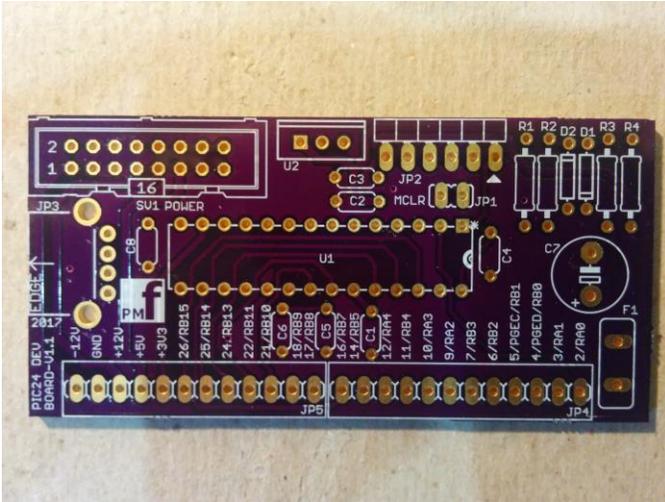# PIC24 Development Board v1.1 – Assembly Guide

Thank you for purchasing this module! This is a simple build with tightly packed components and precision integrated circuits.

The board is designed 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.

Follow the parts lists, these instructions and the PCB silkscreen text to build the module.

You must follow the order of assembly as described below since some components will be soldered underneath other components.
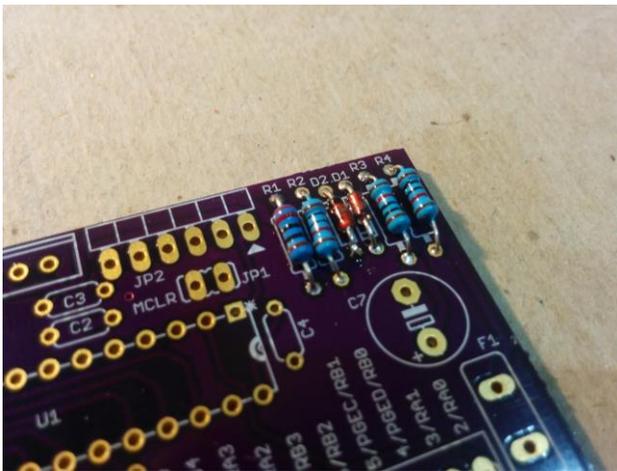
1. Resistors

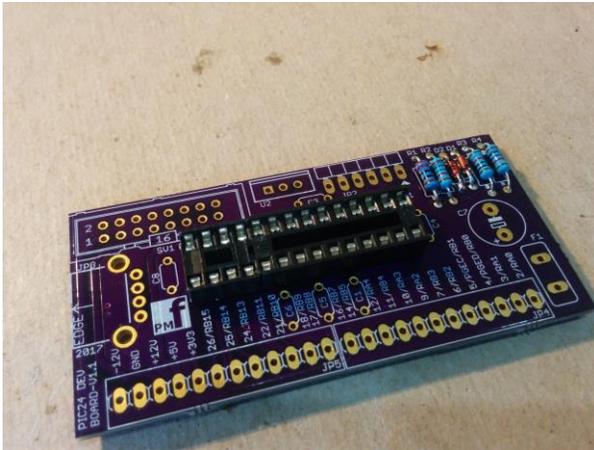   Install the flat resistors on the TOP of the board. Solder and clip the leads.
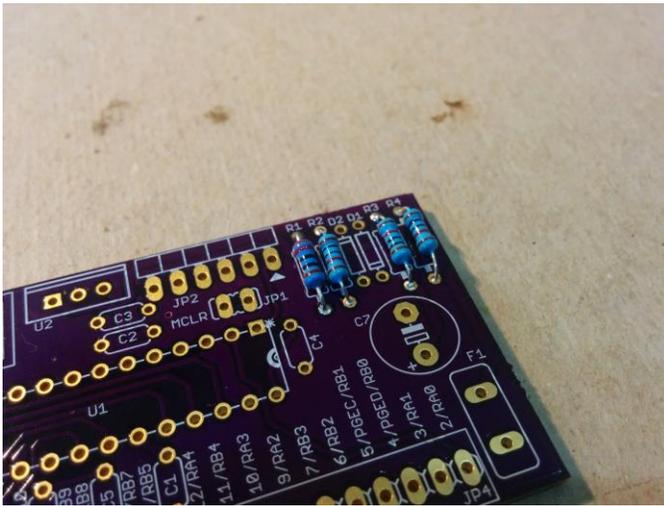
2. Diodes

