

I-3030 3D Printer

Robust and tinker-friendly.

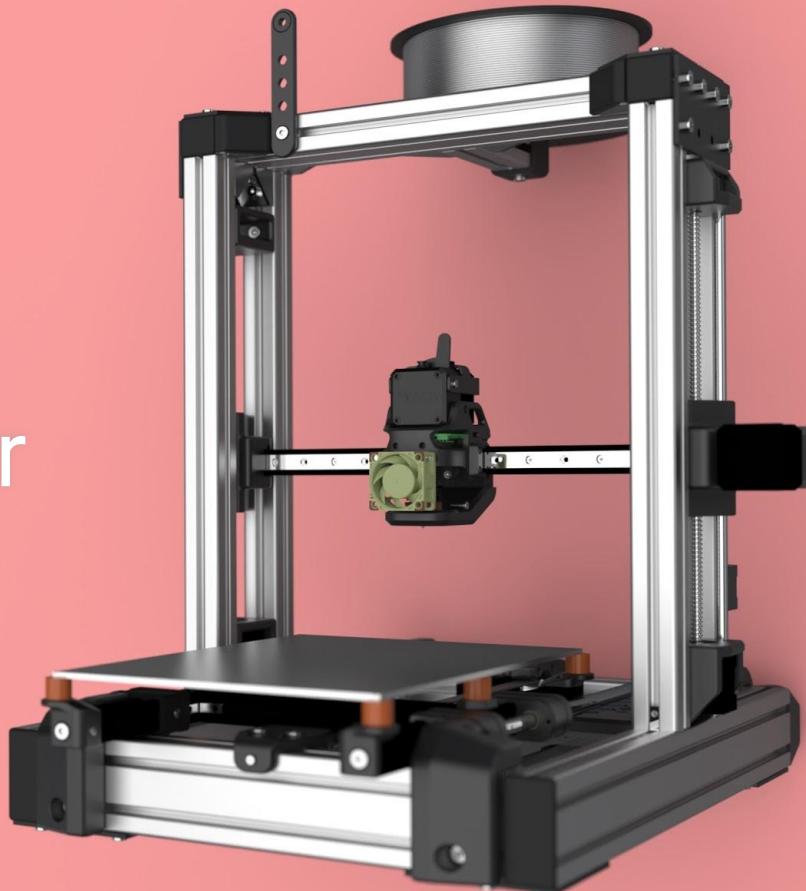
Usability is the main focus, from building the machine to its daily operation and maintenance.

Easy to source and easy to build.

No exotic components and no overly complex assemblies. Only top shelf parts.

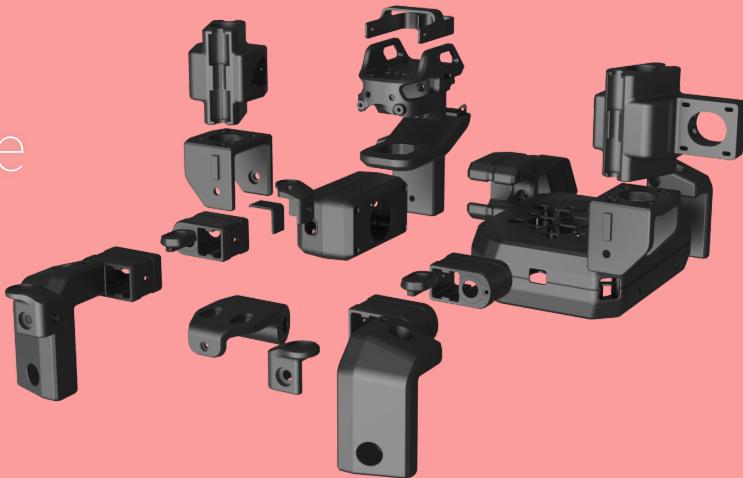
Reliability over speed.

More reliable and less stressful. Not breaking print speed records.



Mechanical Assembly Guide

v1.0



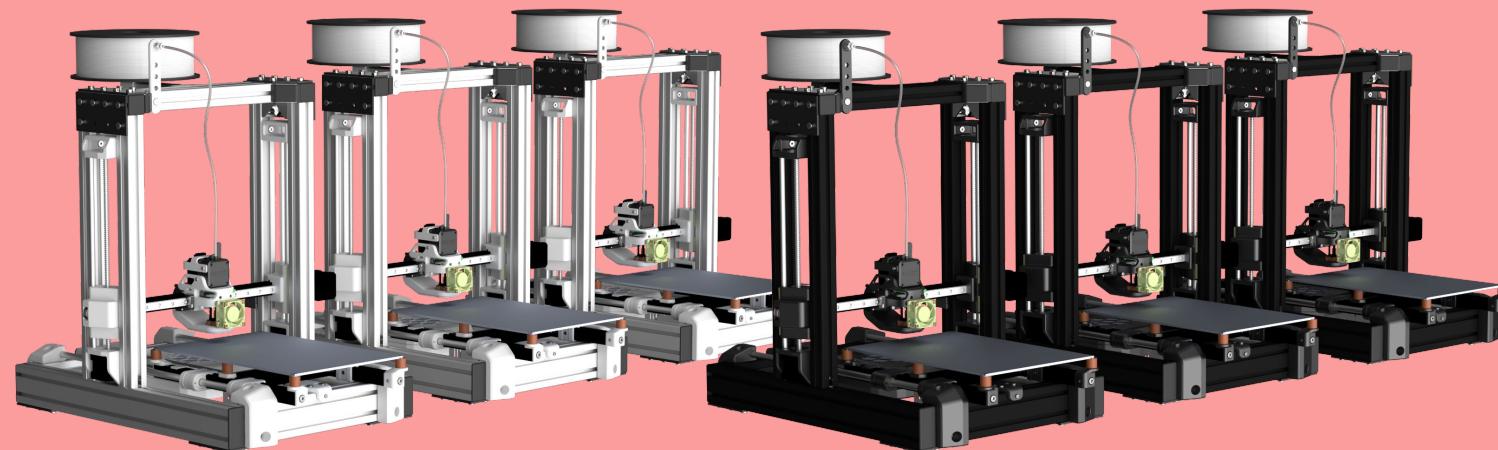
About me / About You

A modern maker is a master of both digital and physical worlds, a true wizard of the modern age and is a force to be reckoned with.

They're hackers, in the truest sense of the word and they're applying their knowledge and machines to tear down the walls of the old world and build something new, something better, something that reflects their own unique visions ideas and identities.

This democratization of manufacturing leads to new ideas and products that might not have otherwise been possible and makers are the first in line.

They're using 3D printers to create a world that defies convention, that challenges the status quo as they transform bits and bytes into tangible, useful and often innovative objects.



...They too have probably printed that guy's friend's butt.

Overview

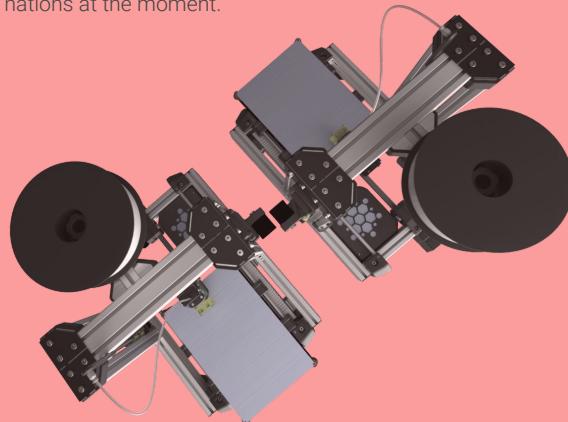
Introducing the I-3030 V4 - a new iteration of a 3D printer that is designed to meet the needs and wants of both, hobbyists and professionals alike. This 200x300x200mm machine is packed with features that set it apart from the competition and ensure an exceptional printing experience.

Equipped with a 32-bit Duet controller that has WiFi connectivity and a WEB-based user interface, it is easy to use and allows for remote operation of the printer. The quiet TMC2660 steppers and advanced RRF3 software enable sensorless self-calibration through automation macros, making it possible to achieve high-quality prints every time with minimal user intervention.

The I-3030 V4 boasts a new printing core that combines a high flow Phaetus Dragon hot-end, a Piezoelectric Orion Z-probe, and a state-of-the-art LGX extruder from Bondtech. This extremely powerful combination ensures consistent and high-quality prints that are unmatched by other printers in the market.

In addition, the I-3030 V4 has an extremely rigid Aluminum extrusion frame that makes it easy to build and use in tough environments, which makes it a top choice for those who need a printer that can withstand challenging conditions, such as in some occupied nations at the moment.

The machine is built with 12-volt components, which means that it is easily convertible to be used in vehicles or in the field away from the power grid.



A few words of caution

If you are to build this, I assume that..

...You have at least basic understanding of coding, mechanics and electronics, and you know how to use a drill and a soldering iron.

...You have access to a working 3D printer that is capable of printing PETG.

...You have access to the European market and DIN standard parts or equivalent.

...You know what you're doing and take full responsibility for doing so safely and in compliance with your local laws and regulations.

