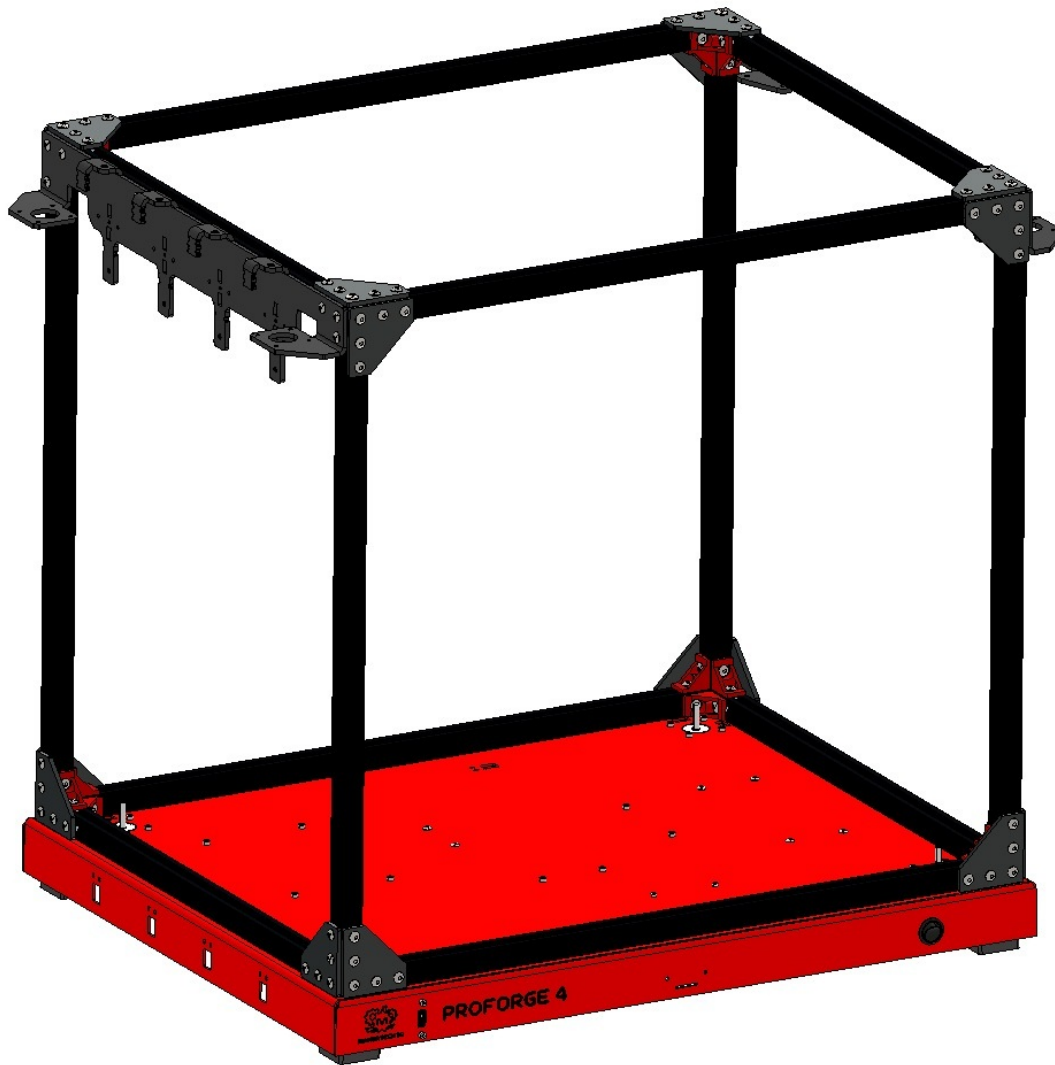


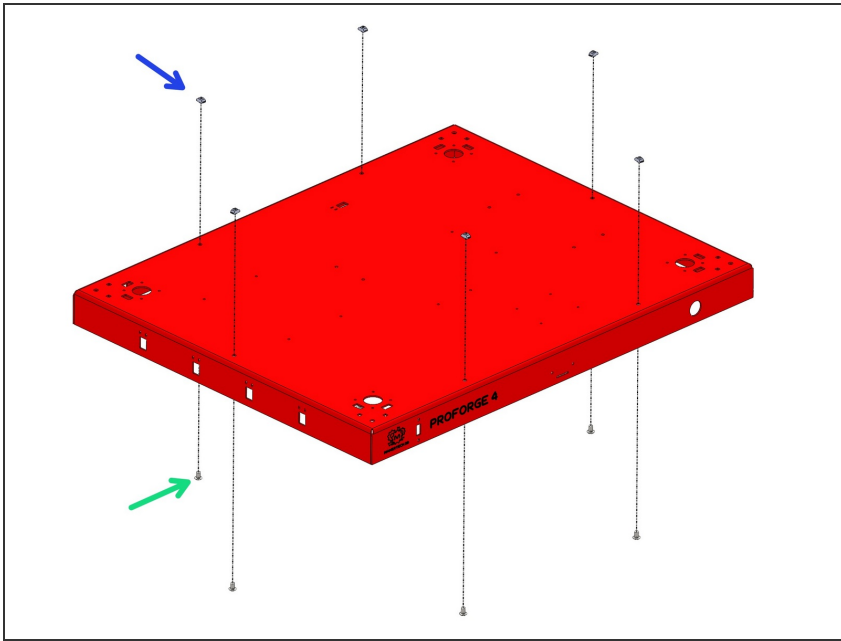
Makertech

Stage 02: Base

Written By: Makertech 3D



Step 1 — Preparing the Base

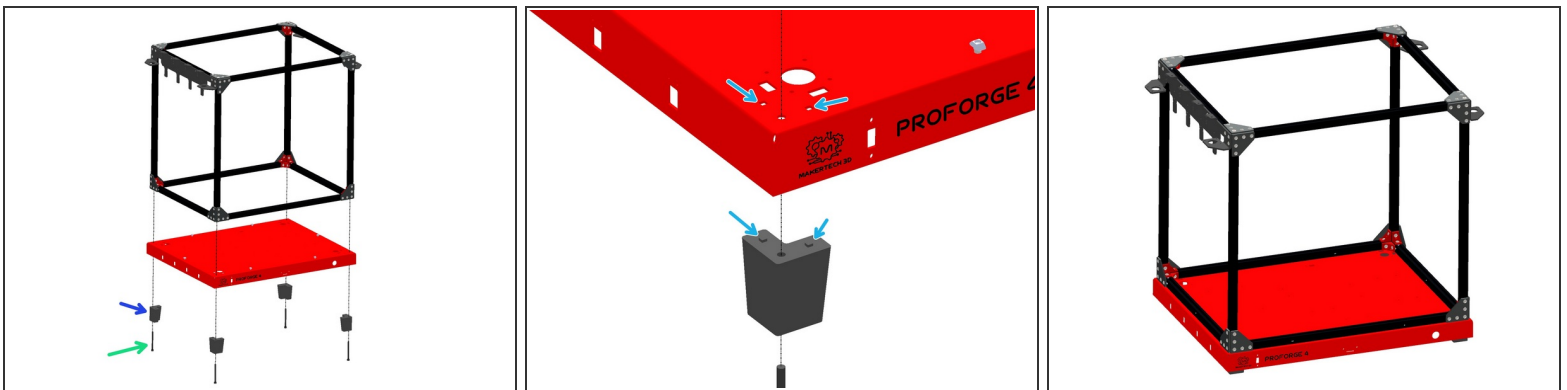


① Prepare the base as shown:

