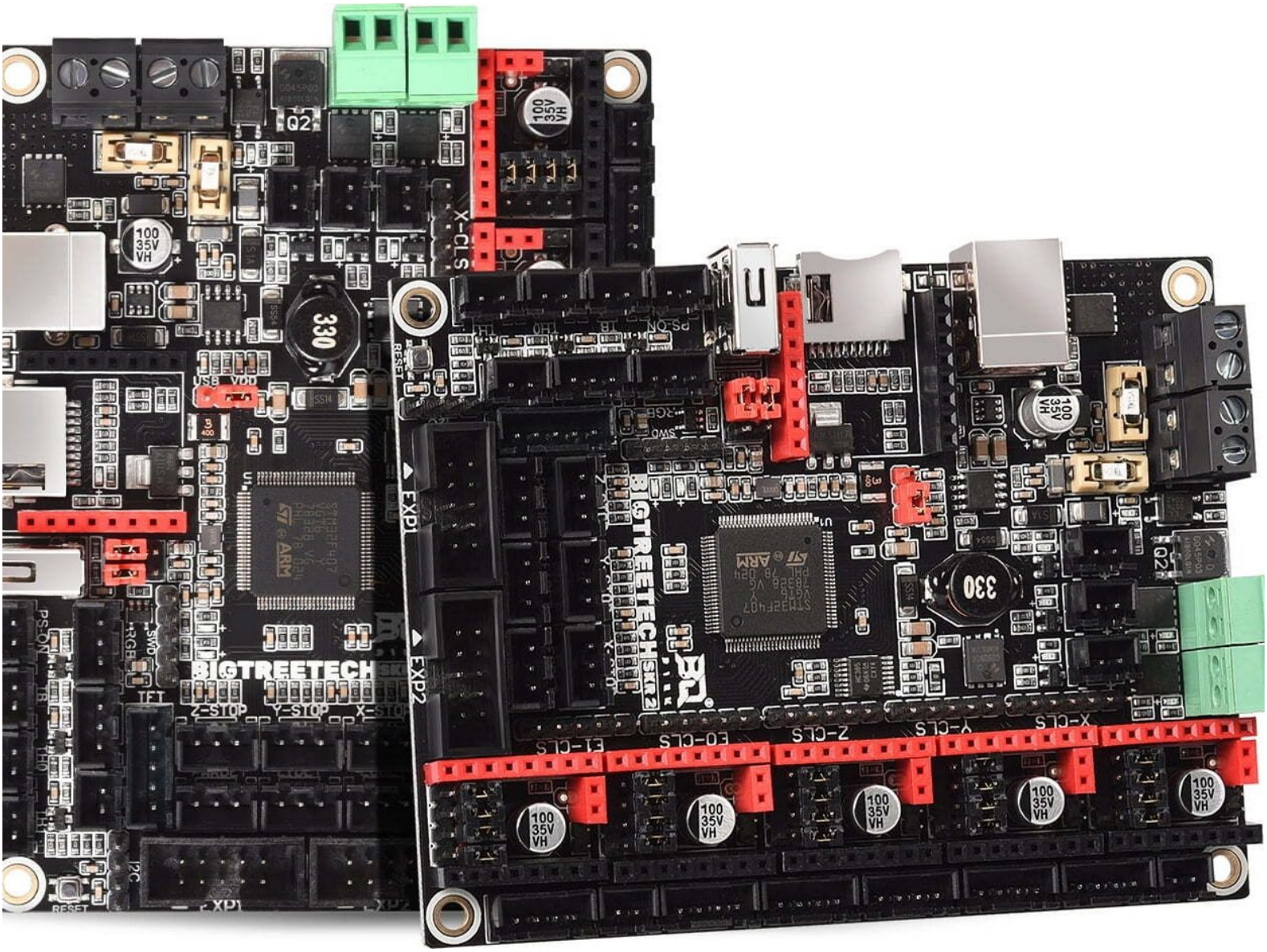
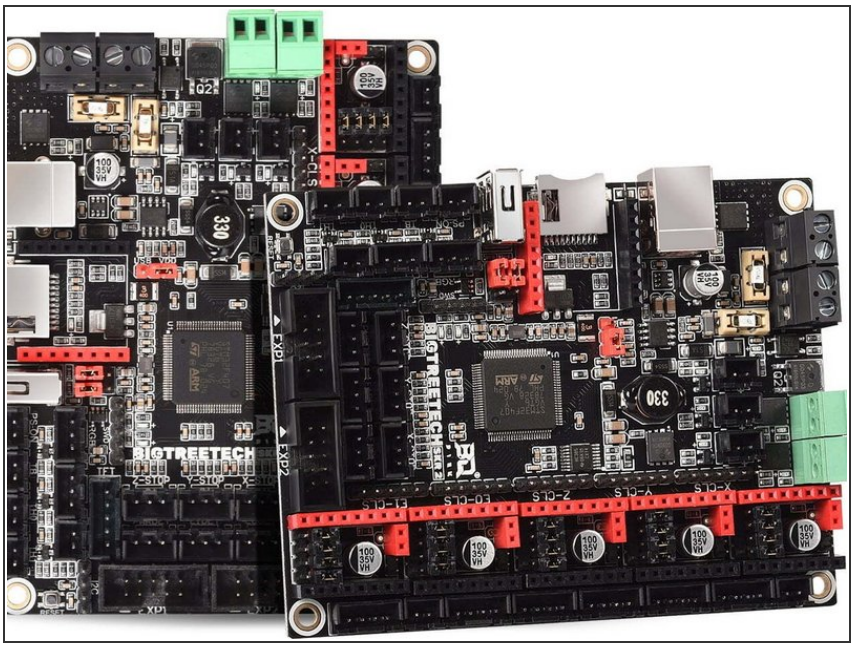
Makertech

# Stage 07: Wiring

Written By: Makertech 3D



## Step 1 — The SKR 2 Control Board

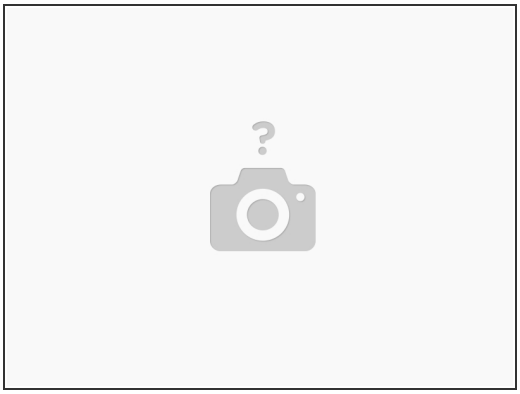



The control board used in the Proforge 3 is the SKR 2 board by BigtreeTech.

More information about it can be found here.

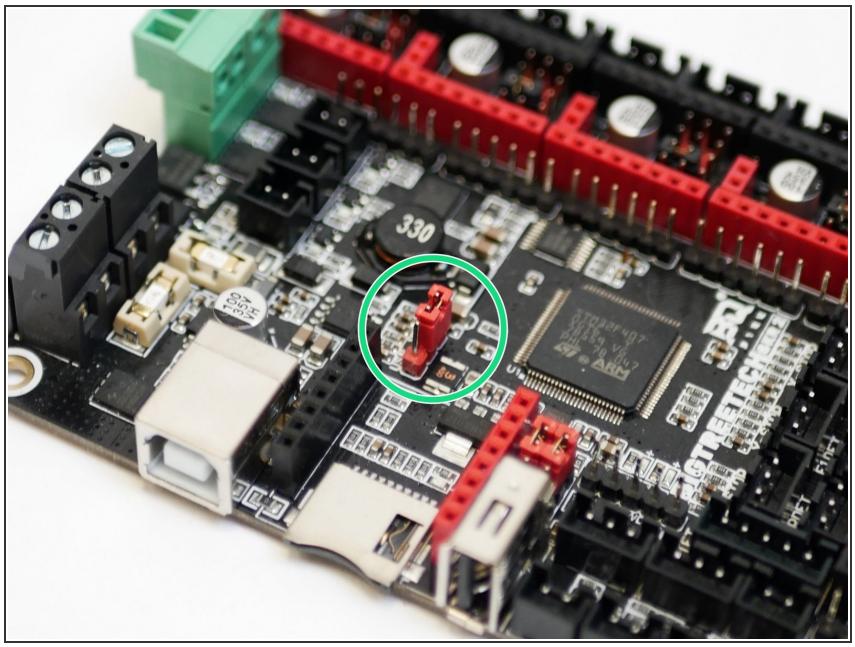
The entire wiring diagram can be found at the bottom of this guide.

