

MTW Create

Assembly Guide

1 — Last update: 2016/09/20

Maker's Tool Works

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3D PDF And how to view it.

We make extensive use of 3D PDF files to help you visualize how the printer is suppose to go together. 3D PDFs let you pan, zoom and rotate the model, as well as hide and show individual parts or assemblies in the model to easier understand what is going on.

3d PDF is an Open file format, but unfortunately it is not as well supported as the standard PDF file format. In particular, most PDF Browser plugins will not properly display them.

The Genuine Adobe Acrobat Reader is one excellent choice, but there are a variety of viewers available for all platforms. If you Google for "[3d PDF Viewer](#)" you should be able to find an option that you like.

>>>>>[MTW Create 3D PDF Link](#)<<<<<<

Install the Z Rails

Install the Top Caps

Parts required.

- 2 – 450mm Extrusions
- 2 – Top Cap Plate
- 4 – M5 × 8 SHCS
- 4 – M5 Washer

1. One end of each 450 mm extrusion is tapped. Install each **Top Cap Plate** using **2 each M5 × 8 SHCS** and **M5 Washer** onto the tapped end of the extrusion..



Installing the Z Linear Rails

Parts Required

- 2 – 380mm Linear Rails
- 2 – Rail Spacer Plates
- 30 – M3 × 10 SHCS
- 30 – M3 Post Install Nut
- 3 – Nut Alignment Jigs

2. Install **15 M3 Post Install Nuts** in each vertical extrusion and use the **Nut Alignment Jig** (the jigs are 12mm wide, and the color may differ from the pictured below) to properly set their spacing. As you add additional nuts, remove the first jig and place it after the last nut until you have added 15 screws per side. **Be sure to install the nuts on the same side of the extrusion as the longer end of the top cap.**



- ✿ Be sure all the nuts are inserted in the same orientation or the spacing will be incorrect. For easiest insertion, insert the end with the spring ball into the slot first as shown below



- ! Use caution removing the rail from the bag. Do not allow the block to come off the rail. A couple small strong magnets placed on each end of the rail can keep the blocks from sliding off.

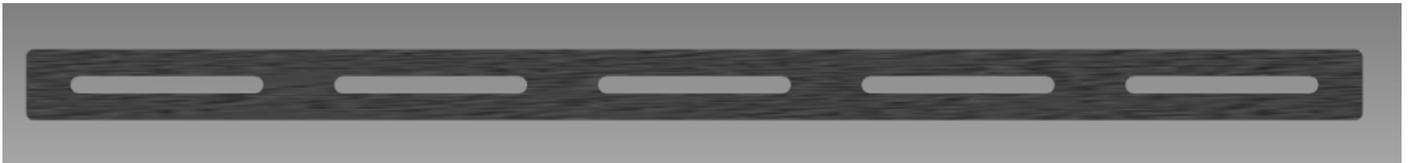
1. **DO NOT REMOVE THE BLOCKS.** They are not designed to be removed from the rail.

- ✿ We highly recommend using [Blue Loctite](#) on the screws in the following steps

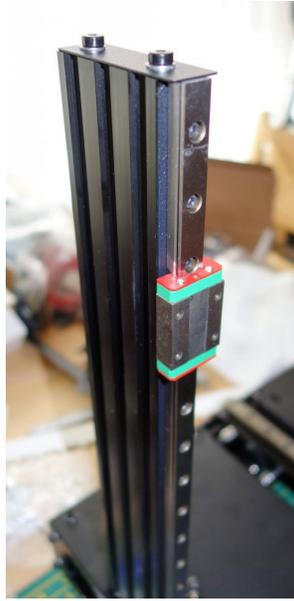
2. Install each of the **380mm Linear Rails**, with the **Rail Spacer Plate** sandwiched between the extrusions and the Rails. **Leave the screws slightly loose.**



- ! Note that the rail spacer plate (Shown below) is important. It is easy to miss in the photo above. Note, the plate may have 3 slots or 5, but either function identically.



3. Slide the rails up so that the top edge of the rail is flush with the bottom of the Top Cap Plate.



4. Tighten the screws holding the rails.

Assembling the Base

Parts Required:

- 2 – 400mm Extrusions
- 2 – 450mm Extrusions with Z Rails pre-installed
- 2 – Machined Side Plates
- 1 – USB Adapter Plate
- 1 – IEC Adapter Plate
- 8 – M3 × 6 BHCS
- 8+ – M3 Washers
- 8 – M5 × 10 SHCS
- 8 – M5 × 16 SHCS
- 8 – M5 Washers
- 4 – M3 Post Install Nuts
- 4 – M3 × 10 SHCS
- 4 – Rubber Feet

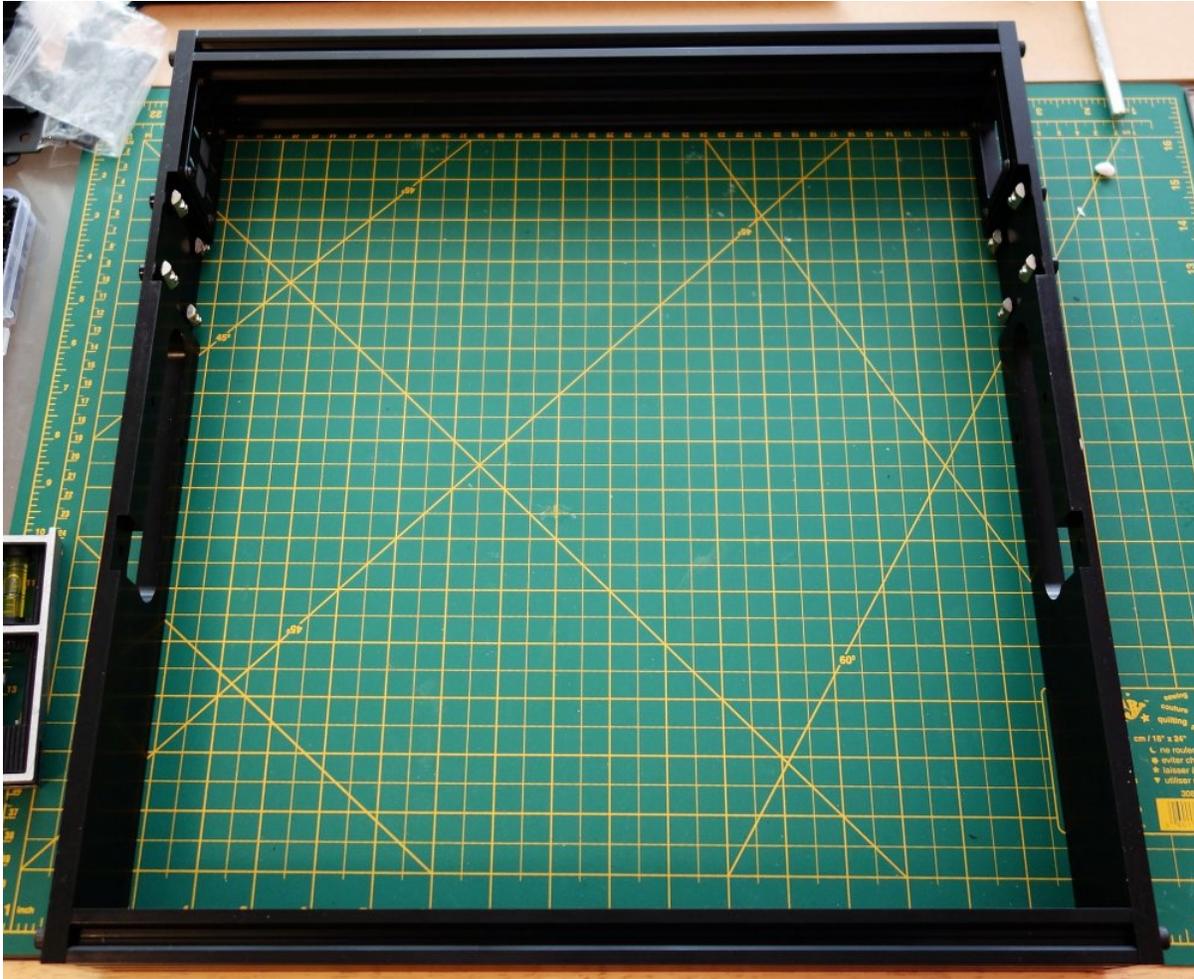


The Machined Side Plates have a notch on one edge near the handle, that notch designates the top of the base.

1. Install the **USB Adapter Plate** onto the **Left Machined Side Plate** using **4 M3 × 6 BHCS** with **one or more M3 Washers as needed**.
2. Repeat the last step with the **IEC Adapter Plate** on the **Right Machined Side Plate**.



3. Loosely assemble the side plates to the 400mm extrusions using **8 M5 × 16 SHCSs** and **8 M5 Washers**. **Do not tighten the screws yet.**



! The following step needs to be completed on a known flat surface. A granite or formica countertop is ideal, or flat, non-carpeted floor will work in a pinch.

4. Sit the assembled base upside down (Machined Side Plate notch down) on a known flat surface and tighten the screws holding the assembly, then flip the assembled base back up.

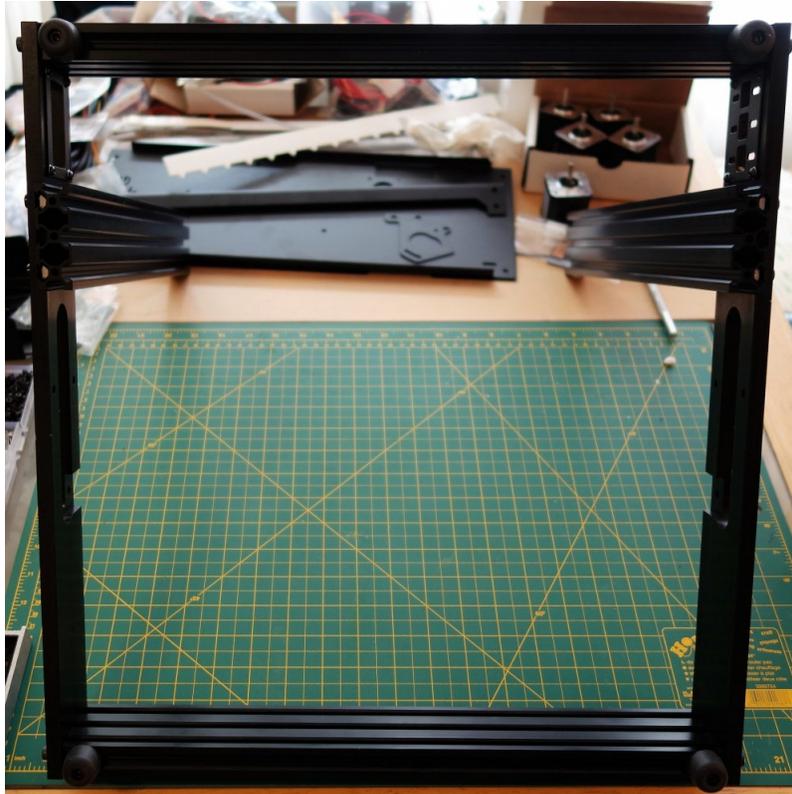
! Only one end of the 450mm extrusions is tapped. Be sure to orient that end to the top.

5. Install the two uprights using **4 M5 × 10 SHCS**, **4 M5 Washer** and **4 M5 Post Install Nut** each. Align each extrusion so it is flush with the bottom of the Machined Side Plate and is pressed against the forward edge of the cutout in the MSP to maintain proper vertical alignment.. **Be sure the tapped end of the 450mm extrusion is up!**



* Note that the Z rails are not shown installed in the photos on this page. We revised the assembly order to make things easier. We will update these photos soon.

6. On the bottom of the Machined Side Plate install one **rubber foot** on each end of the two extrusions using an **M3 × 10 SHCS** and an **M3 Post Install Nut**. They should be approximately 20mm from the end of each extrusion.



7. Sit the assembled base aside for now.

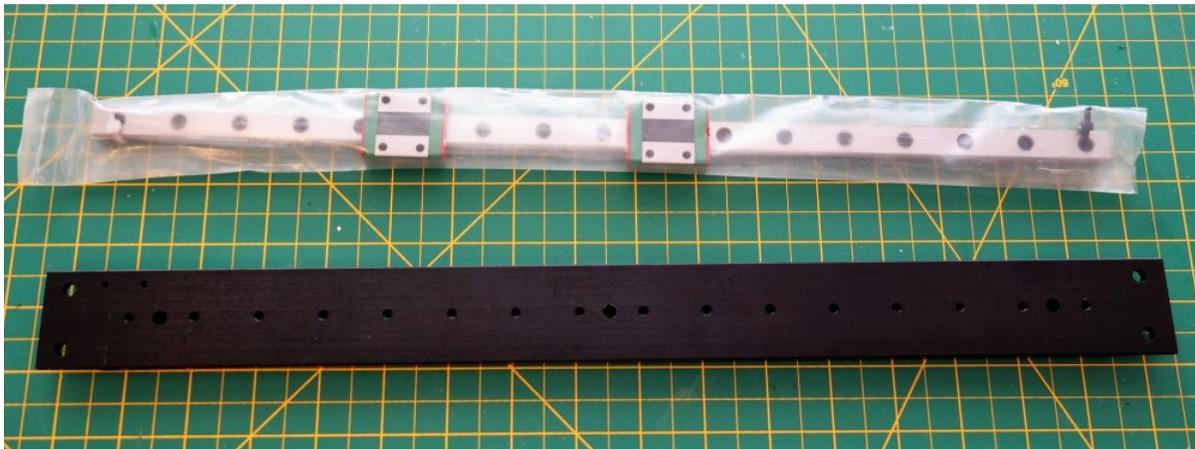
Assembling the Y Axis

* [A 3D PDF Showing just this section](#) available to aid your assembly. For help viewing this file, see our note here

Installing the Linear Rail

Parts Required

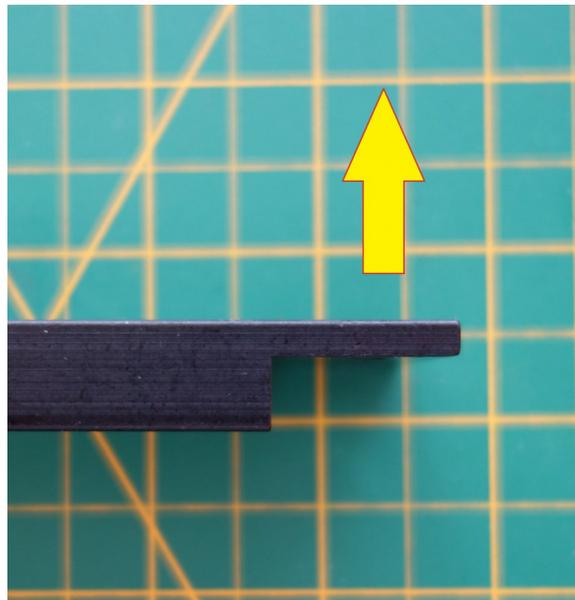
- 400mm Linear Rail
- Machined Y Plate
- 16 – M3 × 10 SHCS
- 2 – M5 × 10 SHCS
- 2 – M5 Washer
- 2 – M5 Nut



1. Carefully remove the linear rail from the bag. Remove the Zip ties on the ends.
2. **DO NOT REMOVE THE BLOCKS.** They are not designed to be removed from the rail. If the block sliding feels a bit rough, it is normal, it will not affect the operation, and in time will break in.



3. Be sure to orient the Machined Y Plate with the “wings” up.



4. Install the Y axis rail using **16 M3 × 10 SHCS**. The screws should be tightened until they are snug only. Try to make sure you tighten them to a consistent level. **Do not over-tighten the screws.**



5. We recommend adding **one each M5 × 10 SHCS, M5 Washer and M5 Nut** temporarily to each end to each end of the assembly to prevent the cars from being able to come off.

Assembling the Y Motor Mount & Belt Idlers

Parts Required

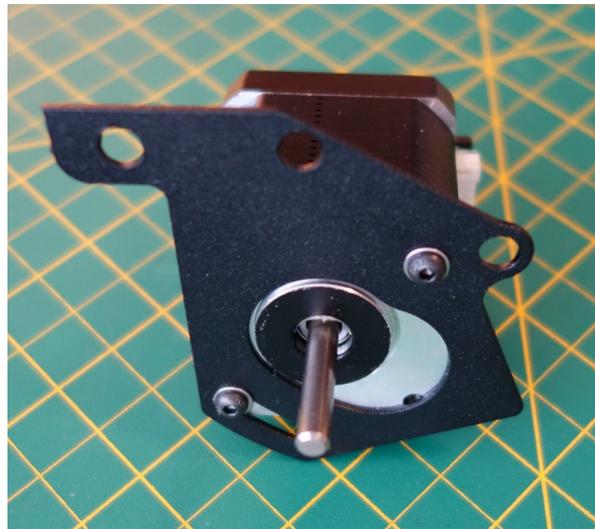
- 1- Y Motor Mount
- 2 – M3 × 6 BHCS
- 2 – M3 Washer
- 1 – M5 × 8 SHCS
- 2 – M5 × 20 SHCS
- 4+ – M5 Washer
- 1 – M5 Nut
- 4 – 605zz Bearing
- 1 – Stepper Motor
- 1- Pulley

Newer Create kits are supplied with noise vibration dampening mounts. Attach the motor to the mount using two button head M3-6 screws. two of the holes on the mount are tapped and two are not tapped. To mount

the motor to the mount use the two holes that are not tapped.



1. Install the Y Motor assembly with 2 M3 × 6 BHCS and 2 M3 Washer. These screws will insert into the tapped holes of the vibration dampening mount. See the pictures below for the proper orientation relative to the rest of the assembly. Be sure that the motor is in the uppermost position so when we later install the belt you have plenty of room to adjust it.



2. Install the pulley, leaving about 1-2mm between the bottom of the pulley and the top of the motor. Install it with the set screw end of the pulley away from the motor. Be sure one of the pulley set screws is aligned with the flat of the motor shaft.



3. All three Idlers will Install in the following order: **M5 × 20 SHCS** > Zero or more **M5 Washer** as needed > **605zz Bearing** > **M5 Washer** > **605zz Bearing** > **M5 Washer** > **Y Motor Mount** or **Machined Y Plate**. The two upper idlers will screw directly into the tapped holes on the Machined Y Plate. The lower idler will screw into an **M5 Nut** Use as many washers below the screw head as needed to keep the bearings snugly in place (probably 2-3).



4. Locate the two 5mm tapped holes on the side of the Machined Y Plate and attach the Y motor plate using an Idler Bearing assembly and an **M5 × 10 SHCS** with a **M5 Washer**. See the images below for clarification.



Sit the assembled Y Axis aside for the time being.

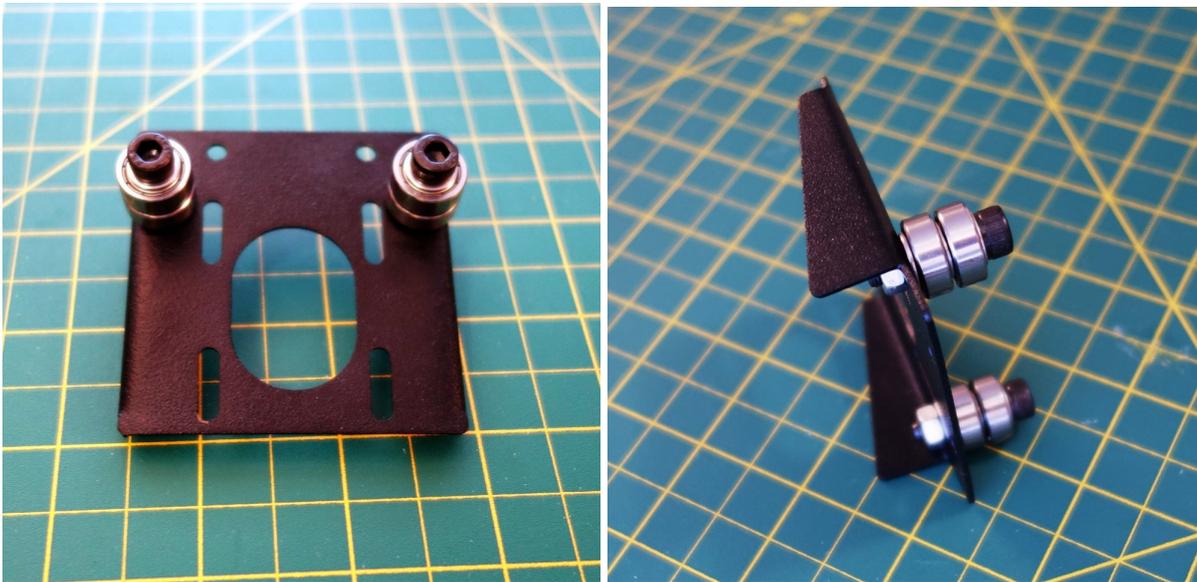
Assembling the X Axis

Assembling the X Motor Mount

Parts Required

- 1 – X Motor Mount
- 1 – Stepper Motor
- 1 – Pulley
- 4 – M3 × 6 BHCS
- 4 – M3 Washer
- 2 – M5 × 20 SHCS
- 8+ – M5 Washer
- 2 – M5 Nut
- 4 – 605zz Bearing

1. Install the idlers in two 5mm holes, using the following order: **M5 × 20 SHCS > 605zz Bearing > M5 Washer > 605zz Bearing > M5 Washer > X Motor Mount > M5 Nut.**



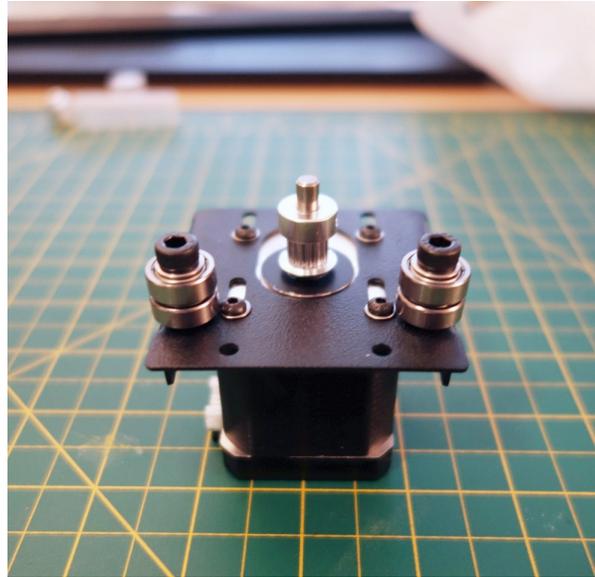
New Create kits are provided with a vibration dampening mount for this axis. Two of the holes on the mount are not tapped. Use these holes and two m3-6 button head screws to attach the mount to the stepper motor.



2. Install the **Stepper Motor Assembly** using **2 M3 × 6 BHCS** and **2 M3 Washer**. Two of the slots of the motor mount plate will not be used. Mount it in the position closest to the idlers. Make sure the port on the motor where the cable connects faces the rear of the printer.



3. Install the pulley, leaving about 1-2mm between the bottom of the pulley and the top of the motor mount plate. Install it with the set screw end of the pulley toward the motor (The opposite of how it pictured). Be sure one of the pulley set screws is aligned with the flat of the motor shaft.



Installing the Idlers

Parts Required

- 2 – M5 × 20 SHCS
- 8+ – M5 Washer
- 4 – 605zz Bearing

1. Install the idlers in two 5mm tapped holes, using the following order: **M5 × 20 SHCS** > zero or more **M5 Washer** as needed > **605zz Bearing** > **M5 Washer** > **605zz Bearing** > **M5 Washer** > **Machined X Plate**. Use 2-3 washers below the bearings as pictured.



Mounting the Linear Rail

Parts Required

- 1 – Machined X Plate Assembly
- 1 – 380mm Rail Assembly
- 15 – M3 × 10 SHCS

1. Carefully remove the 380mm Rail Assembly from the bag. **Watch closely for any loose balls in the bag.** If you find any contact our support for instructions on how to re-insert them. Cut off the zip ties on the ends.



2. **DO NOT REMOVE THE BLOCK.** They are not designed to be removed from the rail.
3. Install the 380mm Rail Assembly on the side of the Machined X Plate with the machined slots using **15 M3 × 10 SHCS**. The screws should be tightened until they are snug only. Try to make sure you tighten them to a consistent level. **Do not over-tighten the screws.**



! Handle the assembly carefully after this point. Until it is fully installed, the cars can come off the end of the rail. A couple small strong magnets placed on each end of the rail can keep the blocks from sliding off.

Installing the X Motor Mount

Parts Required

- Machined X Plate Assembly
- X Motor Mount assembly
- 2 – M3 × 6 BHCS
- 2 – M3 Washer

1. Mount the **X Motor Mount Assembly** to the **X Axis Assembly** using **2 M3 × 6 BHCS** and **2 M3 Washer**.



Installing the Lead Nut Adapters

Parts Required

- 2 – Printed Lead Nut Adapters
 - 4 – M3 × 10 SHCS
 - 4 – M3 Washer
- Install the **two Lead Nut Adapters** using **two M3 × 10 SHCS** with **M3 Washers**



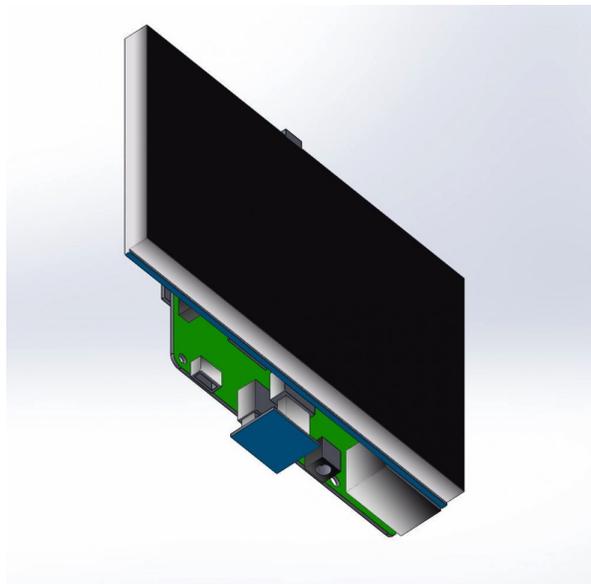
Assembling the OctoPi LCD

Assembling the X Motor Mount

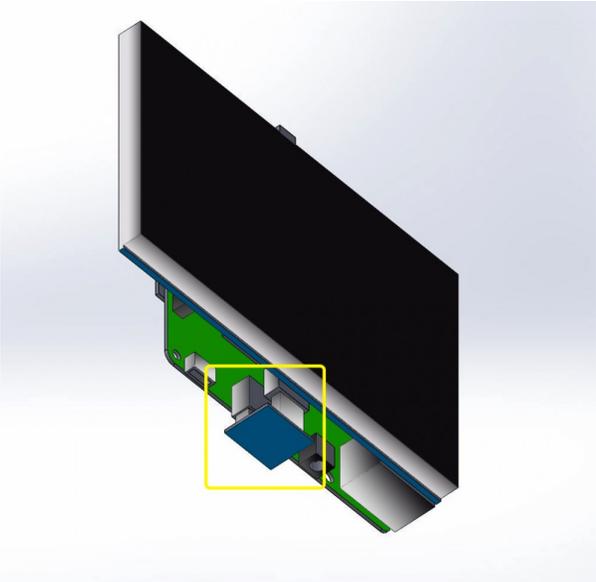
Parts Required

- RPi3
- LCD
- HDMI coupler
- LCD hardware

1. Attach the LCD to the Pi. Line up the pins on the PI with the sockets in the back of the LCD. Use the hardware supplied with the LCD to ensure solid connection. Make sure the hdmi ports on the LCD and the Pi line up



2. Connect the LCD hdmi to the Pi hdmi using the supplied HDMI coupler



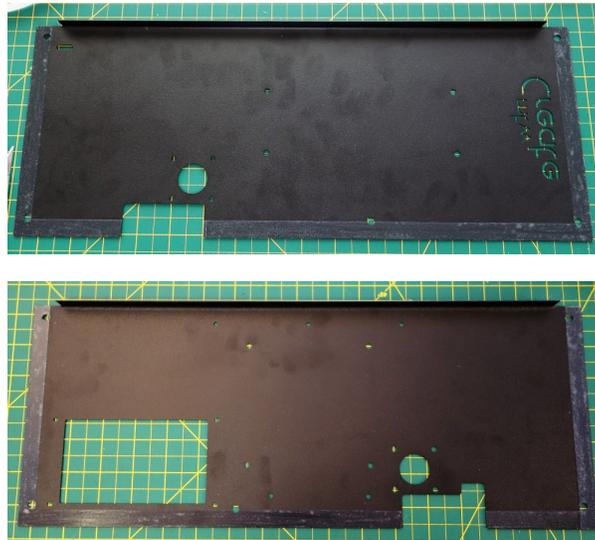
Assemble the Top Deck plates

Assemble the Top Deck – Right Side

Parts Required

- Top Deck Right (includes the MTW Create Logo)
- Power Supply
- 1 – Stepper Motor
- 4 – M3 × 6 BHCS
- 4 – M3 Washers
- 4 – M4 × 5 SHCS
- 4 – M5 Washers

✿ You may optionally apply a couple layers of rubber cement to the outside edges of the top deck plates, to assist with noise reduction. Place the the cement where the tape is on the picture below.



