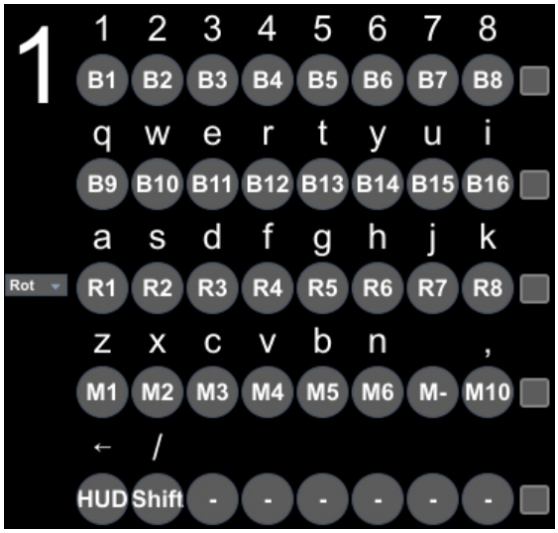


Figure 20- Key Map

The Key Map allows keyboard keys to be mapped to a number of Gridlock controls, broken down into:

- Top buttons (B1-B8)
- Right buttons (B9-B16)
- Rotary bank select (R1-R8)
- Arc button (A1-A8)
- Mode (M1 – Matrix, M2 – Slider, M3 – Bend, M4 – XY, M5 – Keypad, M6 – Drumpad, M10 – Monome)
- HUD (Esc key), Shift

Whether each section of the keymap is active is determined by the checkbox at the end of each row. Currently, the keymap is hardcoded but I may add config for this in the future if there is demand.

It is not possible to send rotary bank and arc button messages at the same time – which is being used can be selected via the menu at the left hand side of the row.

The current instance is shown in the top left of the screen and can be changed via CTRL + F1-F8.

16 Max Sync

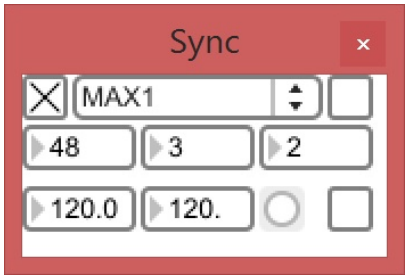


Figure 21 - Max Sync

Sync configuration (only available in standalone) allows the Max global transport to be synced to an external source (e.g. Live, Reaper, Sonar) via MIDI sync. This allows any Max apps that are **synced to the Max global transport** to be synced up to the external clock source. This requires the external source to send MIDI clock and SPP (Song Position Pointer).

From left to right, top to bottom :

Control	Values	Description
Clock source monitor	On|Off	If enabled then the clock source is monitored for SPP and MIDI clock messages
MIDI clock source		MIDI port to monitor for clock source
Metronome	On|Off	Play metronome based on incoming clock source
SPP (Bars,beats,tenths)		Shows bars, beats and teenths of clock source.
Calculated incoming tempo		Calculated incoming tempo. This will likely fluctuate over time due to clock jitter/MIDI timing issues
Input tempo		Intended input tempo
Sync active		This flashes when the Max transport is being synced to the current transport – this is currently done once every bar
Sync Max transport	On|Off	Whether to sync the Max global transport to the current monitored clock source

NOTE: SPP is only sent out at clock start/stop – you will need to stop and start the transport of the external clock source once in order to sync this up – this should not be necessary again.

17 Heads Up Display (HUD)

The Heads Up Display (HUD) gives a graphical representation of the controller on your computer and is intended as a reference to what you are controlling.

Whilst certain controllers can display information (e.g. Push, Lemur) to varying degrees, the Launchpad has nothing. In fact, there isn't any controller that can effectively maximise screen real estate (whether it be on Lemur or the LCD display on Push) and controllability without some trade-off.

Hence, the HUD. As you switch banks and modes, the HUD will update to reflect you current configuration at that point, details what your buttons and grid cells are controlling. It can be zoomed in or out to fit your screen real estate requirements and is easily opened and closed from the controller (SHIFT + bottom right button)

