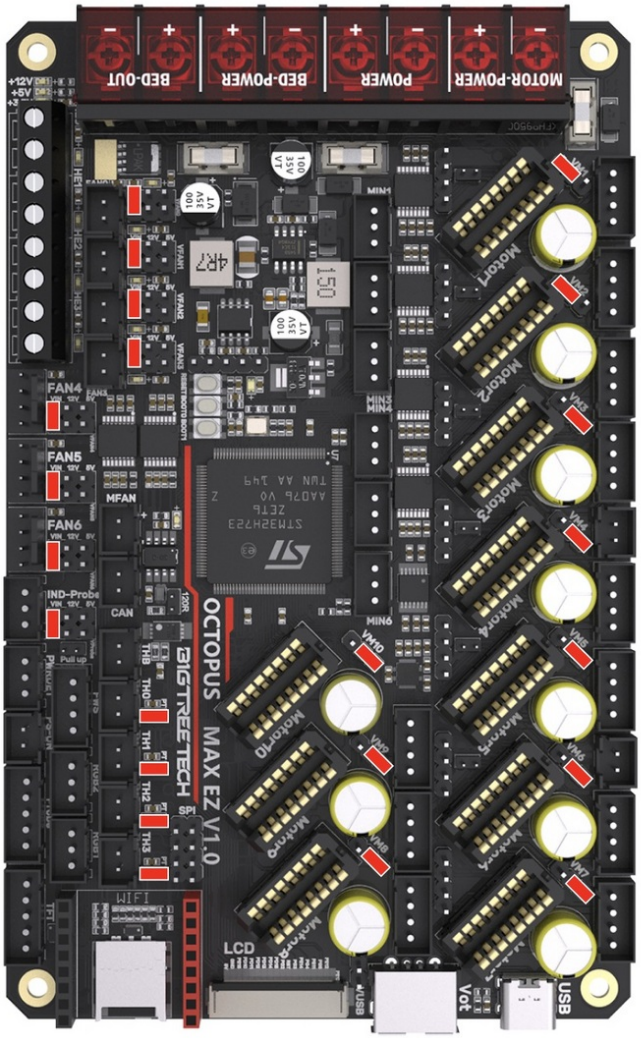
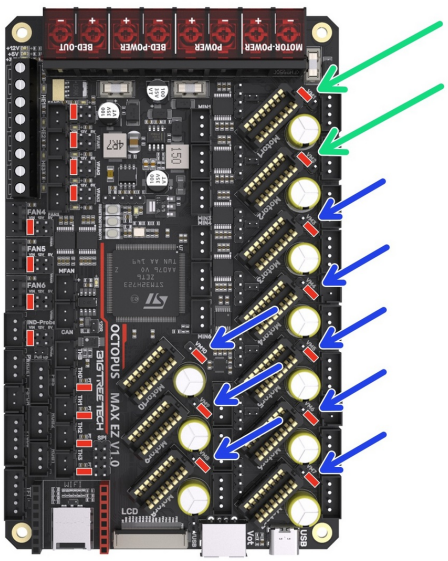
Makertech

Stage 07: wiring

Written By: Makertech 3D



Step 1 — Checking the Control Board



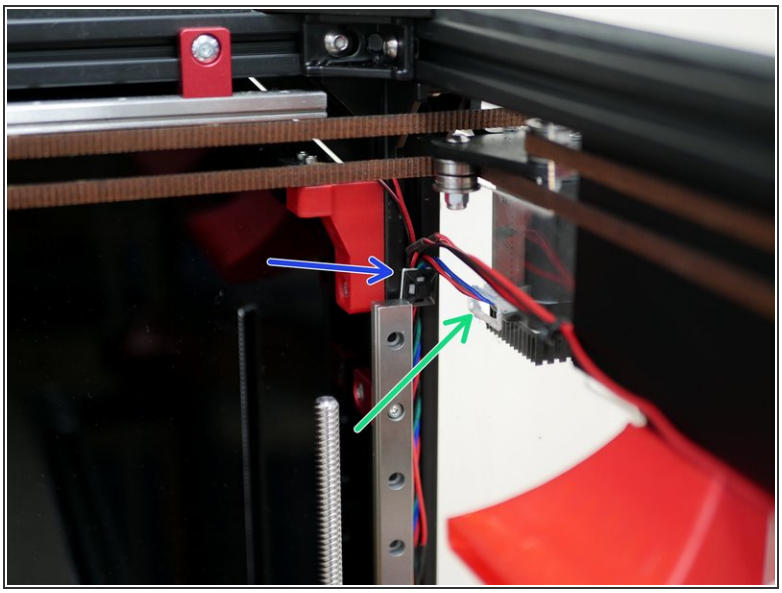
⚠ Double check that you have all of the jumpers installed in the positions highlighted in the image and this step here.