1. Mount the **Stepper Motor** using **4 M3 × 6 BHCS** and **4 M3 Washers**, leave the motor slightly loose until the deck plate is installed.
2. Mount the **Power Supply** using **4 M4 × 5 SHCS** and **4 M5 Washers**.



Make sure to set the PSU to the appropriate voltage!

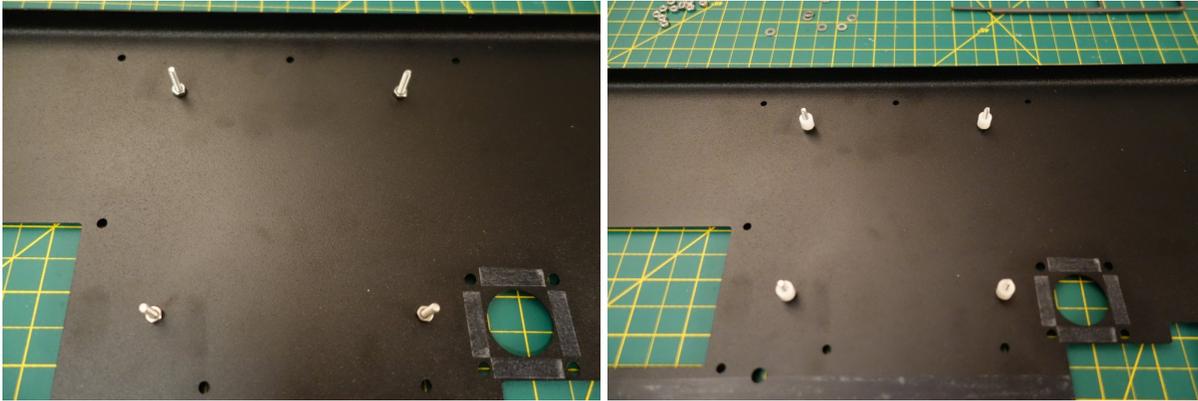
3. Set the assembly aside.

Assemble the Top Deck – Left Side

Parts Required

- Top Deck Left (includes the cutout for the LCD)
- RAMBo Controller
- 1 – Stepper Motor
- 4 – M3 × 6 BHCS
- 17 – M3 Washers
- 9 – M3 × 10 SHCS
- 4 – M3 × 16 SHCS
- 17 – M3 Nuts
- 4 – Nylon Spacers
- 2 – Printed LCD Mounts
- LCD

1. Install the screws to mount the RAMBo Controller using **4 M3 × 16 SHCS** and **4 M3 Nuts**. Installing the screws like this makes the following steps much easier and simplifies any future maintenance. Leave these nuts just slightly loose to allow you to reposition the screws if needed when installing the RAMBo Controller, and put the **4 Nylon Spacers** on the screws.

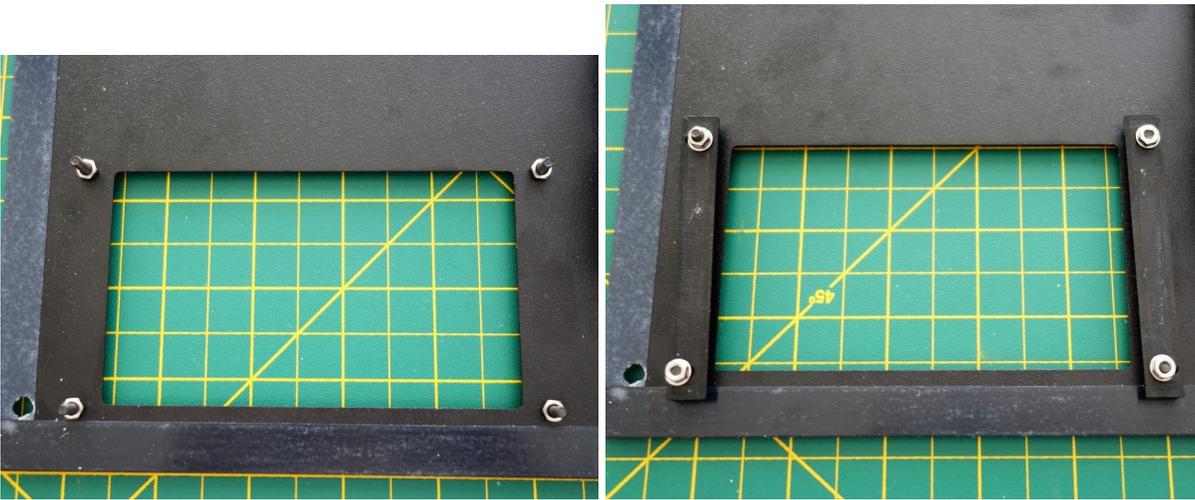


2. Install the **RAMBo Controller** onto the pre-installed studs using **4 Nylon Spacers** to offset it from the metal. Use **4 M3 Nuts** to hold it in place. Orient it with the USB toward toward the front of the printer for easier connection to the RPi.



! Tighten the nuts holding the RAMBo Controller, carefully so not to damage any of the board components.

3. Install the two **Printed LCD Mounts** using **2 M3 × 10 SHCS**, **2 M3 Washers**, and **2 M3 Nuts** followed by **2 M3 Nuts** on each piece. Leave the screws loose.



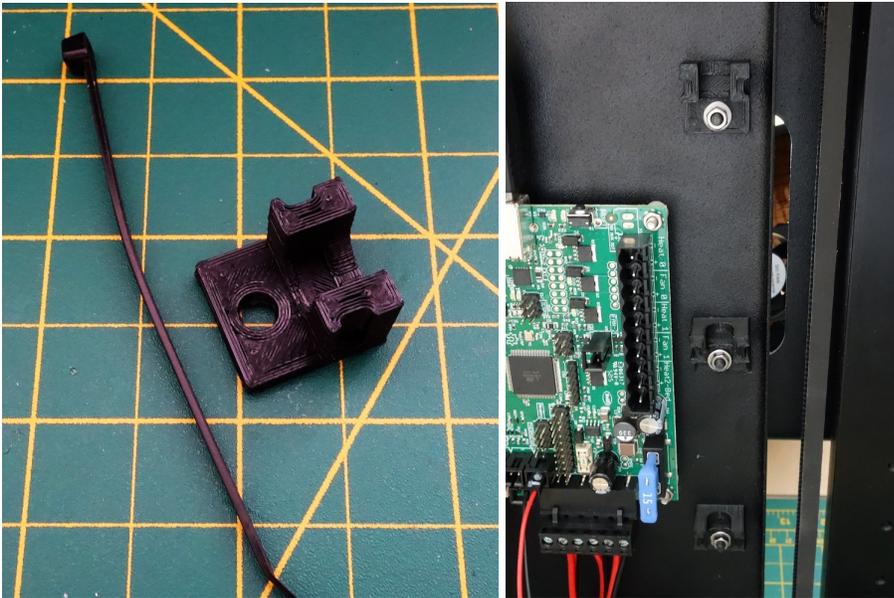
4. Install the **LCD** by carefully sliding it into place between the Printed LCD Mounts.



5. Tighten the screws.
6. Mount the **Stepper Motor** using **4 M3 × 6 BHCS** and **4 M3 Washer**, leave the motor slightly loose until the deck plate is installed.



7. The kit comes with a number of printed clips for easier wire management. Those attach to the deck plate with **one M3 × 10 SHCS**, **one M3 Washer** and **one M3 Nut** each. You will install 3 along the “inside” and two along the “outside” edge of the RAMBo.



Install the Y Axis & Top Deck Plates

Install the Top Deck Left

Parts Required

- Base Assembly
- Top Deck Left assembly
- 4 – M5 × 8 SHCS
- 4 – M5 Washer
- 4 – M5 Post Install Nut

1. Insert **4 M5 Post Install Nut** into the top of the extrusions, two on the front and two in the back.



2. Align the M5 Post Install Nut with the holes in the Top Deck Left Assembly and mount with **4 M5 × 8 SHCS** and **4 M5 Washer**. Leave slightly loose.



3. Align the assembly with the left edge of the base, so the motor is touching the vertical upright and tighten the plate, then the motor.

Install the Y Axis Assembly

Parts Required

- Base Assembly
- Y Axis Assembly
- 4 – M5 × 10 SHCS
- 4 – M5 Washer
- 4 – M5 Post Install Nut

1. Insert **4 M5 Post Install Nut** into the top of the extrusions, two on the front and two in the back.



2. Align the M5 Post Install Nut with the holes in the Y Axis Assembly and mount with **4 M5 × 10 SHCS** and **4 M5 Washer**. Leave slightly loose.



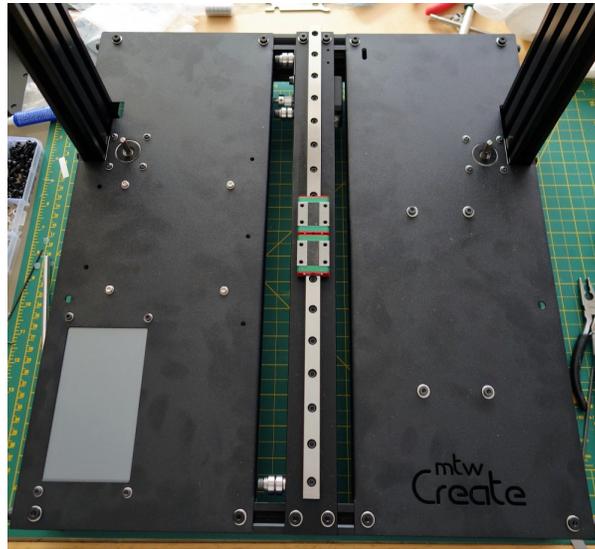
3. Align the assembly so there is about a 1mm gap between the idler screw head and the bend on the Top Deck Left Assembly and tighten.

Install the Top Deck Right

Parts Required

- Base Assembly
- Top Deck Rightt Assembly
- 4 – M5 × 8 SHCS

- 4 – M5 Washer
 - 4 – M5 Post Install Nut
1. Insert **4 M5 Post Install Nut** into the top of the extrusions, two on the front and two in the back.
 2. Align the M5 Post Install Nut with the holes in the Top Deck Right Assembly and mount with **4 M5 × 8 SHCS** and **4 M5 Washer**. Leave slightly loose.



3. Align the assembly with the right edge of the base, so the motor is touching the vertical upright and tighten the plate, then the motor.

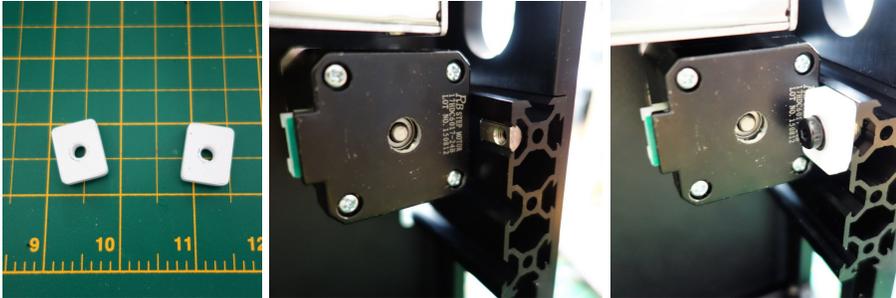
Install the Z Motor Supports

Parts Required

- Base Assembly
- 2 – Z Motor Support
- 4 – M5 × 10 SHCS
- 4 – M5 Washer
- 4 – M5 Post Install Nut

1. Flip the base over so it is lying on it's back.

2. Install the **Z Motor Support** to the inside of the vertical extrusions so they are pushed firmly against the bottom of the Z motors. You will install one per side using one each **M5 Post Install Nut**, **M5 × 10 SHCS**, and **M5 Washer**.



Assembling the Y Carriage

Assembling the Y Carriage Plate

Parts Required

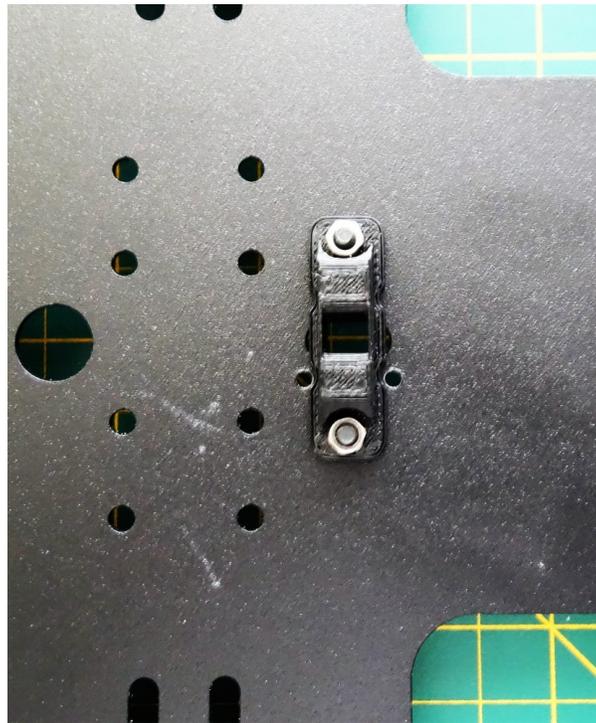
- 1 – Y Carriage Plate
- 4 – Printed Glass Mount
- 1 – Y Belt Offset
- 4 – M3 × 6 BHCS
- 10 – M3 × 10 SHCS
- 4 – M3 × 16 SHCS
- 4 – M3 Washer
- 14 – M3 Nut
- 4 – Silicone dots

* Note: The Y Carriage Plate was redesigned shortly before the MTW Create Kits shipped, and some of the photos shown here still reflect the older version. The basic assembly remains the same in spite of the minor changes.

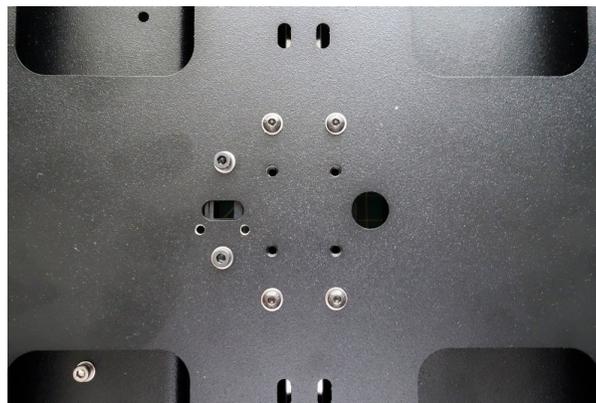
1. Install the **4 Silicone Dots** into the **Printed Glass Mounts**.
2. Install the **Printed Glass Mounts** onto the Y Carriage Plate using **2 M3 × 10 SHCS** for each mount. **Leave the mounts loose for now.**



3. Install the **Y Belt Offset** using **two M3 × 10 SHCS** with **M3 Washers**. Note the screws now go up from the bottom into the tapped holes on the Y Carriage Plate.



4. Mount the Y Carriage Plate onto the Y Axis Assembly, using **4 M3 × 6 BHCS** and **four M3 Washer**.



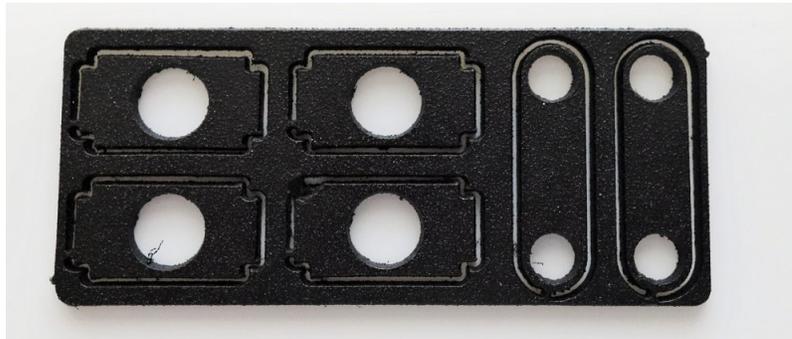
* Some early kits have 8 mounting holes on the Y carriage. You will only use the four outermost holes, with two screws into each of the two blocks. Using all 8 mounting holes can lead to binding.

Installing the Y Belt

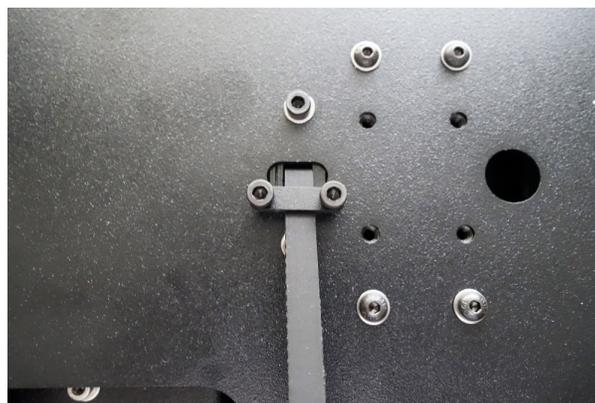
Parts Required

- 1 – Timing Belt
- Y Belt Clip
- 2 – M3 × 10 SHCS
- 2 – M3 Washer
- 2 – M3 Nut

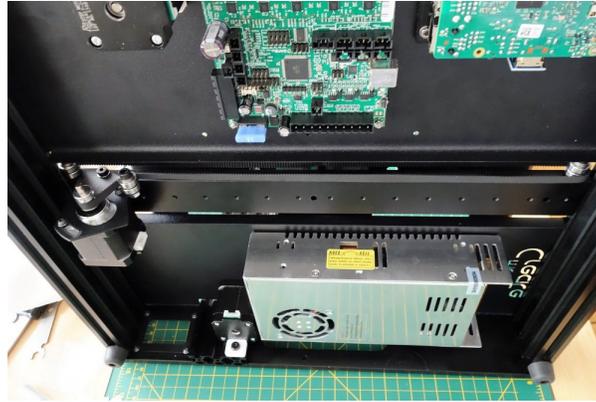
1. Sit the printer on it's side with the Y Belt path facing up.
2. Find the plate shown below, and break out the **Y Belt Clip** – the piece with two holes.



3. Insert the **Belt** ends through the slot in the Y Belt Offset and loosely hold in place with the **Y Belt Clip** using **2 M3 × 10 SHCS**.



4. Wrap the belt around the pulley and idles as shown below.



5. Pull the ends of the belt until it is just barely tight.and tighten the the belt clip screws.

✿ Do not overtighten the belt, you will properly tension the belt in a later step.

✿ Do not clip the belt ends yet. Wait to clip them until the assembly is complete and you are absolutely certain that no changes need to be made.

6. Move the Y carriage back and forth several times to check the belt alignment and tracking, and adjust the pulley position and the position of the belt ends as needed to make it track correctly.

Installing the X Axis

Install the X axis

Parts Required

X Axis Assembly

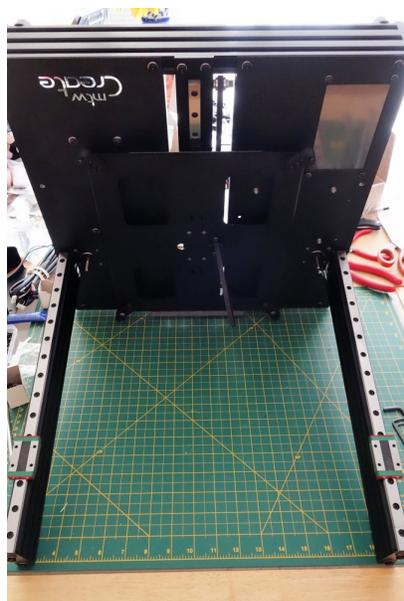
4 – M3 × 6 BHCS

4 – M3 × 10 SHCS

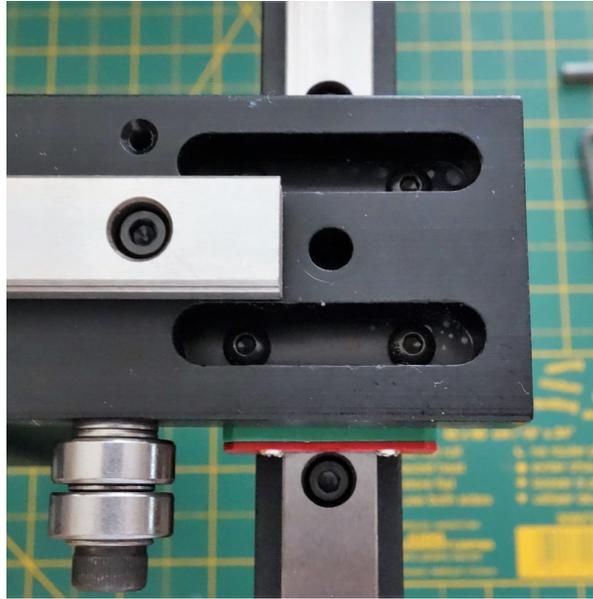
8 – M3 Washer

4 – O-Ring

1. Turn the printer on it's back with the vertical extrusions pointing towards you.



2. Mount the right end (when the printer is upright that will be the left end) of the X axis to the Z rails using **four M3 × 6 BHCS without washers**.. Leave the screws just slightly loose.



3. Mount the left side (when the printer is upright that will be the right side) using **four M3 × 10 SHCS, 8 M3 Washer, and four O-Rings**. Assemble in the following order: M3 × 10 SHCS > M3 Washer > O-Ring > M3 Washer > X Axis plate. Leave the screws slightly loose.



* The O-Rings here help allow for any slight misalignment, guaranteeing smooth, bind-free movement.

Installing the Top Crossbar

Parts Required

Top Crossbar

4 – M5 × 8 SHCS

4 – M5 Washer

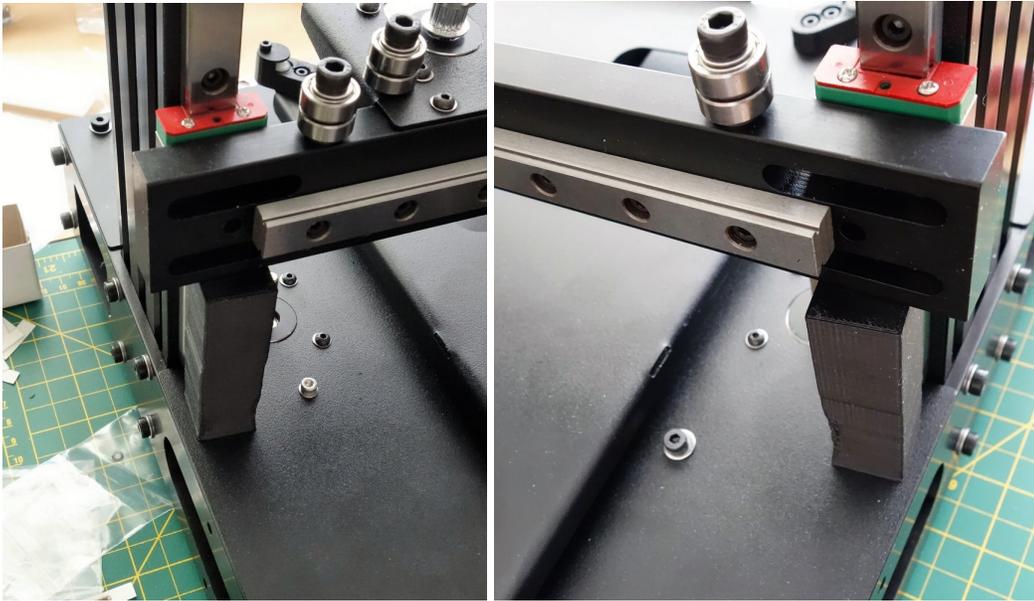
4. Sit the printer back on it's feet, with the back facing you.
5. Install the Top Crossbar using **4 M5 × 8 SHCS** and **4 M5 Washer**. One end of the Top Crossbar is slotted. Leave those screws slightly loose for now.



6. Turn the printer around to face you.

Final X Axis alignment

7. Using two equal length spacers, lower the axis so it is supported on both sides and equal height above the base.



8. Tighten the four button head screws on the left, and then the M3 screws with the O-Rings on the right, do not over tighten them, they need to be just snug.
9. Lift the axis to the top of it's motion and tighten the screws holding the slotted side of the top crossbar.

Installing the Lead Screws

Preparing the Lead Nuts

Parts Required

- 2 – Lead Nuts
- 6 – M3 × 10 SHCS
- 6 – M3 Nut
- 2 – Lead Screw

1. Install **one M3 × 10 SHCS** into each hole on each **Lead Nut** with the screw head towards the flat side of the nut. Secure with *one M3 Nut.



* Note the photo above only shows one screw, but you should add **one screw in each hole**, so three per lead nut.

