M2 Wiring

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M2 Wiring Harness

The M2 wiring harness consists of 5 segments. Each segment is labeled on the heat shrink that is near the end of each wire.

The 5 wire harness segments connect to the electronics (aka RAMBo) as follows:

1) Wire Harness 1 has the following connections:
   a) X Motor

2) Wire Harness 2 has the following connections:
   a) Extruder Motor
   b) Fan 0
   c) Fan 1
   d) Extruder (Hot End)
   e) Heat 0 (Hot End)

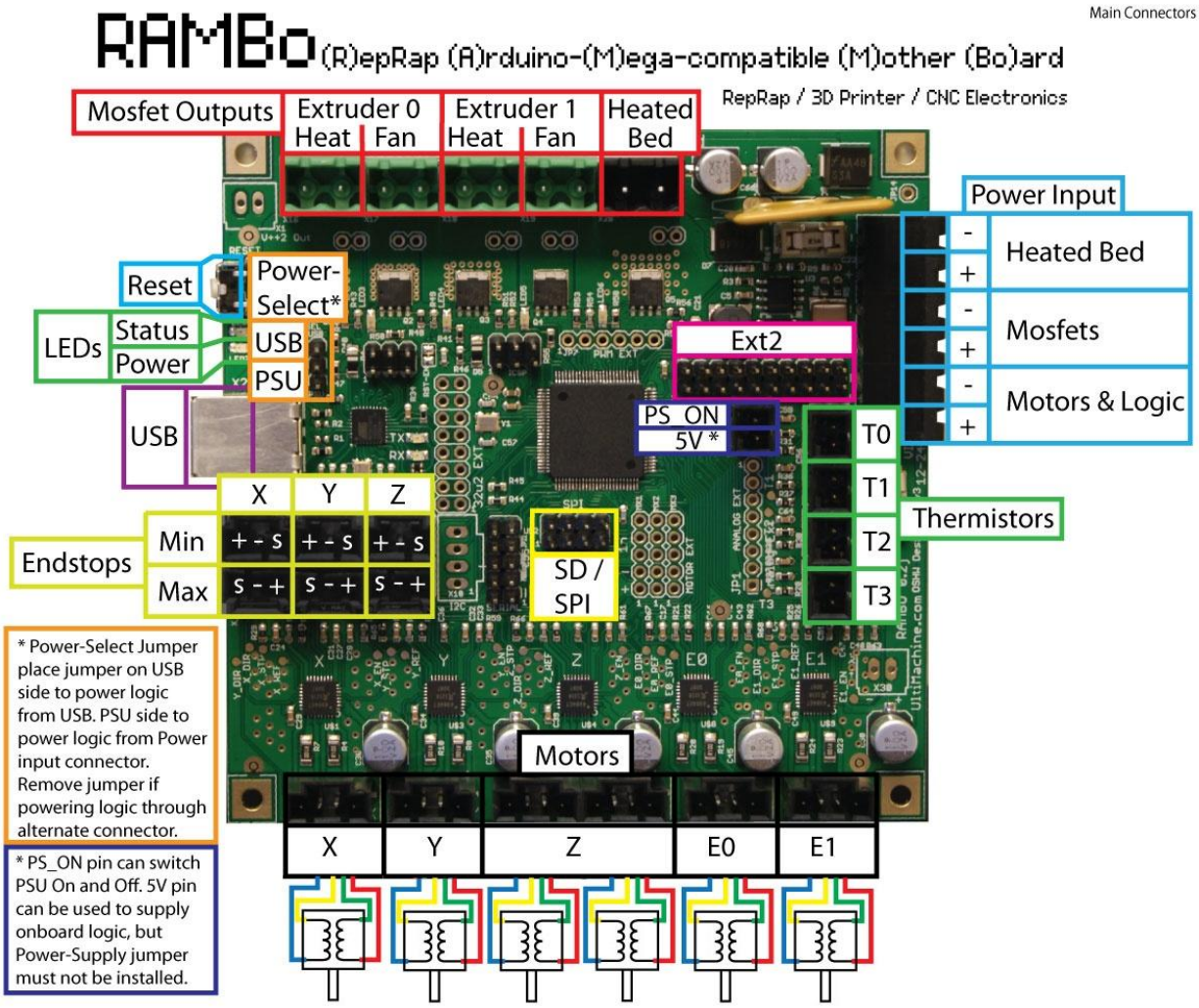
3) Wire Harness 3 has the following connections:
   a) Z Motor
   b) Z End Stop
   c) X End Stop

4) Wire Harness 4 has the following connections:
   a) HBP (large plug)
   b) HBP (small plug)

5) Wire Harness 5 has the following connections:
   a) Y Motor
   b) Y End Stop

RAMBo

The following photo highlights the different areas of the electronics and the locations where the wire harness connects to the board.



The following RAMBo connectors are used with the M2 harness:

Mosfet Outputs – Heated Bed, Extruder 1 Fan, Extruder 0 Fan, Extruder 0 Heat

Thermistors – T0 (EXT) and T2 (HBP)

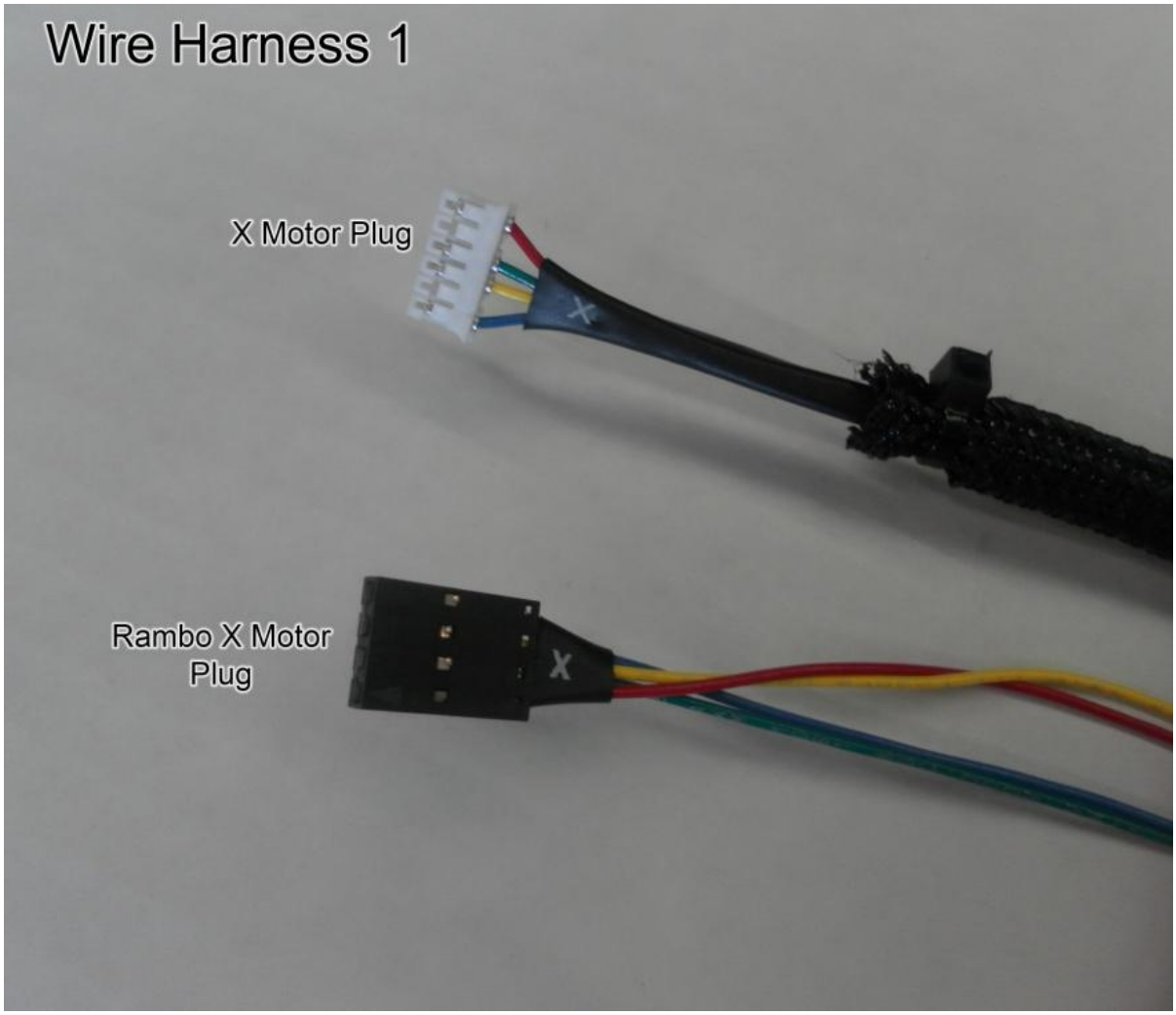
Endstops – Min X, Min Y and Min Z

SD / SPI – SD Card Reader

Motors – X, Y, Z1 and E0

Wire Harness 1 - **Connects X Motor**

X Motor Plug is connected to the X Motor



Rambo X Motor Plug is connected to X in the Motors area of the RAMBo

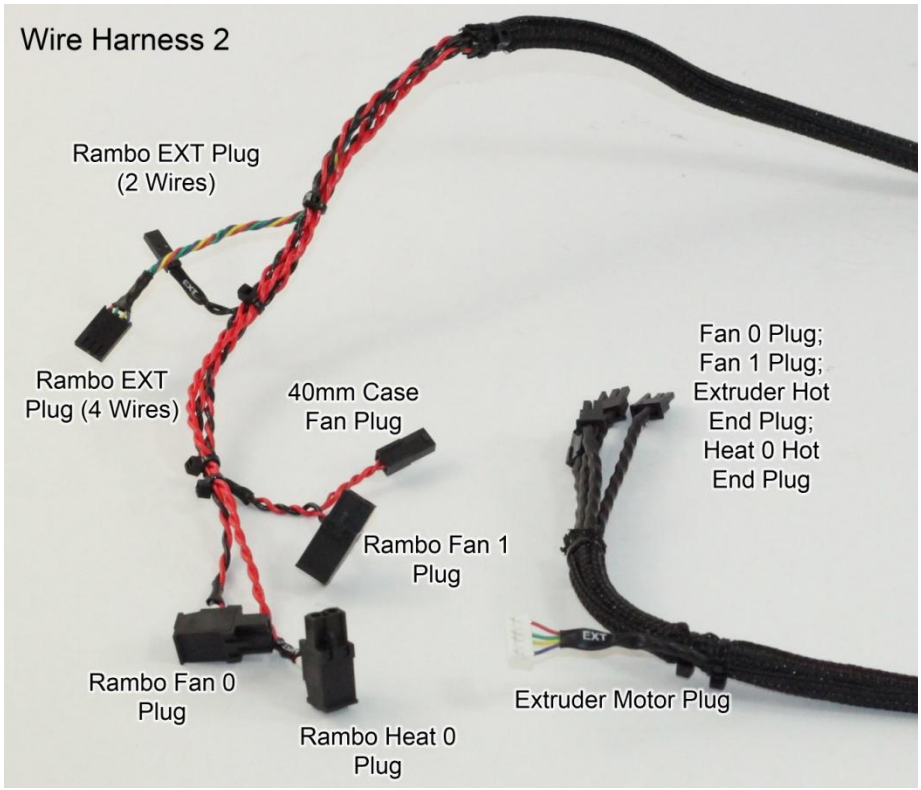
Wire Harness 2 – Connects the Extruder Motor, Fan 0, Fan 1, Extruder Hot End and Heat 0 Hot End.

