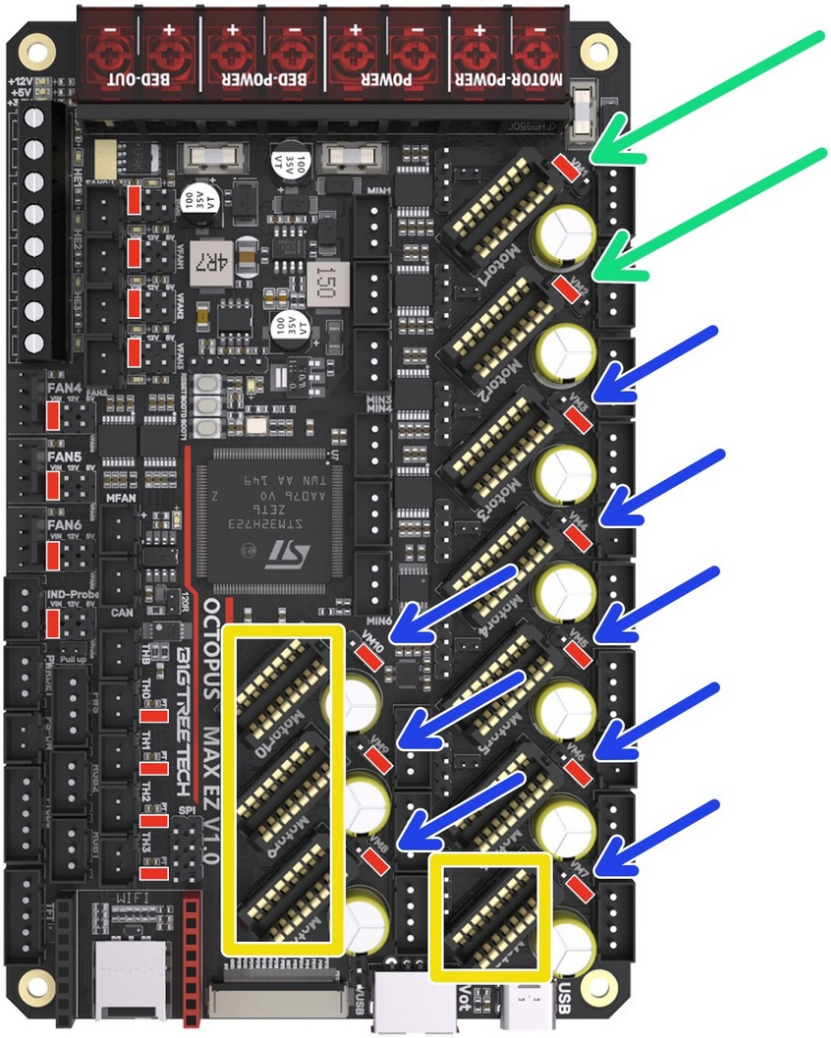
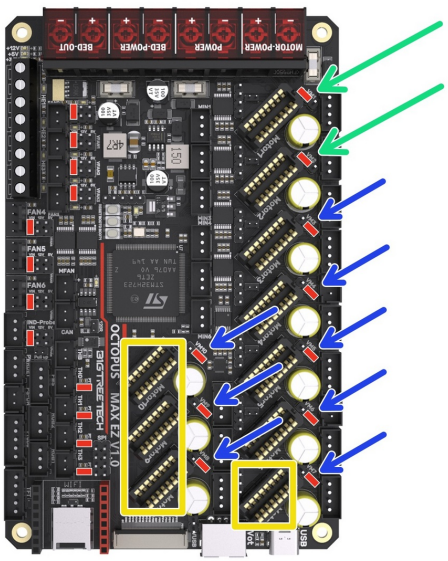
Makertech

Stage 07: wiring

Written By: Makertech 3D



Step 1 — Checking the Control Board



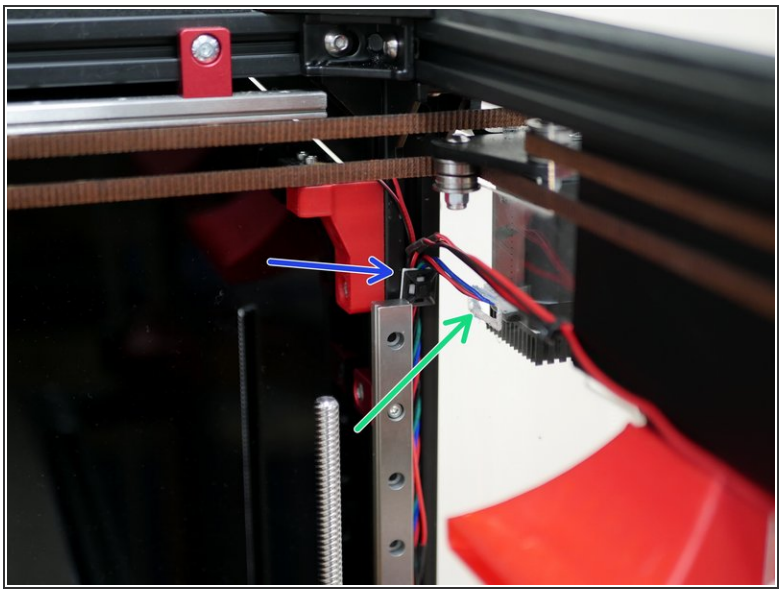
⚠ Double check that you have all of the jumpers installed in the positions highlighted in the image and this step here.