...You understand that this guide covers only the mechanical assembly. You will read the guides and manuals of the individual open source parts used in this build, such as duet, piezo and rrf3 configurations separately - as those will not be covered in this guide.



Waiver of Liability

Disclaimer

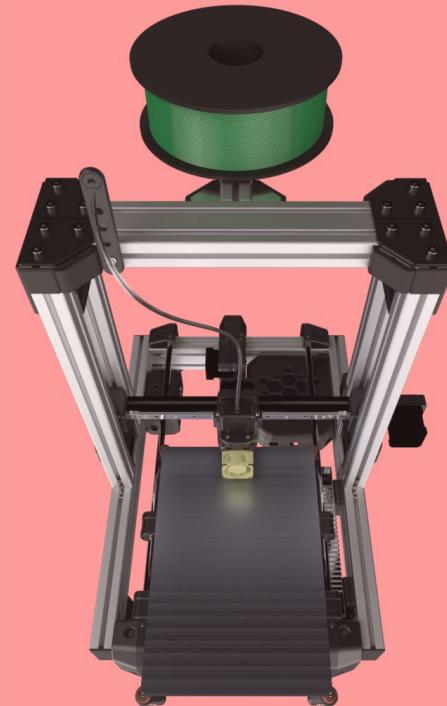
As the designer of this 3D printer I understand that there are inherent risks associated with its use and I have taken all necessary precautions to ensure that the resulting machine is in good working condition and its design has been tested thoroughly prior its release to the public. However, I cannot guarantee that the printer will be free from defects or malfunctions, nor can I be held responsible for any injuries or damages that may occur as a result of its use.

Therefore, I, Pavel Susin, hereby release all liability and responsibility for any damages or injuries that may occur as a result of the use of the I-3030 3D printer or its derivatives.

In no event shall the designer of this machine be liable to you or any third party for any direct, indirect, incidental, special, or consequential damages arising out of or in connection with the use of this 3D printer design, even if the designer has been advised of the possibility of such damages.

By downloading, using or distributing the I-3030 printer design, you agree to indemnify me from any claims, damages, or expenses that may arise from the use of the printer.

This release of liability is binding and will remain in effect even if the 3D printer is sold or transferred to another party and it applies to any and all individuals who may use the 3D printer, including but not limited to yourself, your family members, friends, employees, or anyone else who may have access to the 3D printer.



Checklist of Tools and Preparations

What you'll need besides the parts in the BOM:

- A flat and sturdy surface to work on.
- Hex wrenches in sizes; 2, 2.5, 3 and 4mm.
- Crimping tools for connectors and terminals.
- Soldering iron and soldering tin.
- A drill and 3mm, 5mm and 10mm metal drill bits.
- Measuring callipers.
- Try-square.
- A 30cm ruler.
- Mains tester screwdriver.
- Hot glue or super glue.
- 200x200x0.5mm metal mesh sheet.

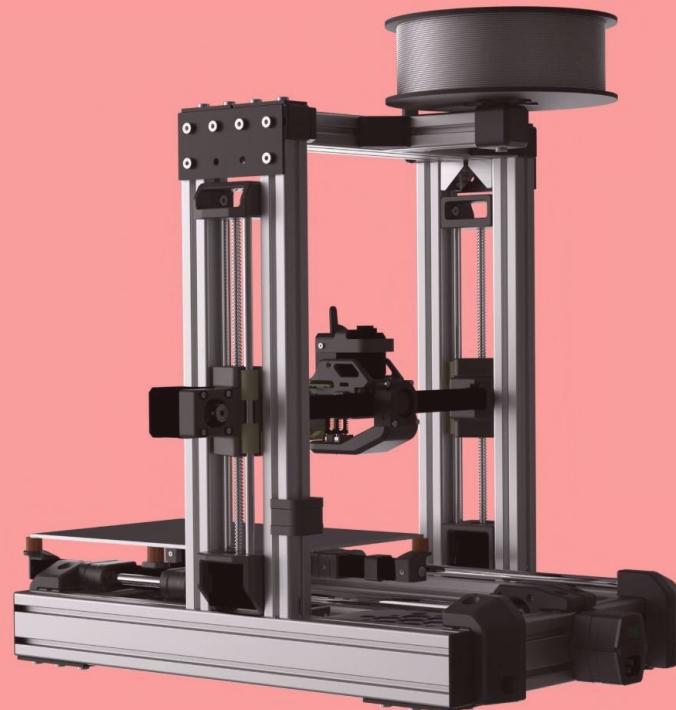


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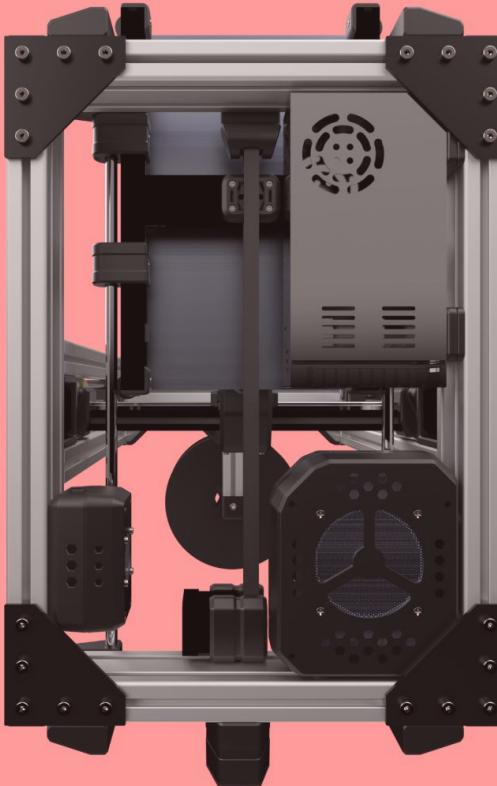
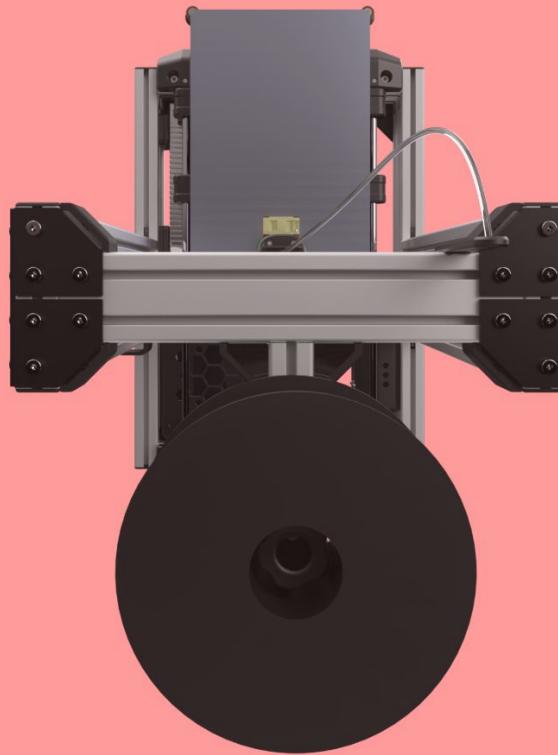


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Hardware



3060 I-type Nut6x500mm



2020 B-type Nut6x315mm



M6x12mm SHSC
+
3030-I M6 Sliding Nut



3060 I-type Nut6x305mm



2040 B-type Nut6x174mm



3030-I Outer Angle



3030 I-type Nut6x400mm



8-Hole Mounting Plate



3030-I Inner Angle



3030 I-type Nut6x135mm



3-Hole Mounting Plate



2020-B Inner Angle



3030 I-type Nut6x120mm



5-Hole Mounting Plate



M3 Sliding Nut



H6 8mmx300mm Steel Rod



H6 10mmx470mm Steel Rod



PC4 6 Pneumatic Connector

Hardware



3030-L Cap



M5x25mm



M3x20mm



3060-L Cap



M4x10mm



M3x10mm Countersunk Hex



Outer Angle Cap



M3x6mm



M3x20mm Countersunk Hex



608 Bearing



M3x8mm



Fan Screw



16x18mm Silicone Spacer



M3x10mm



M3 nut



M5 Washer



M3x12mm



M3 lock-nut/nylock



M5x20mm



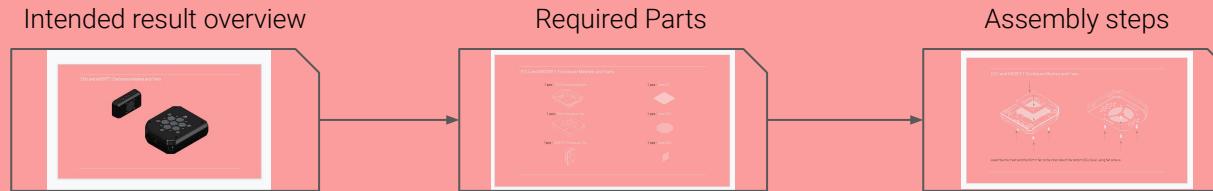
M3x16mm



M3 Brass Insert

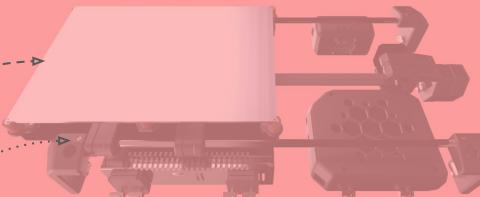
Structure

The following structure and visual cues will be used to cover all mechanical assembly steps in this guide:



Dashed lines - indicate parts.