2. Install each assembled Lead Nut onto the **Lead Screw** and make sure that you can turn the nut with just one finger and thumb.
If you cannot easily turn the nut you will need to chuck the **Lead Screw** into a drill, add no more than

a drop of lithium grease to the threads and run the nut back and forth a couple dozen times, until it becomes easy to turn with a single finger and thumb. **Other than the initial drop of lithium grease during the breaking in process, do NOT lubricate even if it still tight.**

Then position the Lead Nut about 2" from the bottom of the screw.



Install the Couplers and Lead Screw

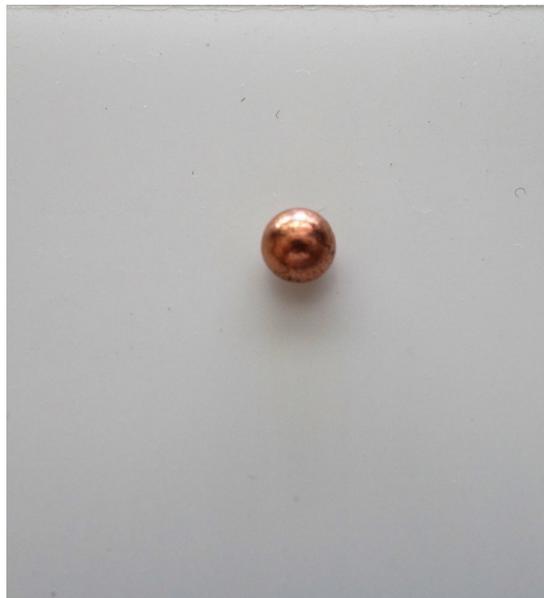
Parts Required

- 2 Helical Couplers
- Printed X Belt Spacer
- 2 – 4.5mm BBs. (steel balls)

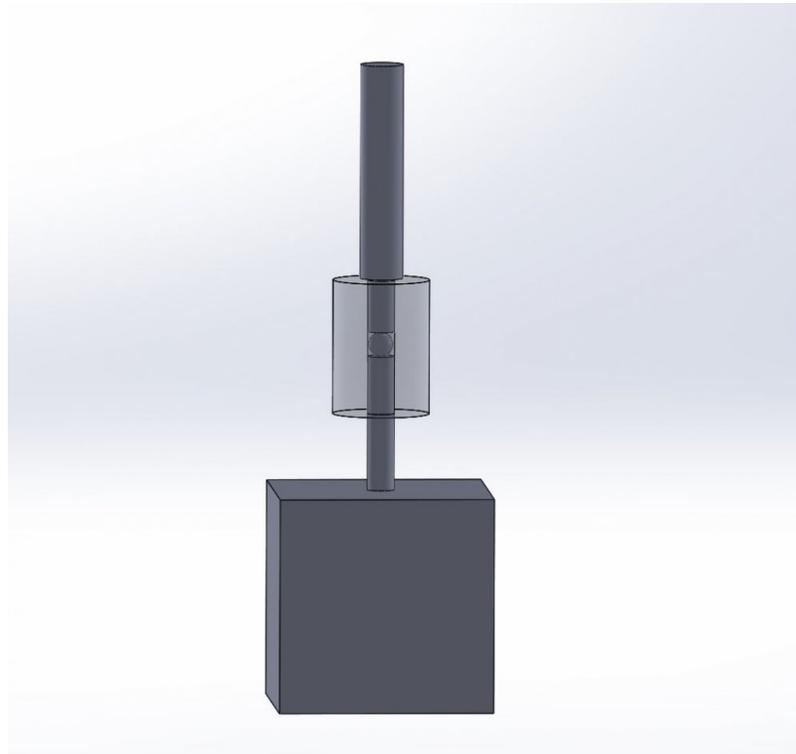
1. Install the Helical coupler onto each Z Motor Shaft. Use the X Belt Spacer on it's side to properly set the spacing above the top deck.



2. Tighten the set screws, making sure one of them is against the flat of the motor shaft.
3. Set the X Belt Spacer aside until you install the X axis belt.
4. Put **one BB** into each helical coupler.



5. Install the Lead Screw so it is resting on the BB. Note the BB is critical for best print quality. We include spares, so be sure to include one.

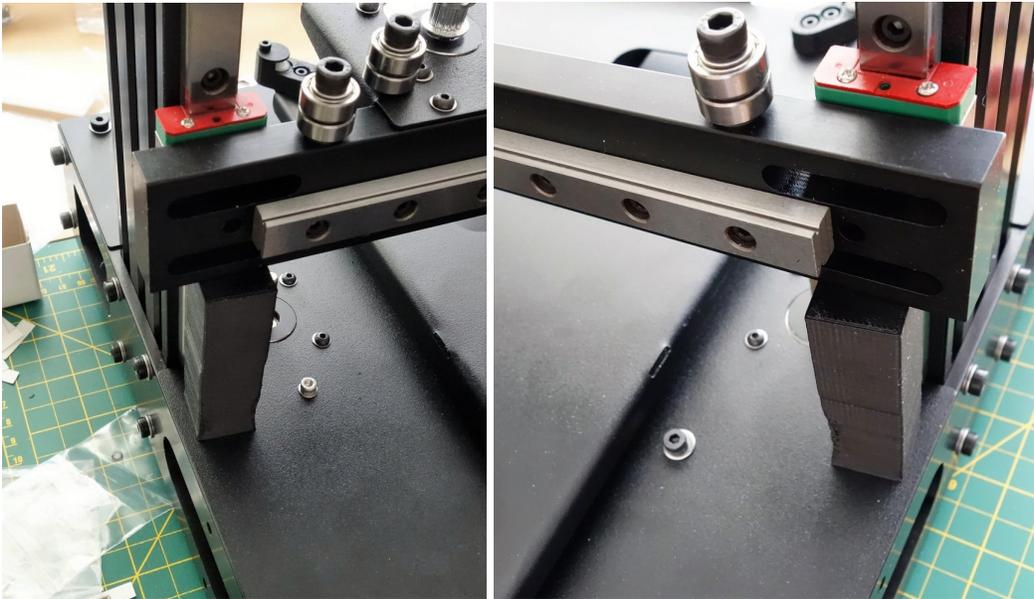


6. Tighten the set screws on the Helical Coupler.

Leveling the X axis and the Lead Nuts

Parts Required

- Calipers or the 2 spacers used in the* Installing the X axis* section
1. Rest the X axis on the Lead Nuts, ensure that the nuts are locked into the Lead Nut Adapters
 2. Using the calipers, measure the distance from the Top deck plate to the X axis, by the Z extrusions.
 3. Turn each leadscrew manually, to get an equal distance on both sides.
 4. If you do not have calipers, rest the X axis on the 2 spacers you have used in the previous section of the guide.
 5. Using two equal length spacers, lower the axis so it is supported on both sides and equal height above the base.



6. Ensuring the nuts are locked into the Lead Nut Adapters, turn each leadscrew manually, until you feel equal weight on both spacers when you try to move them.

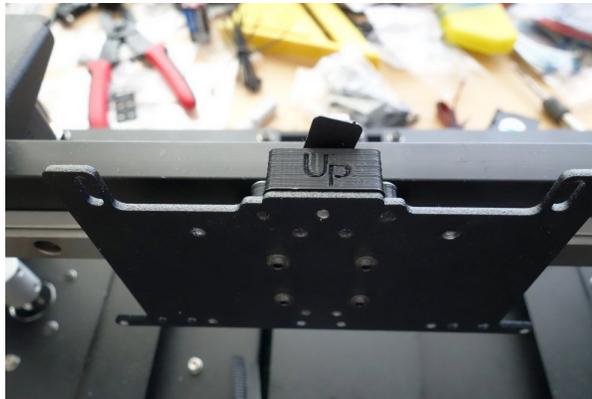
Installing the X Carriage

Mounting the X Carriage Plate

Parts Required

- 4 – M3 × 6 BHCS
- X Carriage Plate

1. Mount the **X Carriage Plate** to the X Rail using **four M3 × 6 BHCS**. Do not use washers.

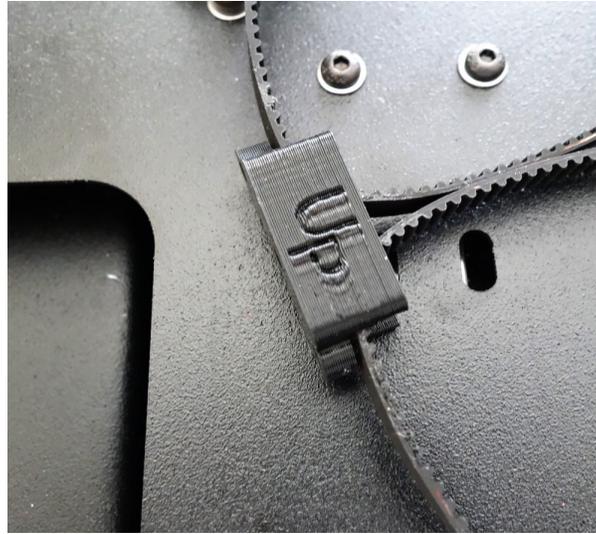


Installing the X Belt

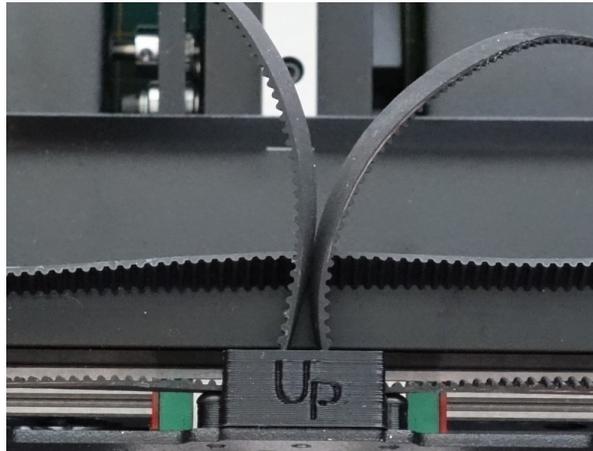
Parts Required

- X Belt Spacer
- X Belt Clip
- 1 – M3 × 16 SHCS
- 2 – M3 × 6 BHCS
- 1 – Timing belt

1. Insert belt into **X Belt Spacer** as shown

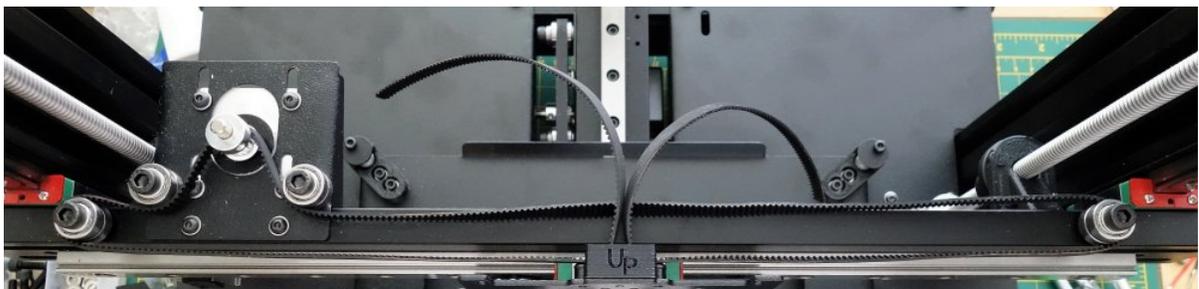


2. Install the **X Belt Spacer** on the **X Carriage Plate** with two **M3 × 6 BHCS**



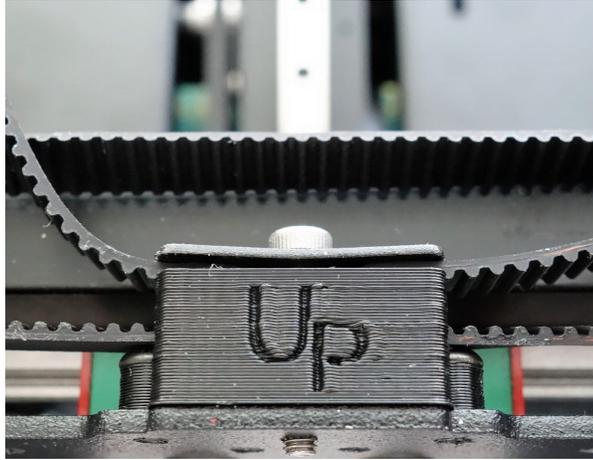
3. Install the **X Belt Clip** using **M3 × 16 SHCS**

4. Route the belt as shown



5. Push on one side of the **X Belt Clip** to hold the belt. Pull on the other side to tension.

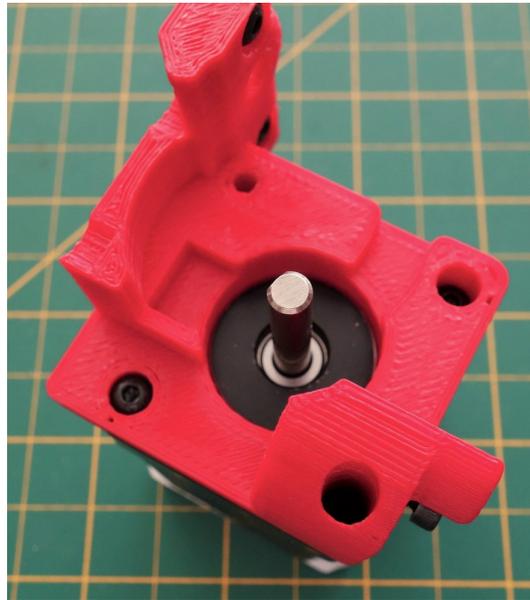
6. Tighten **X Belt Clip**. The clip may bend when properly tightened. That is normal and will not cause a problem.



Extruder Assembly and Installation

Assemble the Extruder

1. Install the Stepper Motor to the printed extruder body with **three M3 × 6 BHCS**. Do not install the screw in the top back position. This will be the hole for later attachment of the lever arm to the extruder body.



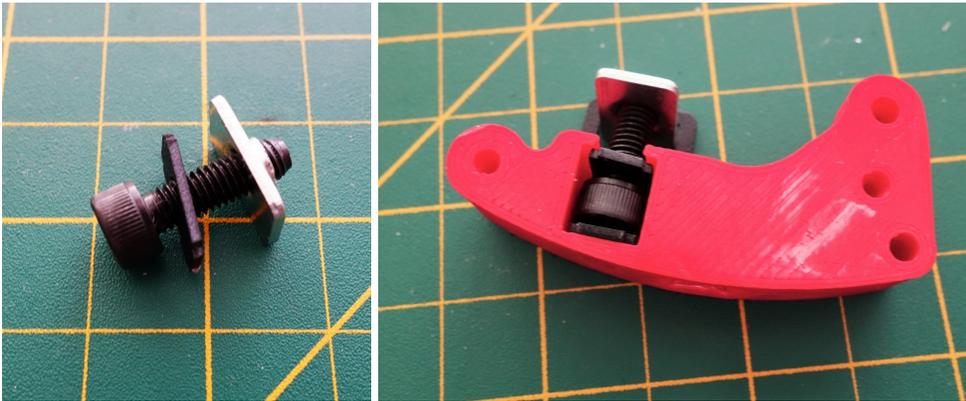
2. Attach the Extruder Arm Plate with **one M3 × 6 BHCS** or a **self tapping screw** to the right side of the printed piece



3. Break out two Extruder Arm Inserts from the plate shown below



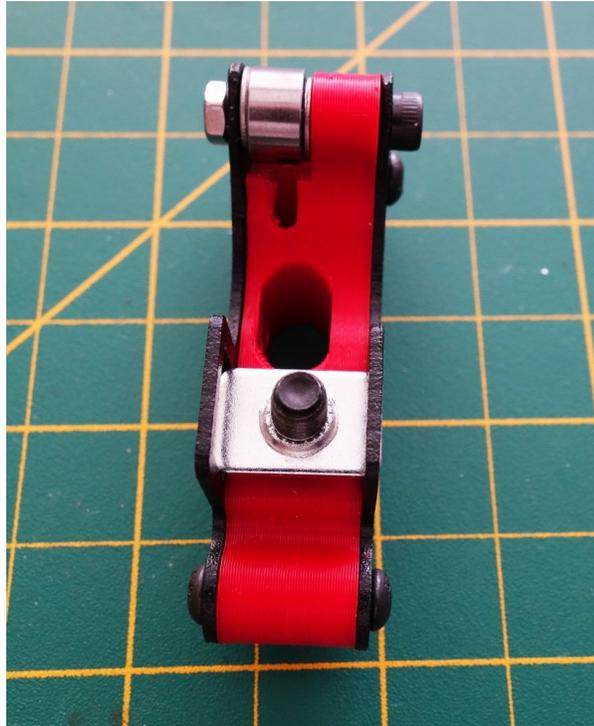
4. Assemble on the **M5 × 16 SHCS** with one Extruder Arm Insert and T-nut, and then together with the other Extruder Arm Insert insert into the slots cut in the Extruder Arm Plate



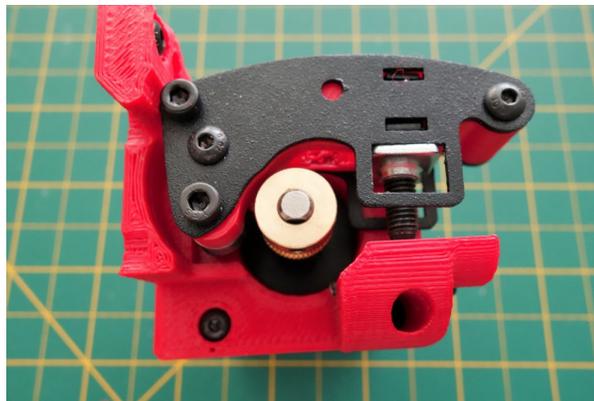
5. The two Extruder Arm Inserts are held in place with the slots cut into the metal side pieces. Use **two M3 × 6 BHCS** or **self tapping screws** to attach the Extruder Arm Plate to the printed part.



6. Install the small bearing using two M3 Washer to center the bearing to the small filament guide hole in the printed plastic part. Use a **M3×18 SHCS** screw and nut to secure the bearing and washers as shown.



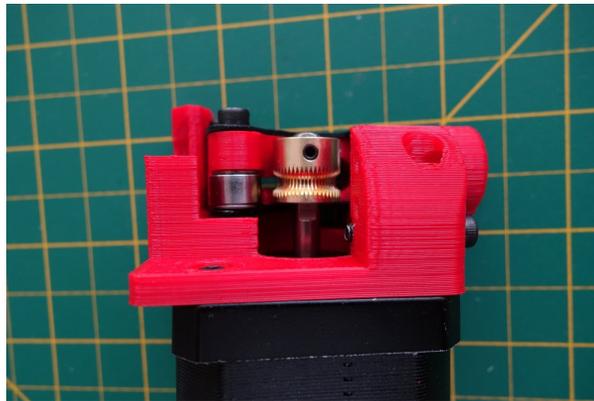
7. Install the completed lever arm to the extruder body with a **M3×30 SHCS** screw using a washer next to the screw head. Use thread lock on this screw. Tighten but leave loose enough so the lever arm can move. Do not install the brass hob yet.



8. Install the spring then the brass hob onto the stepper motor shaft. You will need to squeeze the lever arm down to do this step.



9. Align the brass hob to the filament hole in the arm, and tighten the grub screw against the flat of the shaft.

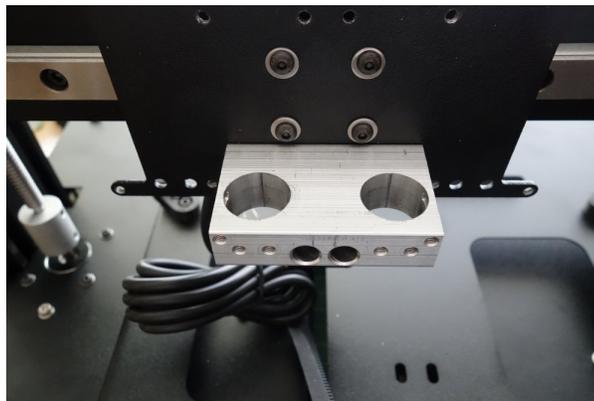


Extruder Installation

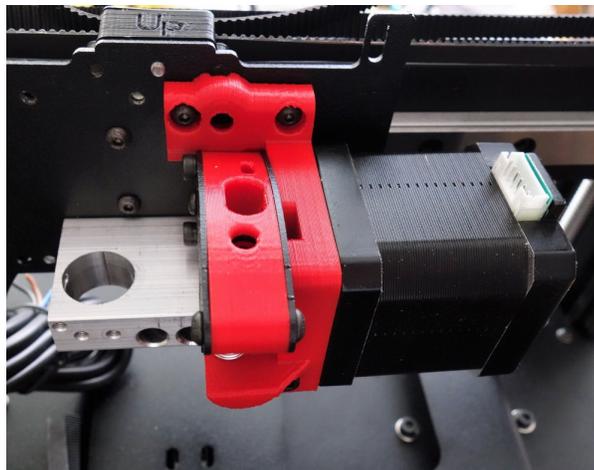
1. Inspect the Aluminum hot end block for any debris or burrs in the hotend mounting holes. If there is any, gently clean with a sharp implement, or a file. Use the E3D hotend heatsink to test fit.



2. Install the Aluminum hot end block to the carriage with **two M3 × 10 SHCS** inserted into the deep holes that are center front of the block.



3. Install the printed extruder body to the carriage with **two M3 × 6 BHCS** screws. Also attach it to the Hotend Block with a **M3×18 SHCS**



Hotend Assembly and Installation

Hotend Assembly

* For the assembly of the E3D V6 Hotend either follow the steps below or use the [documentation](#) and this excellent video tutorial:

! The E3D V6 thermistor leads are very fragile and need to be handled with care, as it is not covered by our warranty.

1. Install the nozzle into the heatblock using a washer to set a gap. Do not screw it in flush with the block. Note the block orientation.



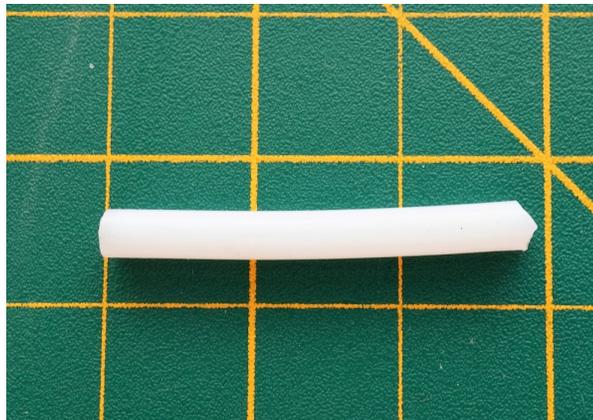
2. Cover the threads on the heatbreak with the supplied thermal compound, and install the short end into the heatblock.



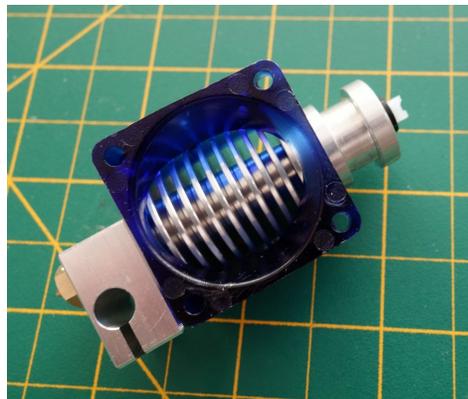
3. Install the heatblock assembly into the heatsink, tighten it slightly using the supplied wrench. Do not over tighten, that can damage the heatbreak.



4. Cut the white PTFE tube to about 36-37mm, ensure the cut on one end is straight, and cut the other end as shown.
This will ensure that the filament does not try to bow out as much from the hob to the hotend causing a jam.



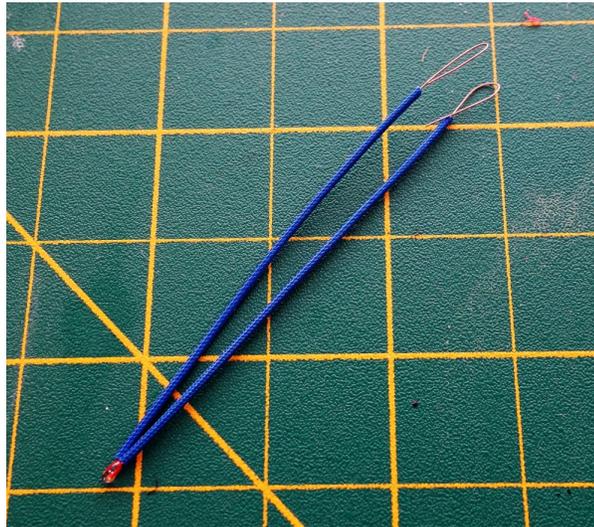
5. Install the tube into the hotend



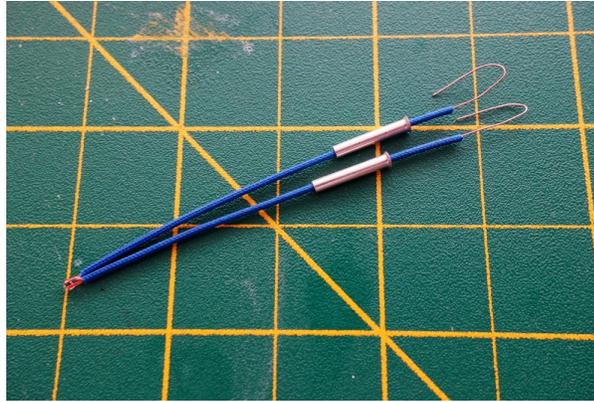
- ! Your kit may have come with the pictured below, stud type of thermistor, if so, skip to **step 12**, and screw it in place of the thermistor retention screw shown in step 12.



6. Cut the supplied blue fiberglass insulation into two equal pieces, and slide them on the thermistor leads.



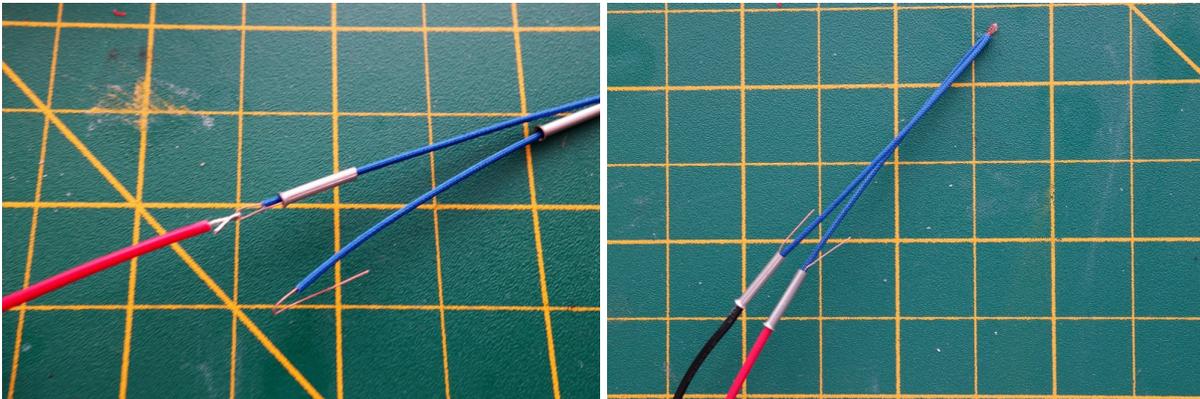
7. Slide the ferrules on the leads, and bend the exposed leads as shown.