## Step 2 — Proforge 3.5 Wiring



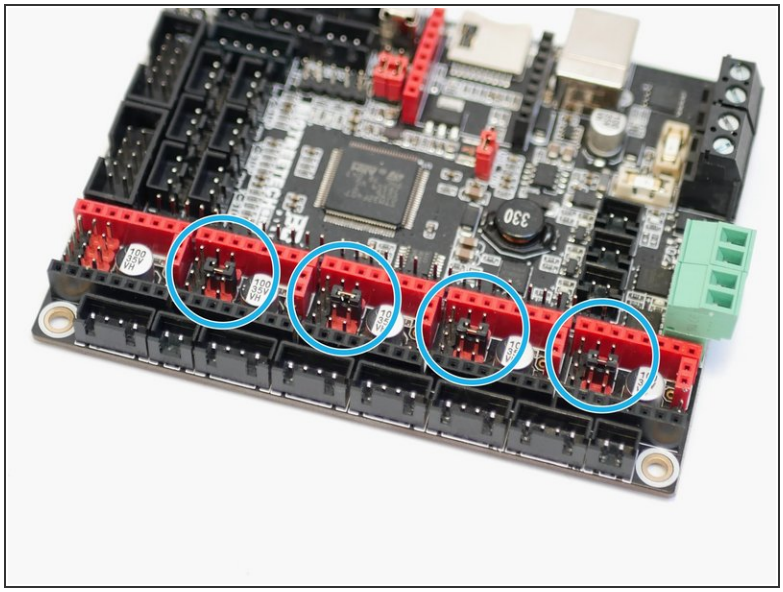
If you are building with the 3.5 upgrade follow the guide for wiring the 3.5 upgrade alongside this guide.

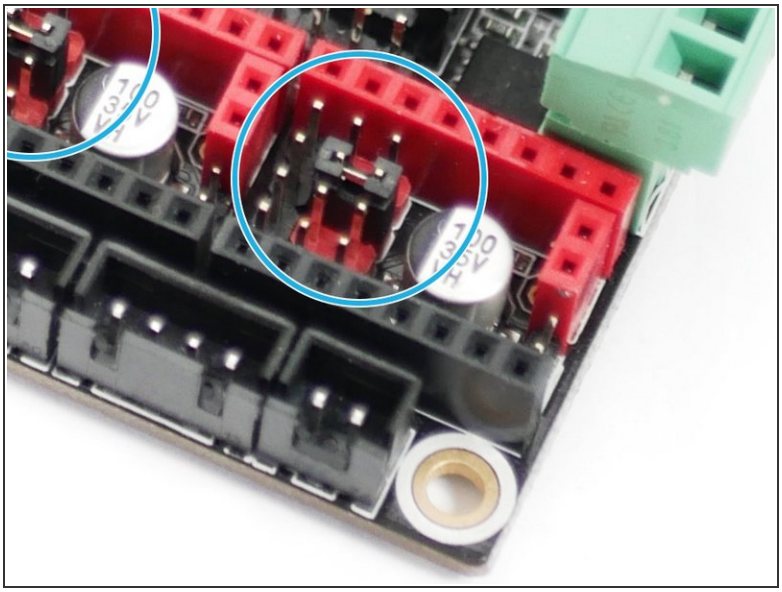
## Step 3 — Preparing the Control Board



- Check that the jumper is set to VDD.

## Step 4 — Stepper Jumpers

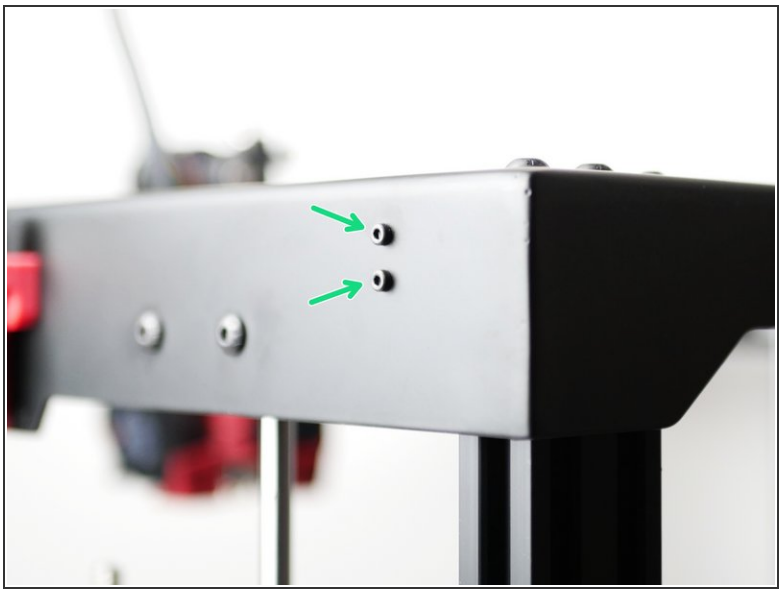


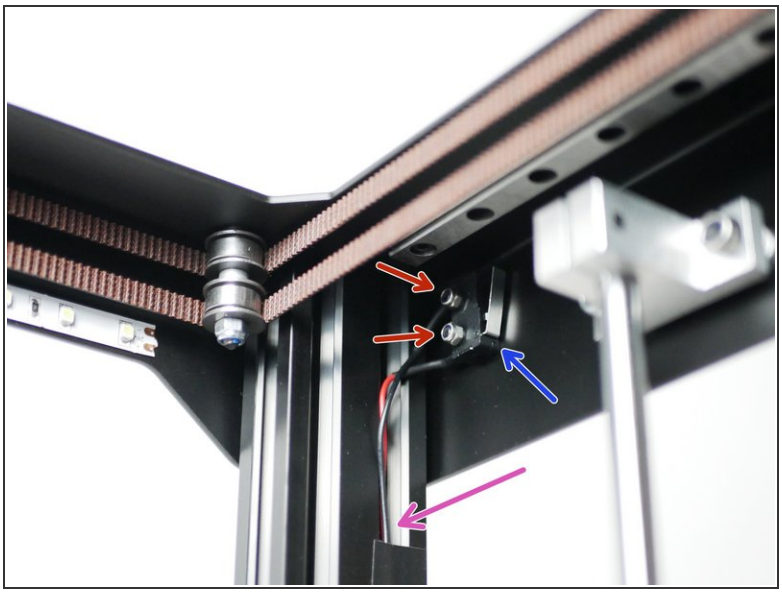


- Make sure the jumpers under the steppers are positioned as shown.

⚠ You will need to pull the other jumpers out, so you have just one connected at each stepper location, as shown.