- M5 x 8mm Button
- M5 T-nut

⚠ As before, do not tighten these nuts, they just need to be placed on by a few turns - they will be tightened down in the next step against the extrusions.

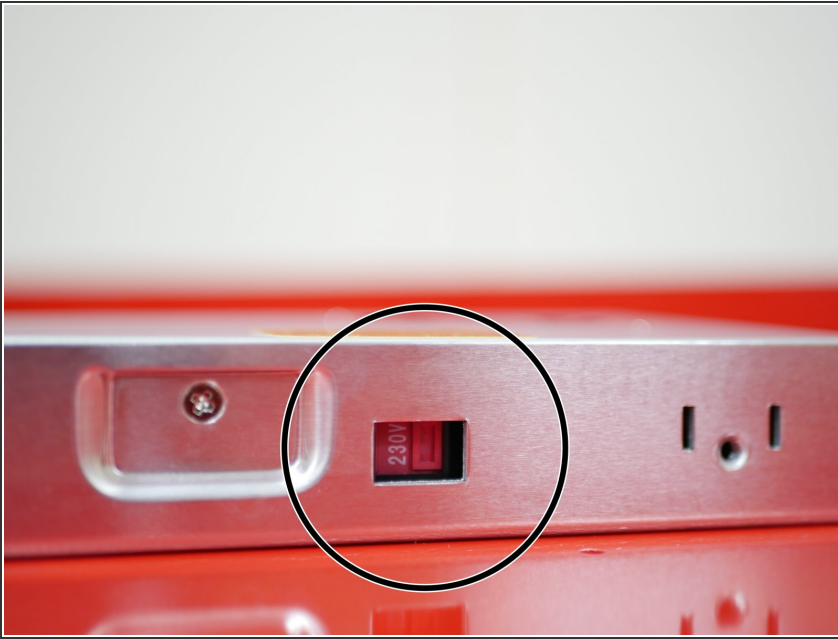
Step 2 — Mounting the Base to the Frame



① Secure the base to the bottom of the frame, orientating it as shown. Tighten the bolts from the previous step against the extrusions on the bottom of the frame.

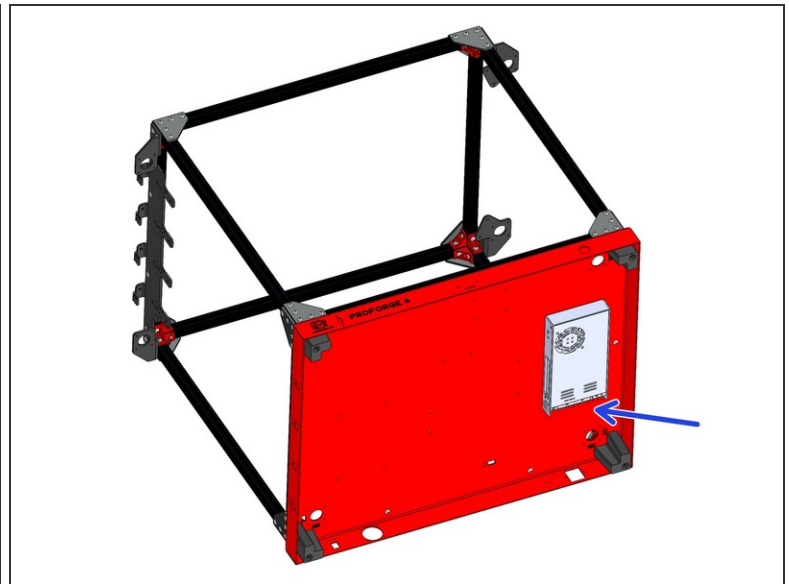
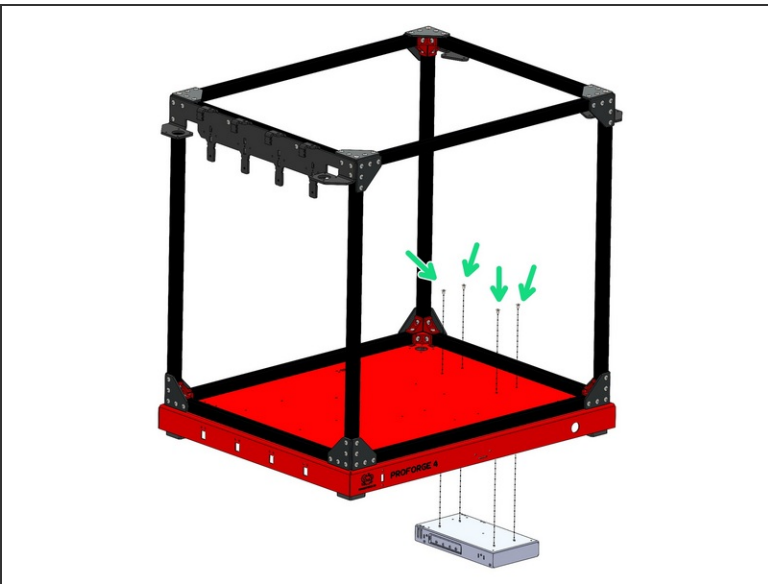
- Also add to each corner a rubber foot.
 - M6 x 75mm Bolt
 - Align the foot so that it slots in place into the cutouts on the base.