   Install the diodes on the TOP of the board. These are polarized components. Align the stripe on each diode with the stripe marked on the board. Solder and clip the leads.
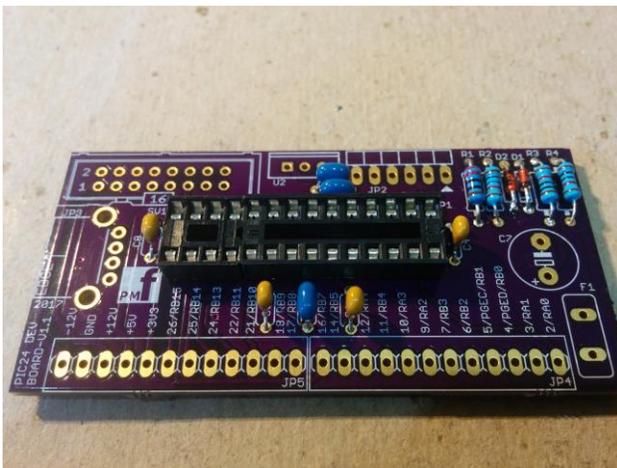
3. IC Socket

Install the socket for U1 on the board. Observe the notch or mark on the socket and align with the notch or mark on the board. Solder.
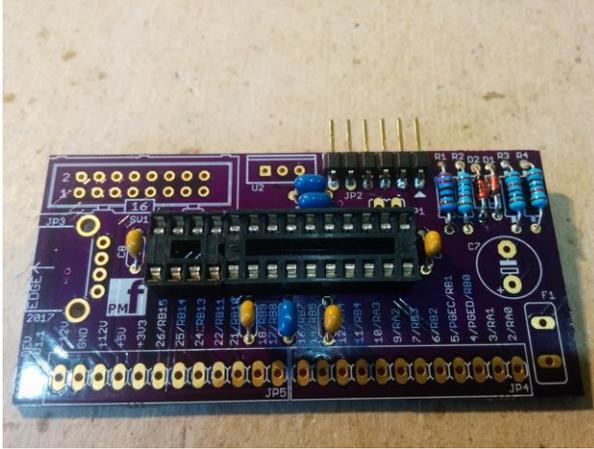

4. Ceramic/film capacitors

Install the ceramic/film capacitors on the TOP of the board. Solder and clip the leads.
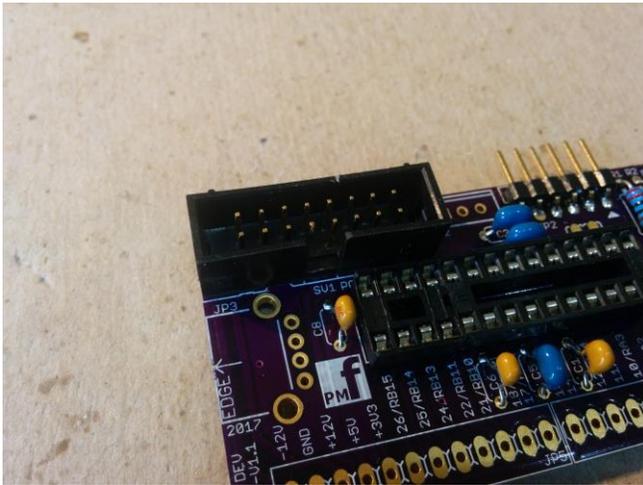

5. ICSP connector

Install the 6 pin ICSP connector on TOP. Orient so the black shroud faces out with the pins and the short, bent pins go into the board. See photos. Solder.