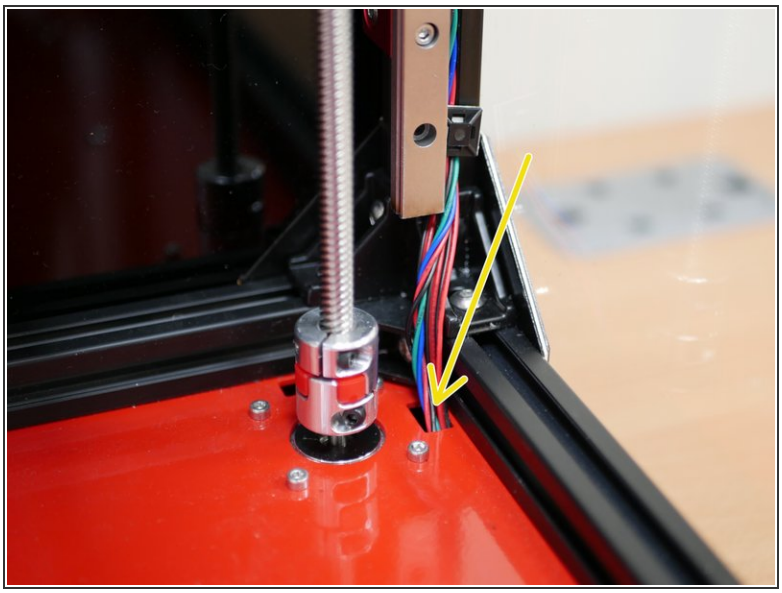
⚠ Powering up with jumpers installed incorrectly can cause irreversible damage to your electronics!

ⓘ Pay special attention to the stepper driver jumpers. These control the voltages going into the driver. Sending 48v to the smaller 24v TMC2209 drivers will cause them to blow.

- 48V Position
- 24V Position
- For v4.2 these stepper positions are not used as the extruder drivers are on the print heads tool board.