Step 3 — 24v PSU - Voltage Setting



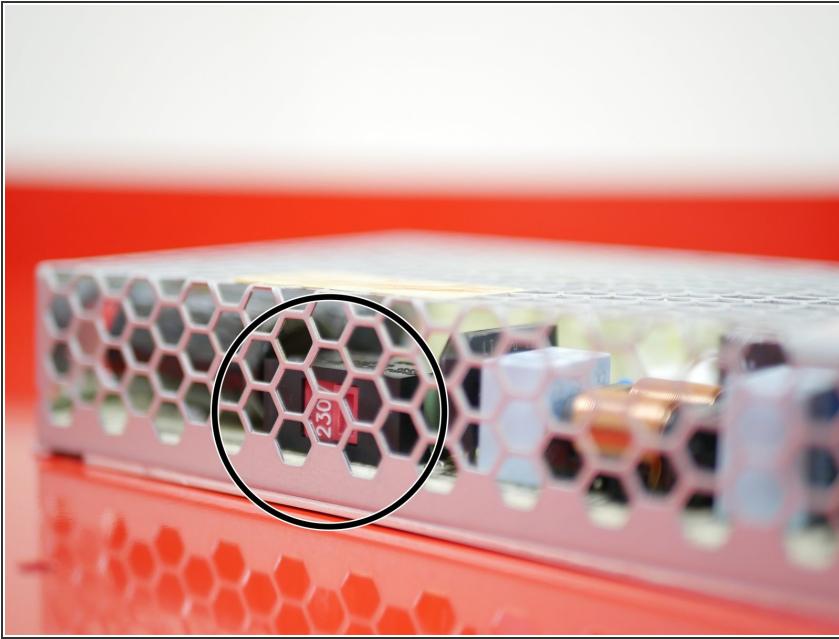
⚠ Before mounting the PSU, check that its voltage input is adjusted correctly. The switch on the side of the unit should be set to your mains voltage. For example, in Europe this would be 230v, and in North America it would be 110v.

Step 4 — Mounting the 24V PSU



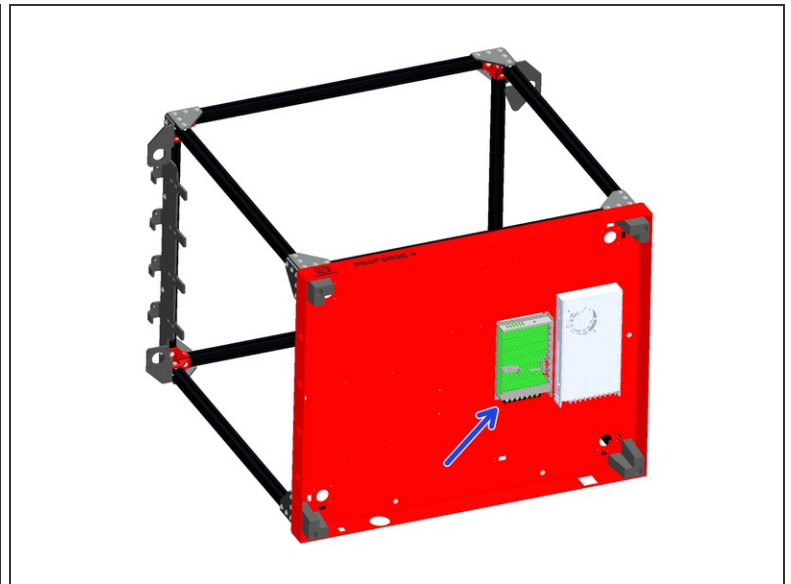
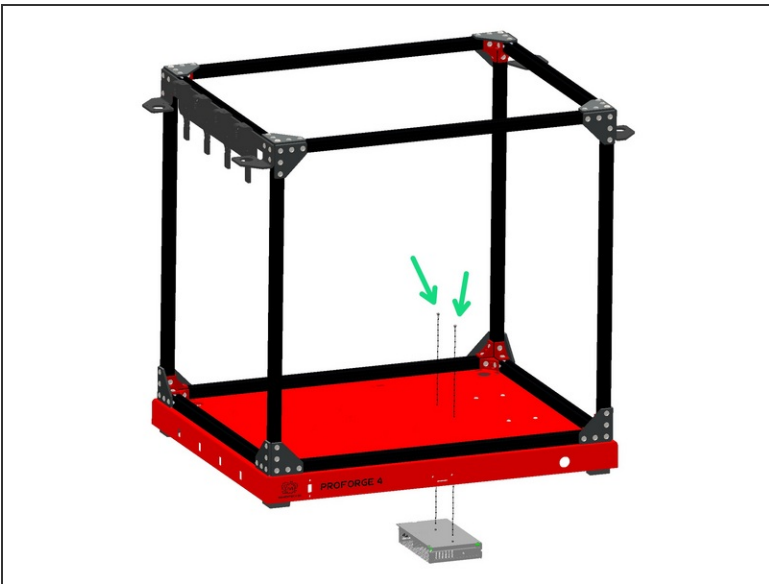
- ① Mount the 24V PSU to the base.
 - M4 x 6mm Button Head Bolts
 - Ensure it's mounted with the terminals pointing to the rear of the machine.

Step 5 — 48v PSU - Voltage Setting



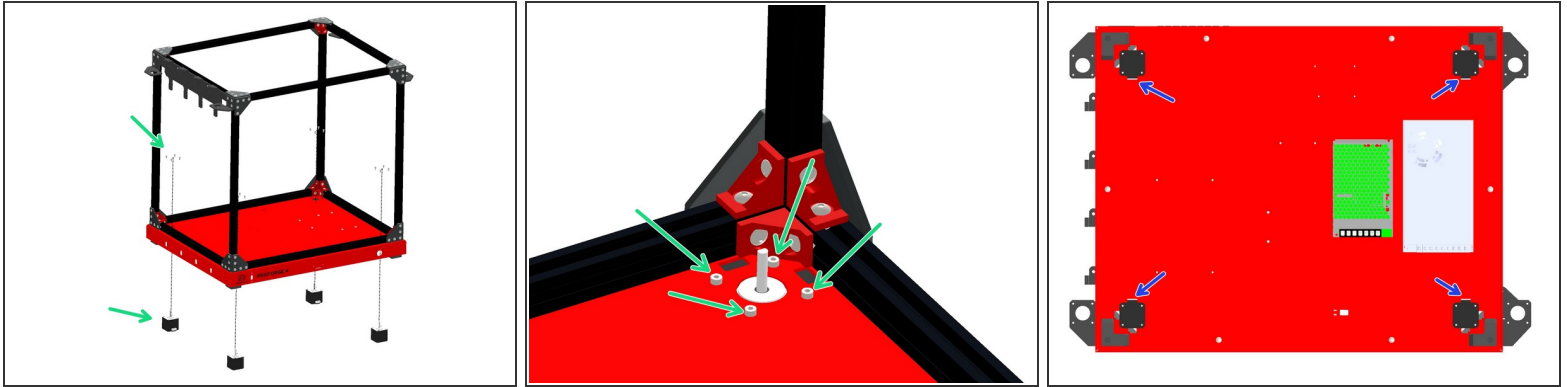
⚠ Before mounting the PSU, check that its voltage input is adjusted correctly. The switch on the side of the unit should be set to your mains voltage. For example, in Europe this would likely be 230v, and in North America it would be 110v.

