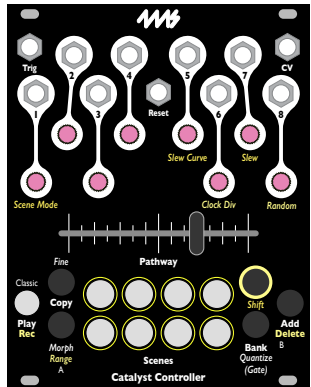
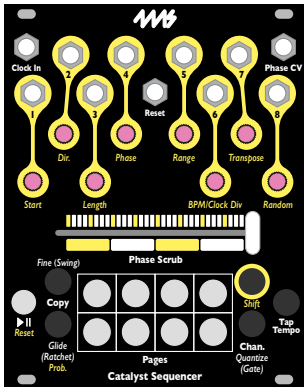


Firmware Update v1.3

Catalyst Sequencer

Catalyst Controller



4ms Company

July 1, 2024

Custom Scales

You can now create custom scales and use them from either **Sequencer** or **Controller** mode. Custom scales can only be created from within **Sequencer** mode, so if you have a **Catalyst Controller**, switch over to **Sequencer** mode to create your scales, and then switch back to **Controller** mode.


The **Catalyst Sequencer** or **Controller** comes with 14 scales programmed at the factory, and eight slots to store custom scales. Custom scales can have up to 21 notes and are neither limited to semitones nor being octave-based.

Creating a Custom Scale

To create a custom scale, make a sequence of notes on any channel, starting at the first note of the first page, and spanning multiple pages if needed. Use the Length parameter to specify the number of notes in the scale. The interval between the last note and first note of the sequence will be the interval at which the custom scale will repeat. This means that in order to create a scale that repeats every octave (like most western scales), the last note of your scale must be one octave higher than the first note.

For example, if you program the notes D2, F2, A2, D3, and set **Length** to 4, then the scale will contain these notes:

... D0 F0 A0 D1 F1 A1 D2 F2 A2 D3 F3 A3 D4 F4 ...



This pattern will repeat every octave because the interval between the first note of your scale (D2) and the last note (D3) is an octave.

However, if you set Length to 3 then the last note will be A2 and the scale would repeat every seven semitones because the interval between your first note (D2) and last note (A2) is seven semitones. Therefore the notes in the scale would be the following:

... C#0 F0 G#0 C1 D#1 G1 A#1 **D2** **F2** A2 C3 E3 G3 B3 ...

The pattern would repeat across the entire range of output voltages. Notice that the notes below the original notes you programmed are calculated by repeatedly subtracting seven semitones, and the notes above are calculated by repeatedly adding seven semitones.

Saving a Custom Scale

Once you've created a sequence as described above, press and hold **Quantize** and then press **Tap Tempo**. Keep both buttons held down. Each of the eight knobs will turn a different color. Knobs that are flashing indicate an empty scale slot, and knobs that are solid indicate a scale is already saved into that slot. Choose a slot and turn the corresponding knob clockwise. All the other knobs will turn off. To save into this slot (overwriting any existing scale), release **Quantize** and **Tap Tempo**. Otherwise, to cancel without saving, turn the same knob counter-clockwise so that all eight knobs are on before releasing the buttons.

Custom scales will remain saved even after a power cycle.

Using a Custom Scale

Quantizing a channel with custom scale is no different than using a factory scale. Press and hold **Quantize** and turn the channel's knob to select the scale. The custom scales are indicated by a flashing light and appear after the fourteen factory scales and before the green Gate mode. If a custom scale slot is empty (that is, you haven't saved a scale in that slot) then the slot will not be displayed as you turn the knob.