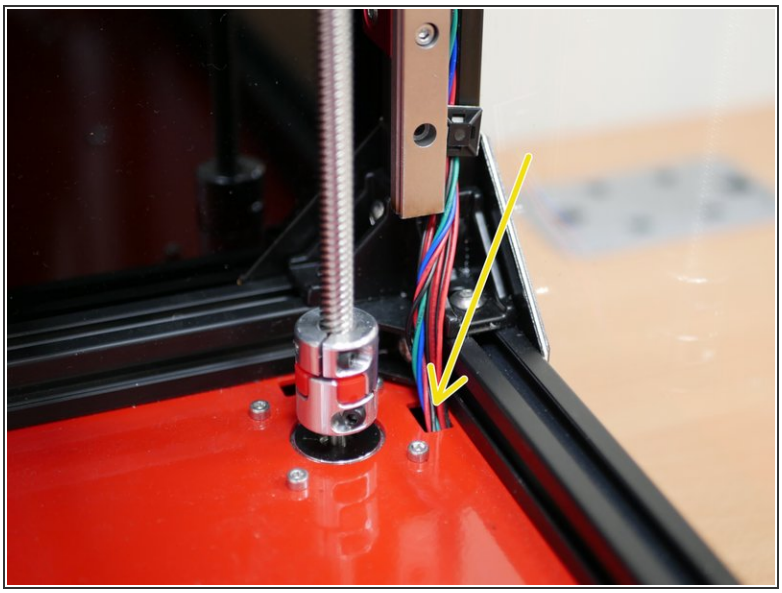
⚠ Powering up with jumpers installed incorrectly can cause irreversible damage to your electronics!

