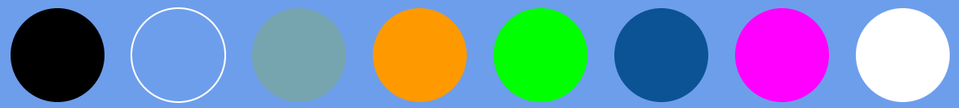
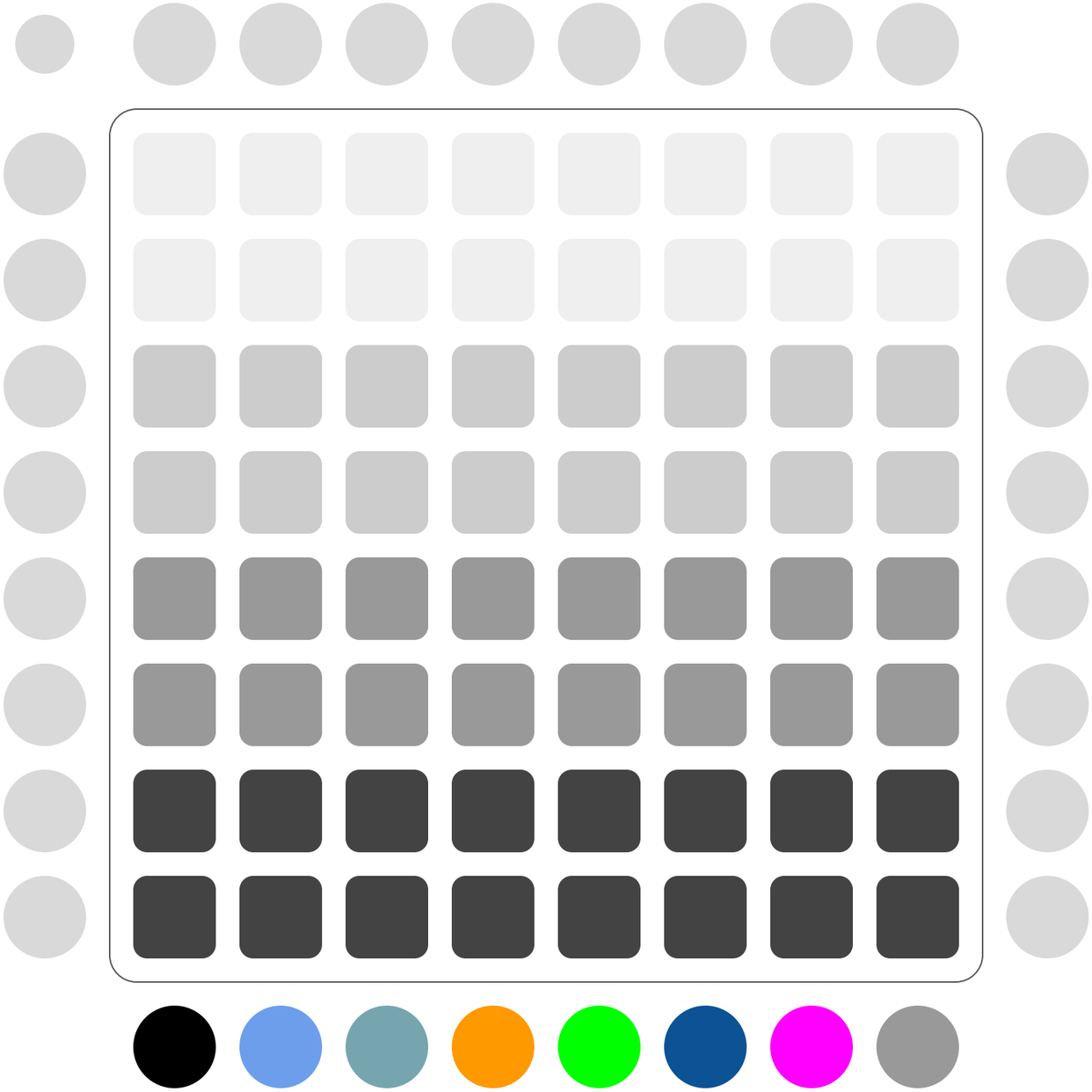


F L O W

Firmware step sequencer for Launchpad Pro

Version 0.2



Concept

FLOW is an 8-stage sequencer. Each stage can play different notes, be of different duration, and repeat itself multiple times. All of these effects are created by placing "markers" on the stage. Markers include specifying notes, sharps/flats, octave up/down, extended duration, repeats, and so on.