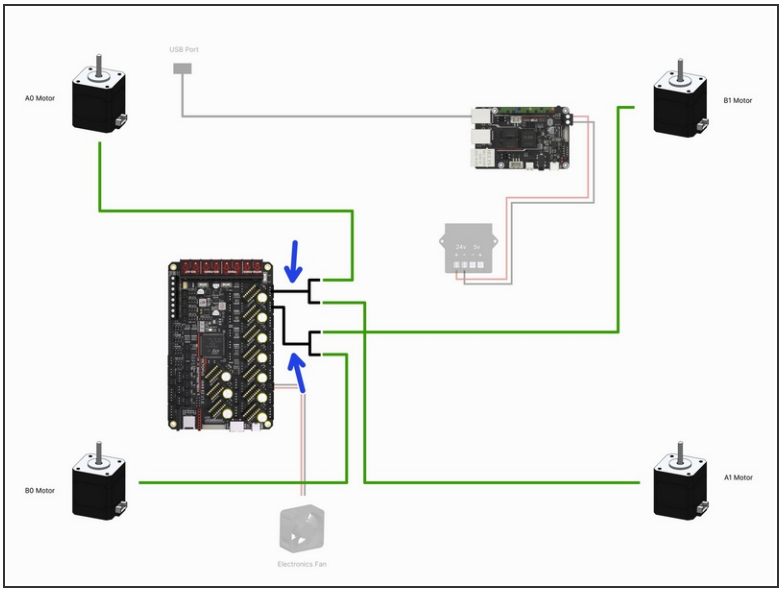
Step 2 — Gantry Cables

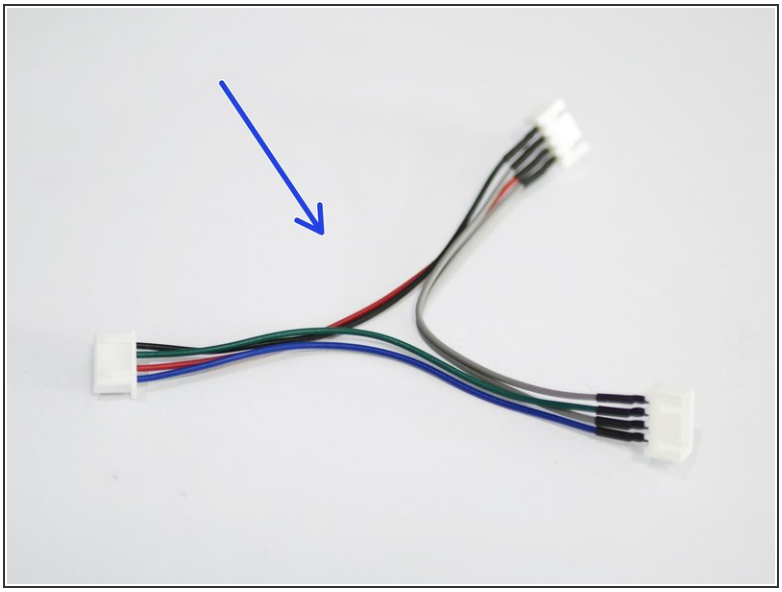




- Connect motor cables to the gantry motors as shown.
  - ⚠ Use the longer twisted cables that are included with the LDO motors.
  - ⓘ On the rear right corner feed together the static fan, endstop and motor cable.
  - ⓘ On the front right corner feed the motor cable and camera cable into the base together.
  - ⓘ The corners on the left side should have just the motor cables going down into them.
- Tuck the cables into the extrusions and hold in place with the cable tie mounts.
- Route the cables down into the base.

Step 3 — Gantry Motor Wiring

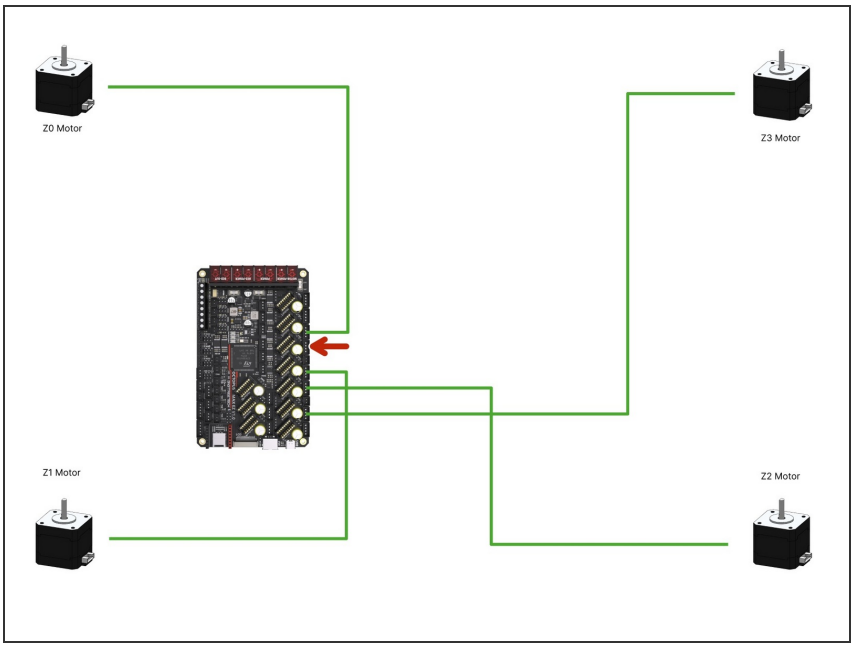




ⓘ The diagram is orientated relative to the control board and shows the motors in the positions that they would be in if looking up **from under the base.**

- Connect to the control board the two motor cable adapters.
- Connect to the adapters the four gantry motors as shown in the diagram.

Step 4 — Z-Motor Wiring



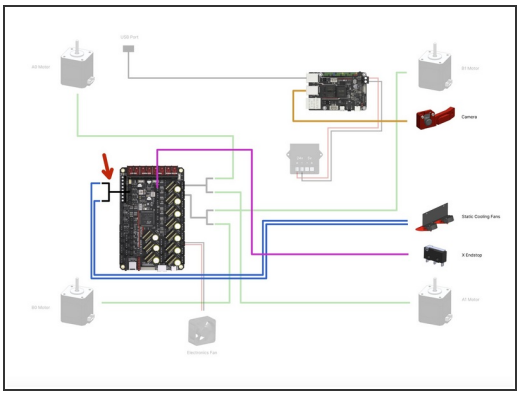
ⓘ The diagram is orientated relative to the control board and shows the motors in the positions that they would be in if looking up from under the base.

