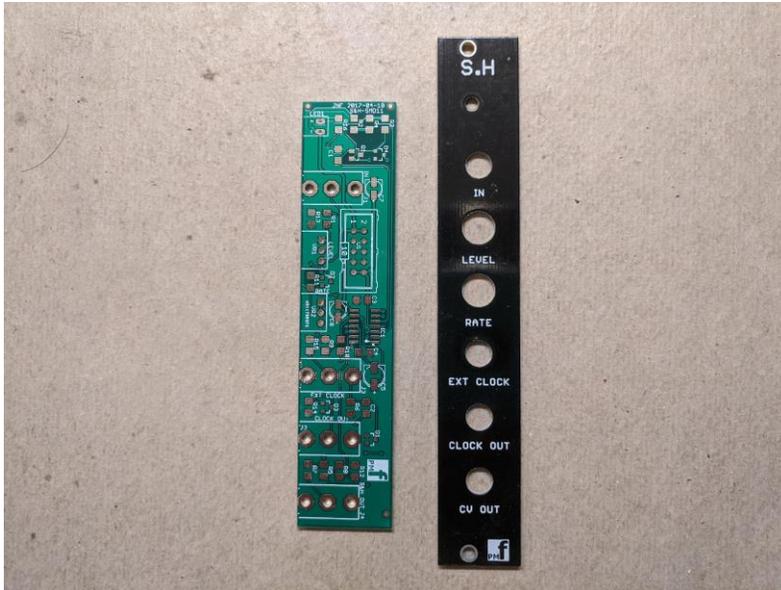


# Sample and Hold – Assembly Guide

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Thank you for purchasing this module! This is an easy build but with some surface mount parts including precision integrated circuits. Some of the pads are quite small and you will need a chisel tip or screwdriver tip soldering iron, fine solder and the skill to solder these tiny joints. If you have not soldered SMD before, we recommend watching some of the many YouTube guides. Our favorite: [EEVBlog](#).

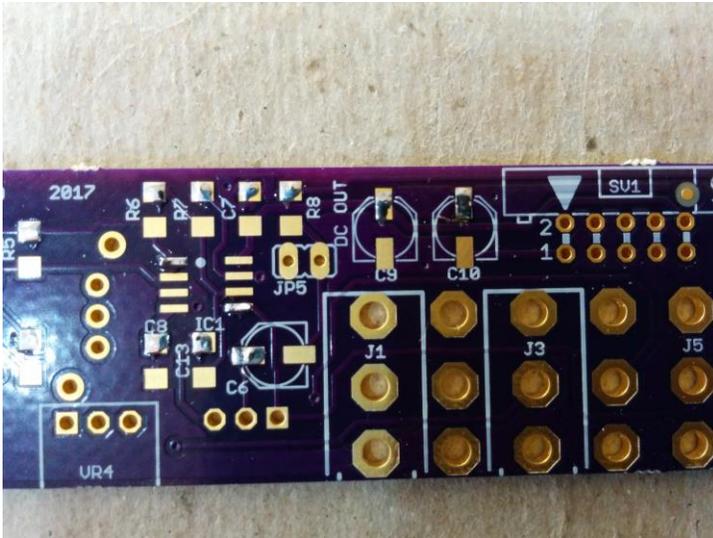


The module is designed and sized for **Euro rack** systems. You will need a 16-10 pin eurorack power ribbon connector with  $-12/0/+12$  which is connected to a synth power supply. The module consists of 1 PCB board and a front panel.

## Constructing the board

### 1. Board preparation

Apply flux to the SMD pads. Tin one pad of each SMD footprint with a SMALL amount of solder. For the ICs, apply a tiny amount of solder to two opposite corner pins. (Photo shows generic board not necessarily this project.)



### 2. 1206 Size Resistors and ceramic capacitors

Install the 1206 resistors and 1206 capacitors on the TOP of the board by positioning on the footprint and heating the cap and tinned pad until the part is attached. When all 1206 parts have been attached. Solder the opposite pad of each part. Finally, reheat and add solder if necessary to finalize the first pad of each part.