ⓘ 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

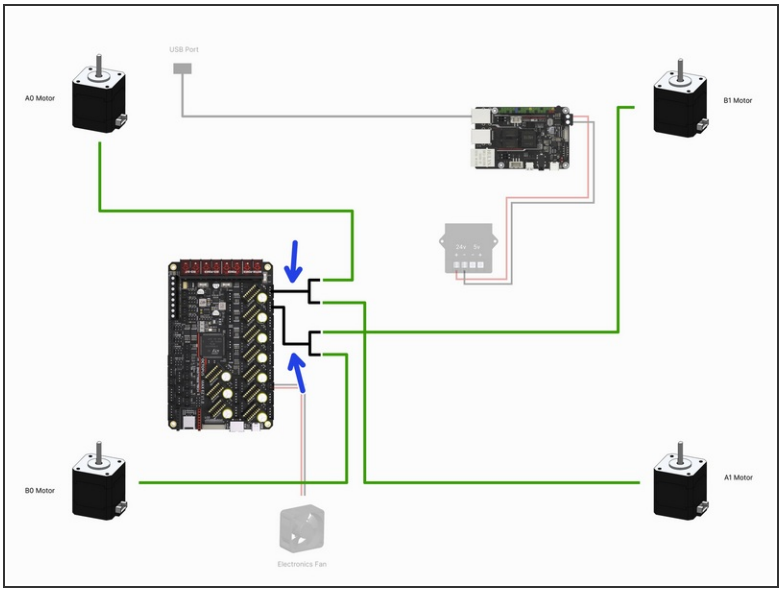
Step 2 — Gantry Cables

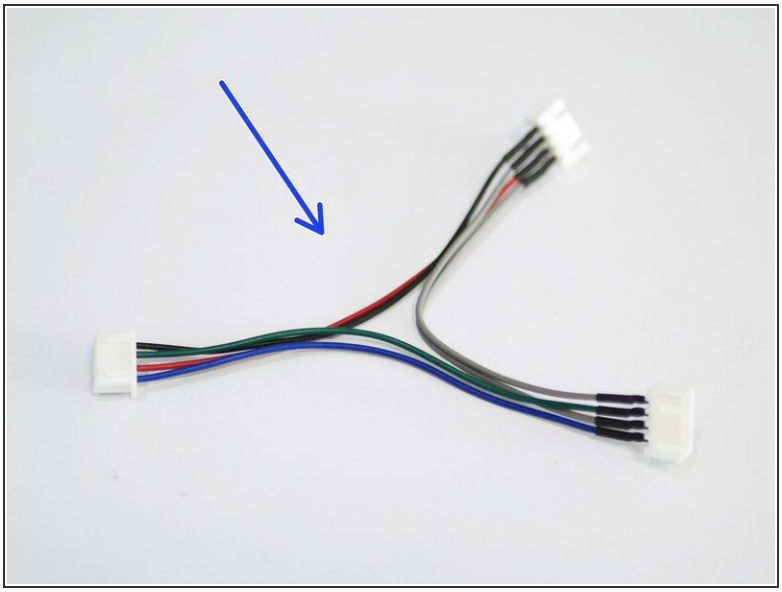




- Connect motor cables to the gantry motors as shown.
  - ⚠ Use the longer twisted cables that are included with the LDO motors.
  - ⓘ On the rear right corner feed together the static fan, endstop and motor cable.
  - ⓘ On the front right corner feed the motor cable and camera cable into the base together.
  - ⓘ 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

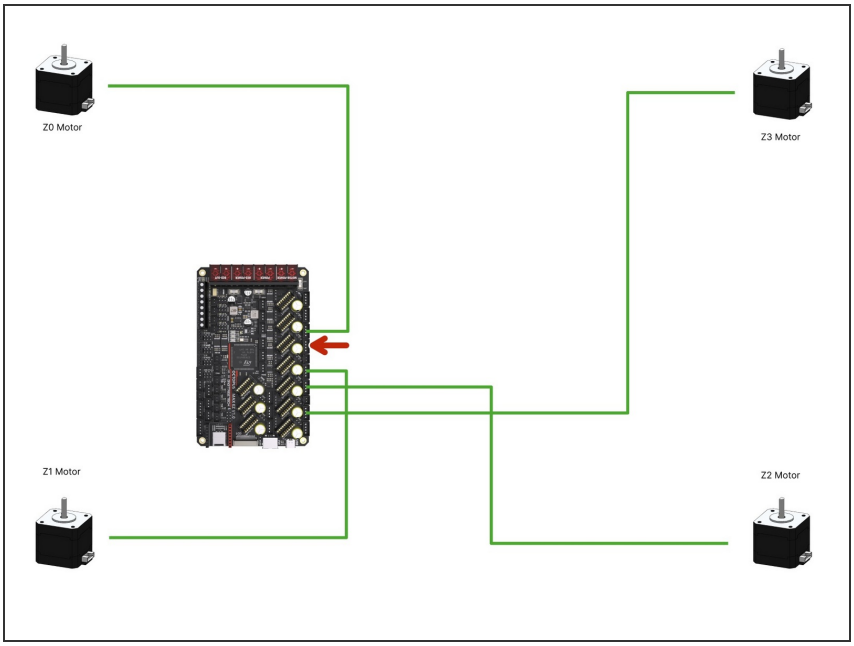




ⓘ The diagram is orientated relative to the control board and shows the motors in the positions that they would be in if looking up from under the base.