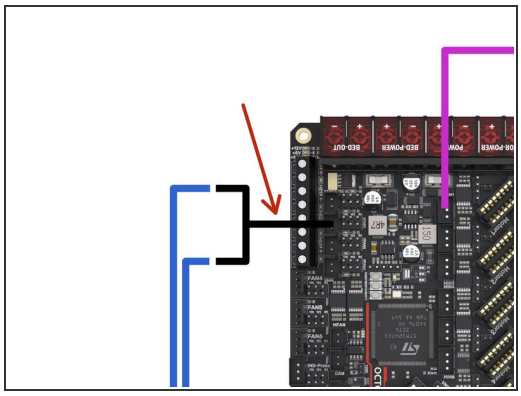
- Connect the four z-motors to the control board as shown.

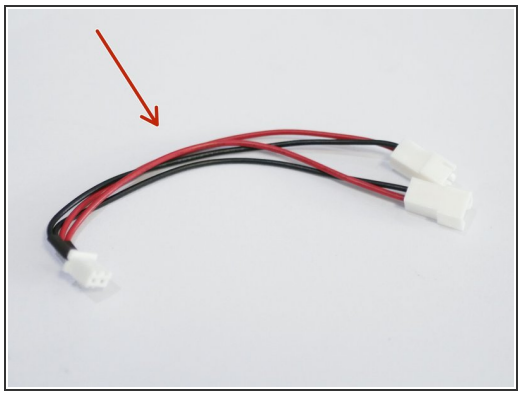
  ⚠ These are the flat motor cables, **not** the twisted ones.

  - Note that a connector on the board is skipped out, this is on purpose.

Step 5 — X-Endstop, Static Fans and Camera Wiring

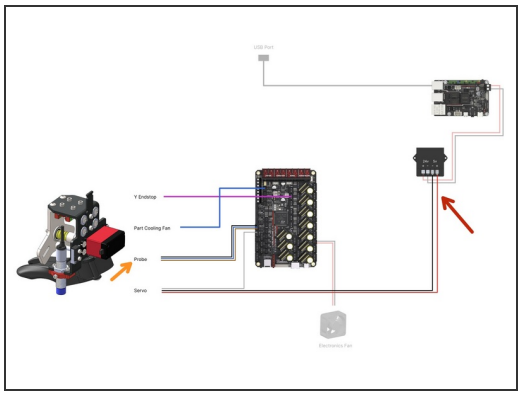


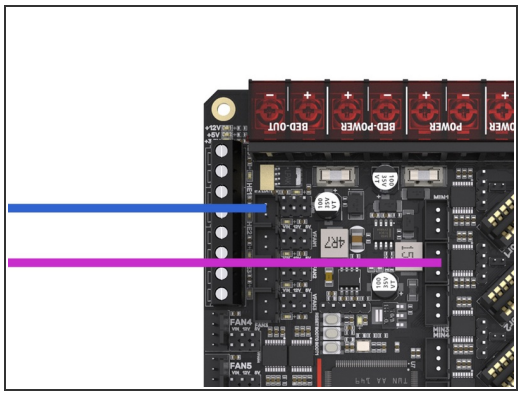


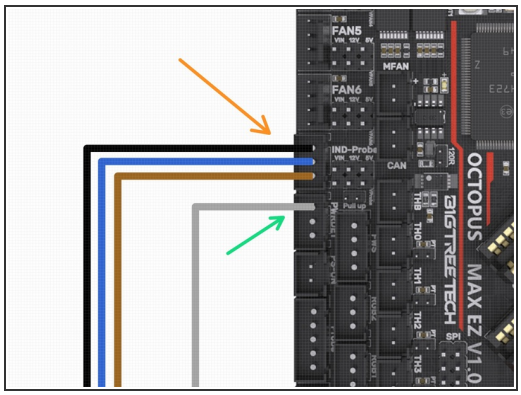


- Connect the USB Camera to a free USB port on the BTT Pi board.
- Connect the X-Endstop to the control board as shown.
- Connect the fan splitter to the control board.
  - Connect to the fan splitter the two static fans.