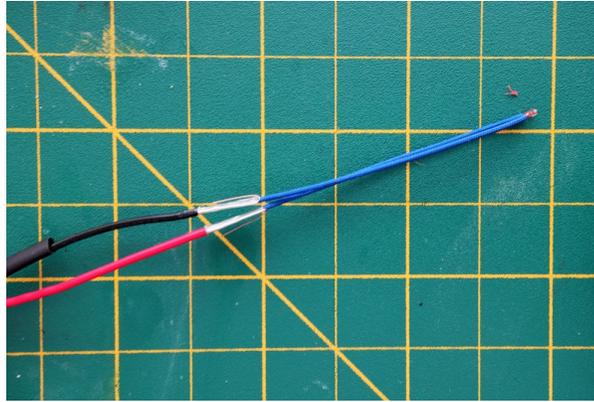
8. Cut the heatshrink in two, and slide the pieces on the supplied thermistor extension wire



9. Hook the extension wire with the thermistor leads, and slide the ferrule over it. Make sure the ferrule goes a bit over the extension wire insulation. Trim, or bend over the excess leads.



10. Make sure the fiberglass insulation is flush with the thermistor glass bead, and no lead is exposed. Using a crimping tool, or pliers, crimp the ferrules.



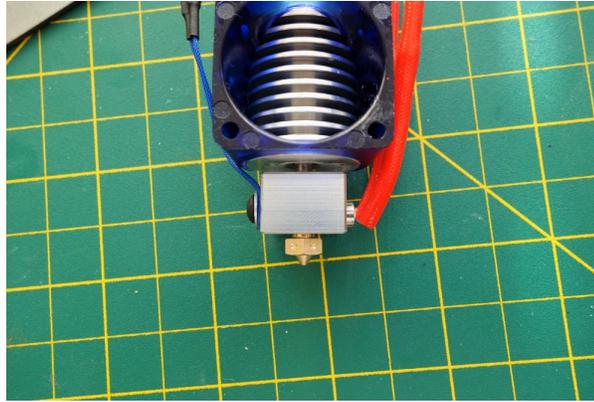
11. Cover the ferrules with heatshrink, and shrink it using a heat gun, or hair dryer set to hot.



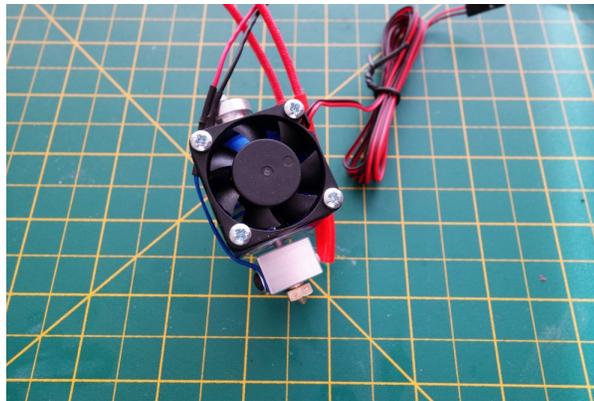
12. Carefully insert the thermistor into the smaller hole, on the side of the heatblock, and secure it in place using the supplied BH 3×4 screw and washer. Flip the washer with the rounded side toward the insulation. Tighten just enough to hold it securely, over tightening can crush the insulation, expose and short the thermistor leads.



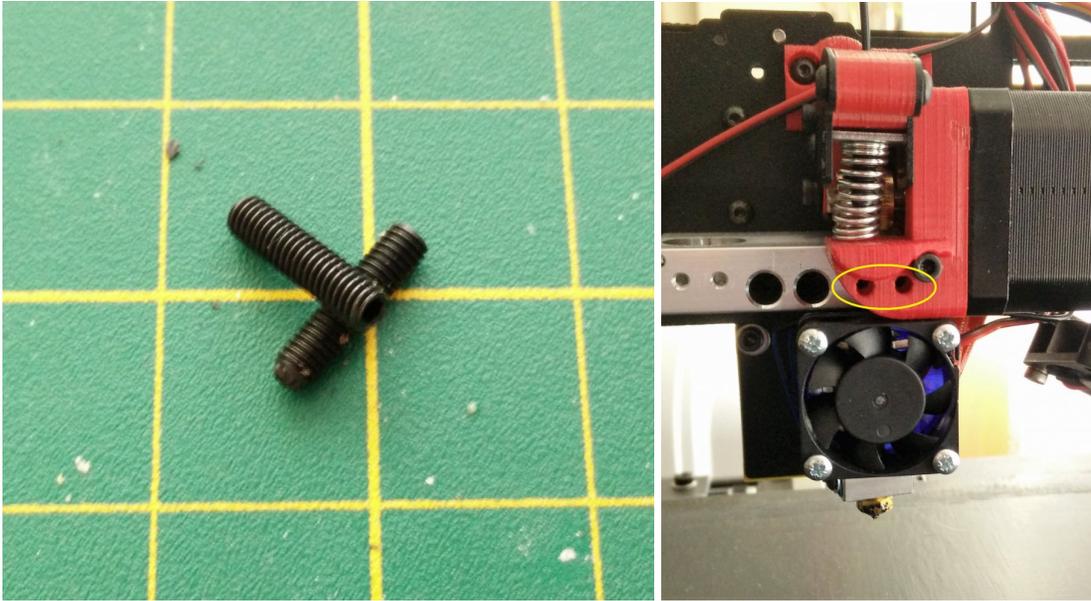
13. Insert the heating cartridge into the heatblock, and secure it with the supplied BH 3×10.



14. Install the 30mm fan, sticker toward the heatsink



15. Install the hotend from the bottom of the hotend block. You may have to raise the Z to have enough room to do this step.
16. The hotend block has two holes in the front, as shown below, for two M3-12mm set screws to secure the hotend in place. Tighten the set screws so the screw hits the Hotend groove.



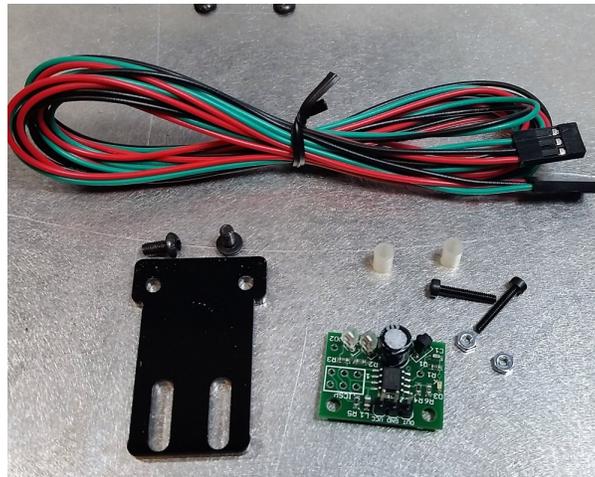
17. With the hotend and the lever arm in place you can now adjust the hob to be centered in the filament path. Look down the small filament hole on top of the lever arm and adjust to location of the hob then tighten.

Installing the ABL Sensor

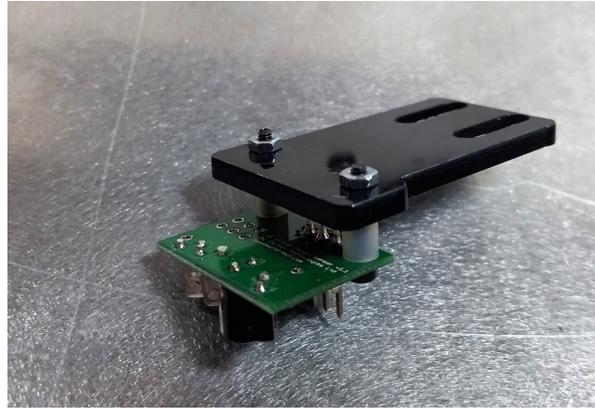
Installing the ABL Sensor

Parts Required

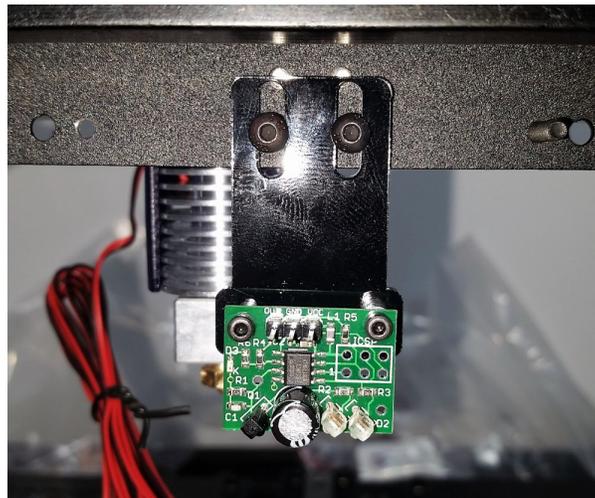
- - 2 M3 × 6 BHCS
- - 2 M2 × 12 SHCS
- - 2 M2 Nut
- - 2 M3 Washer
- - 2 mini standoffs
- - 1 Acrylic ABL Sensor Mount Plate
- - 1 ABL Sensor
- - 1 Sensor wire



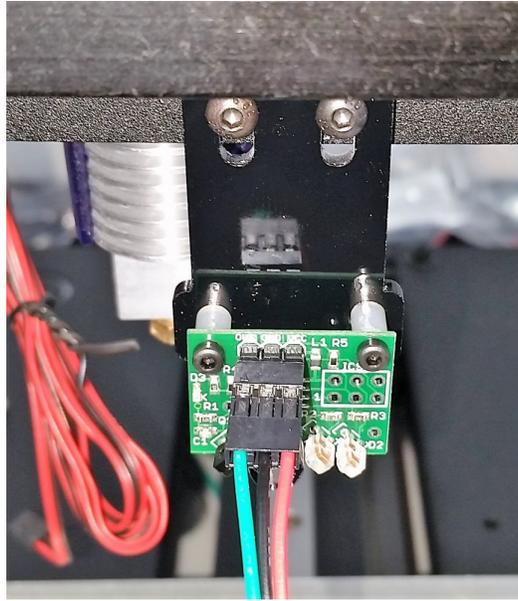
1. Attach the sensor to the acrylic mount using two **M2 × 12 SHCS**, two **M2 Nuts**, and the mini standoffs between the plate and the board as shown above.



2. Attach the plate and sensor to the back of the X Carriage Plate, using the two M3 × 6 BHCS, and two M3 Washer as shown above.



3. Connect the sensor wire. Note the orientation of the connector, the **green** wire should be on the **OUT** pin, and the **red** wire on the **VCC** pin.



! Verify 3 times that your sensor wire is connected as outlined above. Failure to follow these directions will destroy the sensor and can also possibly damage your RAMBo board. Warranty is not available for the sensor being improperly connected or any subsequent damage done to the board.

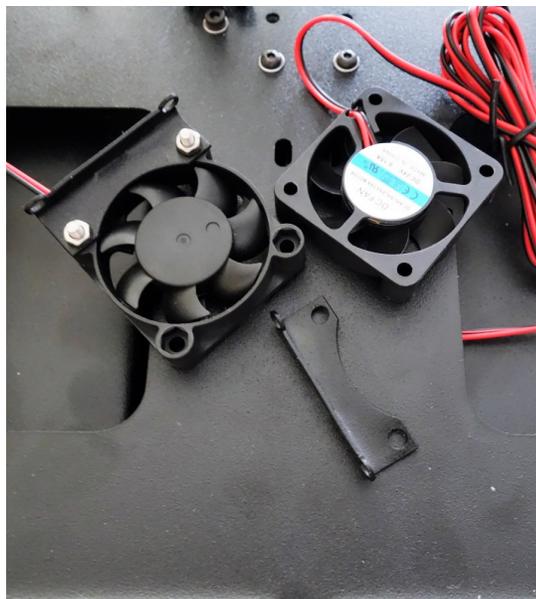
Installing the Fans and Endstops

Installing the 40mm Fans

Parts required

- 2 – M3 × 6 BHCS
- 4 – M3 × 22 SHCS/ zip ties
- 4 – M3 Nut
- 2 – Fan Mounts
- 2 – 40mm Fans

1. Install the fan on the Fan Mount, using **two M3 × 22 SHCS** and **two M3 Nut** or two zipties, repeat with the other fan.



2. Install the Fan Mount on the X Carriage Plate as shown. Repeat on the other side.

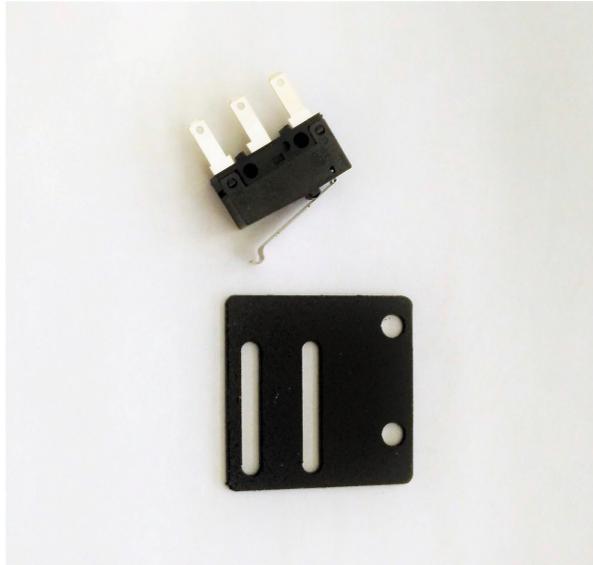


Installing the Endstops

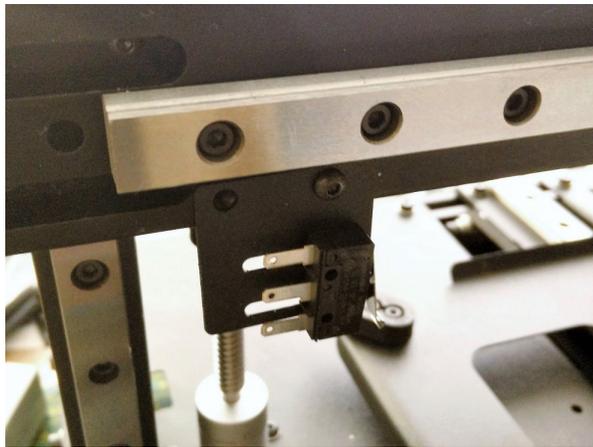
Parts required

- 2 – Endstop switches.
- 2 – Endstop wires
- 3 – M2×15 SHCS (Needs checking)
- 3 – M2 nuts
- 2 – M3 × 6 BHCS
- 1 – M3 × 10 SHCS
- 1 – M5 × 10 SHCS
- 1 – X Endstop Mount Plate
- 1 – Y printed Endstop Mount

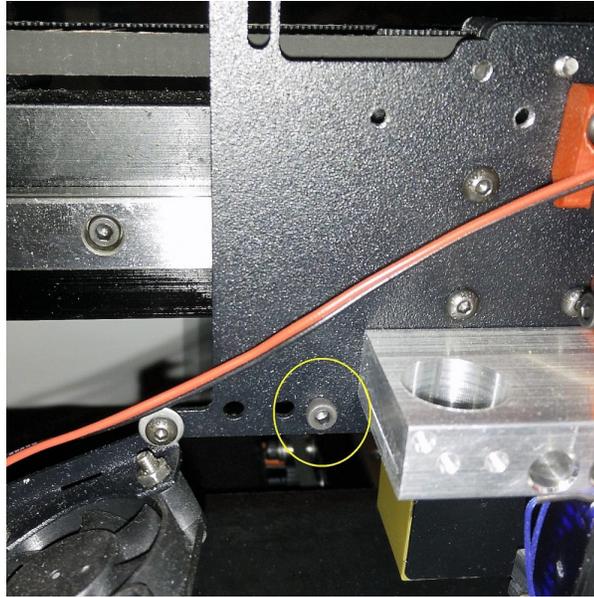
1. Install the endstop switch on the mounting plate using two M2×15 SHCS and two M2 nuts. You will adjust the endstop position, later in the guide.



2. Attach the X endstop mount plate, using **two M3 × 6 BHCS**



3. Install a **M3 × 10 SHCS** into the tapped hole on the X Carriage Plate as shown below

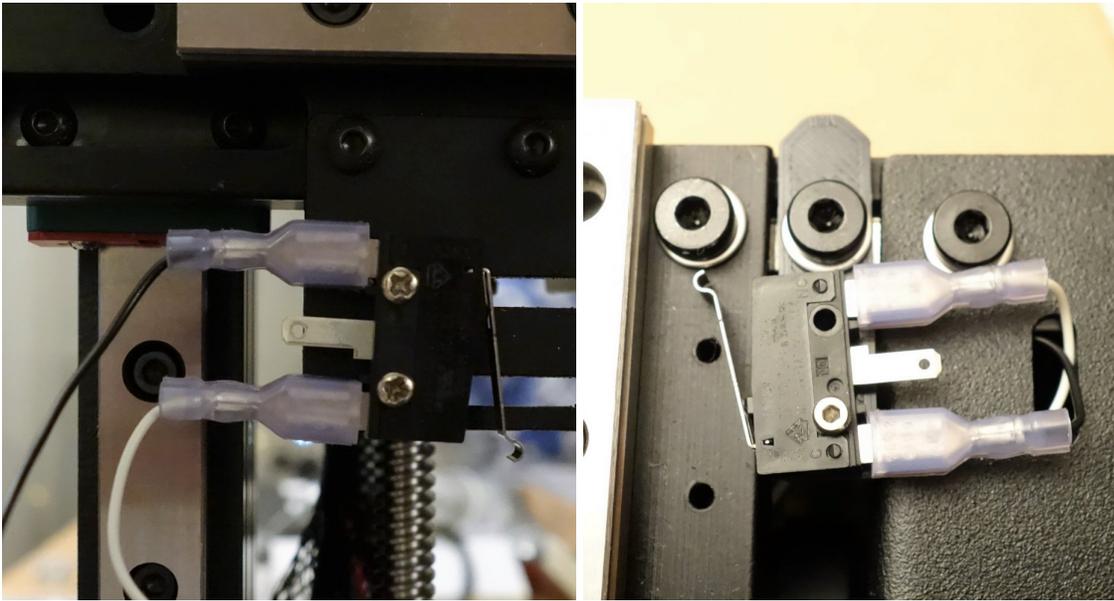


4. Attach the endstop switch to the printed mount, using one **M2×15 SHCS** and one **M2 nut**, then attach the mount to the M5 Post Install Nut in the back extrusion, using M5 × 10 SHCS. You will adjust the endstop angle later in the guide.



5. The endstop wires are provided with the RAMBo board, they are black and white, with spade connectors on one end, and a keyed connector on the other end. Connect them to the switch outside

terminals. Since there is no polarity they can go on either terminal, except for the middle one.



Tightening the belts

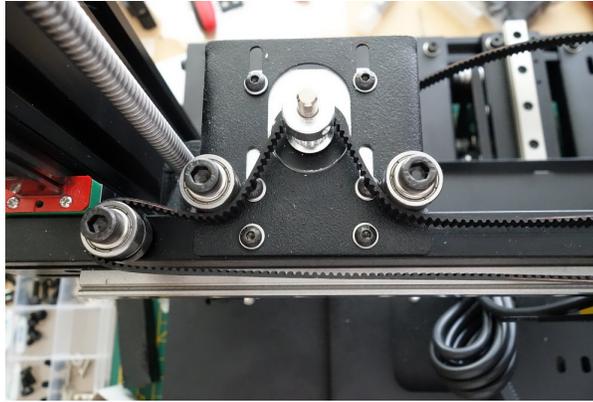
Tightening the belts

* The gauge the belt tightness, pluck it like a guitar string. If you get a thud, the belt is loose, if you get a high note its too tight. Aim for a low bass note (D)

1. To tighten the Y belt, loosen the two button head screws, turn the motor down to the desired tightness, and tighten the screws.



2. Test the belt, if you get the low bass note, trim the belt leaving at least 40mm of the belt.
3. To tighten the X belt, loosen the four button head screws, push the motor toward the back to the desired tightness, and tighten the screws.



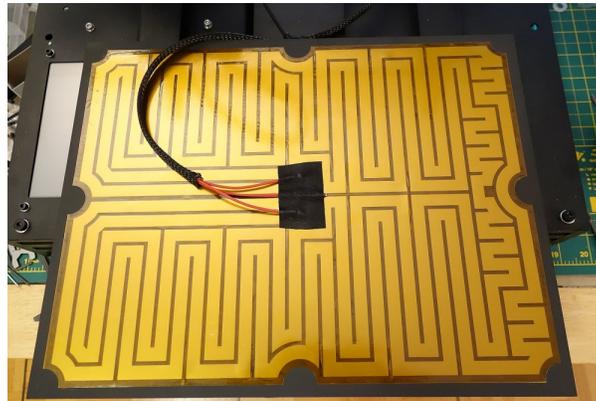
4. Test the belt, if you get the low bass note, trim the belt leaving at least 40mm of the belt.

Installing the Glass and Bed Heater

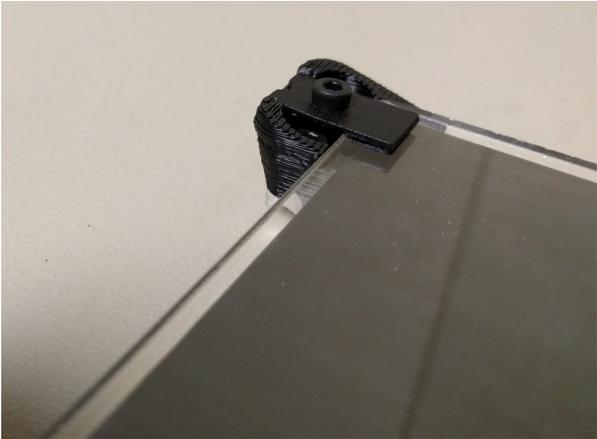
Installing the Glass and Heater

Parts Required

- 1 – Kapton Bed Heater
 - 1 – Heatspreader plate
 - 1 – Glass
1. Align and center the Heater on the Heat Spreader, with the paper backing down towards the aluminum. Use scotch tape or similar along one edge to temporarily hold it in place.
 2. Fold the heater back and peel a corner off the backing on the edge you taped in place to expose the adhesive.
 3. Slowly apply the Heater to the Spreader, peeling off the backing as you smooth out the heater.



4. Use about 240mm of Wire Loom to cover the heater wires. Place the heater, with the heater facing down, and the spreader facing up, and route the cables down through the circular hole on the right hand side. Secure the wires with a ziptie to the two slots of the plate.
5. Place the glass, and secure it with the clip plates, using **M3-18 SHCS**.



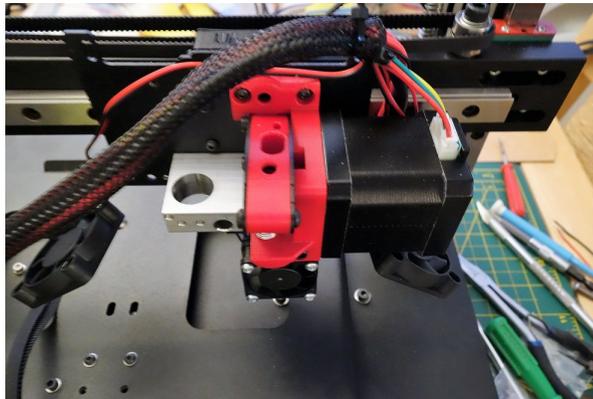
Wiring

External Wire Management

External Wire Management

1. For easier identification of each wire at later steps of the wiring, using tape, and a marker, label:
 - each fan wire,
 - extruder motor wire,
 - thermistor wire,
 - heater cartridge wire,
 - ABL sensor wire
 - X motor wire,
 - X Endstop wire,
2. Connect the two long stepper cables that came with the kit to the Extruder motor, and X motor. The short cables will be used for the other three motors, at a later stage.
3. Cut a 90cm long piece of the provided braided cable sleeving. It should be long enough to allow full Z and X travel of the extruder.
4. Collect all the cables listed in step 1, except for the X motor and endstop, and put them into the cable sleeving.

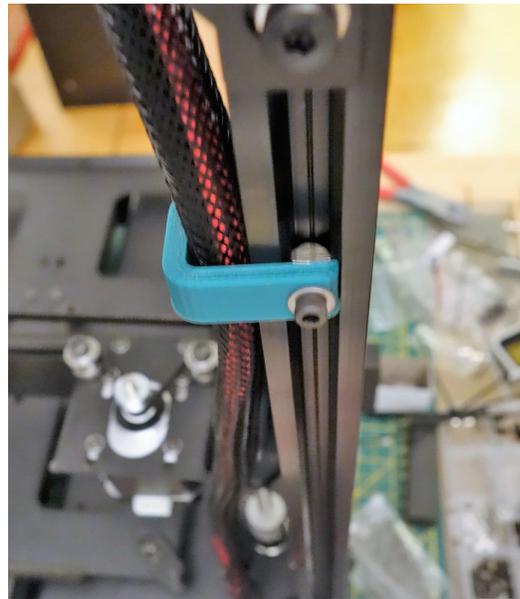
Use a zip tie to attach the bundle to a slot on top of the X carriage



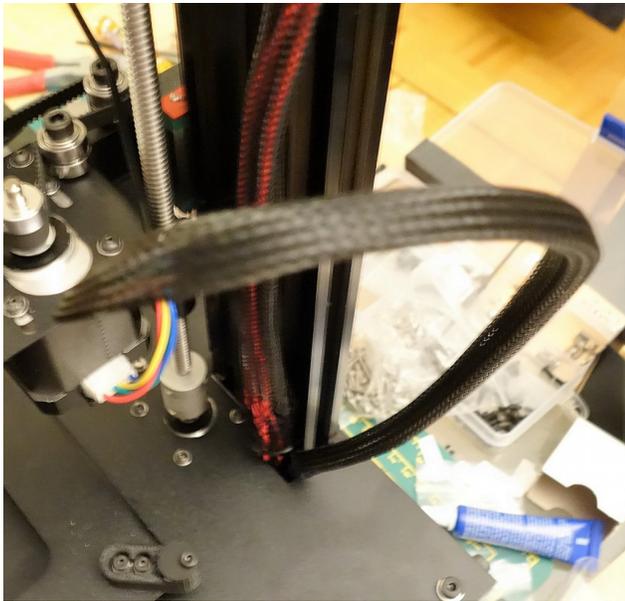
5. Insert the other side of the bundle, into a cutout on the left side of the Top Deck Left, by the Z extrusion.



