Synthola V1.1 – 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 with one row of CVs. You can expand this setup as follows:
    a. You can add an additional 8 steps (total 16) by adding a second CV board and unjumpering JP2 on the main board.
    b. You can stay with 8 steps but add an additional 2nd row of independent CVs by adding a 2ndRow board. Leave JP2 installed on the main board for this option.

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. OPTIONAL: Connect the Control board and the 2ndRow 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". Do NOT cut or remove any jumper installed in JP2.
5. DO NOT MIX UP THE POWER AND INTERCONNECTS!

Controls

Refer to the annotated diagram. The highlighed items are described more fully below.
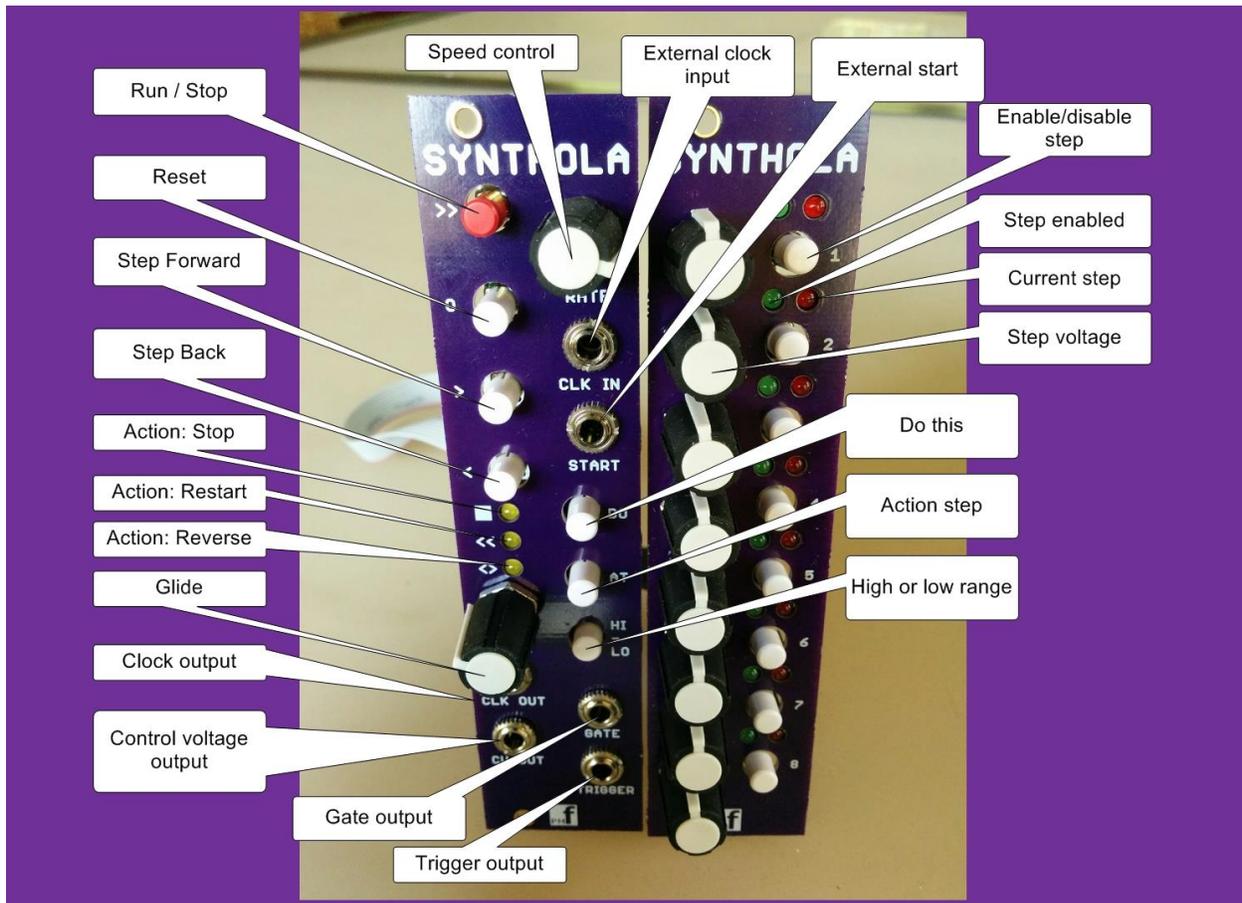
1. Run / Stop
   Press once to run the sequence, once to stop a running sequence. The sequence will stop at the current step and restart from the next step when the button is pressed again.
2. Reset
   Stops the sequence and returns it to step 1.
3. Step Forward
   The sequence must not be running. Plays 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. (A second row of CV outputs is available on the 2ndRow board if installed.)

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

Changes the output of the programmed control voltages between a preset high and low range.