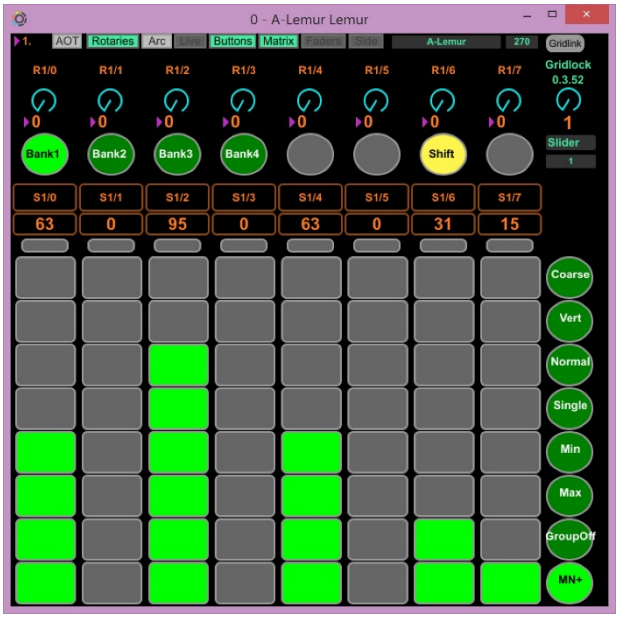


Figure 22 - HUD

17.1 Non-Endless Rotary Display

The rotary display at the top of the HUD can be used to visualise the current settings of non-endless rotaries if they are being used.

Figure 23 - Tracking Rotary

Figure 24 - Rotary Position Unknown

Figure 25 - Rotary needs to move anti-clockwise

Figure 26 - Rotary needs to move clockwise

The four diagrams above show the state of a rotary on the HUD when operating in non-endless mode.

The top image is that of a tracking rotary – the rotary is in control of the value (this is the same as the image for an endless know).

Image 2 is what you will see when first loading Gridlock – this indicates that the rotary has not yet been moved so Gridlock does not know the position of the rotary. As soon as the rotary is moved Gridlock will then track the position of the rotary and will enter one of the other three states.

Image 3 shows that the current value of the physical rotary (i.e. on the controller) is 53 and that the value of R1/14 is 0. Thus, we need to move anti-clockwise to go and pick up the rotary – this is indicated both by the green portion of the dial and the left arrow. Until we move the rotary down to 0 no changes will have any effect, other than to update this display.

Image 4 shows the opposite scenario. Here, the physical rotary has a current value of 15 and R1/6 has a value of 53, so we need to move clockwise in order to pick-up the control and start updating the control.

For both case 3 and 4, both of the images will return to image 1 once the value reaches its target to indicate that movement of the rotary will now have an effect on the control.

17.2 Arc Display

If using Arc emulation, the state of the Arc encoders can be viewed on the HUD by selecting the Arc panel from the top selection box.

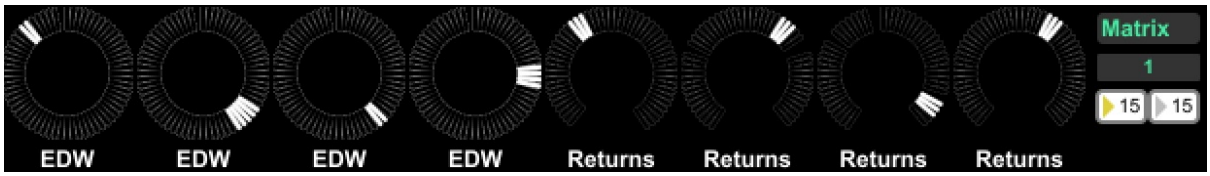


Figure 27 - Arc display on HUD

On the right hand side are 2 number boxes for setting min and max intensity of arc leds for the HUD and for Lemur – if the arc apps appear to generally use low intensity numbers (3-4) you may want to increase the min value to make it more visible.

18 Monome/arc Emulation

Gridlock comes with a fully-fledged monome/arc emulator – with it, you can use monome and arc patches that are available (check out http://monome.org/docs/app for some examples) both in standalone MAX and in M4L.

Figure 28 - Monome Config

Arc emulation is available in the form of a Lemur template for Lemur 5, via builtin roatries on certain controllers (e.g. Push), or via an external bank of endless encoders.

Support is provided for 4 Arc apps which can be mapped across a maximum of 8 encoders, allowing configs for two Arc 4 apps, 4 Arc 2 apps, or an Arc 4 and two Arc 2 apps. Encoder assignments are mapped from 1-8 as each app is added to the config pane.

Arc feedback is provided on Lemur, on the above config screen and also on the HUD.