6. Using a M3 Post Install Nut, a M3 × 10 SHCS, and a printed clip, secure the bundle to the back of the left Z extrusion, about 2" from the top.



7. Cut a ~55cm long piece of the wire loom, and use it on the X motor and endstop wires. Ziptie one end to the X motor plate, and run the other end into the cutout on the Top Deck Left



IEC, PSU and LED

Flip the printer on its back.

IEC socket



1. Install the switch into the IEC. Note the orientation of the switch, steps 3 and 4 depend on it.



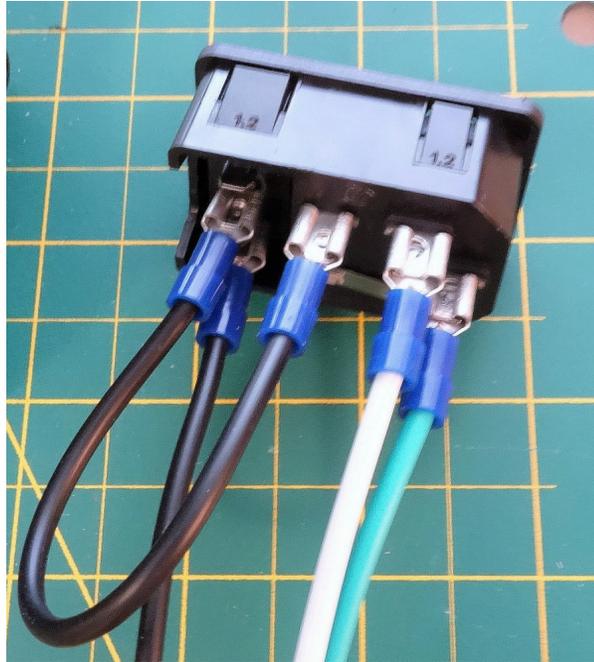
2. Install the fuse into the IEC



3. Connect the jumper wire as pictured below, if the connectors are loose, squeeze them a bit with pliers.



4. Connect the green, white and black wires.

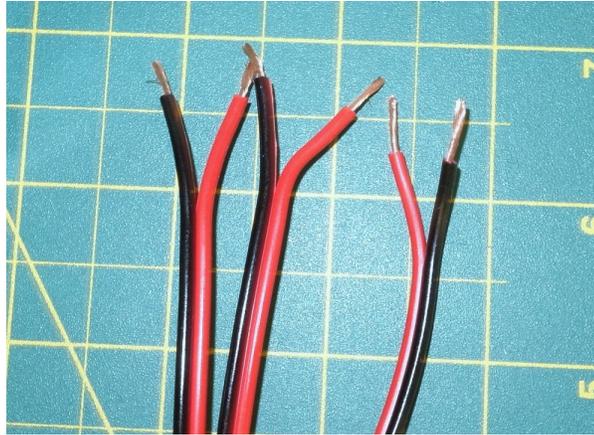


5. Insert the IEC with the wires into the IEC plate on the right side of the printer.

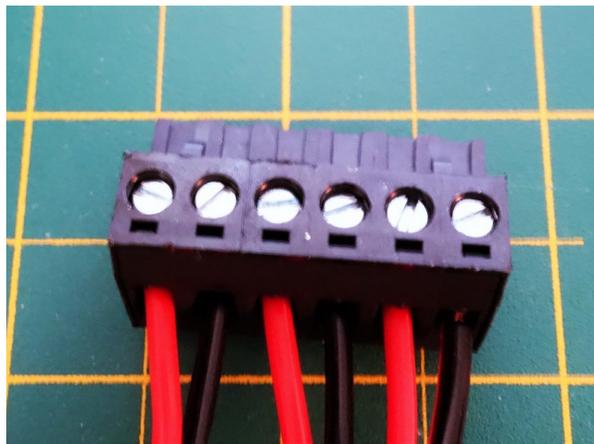


PSU Part 1

1. Strip and twist the cut ends of the three pairs of red and black wires.



2. insert the wires into the power connector supplied with the RAMBo board, and tighten the terminals. Note the polarity.



3. Attach the IEC and power wires to the PSU, as shown.



LED

- * If you prefer a colored LED, you can substitute the white diffuser with a diffuser printed in one of our premium translucent PLA colors. The stl for the diffuser is available here: [diffuser STL](#)

4. Glue the white diffuser plate to the deck plate as shown, using super glue.

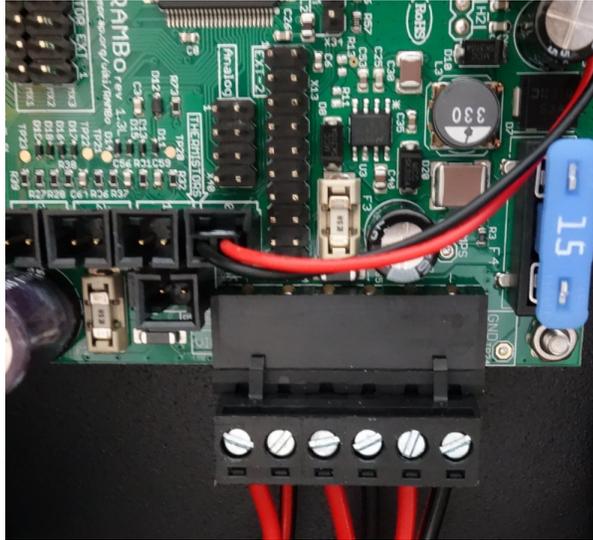


5. Remove the adhesive backing paper off the led strip and stick it to the extrusion as shown in the step above.
6. Wire the strip to the PSU as shown above. Note the red wires goes with the other reds, and black with the blacks.
7. Attach the reflector plate to the extrusion, using two M3 Post Install Nut and two M3 × 6 BHCS



PSU Part 2

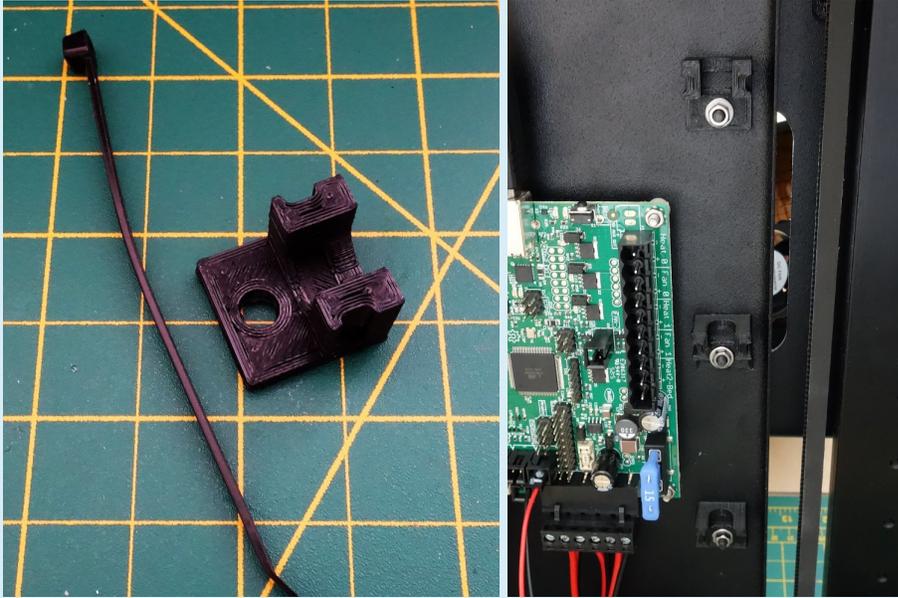
8. Attach the power connector to the RAMBo board



9. Using 2 M5 Post Install Nut, 2 M5 × 8 SHCS and M5 Washer Attach the PSU wire cover to the bottom of the front extrusion, covering the PSU terminals and wires. Attach the IEC cover in a similar manner to the back extrusion covering the IEC terminals and wires,
You may hold on doing this step until you are satisfied with your wire arrangement.



- * The kit comes with a number of printed clips for easier wire management. Those attach to the deck plate with M3 screw and nut.

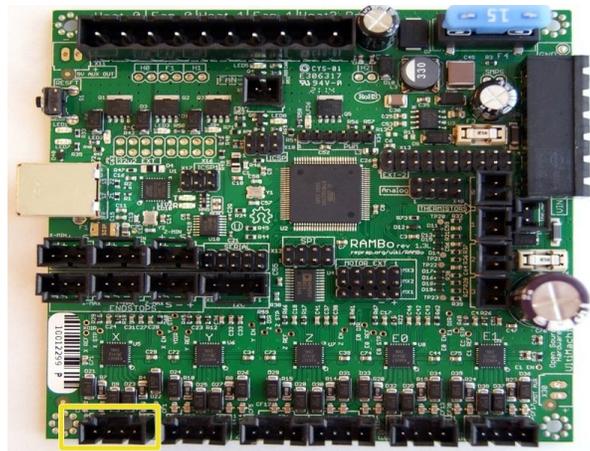


RAMBo – Connecting steppers

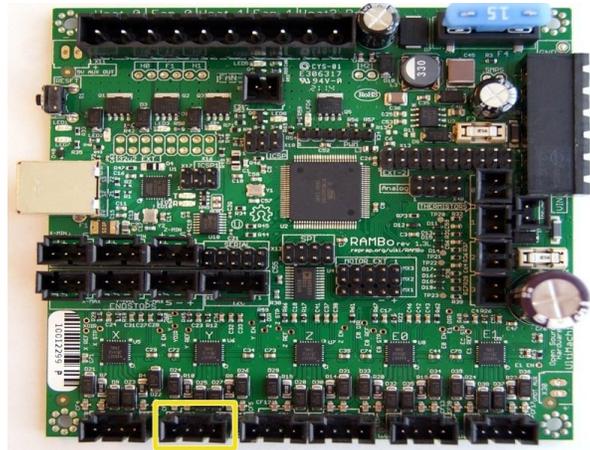
* For the connections for the Rambo controller please refer to the supplied paperwork supplied with the Rambo. Changes to the controller may not have been updated to this document.

! Never plug or unplug the motor connector to the Rambo Controller with power turned on. This can cause the motor driver chip to be damaged.

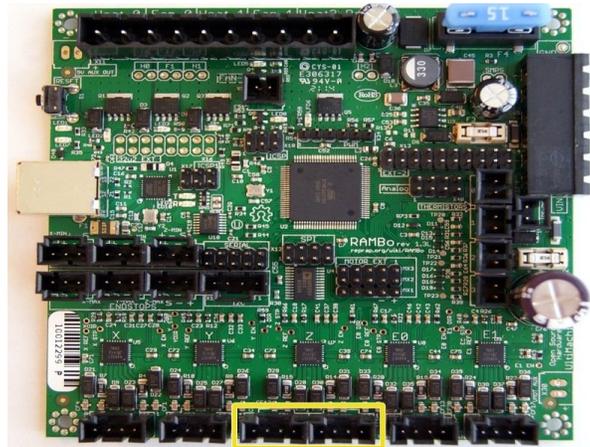
1. Attach the X Axis Stepper to the RAMBo X Driver plug, with the blue wire toward the USB port side, or RasPi side.



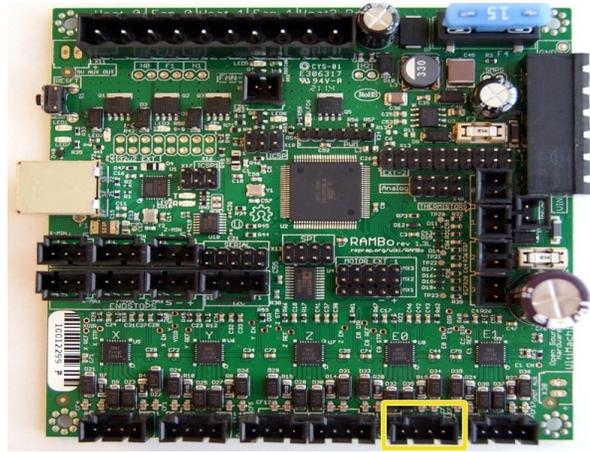
2. Attach the Y Axis Stepper to the RAMBo Y Driver plug, oriented the same manner as the above.



3. Attach the Z Axis Stepper to the RAMBo Z Driver plug, oriented the same manner as the above.
If your printer model uses two Z stepper motors insert the second Z stepper into the next marked port.

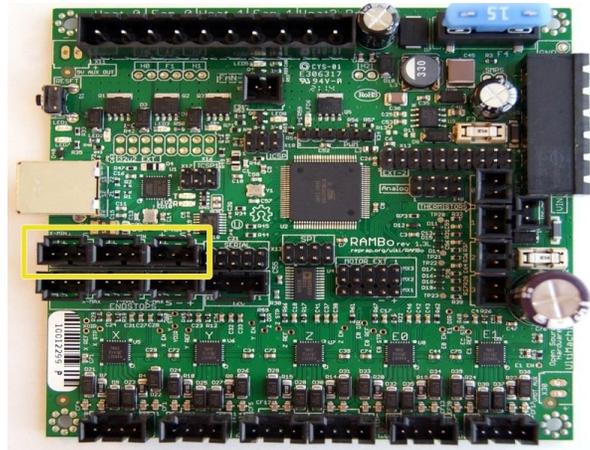


4. Attach the (Default) Right Extruder Stepper to the RAMBo E0 Driver plug, the blue goes toward the USB Port. **If you are installing a second Extruder Stepper to E1 Driver plug, install the second extruder plug reversed.** This makes the motor run in reverse, which is needed since the second extruder is a mirror image of the first.

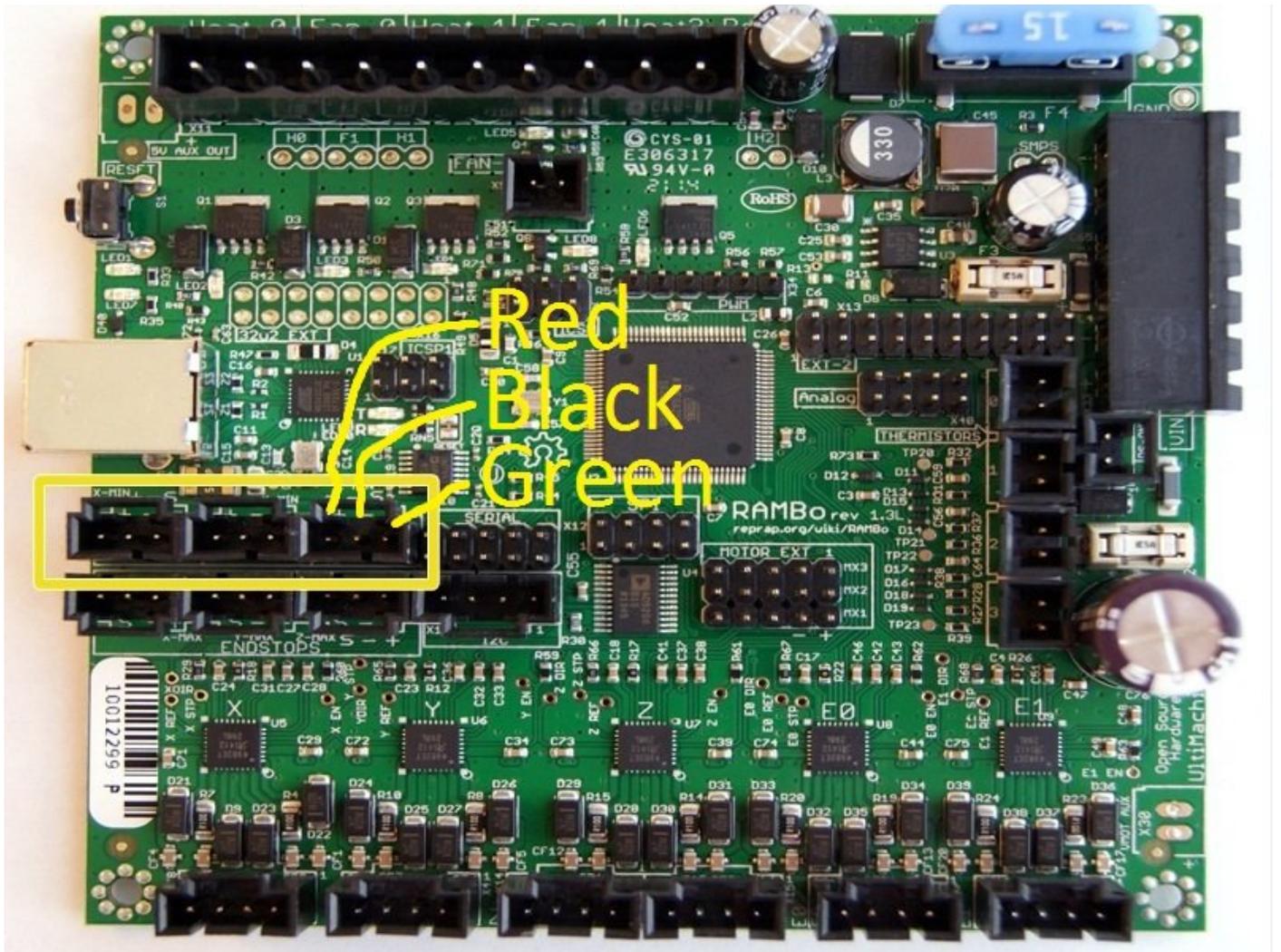


RAMBo – Connecting Endstops, ABL and Thermistors

1. Pay attention to the labels on the board, and connect X and Y endstops to the correct min port.

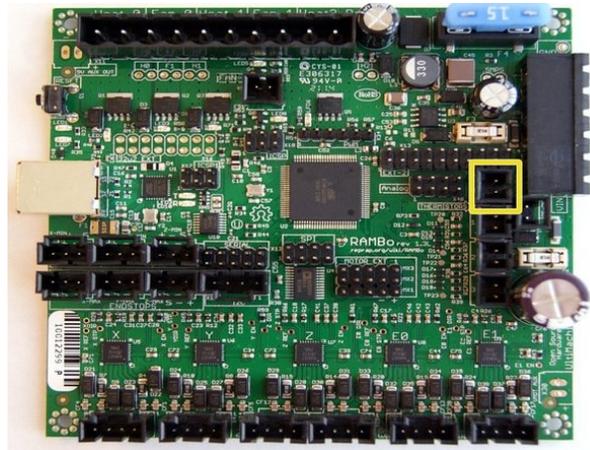


2. Install the ABL Sensor's 3 pin plug into the RAMBo as shown.
 - The red wire of the 3 pin connector goes to the + on the min Z endstop connector port.
 - The black "center" wire of the 3 pin plug goes to the – of the min Z endstop port.
 - The green wire of the 3 pin plug goes to the S position of the Z min endstop port.

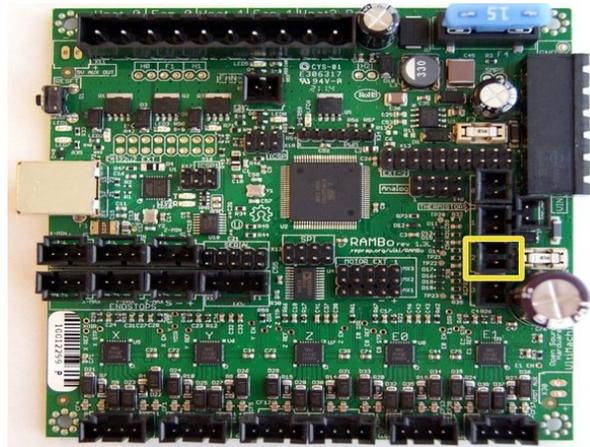


! Verify 3 times that your 3 pin is inserted into the rambo as shown. Failure to follow these directions will destroy the sensor and can also possibly damage your RAMBo board. Warranty is not available for the sensor being improperly connected or any subsequent damage done to the board.

3. Install the Thermistor for the Default Right Hotend to the T0 plug. If you are installing a second Hotend, its thermistor goes to the T1 plug, otherwise leave it unused. Thermistor plugs are not polarized, and the orientation of the plug in the jack does not matter.



4. Install the thermistor cable from the bed heater to the T2 jack. Again, the orientation of the plug does not matter.



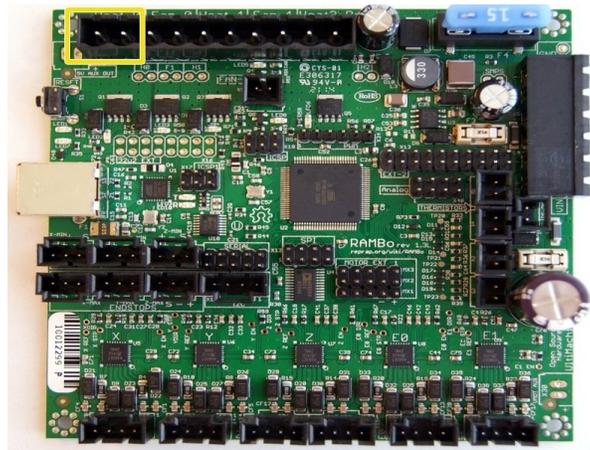
RAMBo – Connecting Heaters

* Included in the rambo controller are push in connectors with screws terminals for wire termination.

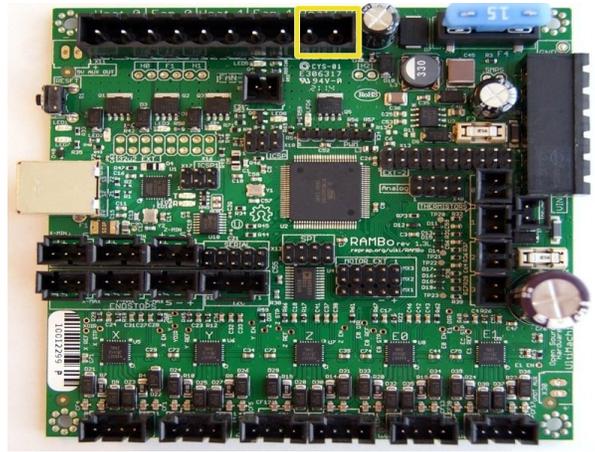
* You need to strip the ends of the cables before insertion into the connector. If after stripping the cable the wires fray out you will need to twist the ends so they go cleanly into the connector. Once the cable is twisted you place the wire into the open hole and tighten the screw down. When done make sure there are no frayed wires that can short to another wire sticking out.

! On the cables for the bed heater pay special attention that the screws are very tight compressing the wire and that the plug is fully secured into its plug. If this connection is loose it will cause excess heat in the connection and will melt the plug plastic.

1. Install the wires for the Right Hotend heater into the two pin screw terminal connector and insert into the plug labeled Heat0. If you are installing a second hotend, connect it to the plug labeled Heat1



2. Install the large wires from the heated bed into a two pin connector and install into the plug Heated Bed.



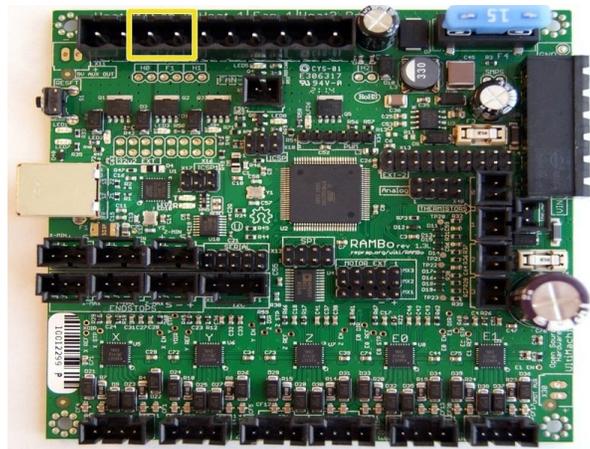
RAMBo – Connecting Fans

- * If you have ordered a Dual Extruder kit, you will need to splice both sets of fans together. Red to Red, Black to Black.

1. The kit may come with one or two fans to cool the print. (a special fan is provided to cool the E3D hotend barrel and is addressed later) These fans may come with a white or black plug on the end. Cut this connector off.
2. Strip the cables of the fan so that about 5mm of copper wire is exposed. Twist the two red wires from each fan together. Twist the two black wires from each fan together. The red wires will go into the screw connector that goes to the small + on the controller board. The black wires will go to the -.

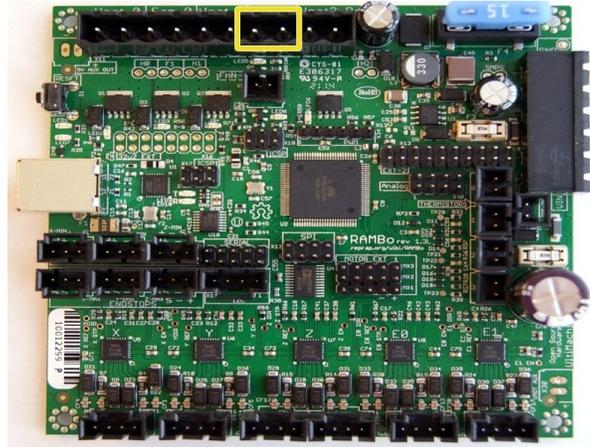
- ! If you get the fan connections wrong you will melt down your fans. (replacements are in the store!) please double check that the red wires end up going to the + and the – goes to the black wires. Do this after you install the plug since its easy to get it backwards in your hand. Negative is toward the USB port, Positive is toward the big fuse.

3. The print fans install into the port labeled fan0



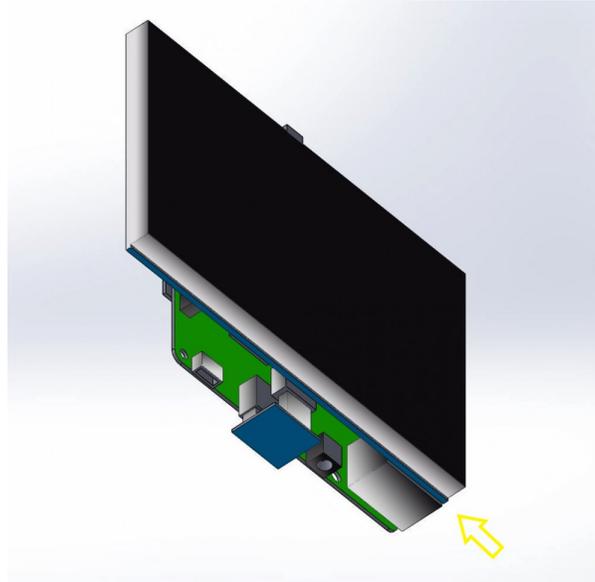
- * If your kit was supplied with a E3D hotend it comes with a 30mm fan to cool the E3d barrel. This fan must be running at all times you are printing or it will cause you to have filament jams. Do not run the E3D hotend without this fan installed and operating.

4. E3D fans connect to the plug labeled Fan1. Like the fans in the previous step install the cables into the plug with the screws. Tighten down and make sure the + and – are in the right position as indicated on the board in small print. The firmware is set to turn on the fans on Fan1 automatically when the hotend reaches 60C.

