Synthola V1.2 – User Guide

The module is designed for a monophonic Analog synthesizer.

The module is designed and sized for **Eurorack** systems. You will need a 16-16 pin **Eurorack** power ribbon connector with –12/0/+12 and +5V which is connected to a synth power supply.

Programming the Synthola

1. If the PIC24 chip is preprogrammed there is nothing else to do for programming.
2. If you intend to program the chip yourself with our .HEX file, use your favorite method to program the chip. If using the ICSP port on the board and MPLAB-X IDE , you can follow this tutorial to set up a pre-built project with our HEX file:

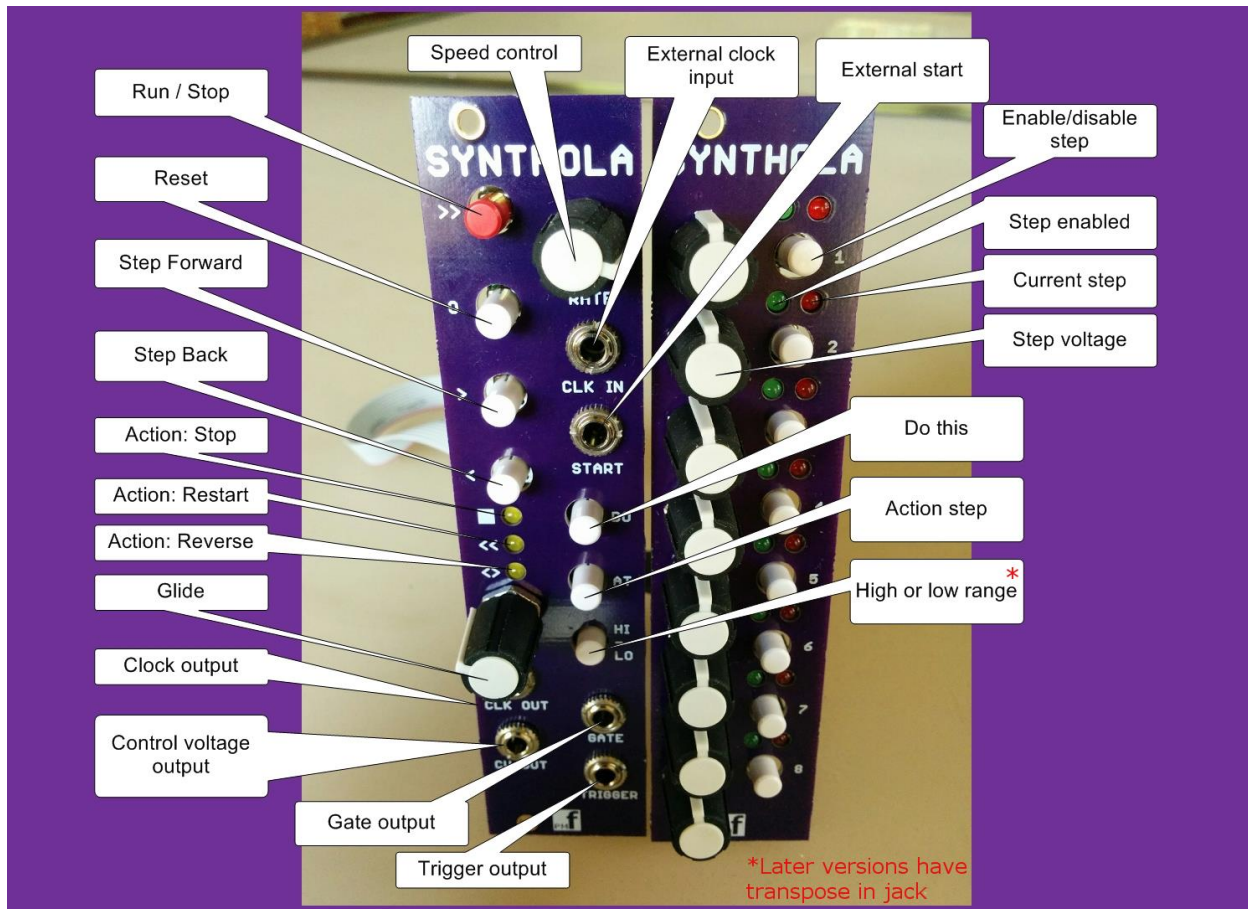   http://microchip.wikidot.com/mplabx:projects-prebuilt

Options

1. The basic kit contains one control board and one CV (control voltage) board. This provides 8 steps. You can add an additional 8 steps by adding a second CV board and unjumpering JP2 on the main board.