## Step 5 — Y-Endstop

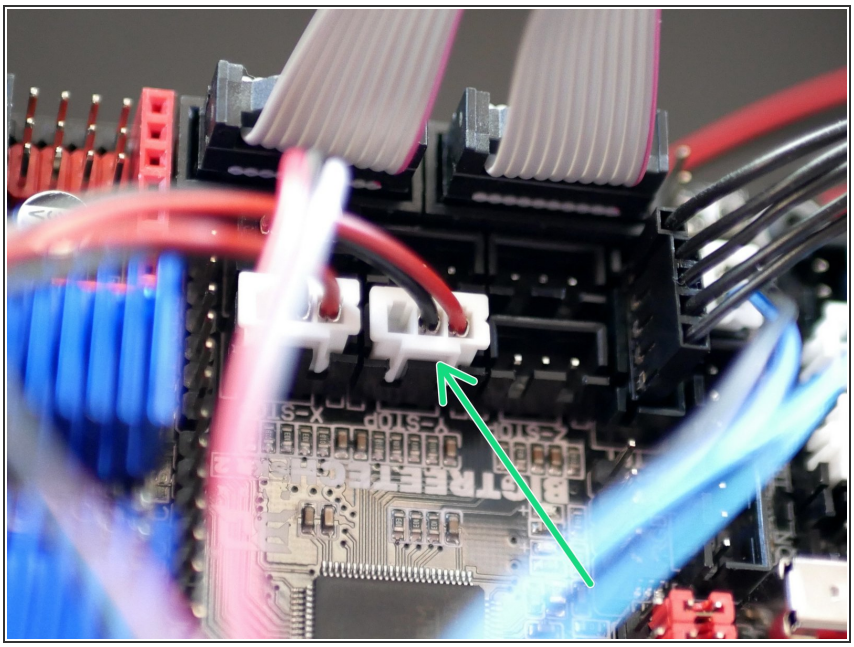




- Fix the Y-Endstop to the top panel.
  - M2.5 x 12mm
  - M2.5 Nyloc
- Route the cable down the 2040 extrusion.

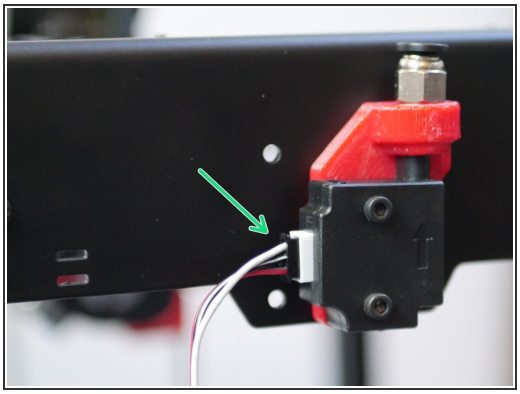
Optional - Use electrical tape to better secure and hide the cable.

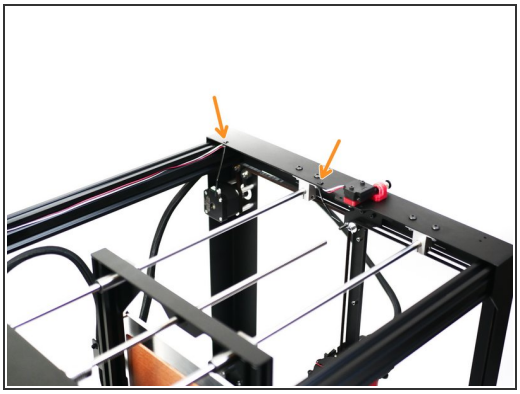
## Step 6 — Y-Endstop to Board

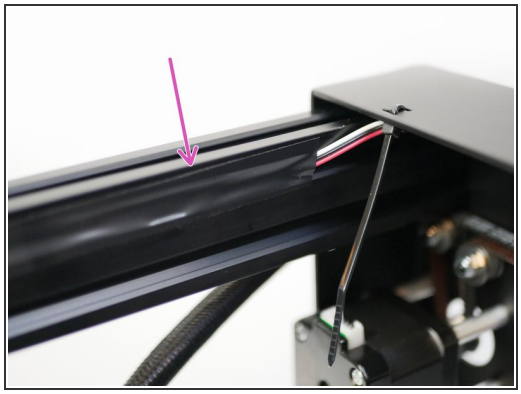


- Connect the Y-Endstop to the control board.

## Step 7 — Filament Sensor Cable

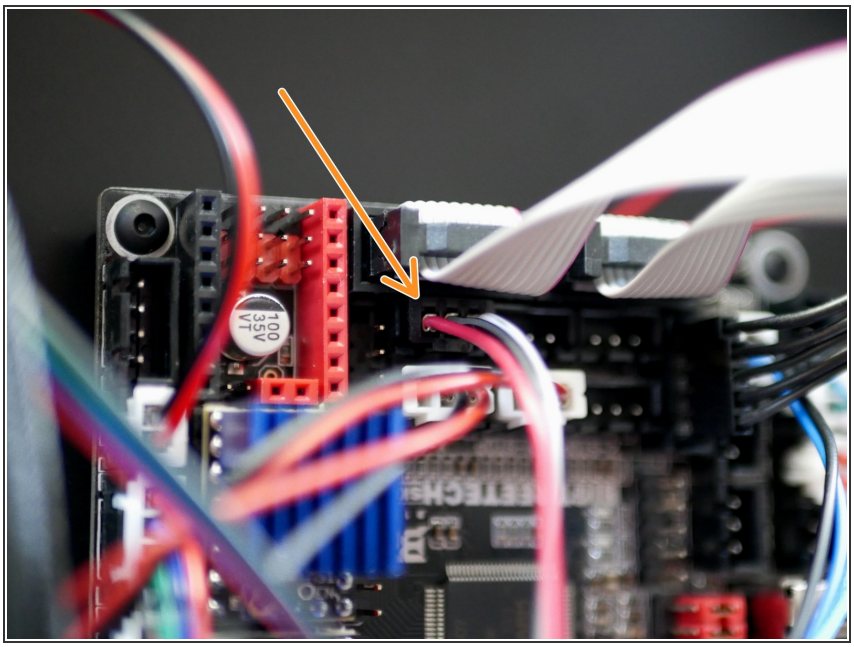






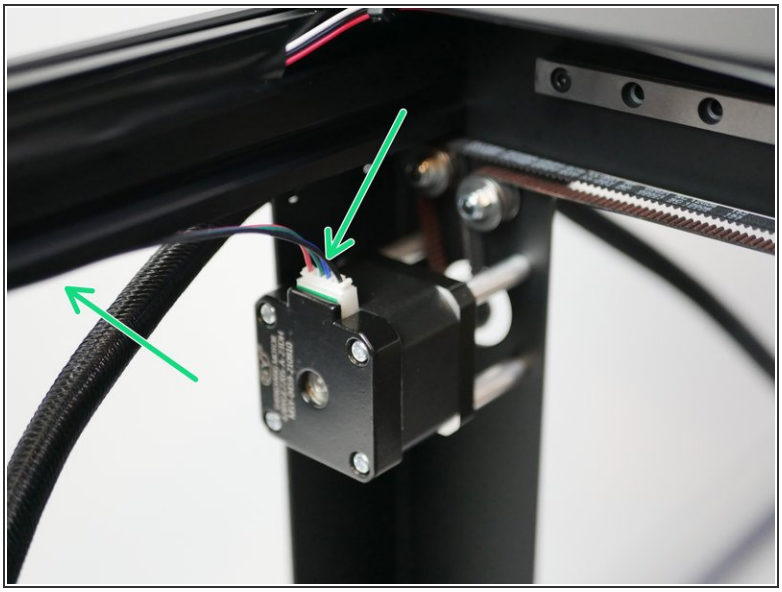
- Fix the filament sensor cable to the filament sensor.
- Route the cable along the side of the top panel. Use cable ties to secure.
- Route the cable down the 2040 extrusion. Use electrical tape to secure it in place.

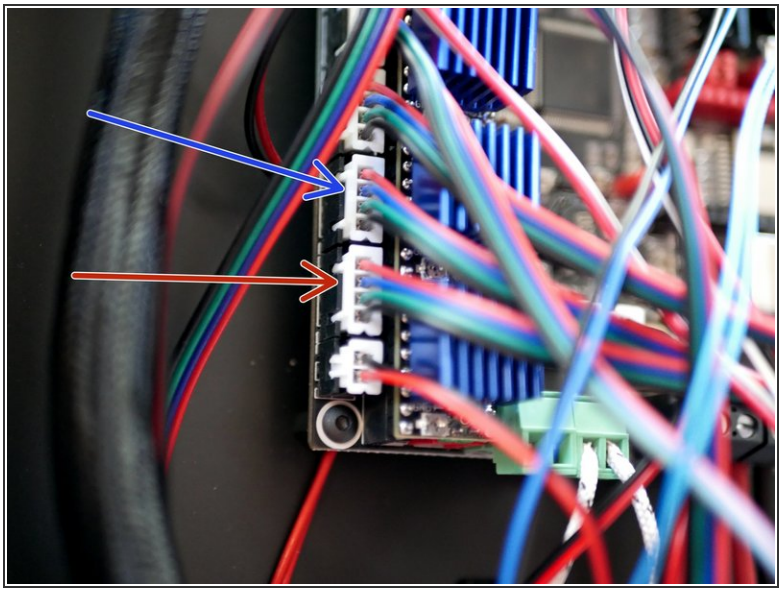
## Step 8 — Filament Sensor Cable to Board



- Connect the filament sensor to the control board as shown.