Extruder Motor Plug is connected to the Extruder Motor

Fan 0 Plug is connected to the 50mm Fan

Fan 1 Plug is connected to the 40mm Fan

Extruder Hot End Plug and Heat 0 Hot End Plug are connected to the Hot End and are keyed to the small connecters from the Hot End



Rambo EXT Plug (4 Wires) is connected to E0 in the Motors Section of the RAMBo

Rambo EXT Plug (2 Wires) is connected to T0 in the Thermistors area of the RAMBo

Rambo Fan 0 Plug is connected to Extruder Fan 0 in the Mosfet Outputs area of the RAMBo

Rambo Fan 1 Plug is connected to Extruder Fan 1 in the Mosfet Outputs area of the RAMBo

Rambo Heat 0 Plug is connected to Extruder 0 Heat in the Mosfet Outputs area of the RAMBo

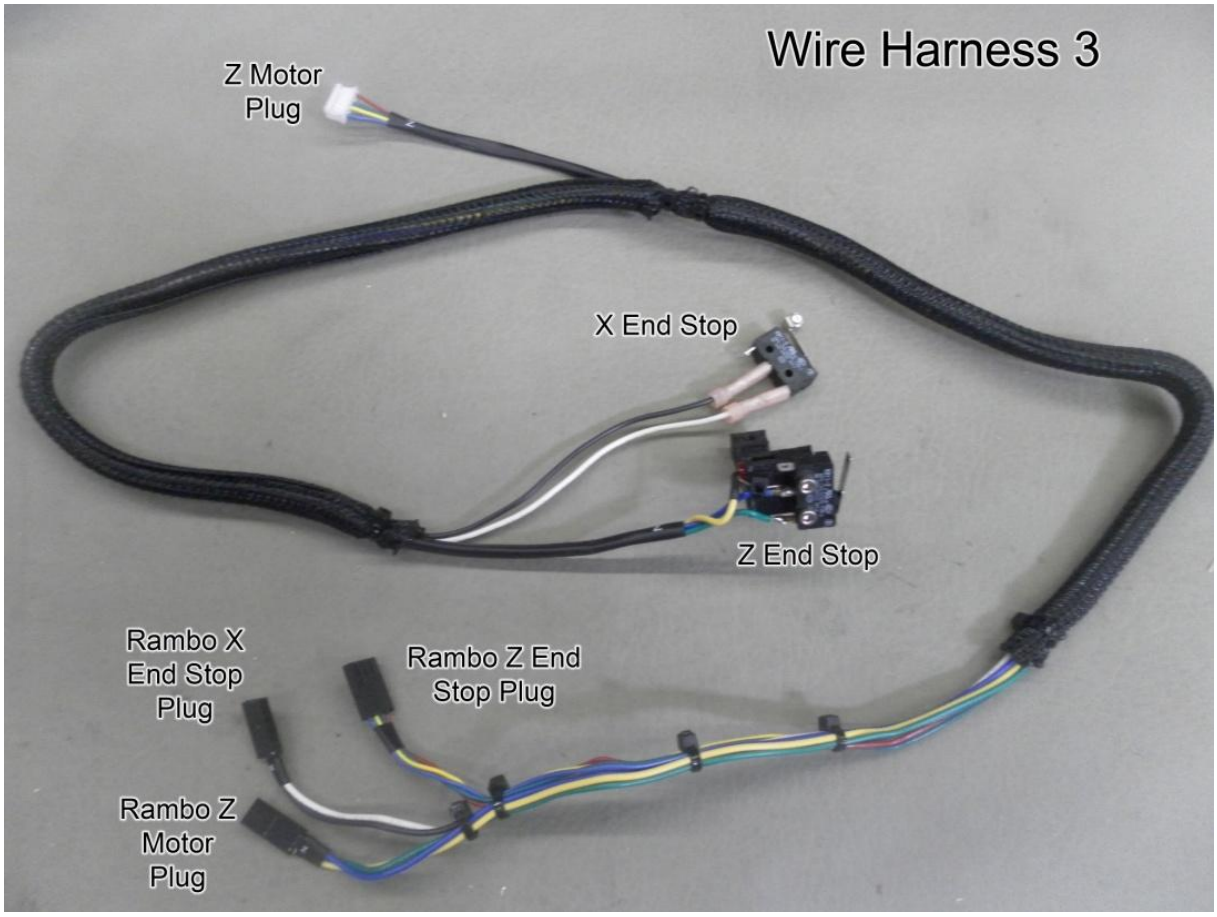
40mm Case Fan Plug is connected to the 40mm Fan attached to the Electronics Case top

Wire Harness 3 - Connects Z Motor, Z End Stop and X End Stop

Z Motor Plug is connected to the Z Motor

X End Stop is attached to the Top Plate

Z End Stop Plug is attached to the rear 10mm rod using Printed Z End Stop Clamp



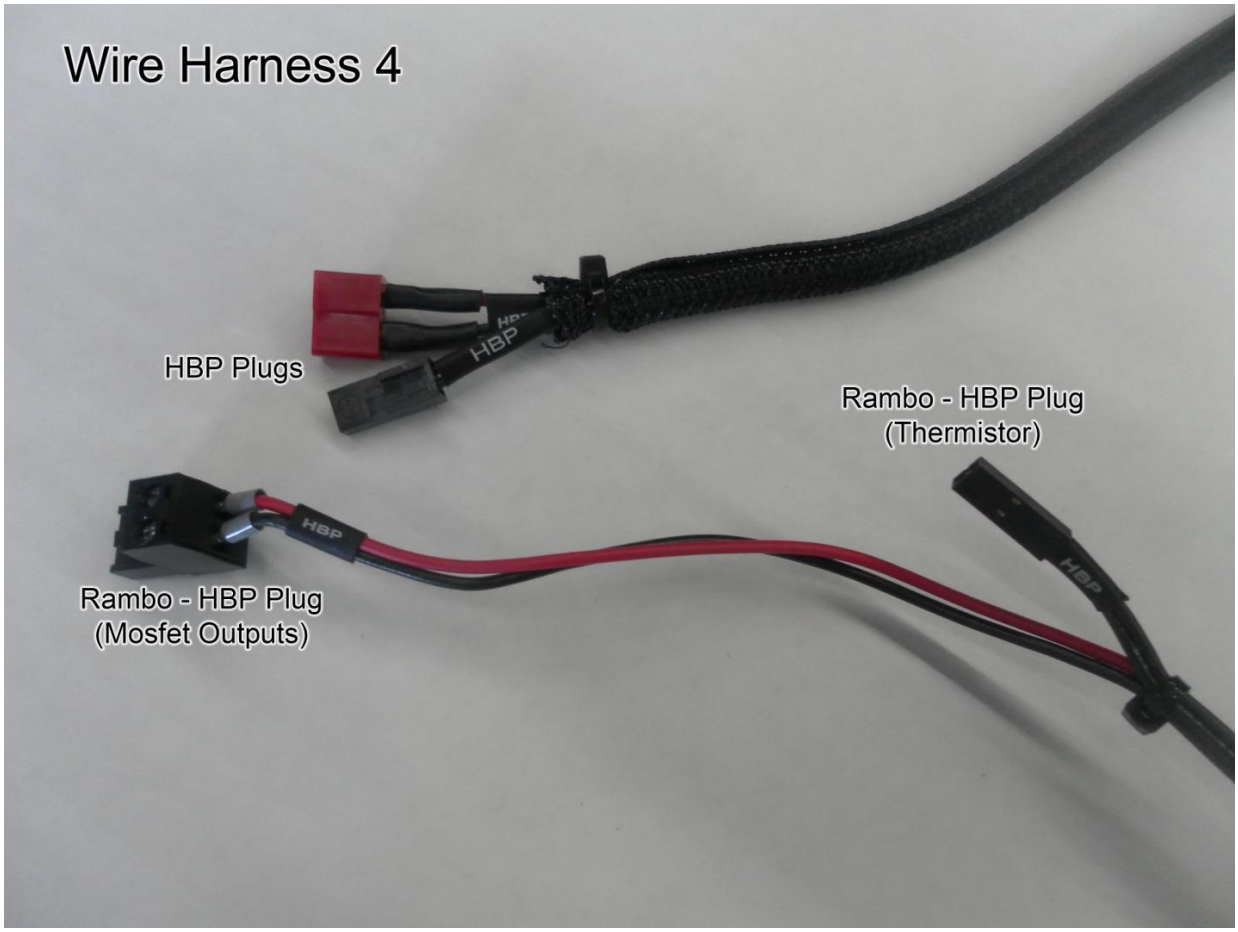
Rambo Z Motor Plug is connected to Z in the Motors area of the RAMBo. See the RAMBo illustration for proper wire orientation.

Rambo X End Stop Plug is connected to X in the Endstop Min area of the RAMBo. Make sure the empty pin of the Rambo X End Stop is over the positive pin.

Rambo Z End Stop Plug is connected to Z in the Endstop Min area of the RAMBo. There is a small triangle on the positive end of the connection. Make sure it is over the + of the Z Endstop.

Wire Harness 4 - Connects HBP

The HBP Connections are connected to the Heated Build Platform



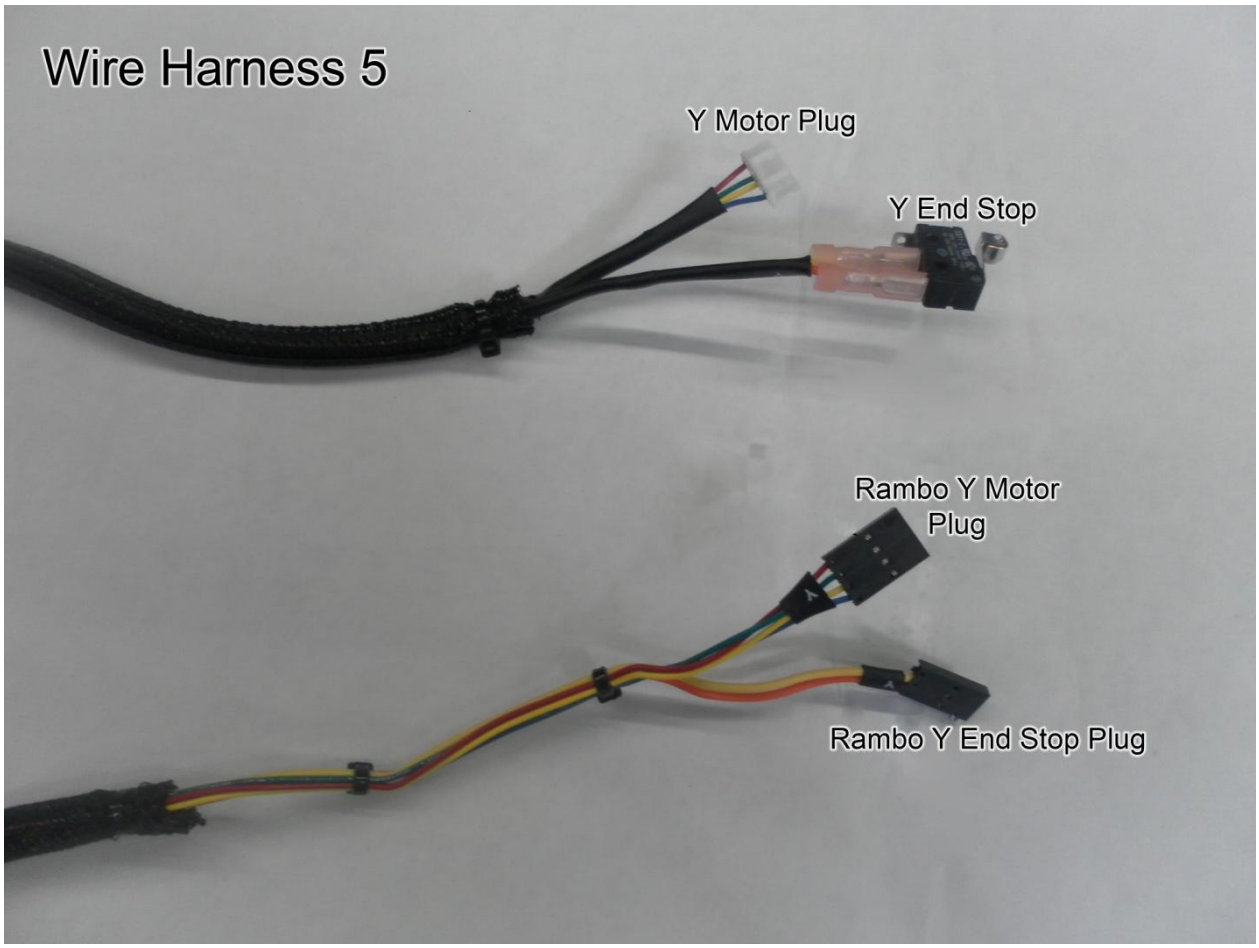
Rambo HBP Plug (Mosfet Outputs) is connected to Heated Bed in the Mosfets Output area of the RAMBo.

Rambo HBP Plug (Thermistor) is connected to T2 of the Thermistors area of the RAMBo

Wire Harness 5 - Connects Y Motor and Y End Stop

Y Motor Plug is connected to Y Motor

Y End Stop is connected to the Z Stage



Rambo Y Motor Plug is connected to Y in the Motors area of the RAMBo

Rambo Y End Stop is connected to Y in the Endstop Min area of the RAMBo. Make sure the empty pin of the Rambo Y End Stop is over the positive pin.