Dotted lines - indicate fasteners.

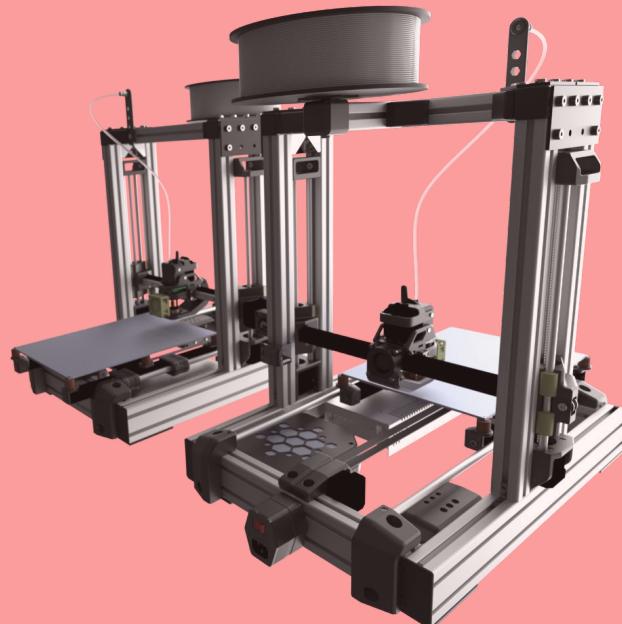


Before you begin...

Please remember to work on a clean and flat surface, have all the parts at ready before you begin the assembly, use the correct tools and refer to the assembly files and this manual before and while building, to avoid damage to yourself, others or to your machine.

You can find the bill of materials [here](#), and the full assembly files [here](#).

Enjoy the process and have fun building!

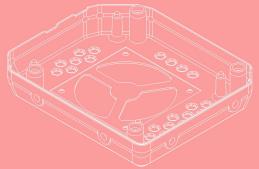


ECU and MOSFET Enclosure Meshes and Fans



ECU and MOSFET Enclosure Meshes and Fans

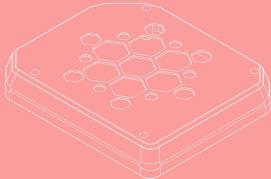
1 pcs - ECU Enclosure Bottom



1 pcs - Mesh.001



1 pcs - ECU Enclosure Top



1 pcs - Mesh.002



1pcs - MOSFET Enclosure Top



1 pcs - Mesh.003



ECU and MOSFET Enclosure Meshes and Fans

1 pcs - 80X15mm 12v fan (ECU)



1 pcs - 40X10mm 12v fan (MOSFET)



4 pcs - Self tapping screw (comes with the fan)



4 pcs - M3 20mm HSSC

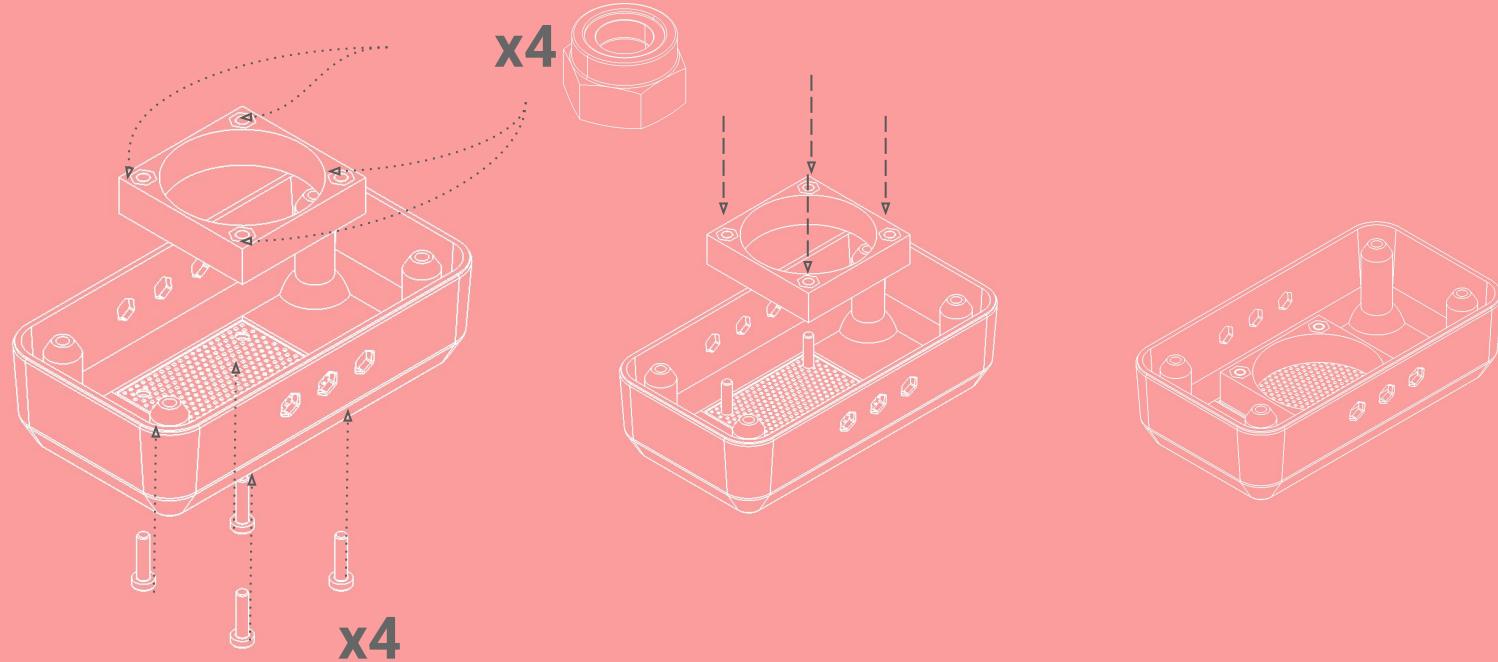


4 pcs - M3 DIN 985 lock nut

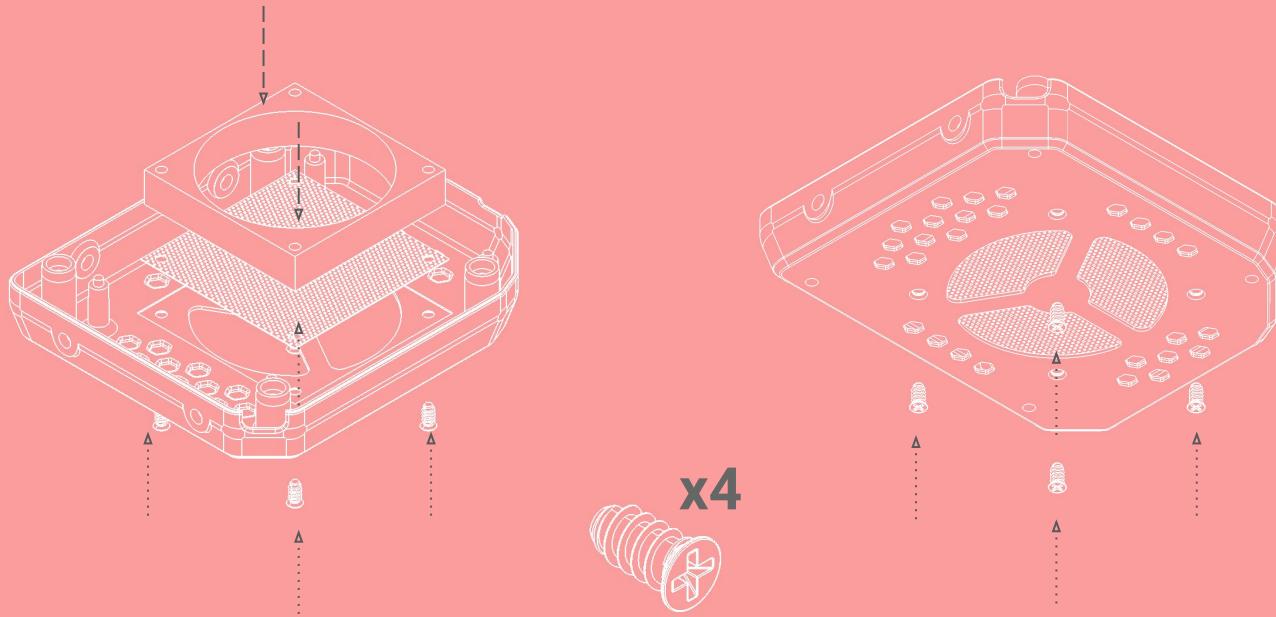


ECU and MOSFET Enclosure Meshes and Fans

Measure cut and assemble Mesh.003 and the 40mm fan to the inside of the top mosfet cover, using -
M3x20mm screws and M3 lock-nuts.



