

Ender 3 Electronics Extension

***** I am not responsible for any wiring problems/fires / or mainboards burning themselves out!!! This is only to help and guide step by step on what I DID*****

Why should you?

- No need to cook your components
- Print higher temp filaments with confidence

What you need (with options)

- Wiring extension set for CR10 (you can modify to fit the ender 3, careful when using this kit, some reviews say the wiring on the limit switches may be flipped)
https://www.amazon.com/gp/product/B0784PQQFX/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1
- If you are using a Raspberry PI for octoprint you will need these to cool the RPI and ender Mainboard
https://www.amazon.com/gp/product/B07KRSJVP7/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&psc=1
- Soldering Iron, heres a link to what seems to be a good kit
https://www.amazon.com/ANBES-Soldering-Iron-Kit-Electronics/dp/B06XZ31W3M/ref=sr_1_1_ssapa?crid=24FLGD24UZ0LM&keywords=soldering+iron&qid=1562630556&s=electronics&srefix=soldering+%2Celectronics%2C166&sr=1-1-spons&psc=1
- Heat shrink
https://www.amazon.com/150Pcs-Adhesive-Shrink-Assortment-Electrical/dp/B07CJZ7R8P/ref=sr_1_11?keywords=wire+heat+shrink&qid=1562630645&s=electronics&sr=1-11
- Male to Female wire jumpers (for new fans if you choose to use a case with 2 fans)
https://www.amazon.com/Premium-Breadboard-Jumper-100-Pack-Hellotronics/dp/B07GJSPF7P/ref=sr_1_2?keywords=female+to+male+arduino+wires&qid=1562961331&s=books&sr=8-2

- Fans, if you would like you can use the original fan for your mainboard and plug it into the existing port, I used these fans and powered them via RPI
https://www.amazon.com/gp/product/B07KRSJVP7/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&psc=1
- Screws - very small screws for lid - small bolt with nut (washer if need be) - Sizes can vary depending on your selection

Procedure

- 1) ELECTRONICS CASE- Before you take apart your printer you should print a case for the electronics and anything else you might need before it is torn apart. Here are some links to good options! (you will have to find other cases if you have changed it to a non creality board) once it is all printed **UNPLUG YOUR PRINTER**
 - Case used in this project ----- <https://www.thingiverse.com/thing:3744155>
 - Another case - <https://www.thingiverse.com/thing:3185793>

2) PREP- since the CR10 has slightly different wiring for the hot end and heated bed you will have to separate all the wires and any wires with this plug



You cut as close as you can to the plug. SAVE THESE WIRES YOU WILL NEED THEM!!!

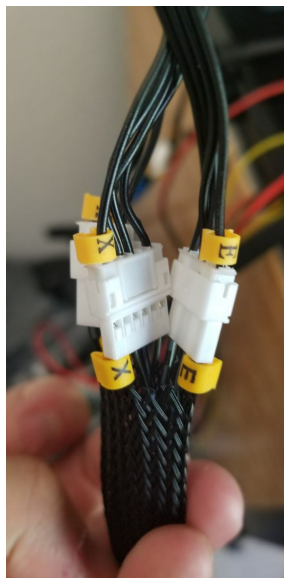


3) While looking at the ender head on, slowly slide your bed all the way to the back. Unscrew the three top screws, and carefully pull the lid off because there is a fan fixed to the lid and it's plugged into the mainboard. Unplug the fan (might have hot glue on it) and bag and label the screws with the lid. Image on Right has bolts missing to show holes

4) Flip the Ender on its side to access the bottom screws holding the original electronics case to the frame, the 2 larger screws on the front must be unscrewed as well. Once unscrewed move it away to set your ender back down on its feet. Image on right shows the 2 larger screws you must unscrew.