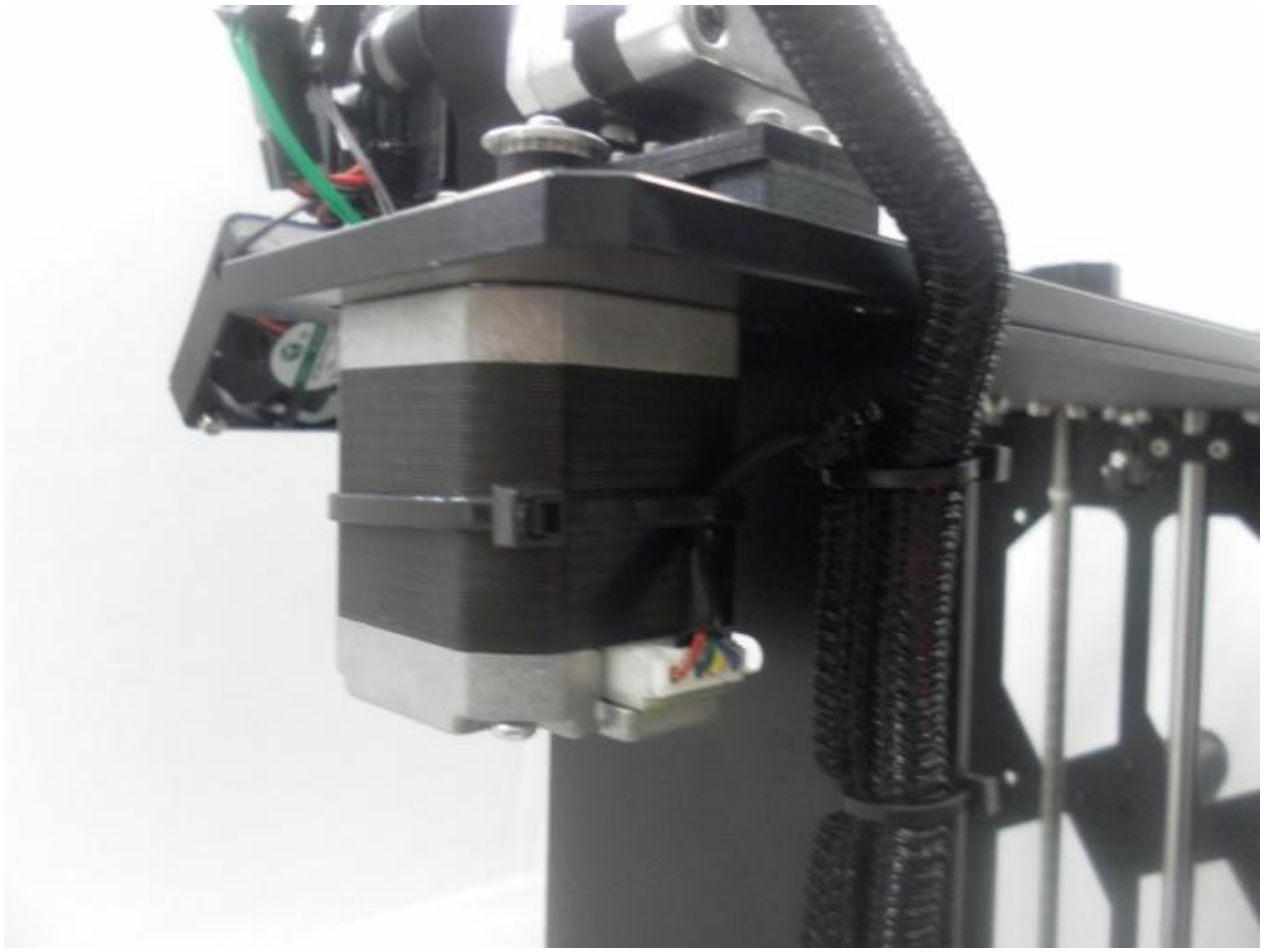
Connecting Wiring Harness to M2 Printer

Wiring Harness 1

Wiring Harness 1 is used to connect the X Motor to the RAMBo.

	
X Motor Plug attached to X Motor	RAMBo X Motor Plug connected to X in the Motors area of RAMBo

To ensure the X Motor Plug does not come loose during printing, secure the wiring to the motor with a cable tie as shown below.

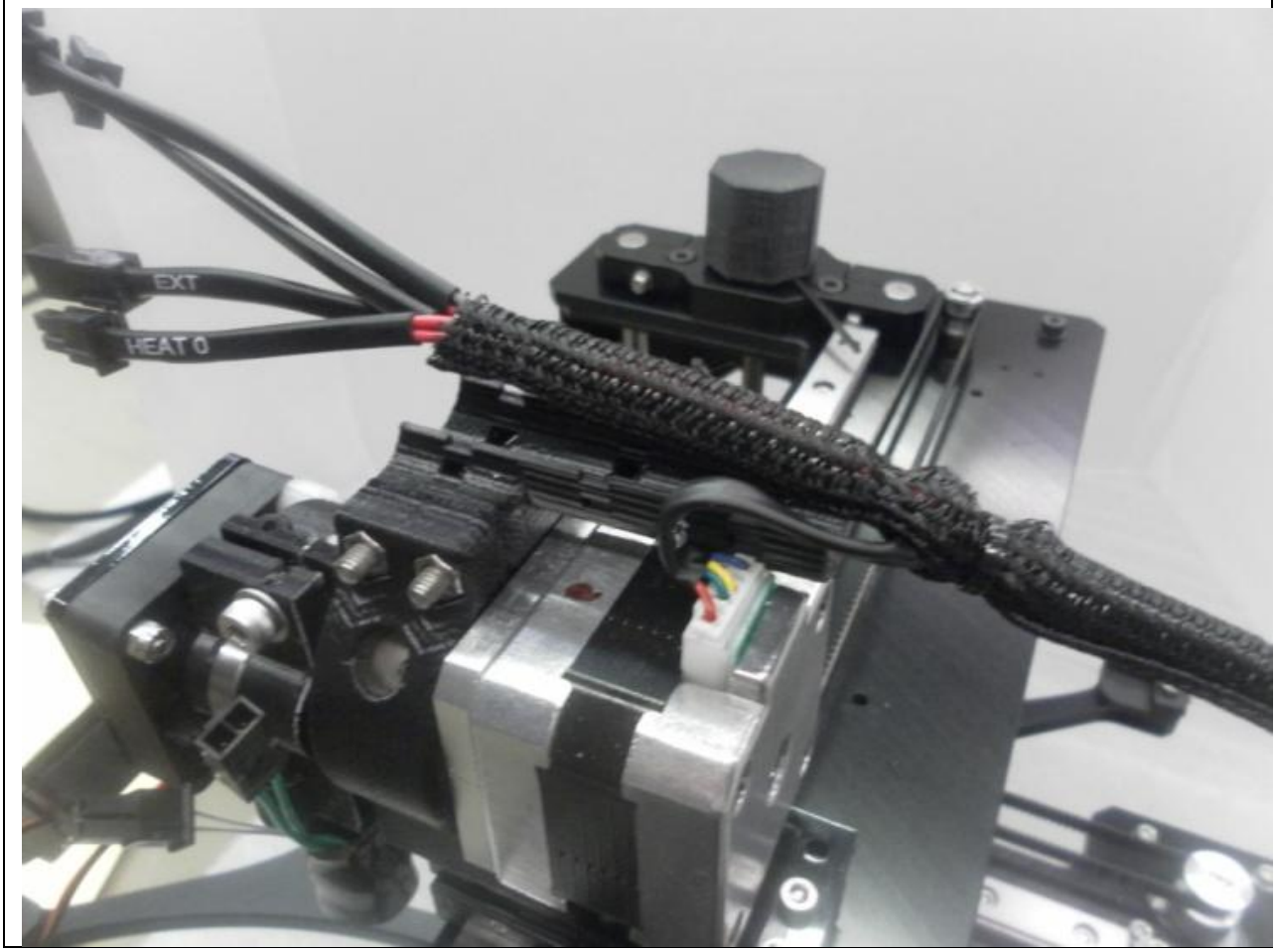


The wire harness will be secured to the frame after installing Wire Harness 2.

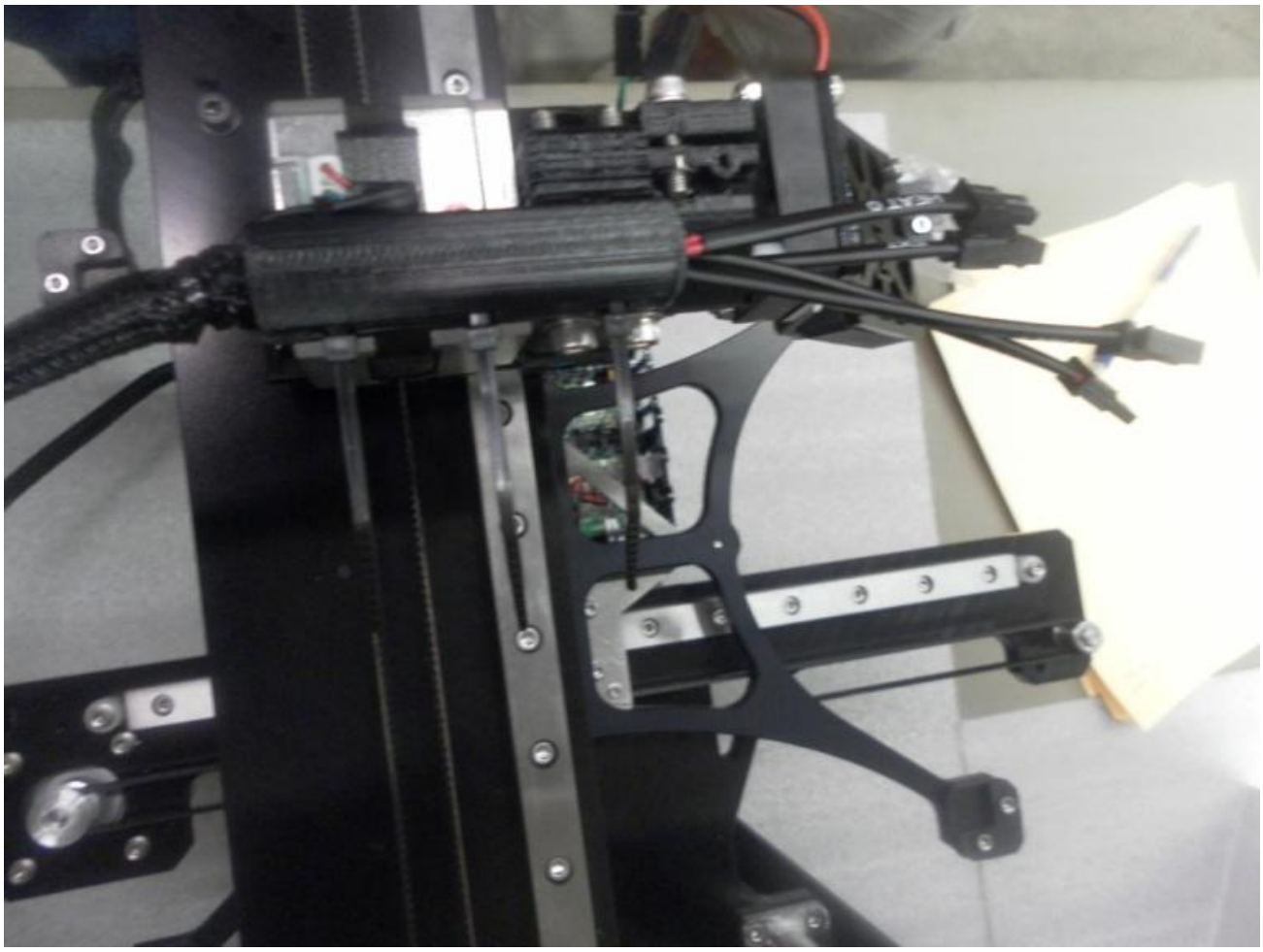
Wiring Harness 2

Wiring Harness 2 is used to connect the Extruder Motor, Fan 0, Fan 1, Extruder Hot End and Heat 0 Hot End.

The picture below shows Wiring Harness 2 with the Extruder Motor Plug connected to the Extruder Motor and with the remainder of the wiring harness resting in the Printed Extruder Motor Mount channel.

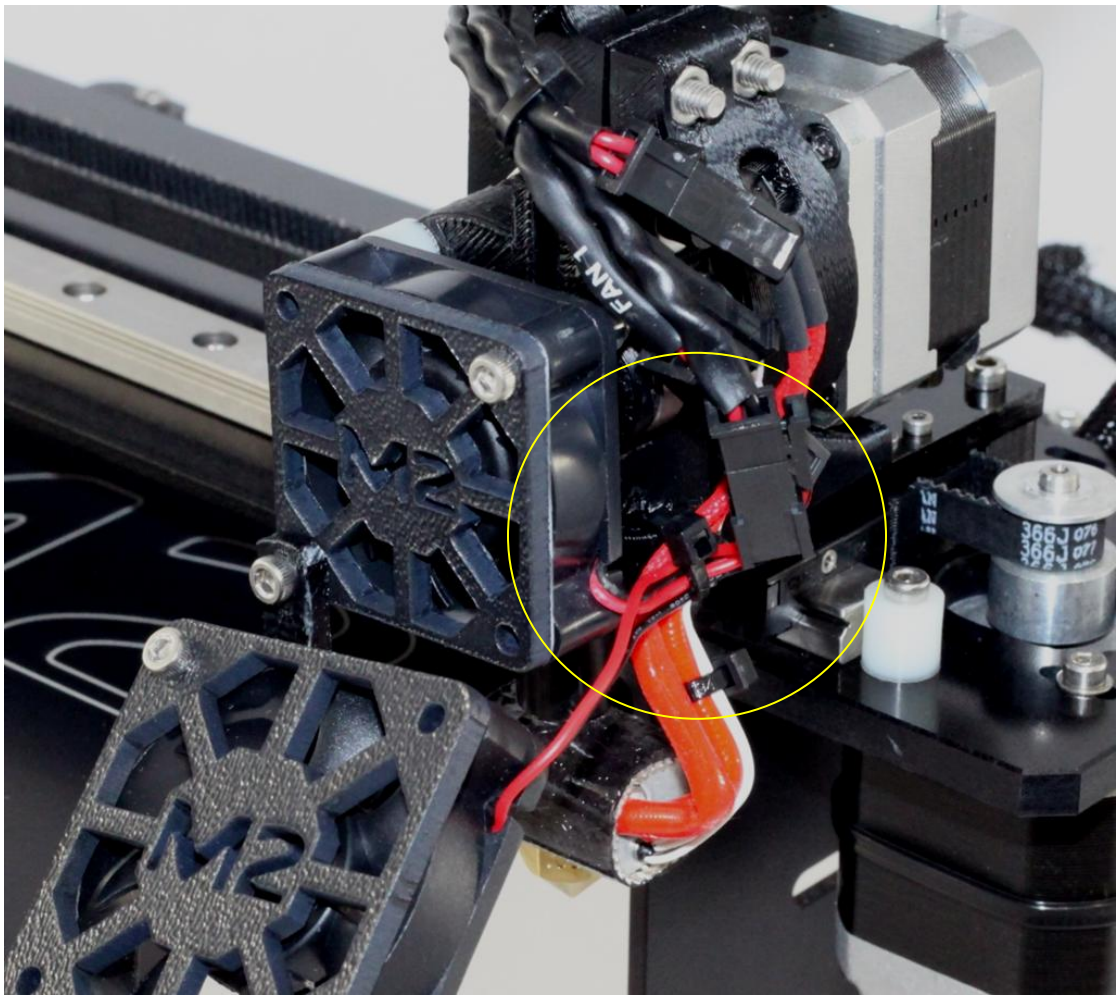


The following shows the Printed Extruder Motor Mount with Cover attached with cable ties that have not been trimmed. Be sure to trim them after tightening.