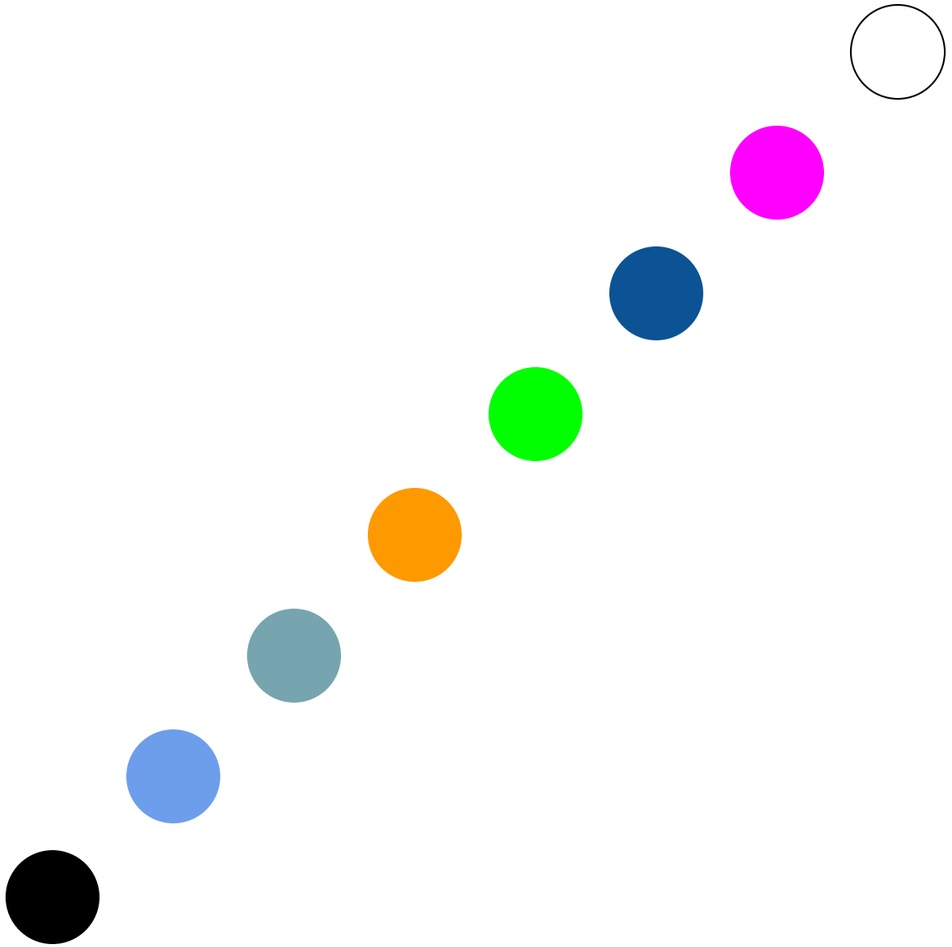
With multiple extends and repeats, sequences can be of irregular lengths, with complex, shifting rhythms. The sequence can be free running or regularly reset to provide more predictability.

This manual describes the general layout of **FLOW** on the Launchpad, the function of each type of marker, and the additional options available.

Background

FLOW is based on the **STEP** sequencer originally created as a module for the Hachi sequencer. Hachi runs on a host computer (Raspberry Pi, Mac, or other), using a MIDI controller as the control surface.

This version is implemented as firmware for the Launchpad Pro (mk1, 2015) and can run standalone, with no computer.