## Step 9 — X/Y Motor Cables



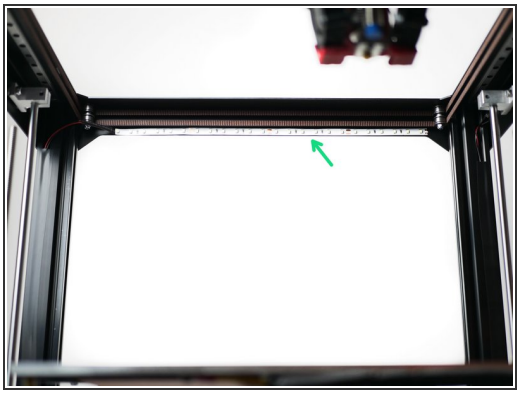
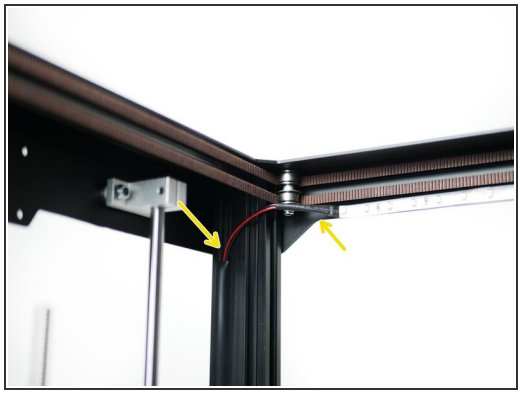


- Connect a motor cable to the X/Y Motors and route them down the side of the 2040 Extrusion.
  - Use electrical tape to hide and secure in place.

Connect the motor cables to the control board.

- Left Motor
- Right Motor

## Step 10 — LED Lights

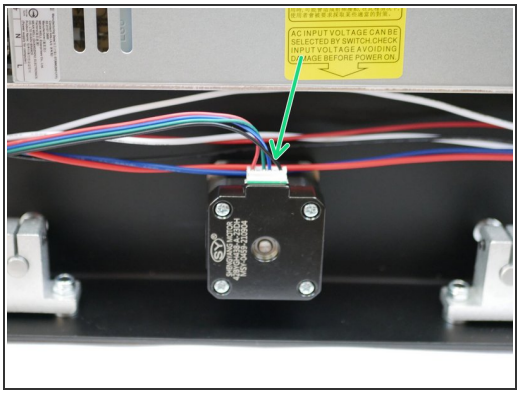
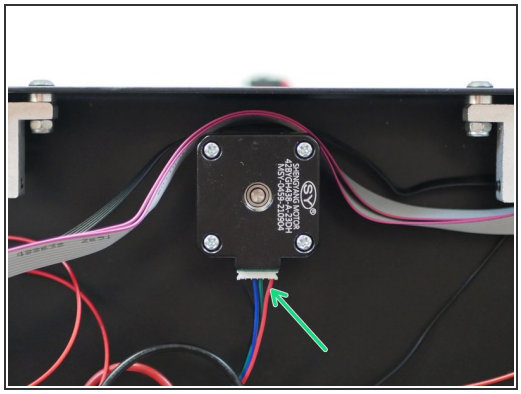
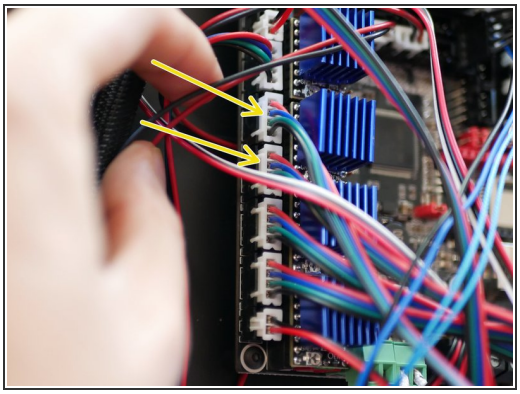




- Stick the LED strip light to the inside front of the top panel.
- Route the cable down the front right side. Again, use electrical tape to hide and hold the cable in place.

ⓘ Wire the LED's directly to the power supply.

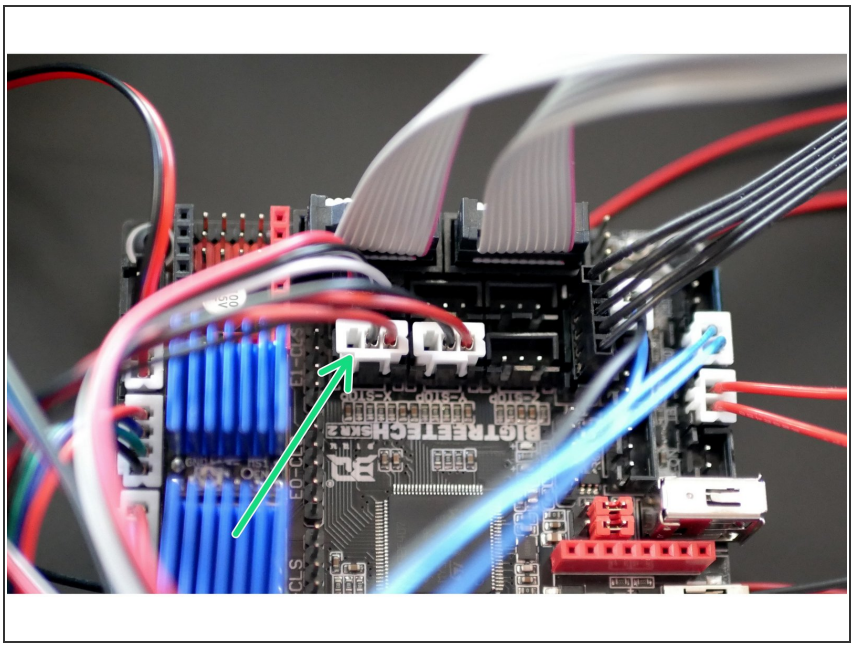
- Red to positive
- Black to negative

## Step 11 — Z-Axis Motors

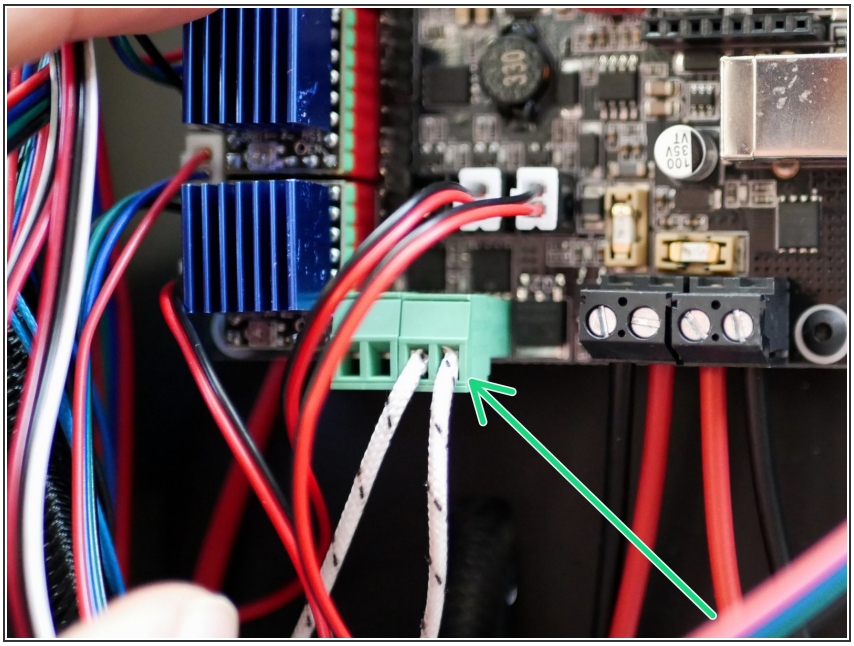
- Connect the remaining two motor cables to the two z-axis motors.
- Connect the other side to the control board.