Step 6 — Mounting the 48V PSU



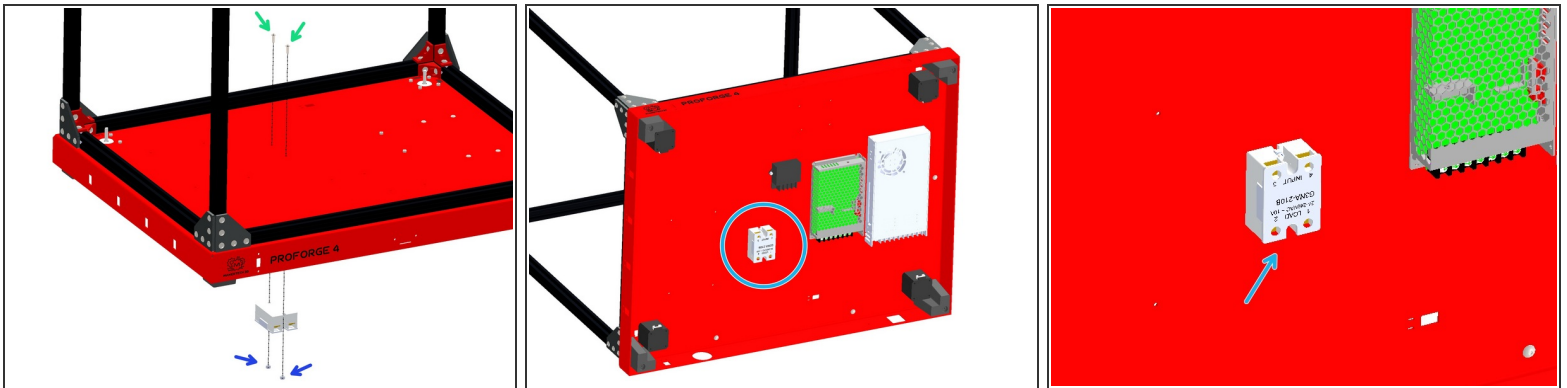
- ① Mount the 48V PSU to the base.
 - M3 x6mm Cap Head Bolt
 - Again - ensure it's mounted with the terminals pointing to the rear of the machine.

Step 7 — Mounting the Z-Motors



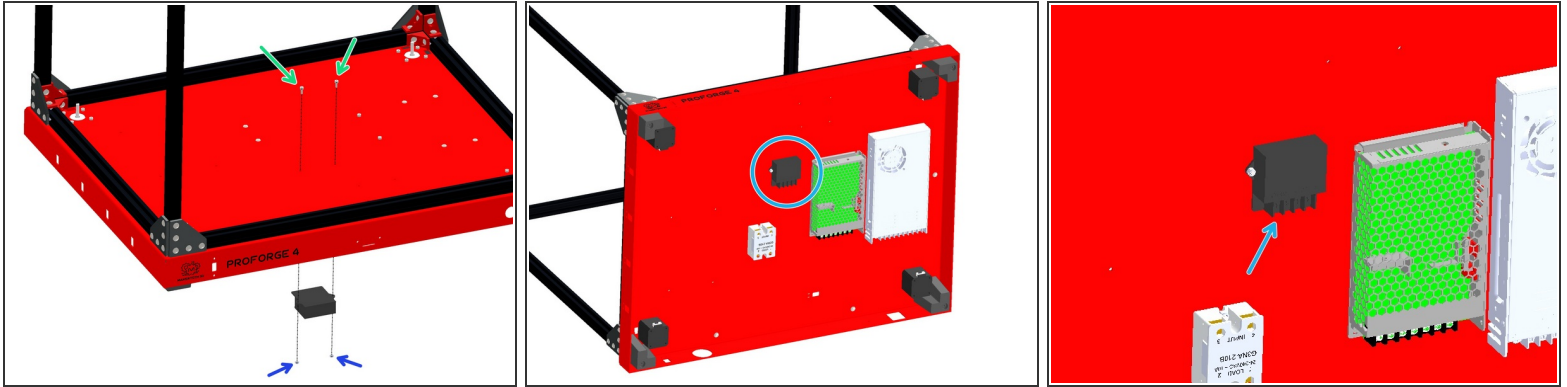
- Mount the four NEMA-17 Motors to the base with M3 x 6mm cap head bolts.
⚠ **These are the smaller BQ motors.**
- Ensure that the cable connectors on the motors are all facing inwards under the base as shown.

Step 8 — SSR Relay



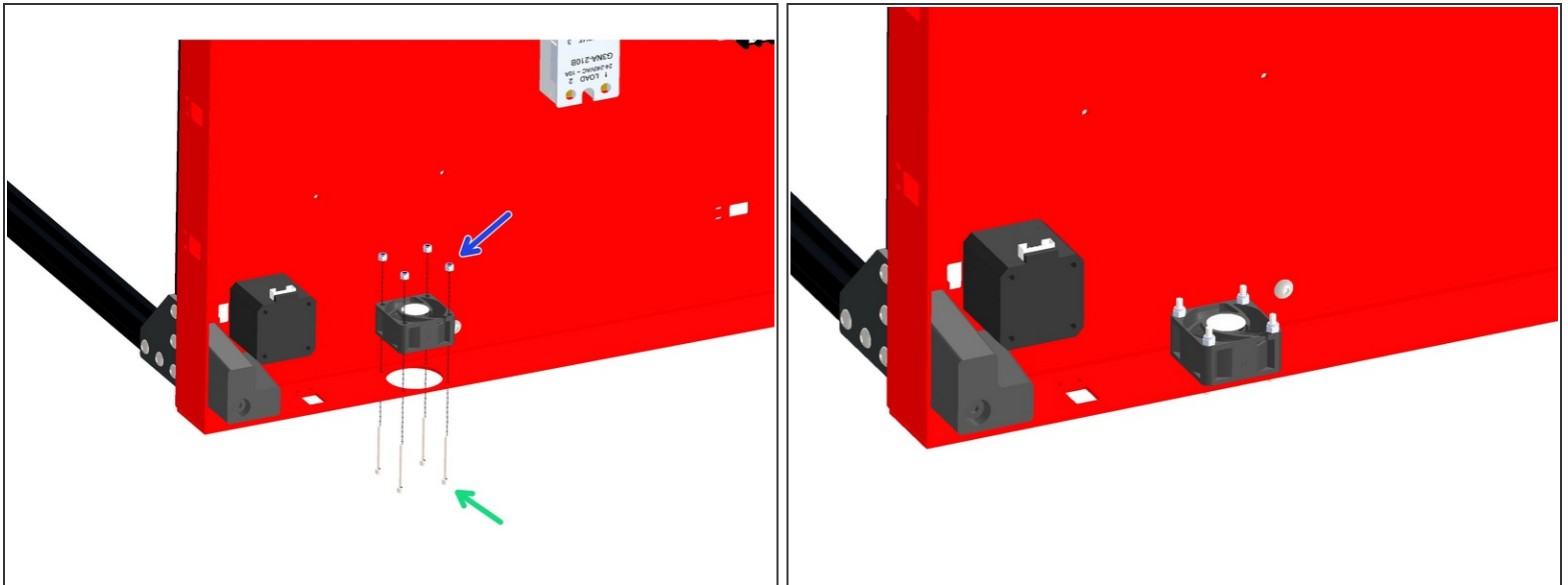
- ① Mount the SSR Relay to the base.
 - M4 x 12mm Button
 - M4 Nyloc
 - Mount the SSR with the load side terminals facing the rear of the base.
- ☑ Bolt orientation is purely aesthetic, feel free to install the other way round (easier), with the nut on the top side of the base.