From left to right, the config options are:

Control	Values	Description
Active	On|Off	Whether this instance is active or not
Monome/Arc size	64|128|256 2|4	Size of the Monome being emulated Number of encoders on the arc being emulated
Ignore prefix	On|Off	Ignores any commands from Monome app to set prefix – essentially disables autofocus.
Prefix		This can either be set manually or in response to messages received from the Monome app as part of handshake.
Link Prefix	On|Off	Indicates whether the display name should always be set when prefix is updated, or only when display name is blank
Display Name		User definable string to identifying the app. If this is blank then it will be populated with the prefix when it is set.
Receive indicator		Flashes when data received from Monome
Trace input	On|Off	Trace incoming commands to MAX window
Receive Port	1024->	Receive from Monome app – this should be matched as the host port on the Monome app
Send port	1024->	Send to Monome app – this should be matched as the receive(listen) port on the Monome app

Trace output	On|Off	Trace outgoing commands to MAX window
Send indicator		Flashes when data sent to Monome
Protocol	VSerialOSC Zeroconfig Manual Manual (MS)	Zeroconifg available 32-bit only
Name		Instance name for use in zeroconfig and VSerialOSC – this is auto-generated and is for reference
N/A		
Instance in view		This indicator lights up if this instance is currently being viewed of a controller
Monitor		Display amount of incoming messages from Monome app
Max		Max number of commands received in monitoring period (100ms)
Monitor enable	On|Off	Enable monitoring
Reset		Reset max count to 0
Patch autoload	On|Off	Load selected patch at configuration load time
Patch	Filename	MAX patch to load for this instance
Select patch		Select MAX patch to load

Table 1 - Monome Configuration

Configuration can be a bit confusing to start with, especially if you are new to Monome.

There is currently 1 video available going through configuration at http://www.youtube.com/watch?v=SMmqYl2RMxI. I intend to do more over time.

18.1 Navigation

When running in MN+ mode, buttons B1-B4 are used to navigate around a Monome 256 grid (these will be available appropriately depending upon the frame size selection in the configuration).

Buttons B9-B15 are used to switch between the different Monome app instance that can be configured, depending upon which version of Gridlock is being used.

If more than 7 instances are available, instances 8 onwards are available by a double press.

18.2 VSerialOSC

This is a Gridlock specific implementation of the Monome SerialOSC protocol which allows Gridlock to register itself as Virtual Monome devices for easier configuration and connection with Monome apps.

In order to use this protocol you will need to make sure that the serialosc.maxpat provided with the release is installed (see installation at the beginning of the doc).

The latest version of VSerialOSC can be used as a direct replacement for serialosc provided with Max7 and therefore allows all Gridlock supported controllers to be directly integrated into BEAP.

19 MIDI Mapping In Live

You can watch this video to see how to MIDI map all Gridlock controls into Live.

http://youtu.be/BeF30gyncFM

20 Tablets

Gridlock supports tablets that can run Lemur or TouchOSC (Mira will be coming once it has matured a little)

20.1 Configuration

Mira needs no additional configuration, and having the app running on your iPad should be sufficient for you to see the display on it.

For Lemur and TouchOSC, you need to configure a surface by using the “Osc Conf” button on the interface.

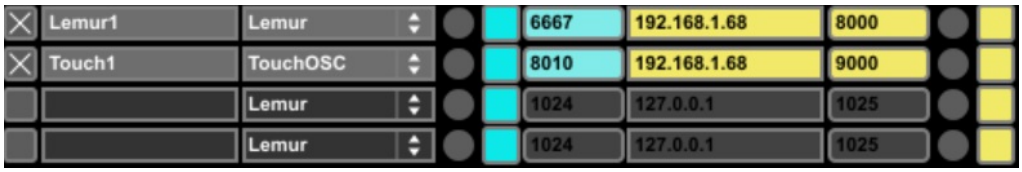


Figure 29 - OSC Config

From left to right, the config options are:

Control	Values	Description
Active	On|Off	Whether this surface is active or not
Name		Name that appears in the drop-down selector next to a grid instance
Type	Lemur TouchOSC	
Incoming Indicator		Indicates that an incoming message is being received
Trace Incoming		Trace incoming messages
In Port	1024->	Port that the tablet app sends on (the port that Gridlock receives on)
Dest Address	x.x.x.x	IP address of tablet
Dest Port	1024->	Port that Gridlock sends on (the port that the tablet app receives on)
Outgoing Indicator		Indicates that an outgoing message is being sent
Trace Outgoing		Trace outgoing messages

Table 2 - OSC Config Options

Figure 30 – Lemur, TouchOSC

The corresponding Lemur and TouchOSC configuration for the above setup is given below.

