

firepickdelta

Final Wiring of the SMT modular tool

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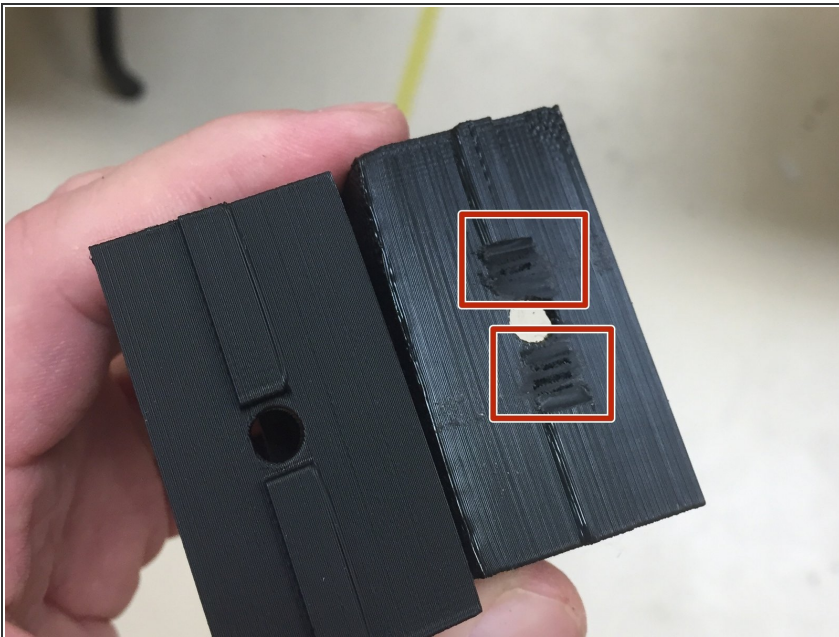


Step 1 — Pre-Requisites



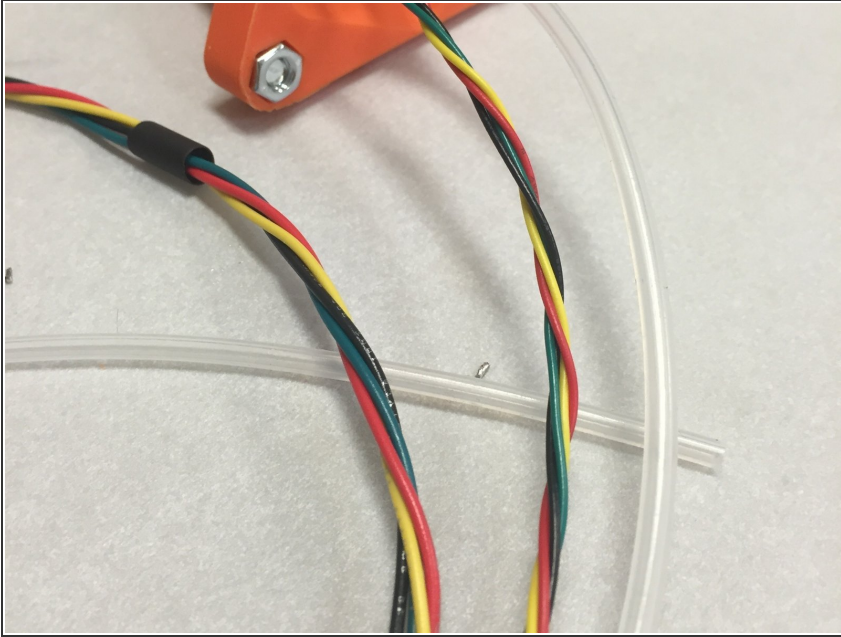
- Ensure that you've completed [the Modular SMT Tool guide](#), and the [Vacuum pump mount assembly](#).