- 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



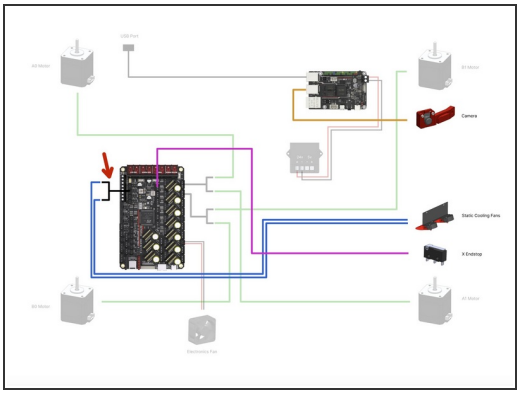
ⓘ The diagram is orientated relative to the control board and shows the motors in the positions that they would be in if looking up from under the base.

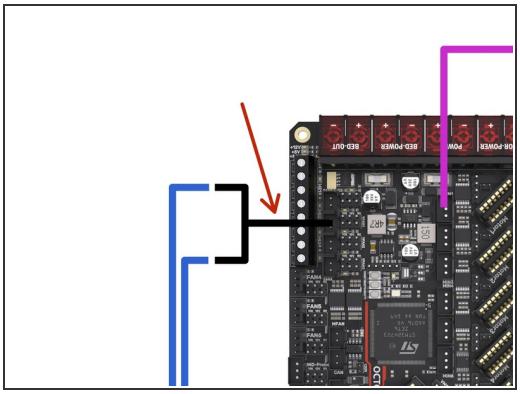
- Connect the four z-motors to the control board as shown.

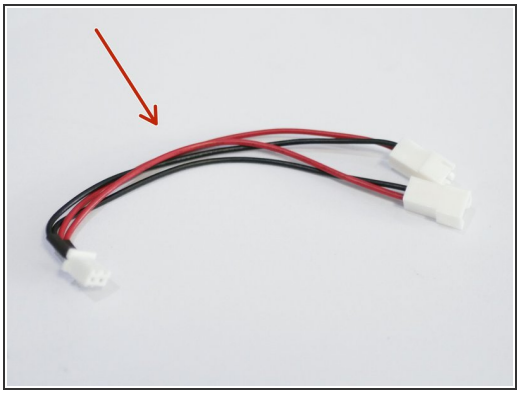
  ⚠ These are the flat motor cables, **not** the twisted ones.

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

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

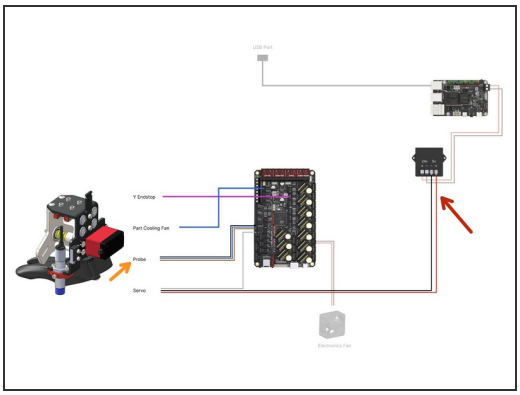


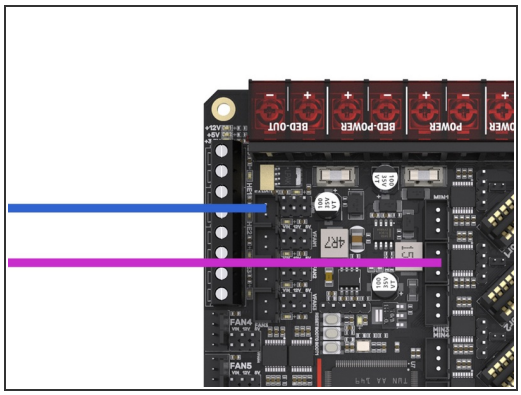


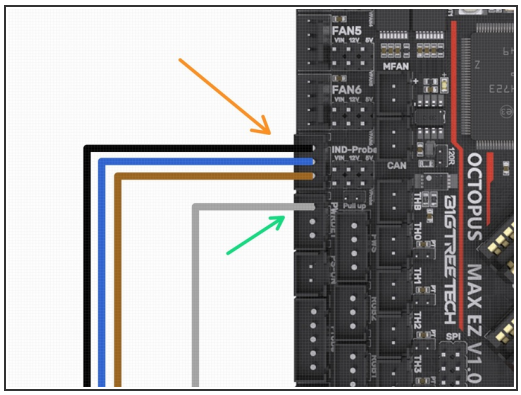


- Connect the USB Camera to a free USB port on the BTT Pi board.
- Connect the X-Endstop to the control board as shown.
- Connect the fan splitter to the control board.
  - Connect to the fan splitter the two static fans.