Connections

1. Connect a 16-16 pin **Eurorack** power ribbon connector with –12/0/+12 and +5V to a synth power supply. This connector is marked POWER on the board.
2. Connect the Control board and the CV board with a 10-16 pin ribbon connector. The 10-pin goes in SV1 of the main board and the 16 pin goes into the CV board. These connectors are marked "DO NOT CONNECT POWER HERE".
3. OPTIONAL: Connect the Control board and the 2nd CV board with a 10-16 pin ribbon connector. The 10-pin goes in SV2 of the main board and the 16 pin goes into the second CV board. These connectors are marked "DO NOT CONNECT POWER HERE". Cut or remove any jumper installed in JP2 to enable 16 steps.
4. DO NOT MIX UP THE POWER AND INTERCONNECTS!

Controls

Refer to the annotated diagram. The highlighted items are described more fully below.

Annotations on diagram (clockwise): Speed control, External clock input, External start, Enable/disable step, Step enabled, Current step, Step voltage, Do this, Action step, High or low range *, *Later versions have transpose in jack, Trigger output, Gate output, Control voltage output, Clock output, Glide, Action: Reverse, Action: Restart, Action: Stop, Step Back, Step Forward, Reset, Run / Stop

1. **Run / Stop**
   Press once to run the sequence, once to stop a running sequence. The sequence will stop at the current step and restart from the next step when the button is pressed again.
2. **Reset**
   Stops the sequence and returns it to step 1.
3. **Step Forward**
   The sequence must not be running. Plays the current step and then moves forward one step. An action will take place at the action step (if any).
4. **Step Back**
   The sequence must not be running. Plays the current step and then moves back one step. An action will take place at the action step (if any).

5. Action: Stop, Restart, Reverse indicators

    Indicates the action that will take place at the action step.   If the action is RANDOM, all three indicators will be on. If the action is NONE, no indicators will be on.

6. Glide

    Sets the portamento/glide time between steps.

7. Clock output

    Allows access to the internal clock signal. Use to synchronize other modules to the Synthola.

8. Control Voltage output

    Sends the control voltage set at at the current step.

9. Gate output

    Send the gate on/off signal. The gate is on at beginning of the step and off after 75% of the step is complete.

10. Trigger output

    Send the trigger on/off signal. The trigger is a short pulse independent of step length.

11. Speed control

    Sets the time between each step. The time is the same for all steps. For more control over this, you should use the External Clock Input.

12. External Clock input

    Allows an external clock e.g. LFO/Sample and Hold/ Clock etc. to control the time between each step.

13. External start

    Allows an external pulse to start the sequence. The sequence will restart at the next pulse even if the current sequence has not completed. This works best with the Action:STOP mode and is often used for apreggiation. [An "arpeggiated chord" means a chord which is "spread", i. e., the notes are not played at the same time, but are spread out. Arpeggiated chords are often used in harp and piano music.]

14. Enable/disable step

    Push in to disable the step. The green indicator will turn off.

15. Step enabled

    Green if step will play, off if step will be skipped.

16. Current step

    Red when this step is playing.

17. Step voltage

    Set the control voltage for the numbered step.

18. Do this (DO button)

    The indicators will cycle through to show the programmed action.

    DO: Nothing: there is no action step, the sequence plays all enabled steps

    　　　No indicators will be on

    DO: Stop: Plays the sequence and then stops

    　　　The STOP indicator will be on

    DO: Restart: plays the sequence and then repeats until stopped

    　　　The RESTART indicator will be on

    DO: Reverse: plays the sequence and then changes direction and plays it in reverse until stopped

The REVERSE indicator will be on

DO: Random: plays random steps between 0 and the programmed AT step

ALL THREE indicators will be on

19. Action Step (AT button)

The red current step indicators will cycle through on the CV board each time the button is pressed. Press and hold to go to step 1. After programming the AT step, the action indicated by the DO button will take place when the AT step is reached.

20. High or low range (later versions have transpose in jack)

Shift the CV range output from the CV jack.