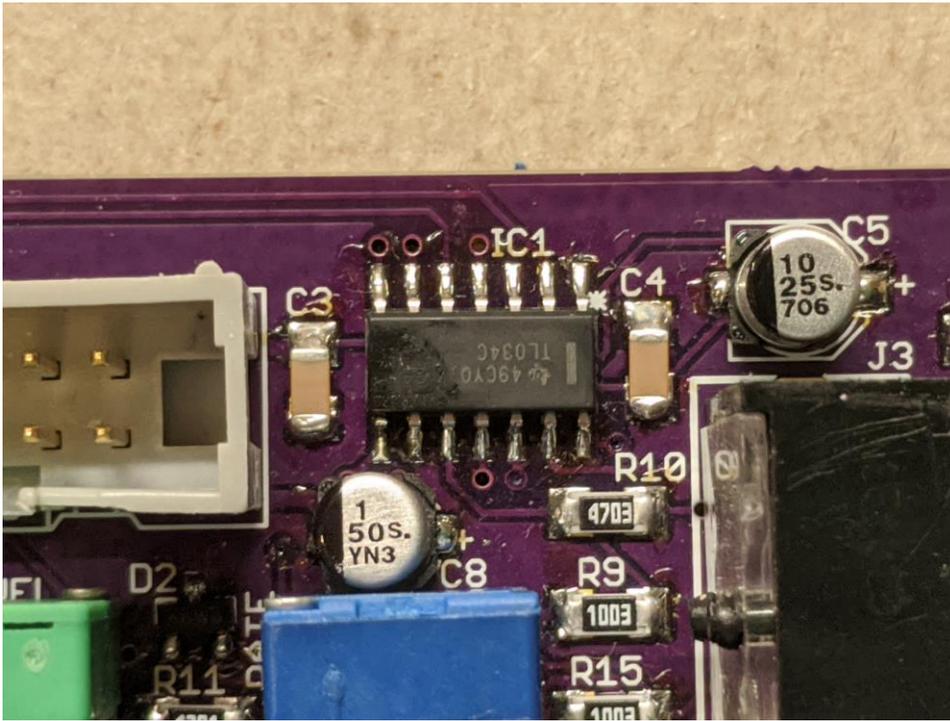
### 3. Transistors and diodes

Install the diodes and transistors on the TOP of the board by positioning on the footprint and heating a pin and tinned pad until the part is attached. When all parts have been attached, Solder the other pads of each part. Finally, reheat and add solder if necessary to finalize the first pad of each part.

### 4. ICs

Install the ICs with the correct orientation. Align the dot or other marker with the corresponding mark on the board. If you solder the ICs the wrong way round, they will explode and render the board useless. Position on the footprint and heat the pin and tinned pad in one corner until the part is attached. Position and heat the pin and tinned pad in the opposite corner until the part is attached and aligned with all pins and pads. Solder the remaining pins

and pads. Finally reheat and add solder if necessary to finalize the corner pads of each part. Check for and remove any bridges between pins.



5. Electrolytic capacitors

Install these on the TOP. Make sure you orient these capacitors correctly. The lead marked with a + needs to be placed on the pad that has the “+” marking near it. Leads marked with “-” go on the pad WITHOUT the “+”.

Position on the footprint and heat the pin and tinned pad until the part is attached. When all have been attached. Solder the opposite pad of each part. Finally reheat and add solder if necessary to finalize the first pad of each part.

6. LED

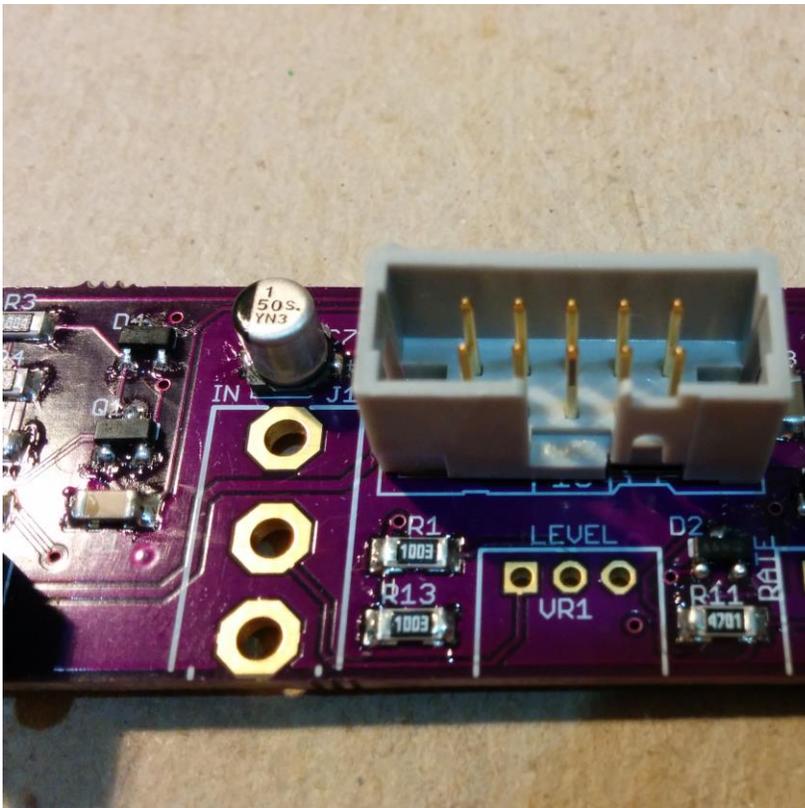
Install the LED on the top of the board and solder on the underside. The LED should face the edge of the board.



#### 7. Power socket

Install the 10 pin power socket on the TOP of the board. This must be installed with the correct orientation or the module will be damaged when the power is connected.

The cut-out in the socket should face the jacks, aligning the cut-out with the "10" marking on the board as shown in the photo. Solder on the underside.