Connect the Fan 0 plug to the 50mm fan, Fan 1 Plug to the 40mm fan, Heat 0 Plug and Extruder Plug to the Hot End plugs with the corresponding male and female plugs.

Secure all the wires to the Hot End using a cable tie as shown below (Do not attach the cable tie directly to the Hot End).



Connect the 40mm Fan attached to the Electronics Case Top to the 40mm Fan Plug on Wiring Harness 2.

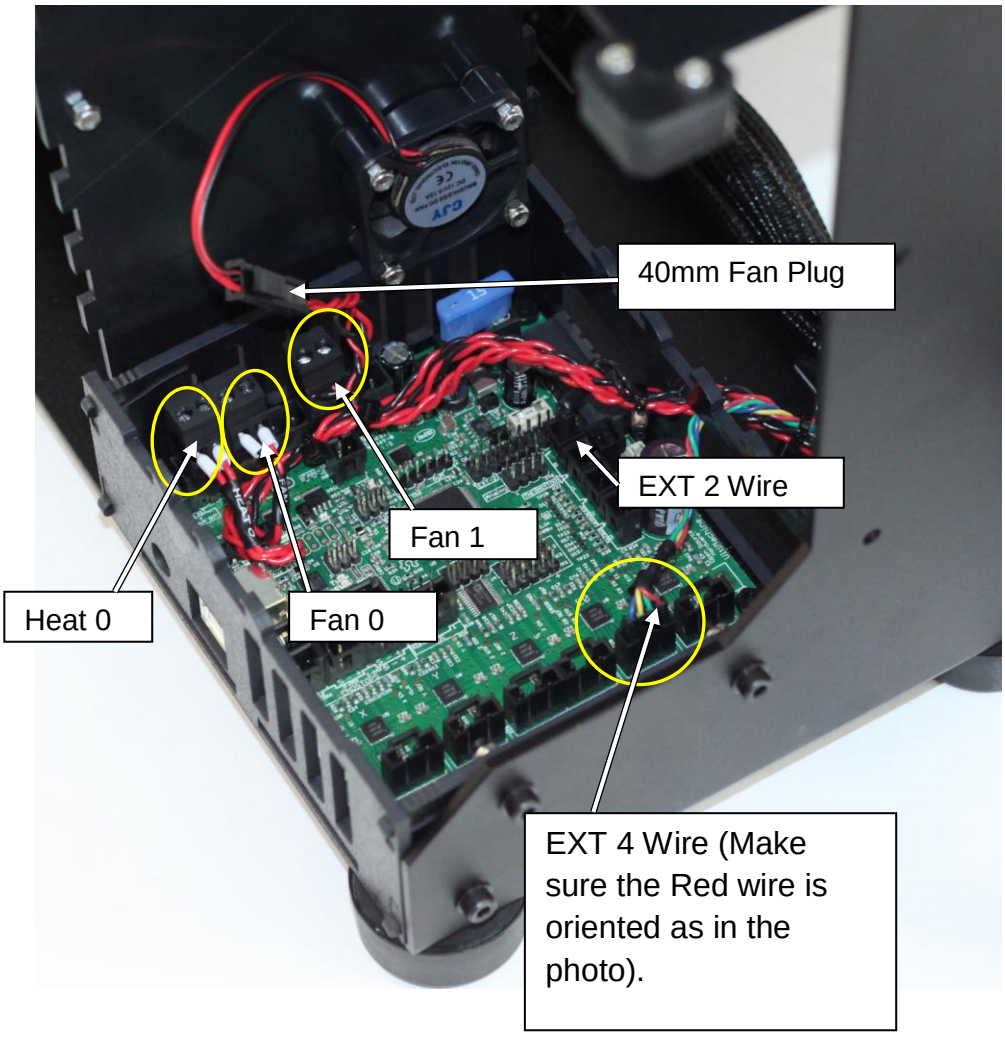
Connect Heat 0 to Heat 0 on the RAMBo

Connect Fan 0 to Fan 0 on the RAMBo

Connect Fan 1 to Fan 1 on the RAMBo

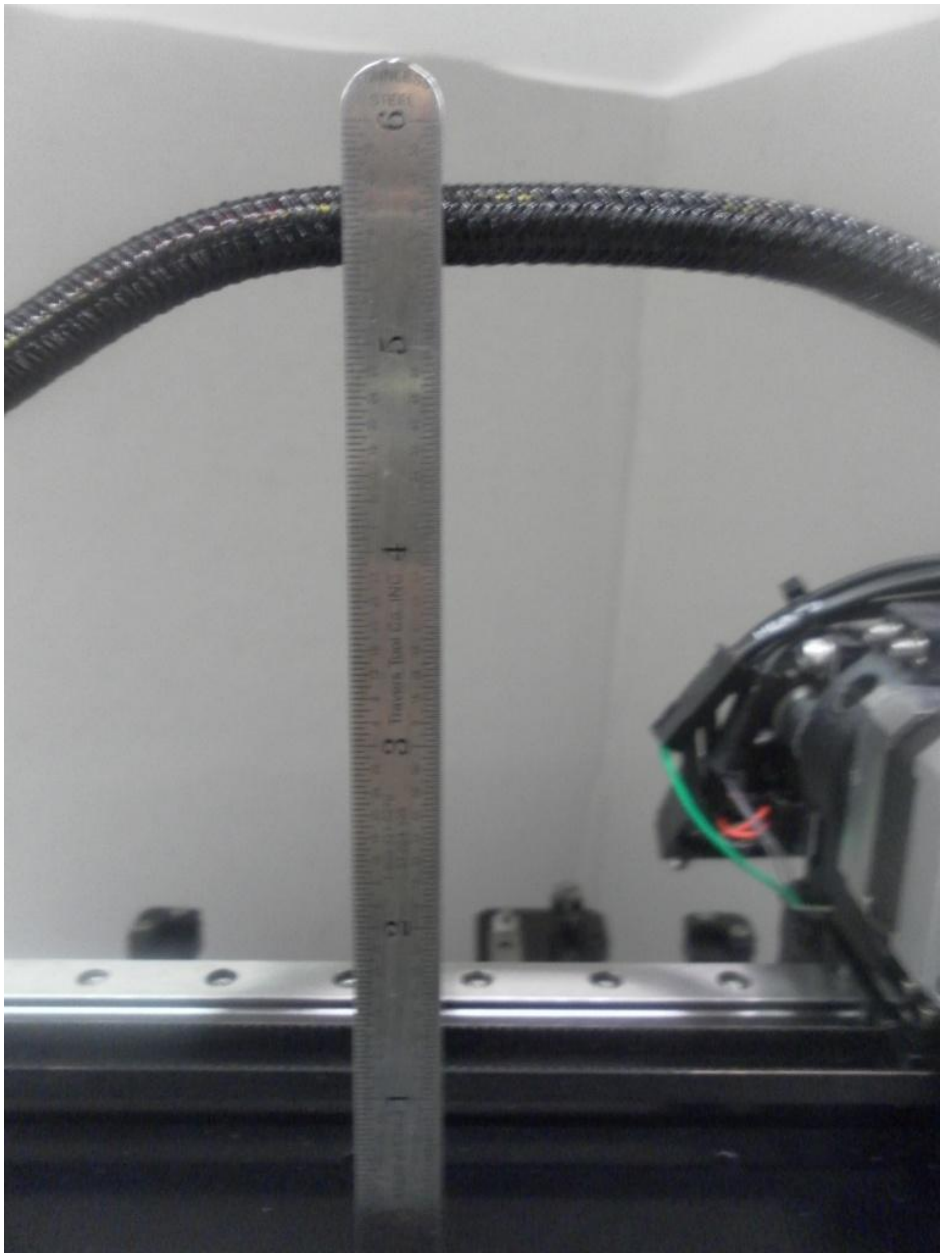
Connect EXT 2 Wire to T0 on the RAMBo

Connect EXT 4 Wire to E0 on the RAMBo

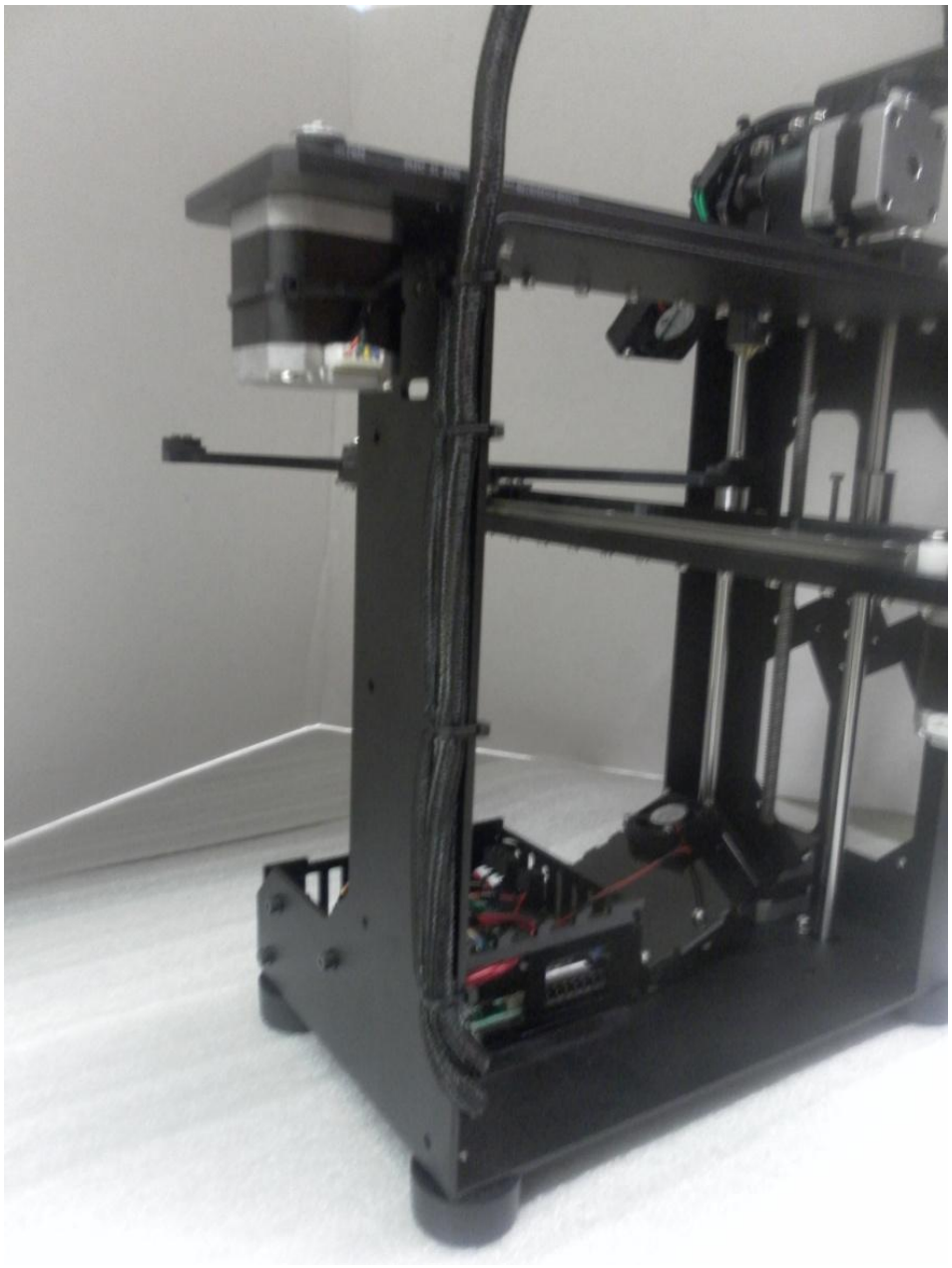


Attach Wire Harness 1 and 2 to M2 Frame

There must be enough slack in the harness to allow the extruder to slide freely. We recommend there is at least 5.5 inches of slack measured from the Top Plate to the crest of the harness when the extruder motor is moved to the right end of the rail (viewed from the back of the machine). See below for clarification.



Wire Harness 1 and Wire Harness 2 are secured together along the edge of the frame using 4 cable ties as shown in the photo below.