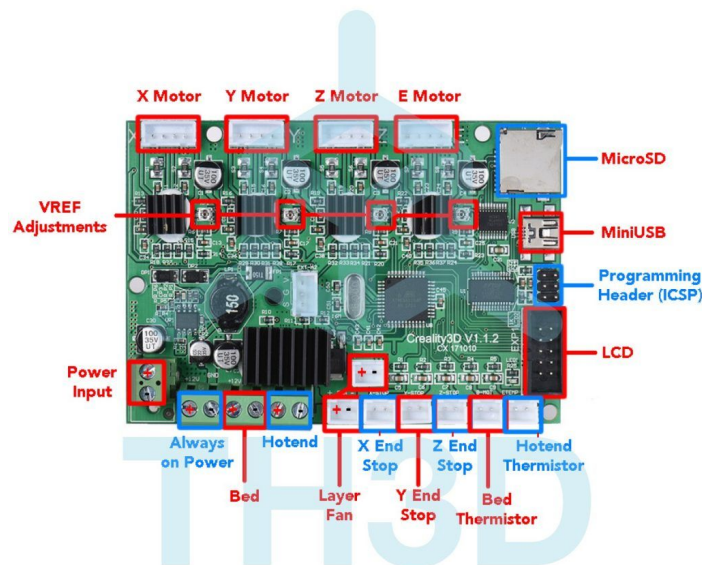
5) Now that the control board and case is separated from the frame gather your wires that you cut/ ordered from earlier and extend all of the stepper motor/ limit switches one by one to ensure you don't get any mixed up (they have nice labels on the side) . The extensions should go from the motors/switches to the original wire, you cant plug the extensions into the mainboard (because its male to female).



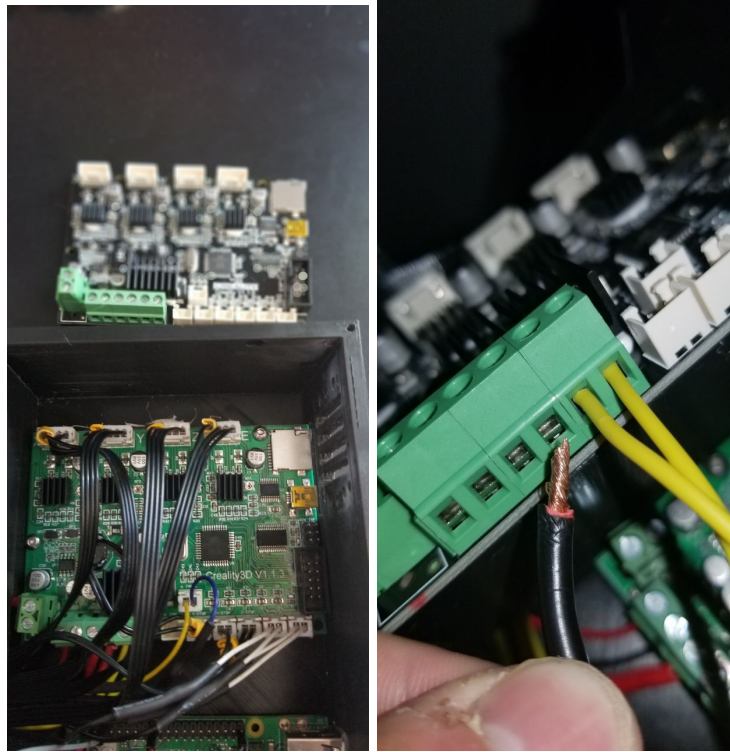
6) Once you have the stepper motor/ limit switches extended you then want to get the wires you cut from the CR10 plugs (first pictures from step 2) and match the gauges up). My colors went

- 1) Both yellow wires = “Hot end ”
- 2) Thicker gauge red/black wires = “bed”
- 3) Thinner red/black wires= “Always on power”
- 4) 2 sets of black wires= “Hot end thermistor, Bed thermistor”

****WITH MOST ELECTRONICS CASES THERE IS NO NEED TO DISCONNECT POWER INPUT PLUG FORM MAINBOARD****



7) Now that the wires are organized and assigned disconnect ONE wire from the mainboard, feed it out of the original electronics case, splice the new wire (ex; yellow wires for the hot end). You want to make sure that you fully and completely finish one wire, feed it through the new case hole, then screw it back into the original port on the mainboard. ***you want to do one wire at a time to stay organized and not confuse any wires with each other., You also want to make sure the wires are not frayed when you insert them back into the motherboard. See picture below on how it the wires should look



8) Once you have completed the bare wire extensions (no JST connectors) you have to extend the Bed and Hot End thermistors. You want to mark one side of the wire, cut that side, splice one of the black wires that you cut earlier from step 2, then once its shrink wrapped you can move on to the other half of the connector. I am not sure if polarity matters but to play it on the safe side I made sure to keep the original polarity. It should look like this once you are finished with this step.