Step 2 — Dremel off some Plastic (our mistake)



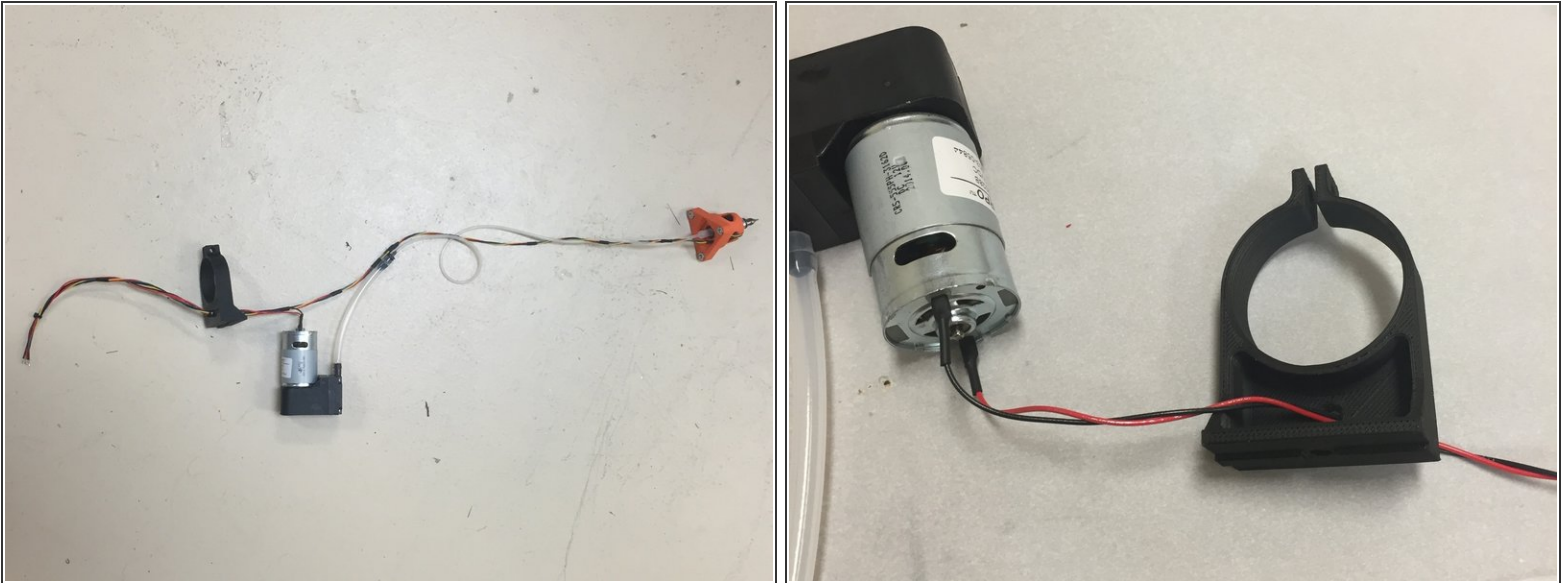
- A problem was discovered that the T-slot extrusion nuts we chose were so thick that they interfered with the 3D printed mount's anti-rotation boss.
- The kits that got shipped to beta test customers need to be modified in order to fit properly on the frame. This is quick and easy to do with a high-speed rotary (Dremel et. al.) tool.
- Shave of a few millimeters of the raised portion, just around the 5.5mm hole.
- The part on the left is un-modified. The part on the right is modified.