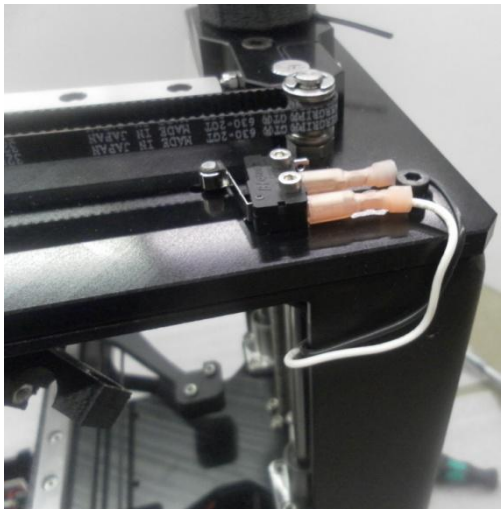


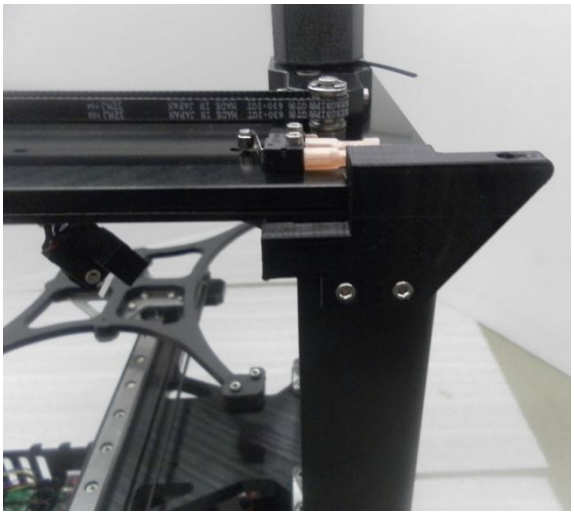
Wiring Harness 3

Wiring Harness 3 is used to connect the Z Motor, Z End Stop and X End Stop.

This harness runs along the base of the frame and then up along the inside of the rear of the frame towards the Top Plate.

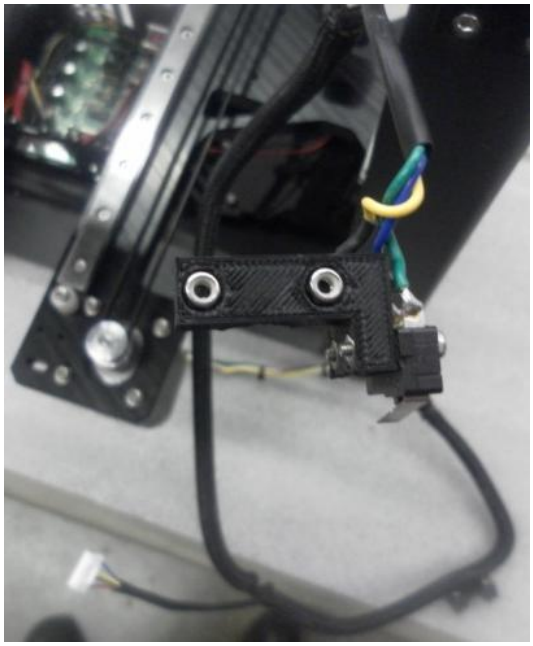
The X End Stop is attached to the Top Plate using 2 M2.5X12 SS Socket Cap screws as shown in the photo on the left. Bending the wires as shown allows easier attachment of the Printed X End Stop Wire Shroud. See photo on the right showing Printed X End Stop Wire Shroud attached to the M2 frame using 2 M3X8 SS Socket Cap Screws.



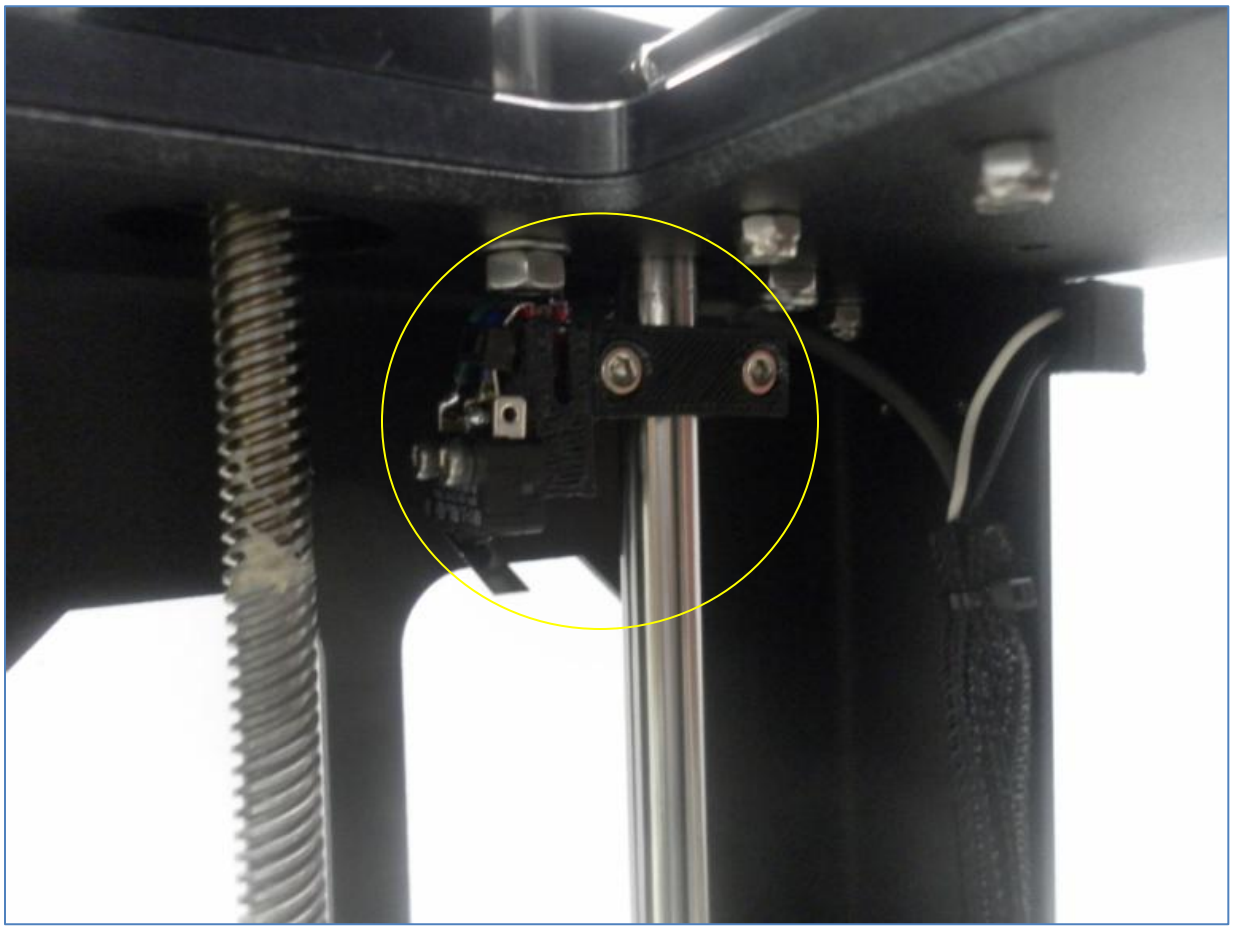


The Z End Stop is attached to the rear 10mm rod using the Printed Z End Stop Clamp, 2 M3 Nylocks and 2 M3X12 SS Socket Cap Screws.

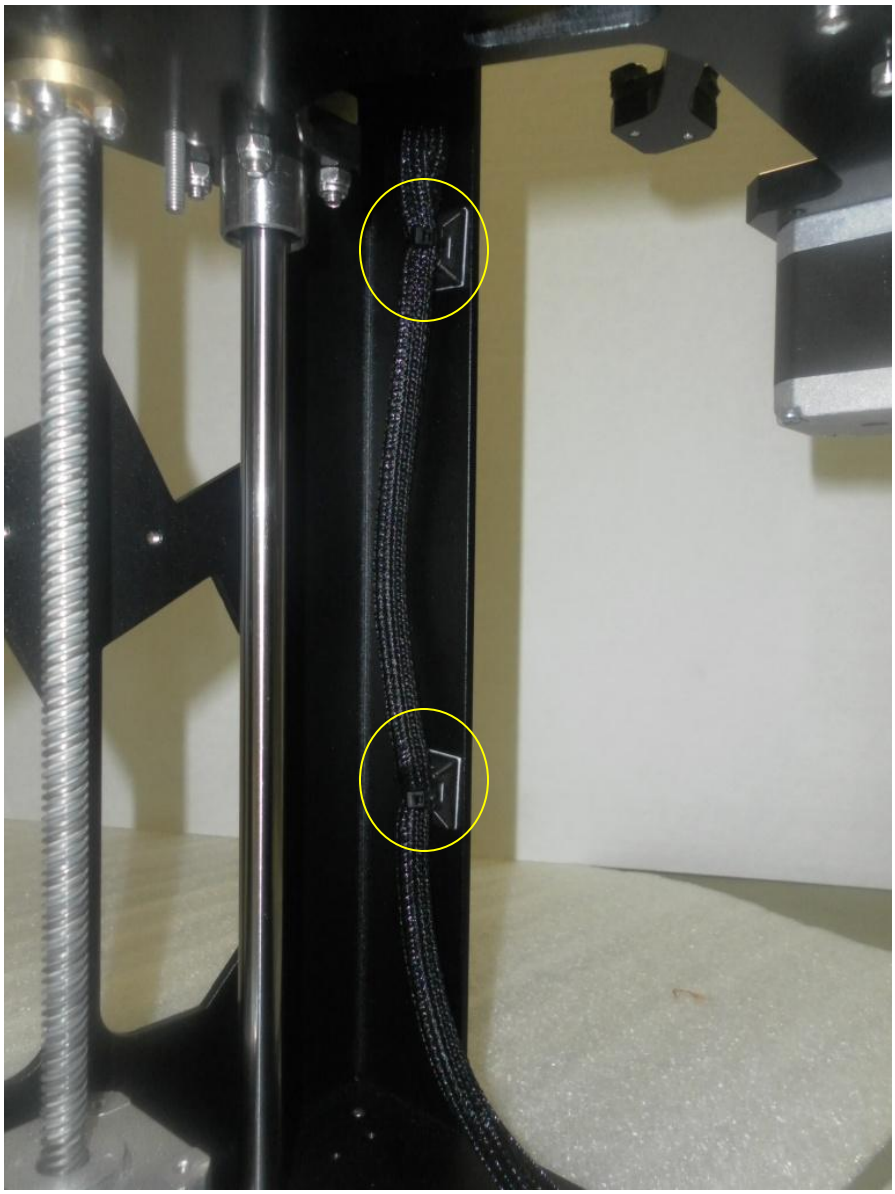
The photo on the left shows the Printed Z End Stop Clamp and 2 M3X12 SS Socket Cap Screws. The Photo on the right shows the Z End Stop with M3 Nylocks inserted.



The Z End Stop is attached to the rear 10mm rod as shown below. Be certain the wire attached to the Z End Stop runs behind the 10mm rod.

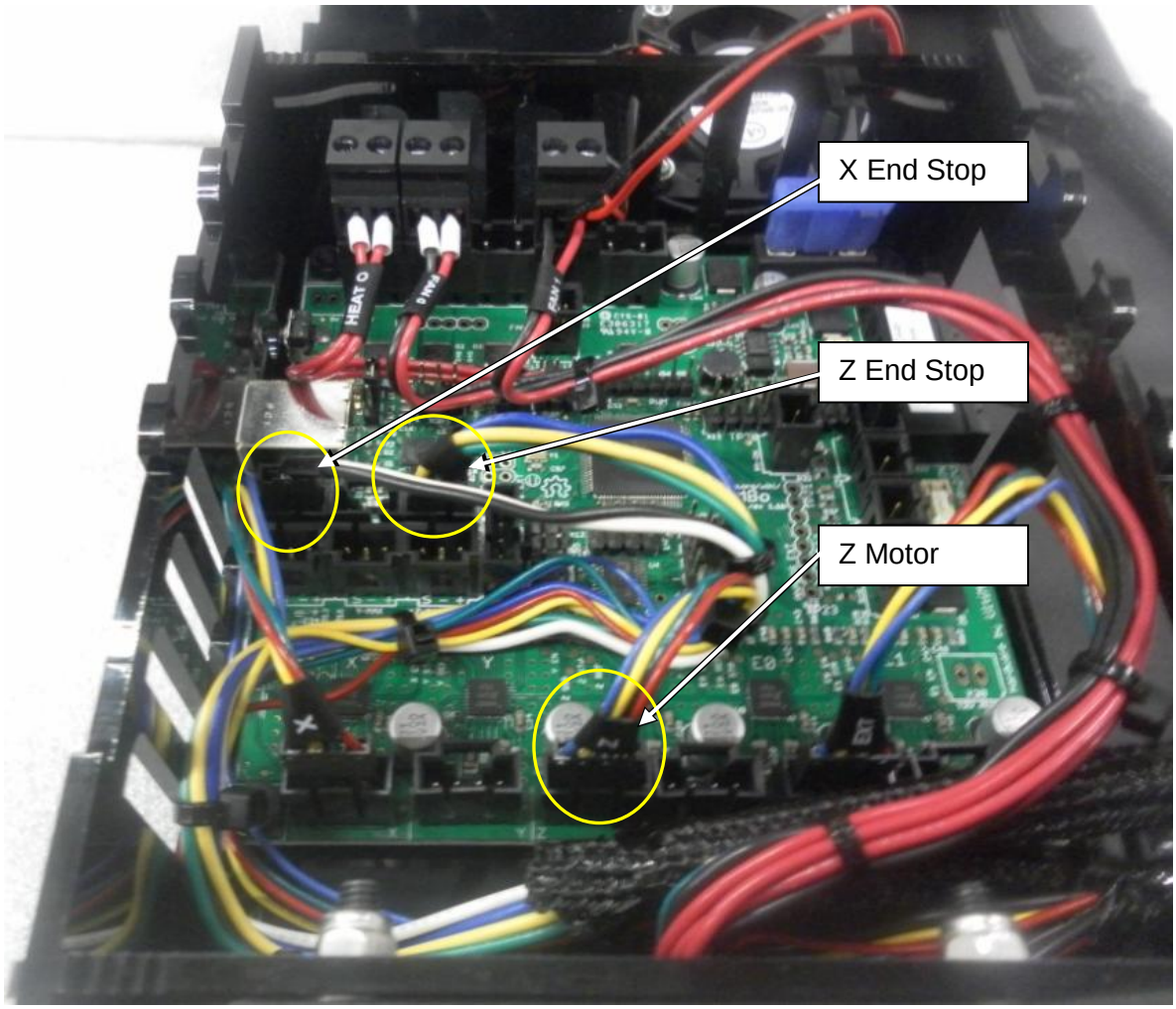


After the Z and X end stops are done, the harness gets attached to the frame using 2 cable tie anchors as shown in the photo below.