Step 9 — Mounting the 5V Power Convertor



- ① Mount the 5V Power Convertor to the base.
 - M3 x 8mm Bolt
 - M3 Nyloc Nut
 - Orientate the power convertor so that its terminals are facing the rear of the base as shown.

Step 10 — Mounting the Electronics Fan



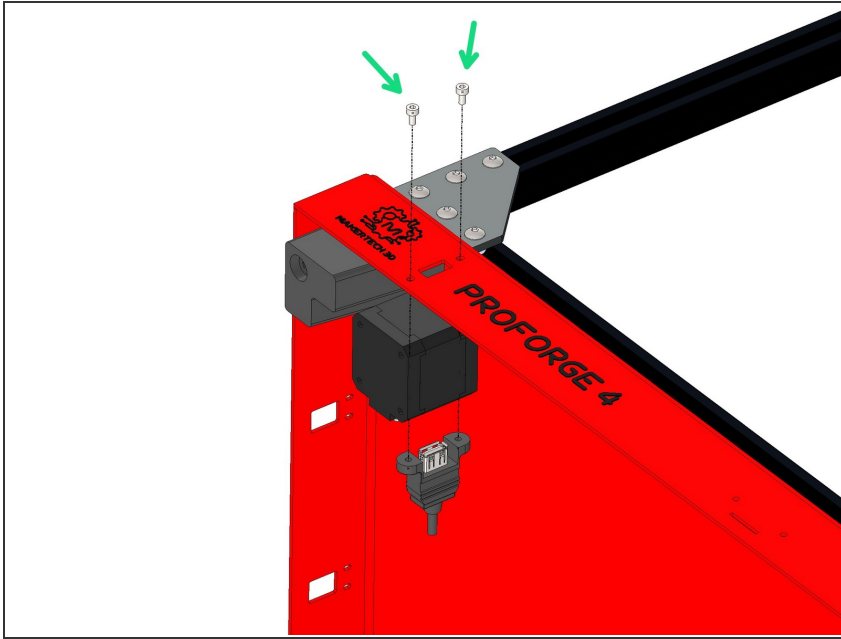
① Mount the 40mm fan as shown - orientate the cable so it points to the top of the base.

⚠ Select the fan with the shorter (approx 20cm) cable.

⚠ Install the fan with the sticker side facing into the base.

- M3 x 28mm Bolt
- M3 Nyloc Nut

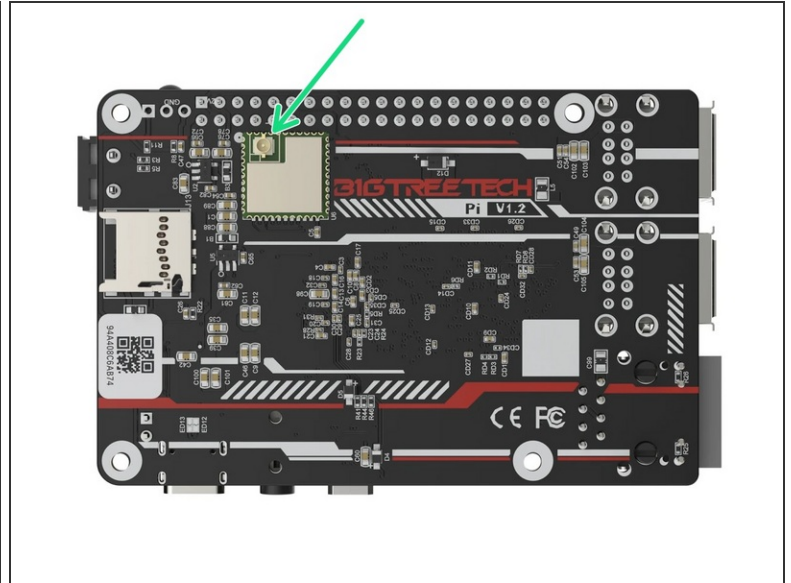
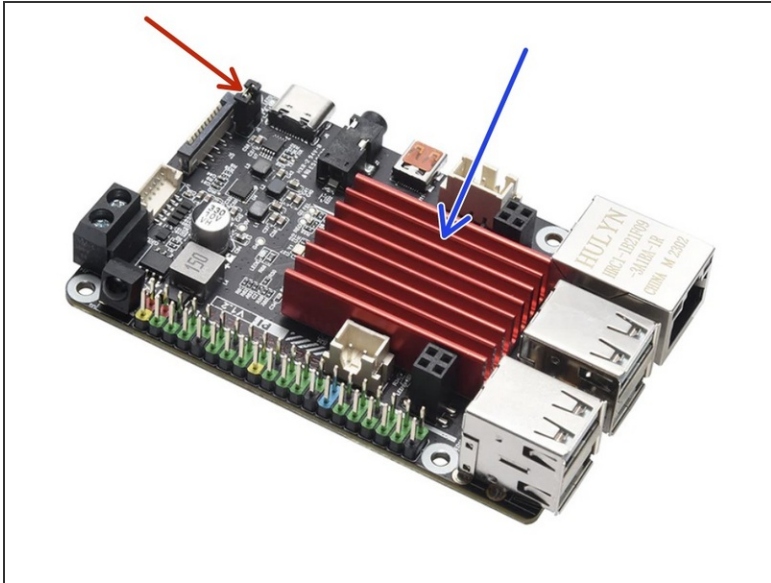
Step 11 — USB Port



① Mount the USB port to the front of the base as shown.

- M3 x 6mm Cap Head Bolt

Step 12 — Preparing the BTT Pi



⚠ Before unpacking the Pi control board 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 control board when handling it.

- Stick the heatsink on to the Pi board.
- Ensure that there is **no jumper** placed here - you may need to remove it.
- Connect the WiFi antenna to the back of the board.