6. Power socket

   Install the 16 pin power socket on the TOP of the board. The socket should face OUT from the board. Solder.

7. USB socket

   If you need USB functionality, install the USB socket. Squeeze the frame clips on each side together slightly so that it fits in the holes. Ensure that it is TIGHT and flush against the PCB before soldering. Solder the pins and the retaining clips.
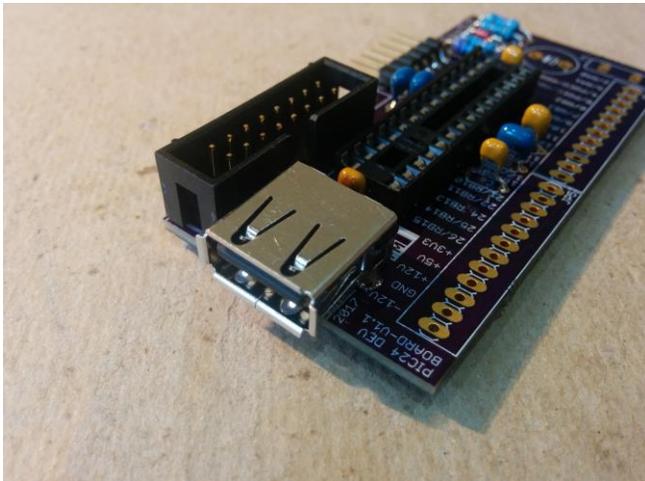
8. 2 pin jumper

Optional. Only needed if you need to cycle the board using the hardware MCLR pin. Install the 2 pin jumper marked MCLR on the TOP of the board. Solder.

9. Pin headers

You can install screw terminals or pin headers that accept breadboard jumpers. You can also just solder permanent wires into these holes.

If you use screw terminals, ensure that the hole for the wire faces out from the board.

Pins 21 and 22 are paralleled with the USB socket. If you are using the USB funtionality, don't connect anything to terminals 21 and 22 except USB related components of your design.
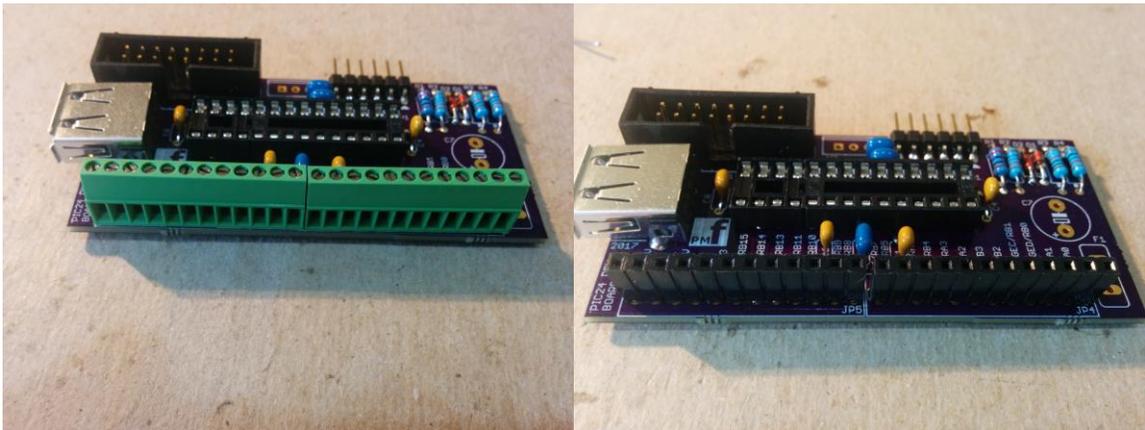
10. Electrolytic capacitor

    Optional. Only needed if you need to supply 5V to the USB bus.