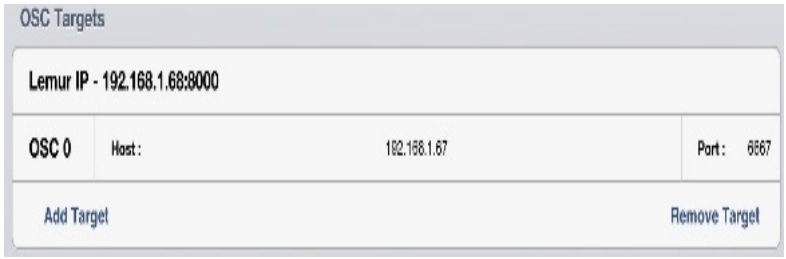


Figure 31 - Lemur Config

Figure 32 - TouchOSC Config

Once configured, the OSC targets will appear in the drop down used to select a control surface:

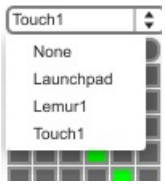


Figure 33 - Control Surface Selection

The tablet conversions are a straight copy of the main physical implementation at this time, but I'll extend these with more natural controls (e.g. replace the grid based sliders, bends with actual controls) and extend them over time.

20.2 Framesize

Both Lemur and TouchOSC can display 16x8 and 16x16 grids for Monome emulation (not for native operation currently).

This can be selected by the appropriate buttons on the iPad display.

20.3 Native Mode

When in native mode, native controls will be used where possible. This is available for sliders, bends and XY controls, where the native implementation will be used on the control surface, rather than a grid of buttons.

20.4 Display Mode

There are 4 display modes available for Lemur and 3 for TouchOSC:

Grid – the whole of the main display is taken up by the grid

Rotaries – the grid size is slightly reduced a row of 8 rotary controls is provided at the top

XYs – the grid size is slightly reduced and a row of 4 XY controls is provided at the top, each control controlling 2 rotary assigned parameters.

Sliders – the grid size is slightly reduced a row of 8 slider controls is provided at the top

Arc (Lemur only) – the grid size is slightly reduced a row of 8 Arc encoders is provided at the top

20.5 Zoom

Zoom mode is only available on Lemur at the moment and is enabled when in rotary, XY, or Arc display mode. Enabling zoom will remove the grid display and give the whole screen over to the rotary or XY displays, allowing for much finer control.

Figure 34- Zoomed rotary and XY controls

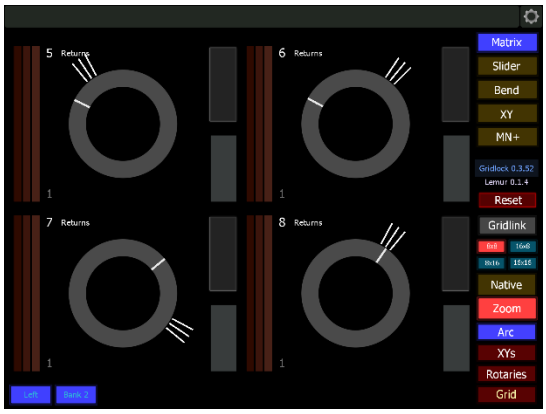


Figure 35 - Zoomed Arc Display

Additionally, on the zoomed XY controls page it is possible to set physics on the ball controlling the X and Y values (set all to 0 to disable physics). This will be available for rotaries and Arc in the future.

- F – Friction
- A – Attraction
- S - Speed

21 GridLink

Gridlock 0.3.5 introduces GridLink – a piece of tech which will enable multiple control surfaces to communicate in order to produce a larger frame controller. Currently this allows up to 8 surfaces to be connected together to form grids up to 4 units wide on a side (i.e. up to a horizontal width of 32 buttons). Any supported surfaces can be mixed with others, e.g. you can put 2 Launchpads together, or a Launchpad with a Push, or a Push and a Lemur.

GridLink is designed to be enabled and disabled on the fly to suit your needs – it is not a fixed operation mode – thus you can still treat controllers as individual entities and configure them individually to your needs and just bring them together when you need access to more than a single 8x8 grid.

21.1 Operation

When GridLink is activated, there will always be a master instance a number of slaves. The master unit will always be the one that Gridlink is activated from, and the other units will be slaves.