Step 13 — Mounting the Pi Board

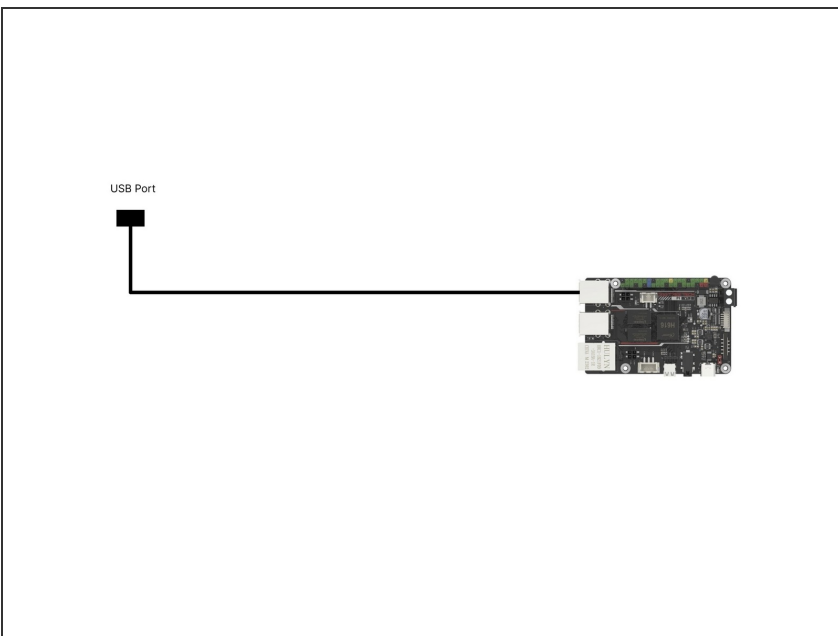


① Mount the board to the base:

- M2.5 x 6mm bolt
- M2.5 x 10mm standoff
- Mount the board with the USB ports pointing to the left as shown.

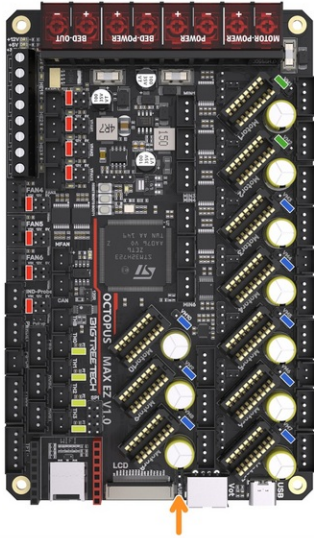
✦ **Do not** stick the antenna to the base. We've been told by BTT that this can cause signal issues if it is stuck onto metal. Instead leave it hanging.

Step 14 — USB cable



① Connect the other end of the front USB port cable to a USB port on the Pi board.

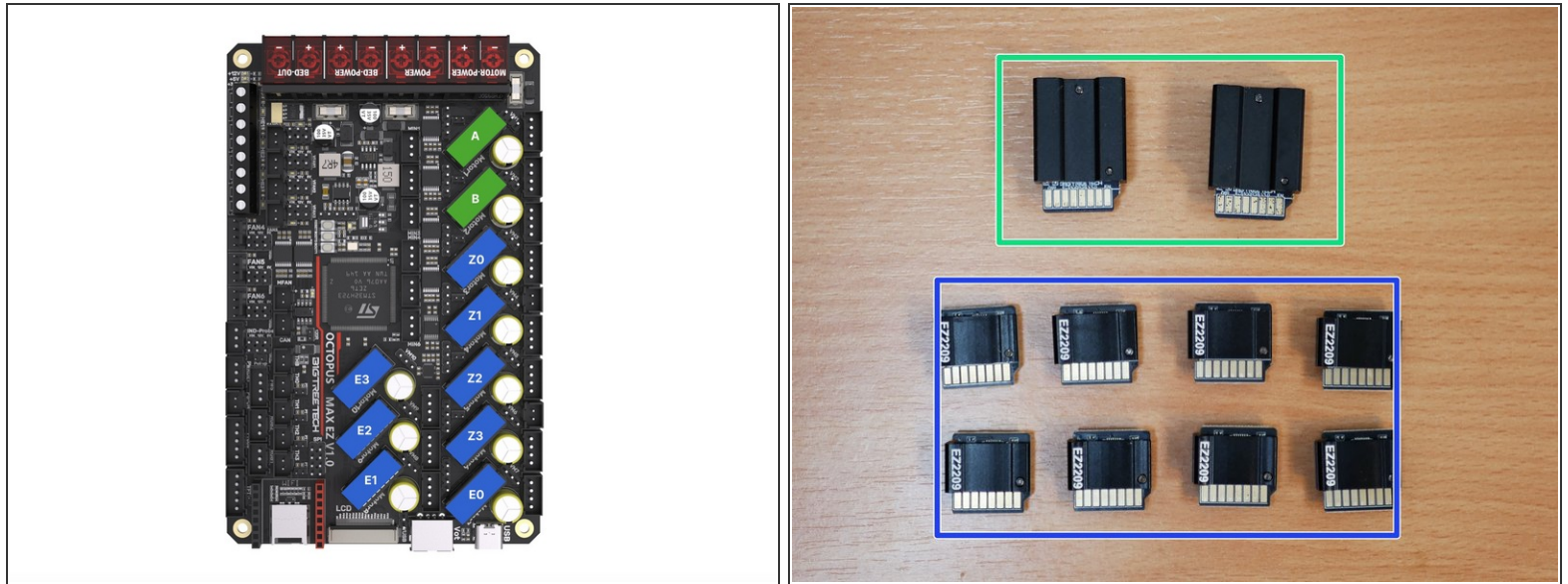
Step 15 — Preparing the Octopus MAX EZ Control Board



⚠ Before unpacking the control board 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 control board when handling it.

- After unpacking the control board you should find a bag of jumpers.
- ① Use these jumpers to close connections between pins as shown on the diagram.
 - Set fan voltages to board voltage (24v)
 - Set thermistors to PT1000 (small jumpers)
 - Set gantry motors to 48V
 - Set all other motors to board voltage (24v) **Installing these in the wrong position will cause damage to the drivers!**
 - Make sure there is **NO** jumper placed on the USB power pins.