- | | |
|-------------------------------------|-----------------------------------|
| ● <i>Dim grey</i> = no quantization | ● <i>Salmon</i> = Lydian Dom. |
| ● <i>Pink</i> = semitones | ● <i>Lavender</i> = Beebop |
| ● <i>Red</i> = major | ● <i>Dim Red</i> = Enigmatic |
| ● <i>Orange</i> = minor | ● <i>Dim Yellow</i> = Vietnamese |
| ● <i>Yellow</i> = harmonic minor | ● <i>Dim Orange</i> = Yo scale |
| ● <i>Teal</i> = major pentatonic | ● <i>Dim Blue</i> = 16-TET |
| ● <i>Blue</i> = minor pentatonic | ● <i>Dim Teal</i> = 21-TET |
| ● <i>White</i> = whole tones | ● (flashing) = Custom scale slots |
| | ● <i>Green</i> = Gates |

Color Palettes

By default, negative voltages are red and positive voltages are blue, with the brightness of either color indicating the magnitude. You can change the color palette globally by holding down **Quantize** for four seconds until the lights change. Channel 1's knob will be flashing grey. Turning it will select one of four different palettes. The other seven knobs will display example colors of the palette.

Palette 1: default: negative = red, positive = blue

Palette 2: "rainbow": each semitone is a different color

Palette 3: "octave rainbow": each octave is a different color

Palette 4: "ice": negative = blue, positive = white

The palette selection will be saved and restored after power-on.

Controller Latch Mode

In previous firmware versions, there were two modes to determine what happens when you press a **Scene** button: Momentary Mode, and Blind Mode. These are described in the user manual. In firmware v1.3 there is a new mode: Latch Mode.

To change Scene Button Modes, hold down the **Shift** button and turn Channel 1's knob. The color of the knob indicates the Scene Button Mode:

- **Red:** *Blind Mode*
- **Green:** *Momentary Mode* (default)
- **Blue:** *Latch Mode*

In Latch Mode, pressing a **Scene** button will make that scene active, keeping it active even after you release the button. In this mode, the crossfade and CV jacks have no effect and there is no notion of a Pathway. If Slew is enabled, the outputs will fade from their current values to the selected scene.

The Scene Button Mode is saved in memory when you save the **Controller** banks (**Bank + Morph**)

Other Features

Sequencer Random Step Mode

In **Sequencer** mode, a new Direction mode has been added: Random Steps mode. When changing the Direction with **Shift + Dir.** (or **Shift + Chan. + Dir.**), the new mode is indicated by the knob being green. The existing random mode has now been renamed to “Random Pattern” (and is still indicated by a randomly changing color).

In Random Steps mode, a random step will be chosen each time the sequence progresses forward or backwards. This means that the same sequence will never be played twice.

This is different than Random Pattern mode, where the order of the steps will be randomized once and then that order will repeat.

Sequencer Random Gate Skip

When Random amount is set to maximum (**Shift + Random**, or **Shift + Chan. + Random**), the knob will turn white. When using Probability with channels in Gate mode set to maximum Random amount, the steps will not have their pulse width randomized. Instead, the Probability setting for each step determines the chance of that step playing normally or not playing at all. This is useful if you want a steps to randomly play, but don't ever want the pulse width to change.

Controller Slew with Buttons

In **Controller** mode, Slew affects scene changes when pressing **Scene** buttons. This applies to Momentary Mode and Latch Mode.

Controller Gates 100% Pulse Width

In **Controller** mode, setting a Gate channel's pulse width to maximum will make that channel stay on whenever the scene is selected. The knob will turn bright blue-ish white to indicate this maximum value.

Gate Amplitude

In previous firmware versions, gates were always 5V amplitude. In v1.3, the gate amplitude voltage is set by the maximum value of the channel's Range parameter. By default, this is 10V. Gates are always 0V when off.

Change CV by Octaves

If you hold down **Fine** and **Glide (Morph)** at the same time while turning the knob, it will change the value of a CV step or scene by octaves (1.00V). In **Sequencer** mode, this also works for Transpose (Global Parameter, and Channel Parameter, and Page Feature).