Step 3 — Twist the Wires



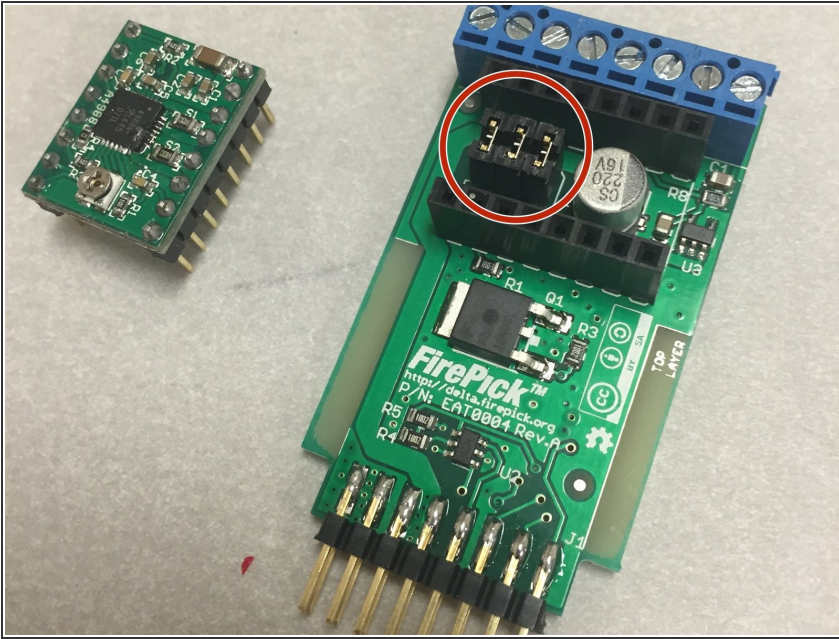
- Wires should have been twisted when the modular tool / NEMA 8 motor assembly was being built. Ensure the wires are still tightly twisted.

Step 4 — Thread Wires Through 3DAT0005 Vacuum pump mount



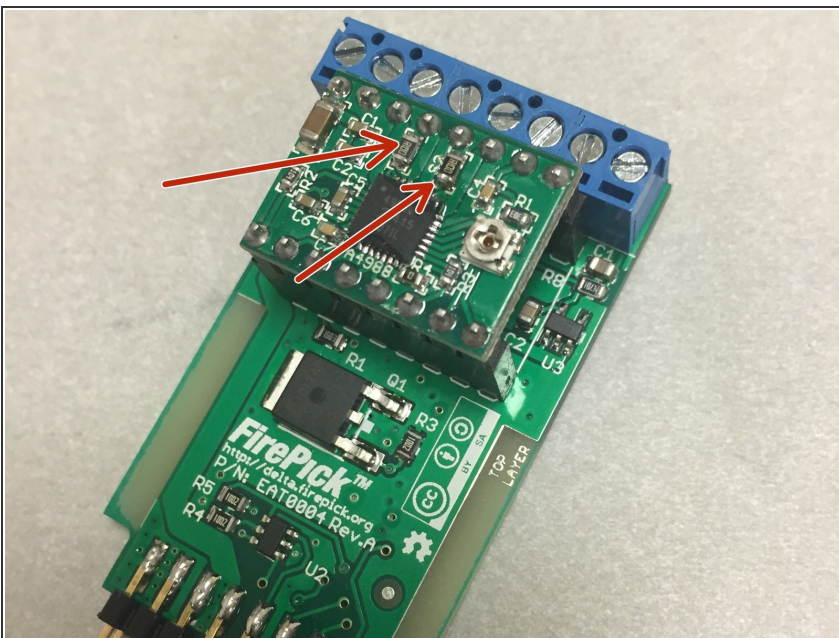
- Thread the stepper motor wires through the hole in the 3DAT0005 mount (from the bottom, out the top).
- Aim for about 230mm (~9") of wire out the top.
- Next, thread the vacuum pump wires through in the same fashion. Get both sets of wires to line up at the ends, and remove any slack in the wires.
- Use a cable tie at the mount to hold the wires in place at that position.
- Ensure the wires and assemblies now look like the pictures to the left.
- Connect the small silicone tube to the barbed fitting, if you haven't done so already.

