

Time Machine Manual

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Introduction

Time Machine is an eight-tap, stereo, granular delay for Eurorack modular. It allows you to mix together eight delay lines that can range from milliseconds to minutes of delay. These delay lines can be evenly distributed across time or skewed toward now or then. Whether skewed or evenly distributed, the delay lines can be clock-synced. Feedback allows the past to linger. All of this is controllable via CV.

Controlling Delay Time

The t knob adjust delay from [almost] 0s to 8s. The knob provides exponential control, so you have more control over very short delay times.

The $t/2^v$ input provides exponential CV control over the maximum delay time. This means that +1V will halve the delay time set by the knob and -1V will double it. This input can handle CV from -5V to +5V, allowing delay times from 0.0001s to 2m 30s

If a Clock is provided, the delay lines will be quantized to it while still observing the behavior described above.

Delay Spread

With the Spread knob at noon (and 0V going into spread CV) all of the delay lines will be evenly spaced. By adjusting the spread you can create reverb-like timespaces.

Turn it to the left (or send negative CV) and the delay lines will bunch up around *now*. You'll have more recent delays and fewer ones near *t*.

Turn it to the right (or send positive CV) and the delay lines will bunch up around *t*. You'll have more recent delays and fewer ones near *now*.

The CV input takes -5V to +5V signals.

All eight delay lines are quantized to the clock when they are evenly distributed. As you change the spread the delay lines will move away from the beat. That is, the except the last one. If you provide a clock, *t* is always quantized to it.

Feedback Behavior

When feedback is in the region indicated by the arc above the knob, sound will neither disappear nor swell out of control. Consider this the sound-on-sound zone.

Beyond this zone there will be feedback and chaos similar to guitar-amp feedback but evil and digital.

The CV input takes -5V to +5V signals.

Updating The Firmware

1. Power off your rack (or just unplug Time Machine)
2. Connect the MicroUSB on the back of the module to your computer
3. Hold down the button nearest the MicroUSB port and press the one next to it to prepare it for the new software
4. Download the newest version of the firmware from <https://oamodular.org/products/time-machine>
5. Go to <https://electro-smith.github.io/Programmer/>
6. Click the Connect button and choose "DFU in FS Mode"
7. Go down to "Or select a file from your computer" and choose the .bin file you downloaded from our website.
8. Click the Program button and wait for it finish

Calibration

1. Power off your rack (or just unplug Time Machine)
2. Make sure there is nothing plugged into the spread, time, and feedback CV
3. Turn all the knobs and sliders all the way up
4. Patch a high voltage (>2 V) into the clock input (anything that outputs a voltage offset will work)
5. Power on your rack (or plug in Time Machine)

You'll know you've run the calibration routine if the lights on Time Machine flash from right to left several times then blink and stop.

This information will be stored in the module even across future software updates.

Firmware Changelog

- v1.0 Initial release. Only orders shipped before March 25, 2024 came with this
- v1.0.1 Fixed a bug in v1.0 that caused all CV below 0 V to be recognized as 0 V. This bug prohibited calibration information from being properly stored. Subsequently, anyone upgrading from v1.0 to v1.0.1 should [run the calibration routine](#).

Warranty

We'll replace this with the necessary legal jargon but basically we'll repair or replace the module if anything goes wrong in the first year. If it's been more than a year, we'd still love to help. Just [reach out](#).