Step 6 — Tool Carriage Wiring

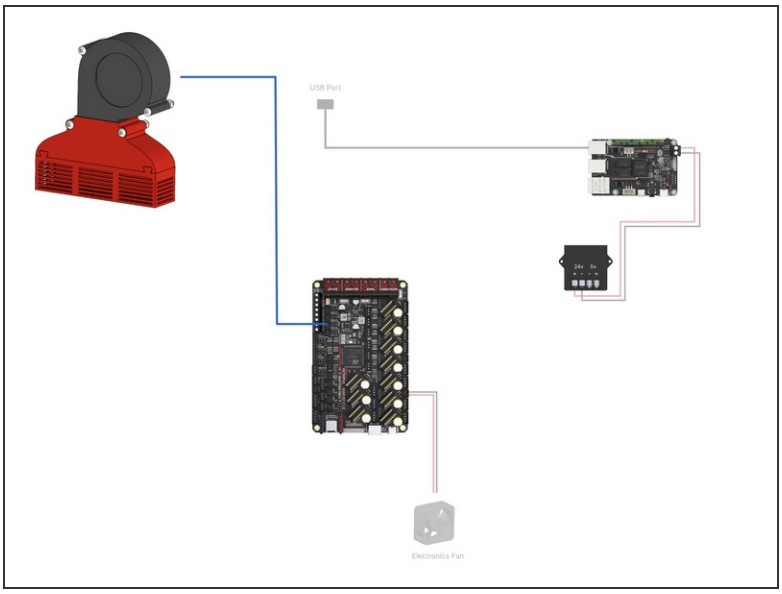


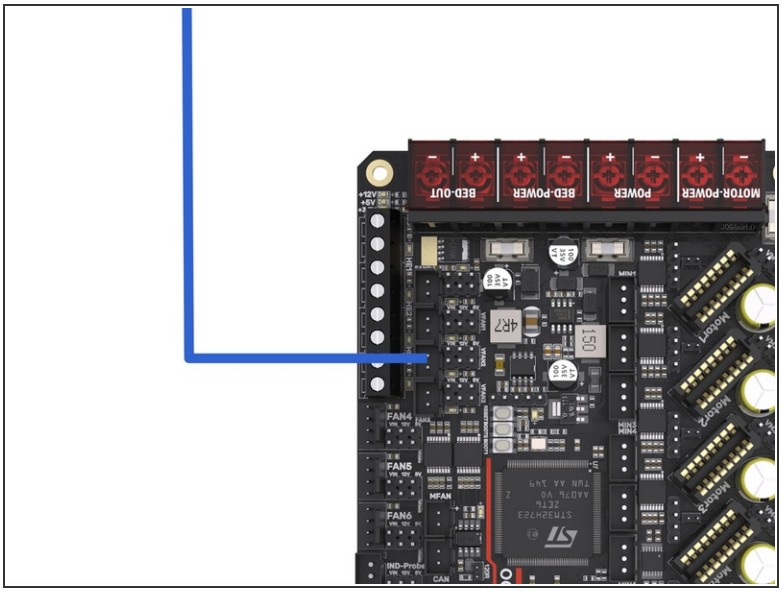




- The following cables all come from the tool carriage loom:
- Connect the Y-Endstop to the control board.
- Connect the part cooling fan to the control board.
- Connect the bed probe to the control board.
- Connect the white servo signal cable to the control board as shown.
  - Connect the servos power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