Step 6 — Tool Carriage Wiring

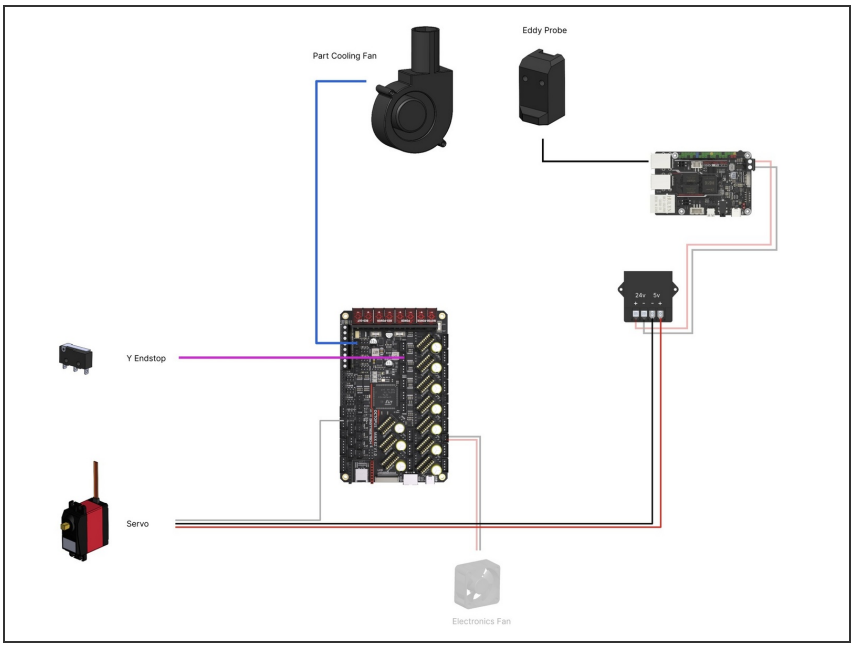






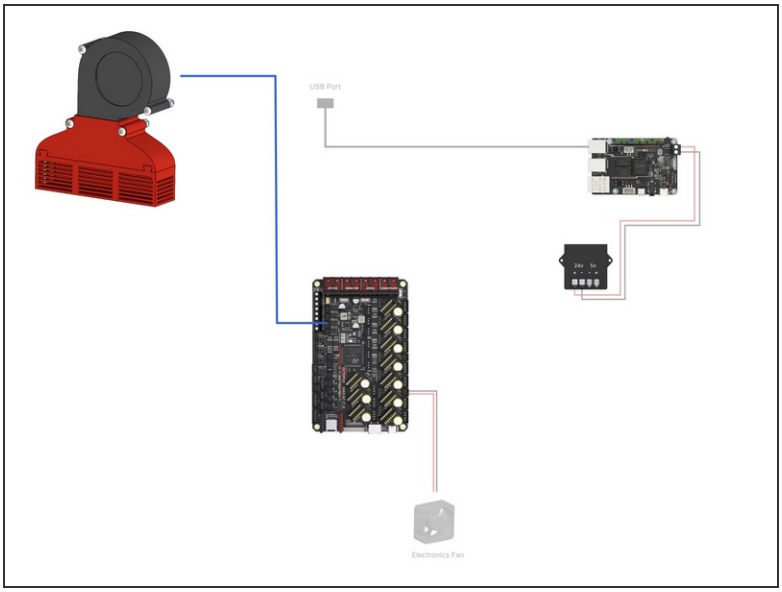
- ⓘ See the next step if you are building v4.2
- ⓘ The following cables all come from the tool carriage loom:
- Connect the Y-Endstop to the control board.
- Connect the part cooling fan to the control board.
- Connect the bed probe to the control board.
- Connect the white servo signal cable to the control board as shown.
  - Connect the servos power cables to the 5V output of the convertor. Red to positive and black to negative.

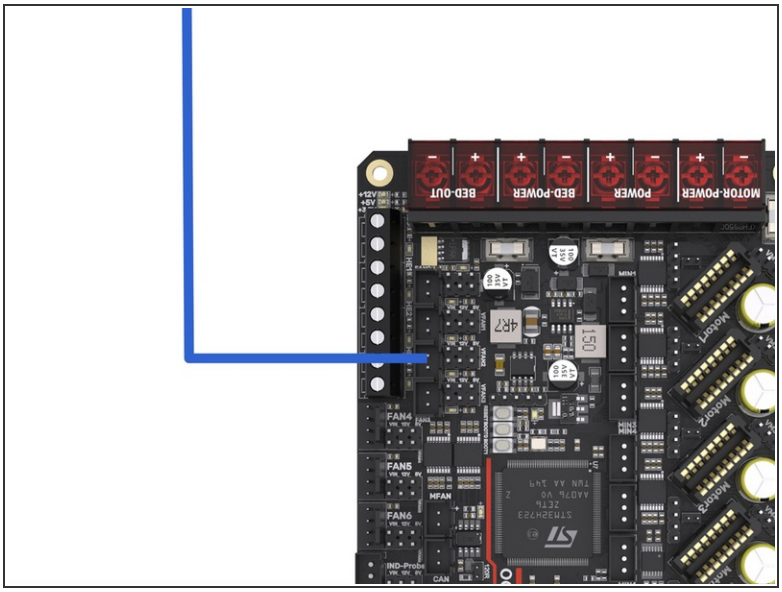
Step 7 — Tool Carriage Wiring - v4.2



ⓘ Wire the components as shown in the diagram.