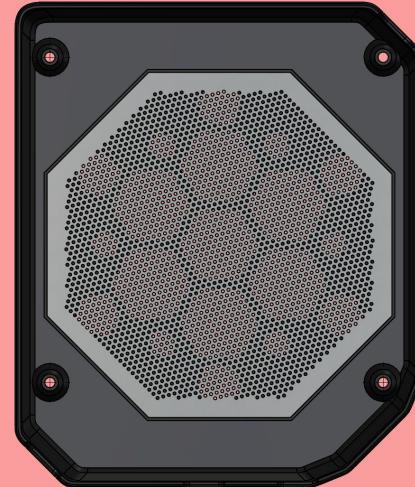
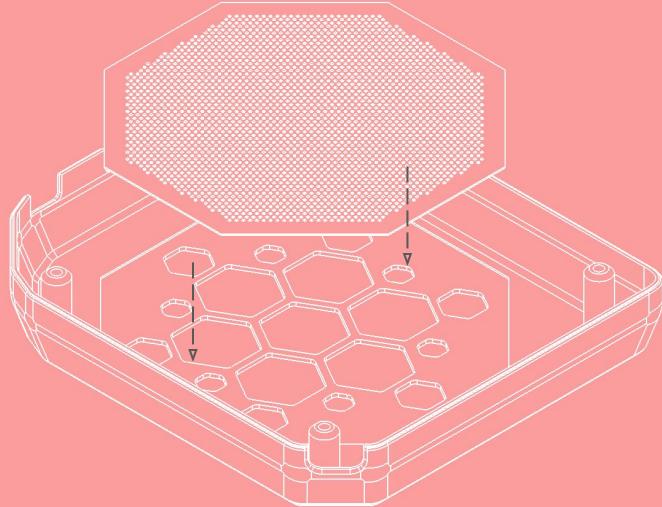
ECU and MOSFET Enclosure Meshes and Fans



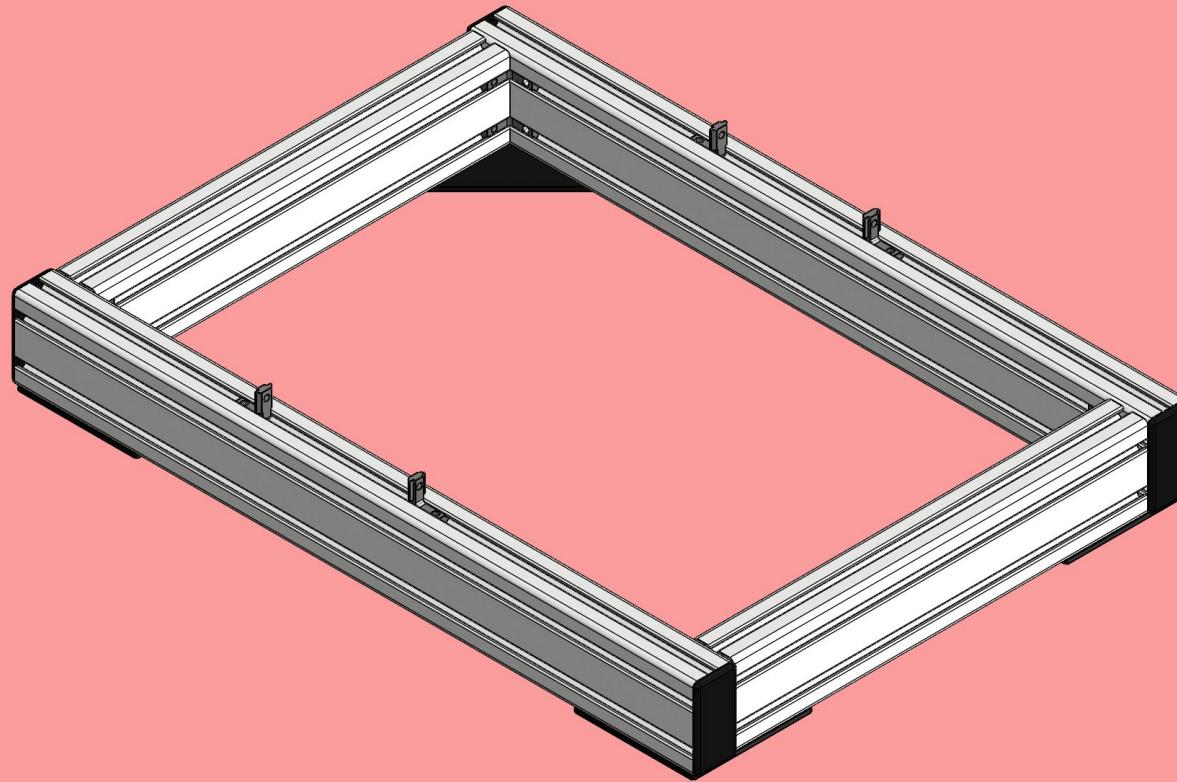
Measure cut and assemble Mesh.001 and the 60mm fan to the inner side of the bottom ECU cover, using fan screws.

ECU and MOSFET Enclosure Meshes and Fans

Measure, cut and glue Mesh.002 to the top ECU cover using a hot glue gun or superglue.



Bottom Frame Assembly



Bottom Frame Assembly

2 pcs - 3060 I-type Nut-6 500mm



12 pcs - 3030 I-type Inner corner bracket



2 pcs - 3060 I-type Nut-6 305mm



4 pcs - 3030 5 hole corner mounting plate



4pcs - 3060 End cap



20 + 20 pcs - M6 12mm + M6 Sliding Nuts

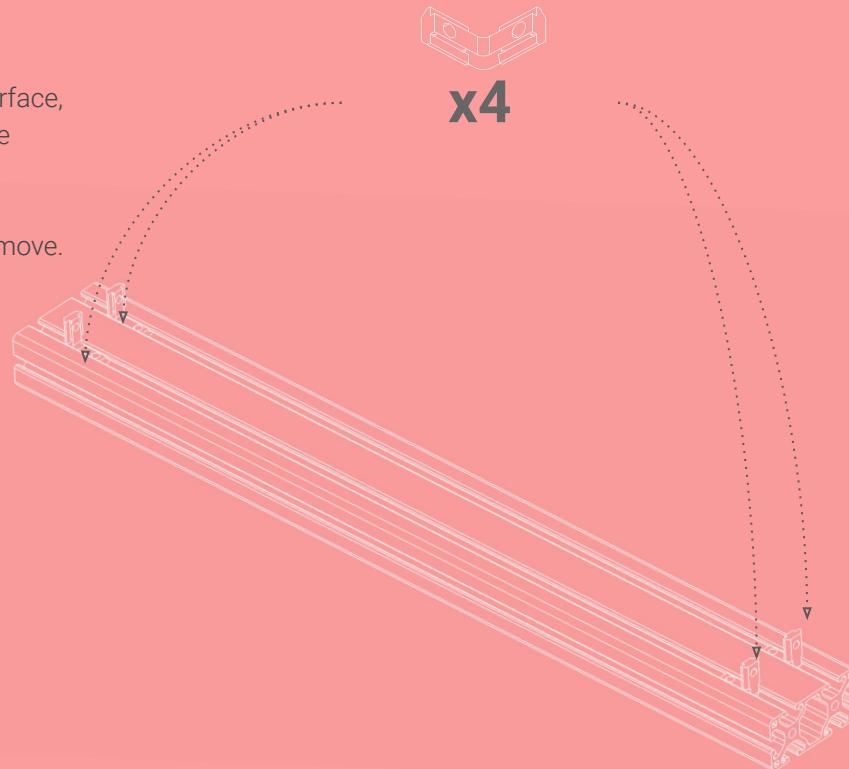


Bottom Frame Assembly

Lay one of the 500mm 3060 extrusions flat, on a flat surface, and slide in four inner angle brackets to both ends of the extrusion, facing the opposing sides.

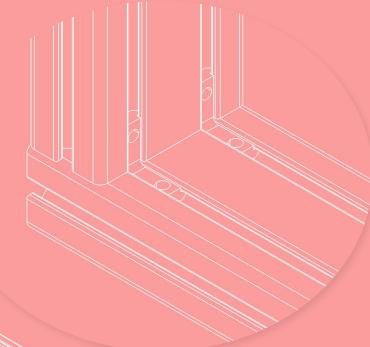
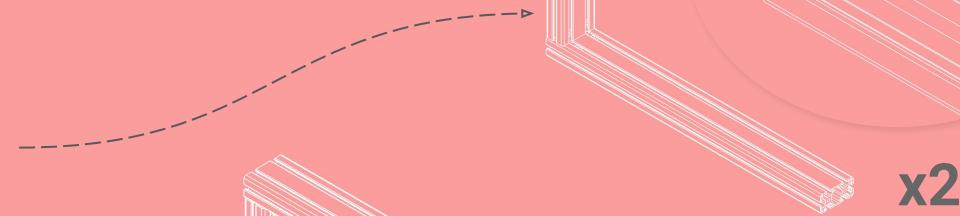
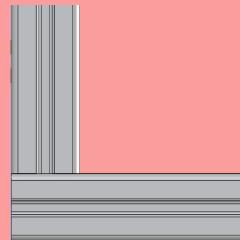
Tighten the screws just enough for the brackets not to move.