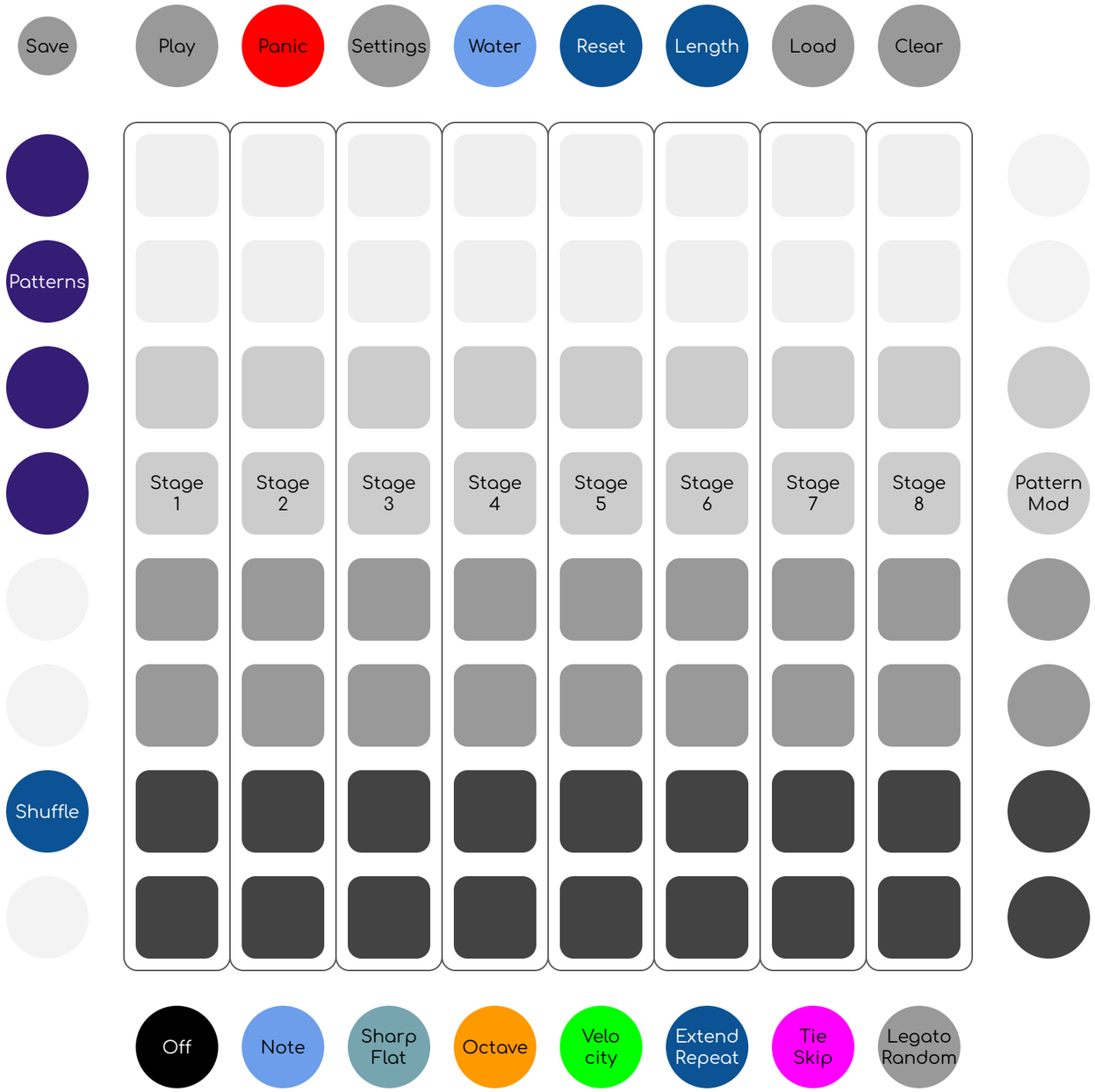
Version

This manual describes version 0.2 of the **FLOW** firmware. Check the GitHub repo for updates.

Installation

See the official directions at the Launchpad Pro firmware repo. You'll need a tool for sending sysex to your Launchpad Pro from your computer.

1. Turn off or unplug the Launchpad Pro.
2. Hold the "setup" button while connecting and turning the unit on. It will start up in "bootloader" mode.
3. Send the **`issho_launchpad_flow.syx`** file to the device MIDI port (it will probably appear as "Launchpad Pro" among your MIDI devices). The Launchpad will scroll "upgrading" across the grid.
4. When updating completes, the Launchpad will reboot into **FLOW**.
5. To return to the factory firmware, follow the same procedure with the "**`Launchpad Pro-1.0.154.syx`**" file from the official repo.



Layout

The **FLOW** layout consists of six sections.

The central 8x8 grid of pads is for editing **stages**. Each column represents one stage.

The top row of buttons is for **settings**, both sequence-specific and system-wide. The small button at the top left is for saving data to flash memory.

The bottom row of buttons is the **markers palette**, where you can select markers to add to stages.

The top 4 of the left buttons are for **patterns**. **FLOW**'s memory can hold 8 patterns at a time in groups of 4.

The bottom 4 of the left buttons are for **performance**. These buttons make various changes to the way the patterns are played back.

The right row of buttons is for **pattern modifiers**. Markers placed here affect all stages.

Primary	Secondary		Effect on a stage when applied
		**Off**	Removes marker from a pad.
		**Note**	Plays the note corresponding to the vertical position (C-D-E-F-G-A-B-C).
		**Sharp** **Flat**	**Sharp** increases the note pitch by a semitone; **flat** decreases it.
		**Octave**	Transposes the note up or down an octave.
		**Velocity**	Increases/decreases the velocity of the MIDI note by about 24.
		**Extend** **Repeat**	**Extend** increases the duration of the stage by one step. **Repeat** plays the stage again. A stage with both extend and repeat will have the extend applied first, and then the extended note will be repeated.
		**Tie** **Skip**	**Tie** holds the previous stage's note for the duration of this stage. **Skip** skips the stage entirely.
		**Legato** **Random**	**Legato** will play this stage's note before releasing the previous stage's. **Random** will add a random marker to the stage each time it is played.

Pressing a marker button selects the primary marker. Pressing a selected marker again selects the secondary marker, if one exists.

Markers

Markers determine what happens in each stage. Each stage has 8 rows for placing markers.

To place a marker on a stage, first select it from the palette by pressing its button. If it's a secondary marker, press the button once to select the primary, then again to switch to the secondary. Pressing a selected marker will continue to alternate between primary and secondary. The selected marker will blink. With the marker selected, press any pad in a stage. That pad will take on the marker's color, and that marker will now be applied to the stage. If another marker was already at that location, it will be removed from the stage.

Aside from the note marker, markers have the same effect regardless of where they are placed on the stage. Placing a marker on a stage twice will have that effect twice (aside from Tie, Skip, and Legato, which are either on or off). For example, with the clock set to 16th notes, adding an Extend marker to a stage will hold that stage for an 8th note. Adding another will extend it to three 16th notes (or a dotted 8th). Adding a Repeat marker to that stage will cause it to play that dotted 8th note twice; Repeat is always applied after Extend.

Note markers do rely on position. Counting from the bottom, the rows correspond to notes C, D, E, F, G, A, B, and C. For sharps and flats, use the Sharp and Flat markers. Notes default to the middle-C octave; use Octave up or down markers to transpose.

Random plays the stage as though a random marker were added; chosen markers can include Octave, Sharp/Flat, Velocity, Skip, Extend, Tie, and Repeat. Placing an additional Random marker causes an additional random element to be added.