Step 5 — Locate EAT0004 PCB and Stepper Driver Module



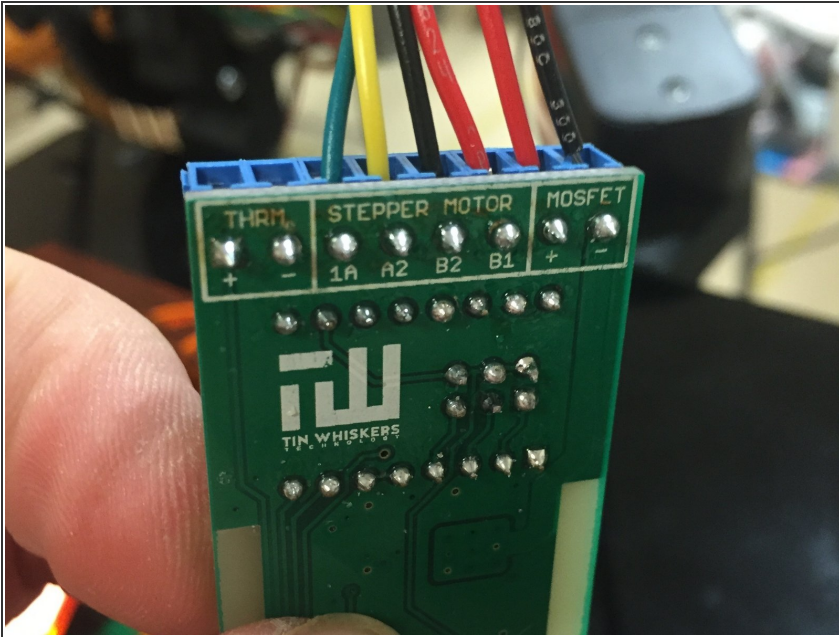
- Locate the EAT0004 PCB. Look it over visually and make sure we didn't miss anything.
- Ensure that the three jumpers (shunts) are placed on the PCB, as shown in the picture. These set the micro-stepping ratio on the stepper driver.
- Locate the StepStick stepper driver module. Visually inspect it and look for any damage or defects.

Step 6 — Plug In the Stepper Driver Module



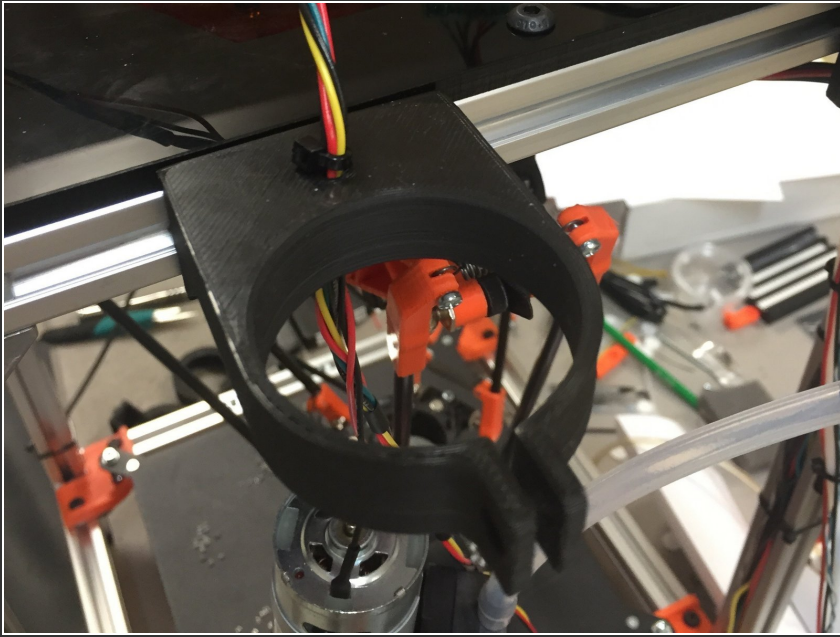
- ⚠ Plug in the StepStick module. **Ensure that you are placing the module on with the correct orientation.** The two big resistors (S1 and S2) should face the blue terminal block. These are the sense resistors and are located near the stepper motor pins.