## Step 12 — X-Endstop



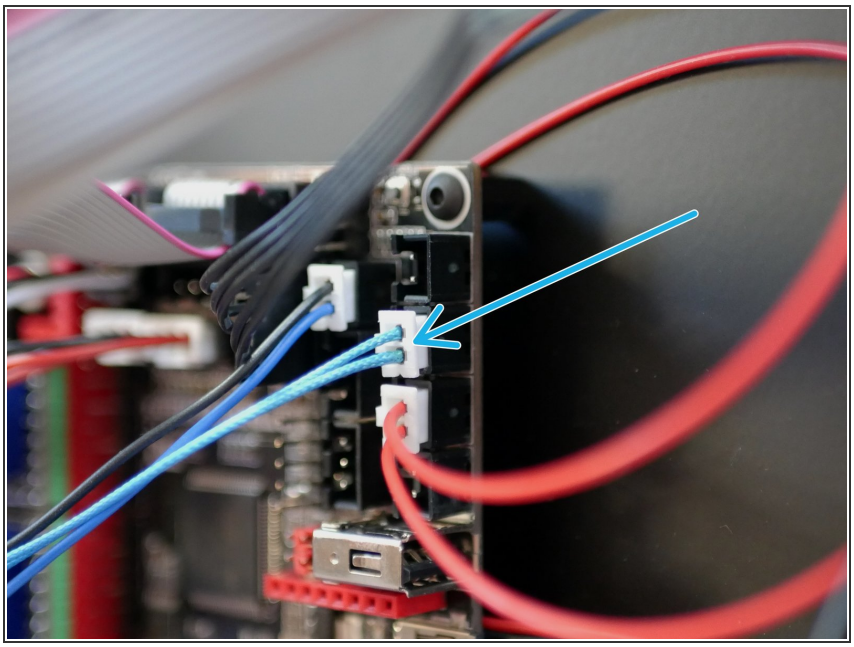
- Connect the X-Endstop to the control board.
  - This is the endstop cable from the tool carriage wiring loom.

## Step 13 — Hotend Heater



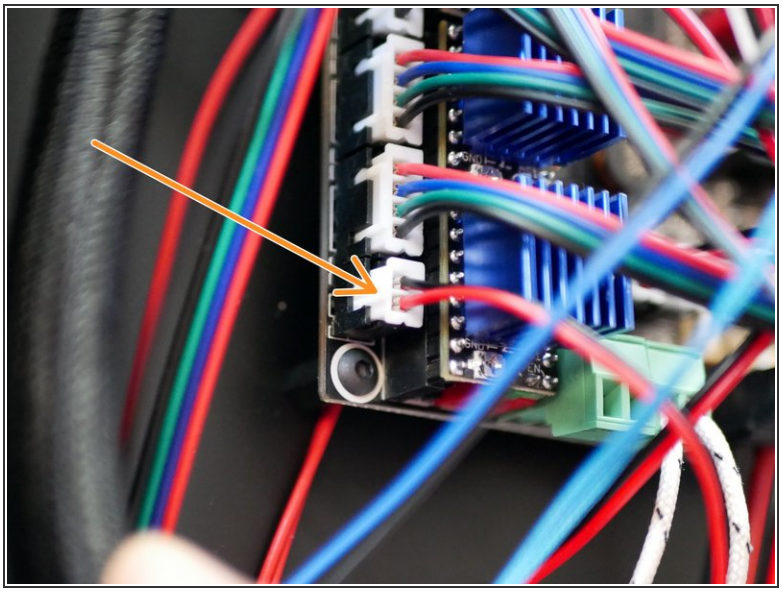
- Connect the Hotend heater to the control board.
  - The connector can actually be pulled out of the board to make connecting the cables easier.
  - You will need a small flat head screw driver for this step.

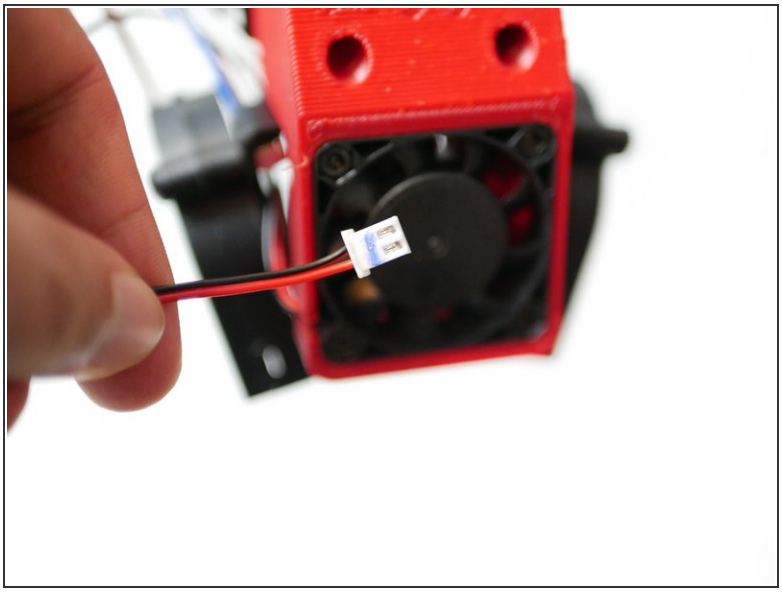
## Step 14 — Hotend Thermistor



- Connect the thermistor to the control board.

## Step 15 — Hotend Cooling Fan

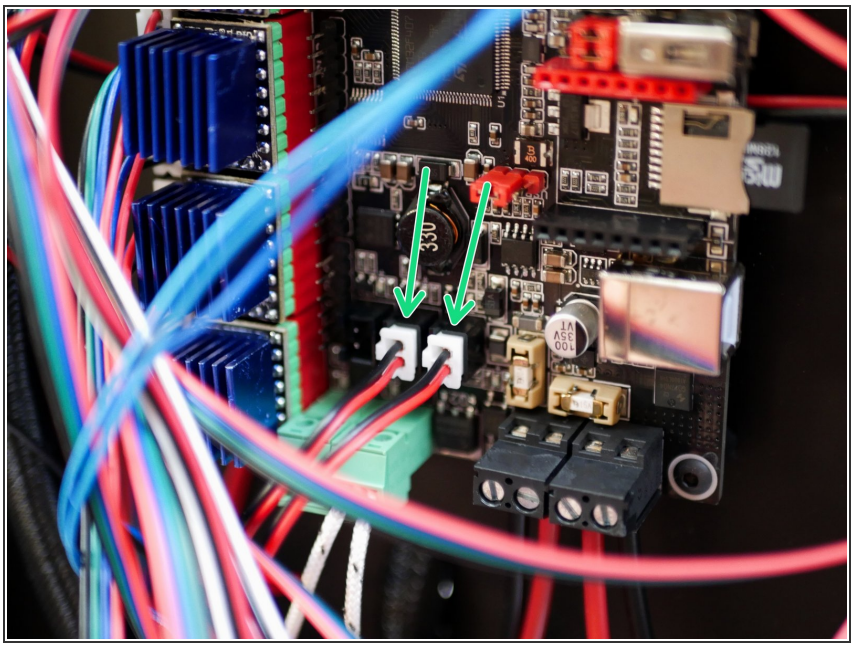




- Connect the hotend cooling fan cable to the control board.