Step 7 — Enclosure Fume Filter Fan

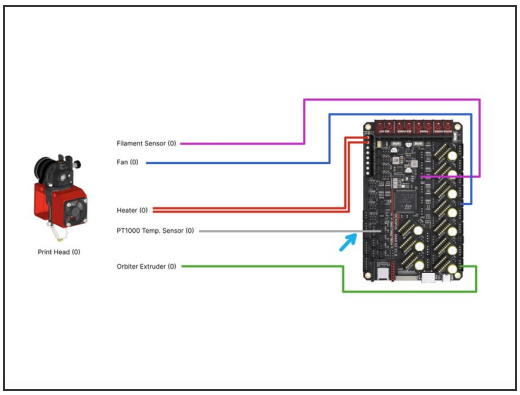


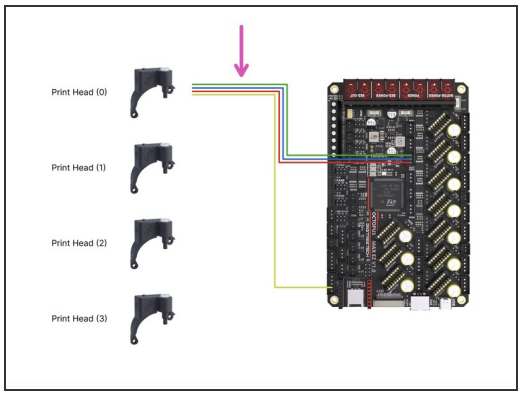


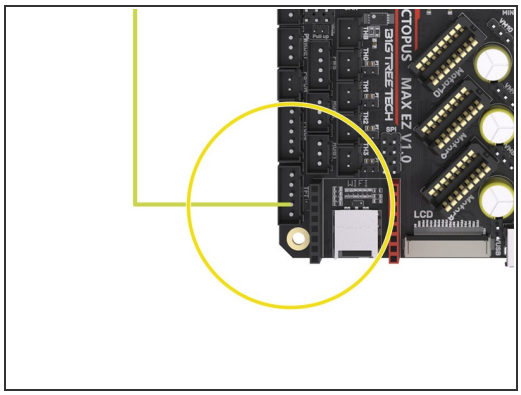
ⓘ Complete this step if you have the enclosure upgrade installed.

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

Step 8 — Print Head (0 - Nearest the Front) Wiring



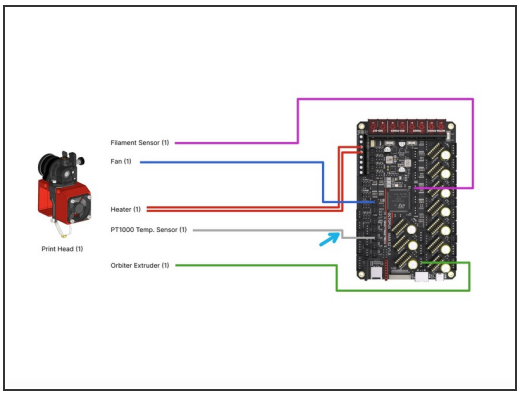


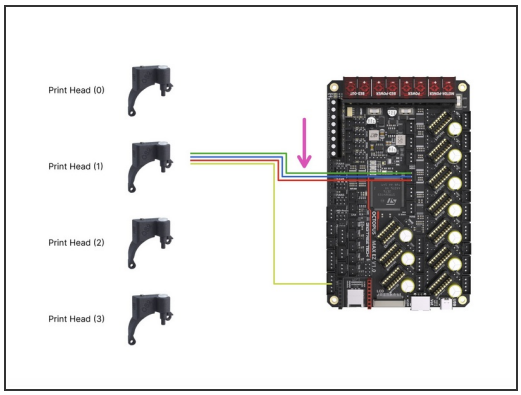


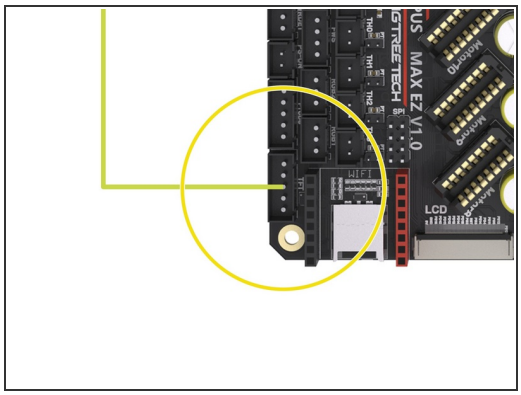
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board 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 9 — Print Head (1) Wiring