The Z Motor Plug can now be attached to the Z Motor. Use a cable tie anchor to secure the Z wire to the frame as shown.

Connect Wiring Harness 3 to RAMBo as shown below.



The Z Motor connector must be attached with the red wire towards the rear of the RAMBo.

On the Z End Stop plug, there is a small triangle embossed on the connector. The triangle on the connector must be attached to the positive (+) pin on the RAMBo. See the RAMBo illustration (shown earlier in the document) for clarification on which pin is positive.

The X End Stop plug has room for 3 pins, but only 2 are used. The empty pin must be placed over the positive pin on the RAMBo.

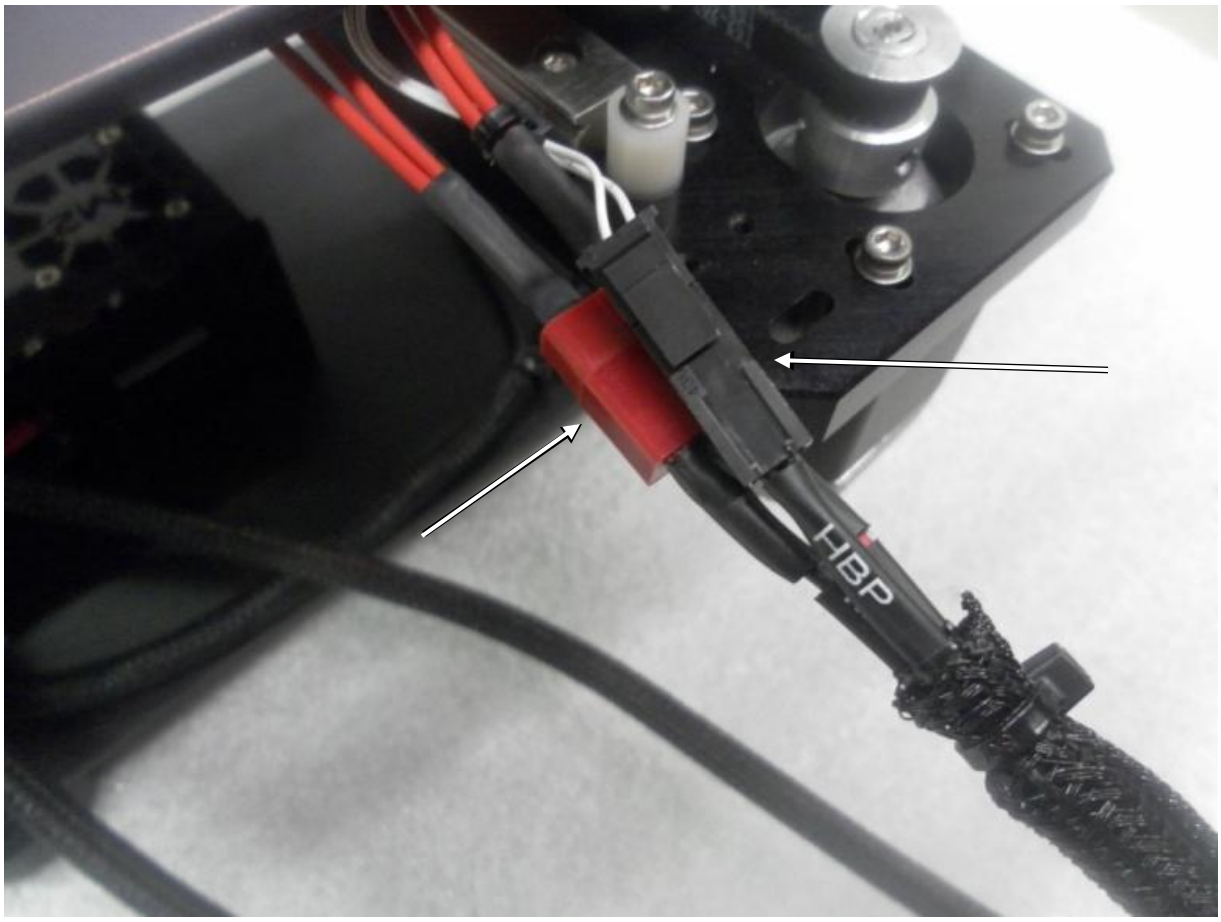
Do not secure the wiring harness to the frame at this time. It will be attached with Wiring Harness 5.

Wiring Harness 4

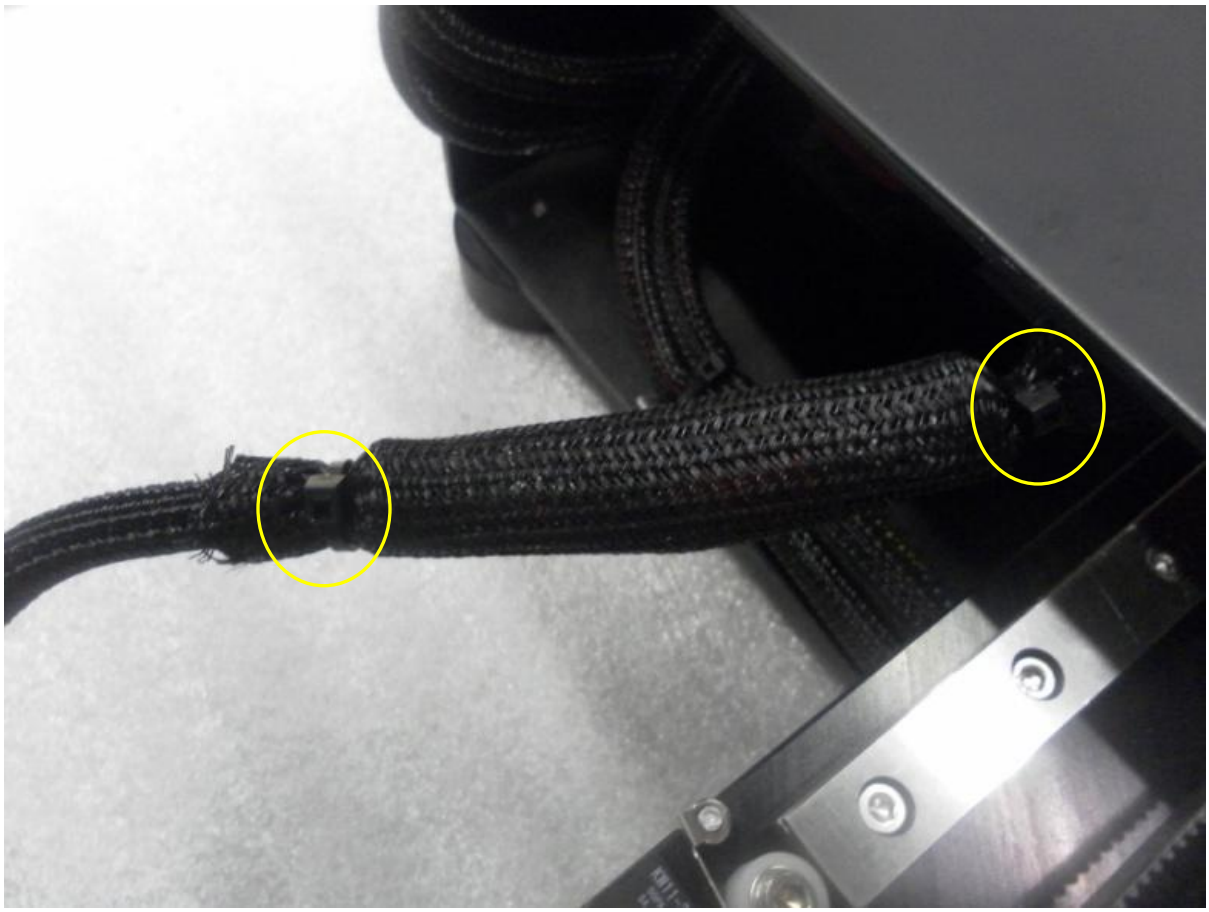
Wiring Harness 4 is used to connect the Heated Build Platform (HBP).

This harness runs along the base of the frame and will be attached later with Wiring Harness 3 and 5.

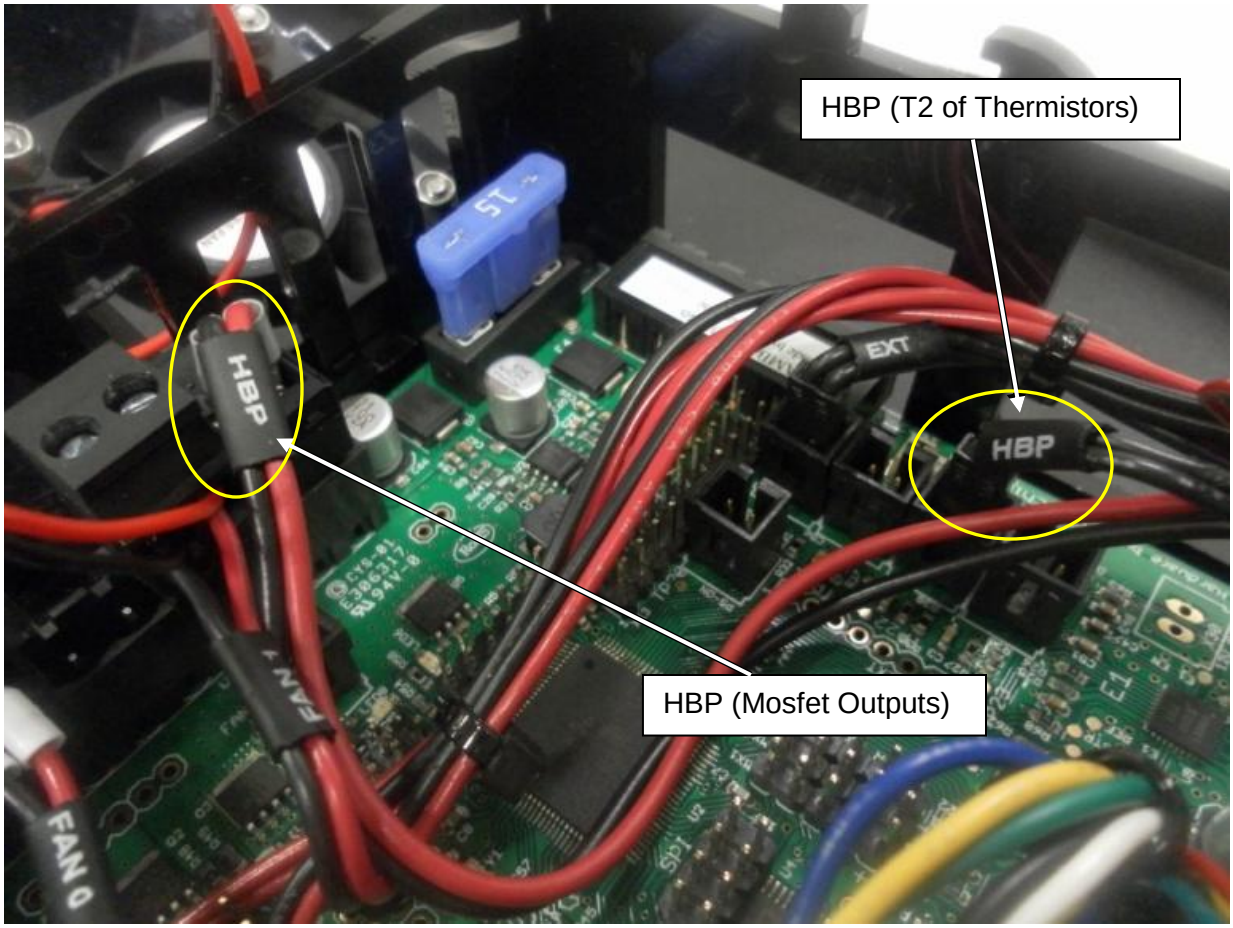
There are 2 HPB plugs used to connect to the Heated Build Platform as shown below.



After connecting the 2 HBP plugs, this section of wire needs to be covered by loom as shown in the photo below. Secure the ends of the loom with cable ties.



Connect Wiring Harness 4 to RAMBo as shown below.