Repeat for the second 500mm extrusion profile

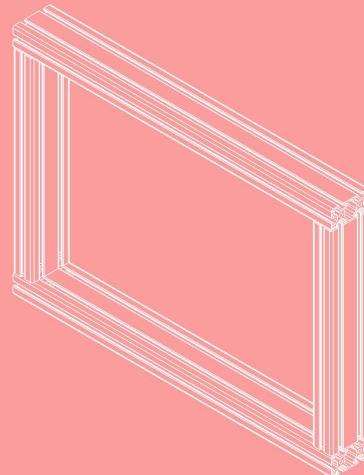


Bottom Frame Assembly

After aligning the two extrusion profiles, gently fasten the 305mm profile to the 500mm profile - creating a corner.



x2

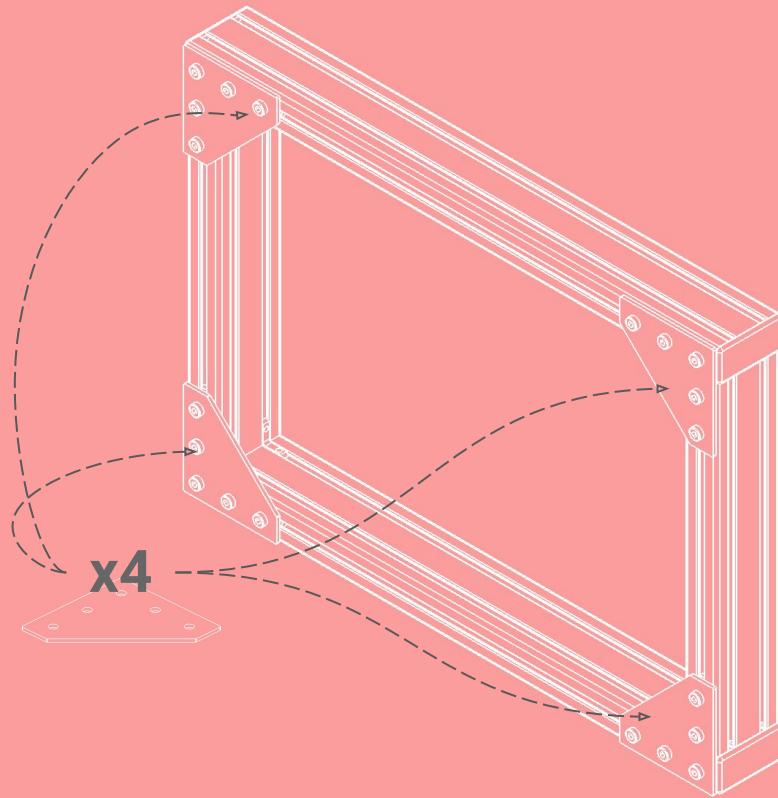
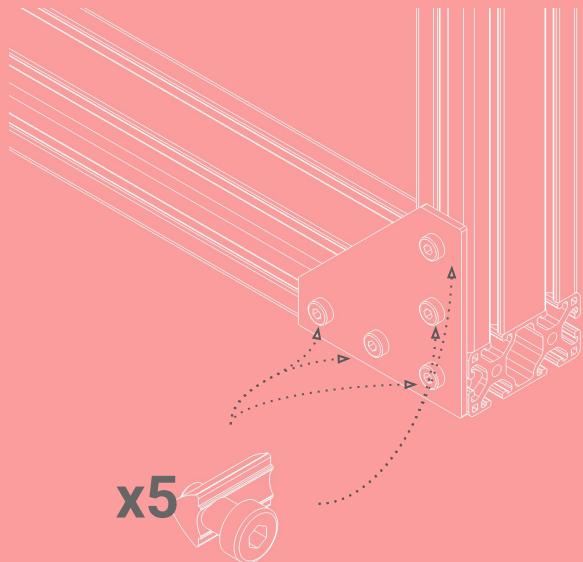


Repeat for the other 500mm extrusion profile and put the two corners together, creating a rectangular frame.

Do not tighten the corner screws yet.

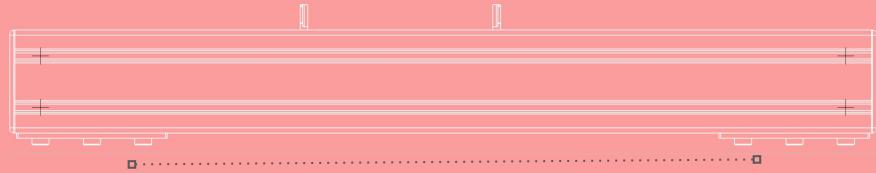
Bottom Frame Assembly

Assemble the 5 hole corner brackets to the chassis corners using the M6 12mm bolts and sliding nuts.

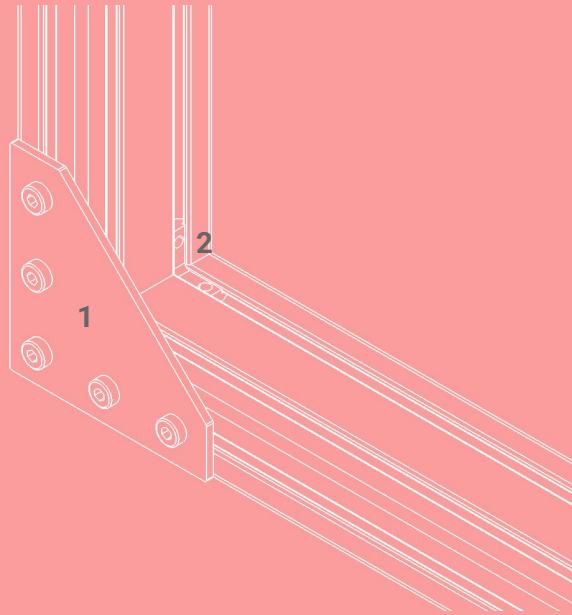


Bottom Frame Assembly

Lay the frame flat on another flat surface and check if the frame is true and that there is no wobble in any of the corners when they are pressed downwards against the surface the frame rests on. Use the Try-Square tool.

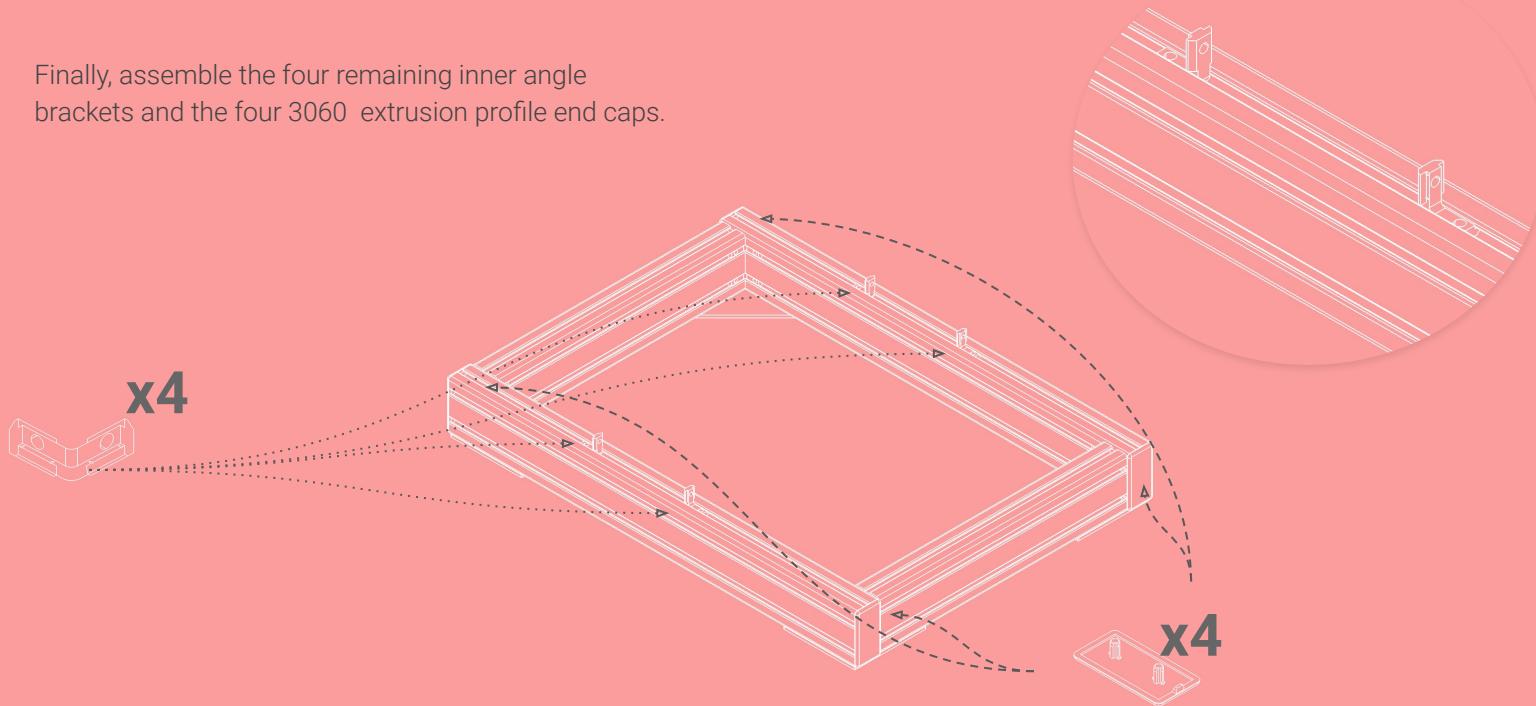


Once the frame is true and all corners are square - proceed to tighten all the screws, first on the 3030 inner brackets and then on the corner bracket plates.