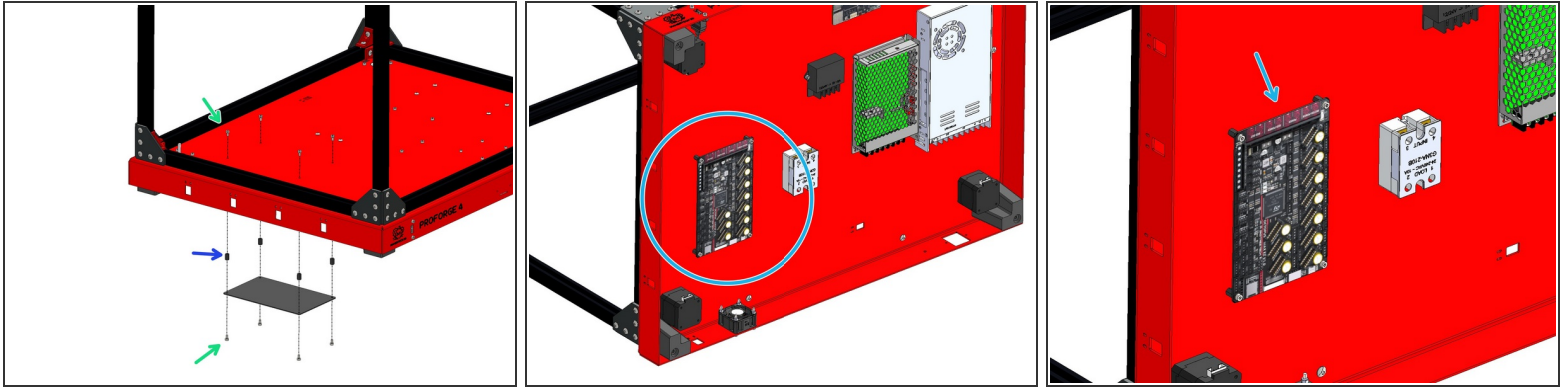
Step 16 — EZ Stepper Drivers



⚠ 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.

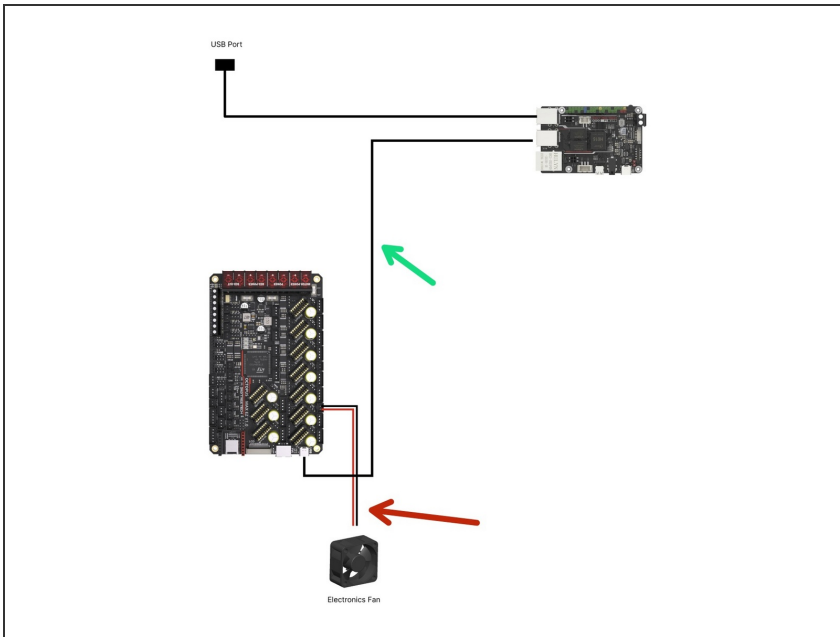
- ☑ These drivers can only be plugged in one way. The fin side of the heatsink points towards the USB C port on the board.
- ⓘ With the board placed on a flat/hard surface, like a table, carefully push the motor drivers into their slots.
- Plug the TMC5160 RGB EZ Drivers into the board as shown. They will drive the gantry motors.
- Plug the TMC2209 EZ Drivers into the board as shown. They will drive the Z motors and extruders.
 - ☑ The extruder drivers are packed in with the print head bags.
 - ☑ You will have 4 for the z-motors by default and then one for each print head.

Step 17 — Mounting the Octopus Max Control Board



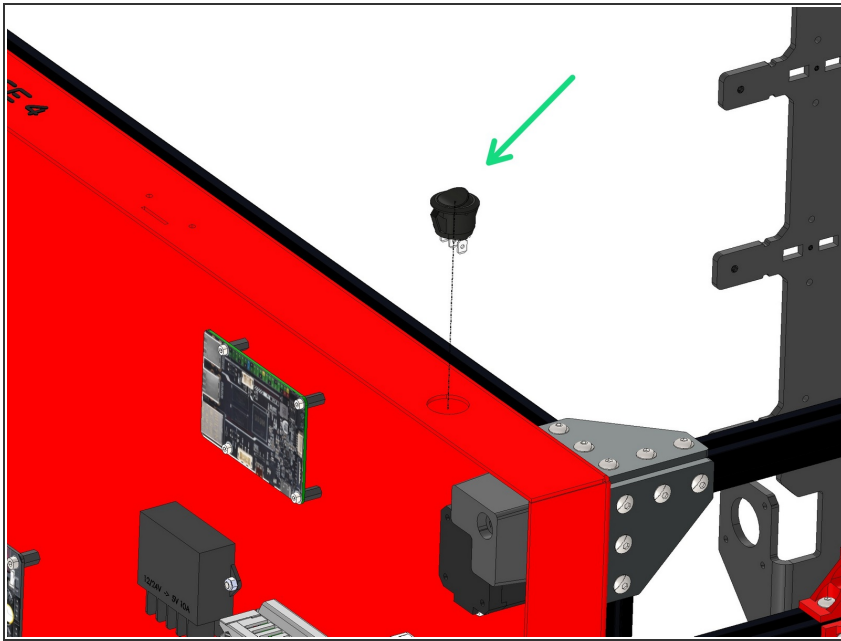
- ① Mount the Octopus Control Board as shown:
- M3 x 6mm Cap Bolt
 - M3 x 10mm Standoff
 - Orientate the board with the power terminals pointing to the front of the base.