Step 7 — Attach Wires as Shown



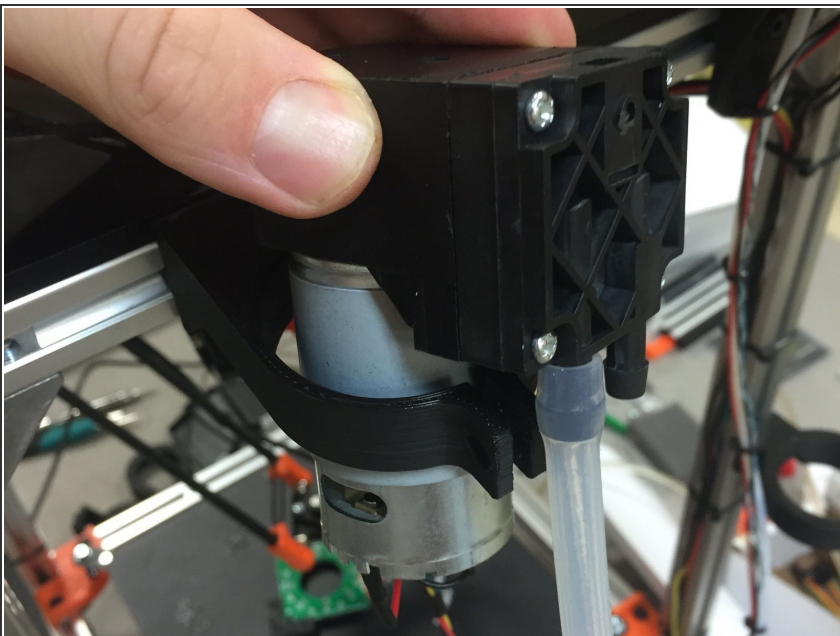
- Strip the ends of the stepper motor wires and the vacuum pump wires, if not already done. Do not tin the wires.
- Insert the stepper motors into the middle four terminals, as shown.
 - Green - A1
 - Yellow - A2
 - Black/Gray - B2
 - Red - B1
- Insert the vacuum pump wires into the MOSFET terminals. Insert RED into the "+" terminal and BLACK into the "-" terminal.
- Tighten down on the screw terminals and ensure that the wires do not pull out.

Step 8 — Attach the Pump Mount to Machine Frame



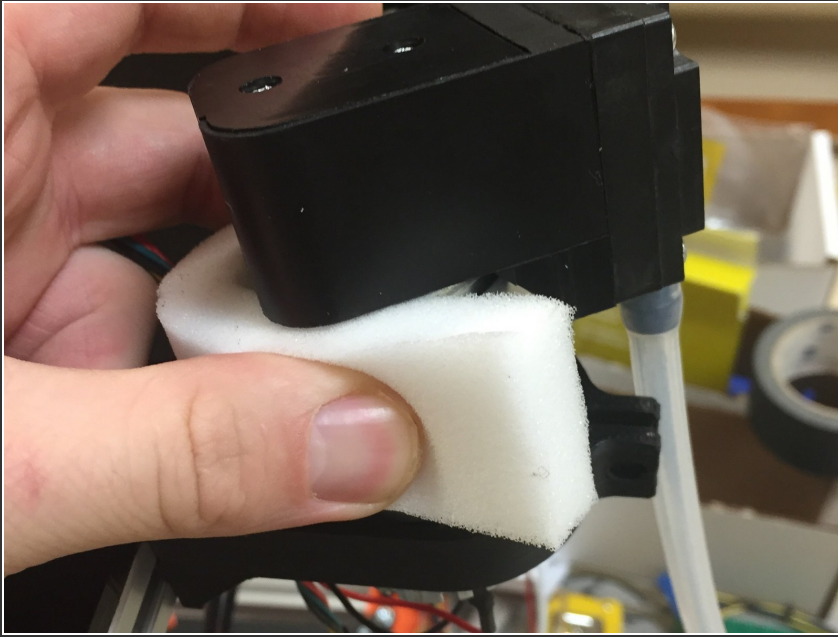
- Attach pump Mount to machine frame, using a M5 x 10mm button-head cap screw.