    Install this on the TOP. Make sure you orient these capacitors correctly. The longer lead and/or the lead marked with a + needs to be inserted into the hole that has the "+" marking near it. Leads marked with "-" go in the board hole WITHOUT the "+". Solder and clip the leads.
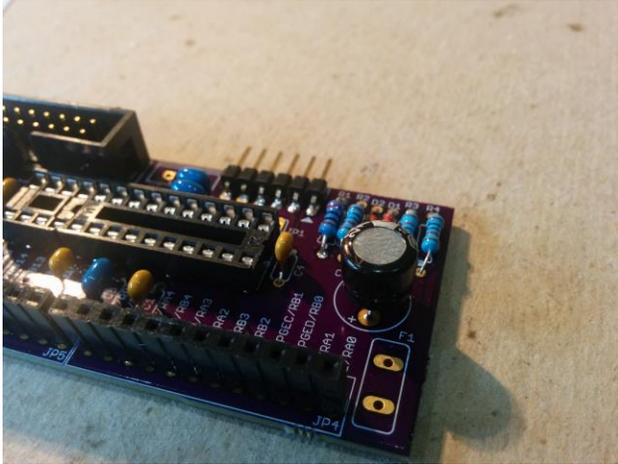

11. Resettable fuse

    Optional. Only needed if you need to supply 5V to the USB bus and protect against overcurrent. If you need to supply power to the bus but are unconcerned about current limiting, you can solder a wire link in place of the fuse.