The operation of master and slave units differ in the following way:

Master	Enable Gridlock		Gridlock will be enabled for all units
	Disable Gridlock		Gridlock will be disabled for all units
	Slider, Bend	Change bank	Bank will be updated on slave units
	MN+	Change unit	If emulated size > 64, unit will be updated on slave units
	MN+	Change instance	64: Instance for this unit will change as normal – no updates to slaves
			128: Instance for this unit and slave will be updated
			256: Instance for this unit and slave(s) will be updated
Slave	Enable Gridlock		Gridlock will be re-enabled for the unit and it will start to respond to updates from the master **NOTE: It will not automatically update its state at this point – only on the next update from the master**
	Disable Gridlock		Gridlock will be disabled for this unit – it will no longer respond to updates from master until it is re-enabled
	Slider, Bend	Change bank	Bank will be updated on this unit only
	MN+	Change unit	Unit will be updated on this unit only

MN+	Change instance	Instance will be updated on this unit only

From the above table you can see that it is easy, for example, to run 2 separate 64 apps on 2 control surfaces and then select a 128 app from the master which will make them operate as a 128 when you need it, then switch back to the other apps.

21.2 Activation

Gridlink can be activated in a number of ways:

- From the controller: active the shift menu and then select the Gridlink button
- From the device: click on the 'Gridlink' button on the device display or HUD
- iPad: Use the provided button on the Lemur and TouchOSC templates

Figure 36 - Gridlink Activation

21.3 Status

Gridlink status is indicated in the following ways:

Controller: shift mode	Green	Inactive
	Red	Master
	Amber	Slave
Device/HUD: button	Grey	Inactive
	Red	Master
	Amber	Slave
iPad template: button	Grey	Inactive
	Red	Master
	Amber	Slave

21.4 Buttons

The bank/MN+ instance buttons (the top-left 4 buttons) are also coloured in the same way as above.

When in MN+ emulation mode, the size of the surface is still indicated: the number of dark green buttons indicated the size of the Monome (1 button, 64; 2 buttons 128; 4 buttons 256).

21.5 MN+ Instance Buttons

The MN+ instance buttons operate slightly differently in GridLink mode to non-GridLink.

For both master and slave(s), apps that are configured to be 64 will be shown in green. This is to indicate that it safe to switch to these apps on any unit without it affecting another unit.

For 128 and 256 apps, on the master the buttons are red and on the slave(s) they are amber. This is to indicate that pressing a red button on the master may affect other units, and for the slave(s), it is possible to be moved into these instances via an operation on the master.

21.6 Configuration

Configuration of GridLink is provided through the 'Link' button on the main panel. Pressing this button will bring up the config screen.

The config screen consists of a large 4x4 grid, with each cell containing a familiar 8x8 matrix. If you have no input surfaces configured, this will be empty, otherwise it will always contain control surface 1 in the upper left hand corner, and will indicated any other surfaces that are configured into GridLink.

Pressing edit will enter edit mode and will overlay all surfaces (that are not currently configured for GridLink) available. This is indicated by the control surface number (2-8) as configured in Gridlock.

Selecting a control surface for a cell will assign that controller to that relative position in the group and allow X and Y offsets to be adjusted if necessary.

Additionally, different groups can be inferred from the setup and these are indicated in different colours.

Now we've had some description, let's look at a few examples (I will provide some videos after the release).

21.6.1 1 Group, 2 Surfaces

This is the simplest setup and will allow us to use 2 separate control surfaces as a single surface, in this case 16x8. In all of the examples, I'm going to use multiple Launchpad setups, but these can be replaced with any supported control surface.

First, we select 2 control surfaces in Gridlock

Figure 37 - Gridlock 2 controller example

And then open up GridLink config by pressing the ‘Link’ button:

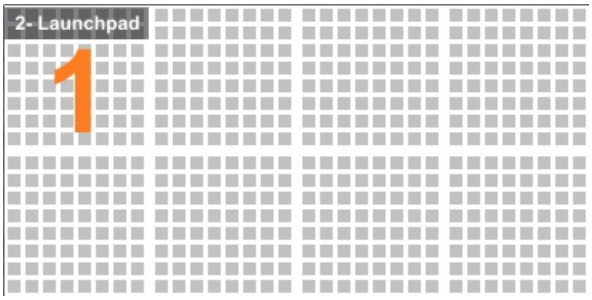


Figure 38 - GridLink, initial view

Press edit to allow editing:

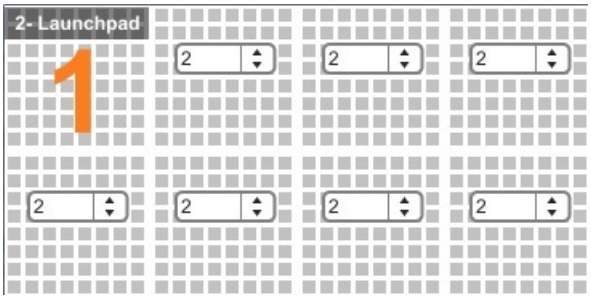


Figure 39 - GridLink edit surfaces

And then select ‘2’ for the 2nd cell across:

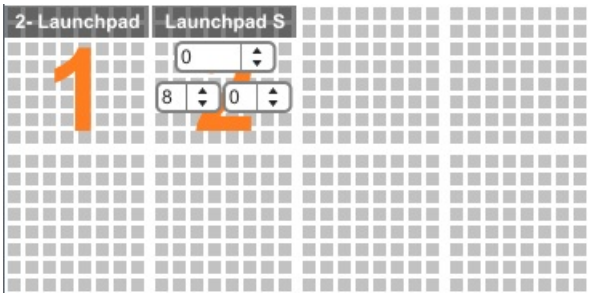


Figure 40 - GridLink, edit surface parameters

We can see that this cell is automatically populated with an X offset of 8 and a Y offset of 0 which is what we want here (the 2nd control surface will issue X coordinates from 8-15 rather than the normal 0-7).

Press ‘Done’ and see that the ‘Gridlink’ buttons are now enabled in the controller’s config section so that GridLink can be enabled.

For the following example we will use a 4 controller setup as indicated here:

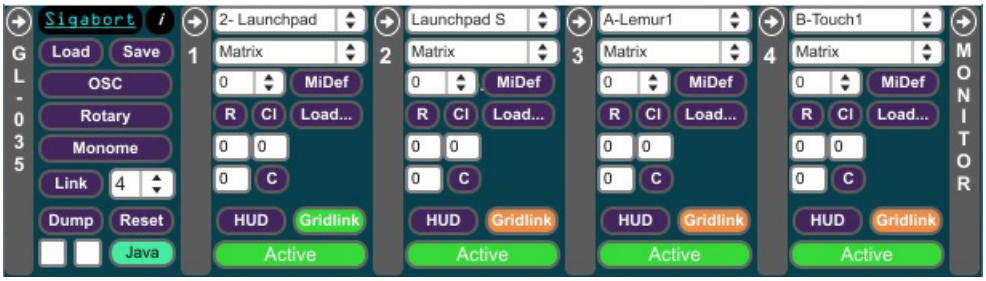


Figure 41 - Gridlock 4 controller example

21.6.2 1 Group, 4 Surfaces, 32x8

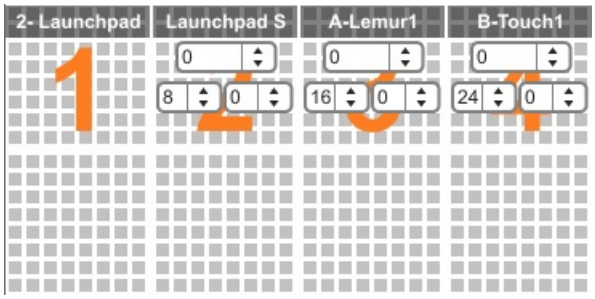


Figure 42 - GridLink config, 32x8

21.6.3 1 Group, 4 Surfaces, 8x32

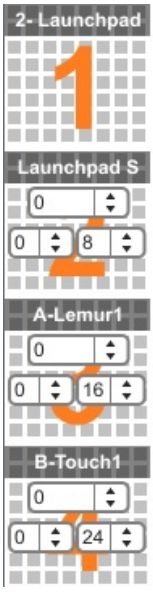


Figure 43 - GridLink Config, 8x32

21.6.4 1 Group, 4 Surfaces, 16x16

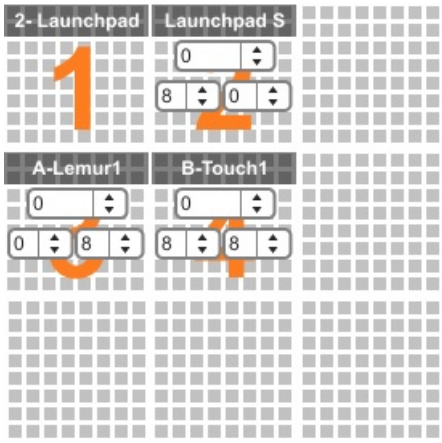


Figure 44 - GridLink Config, 16x16

21.6.5 2 Groups, 4 Surfaces, 16x8 & 8x16

It is possible to create multiple GridLink groups – these are sets of surfaces that are linked together, but only with those in the same group.

All configs we have created so far have all been part of a single group (in fact, they have all been part of group 0 as they start in the upper left corner of the grid).

It may be desirable to have larger surfaces that do not interact with each other – for this we implicitly assign different groups.