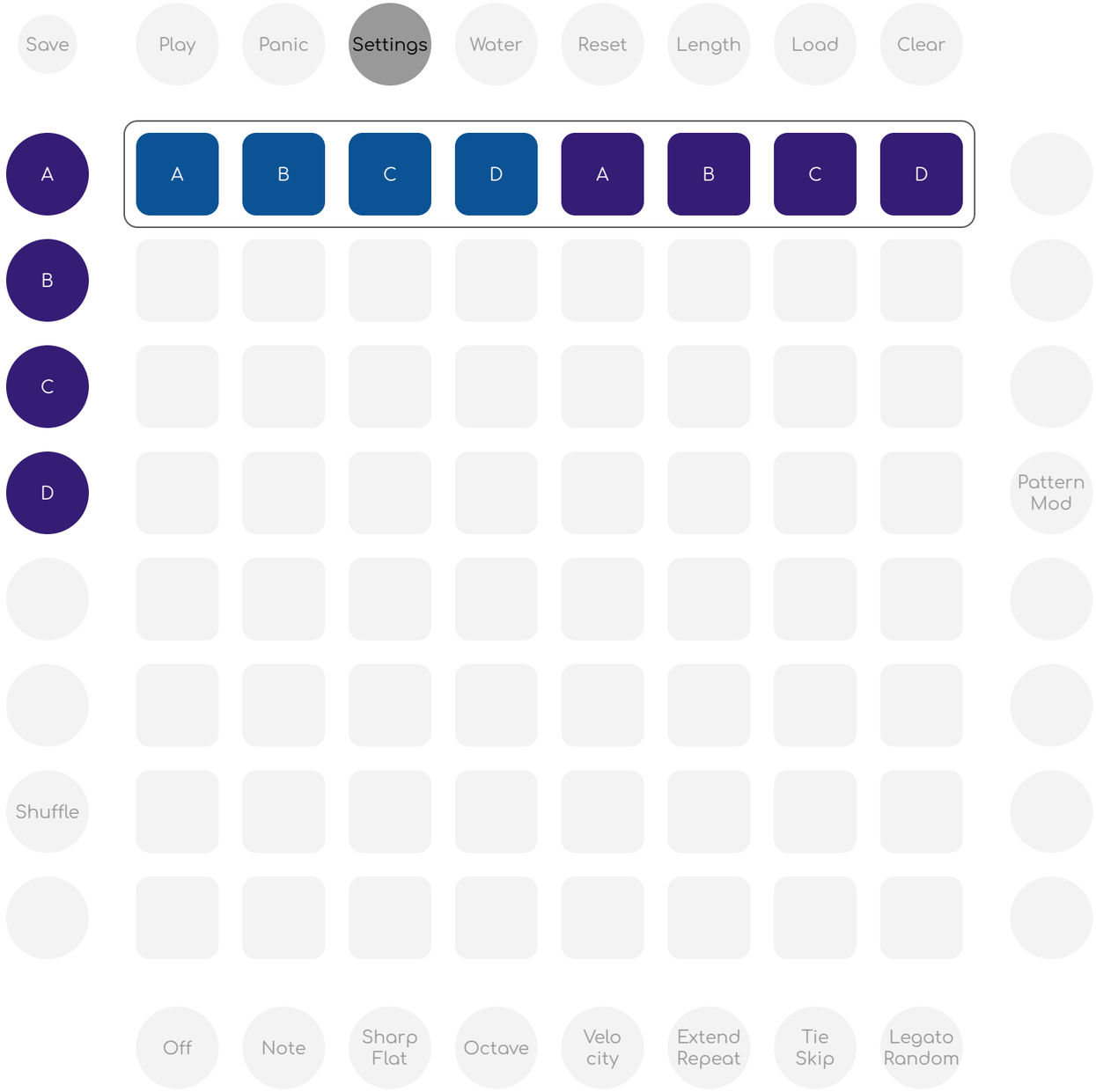
Primary	Secondary		Effect on all stages when applied as a pattern modifier
		**Off**	No effect.
		**Note**	Transposes the entire pattern from C to the location of the marker.
		**Sharp** **Flat**	Transposes the entire pattern up or down a semitone.
		**Octave**	Transposes the entire pattern up or down an octave.
		**Velocity**	Increases/decreases the velocity of every note in the pattern.
		**Extend** **Repeat**	**Extends** the duration of each stage, or **repeats** each stage.
		**Tie** **Skip**	**Tie** and **Skip** have no effect.
		**Legato** **Random**	**Legato** has no effect. **Random** will add a random marker to each stage every time it is played.

Pattern Modifiers

The buttons on the right side are the pattern modifiers: markers can be placed here just as on the stages, but they will affect every stage. Not all available markers have an effect when used as pattern modifiers (yet).

For example, adding Octave Up to the pattern modifiers will increase the octave of the note sent for every stage. Adding Extend will extend each stage by one step. A single-step stage will now last two steps; a two-step stage will now last three. As with regular stages, Extend will be applied before Repeat.

Pattern modifiers will be saved with the pattern.