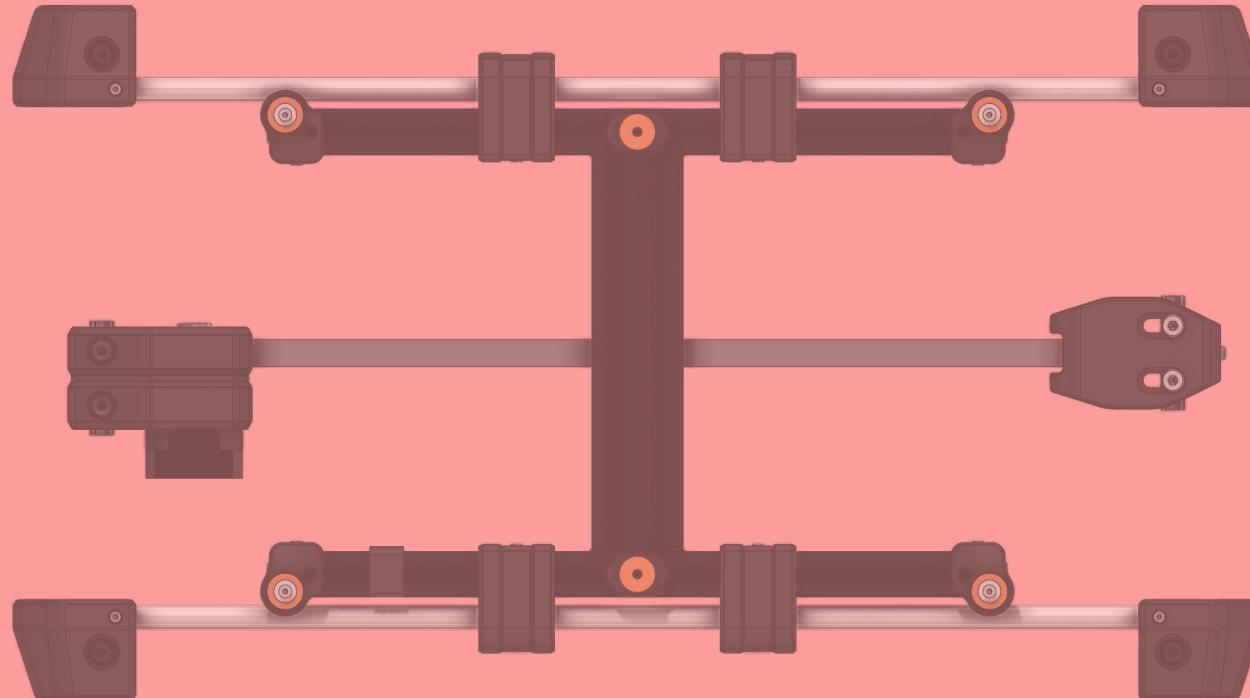
Bottom Frame Assembly

Finally, assemble the four remaining inner angle brackets and the four 3060 extrusion profile end caps.

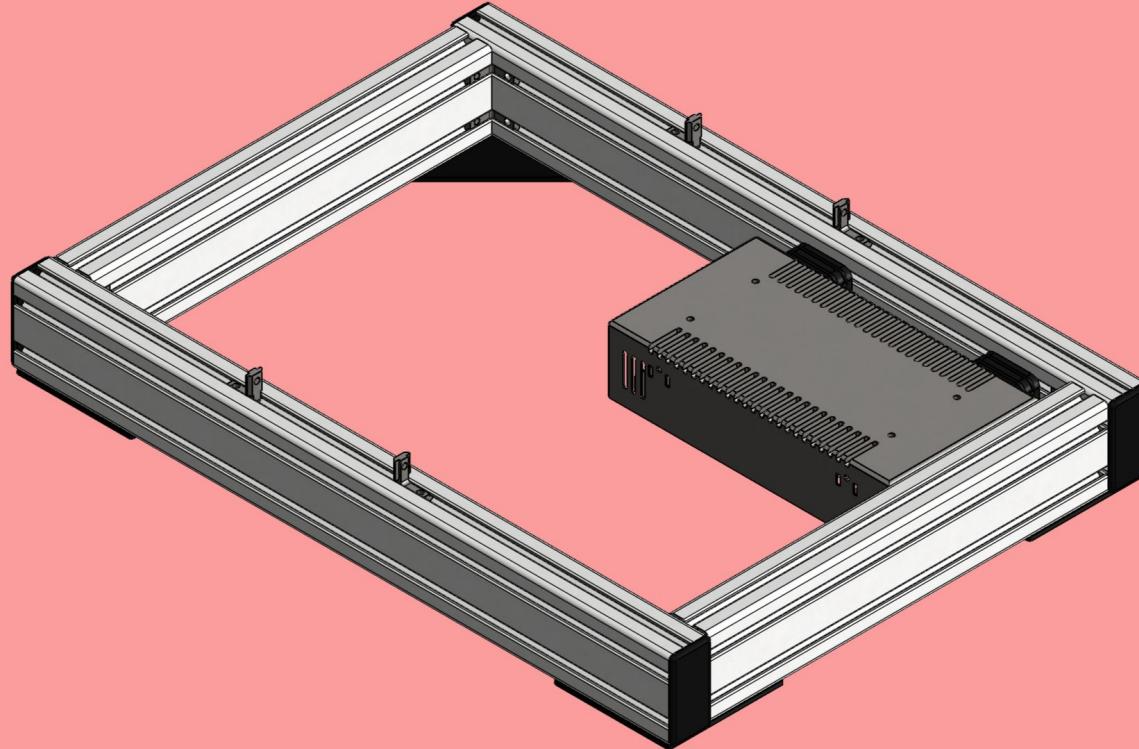


R&D Insights

I-3030 V4 Heatbed carriage design uses standard 10mm rods and 2020 and 2040 extrusion profiles; An extremely rigid heatbed was a hard requirement for using the Piezo Z-probe reliably.