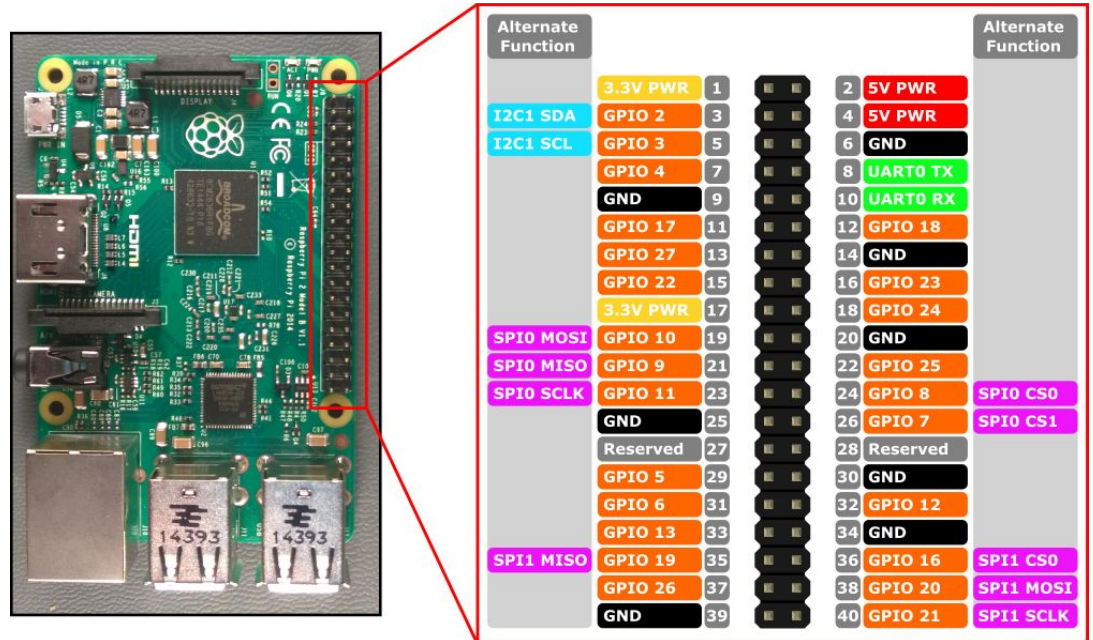


9) Next, with your extended limit switches from set 5, you will route them through the new case, and into your mainboard where the labels are. (see image under step 6 for any clarification) Once everything is lined up it should look like the image below.



10) In my case I am using two 5v fans powered from the GPIO pins on the raspberry pi. I am currently using the male to female jumper wires in order to connect them. ***WHEN YOU DO THIS YOU MUST KEEP YOUR RASPBERRY PI ON, INCLUDING SD CARD PRINTS, TO COOL YOUR

MAINBOARD***



11) Route your PI cam and LCD ribbon cable through your new case. Before your screw a lid on double check all wires.

12) Plug your power connectors for your raspberry pi and mainboard power. Turn them both on to test if you have power. If this test passes, Auto home your axes and do a test print. *******IF YOUR PRINTER FAILS TO AUTO HOME THIS IS MOST LIKELY A PROBLEM WITH THE EXTENSION KIT(some people reported this problem in the reviews for it) CONTACT THE MANUFACTURE*****

13) Screw the bottom bolt into the LCD and rotate it down, screw in the fans, then secure the Lid. Then rotate your lcd back up. Feed the power cable coming from your power supply through the hole and insert your power supply on the side.

14) HAPPY PRINTING!