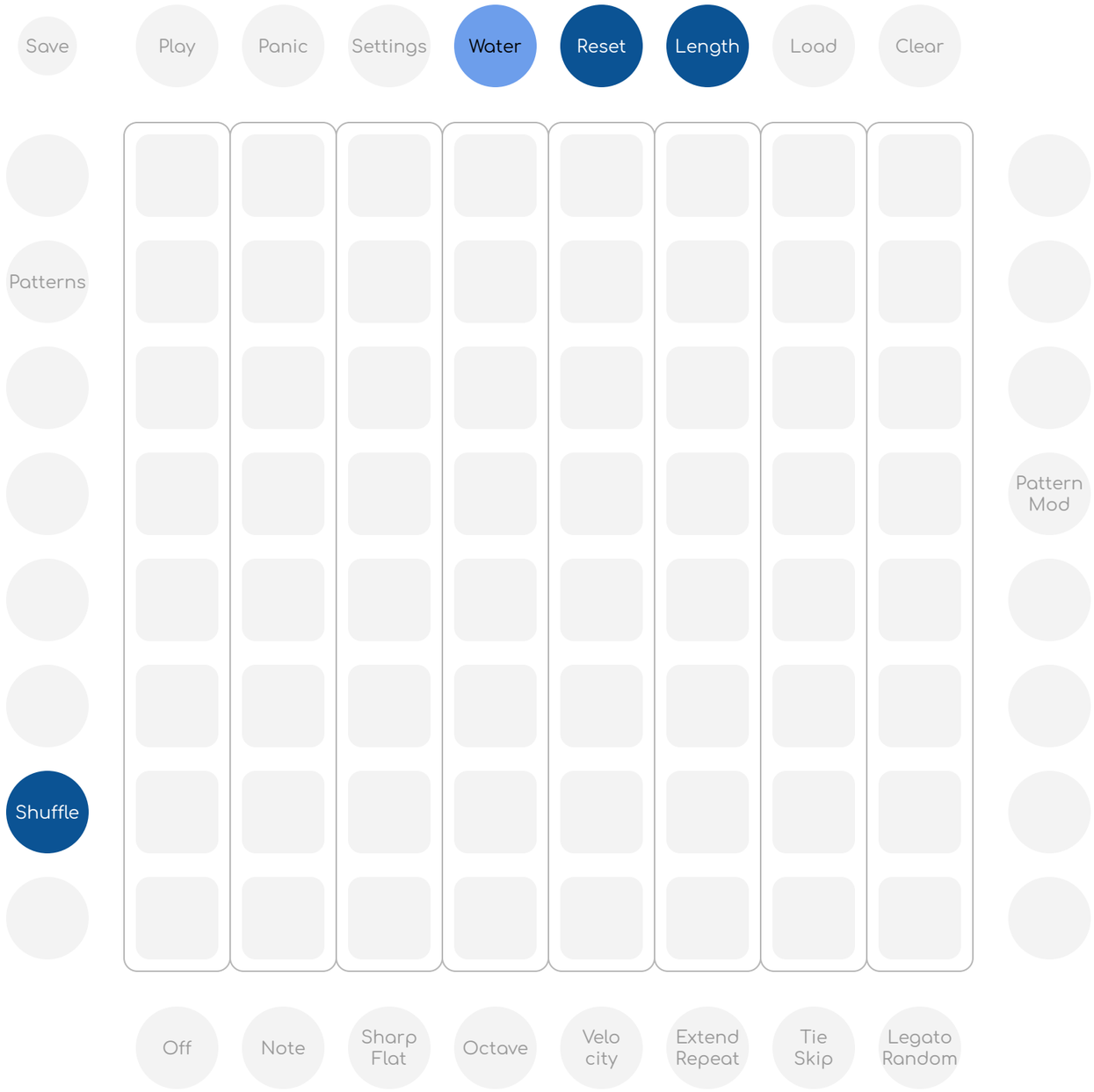


Patterns

FLOW can store 8 patterns in its memory, grouped into 2 pattern groups of 4 patterns each. The 4 patterns of a group are denoted as A, B, C, and D and are accessible together from the top 4 buttons on the left side. To load a new pattern from the current group, just press its button; it will start playing immediately.

All 8 patterns can also be accessed from the top row in the Settings mode. Selecting a pattern from Settings will make that pattern's group available from the left buttons.

The currently playing pattern can be copied to another pattern in the group by pressing and holding the target pattern button for at least two seconds.



Performance

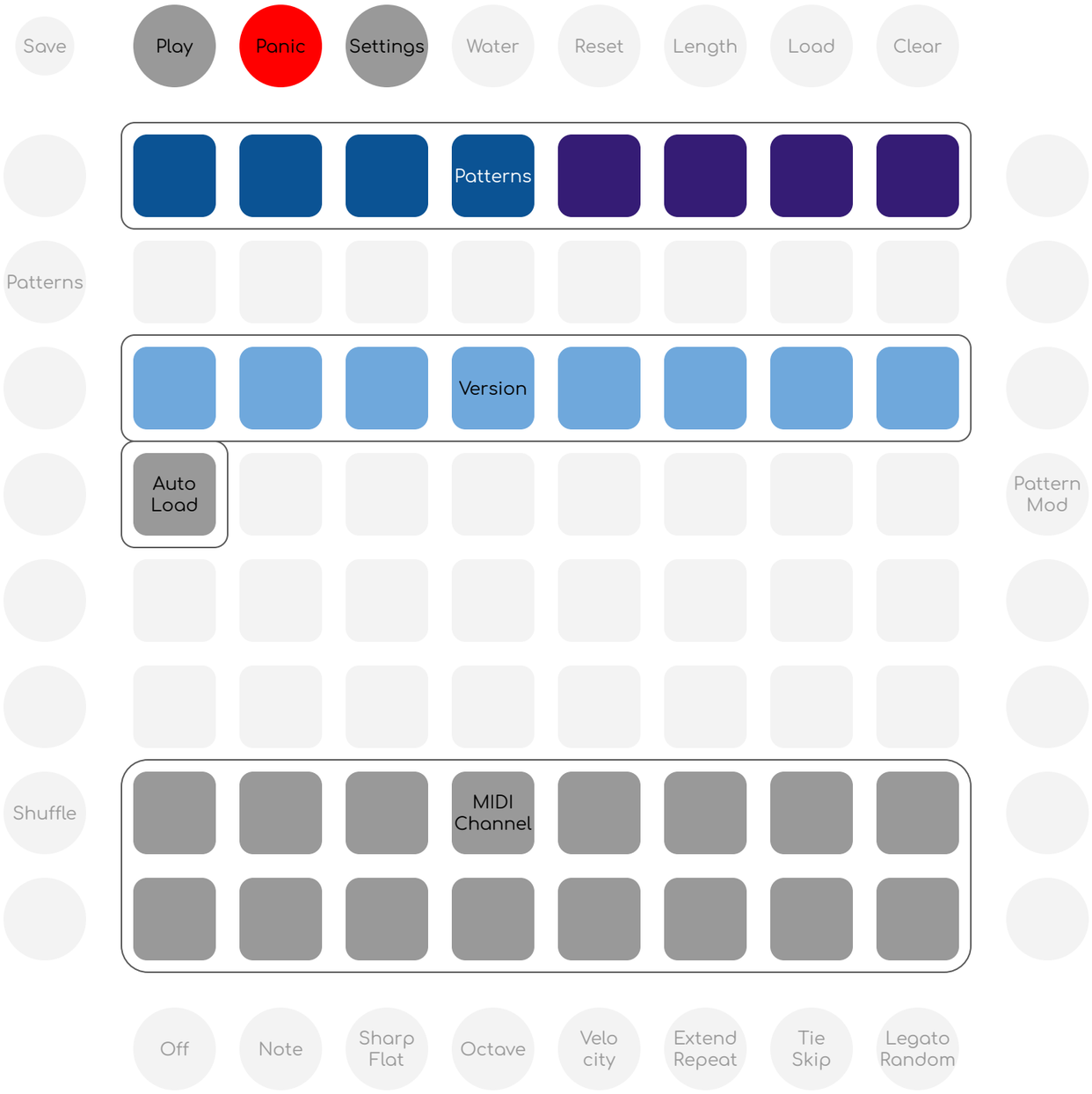
These controls affect pattern playback, either temporarily or by changing pattern-specific settings.