Step 8 — Enclosure Fume Filter Fan

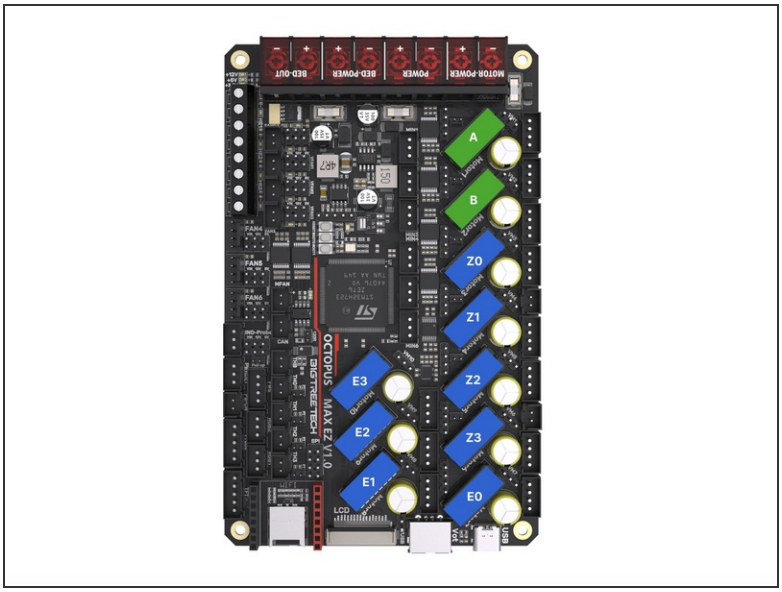


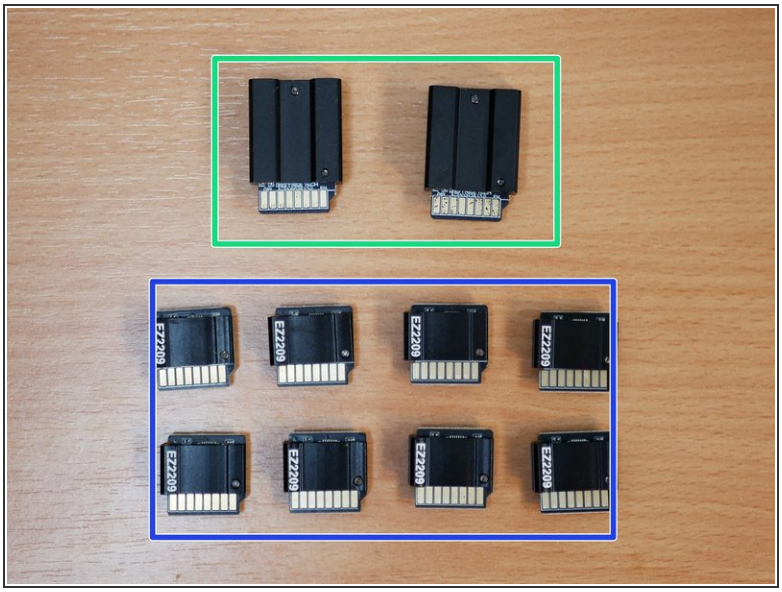


ⓘ Complete this step if you have the enclosure upgrade installed.

- Plug the filter fan into the control board as shown.