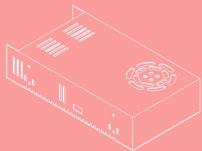


PSU assembly



PSU assembly

1 pcs - 12v 16A PSU



4 + 4 pcs - M6 12mm + M6 Sliding Nuts



2 pcs - PSU clamp



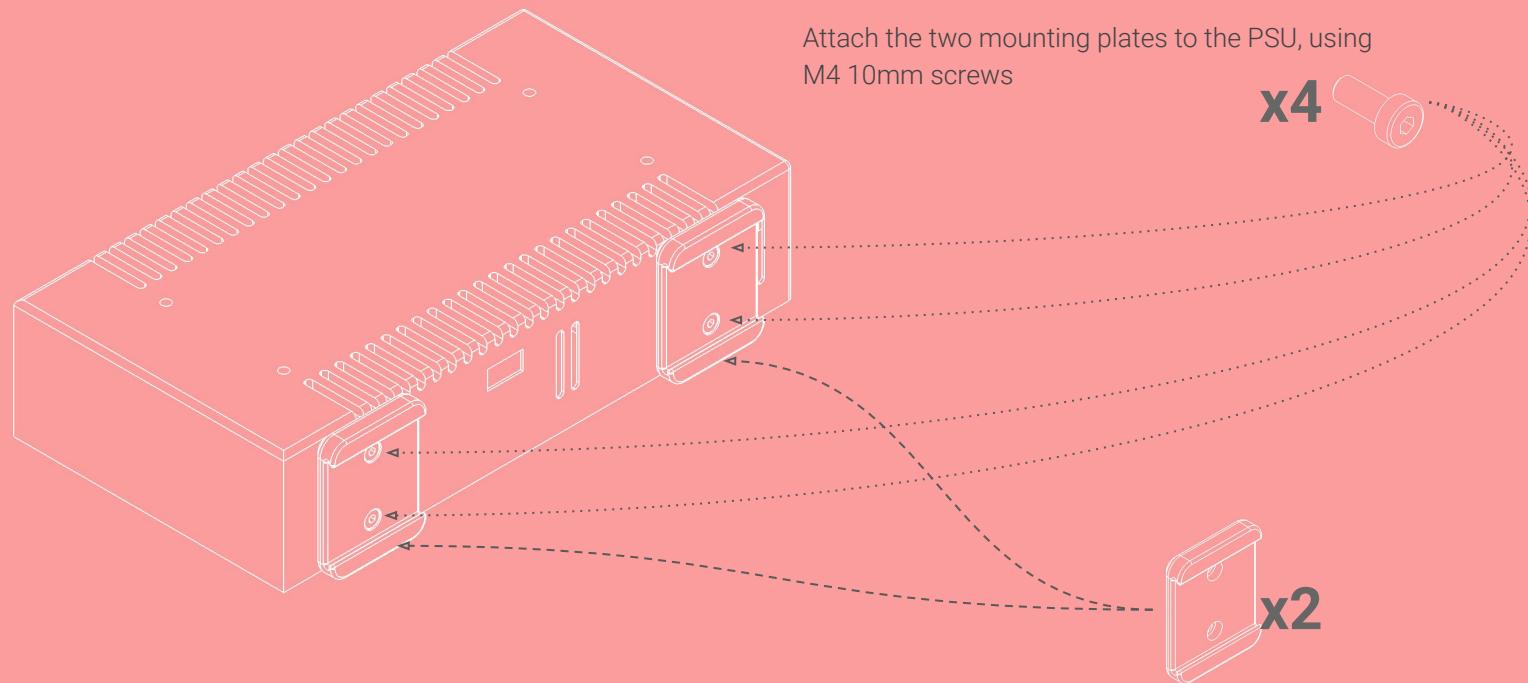
2 pcs - Frame clamp



4pcs - M4 10mm

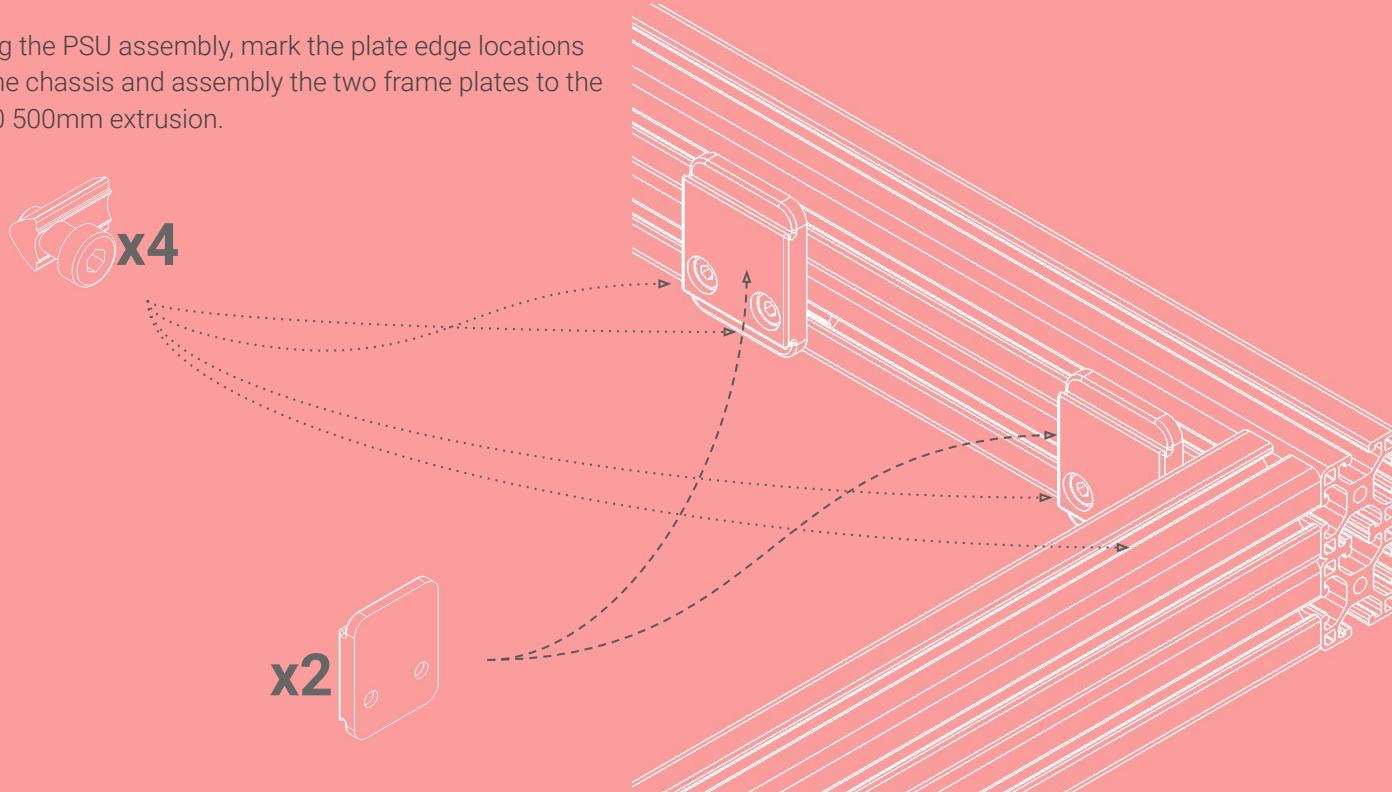


PSU assembly



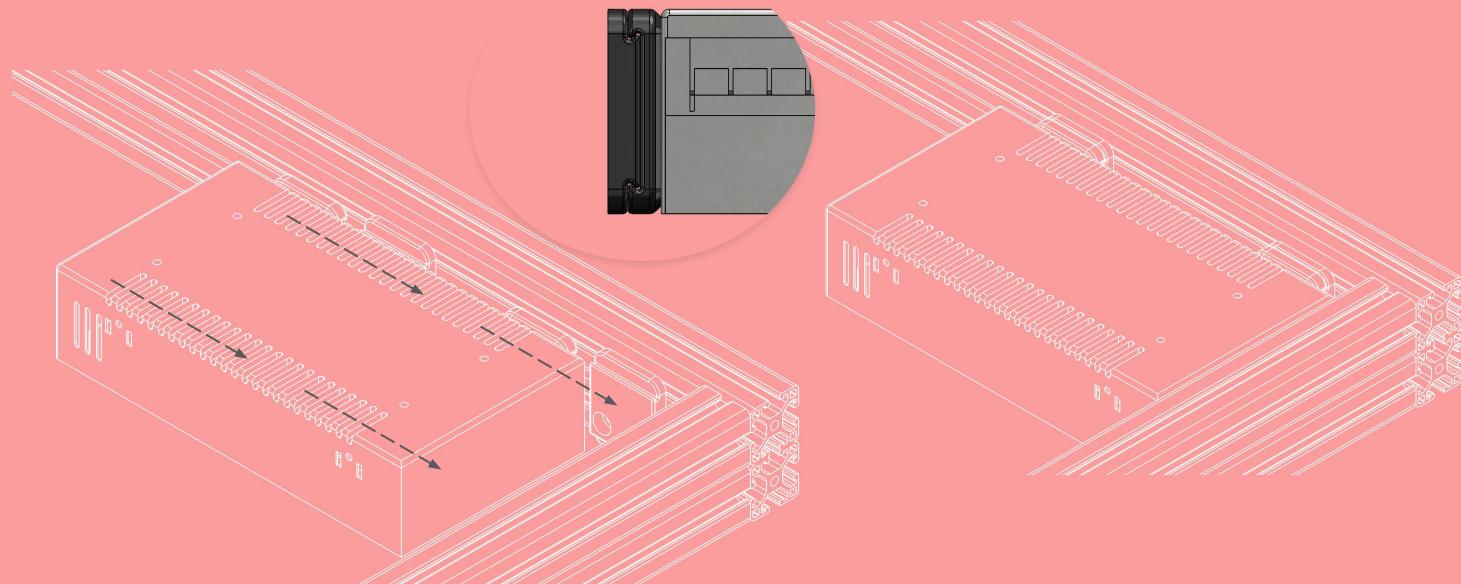
PSU assembly

Using the PSU assembly, mark the plate edge locations on the chassis and assembly the two frame plates to the 3060 500mm extrusion.

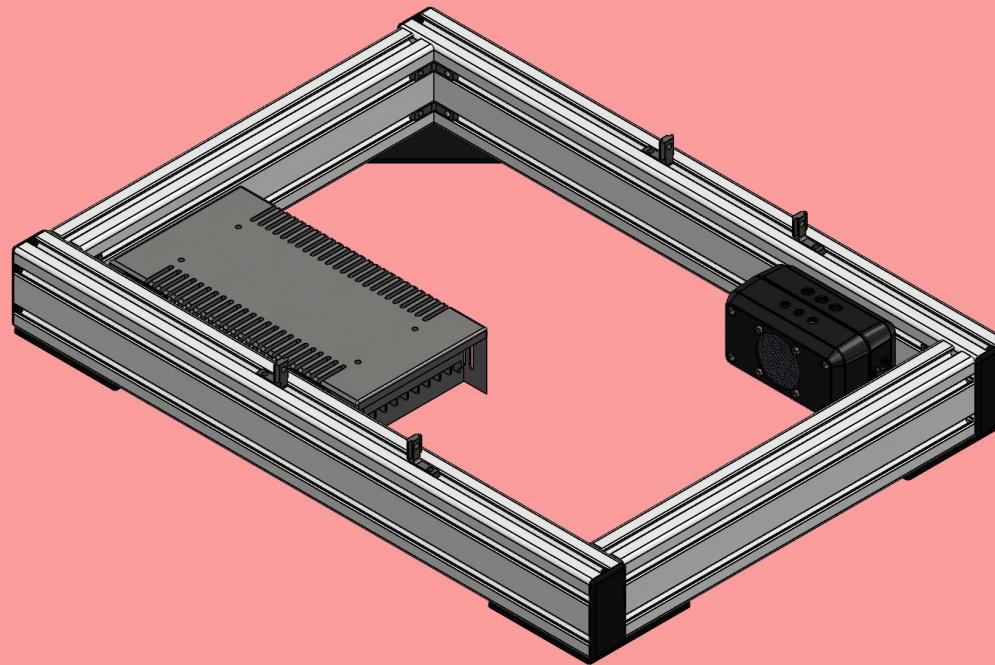


PSU assembly

Mount the PSU by aligning the plates of the PSU and the chassis, and then sliding the PSU to the back of the frame.