12. Voltage regulator

    Install the Voltage regulator on the board. This is a polarized component. Align the outline with the outline on the board. Solder and clip the leads.
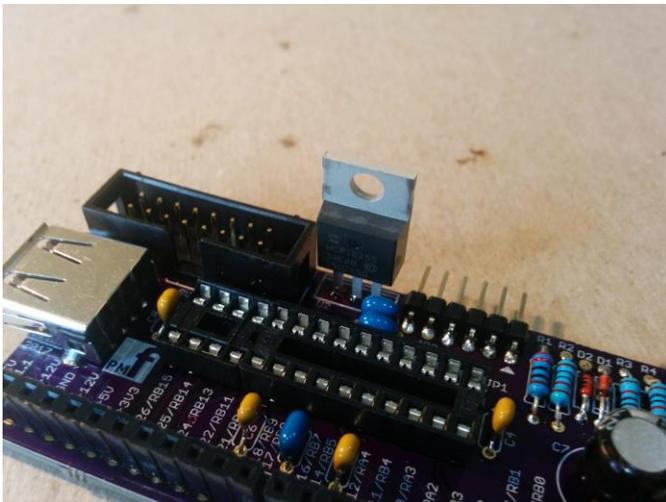
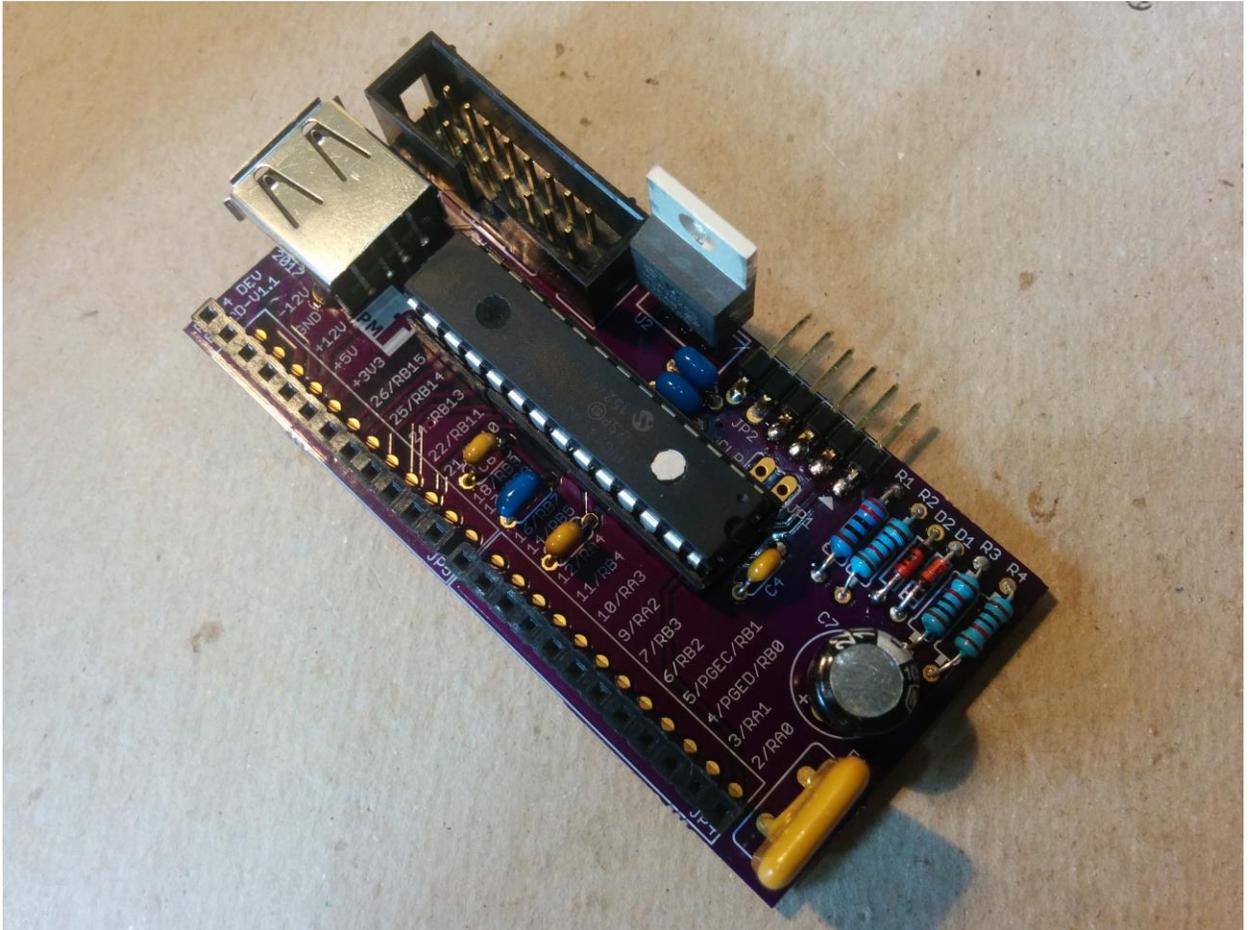13. Do not install the ICs until the voltage tests are complete.

14. If you do not trust all your soldering and connections, carry out the voltage tests below before connecting a USB device or installing the ICs

Voltage tests

1. You do not have to do these tests if you are completely happy with your soldering and are sure there are no bridges or incorrectly placed components. However, these tests will ensure that the correct power supplies are sent to the IC pins to ensure they will not be damaged on power up.
2. Plug in the power supply and connect the –VE probe of a multimeter set to the 20V range to the ICSP pin 4 or any ground source.
3. Check the voltage at the following points on the board:
   a. At U1 pins 1,13,23,28 approx = 3.3V
   b. At U1 pin 15 approx = +5V
   c. At U1 pins 8,19,27 = 0V
   d. Other U1 pins should be well below 3.3V
4. Check the voltage at the following points on the board:
   a. +12V, -12V, +5V, +3.3V, GND at the breadboard pin headers.
5. If any of these tests fail to match the readings given, you should check the components and soldering before progressing
6. TIP: If there are no shorts, missing components or unsolderd joints, the most likely cause for a voltage discrepancy is one or more resistors in the wrong place. You will need to check the value of each resistor against the BOM and the layouts shown in the photos of the unpopulated boards.

Final Assembly

1. Place the IC in place by aligning the notch with the notch graphic on the PCB Silk Screen and notch on the sockets.

2. **NOW READ THE USER GUIDE.**