The Circuit Slices **Sample + Noise** is a dual-function module for Eurorack-compatible synthesizers. Packed in a narrow panel is a classic analog 'sample & hold' circuit and an analog noise source with three outputs – white, pink, and low frequency noise.

Specifications for the CS019 Sample + Noise
Noise output level: Factory set to about +/- 5V (10Vpp) User Adjustable from +/- 10V to 0V
Noise output bands
        White (flat-band)
        Pink (low-pass filtered to 3dB/octave for a less 'bright' or muffled noise signal.)
        LF (very low, non-periodic 'frequency' near 8 Hz. Useful as a random CV.)
Noise source: amplified transistor junction noise
S&H CLOCK trigger level: >1V (any level greater than 1V)
The S&H circuit samples and outputs voltage levels in the +/- 10V range.
Connections: Standard 3.5mm jacks
Depth: 37mm
Panel width: 4 HP
Power required: +12VDC @ 20mA, -12DC @ 17mA, using a standard Eurorack 10-pin power connection

Features for CS019 Sample + Noise
Classic analog 'sample & hold' and noise circuits in a narrow 4 HP module
Three noise outputs – white and two filtered
Adjustable noise output level
Low cost, due to modern surface-mount manufacturing production
DIY expansion option for the use of an internal clock source
Low power consumption (20mA or less per supply)
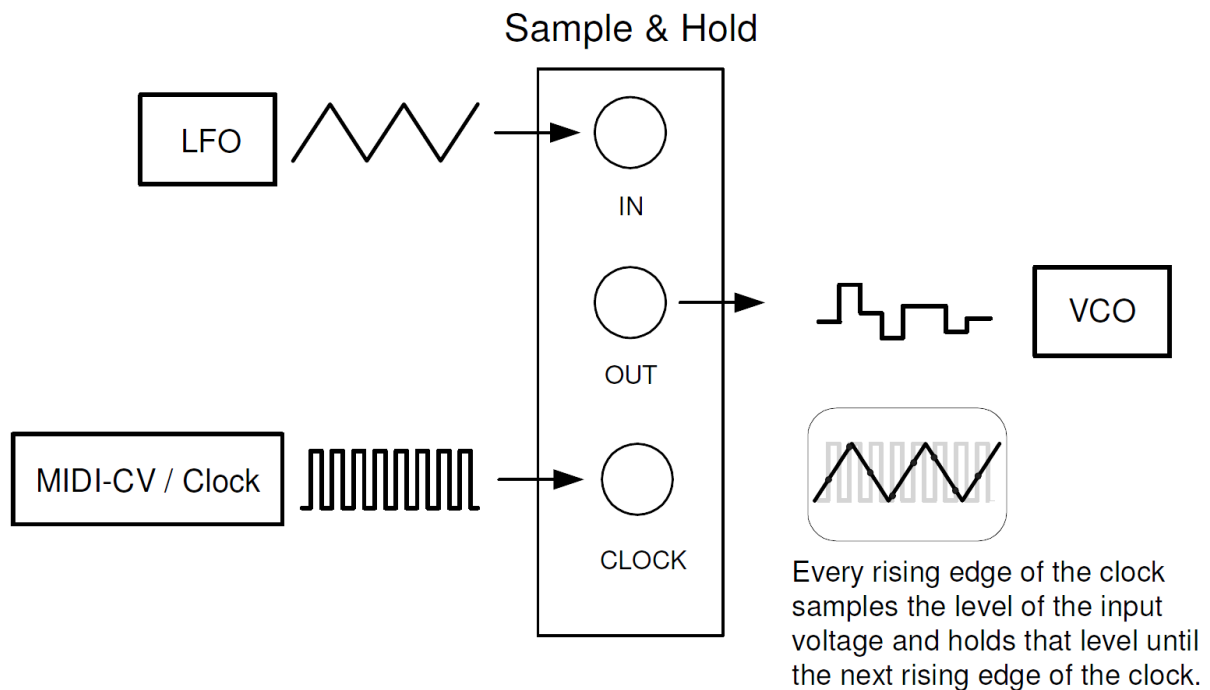Includes power cable and case screws

Installation

The Sample + Noise module is ready to install in your Eurorack system. Simply mount the panel using the supplied screws and route the ribbon-cable power connector to your power bus. **Be careful making the connection to your power bus and double check your connection before applying power.** The red stripe on the ribbon cable must be toward the -12V pin on the power bus and the module. Note that it can take a few seconds after power-up before you see a signal at the noise outputs.