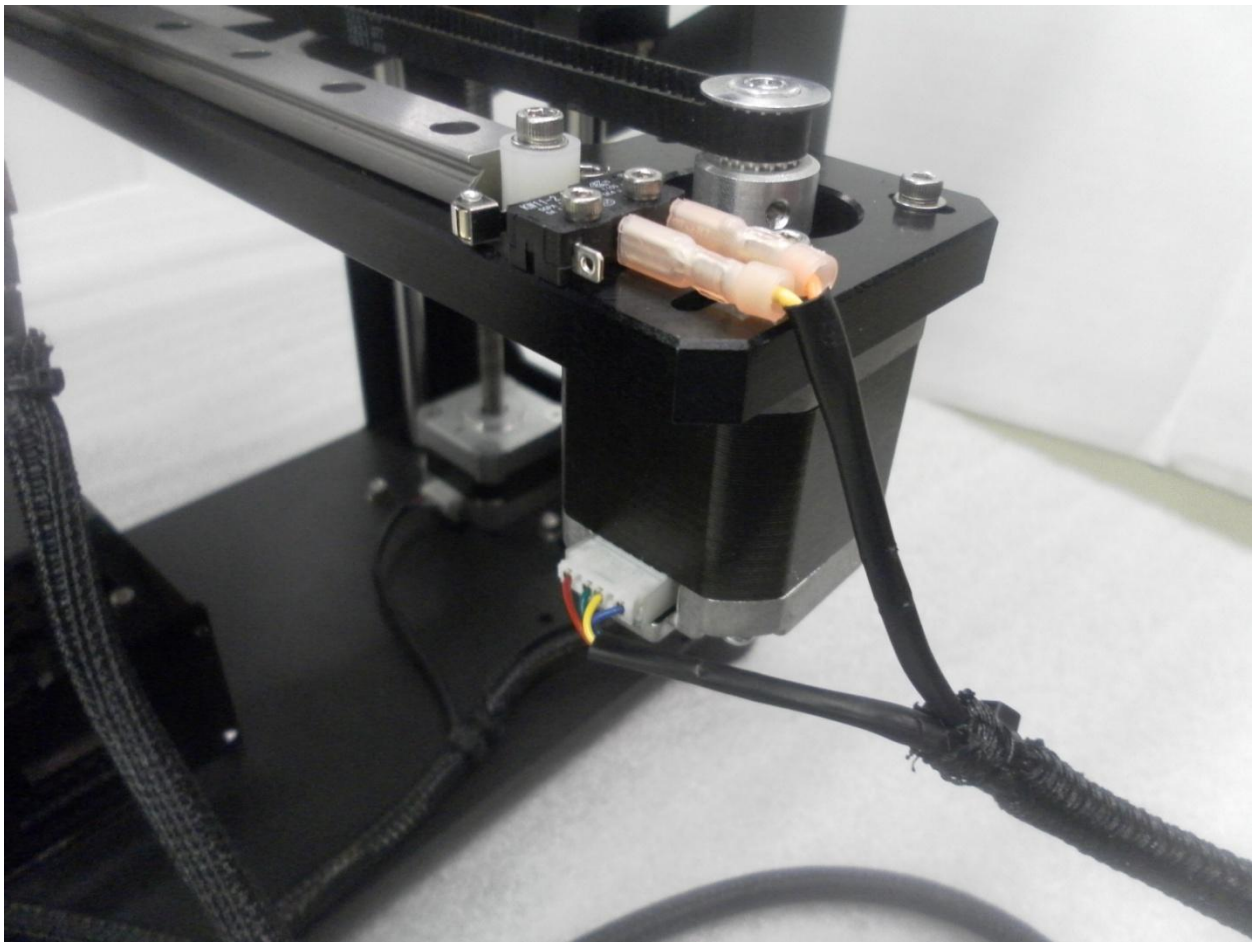


Wiring Harness 5

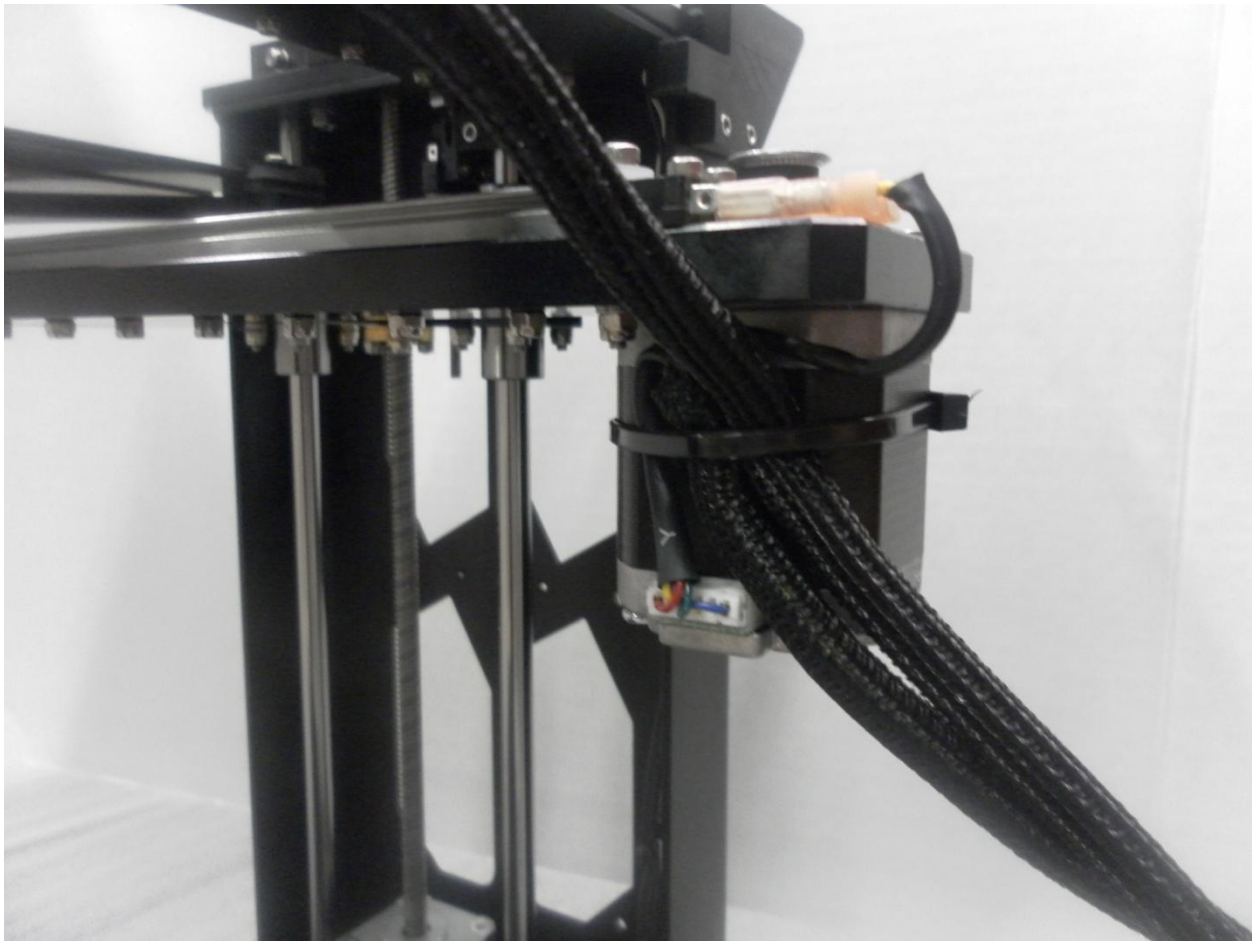
Wiring Harness 5 is used to connect the Y Motor and Y End Stop.

This harness runs along the base of the frame along with Wiring Harness 3 and 4.

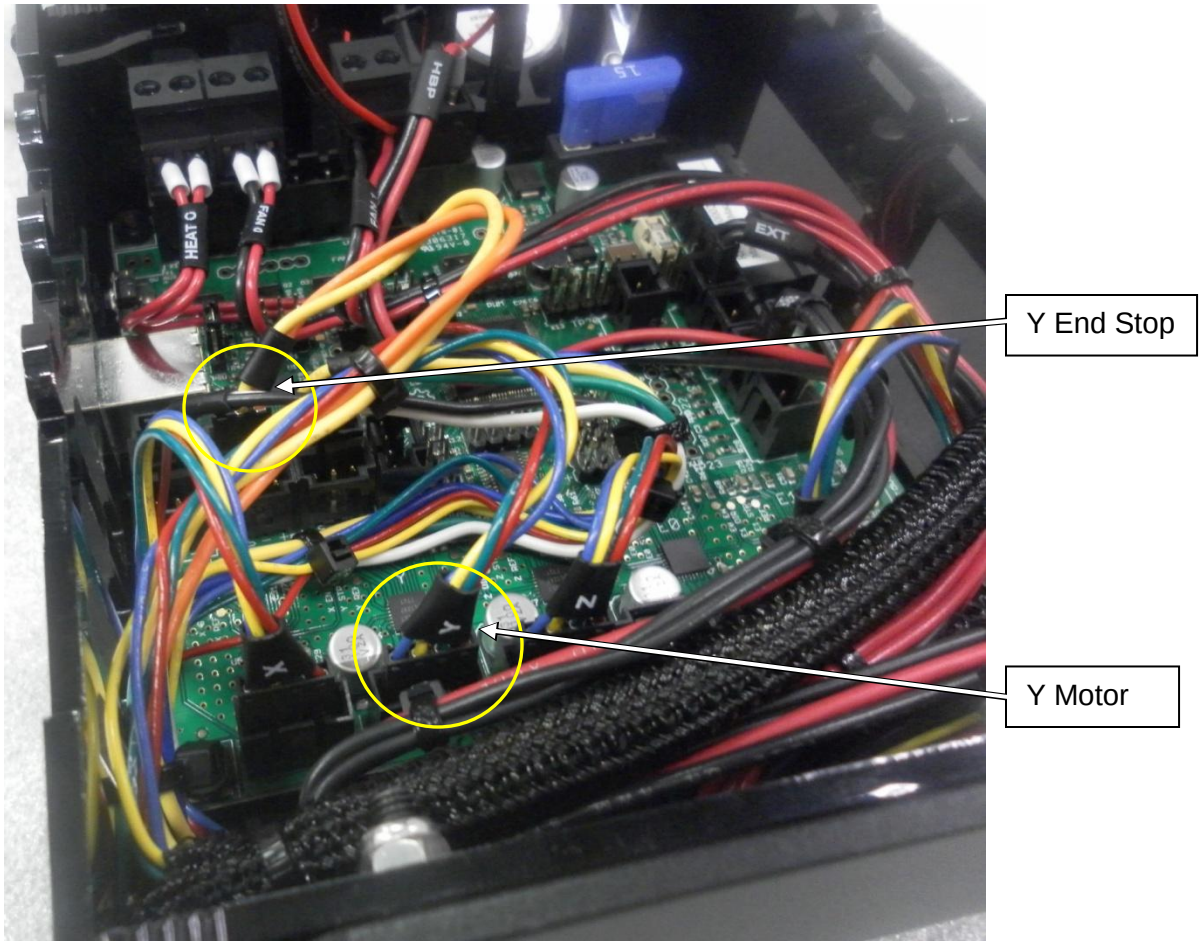
The photo below shows the Y Motor plug attached to the Y Motor and the Y End Stop attached to the Z Stage using 2 M2.5X12 SS Socket Cap screws.



Use a large cable tie to secure Wiring Harness 4 and Wiring Harness 5 as in the photo below. Note that Wiring Harness 5 is below Wiring Harness 4 in the photo. The cable tie provides strain relief for the Y Motor connector.



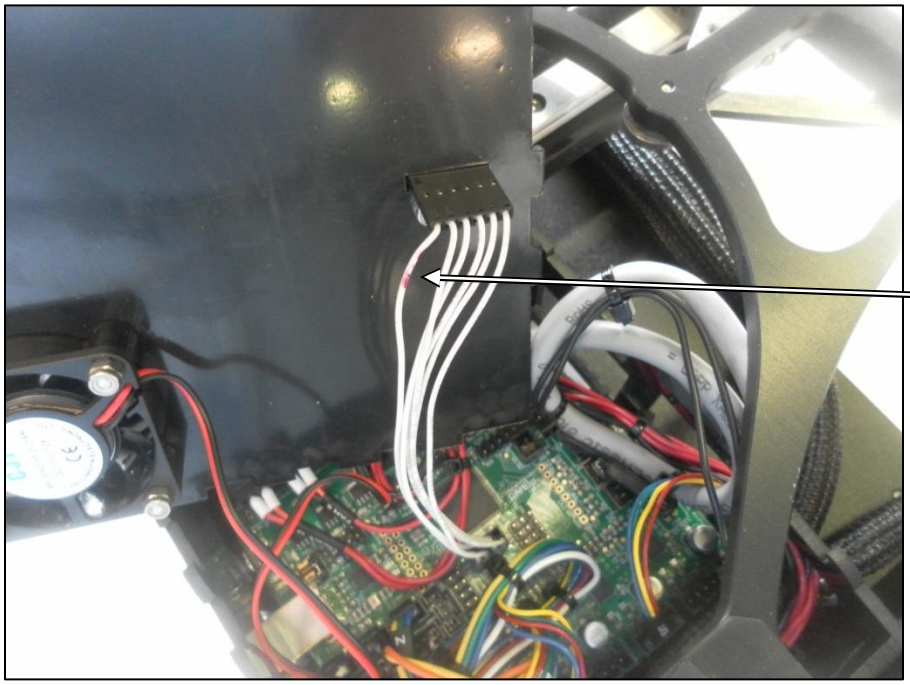
Connect Wiring Harness 5 to RAMBo as shown below.