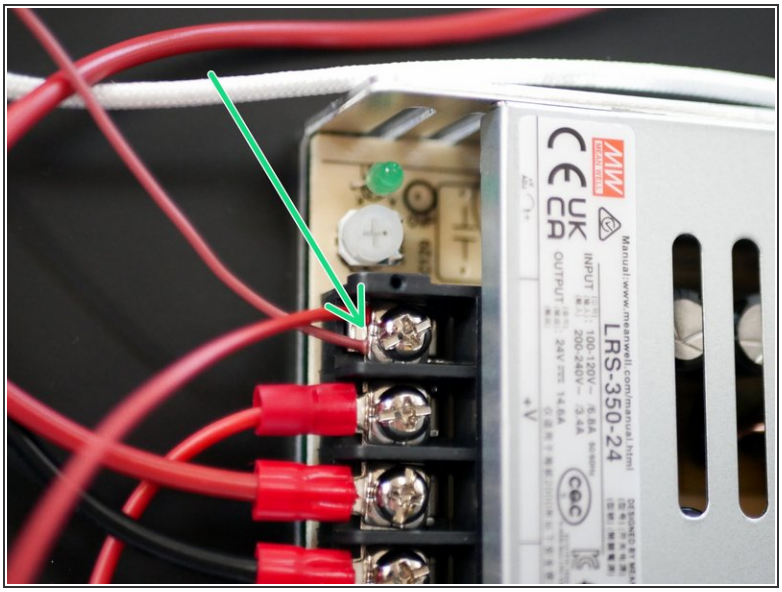
  This is the cable that you marked earlier in the direct drive stage of the assembly.

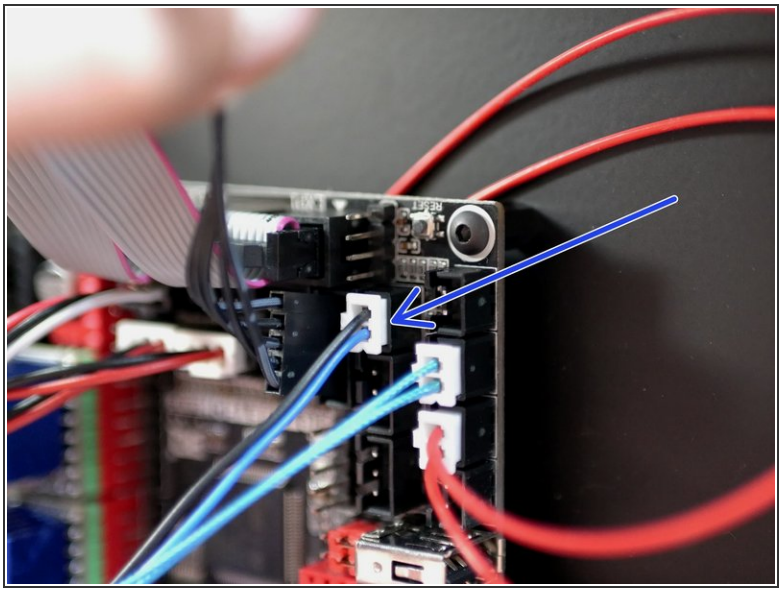
## Step 16 — Part Cooling Fans



- Connect the part cooling fans to the positions show.
  - A fan can be connected to either spot.

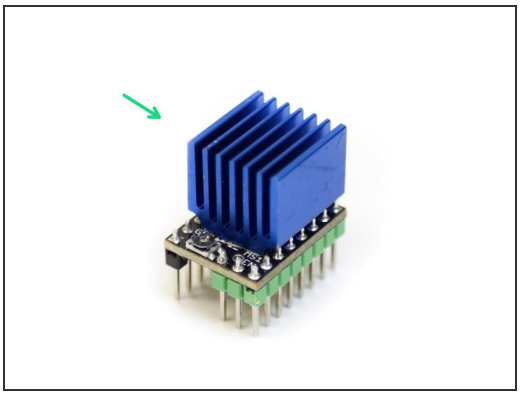
## Step 17 — Probe

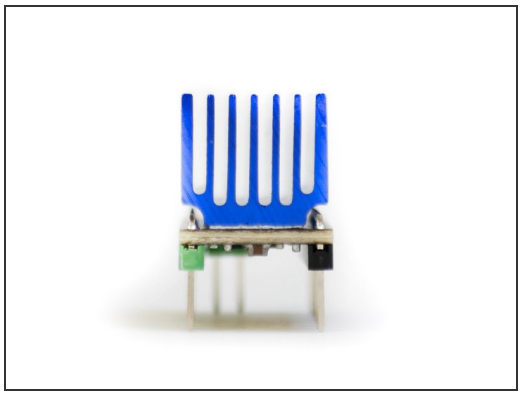


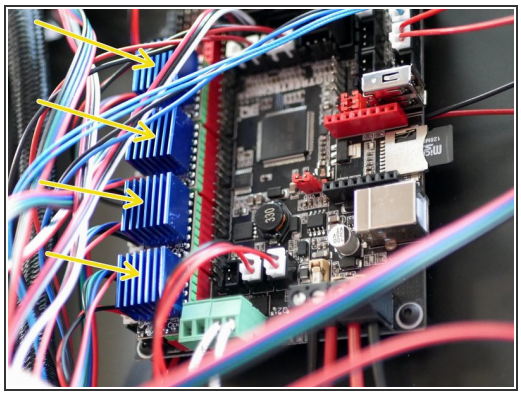



- Connect the brown cable from the probe directly to a positive terminal on the power supply.
- Connect the black and blue cable from the probe to the control board in the position shown.

## Step 18 — Stepper Drivers





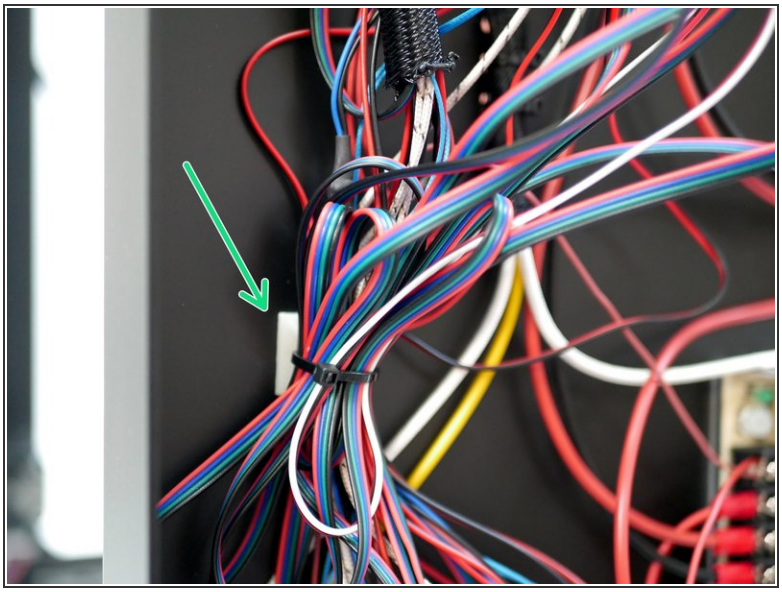


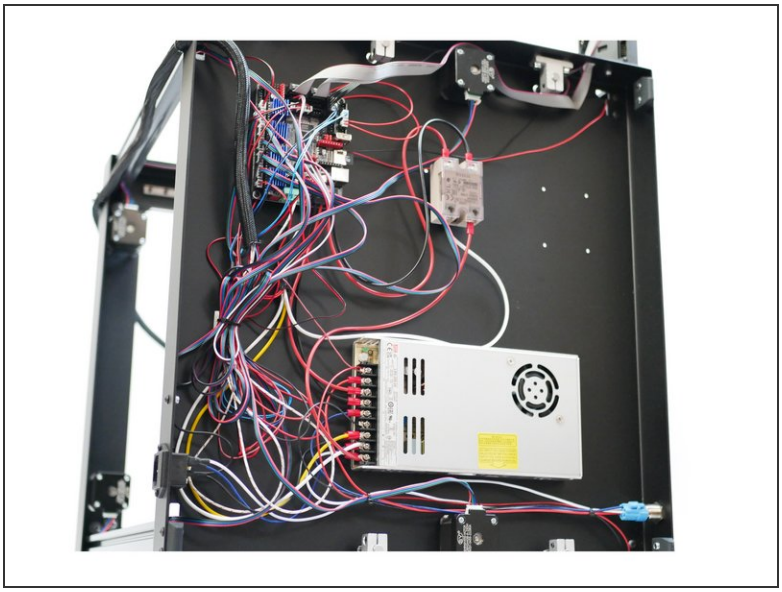
⚠ Before beginning, make sure that you have earthed yourself (by touching a large metal object) to avoid the chances of static damage.