WARNING: Reversed power *may* damage the module and your power supply.

Using the Sample & Hold

A typical patch for this classic analog 'sample & hold' is to apply a low-frequency sinewave or triangle waveform to the IN jack with a clock source plugged into the CLOCK input. Then patch the OUT signal to a VCO to produce a sequencer-like effect. Adjust the clock rate and input frequency for various pitched sequences. See the patch below.

Sample & Hold

Every rising edge of the clock samples the level of the input voltage and holds that level until the next rising edge of the clock.

If your clock signal is generated from a MIDI-CV module having a MIDI clock output, your patch will be in sync with your MIDI drum machine or computer sequencer. This is not the only patch to try. As an example, the gate from an analog sequencer could be divided by 4, using a clock divider, and sent to the S&H CLOCK input allowing you to produce a CV that 'holds' and only changes for every forth note played.

Using the Noise Source

Patch a little white noise to the input of a VCA or VCF, while also adding a very sharp attack and decay envelope to produce interesting percussive hits, or with longer attacks, steam-pipe organ sounds.

The PINK output is useful for producing lower-pitched sounds, while the LF output can be used to thundering rumbles or random pitch sequences when used as a control voltage. And the obvious patch is to use noise for the input to your sample & hold, while clocking it with a steady clock source. This will produce random pitched steps if the S&H is patched to a VCO.

The amplitude of the outputs is user adjustable using a single PCB-mounted trimmer, P1. The trim potentiometer is located on the board between the WHITE and PINK jacks. Use a small screwdriver to adjust the noise outputs – turning counter-clockwise will decrease the output. The factory setting keeps the white noise just inside of +/- 5V, with some peaks just above. The PINK and LF outputs will be a little lower, within +/- 5V. You can adjust higher or lower than this.

DIY Option for Internal Clock Source

If you would like to expand the capabilities of this module, you can add a switch and potentiometer to enable an internal clock source function. First remove the shorting jumper on J9 (located between the OUT and CLOCK jacks), then an SPDT switch can be connected to J9 to select between the internal clock or an external source. A 1 Meg ohm potentiometer is then connected between the two pins of J8 (located between IN and OUT jacks). See the figure below for wiring details.
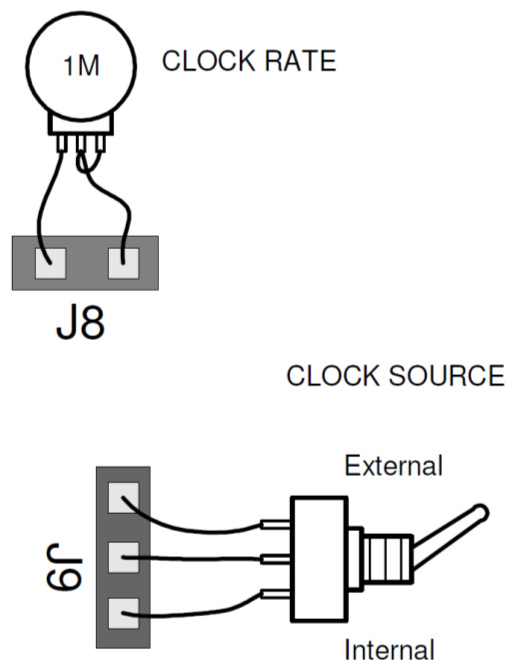
This DIY option was not included as most patches will use a master or MIDI clock, to keep everything synchronized.

If not using this internal clock option a shorting jumper must be placed between the center and lower pins of J8. The module comes from the factory with this jumper installed. See below.

For easier RATE adjustments, you can use a 'Log' taper pot. The switch and potentiometer could be mounted on a narrow blank panel positioned next to your Sample + Noise module.

If you use '0.1' headers to connect to J8 and J9, and wire as shown, you will not void the model's warranty.

This little and affordable module will greatly expand the capabilities of any modular synthesizer rack. We know you will enjoy experimenting with noise, sampling patches, and random control signals for hours on end, but don't forget to make music!

This module is limited-warranted for one year with parts, under normal use – not including the application of reverse or over-voltage power by customer. Return shipping to Circuit Slices from customer not included. Return to Circuit Slices, LLC for repairs. Circuit Slices, LLC reserves the right to replace the module if necessary. Please keep your receipt / packing slip for warranty information.

Circuit Slices, LLC
10028 Windjammer Trail
Aurora, OH 44202