A group is implicitly created when a control surface exists with an X and Y offset of 0. Thus, we automatically have a single group created for us as cell 0 is always the origin for any config we build. So, in order to create a different group, we just select a cell at another location and set its X and Y offset to 0:

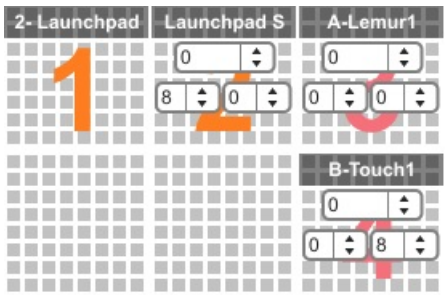


Figure 45 - GridLink Config, 16x8 & 8x16

You will notice when this is done that the ID number is in a different colour from our initial group – this is used to distinguish different control groups from each other.

As we want this group to be a 16x8 control surface, we then assign a control surface to the cell directly beneath and then adjusts the offset that it gives us the required mapping (i.e. X 0, Y 8)

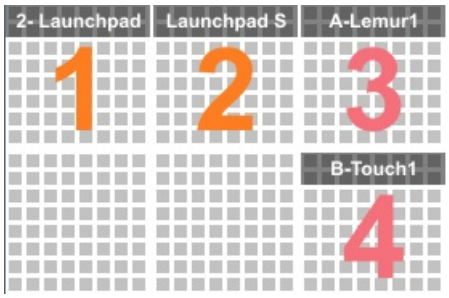


Figure 46 - GridLink Config, 16x8 & 8x16

Please Note that whilst this scheme should support any exotic surface placement that you desire, due to my time I have only tested basic setups (e.g. 16x8, 8x16, 32x8, 8x32, 16x16) – if you create mappings outside of these and encounter problems then please drop me a line and I'll sort out ASAP.

22 Rotation

In order to be able to better place controllers next to each other without cables getting in the way, it is possible to rotate each surface in 90° increments. For example, the USB port on a Launchpad is on the right hand side, making it awkward for 2 to be placed next to each other to form a nice continuous surface.

Figure 47 - Controller Rotation

This can be solved by rotating the left unit 90° anti-clockwise (expressed as a 270° clockwise rotation on the device) so that the units can fit together more snuggly. All input and output will be rotated accordingly, so the unit will still operate in the correct way.

Buttons are rotated accordingly when in Max so that they contain their same spacial configuration, even if this means that they may move to the left/right or top/bottom of the grid.

NOTE: Buttons are not rotated in the M4L version at this point – I will add this in the future, but need to provide additional work in order to support this

23 Ableton Live Devices

23.1 MIDI In

The MIDI in device provides a way of routing MIDI data from a track **INTO** Gridlock.

When dropped on a track, all MIDI received by the device will be sent to a specific instance of Gridlock (filtering permitting). To see what each control does, hover the mouse over it.

From left to right, top to bottom, here is a description of each control.

- Trace – Trace incoming data to Max window
- Device active only if on selected track – Enable this to only send data to Gridlock if the track this device sits on is the currently selected track
- MIDI Thru – Enable copying of incoming MIDI data to the device to the device's MIDI output
- MIDI Thru Filter – Disabled
- MIDI Thru Indicator – Lights blue when MIDI Thru data is transmitted
- MIDI In Indicator – Flashes yellow when MIDI data is received
- MIDI Out Indicator – Flashes green when MIDI data is transmitted to Gridlock (filter permitting)
- Instance – Gridlock controller instance to send data to
- Version
- Transpose - +/- 48 transposition of data
- Bank – If specified, send data only to a specific bank rather than to all banks subscribed to the MIDI message
- MIDI channel – If specified set the MIDI channel on the message
- Receive Notes – If enabled following two controls determine min and max note to be processed
- Receive CCs – If enabled following two controls determine min and max CC number to be processed
- LP-U1/U2 (only present if controller is Launchpad family) – If enabled forward MIDI data to Launchpad when in user 1/2 mode

23.2 MIDI Out

The MIDI Out device provides a way of routing MIDI from **OUT** from Gridlock onto a Live track.

When dropped on a track, all MIDI generated by the given Gridlock controller (filtering permitting) will be transmitted to thee MIDI output of the device. To see what each control does, hover the mouse over it.

From left to right, top to bottom, here is a description of each control.