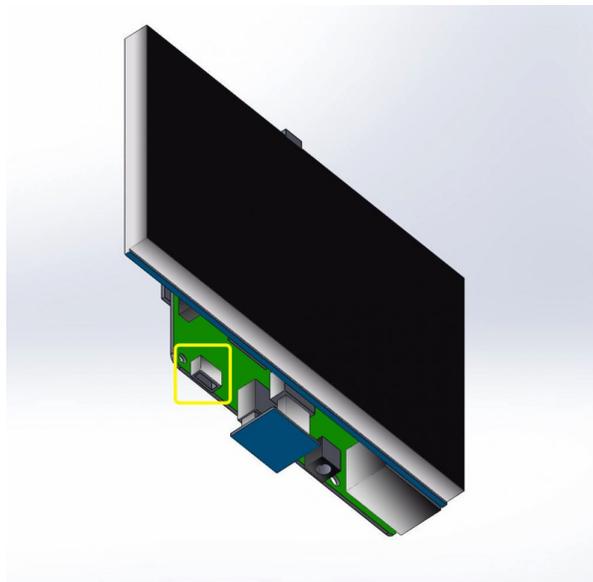


USB and testing

1. Your kit includes a short USB A/B cable. The cable plugs into the USB port on the RAMBo and the closest USB Port on the RasPi



2. You may need to provide your own USB cable for powering the Pi, a standard phone charging cable and a 2.5-3A phone charger will suffice. Connect it to the power port on the Pi.



3. Verify all connections one more time. Plug the power cord in and turn on the switch. You should see a power on light next to the + and – terminals on the PSU, and you should see a power on light next to the USB connector on the Rambo.

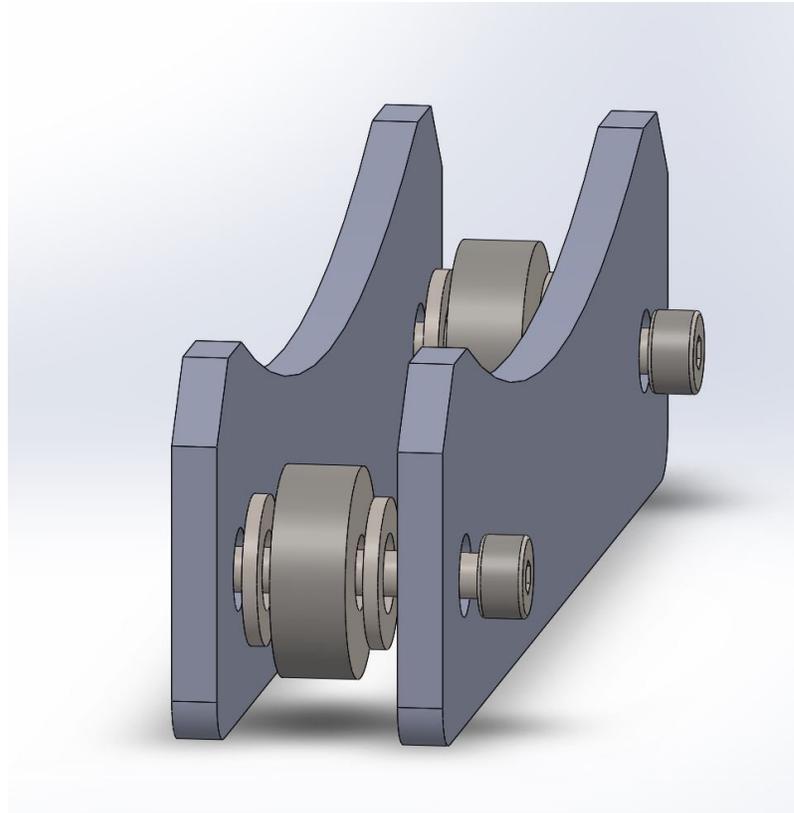
✿ If the power supply led is on and there is no leds on the Rambo its possible you may have a blown fuse. F3 . This is most common when you accidentally plug the heated bed into the hotend connector.



Spool Holder

Spool Holder

1. Remove the paper covering the acrylic parts
2. Assemble using the bearings and hardware from the package.



3. Place the spool on the holders

Downloads

- [MTW Create Drivers & Firmware](#)
- [Required Software](#)
- [MTW Create STL Files](#)

Drivers and Firmware

- **Download:**

1. * [Arduino 1.6.4](#)
2. [Drivers](#) (only necessary for Windows at this time) for RAMBo.
3. [Firmware](#)
4. [OctoPi Image](#) (Or download in [multiple pieces](#)) Note: 3GB Download. Do not download unless you need to re-flash the SD card that was included with your Create. For flashing instructions on windows, see this [link](#).
5. Unzip all files

✿ Arduino is an application used to modify, compile, and upload the firmware to the print RAMBo controller.

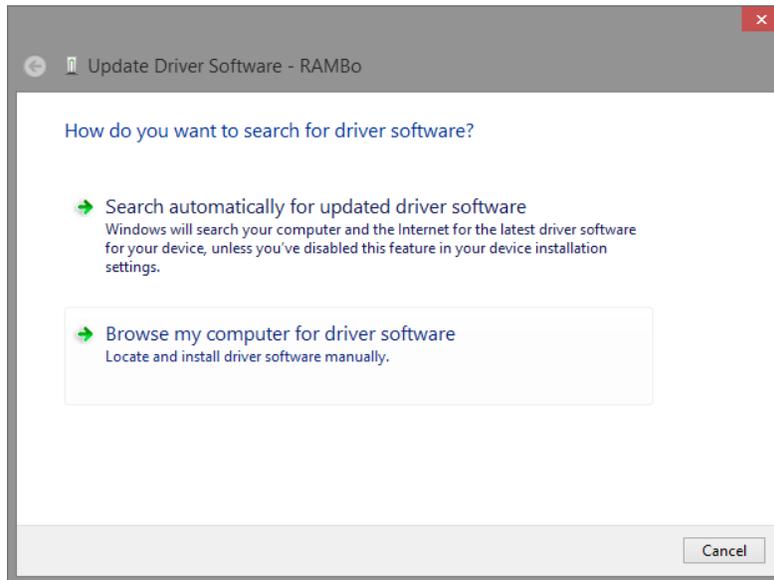
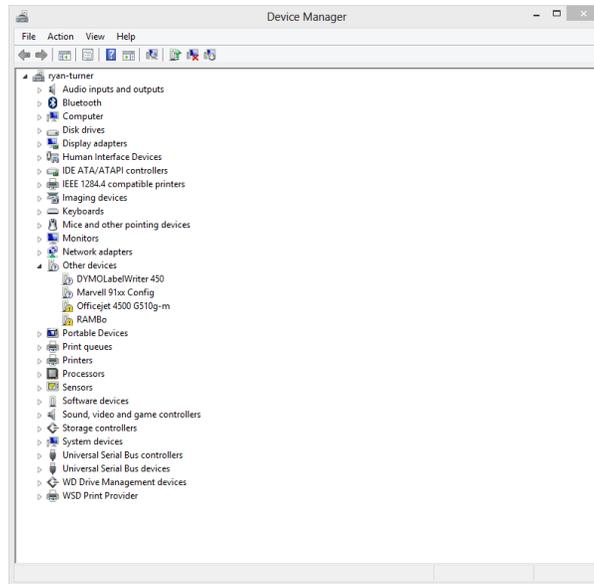
✿ Marlin is the firmware that is running on the print controller, interpreting instructions and powering the different parts of the printer

✿ Using the GLCD on RAMBo requires a special arduino build

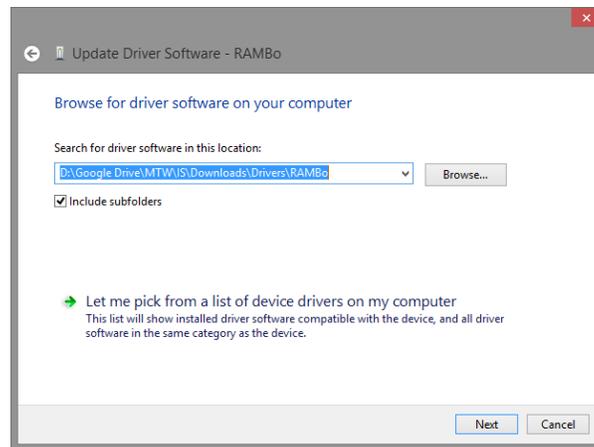
✿ If using Windows, it is necessary to first install the RAMBo driver that you previously downloaded.

- **Installing RAMBo Driver**

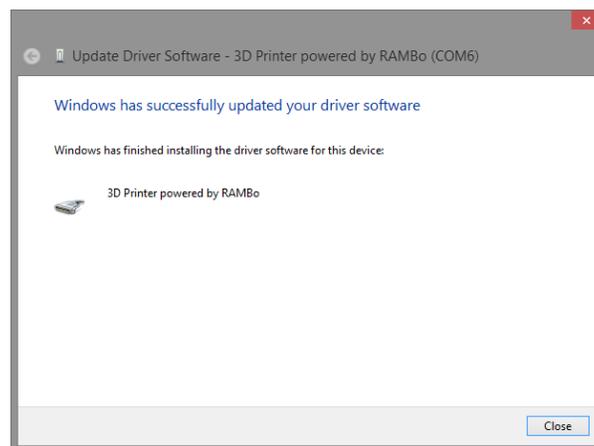
1. Attach the RAMBo to the computer via the USB cable.
2. Open Device Manager
3. Under Other devices, look for RAMBo
4. Right click RAMBo and select Update Driver Software



5. Click Browse my computer for driver software, then click the Browse... button and browse to the directory where you have unzipped the RAMBo drivers, click OK, and then click Next

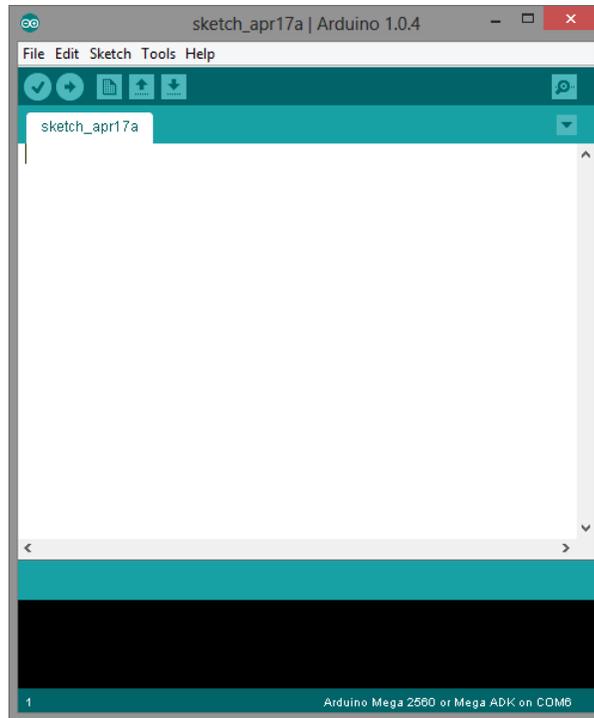


6. Taking note of the COM port listed in the title of the window, click close

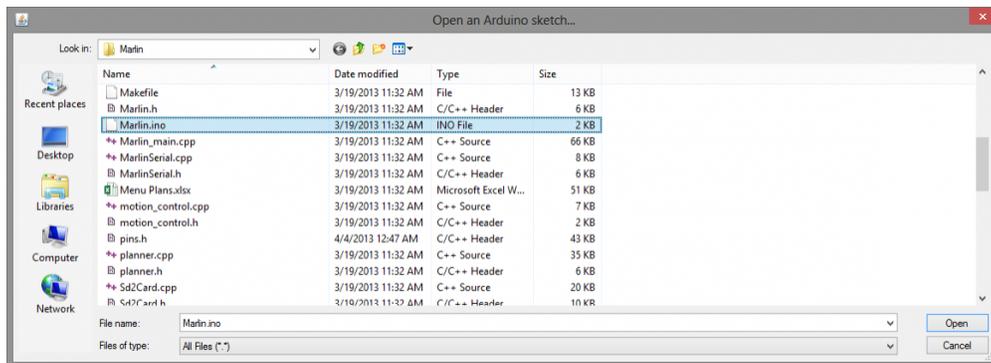


- **Uploading the Marlin firmware using Arduino to your print controller**

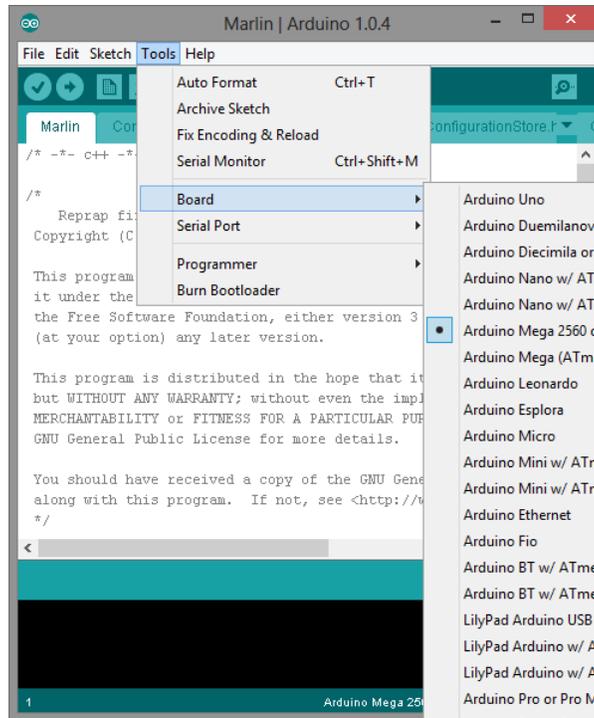
1. Provide 24v to all the inputs on the Print controller. (Power it up)
2. Open the previously-downloaded Arduino application by clicking on arduino.exe.



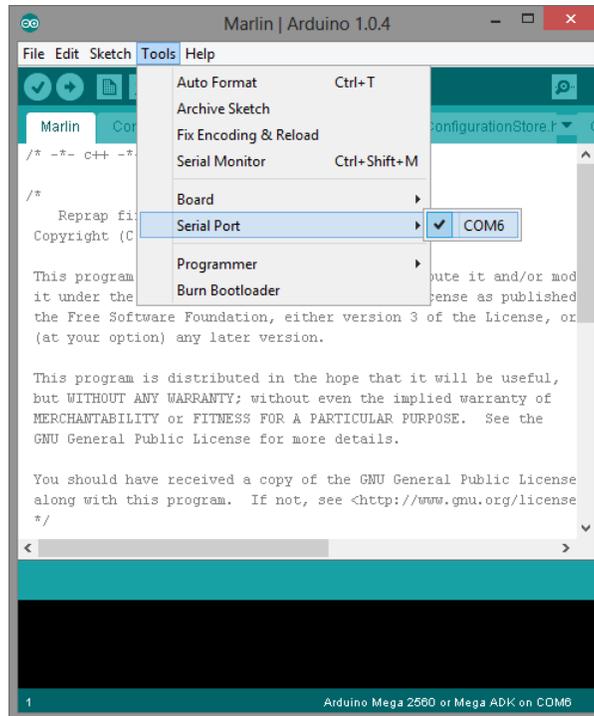
3. Select File: Open. Browse into the directory that you extracted your firmware, then in the Marlin folder, then selecting the file Marlin.pde or Marlin.ino (whichever exists)



4. Select Tools: Board: Arduino Mega 2560



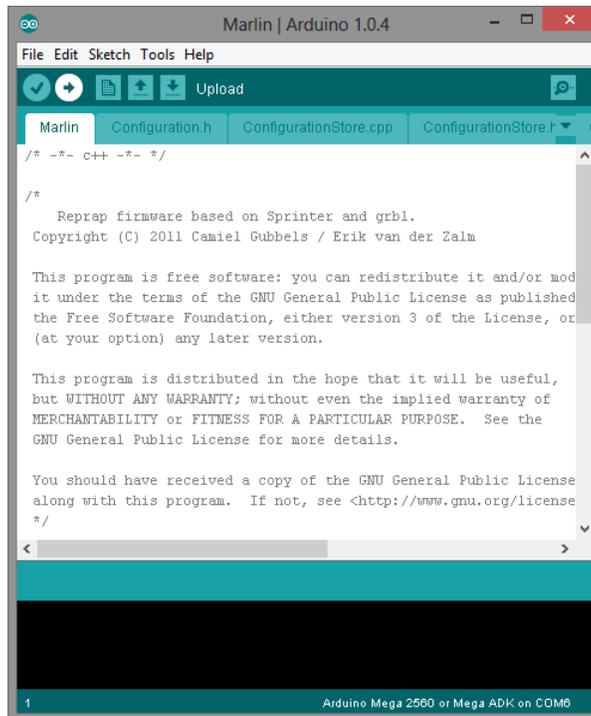
5. Select Tools: Serial Port: and then the port that you noted earlier when installing drivers



6. Select the Configuration.h tab, here you can review and change all the common settings and tuning changes.

✿ If you are running linux you need to change the firmware setting in Configuration.h to `#define BAUDRATE 115200`

7. Press the Upload button.

A screenshot of the Arduino IDE interface for Marlin 1.0.4. The window title is "Marlin | Arduino 1.0.4". The menu bar includes "File", "Edit", "Sketch", "Tools", and "Help". The toolbar shows icons for opening files, saving, and an "Upload" button. The file explorer shows tabs for "Marlin", "Configuration.h", "ConfigurationStore.cpp", and "ConfigurationStore.h". The main editor area displays the contents of Configuration.h, which includes a copyright notice for Camiel Gubbels and Erik van der Zalm, and a GNU General Public License notice. The status bar at the bottom indicates "1" and "Arduino Mega 2560 or Mega ADK on COM8".

```
Marlin | Arduino 1.0.4
File Edit Sketch Tools Help
[Icons] Upload
Marlin Configuration.h ConfigurationStore.cpp ConfigurationStore.h
/* -*- c++ -*- */

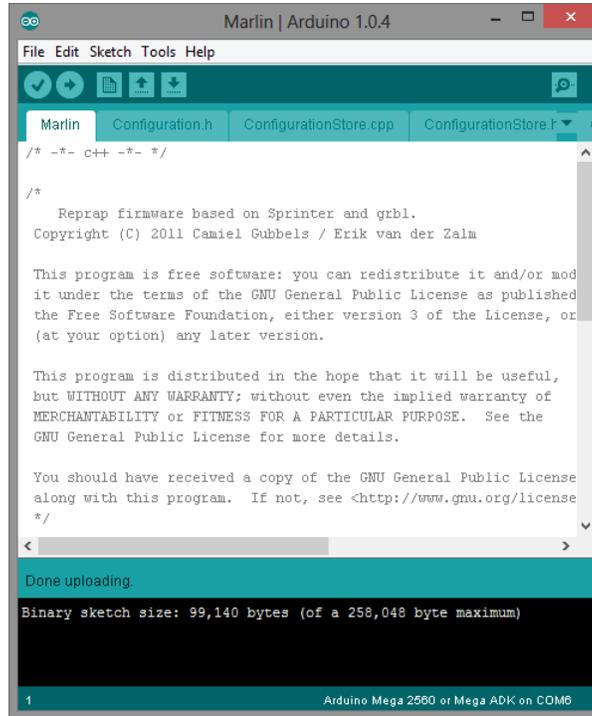
/*
  Reprap firmware based on Sprinter and grbl.
  Copyright (C) 2011 Camiel Gubbels / Erik van der Zalm

  This program is free software: you can redistribute it and/or modify
  it under the terms of the GNU General Public License as published by
  the Free Software Foundation, either version 3 of the License, or
  (at your option) any later version.

  This program is distributed in the hope that it will be useful,
  but WITHOUT ANY WARRANTY; without even the implied warranty of
  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
  GNU General Public License for more details.

  You should have received a copy of the GNU General Public License
  along with this program. If not, see <http://www.gnu.org/licenses
  */
1 Arduino Mega 2560 or Mega ADK on COM8
```

8. Check to see if the upload succeeded; if not, troubleshoot the board type, com port, and firmware



Software

Arduino IDE

- [Arduino 1.6.4](#)

Matter Control 1.5

- [Windows](#)
- [Mac OS](#)
 - [MatterControl User Guides](#)

The following software is supported but is **not recommended for new users**. Matter Control integrates all the functionality of these programs into one user-friendly interface.

Repetier Host *Windows only*

- [Version 1.0.6](#)
 - [Repetier User Guide](#)

Printrun

- www.pronterface.com/

Slic3r

- slic3r.org
 - [Slic3r Manual](#)
 - [Slic3r configurations bundle](#)

STL Files

[MTW Create's STLs](#)

Configuring WiFi on your MTW Create

You can connect to your MTW Create using either Ethernet or WiFi. If you prefer to use Ethernet, you should not need any special configuration at all, just skip to the bottom of this page for how to connect and login to OctoPrint. If you prefer to use WiFi, you will need to follow the instructions below.

Depending on what you have available, there are two different ways to configure your WiFi Connection.

✿ Before you begin, you need to know your WiFi Router's SSID, Password, and what security protocol your router is configured to use. Due to the huge number of different routers available, MTW Support can only provide limited support finding this information.

Option 1: On your Desktop PC or Laptop:

✿ Use this option if you have a MicroSD card reader for your computer.

1. Be sure your Raspberry Pi & MTW Create are powered off, and remove the MicroSD Card from the printer.
2. Insert the MicroSD Card into a card reader on your PC.
3. **Edit the file octopi-network.txt** with Notepad or another text editor. Note that in Notepad, all the text will appear in one long line, so it is harder to find what you need.
4. Depending on the security your router uses, you will either edit the section on the file for WPA/WPA2, WEP, or open/unsecured. Enter your SSID and password in the appropriate fields and add or remove comment marks (“#”) as needed.

```
### WIFI CONFIGURATION #####  
# The three segments below should cover you in most cases if you run  
# a wifi network that uses either WPA/WPA2 or WEP encryption.  
#  
# Just uncomment the lines prefixed with a single # of the configuration  
# that matches your wifi setup and fill in SSID and passphrase.  
  
## WPA/WPA2 secured  
iface wlan0-octopi inet manual
```

```
wpa-ssid "put SSID here"
wpa-psk "put password here"

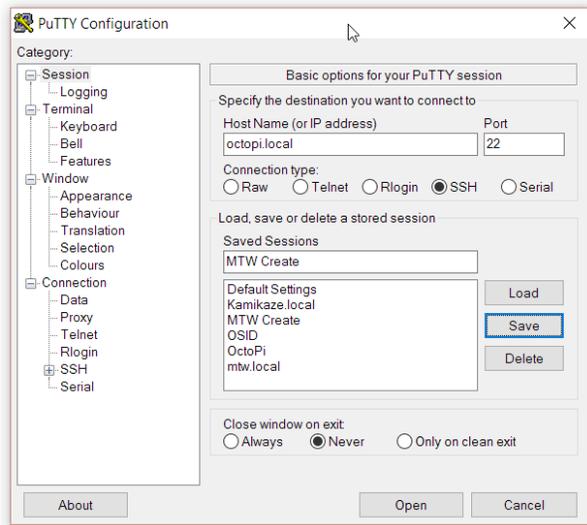
## WEP secured
#iface wlan0-octopi inet manual
#   wireless-essid "put SSID here"
#   wireless-key "put password here"

## Open/unsecured
#iface wlan0-octopi inet manual
#   wireless-essid "put SSID here"
#   wireless-mode managed
```

5. Reinstall the MicroSD Card into your Raspberry Pi.

Option 2: Over Ethernet:

1. Make sure your Raspberry Pi is plugged in using the included power adaptor.
2. Connect your printer to your network via ethernet, then [click on this link](#) to connect to your printer. You should see the octoprint webpage in your browser. For now, you can close your browser and proceed to the next step, we just wanted to test that you were properly hooked up. If you can't connect, contact our support for more help (Note, we can only provide limited help with networking issues).
3. Download PuTTY (putty.exe) from [here](#).
4. Run the program (you do not need to install it).
5. Enter octopi.local in the Host Name field and MTW Create in the Saved Sessions field, then click Save.



6. Click Open to open the connection to your printer.
7. Login to using the username `pi` and password `raspberrypi`
8. We strongly recommend changing your password to something more secure by typing the command `passwd` and following the prompts. Be sure to note your new password, we do not have a way to recover your password if you lose it. You will need to re-flash the SD card image.
9. Type the following:


```
cd /boot
sudo nano octopi-network.txt
```
10. **Edit the file `octopi-network.txt`** with Notepad or another text editor. Note that in Notepad, all the text will appear in one long line, so it is harder to find what you need.
11. Depending on the security your router uses, you will either edit the section on the file for WPA/WPA2, WEP, or open/unsecured. Enter your SSID and password in the appropriate fields and add or remove comment marks (“#”) as needed.

```
### WIFI CONFIGURATION #####
# The three segments below should cover you in most cases if you run
# a wifi network that uses either WPA/WPA2 or WEP encryption.
#
# Just uncomment the lines prefixed with a single # of the configuration
# that matches your wifi setup and fill in SSID and passphrase.

## WPA/WPA2 secured
```

```
iface wlan0-octopi inet manual
    wpa-ssid "put SSID here"
    wpa-psk "put password here"

## WEP secured
iface wlan0-octopi inet manual
#    wireless-essid "put SSID here"
#    wireless-key "put password here"

## Open/unsecured
iface wlan0-octopi inet manual
#    wireless-essid "put SSID here"
#    wireless-mode managed
```

12. to save the file type

CTRL-x

y

[Enter]

13. Type `sudo reboot` to restart the Pi and load the new settings.

Accessing the Octoprint UI on your browser

1. Be sure your Raspberry Pi is powered on
2. [Click this link](#) to open Octoprint in your browser.
3. Login using the Username `MTW_Create` and password `octopi`.