Step 9 — Drop Pump Into Mount



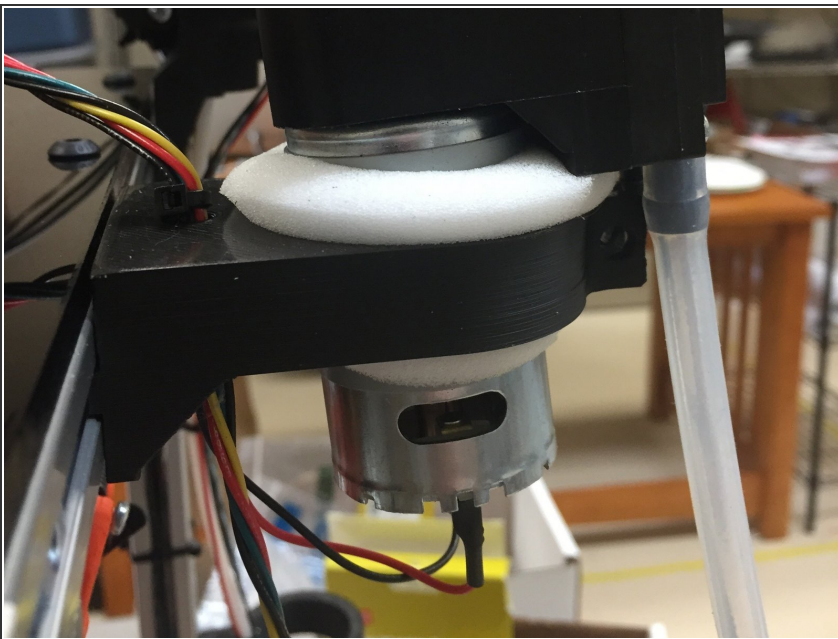
- Locate the vacuum pump into the mount, as shown.
- ⓘ Note that the black and red wires may have to slip through the clamp area, in order to orient the pump correctly in the mount.

Step 10 — Add Foam



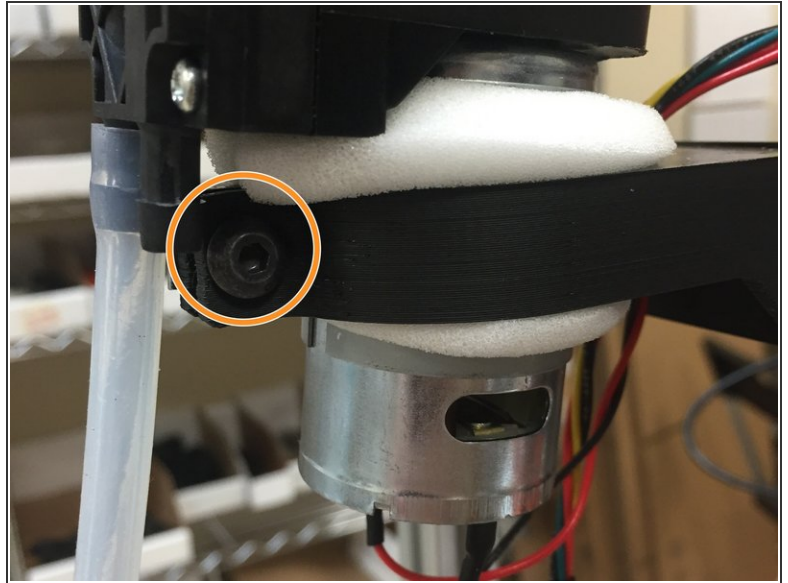
- Wrap the piece of foam around the pump motor.
- ⓘ NOTE: This foam will act as a vibration damper, when the pump is running. It is rather noisy and shaky while it's on.

Step 11 — Position Foam



- Carefully try to compress the foam and slide it down so that it comes out the bottom of the mount.
- ⚠ Be extremely careful not to bend the 3D printed mount, as it might break.