Reset. This pattern setting determines how often the pattern resets to its first step. When Reset is off (showing gray), the pattern is never reset, always running through the full pattern regardless of length. When Reset is "1" (dim blue), the pattern will reset at the start of each measure. When reset is "2" (bright blue), the pattern will reset at the start of each second measure. The pattern will loop until reset.

Length. By default (Length=1, showing gray), each pattern is played separately, looping over the eight stages of the pattern continually. Increasing the length tells **FLOW** to treat multiple patterns as one. When Length=2 (showing dim blue), A and B play together, as do C and D. Selecting either will play both alternately. When Length=3 (light blue), A, B, and C will play together; D remains alone. When Length=4 (white), all 4 patterns play together.

Shuffle. Pressing the Shuffle button will reorder the current pattern's stages randomly. Pressing shuffle again will return to the original order. Saving to a new pattern will store the ***shuffled*** order as the new pattern's original order. The button will show dim blue for original order and white when shuffled. Shuffle order is not saved with the pattern, but it is remembered while **FLOW** is on.

Another sort-of performance option is **Water mode**. This fills the main pad grid with ever-changing watery colors. Playback is unaffected; buttons still work as normal, you just can't see them. Press the Water mode button again to turn it off.



System and Settings

The top row of buttons is for various global functions and settings, as well as pattern-specific settings. Global settings apply to all patterns and are saved in memory. pattern settings are saved with each individual pattern.

Play. The Play button starts and stops the sequencer. When clocked externally, the Play button will illuminate when the sequencer is running. FLOW only supports an internal tempo of 120 bpm at the moment; an external clock will take precedence over the internal tempo.

Panic. The Panic button is used to send a MIDI "all notes off" message on the current sequencer channel, in case of any stuck notes.

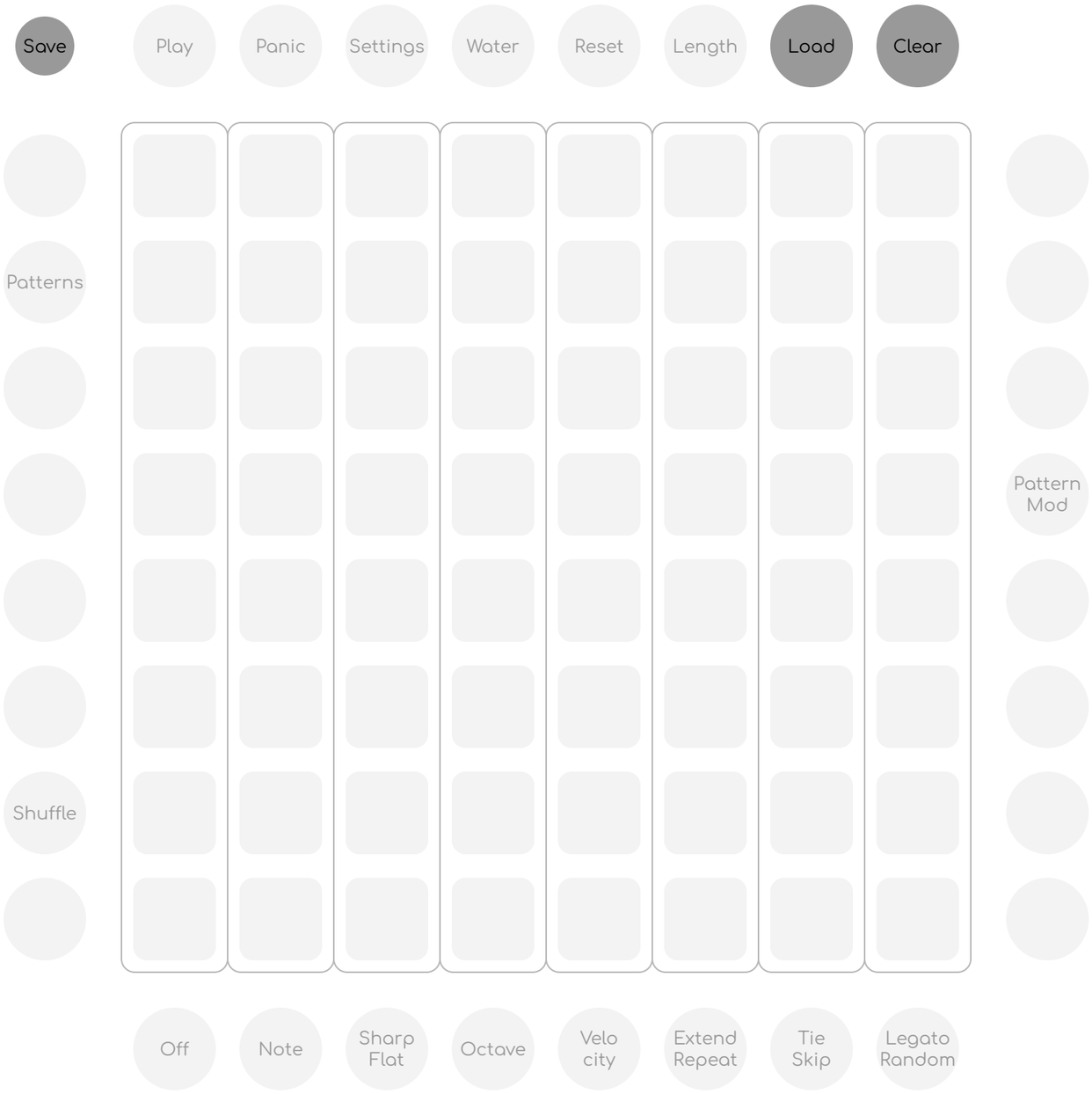
Settings. Press and hold the Settings button to access additional settings using the pad grid.