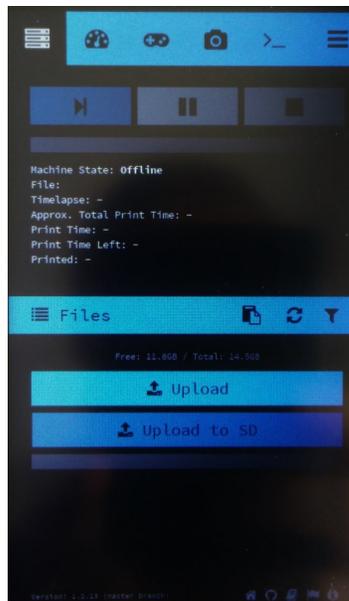
Bringing your MTW Create online

Powering Up and Testing

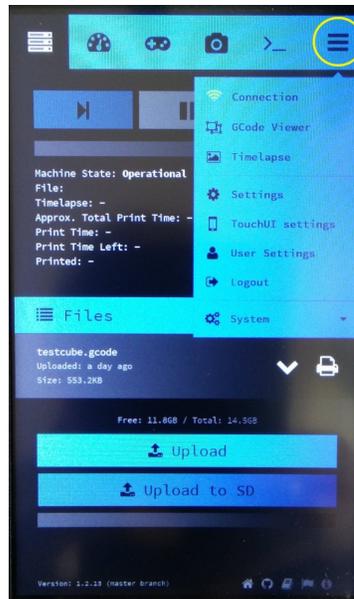
! If you do not intend to use OctoPi, and have the RAMBo board plugged directly into your computer, skip this section to [Bringing Online without OctoPi](#)

Powering Up and Testing

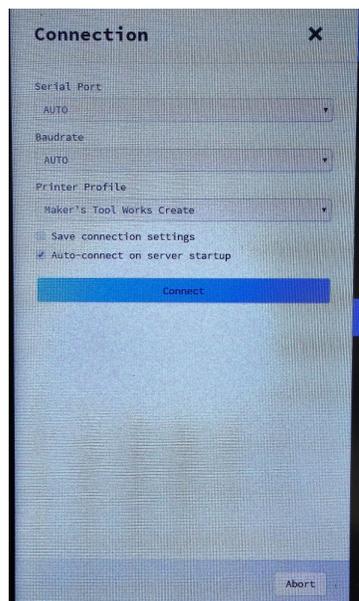
1. Power up the printer, using the switch, and plug in the RPI power brick. The touchscreen will show the boot process, and then will open Octoprint as shown.



2. Click on the highlighted below menu button to open the menu



3. Click on the **Connection**. In the popup shown below check the Auto-connect box, press the **Connect** button, then close it with the **X** button.

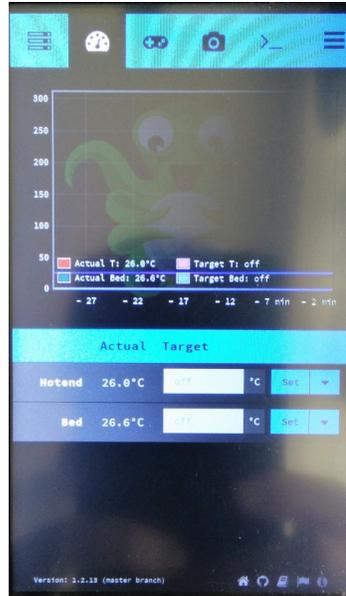


! The printer will lock down, and prevent any use, unless it can read the proper temperatures of the hotend/bed

4. Check the **Temp** tab to see that all of your thermistors (for the hotend and heated bed) are reporting reasonable room-temperature values (typically, a comfortable room is 19-23c).

- If the temp is abnormally high (3 digits high) the thermistor is shorted, inspect it and its wires for any sign of a short.
A common cause for a thermistor short, is improperly installed insulation, or over tightened retention screw.
- If temp shows as 0, the thermistor is either plugged in the wrong port, or has a broken lead.
This applies to hotend and bed thermistors.

5. Press the **Temp** tab button to open the temperatures tab.



6. Set the bed temp to 60C, and watch it to reach that temp, if it reached it, set it to 0, and do the same test with the hotend.
7. Click on the **Control** tab button, to open the controls



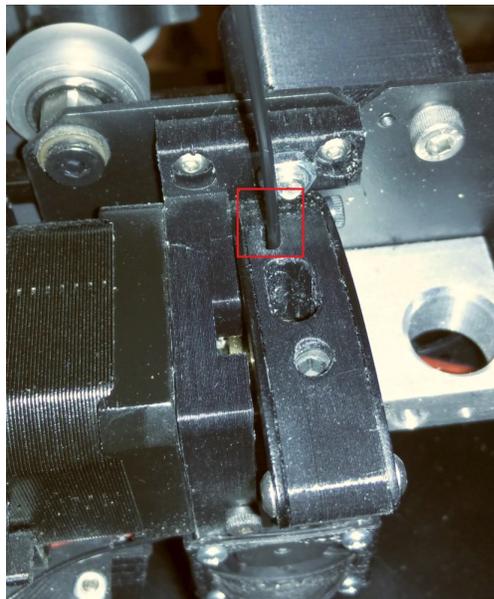
✿ If the control buttons are greyed out, the RPI is not connected to the printer, or there is a fault with the thermistors, see steps 3 and 4.

- Using the controls test the motion, starting by moving the bed forward, extruder to the right, and Z axis, up.

! The image below shows the control panel functions. At this stage of the guide, avoid pressing **Home Z** button.



9. Insert the filament through the supplied PTFE tube, then the smaller hole on the extruder arm, into the hotend.



Applying 3D Eez

Printing on glass typically requires some adhesive solution for keeping the print stuck to the glass during printing. The solution can differ with some filaments.

For PLA we recommend the 3D eez bed treatment that has been provided with your kit.

The application can be a bit tricky but we will try to explain the method that has worked best for us.

- You start by clean the glass surface with the wipes that came with the kit. If you need to do it again in the future and are out of the wipes you can use alcohol and cotton swabs or a microfiber cloth. The glass needs to be very clean or the 3D eez will not stick to it. Go over each area at least 3-4 times.
- Applying 3D eez is a lot like trying to paint with a fast drying blob. You are supplied with a foam brush but we will cover two techniques for application.
- Foam Brush Method:
 1. I start by pouring a small amount (roughly 2 cap fulls) to the back left quadrant of the glass.
 2. Using the brush I make quick side to side movements as move the blob to the front. When it gets to thin and doesn't cover I go back over the same area trying to drag move of the 3D eez to the front using the same motion.
 3. If needed I add more of the 3D eez. Do this to all areas of the bed. The 3D eez will slowly spread out and dry. You can quicken the dry time by blowing a fan at the bed.
 4. Once dry (usually about 30 minutes) apply a second coat and allow to dry then a final 3rd coat and allow to dry. It is normal for the texture to be a bit wavy rough.
- Credit Card Method.
 1. Pour a cap full of 3D eez in the back corner.
 2. Find an old credit card or something about the same size that is somewhat flexible. Place the credit card behind the blob and hold it at an angle and drag the blob to the front. Continue this for the whole bed adding more 3D eez as needed.
 3. Apply 3 coats to the bed allowing drying time between each coat. This method provides a flatter surface but requires a bit more skill and will still be somewhat rough and wavy.

Remember that if you set your Z sensor you will need to repeat the Sensor calibration again after applying the bed treatment. You will need to re calibrate if you switch bed treatment types like moving to hair spray for printing ABS.

For ABS we recommend using hairspray on the glass. Specifically Garnier Fructis Hairspray (pump style). Apply the product to a paper towel and wipe it on to the glass surface.

[Product Link](#)

Calibrating your Auto Bed Leveling Sensor

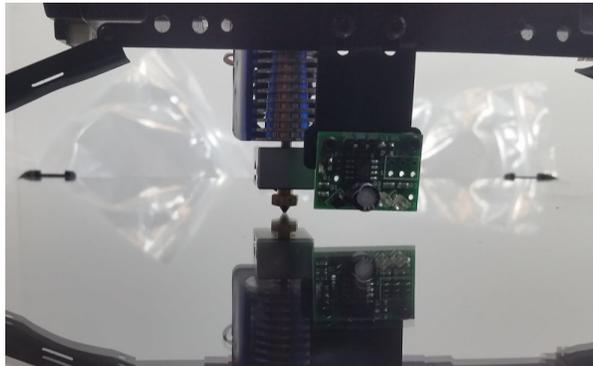
Setting up the IR Auto Bed Level System:

Setting the Sensor

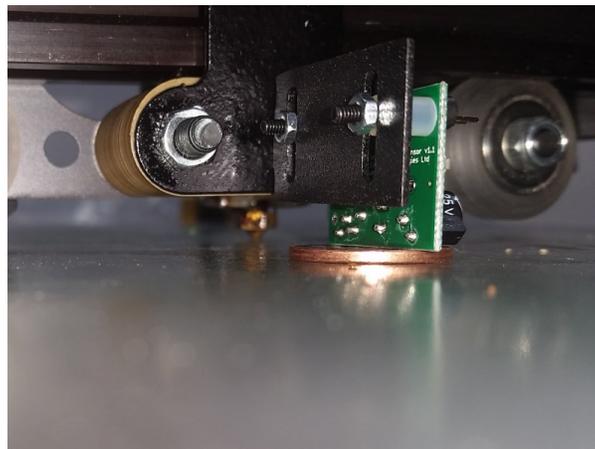
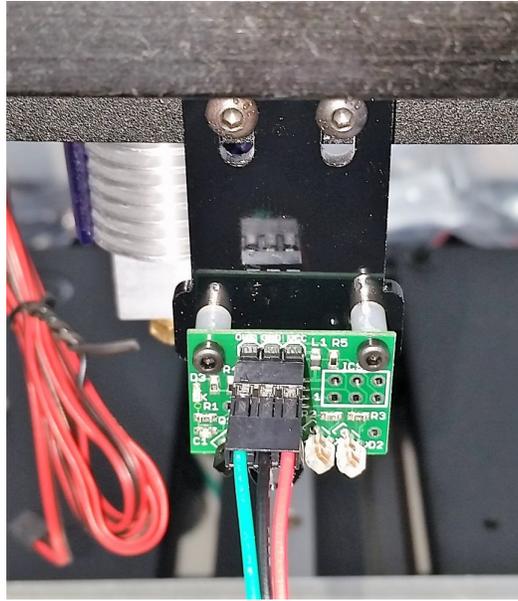
You will need to align the ABL sensor prior to use. This procedure is simple and only takes a few minutes. You will need an old CD or DVD, or another flat item about 1.5-2mm thick.

! Be sure you have leveled the X axis as described in [Installing the X Axis](#).

1. Turn your printer so the back is facing you. It should be plugged in and powered on.
2. Lower the printhead until your nozzle is just touching the glass.



3. Loosen the two screws holding the ABL sensor mounting plate (not the sensor itself), and adjust it so it is resting on DVD as shown below (shown below with a penny)



4. Retighten the screws.

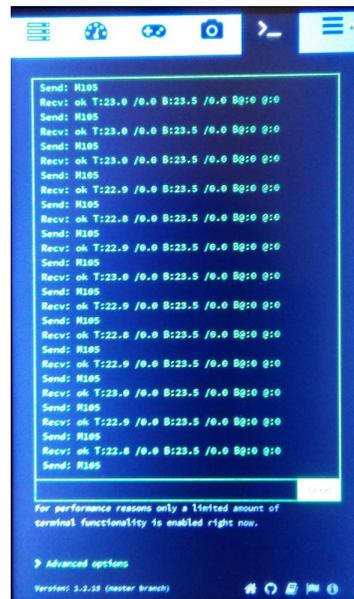
Setting the Z offset

- We are now going to determine the **G92 Z** offset value for your printer, this will set the distance between the nozzle and the glass after the auto bed leveling sequence.
1. Using the the touchscreen controls, move you **Extruder** (X axis) and **Bed** (Y axis) so the extruder nozzle is centered above the glass.
 2. Press the **Home Z** button. Keep your other hand near the printer's power switch when you do this. If your nozzle crashes into the glass you will want to power the printer off quickly. Once homed the nozzle should be slightly above the glass and roughly centered over the glass.



3. Switch to the **“Terminal”** tab shown below. Press on the input box to the left of the **“send”** button, type **G92 Z4**, and press **“send”**.

This command will trick the printer into thinking the Z home is much lower than it really is and will allow us to move the Z axis down.



4. Place a thin piece of paper such as newspaper under the nozzle.
5. On the touchscreen, go to the **“Controls”** tab. Select .1mm for the amount of step for each press.



6. Press the **Arrow down** button to lower the Z axis until the nozzle is touching the paper. You can move the paper around while doing this until the paper drags under the nozzle.



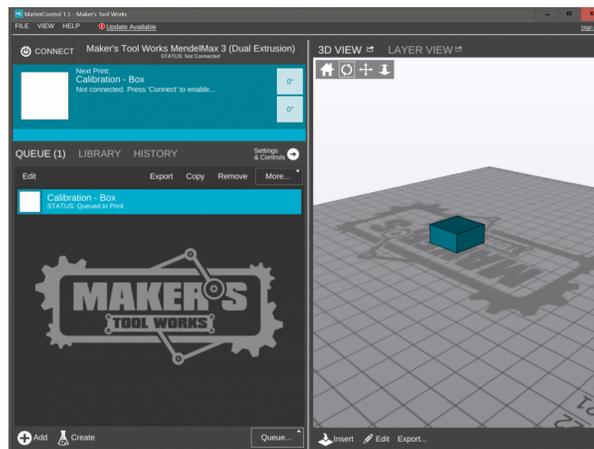
7. We are now going to raise the Z by pressing the **Arrow up** button and count each time you press the button until the LED on the sensor goes off.



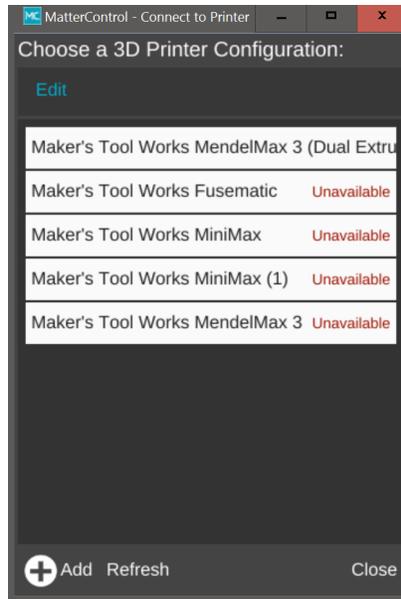
- The total count is is how many .1mm steps from the glass the sensor is before it trips. If you counted 9 steps the offset will be **0.9**. If you counted 16 steps it would be **1.60** pay close attention to the **_** it is easy to miss. Write down the number.

8. Download and install Matter Control from the [Software](#) section if you haven't done so yet.

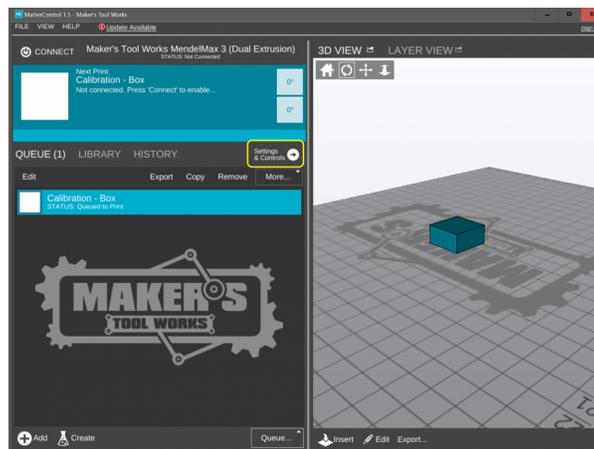
9. Open Matter Control.



10. Click on **File/Add Printer**, and select the Mendel Max 3, or Mendel Max 3 Dual profile.

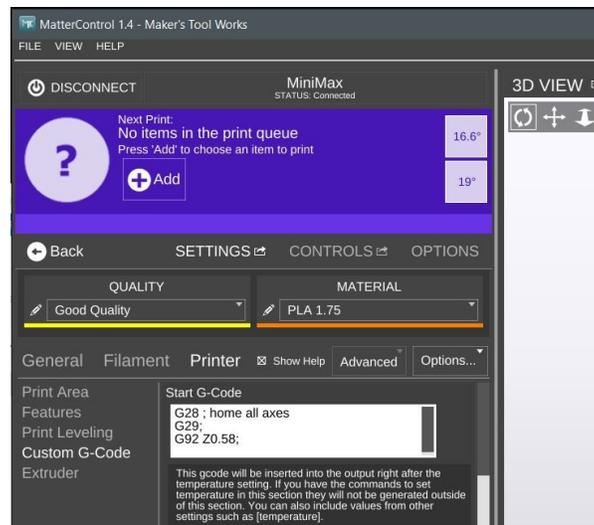


11. Click on the **Settings&Control** button in Matter Control.



12. Make sure the button next to **“Options”** says **“Advanced”**, if it does not, click on the button, and select **“Advanced”** from the dropdown. See the picture in the step below.

13. Click on the **“Printer”** tab, and select **custom G code** on the left hand list. Find the box that says **Start G Code**, remove all text from that box, and enter the following:



```
G28; Home all axes
G29; Start ABL
G92 Zx.xx; Enter the offset value you have written earlier, where the x.xx is on
this line.
```

14. After you make the changes you will have to **SAVE** for the changes to be accepted by Matter Control.

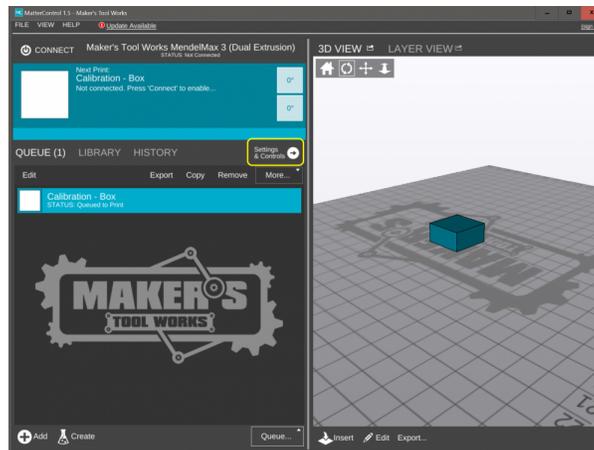


Avoid placing and printing items placed in a 25mm square on each of the back corners of the bed, it may damage the sensor. We are aware of the issue, and currently working on a solution.

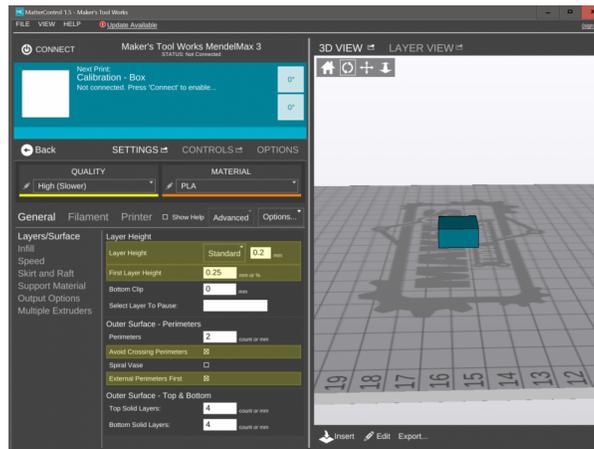
Starting your first Print

Starting your first Print

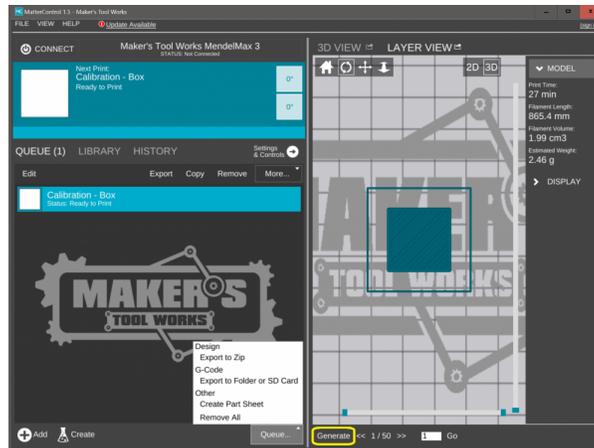
1. In Matter Control, click on the **Settings&Control** Button



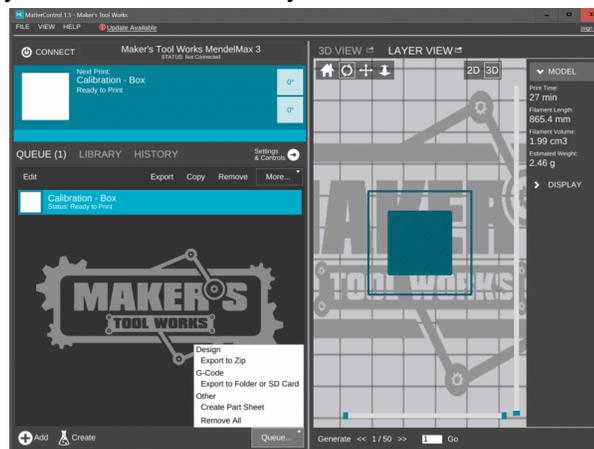
2. Select the desired Quality preset and the correct Filament preset (Do not use the presets named **“Default”**)



3. Click on the Layer View button, and then press **“generate”**

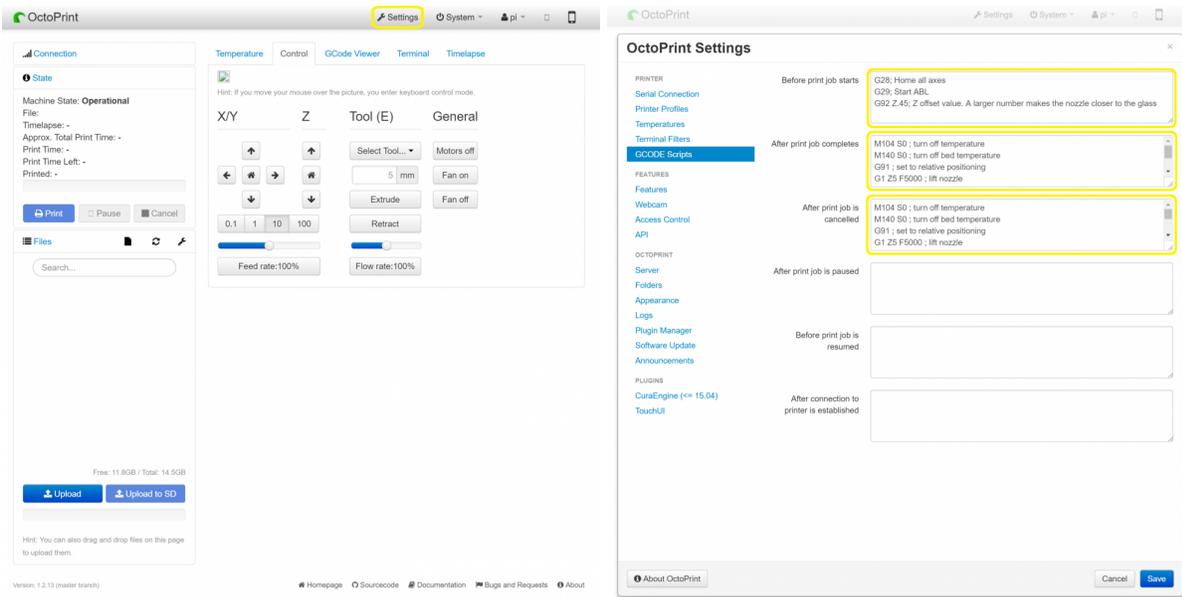


- When the slicing is done press the **“back”** button to return to the queue tab.
- Press the **“Queue”** button and select Export to Folder or Gcode, and save the file to the desired location. Remember where you have saved it, as you will need it for the next step.

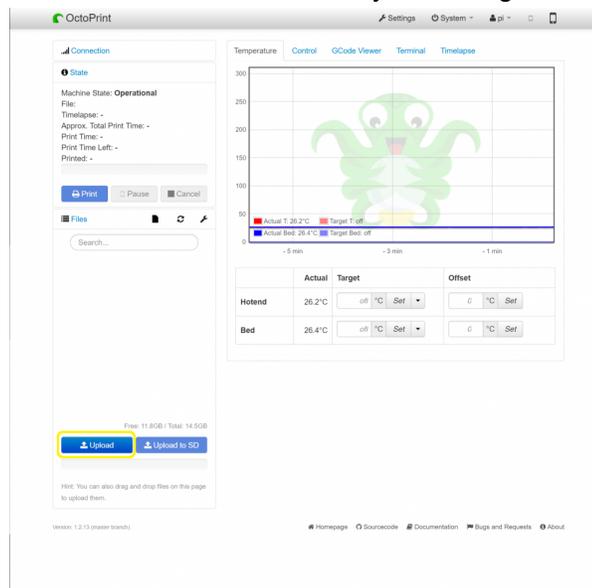


- [Click this link](#) to open Octoprint in your browser.
- If you havent changed it yet, login using the Username `MTW_Create` and password `octopi`.
- Click on the **Settings** button to open Octoprints settings, then click on **GCODE Scripts**, clear all of the outlined scripts, and close.

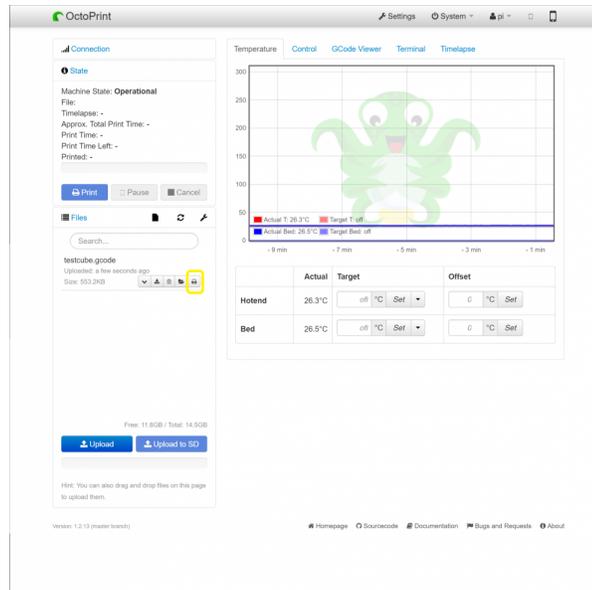
Leaving those scripts there will cause a code duplication that can result in a crash.



9. Click on the **“Upload”** button, and select the Gcode file you have generated earlier



10. Press the **“Load and Print”** button, and your print will begin.



11. If the Z height is too high (ie poor adhesion to the glass or the filament being dragged behind the nozzle like a piece of thread) then change the **G92 Zx.xx** number to a larger value. Increase the value slowly .05mm at a time until your Z height is good. If the Z height is too low (filament extruded on the glass looks like a smear and the extruder is making a thumping noise) then make the value of your **G92 Zx.xx** value smaller.

You are looking for your first layer to be **squished** close to the picture shown below. The picture has two perimeter skirt lines drawn around the object. Note how the two lines blend into a single line.



Bringing Online without OctoPi

! The following guide is to be used only if you do not intend to use OctoPi, or intend to use the GLCD. Your RAMBo board needs to be connected directly to a computer for the initial setup in case of the GLCD. See this page for assembly of the GLCD: [GLCD Supplement](#)

- The latest version of our private labeled MatterControl software and their operation manual can be found [here](#)

Heaters status

! The printer will lock down, and prevent any use, unless it can read the proper temperatures of the hotend/bed

1. Check the status line to see that all of your thermistors (for the hotend and heated bed) are reporting reasonable room-temperature values (typically, a comfortable room is 19-23c).
 - If the temp is abnormally high (3 digits high) the thermistor is shorted, inspect it and its wires for any sign of a short.
A common cause for a thermistor short, is improperly installed insulation, or over tightened retention screw.
 - If temp shows as 0, the thermistor is either plugged in the wrong port, or has a broken lead. This applies to hotend and bed thermistors.