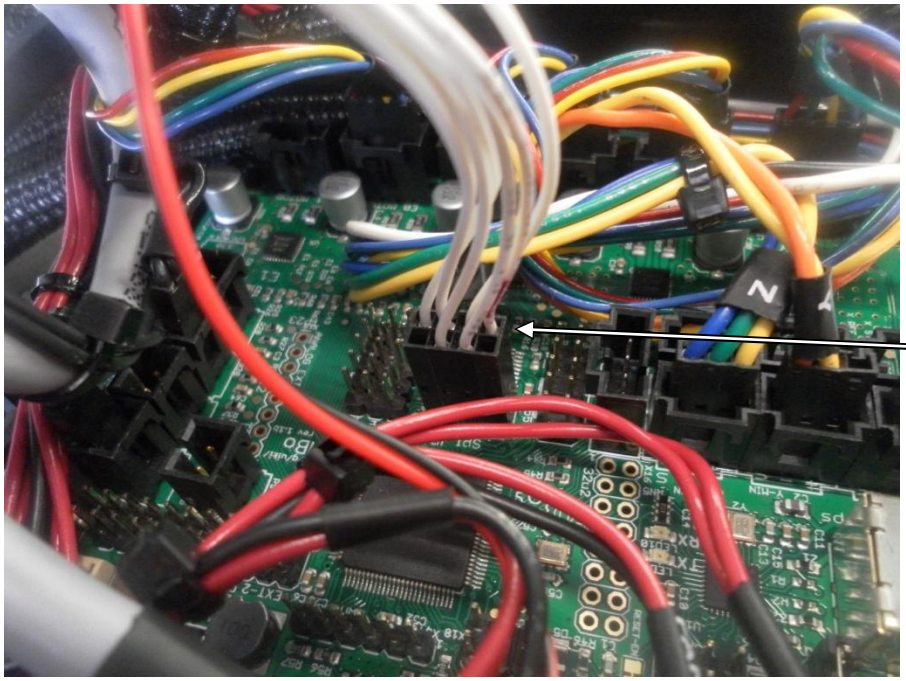
The Y Motor must be connected with red wire towards the rear of the RAMBo.

The Y End Stop plug has room for 3 pins, but only 2 are used. The empty pin must be placed over the positive pin on the RAMBo.

Attach SD Card Reader to RAMBo



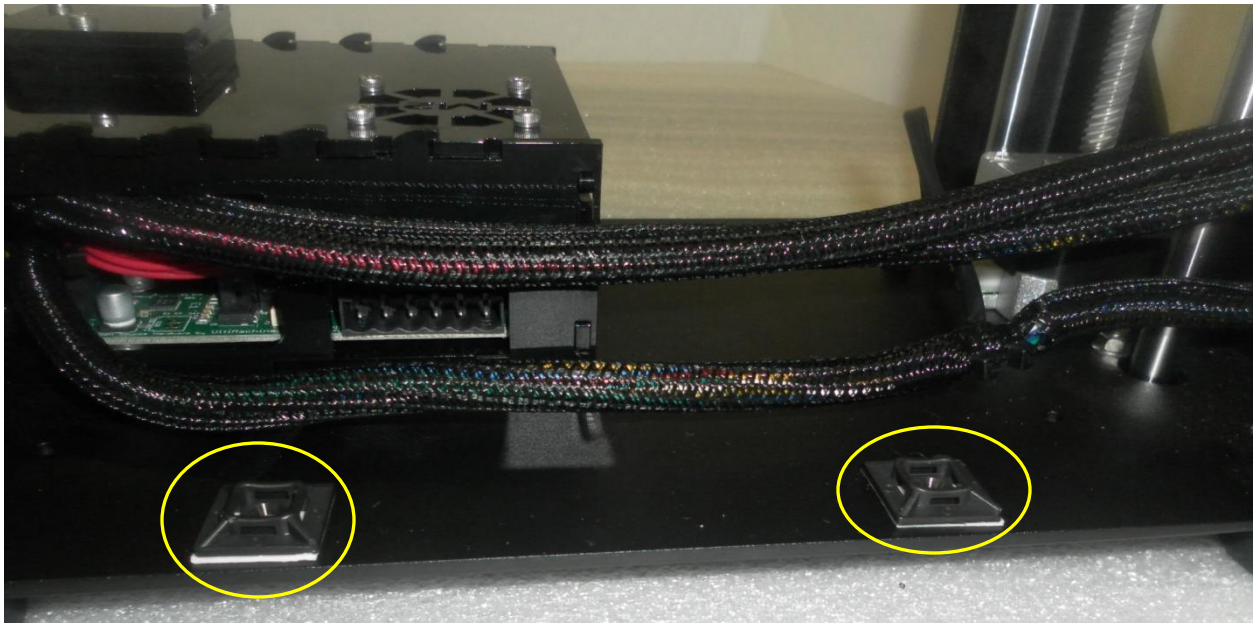
Connect the SD Card Reader Cable to the SD Card Reader so that the color coded wire is closest to the 40mm Fan attached to the case top.



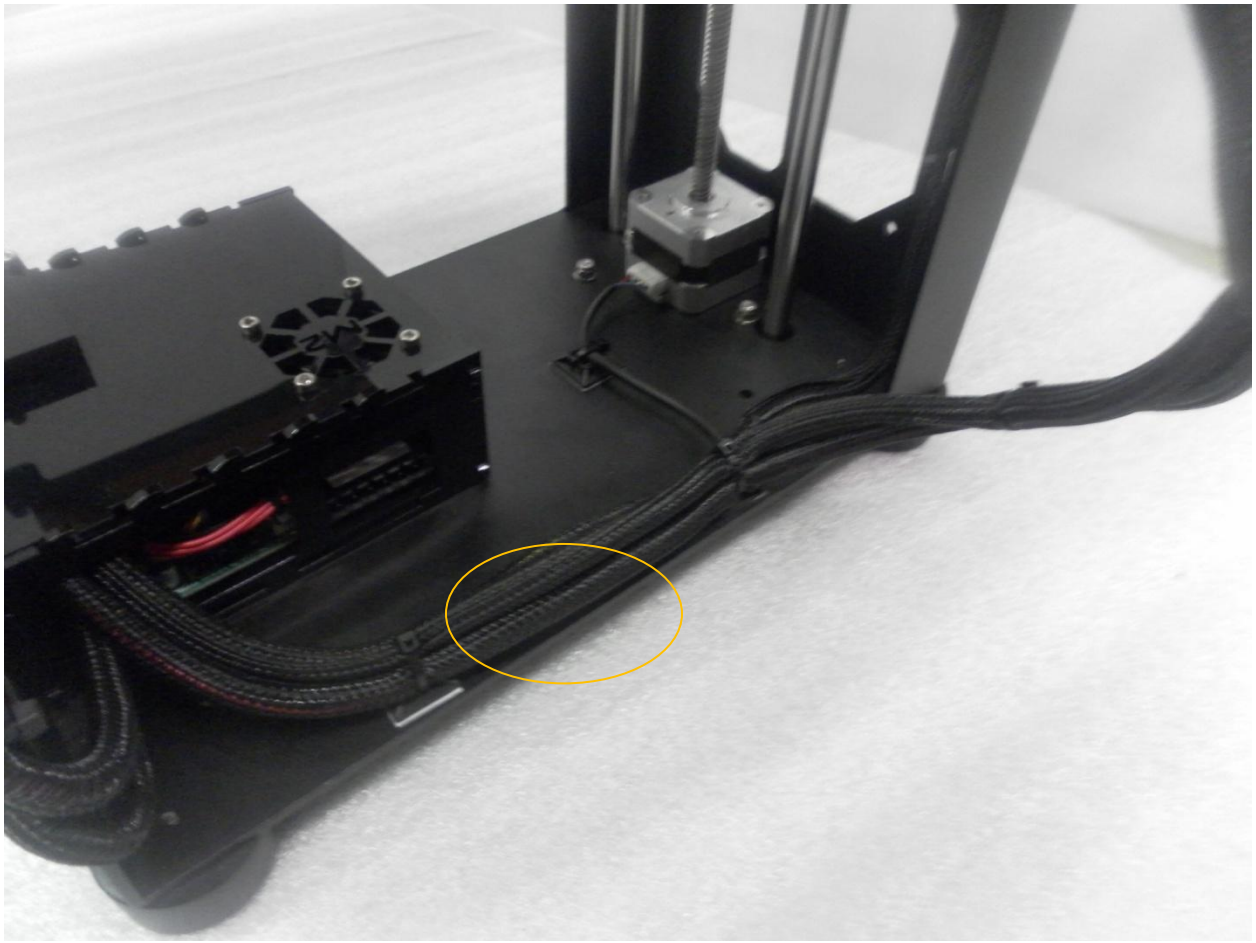
Connect the other end of the SD Card Reader Cable to the SD /SPI pins on the RAMBo. Note the four wires are inserted on the pins closest to the motors connection on the RAMBo. See RAMBo illustration at beginning of the document.

Rear of Machine Front of Machine

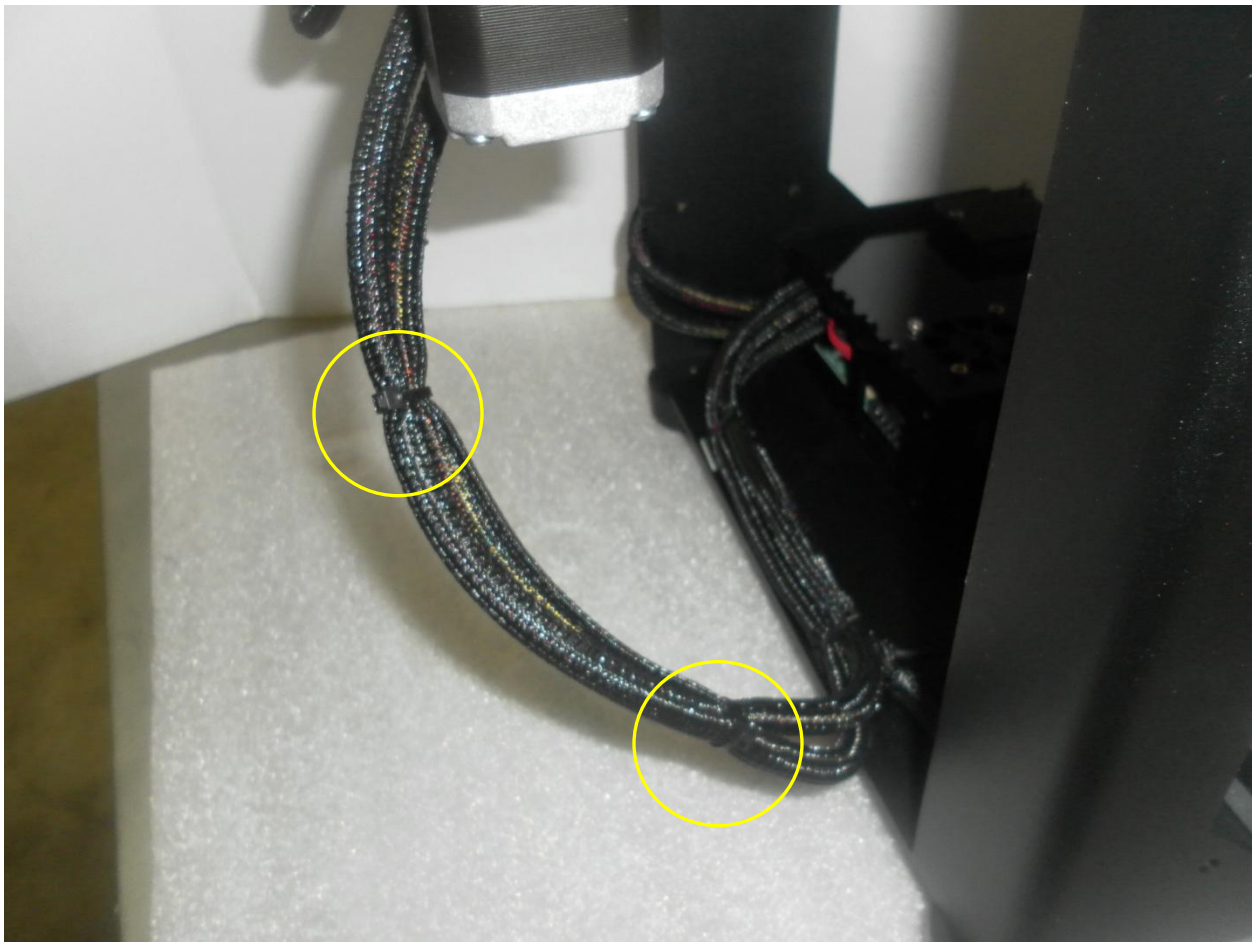
Attach 2 cable tie anchors to the frame as shown in the photo below.



Wiring Harnesses 3, 4 and 5 are attached to the frame via the cable tie anchors as shown below. Leave approximately a ½ inch gap under the harnesses between the two anchors. This allows the power cables to plug-in under the harness. The yellow circle indicates where the power cables will pass under the harness.



Cable tie Wiring Harnesses 4 and 5 together as shown below. Move the Z platform up and down to ensure there is enough slack in the harness. If not, reposition the harness until there is enough slack. Also, slide the build platform all the way forward and all the way back to ensure there is enough slack in the harness. If not, reposition the harness until there is enough slack. There should always be play in the harness, it should never be taut.



M2 Wiring Complete!