Version displays the current firmware version, in binary.

Auto Load sets whether to load flash memory on startup (when showing white).

MIDI Channel sets the output MIDI channel, from 1-16.

Patterns can be loaded from the top row of Settings.

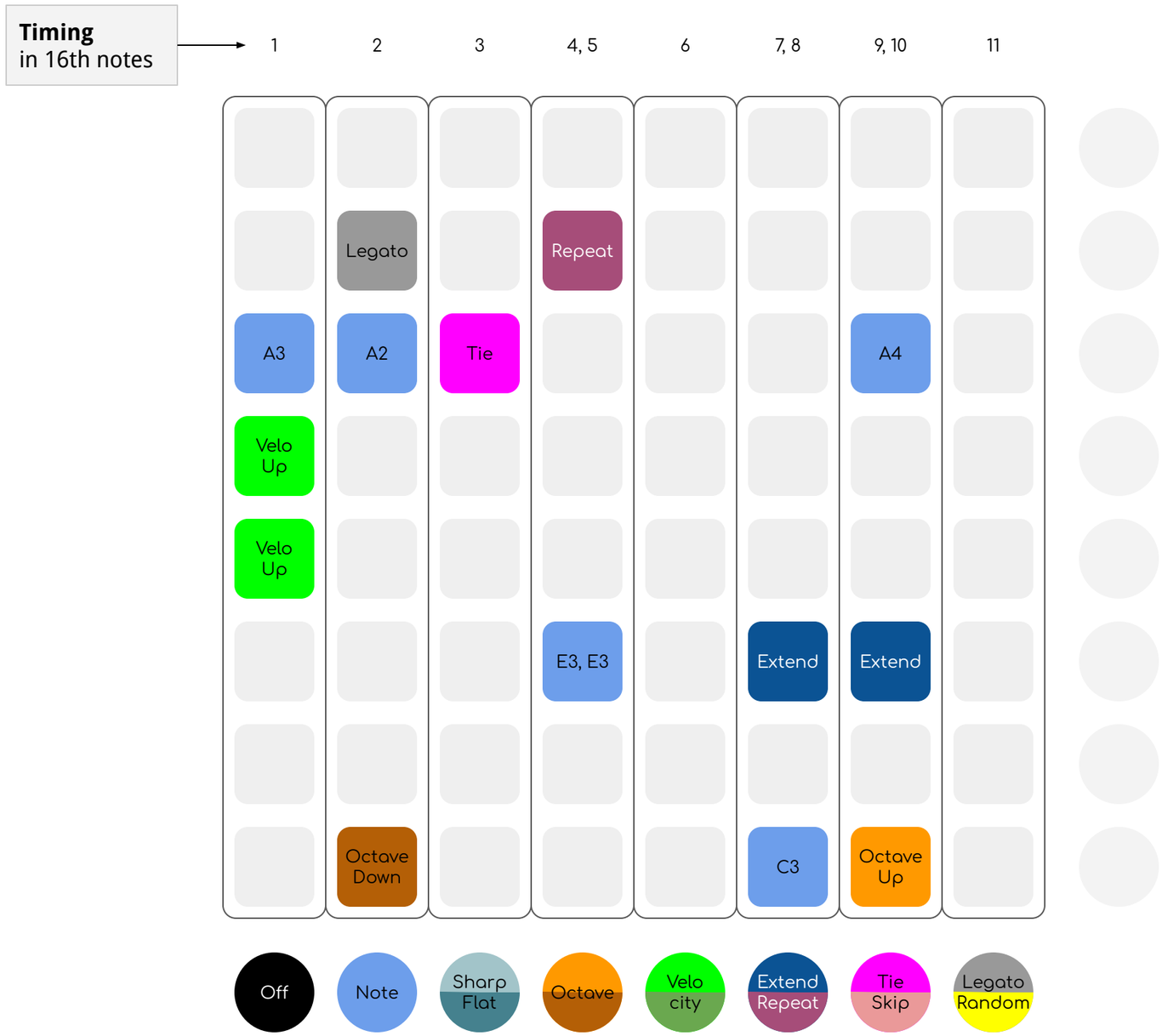


Save, Load, and Clear

Save. Pressing the small button in the top left will save the entire contents of memory, including all patterns and global settings, to flash memory. Saved data will be loaded when **FLOW** is next turned on. **Load** will reload from the flash memory. **Clear** will clear all patterns in active memory (but not from flash).

