

Quantola 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-pin **Eurorack** power ribbon connector with $-12/0/+12$ and $+5V$ which is connected to a synth power supply.

Programming the Quantola

1. If the PIC24 chip is pre-programmed, 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 unjumping JP2 on the main board.

Connections

1. Connect a 16-16 pin **Euro rack** 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!

Scales

Press the DO button until all three LEDs are flashing. You are now in SCALE mode. Use the AT button to step through the scales. If you have one CV module, 8 scales are available (see Bank 1 below). If you have two CV modules, two banks of scales are available.

Bank 1.

Tones: 0,1,2,3,4,5,6,7,8,9,10,11 chromatic (semi-tones)

Tones: 0,2,4,5,7,9,11 major

Tones: 0,2,4,7,9 major pentatonic

Tones: 0,3,5,7,10 minor pentatonic

Tones: 0,2,3,5,7,9,10 dorian

Tones: 0,1,3,5,7,8,10 H-W-W-W-H-W-W Phrygian

Tones: 0,2,3,5,7,8,11 harmonic minor

Tones: 7,0,2,4,6,7,9,11 lydian

Bank 2 (Only available with 16 steps)

Tones: 0,2,4,6,8,10 whole tones

Tones: 0,2,3,5,7,8,10 Aolian minor

Tones: 0,3,5,6,7,10 Blues 3H-W-H-H-3H-W

Tones: 0,4,7,11 7th

Tones: 0,3,7,11 Minor 7th

Tones: 3,0,4,8 3rd

Tones: 0,3,6,9 Minor 3rd

Tones: 0 1V steps for testing

Calibrating the (Digital-Analog Converter output) DAC

This adjusts the output buffer so that a digital representation of the scaled voltage is converted to an analog output voltage.

If you bought PCBs or a kit, you should only need to calibrate the unit once. If you bought a pre-built and tested unit, you can skip this section.

1. Power up the module and allow it to warm up for a few minutes.
2. Press the Quantize button so it is pushed in.
3. Set the scale to Scale 1 by pressing the DO button until all three LEDs are flashing and confirm that Scale 1 LED on the CV module is lit and use the AT button to select Scale 1 if needed.
4. Connect the -VE probe of a multimeter to a GND pin of the power connector or other ground point on the board.
5. Disconnect all inputs and outputs except CV out.
6. Monitor the CV out with the +VE probe of the meter.
7. Use the DO button to set the mode to NONE (all control board LEDs off).

8. Set the sequencer so it is outputting step 1. Use the forward and back buttons to do this.
9. Set the pot for step 1 fully CCW.
10. Adjust trimmer **R32** until the voltage output is 0.000V.
11. Advance the step 1 pot and adjust the gain trimmer R26 so that the CV advances in 0.083V steps as the pot for step 1 is turned.

Controls

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 LEDs: Stop, Restart, Reverse, Random, Scale indicators
Indicate 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. If the action is SCALE, all three LEDs will flash.
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. Quant
Set the quantizer on or off.
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. Transpose input

Allows an external voltage to change the CV that is set on the step pots. Transpose voltage is analog and is not quantized.

14. 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 arpeggiation. [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.]

15. Enable/disable step

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

16. Step enabled

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

17. Current step

Red when this step is playing.

18. Step voltage

Set the control voltage for the numbered step.

19. 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

DO: Scale: Use to set the quantizer scale.

ALL THREE indicators will be flashing

20. 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.

In SCALE mode the AT button sets the scale. The LEDs of the CV board tell you which scale is set.