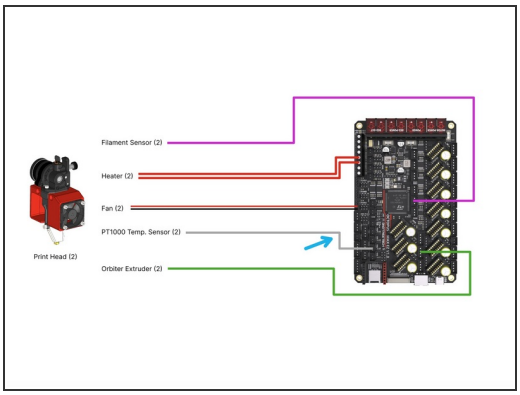


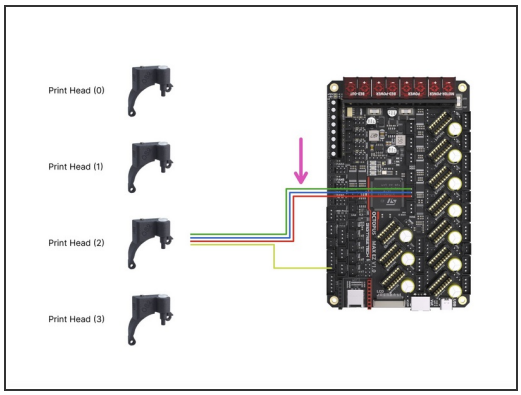


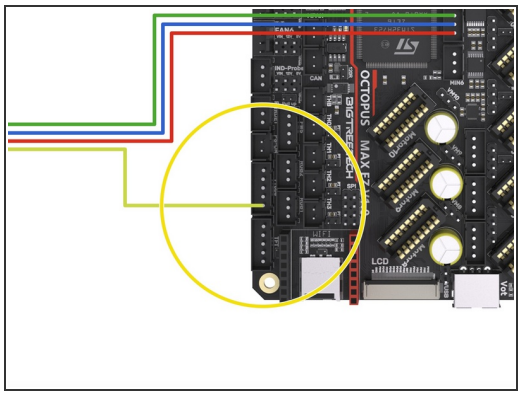
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board 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 10 — Print Head (2) Wiring