- Prepare the four TMC2209 stepper drivers by removing them from their packaging and securing onto them their heat sinks as shown in the first image.
  - Make sure the heatsink is not touching any of the pins.
  - Orient the fins of the heatsink as shown.
- Mount all four of the TMC2209 Stepper Drivers to the control board as shown.
  - When installing, match the orientation of the drivers as shown, the green side of the stepper should go onto the red side of the mounts on the board.

⚠ Installing a stepper driver the wrong way round will destroy it.

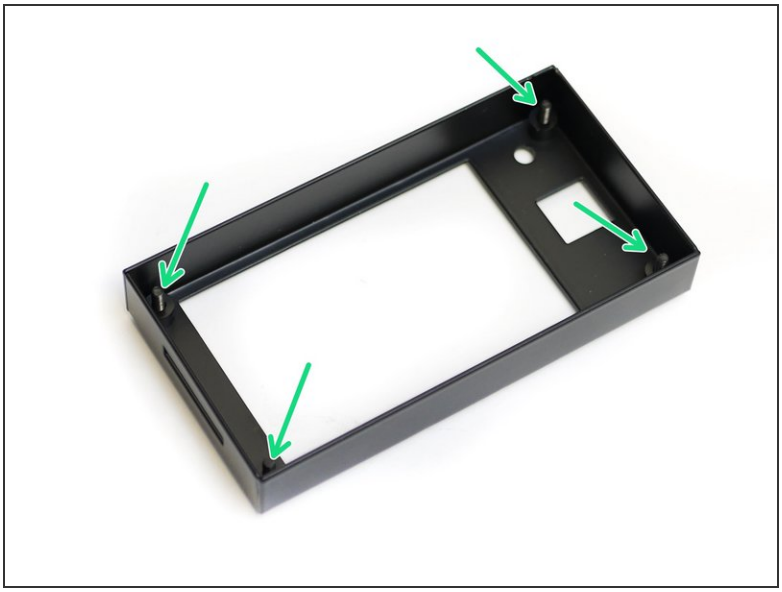
## Step 19 — Tidying Up

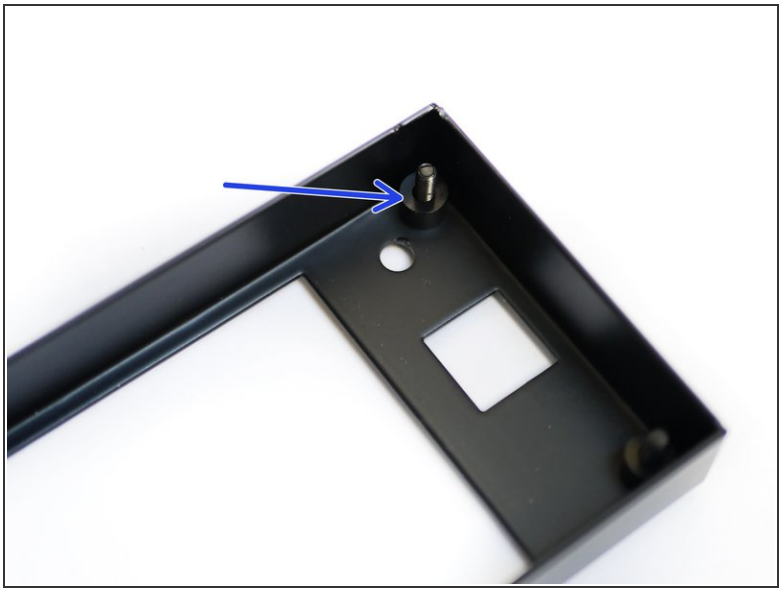




- Finally, use cable tie mounts to clean up the cables.

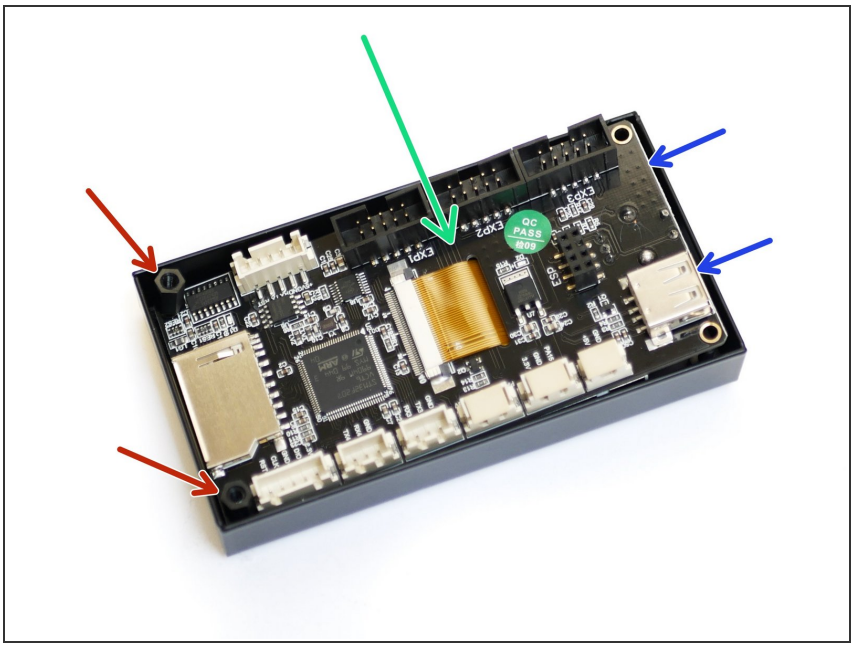
## Step 20 — Preparing the Touchscreen Case





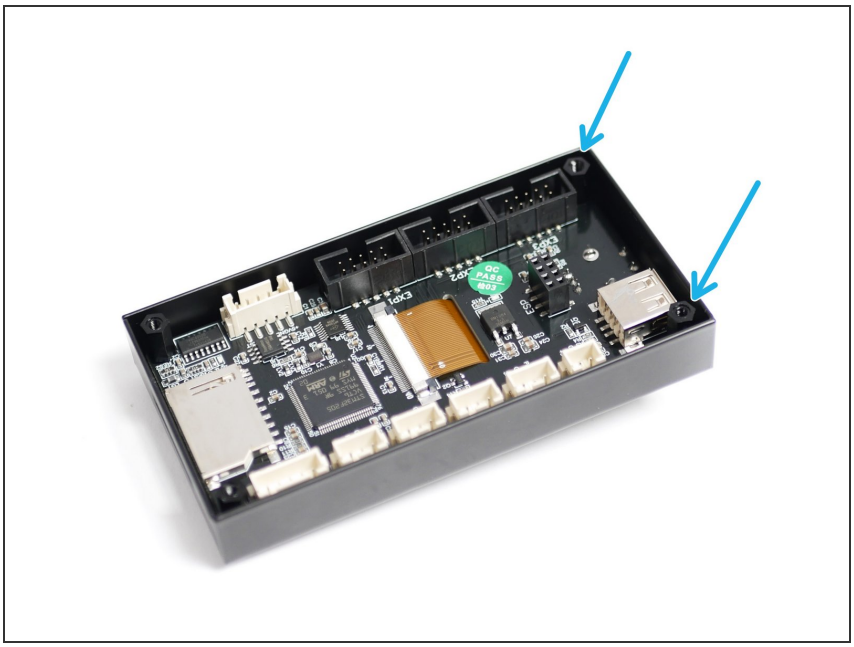
- Begin by taking the touch screen case and insert four M3 x 12mm bolts through the four holes shown.
- Place onto each of these bolts an M3 x 5mm spacer.