Testing motor direction and setting zero on each axis.

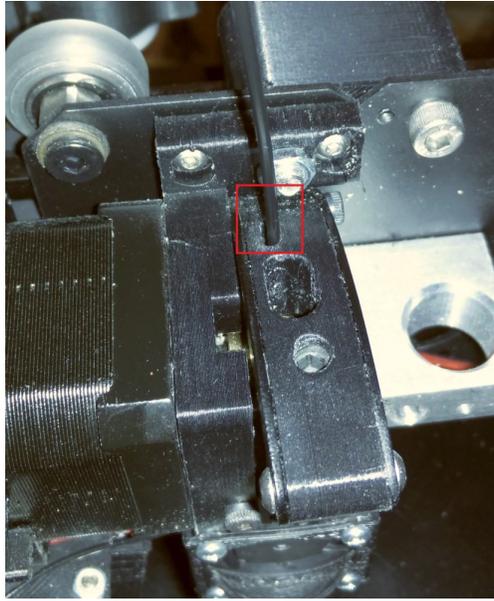
1. Position by hand the X carriage in the middle of the X axis and the Y axis bed in the middle of the frame. Your Z Axis should be at least 30-50mm above the bed. (you can raise or lower the Z axis, at this stage, by manually rotating the leadscrews. Ensure that the X assembly is even afterwards)
2. Plug the power cord into your printer's IEC plug and turn on the switch.
3. In MatterControl/ LCD, use the manual controls to move the X axis right and left 10 mm at a time. Note that the printer will not know when it has moved too far, so use proper judgement to prevent it from hitting the ends of your axes.
4. If it moves the wrong direction, disconnect power and flip the X axis stepper motor connector's orientation.

5. If it moves in the correct direction, press the home X button (Do not press Home All). Keep your hand on the power button, to shut the printer in case of crash.
6. Adjust the X endstop position if necessary. It should trigger with the nozzle on the left most edge of the glass.
7. Repeat the above on the Y axis.
Making the bed move in the positive Y direction actually moves the bed forward toward the front of the printer.
8. Use the manual controls to move the Z axis up 1 mm. Ensure that it is actually moving up and not down.
If it moves the wrong direction, disconnect power and flip the Z axis stepper motor connector's orientation.
9. Heat the hotend/hotends to 190C, and using manual controls extrude 10mm. Note the direction the hob turns, it should turn counterclockwise on the right extruder, and clockwise on the left extrude.
10. If it moves the wrong direction, disconnect power and flip the Extruder stepper motor connector's orientation.

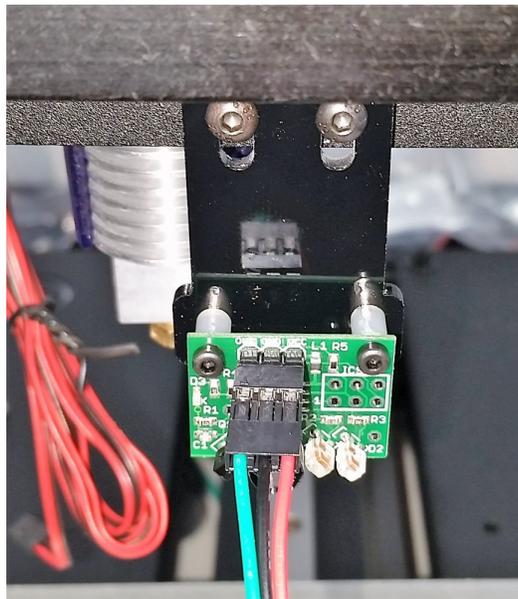
Hotend Final Prep

1. Heat the hotend to 275C
2. Using a wrench, hold the heatblock in place, and slightly tighten the nozzle against it with another wrench. Turn it just a fraction of a turn. Do not over torque, that can damage the nozzle, or even break it off, and it is not covered by the warranty.

Insert the filament through the supplied PTFE tube, then the smaller hole on the extruder arm, into the hotend.



Setting up the IR Auto Bed Level System:



A few things about your IR ABL before we start.

A brief explanation of how the sensor works with the Start G code of your slicer:

When you start a print, the extruder and bed heat up, once at the proper temperature is reached the printer will home the X, Y and Z axis. (while homing the Z the nozzle will not be close to the glass).

After homing the Start G code will give the command **G92 Zx.xx**. This command resets the Rambo

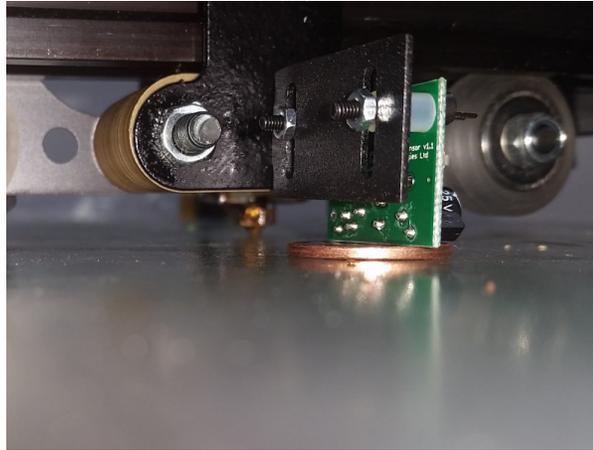
controller to know where the real Z home position is. We will go over how to get the proper number for the **G92 Zx.xx** below. Matter Control will then perform a **G29** ABL command. This command reads the bed in 4 areas, and determines the plane the glass is sitting on, and will then make small changes to the incoming print code that keeps the nozzle close to “plane” it determined during the sense cycle.

For those upgrading from a switch type Z homing. Homing will no longer work as it did with the switch. Home Z is not functional. You have to use *Home All* instead, and then the nozzle will not be close to the glass after homing.

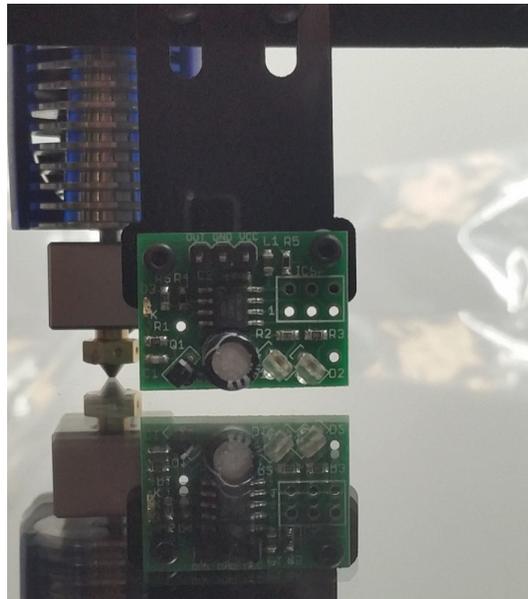
1. Ensure that the ABL sensor is perpendicular to the glass in the X and Y axis. The closer to perpendicular the sensor is to the bed the better the ABL will work. Get a small square object and place it next to the edge of the sensor board and adjust its mounting until its square.
2. Double check your wiring of the ABL before powering up the printer.
The red wire must be on VCC at the sensor end and the red wire must go to + of the Z Min port of the Rambo.
3. With printer power off move your X and Y axis so the nozzle is roughly centered over the glass. Turn the leadscrews in unison to bring the Z axis down to where the nozzle just touches the glass surface.



4. Once the nozzle is touching the glass ensure that the left and right sides of the X axis are equal above the top deck plate. Measure the height of the X axis on each side of the printer from the top deck and adjust the Z leadscrews by hand until you have the distance equal on each side. When you turn one leadscrew the other side may try to turn in lock step they have an electrical connection. You might have to hold the other leadscrew in place while you do this step. Double check the nozzle is still just touching the glass.
5. Place a US Nickle or other object that is 2mm or slightly less under the sensor. Lower the sensor so it rests **FLAT** on the Nickle. Tighten the screws to secure the sensor.



6. Now remove the spacer! The sensor should be parallel to the glass as shown below.



7. With the printer power off, move the X and Y axis so the sensor is roughly in the center of your glass bed. Turn on the printers power.
8. Raise the Z axis to 50mm or so using the + Z in the controls tab. With the Z raised place a piece of paper under the sensor, and verify that the led on the sensor board comes on when the paper is near the bottom of the sensor, and turns off when the paper is removed. If your sensor is not operating properly check your wiring and ensure your printer has power and the power on LED is active on the Power Supply as well as the Rambo.
9. When your sensor is operating properly. Open Matter Control and go to the View Tab at the top of the screen and select terminal. This will bring up terminal window. While in this window type **M119**, please

note the M is upper case in **M119**.

The Rambo will respond with the status of all the Endstops. Z endstop should say Z open.

10. While holding a piece of paper under the sensor and the sensor led lit send the M119 command again. The Rambo should respond with Z triggered.

If you don't get the status messages as indicated check your wiring and make sure you are not plugged into the **Z MAX** port on the rambo.

11. If the reading for M119 is backwards ie says Z min triggered when the led is off you will need to make a change in your marlin firmware configuration.h file.

ONLY make this change if your Z endstop is not reporting correctly.

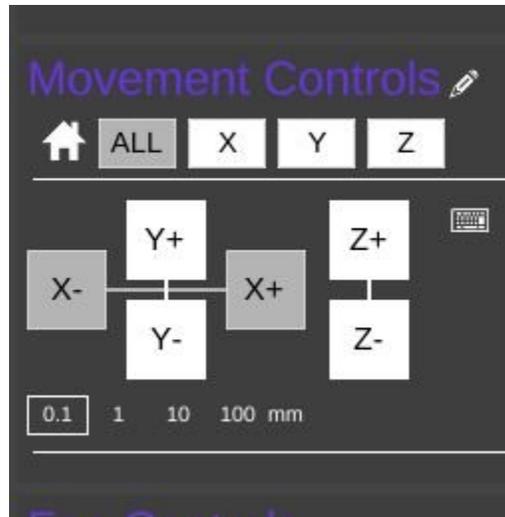
Find this line of code. ***const bool Z_MIN_ENDSTOP_INVERTING = false; // set to true to invert the logic of the endstop*** your line may say ***=false*** or ***=true***.

If your sensor is not reporting correctly change **false** to **true**, or **true** to **false** which ever yours was set to. After you make this change save your marlin in arduino then upload. **Dont forget to Disconnect the printer in Matter Control. If you fail to disconnect you will not be able to upload the modified firmware.**

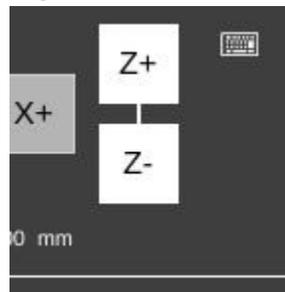


NOTE!! The LED on the IR sensor will not change how it operates after you make the change to the firmware. The sensor itself generates how the led behaves.

12. We are now going to determine the **G92 Z** offset value for your printer. Press the Home All button from the controls tab of Matter Control. Keep your hand near the power switch when you do this. If your nozzle crashes into the glass you will want to power the printer off quickly. Once homed the nozzle should be slightly above the glass and roughly centered over the glass.
13. From the Terminal tab. Type **G92 Z4**. This command will trick the printer into thinking the Z home is much lower than it really is and will allow us to move the Z axis down.
14. Place a thin piece of paper such as newspaper under the nozzle.
15. In Matter Control go to the Controls Tab. Select .1mm for the amount of step for each press.



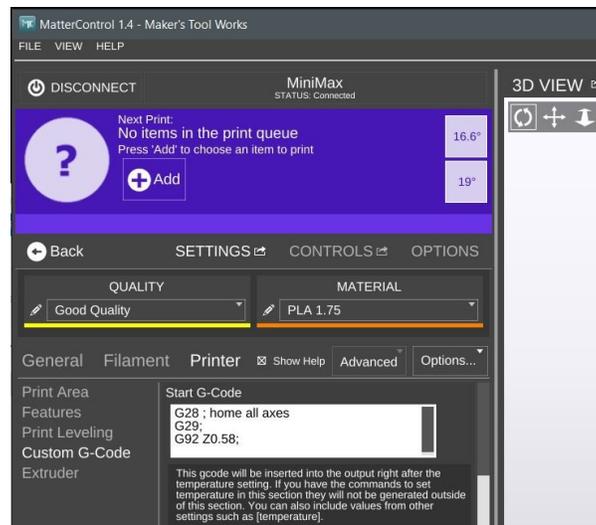
16. Press the Z- box to lower the Z axis until the nozzle is touching the paper. You can move the paper around while doing this until the paper drags under the nozzle.



17. We are now going to raise the Z by pressing the Z+ button and count each time you press the button until the LED on the sensor goes off.

The total count is is how many .1mm steps from the glass the sensor is before it trips. If you counted 9 steps you would enter **G92 Z0.9** for your **Start Gcode** offset value. If you counted 16 steps it would be **G92 Z1.60** pay close attention to the `_` it is easy to miss.

18. In Matter Control, under settings, under printer, under custom G code. Find the box that says **Start G Code** remove all text from that box and enter the following:



G28; Home all axes

G29; Start ABL

G92 Zx.xx; Enter the G92 offset value where the x.xx is on this line.

After you make the changes you will have to SAVE for the changes to be accepted by Matter Control.

19. Load a small test object and print it. If the Z height is too high (ie poor adhesion to the glass or the filament being dragged behind the nozzle like a piece of thread) then change the **G92 Zx.xx** number to a larger value.

Increase the value slowly .05mm at a time until your Z height is good. If the Z height is too low (filament extruded on the glass looks like a smear and the extruder is making a thumping noise) then make the value of your **G92 Zx.xx** value smaller.

You are looking for your first layer to be **squished** close to the picture shown below. The picture has two perimeter skirt lines drawn around the object. Note how the two lines blend into a single line.



1. For superior print adhesion with different filaments we recommend treating the glass with 3dEez available in our store (see product description [here](#) for how to use)
2. For medium to large ABS prints we have had good luck using Garnier Fructis Hairspray (pump style) printing abs. Apply the product to a paper towel and wipe it on to the glass surface.
[Product Link](#)
3. Glass treatment for printing with PLA Filament



! Avoid placing and printing items placed in a 25mm square on each of the back corners of the bed, it may damage the sensor. We are aware of the issue, and currently working on a solution.

Dual Extruder Supplement

The Dual Extruder option should not even be attempted until you are printing **very** well with a single extruder.

If you are having problems printing with a single extruder enabling the dual will increase the problems threefold!

Tools

- Allen wrench for Hotend Set Screws



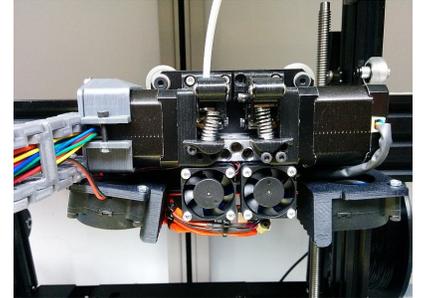
✿ [click on the pictures for larger easier to read versions.](#)

Step 1 – Hardware Changes

1. Install the second hotend and extruder assembly, in the same manner as the first one but on the left side. see [Extruder Assembly and Installation](#) [Hotend Assembly and Installation](#)

The wiring:

- Wire motor to E1
 - Thermistor to T1
 - Heater to Heater1
-
- Hotend fan needs to be connected to the same plug (Fan1) as the first hotend, so they power on and run at the same time.
 - When homed, the left hotend should be in the air to the left of the bed, while the right hotend at the front left starting position on the bed.



Step 3 – Software Setup

✿ click on the pictures for larger easier to read versions.

1. Open up Marlin.ino in Arduino and go to:

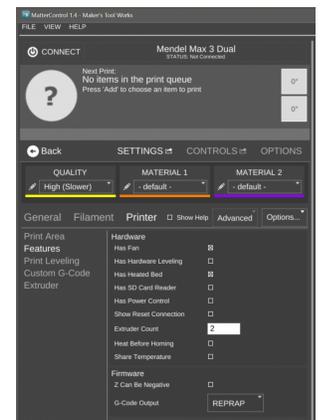
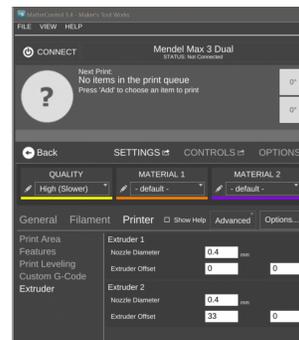
2. Configuration.h tab

- Search for and change **#define EXTRUDERS 1**. Change it to read: **#define EXTRUDERS 2**. This enables firmware to know it has two extruders wired up.
- Search for and change **#define TEMP_SENSOR_1 0** to say **#define TEMP_SENSOR_1 5**. Both Temp_Sensor 0 and 1 should have 5 as the value. Upload.

1. Matter Control Setup

The version downloadable from our site comes with a Dual Extruder profile, however due to variance in assembly and hotends you may need to fine tune it later.

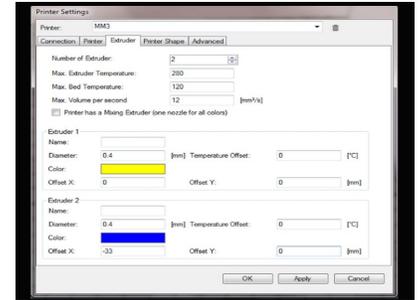
- If you have downloaded Matter Control elsewhere make sure to enable dual extruders
- Fine tuning the offset is done here:



We recommend using MatterControl for most users. We continue to support the following software but only use it if MatterControl is not working for you for some reason.

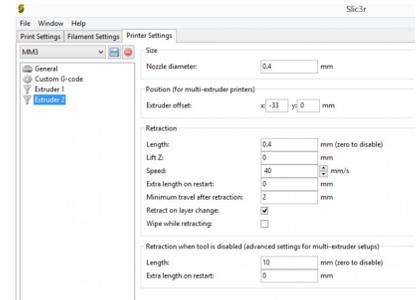
2. Repetier Host Setup

The version downloadable from our site comes with a Dual Extruder profile, however due to variance in assembly and hotends you will need to fine tune it later.



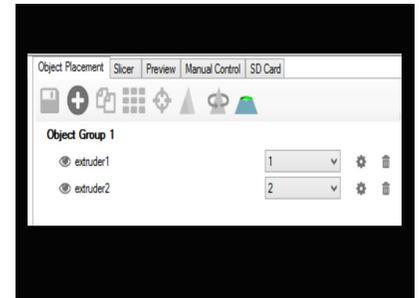
3. Slic3r Setup

- Under Printer Settings > General change Extruders to 2 Click on Extruder 2(is should have copied settings from Extruder 1)
- Set offset to -33 for x and 0 for Y for Extruder 2. Like in Repetier Host, the setting will be fine tuned later.



4. Test Print with Repetier

- Download [test model](#).
- Load both files into repetier host and move them into the same object group by clicking and dragging the 2nd item into the object group of the top item



! Repetier has a extruder selecting bug, the first item in the group is always to be printed with the right extruder no matter what the plating view has shown. You can click the item in the list to switch position

* You will have to tell it which extruder goes to which part of the print. Do this by selecting the extruder number in the dropdown list next to each item Tell it to slice and your gcode should come out with both parts properly centered and colored according to each extruder.

* Once your gcode looks like this you can try a test print with your filament settings. If your print is way off there is no need to finish the print to start making adjustments, you can kill the print after a couple layers to try a small adjustment.

Step 3 – Offset Fine Tuning

! All adjustments to extruders distance must be done and saved in both Repetier Host, and Slic3r. See [Software Setup](#)

1. Left Triangle Results

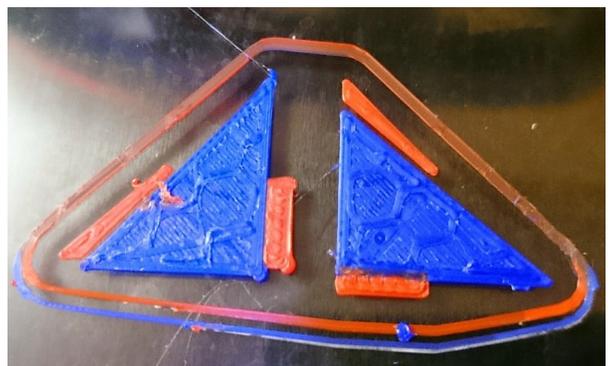
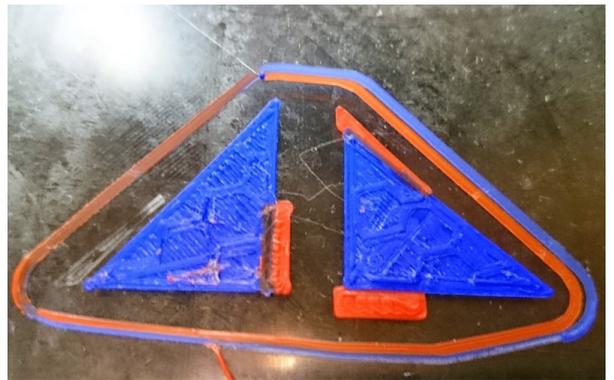
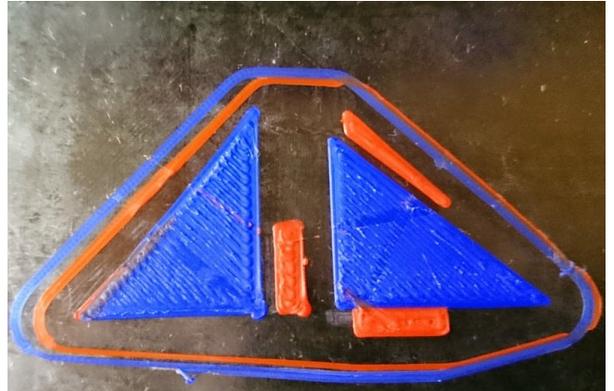
- If the left large triangle is not touching the small rectangle you need to increase your X distance to fit (from -33 to -33.2 or more as needed)
- If the left large triangle is overlapping the small rectangle you need to decrease your X to fit (from -33 to -32.8 or less as needed)

2. Right Triangle Results

- If right large triangle is not touching the small rectangle you need to increase your Y spacing (from 0 to .2 or more as needed)
- If right large triangle is overlapping the bottom rectangle you need to decrease the Y spacing (from 0 to -.2 or lower as needed)

3. Matched Up Results

Once both triangles are matched up to their small pieces correctly then your xy offset is correctly set.





* For a more challenging Dual color print try the [Dual Color Logo](#)

Troubleshooting

- **No power**

When checking the power connections please take care there is high voltage on the IEC and the L-N-G connections on the power supply.

Check the rear of the PSU when powered there will be a red led turned on. If not make sure:

The power cord is plugged in,

The switch on the IEC is in the on position.

The 8 amp fuse is installed in the IEC.

Check the wiring from the IEC, Switch on the IEC to the PSU. (remove the power cord from the machine while you perform this step)

If all the above have been checked and you still do not have a red led power light on the back of the PSU contact Makers Tool Works.

- **Cant Upload Marlin Firmware**

USB 3.0 Ports have been know to cause issues with arduino and uploading. Use a USB 2.0 port on your computer or use another computer that has USB 2.0 ports.

Make sure the Rambo Driver is installed. It can be located here: <https://doc.google.com/uc?export=download&id=0B3Umy7TcYSXJRDBpOHJWM0J4WnM>

Make sure your settings in the Arduino Firmware are set to :

Under the Tools Tab Board is set to Arduino Mega 2560 or Mega ADK

Under the Tools Tab serial port is set to the port the Rambo has chosen on your computer. This can be found in the device manager under ports.

If the above are set and you can see the Rambo in device manager and still cannot upload is most commonly associated with:

Power issues to the Rambo (see No Power in this trouble shooting section)

If the power supply led is on and there is no leds on the Rambo its possible you may have a blown fuse. F3 . This is most common when you accidentally plug the heated bed into the hotend connector.

- **Printer wont connect with Repetier Host:**

Make sure USB cable is plugged in from the Rambo to the back panel adapter and the back panel adapter to the computer.

USB 3.0 Ports have been know to cause issues. Use a USB 2.0 port on your computer or use another computer that has USB 2.0 ports.

Make sure your settings in Repetier Host match your controller.

- **Printer gives temp error on the screen and motors wont move:**

Make sure the Extruder thermistor is plugged into T0 plug.

Make sure the Heated Bed thermistor is plugged into the T2 plug.

If the Rambo is reporting "0" temp and you are plugged into the right thermistor ports then check your wiring for a broken connection.

If the Rambo is reporting crazy high temperature your thermistor wiring is shorted. Check to make sure the screw holding the wire on the E3d heater block is not cutting into the sleeving. Also check to make sure the sleeving is all the way up to the small glass bulb and the tiny wires are not shorting to each other or the heater block. Using a magnifying glass for this is recommended.

- **Motors run backwards:**

Reverse the plug 180 degrees in the socket for the motor that is running backwards.

- **Fans will not turn on.**

Check Polarity of the fans. On the Rambo in very small print is a + and -. Red goes to + black goes to -. If you have reversed these there is a strong chance that you will have damaged the fan. The Fan for the E3d hotend will not turn on until the extruder reaches 60C and will not turn off until the extruder is cooler than 60C. This is normal.

- **Prints will not stick to the glass:**

Starting Z height is too high is the most commonly seen issue for this. It can present as the filament being dragged behind the hotend nozzle like a piece of thread or the plastic collecting around the nozzle.

Printing on bare glass. Trying to print on bare glass rarely works. For PLA filament follow these instructions :



For ABS follow these instructions:



Heated bed temperature. PLA set heated bed to 60C for ABS set heated bed to 100C

- **Printed part surface is rough:**

Ensure that the two screws that secure the Hotend are tight. If they are loose it will allow slight movements and this can be seen as a rough surface in the printed part.

Ensure that your wheels are not too tight or loose. If they are too loose it will allow play in the system and cause a rough print surface. If the wheels are too tight it can cause the wheels to bind and bite into the extrusion. When this occurs in the Z it will present most often as a banding pattern in the Z direction.

- **Belt will not track on bearings**

Make sure there are no burrs on the small D shaped plate that is part of the bearing assembly. If any defects are found file smooth.

Make sure that the screw that tightens the assembly down is not hitting the bottom of the extrusion before it gets tight. Add an additional washer to the top of the assembly if needed.

Make sure that your belt is not too tight and possibly bent the screw.

Remove the bearings and make sure they are not damaged. Place a 5mm screw in the center and wiggle back and forth. There should be very little play.

- **Bed leveling issues**

It is possible to install the Y subsection into the base frame twisted just a small amount. This can happen as you tighten the screws. Use a washer on the rear screws that go into the extrusions to minimize this. To ensure you have a flat plane measure the gap from the top of the extrusion in the Y assembly to the top of the front and rear plates. All extrusions need to be the same distance. If one side is higher you will have difficulty in leveling the bed. One corner will dip slightly and the corner at its diagonal will be high.