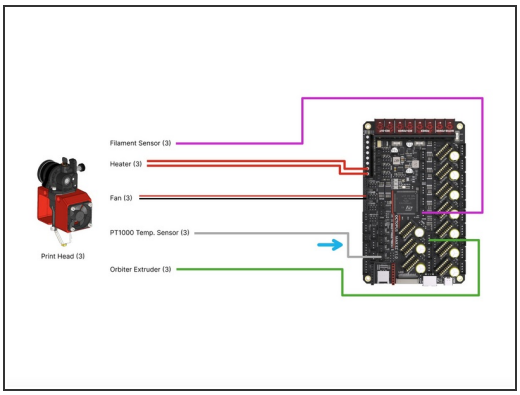


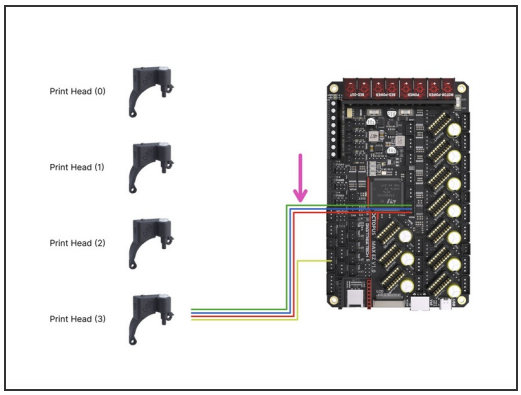


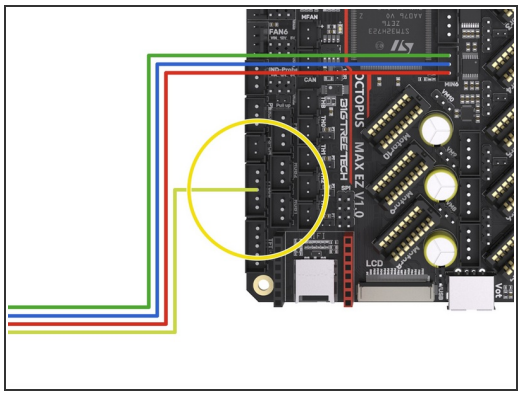
- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board 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 11 — Print Head (3) Wiring



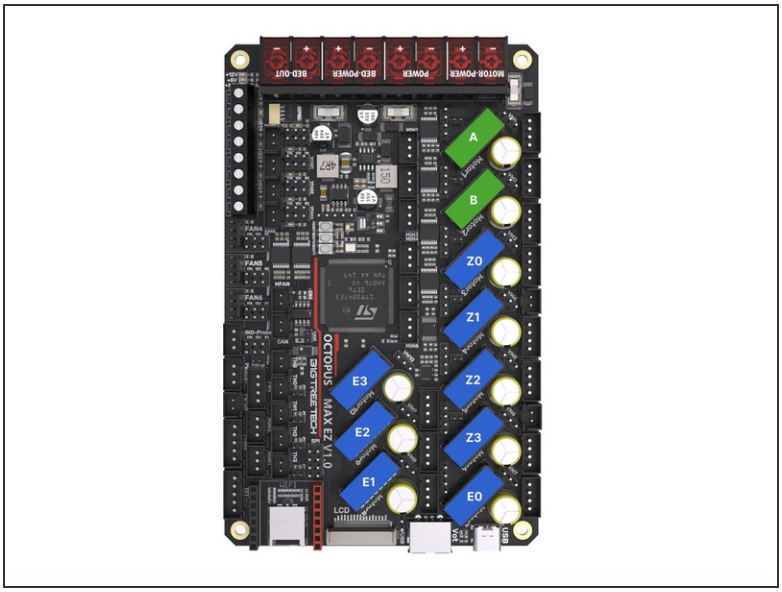


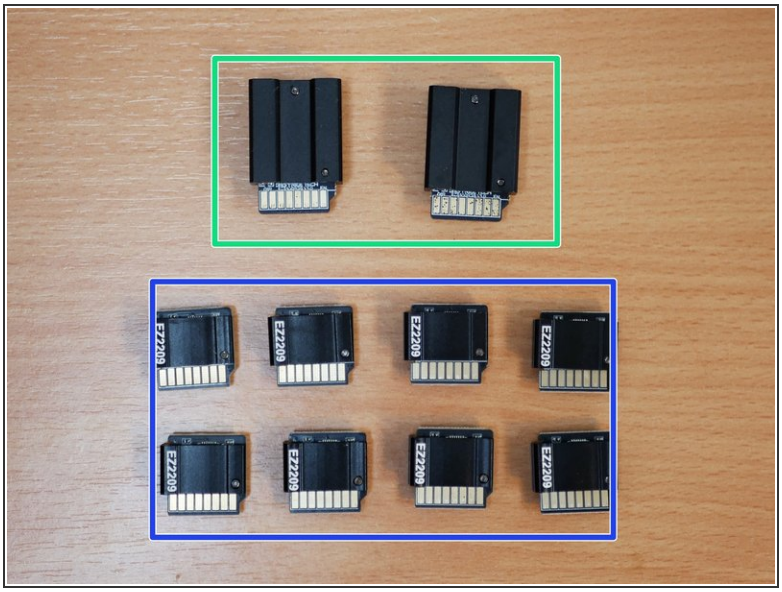


- Connect the filament sensor to the control board as shown.
- If you are running the Orbiter filament sensor then see the second image for wiring it to the control board.
  - Connect the loose yellow cable from it to the control board as shown. It doesn't have a dedicated position on the control board 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.

Step 12 — 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.