- Trace – Trace incoming data to Max window
- Device active only if on selected track – Enable this to only receive data from Gridlock if the track this device sits on is the currently selected track
- MIDI Thru – Enable copying of incoming MIDI data to the device to the device's MIDI output
- MIDI Thru Filter – Disabled
- MIDI Thru Indicator – Lights blue when MIDI Thru data is transmitted
- MIDI In Indicator – Flashes yellow when MIDI data is received from Gridlock
- MIDI Out Indicator – Flashes green when MIDI data is transmitted to the MIDI output of the device (filter permitting)
- Instance – Gridlock controller instance to receive data from
- Version
- Transpose - +/- 48 transposition of data
- Receive Notes – If enabled following two controls determine min and max note to be processed
- Receive CCs – If enabled following two controls determine min and max CC number to be processed
- MIDI channel matrix – selects which MIDI channels data will be processed for when receiving from Gridlock
- MIDI channel – If specified set the MIDI channel on the message
- Bank matrix – selects which banks will be processed for when receiving from Gridlock

23.3 KDS – Keyboard, Drumpad, Sequencer

The KDS device provides a round-trip way of routing data out from the Keypad (0.3.91), Drumpad (0.3.91) and Sequencer (0.3.92) modes, onto a Live track, and also providing feedback from that track back to the controller.

24 Controller Specific Notes

24.1 Livid Base

24.1.1 Operation

Operation is mostly the same as standard Gridlock with the following differences.

B8 – Switch between rows 1-4 and 5-8 for 8x8 grids

1. When in matrix/XY mode, T1-T8 control R1-R8, i.e. controls the rotary setup – adding an extra rotary controller will control the same settings – this will eventually have its own config
2. When in slider/bend mode, T1-T8 control sliders or bends. The matrix buttons will continue to operate standard matrix configuration.
3. The matrix is still based on an 8x8 grid and B8 is used to toggle between rows 1-4 and 5-8
4. T128 controls either rotary, slider, or bend bank depending upon current mode.
5. When in slider/bend mode, B1-B4 continue to control matrix bank.
6. 2 char display displays r1-8, S1-4, b1-4 to show current bank of rotary, slider, or bend.

24.1.2 Current limitations

1. Inverted display is not currently available in slider mode (B10).
2. Auto-zero is not currently available in slider/bend mode (B11).
3. Dual mode is not currently available (B12).
4. When switching into monome mode, the touchstrips go back to controlling the rotary banks

24.2 Launch Control

24.2.1 Operation

Gridlock is set to operate on User 8 mode.

B1 – shift
B2 – normal mode HUD on/off; shift - switch between R1-R8 feedback (off) and R9-R17 feedback (on)
B3 – dec matrix bank; shift – switch between displaying parameters and names
B4 – inc matrix bank

When pressing B1 to enter shift mode the current rotary bank will be indicated by one of the pads being briefly lit green. To change the current rotary bank one of the pads can be selected whilst in shift mode. The new bank will be indicated by the pad turning green briefly.

24.2.2 Feedback

Whilst in shift mode the pads are used to indicate the current pickup state of the rotaries.
Amber – position of rotary is unknown
Green – rotary needs to move left to pickup current value
Red – rotary needs to move right to pickup current value

Off – rotary is tracking

Button B2 can be used to change the feedback between the top and bottom rows of rotaries.

All feedback will dim when the current value of the control is +/- 10 away from the target value

24.3 Launch Control XL

24.3.1 Operation

Gridlock is set to operate on User 8 mode.

B1 – shift
B2 – show/hide HUD; shift - NOP
B3 – dec matrix bank; shift – toggle HUD display params/names
B4 – inc matrix bank
B5 – matrix rows 1 & 2
B6 – matrix rows 3 & 4
B7 – matrix rows 5 & 6
B8 – matrix rows 7 & 8

When pressing B1 to enter shift mode the current fader bank will be indicated by one of the pads on the bottom row being briefly lit yellow. To change the current fader bank one of the pads can be selected whilst in shift mode. The new bank will be indicated by the pad turning green briefly.

Current rotary bank is indicated by the lit yellow pad on the top row and can be changed by selected another pad on that row.

24.3.2 Feedback

The led under each rotary is used to indicate the current pickup state of that rotary. Additionally, when in shift mode the bottom row of pads are used to indicate the current pickup state of the faders.

Amber – position of rotary/fader is unknown
Green – rotary needs to move left/fader needs to move down to pickup current value
Red – rotary needs to move right/fader needs to move up to pickup current value
Off – rotary/fader is tracking

All feedback will dim when the current value of the control is +/- 10 away from the target value

24.4 APC40 II

24.4.1 Operation

B5 – MN+ toggle
B8 – Switch between rows 1-4 and 5-8 for 8x8 grids