## Step 21 — Installing the Touch Screen



- Begin by removing the black control know from the front side of the screen, it should simply pull off.
- Align the touch screen with the case and drop it onto the four bolts.
- When you drop the touch screen into the case, you'll find that the control knob side will stick up.
- Thread on two M3 x 10mm threaded spacers to the two bolts on the left as shown.

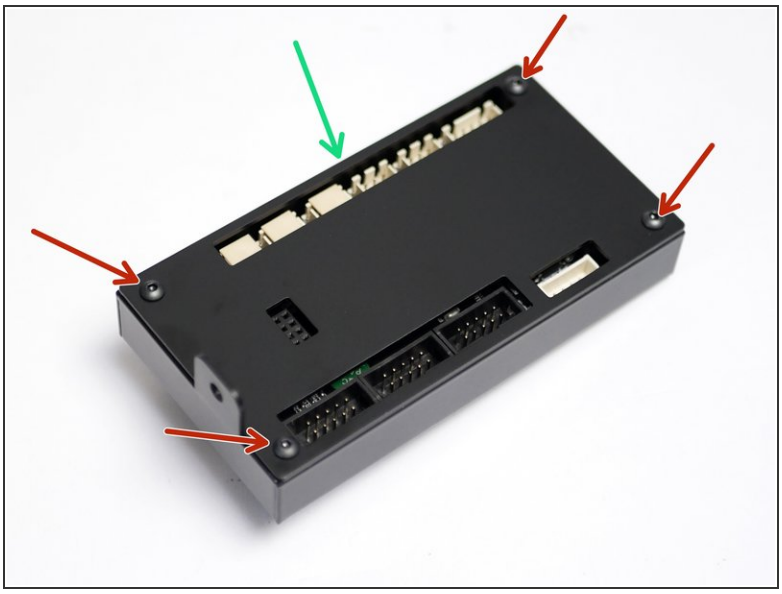
## Step 22 — Installing the Touch Screen Cont.



- With the left side secured, thread on two M3 x 10 threaded spacers to the remaining two bolts.

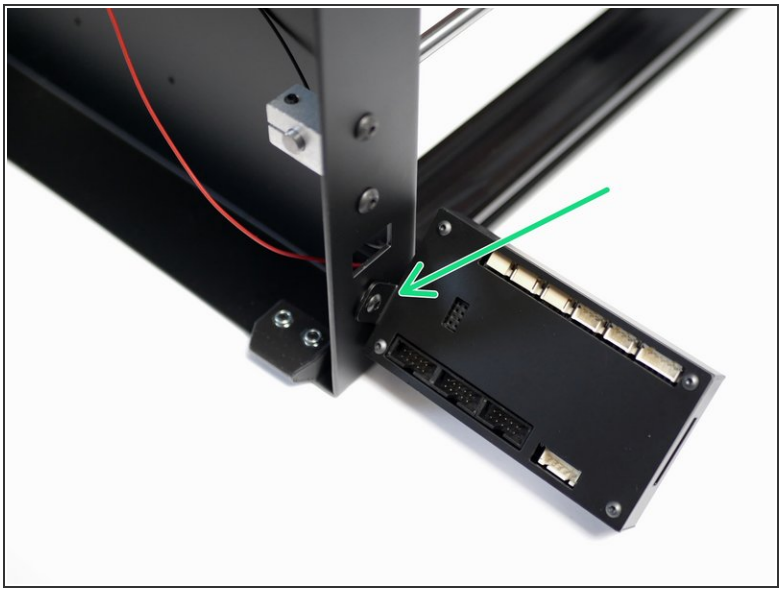
⚠ Hold the bolts from the underneath to prevent them from falling out.

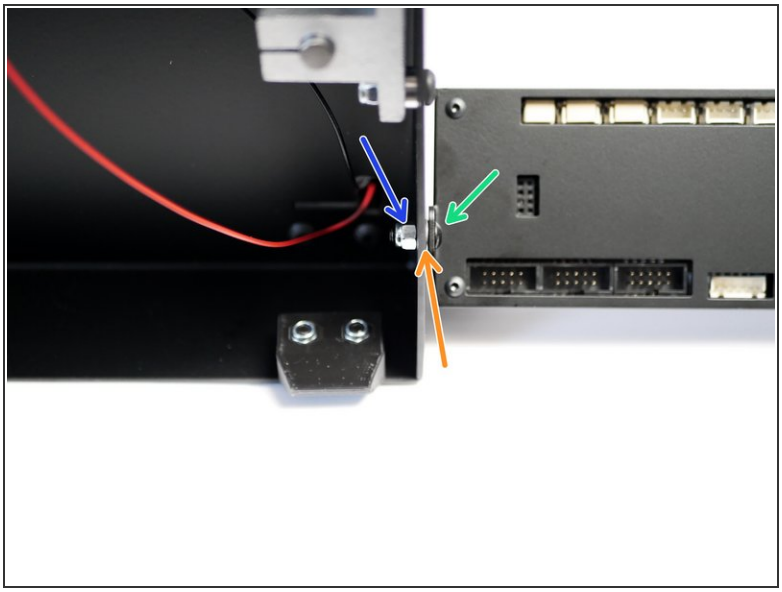
## Step 23 — Fixing the Mounting Plate



- Fix the mounting plate onto the back of the casing as shown.
  - M3 x 6mm bolt
- Push the control knob back back on.

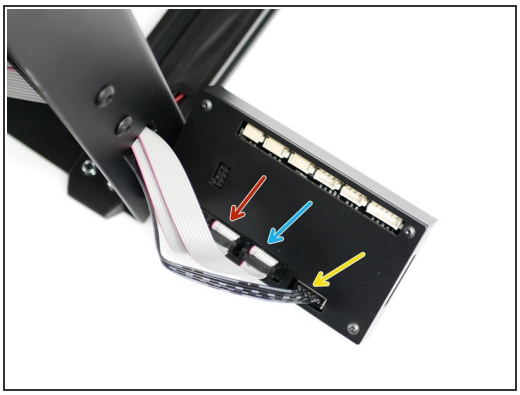
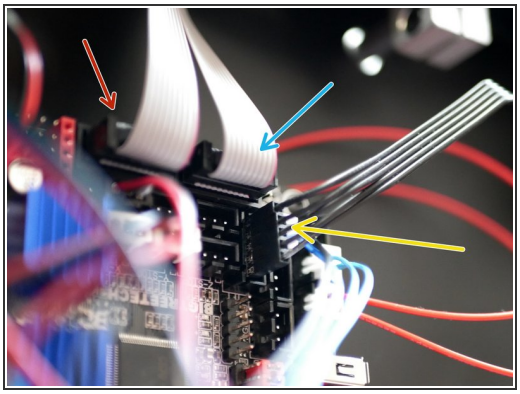
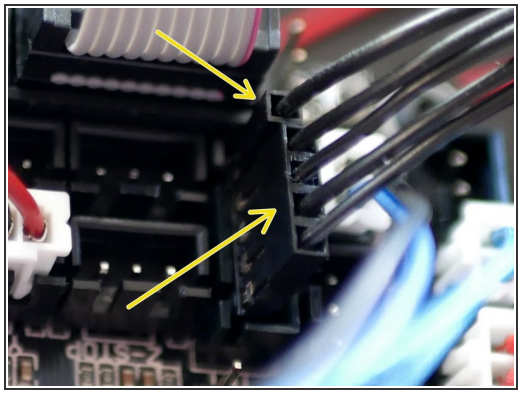
## Step 24 — Attaching to the Base





- Attach the touch screen case assembly to the base of the printer as shown.
  - M4 x 10mm bolt
  - M4 Washer
  - M4 Nyloc

## Step 25 — Touch Screen Cables

- Black cable: This is for controlling the printer through the touch screen interface via serial.

The two white cables are for controlling the printer directly via marlin's interface through *emulation mode*.

- EXP 1
- EXP 2

- Black cable - board side.

Note the orientation of the loose connector and the 4-pin connector, match as shown in the third image.