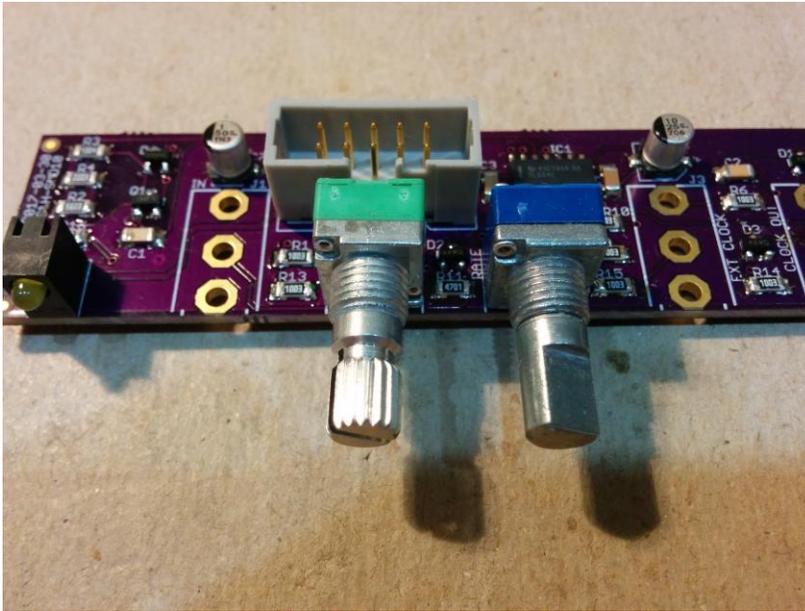
#### 8. Potentiometers

If the pots have positioning lugs on the front, cut these off with a sharp pair of flush cutting pliers. The front of the pot (where the shaft protrudes) needs to be flat.

Install the pots on the top. The level pot is 100k and the sample rate pot is 1M.

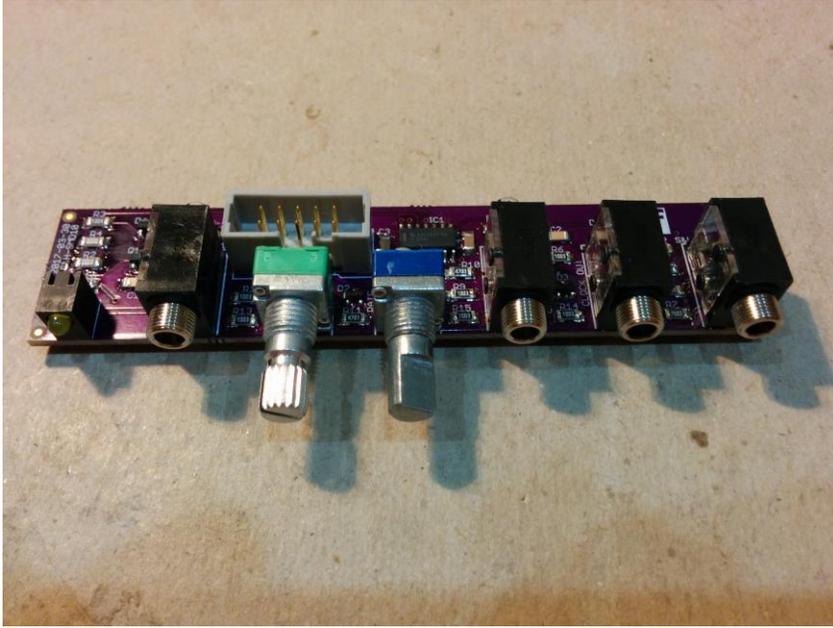
The sample rate pot is a tight fit against C8. Ensure that the leads of the pot are completely straight to allow the pot to fit exactly in its footprint on the board.

Tack one pin only of each pot with solder. These will be finalized later. Please ensure they are on the CORRECT SIDE OF THE BOARD. See Photo.



9. 3.5mm Jack Sockets

Install the jacks on the top. Tack one pin only of each socket with solder. These will be finalized later. Please ensure they are on the CORRECT SIDE OF THE BOARD. See Photo.



#### 10. Alignment

1. Place a washer over each pot shaft. Place the front panel over the board so that the 3.5mm jacks, LED and pots align with the holes in the panel.
2. Put nuts on the pots and jacks and FULLY TIGHTEN all of them. Do not overtighten!
3. Now fully solder all the pins of the jack sockets and pots.
4. Install the knobs.





1. Double check again that you have installed the power socket the correct way around.
2. Connect the power supply from the synth.
3. To get started, connect a ramp wave from an LFO to the input, and feed the output to a VCO CV input. Patch the VCO to a VCA and the clock out from the S&H to an envelope generator controlling the VCA. Patch the VCA to your output mixer. You'll hear a distinct note played at each sample.
4. Or patch a low frequency (.2 Hz) sawtooth into the S&H input, adjust the sample rate to about 2 Hz. The output will be a staircase wave. Using the staircase output to drive a VCO, you will hear a rising sequence of 10 notes. A triangle wave input will produce an up and down staircase.
5. Research S&H applications and try a variety of other patches.