Step 9 — EZ Stepper Drivers

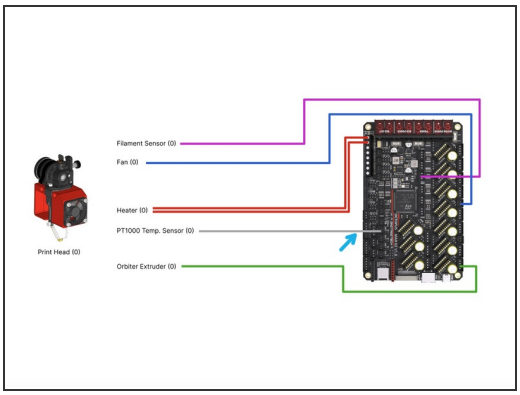


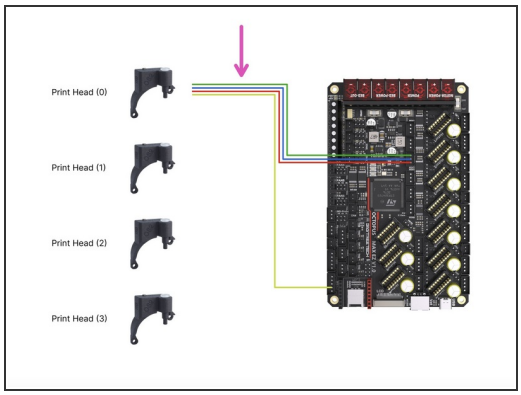


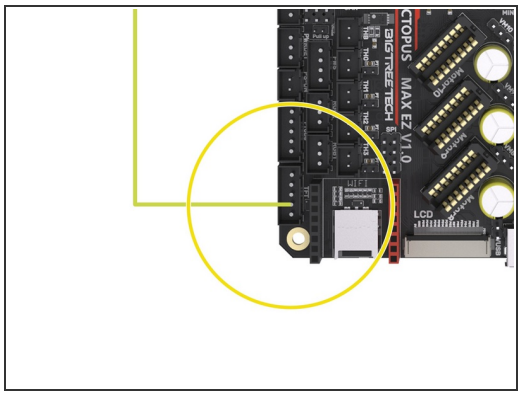
⚠ Before unpacking the stepper driver boards make sure that you have grounded yourself. You can do this by touching a large metal object. This is to prevent any static from damaging the drivers when handling them.

- These drivers can only be plugged in one way. The fin side of the heatsink points to the back of the printer.
- Plug the TMC5160 RGB EZ Drivers into the board as shown. They will drive the gantry motors.
- Plug the TMC2209 EZ Drivers into the board as shown. They will drive the Z motors and extruders.
  - If building the 4.2, ignore the E drivers, as these are already on the print head orbiter control boards.

Step 10 — Print Head (0 - Nearest the Front) Wiring



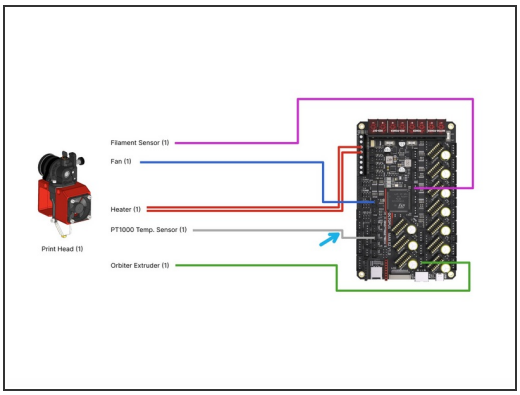


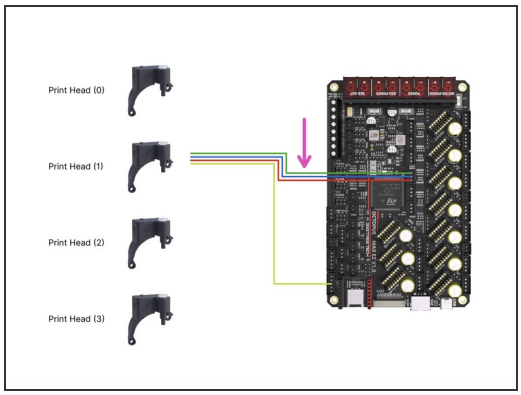


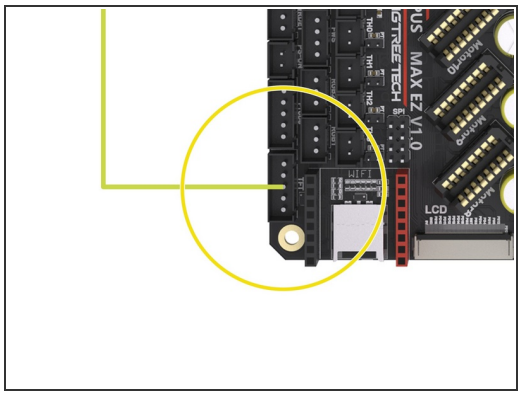
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board so we will need to borrow a pin from a header that we are not currently using.

  We recommend using either tape or a hot glue gun to hold the cable in place.
- Connect the hotend fan to the position shown on the board.
- Connect the heater to the HE0 screw terminal on the board.
- Connect the PT1000 to the TH0 position on the board.
- Connect the Extruder to the Motor7 position on the board.