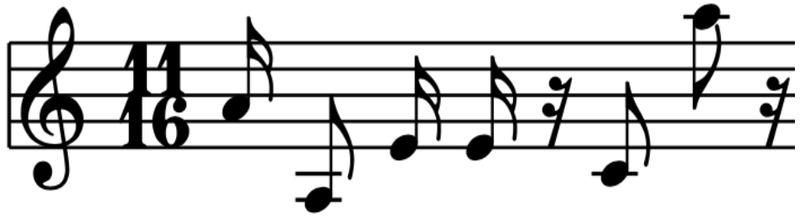
Load. Pressing the Load button will reload the contents of flash memory, overwriting any changes that have been made.

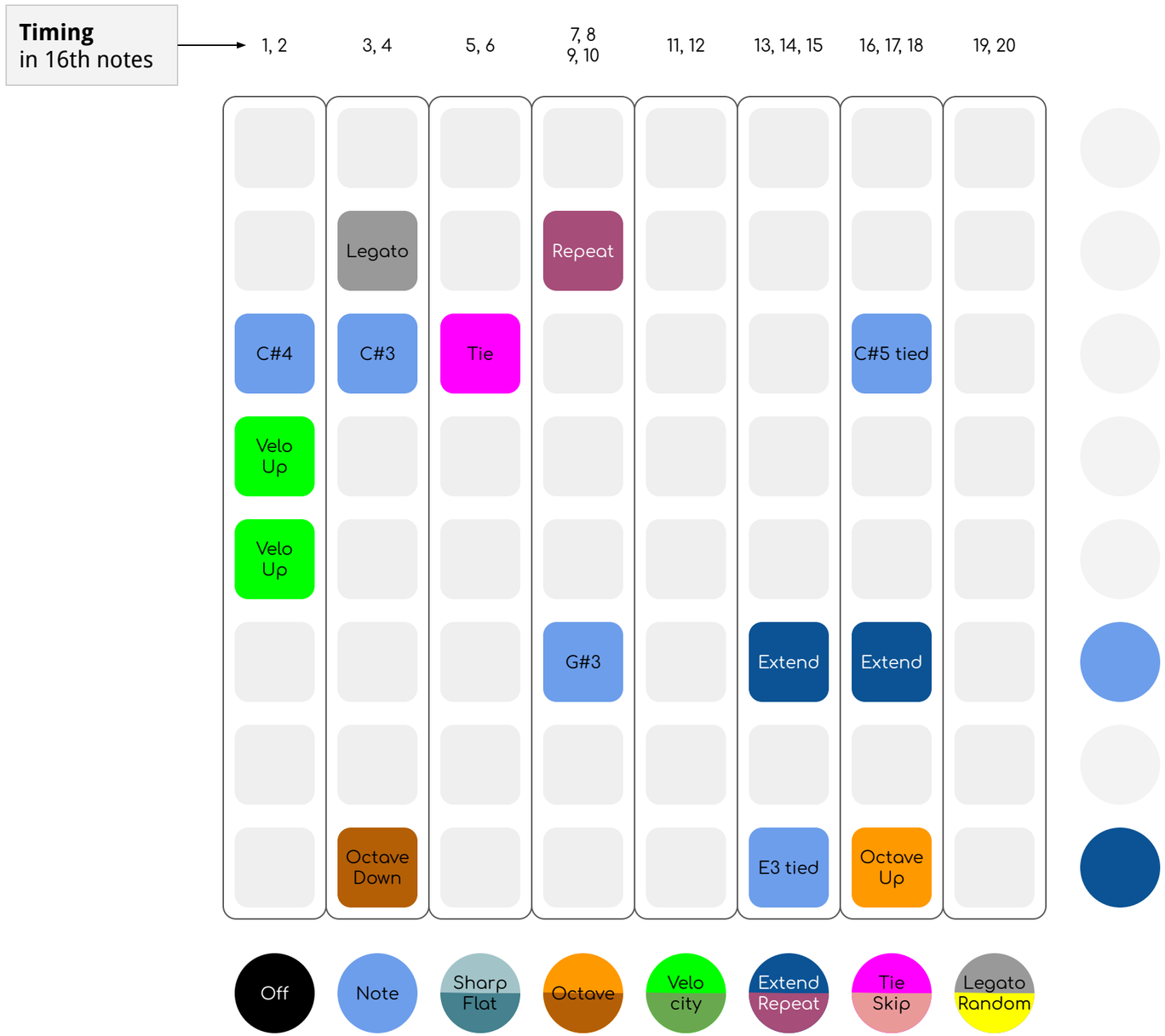
Clear. Pressing the Clear button will clear all the current patterns. Flash memory will not be affected.



Example

In this example, the 8 stages create a pattern 11 steps long, due to stage 4 being repeated and both 6 and 7 being extended. With no reset, the pattern will just loop after 11 16th notes. With reset every measure, it would play the pattern through once, and then play the first 5 16th notes again before being reset.





Example

This example shows the previous pattern with a couple of pattern modifiers added. The note on the third row transposes the whole pattern from C to E (so, 4 semitones up). The extend marker adds an extend to every step. Note that this doesn't just double the total length of the sequence. The single step stages become two steps long, but the repeated stage 4 becomes 4 steps long (the stage is extended then repeated) and the extended stages become extended to 3 steps.