Step 12 — Add Clamp Tightening Hardware

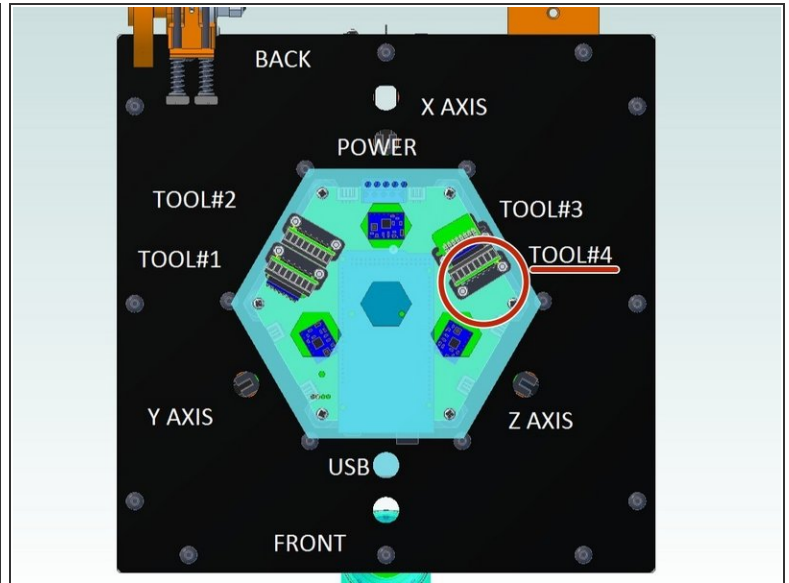
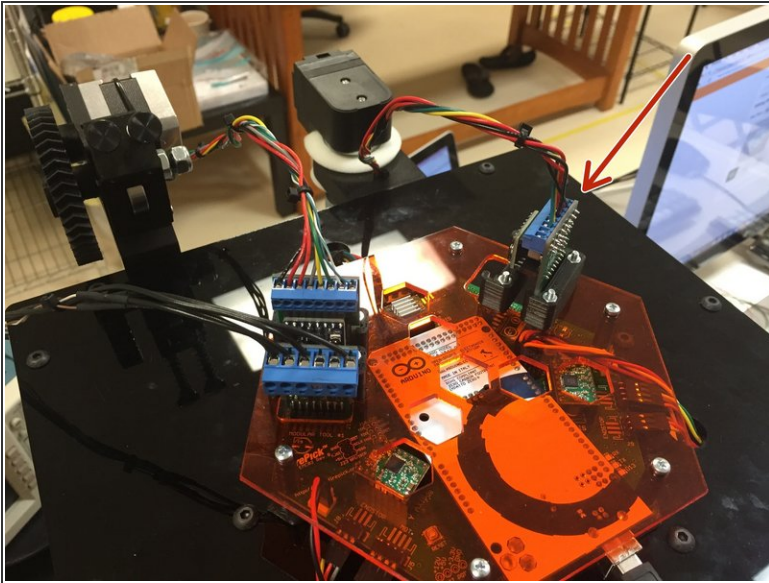


- Add an M5 x 14mm screw through the clamp.
- Use an M5 extrusion nut on the other side to secure it.

⚠ NOTE: Do not over-tighten. Tighten it only enough to ever so slightly compress the foam. Check this screw from time to time to ensure the tension is correct.

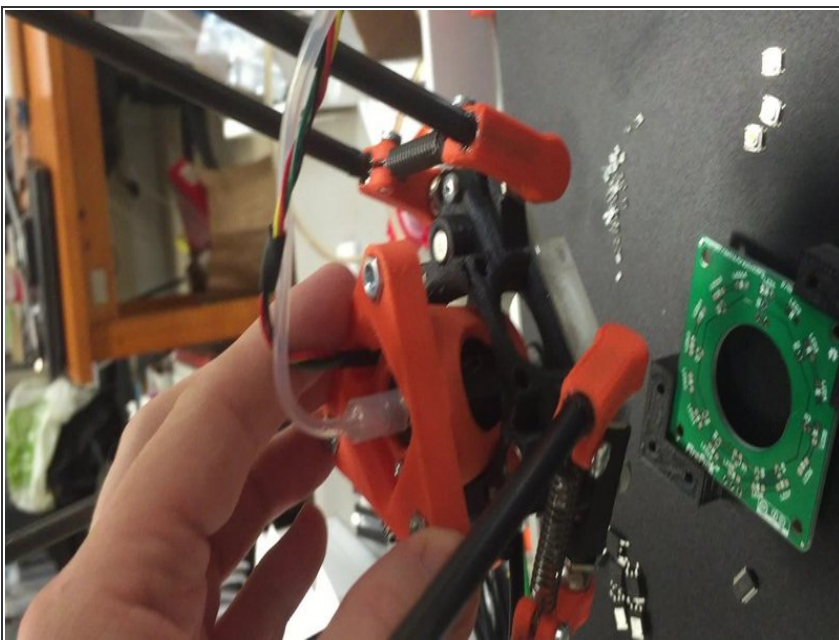
ⓘ NOTE: The fastener in this step is normally a pan-head machine screw, but a button head cap screw is shown. Technically either will work, but the kits shipped pan-heads.