Step 11 — Print Head (1) Wiring



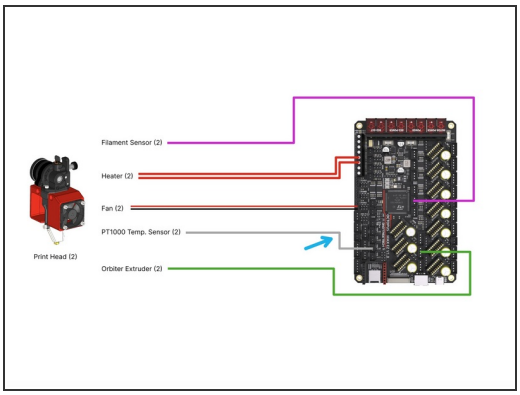


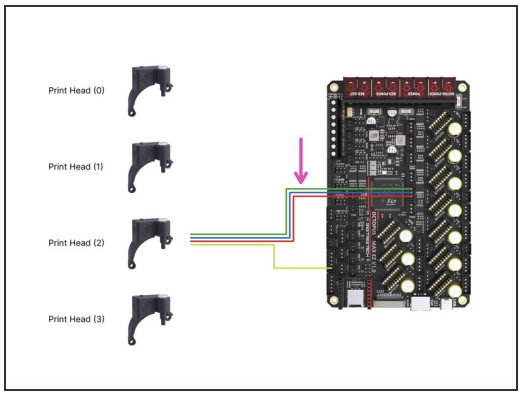


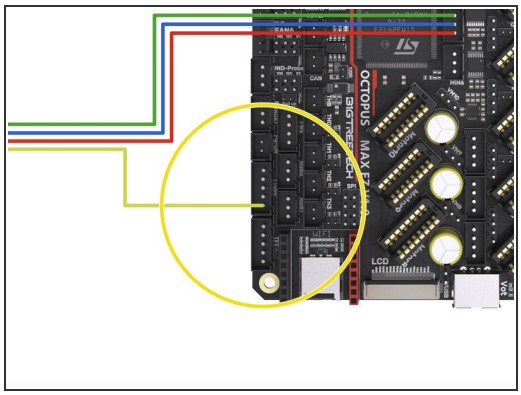
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board so we will need to borrow a pin from a header that we are not currently using.

  We recommend using either tape or a hot glue gun to hold the cable in place.
- Connect the hotend fan to the MFAN position on the board.
- Connect the heater to the HE1 screw terminal on the board.
- Connect the PT1000 to the TH1 position on the board.
- Connect the Extruder to the Motor8 position on the board.

Step 12 — Print Head (2) Wiring



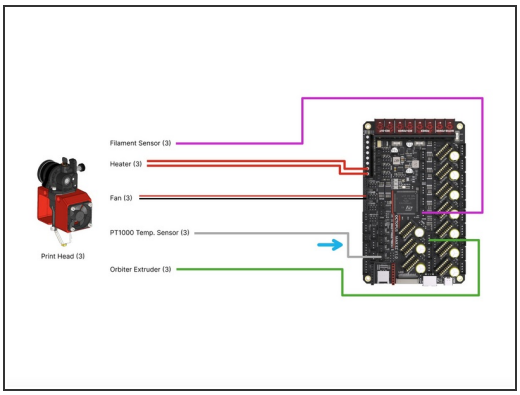


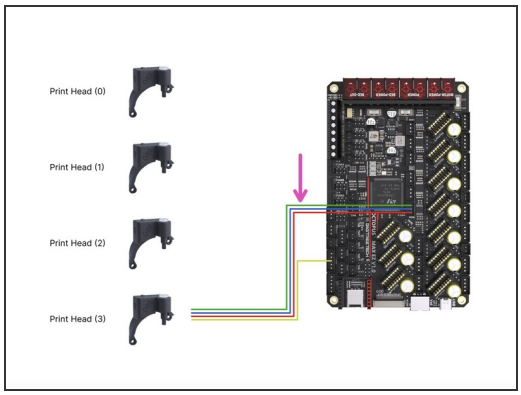


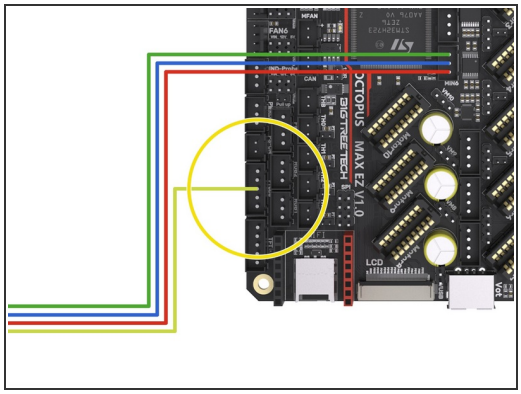
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board so we will need to borrow a pin from a header that we are not currently using.

  We recommend using either tape or a hot glue gun to hold the cable in place.
- Connect the hotend fan to the FAN6 position on the board - this fan is connected to the two lower pins on the header as shown in the diagram, ensure to orientate the black and red cables as shown.
- Connect the heater to the HE2 screw terminal on the board.
- Connect the PT1000 to the TH2 position on the board.
- Connect the Extruder to the Motor9 position on the board.

Step 13 — Print Head (3) Wiring







- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board so we will need to borrow a pin from a header that we are not currently using.

  We recommend using either tape or a hot glue gun to hold the cable in place.
- Connect the hotend fan to the FAN5 position on the board - this fan is connected to the two lower pins on the header as shown in the diagram, ensure to orientate the black and red cables as shown.
- Connect the heater to the HE3 screw terminal on the board.
- Connect the PT1000 to the TH3 position on the board.
- Connect the Extruder to the Motor10 position on the board.