Step 18 — USB Cable and Electronics Fan



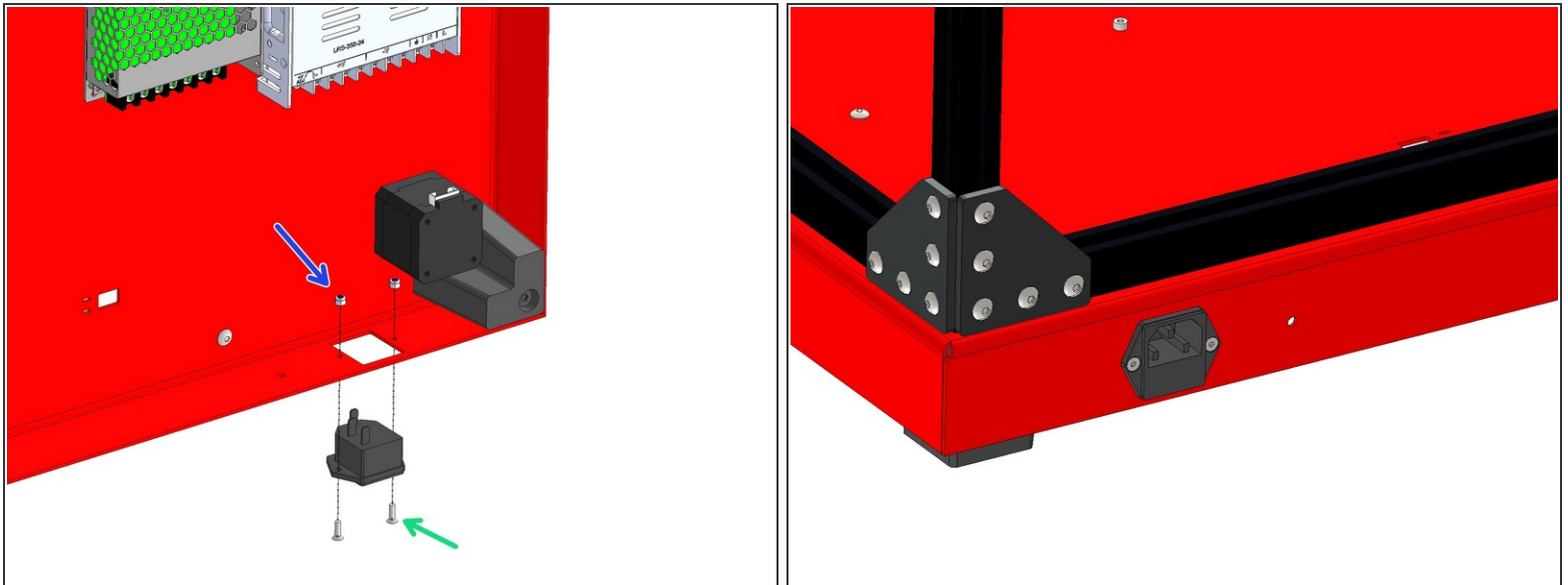
- Connect the fan to the Octopus Max control board as shown.
- Take the USB cable from the Octopus Max control boards box and connect one side to the USB C port on the control board and the other to a USB port on the BTT Pi.

Step 19 — Power Switch



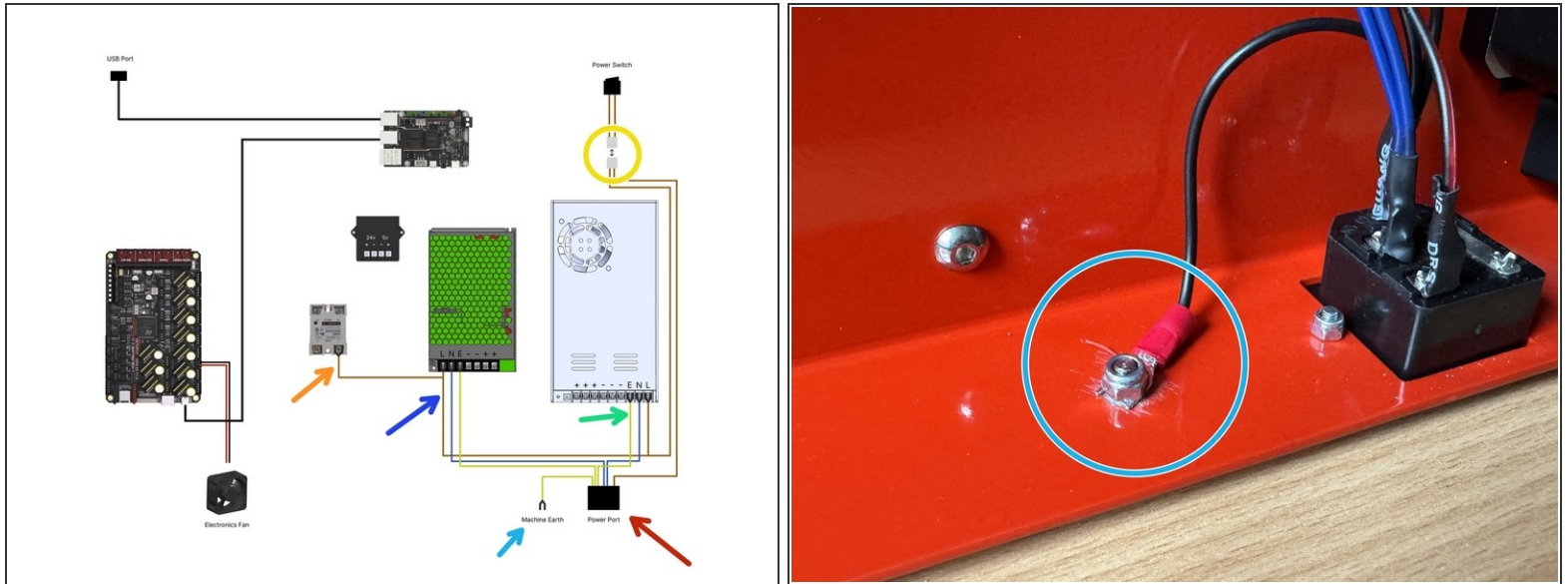
- Disconnect the power switch from the mains power cable assembly. Push the power switch into the front of the base.

Step 20 — Mounting the Power Port



- ① Fix the power port to the rear of the base.
 - M3 x 10mm Counter Sunk Bolt
 - M3 Nyloc Nut
- ☑ Push all of the cables attached to the power port into the base.

Step 21 — Mains Wiring



- Connect the switch to the mains power port.
- As shown in the diagram connect the cables from the mains power port to the:
 - 24V Power Supply
 - 48V Power Supply
 - SSR Relay
- Fix the shortest earth cable to the base. Scuff the paint a little so that it is able to make contact with the metal.
- ☒ M4 x 12mm button bolt and M4 Nyloc Nut

The diagram illustrates the electrical connections for a Raspberry Pi 4B system. Key components and their connections include:

- USB Port:** Connected to the Raspberry Pi via a black cable.
- 24V 5V DC-DC Converter:** A black module that converts 24V input to 5V output for the Raspberry Pi. A blue arrow points to it.
- Battery Pack:** A green rectangular battery pack with a 5V output terminal connected to the Raspberry Pi.
- Small DC-DC Converter:** A small module connected to the battery pack and the Raspberry Pi.
- Electronics Fan:** A black fan connected to the Raspberry Pi's 5V and GND pins.
- Machine Earth:** A ground connection point for the system.
- Power Port:** A power input point connected to the system's ground and power lines.

Wiring colors are used to distinguish between different power lines: red for positive voltage, black for ground, and yellow/green for other power lines. A green arrow points to the 24V 5V DC-DC converter.

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