Step 13 — Plug Module into EMC02



- Plug the module into the EMC02 as shown.
- Currently, it must be plugged into Slot #4 as shown. This is a software issue that we're working on; eventually these modules will be auto-sensing and hot-pluggable, but for now, it's hard-coded to work in slot #4.

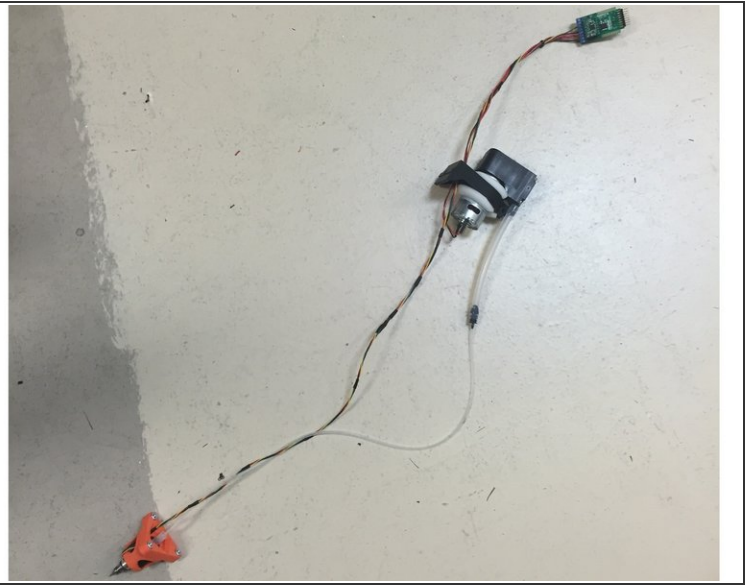
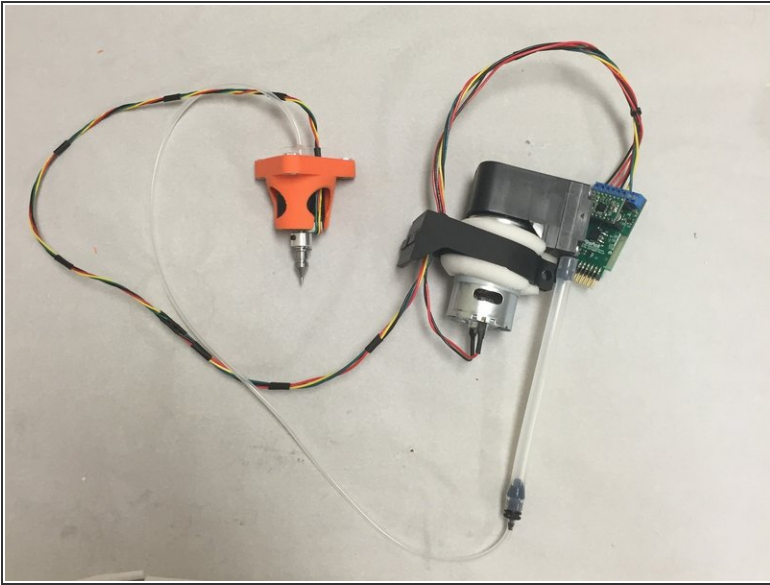
Step 14 — Insert Modular Tool



- Insert the Modular tool, as shown.

⚠ Looks like Dozuki isn't handling the video meta-data correctly on the preview image... Do not turn your machine sideways!

Step 15 — You're done! (mostly)



- The wiring is now complete. Your tool should be mounted on the machine and ready to go (shown below off the machine, for illustration purposes)
- During the commissioning process, you will need to dial the stepper driver potentiometer, which sets the stepper drive current. This will be covered in the commissioning guide.