MOSFET Enclosure Assembly



MOSFET Enclosure Assembly

1 pcs - 12v MOSFET Circuit



2 + 2 pcs - M6 12mm + M6 Sliding Nuts



1 pcs - MOSFET cover bottom



4 pcs - M3x10mm



1 pcs - MOSFET cover subassembly

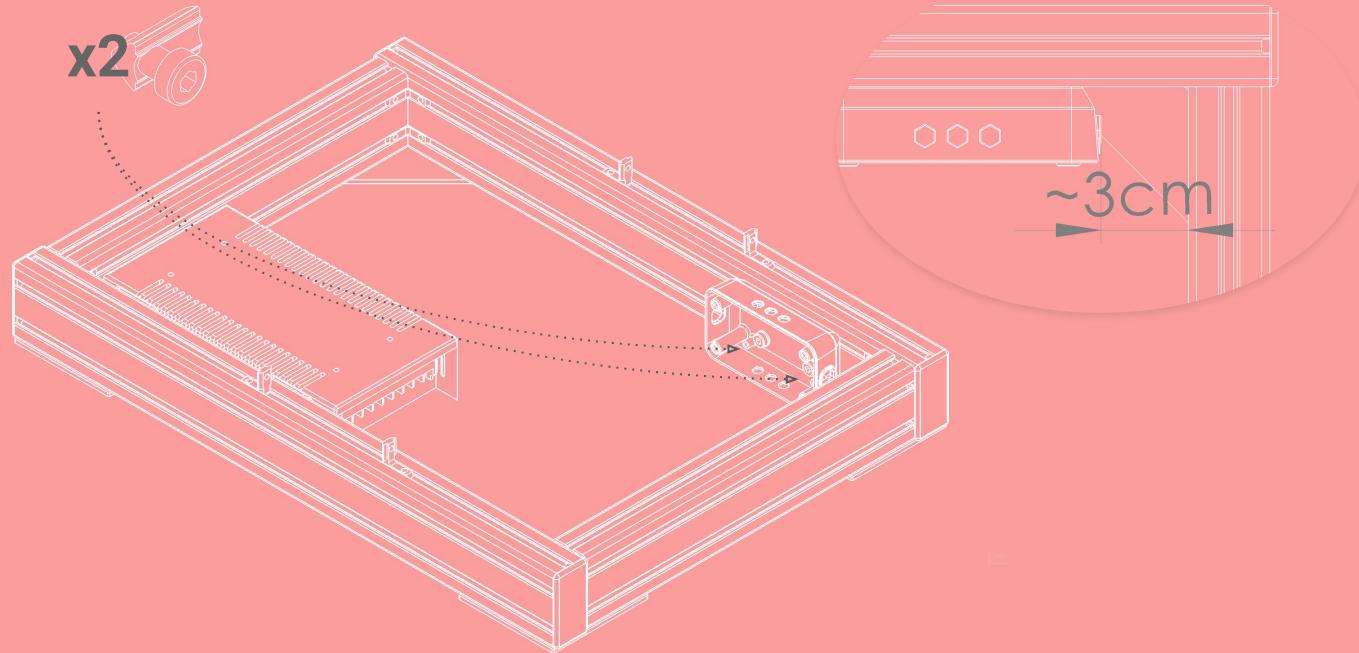


4 pcs - M3x20mm



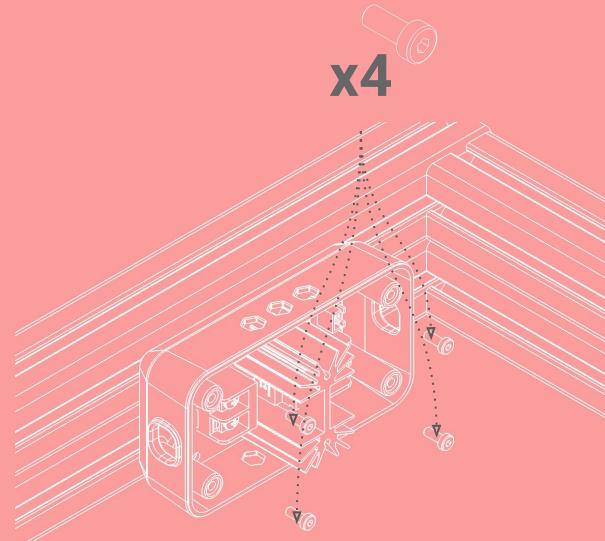
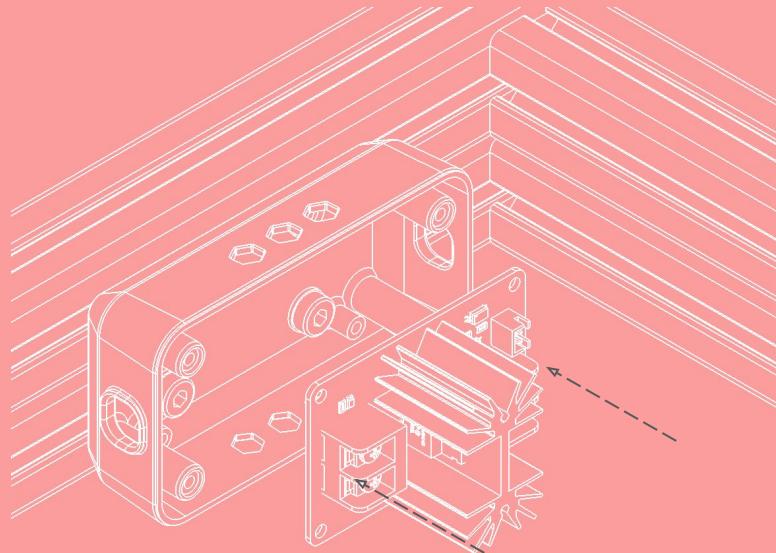
MOSFET Enclosure Assembly

Assemble the bottom MOSFET enclosure to the frame, using M6x12mm screws and sliding nuts.



MOSFET Enclosure Assembly

Align the mosfet board with the mounting holes in the bottom MOSFET enclosure...



...Mount the MOSFET board to the bottom MOSFET enclosure using M3x8mm screws.

MOSFET Enclosure Assembly

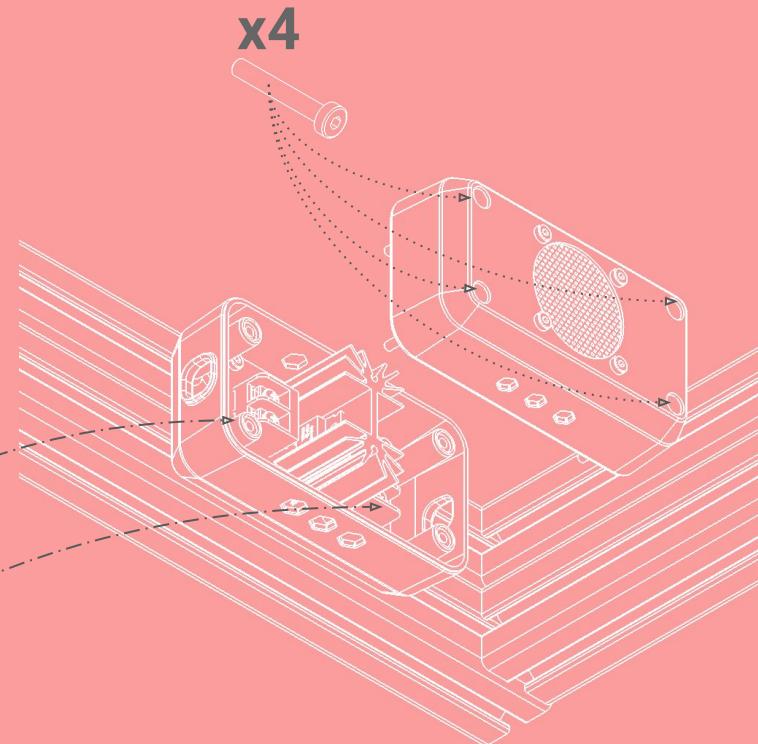
Using the opening on the left side of the MOSFET box, wire and fasten the PSU leads to the MOSFET board.

Using the opening on the right of the MOSFET box, wire the hotbed cables and connect the hotbed signal cable and the 12v fan that you've mounted on the MOSFET cover in previous steps.

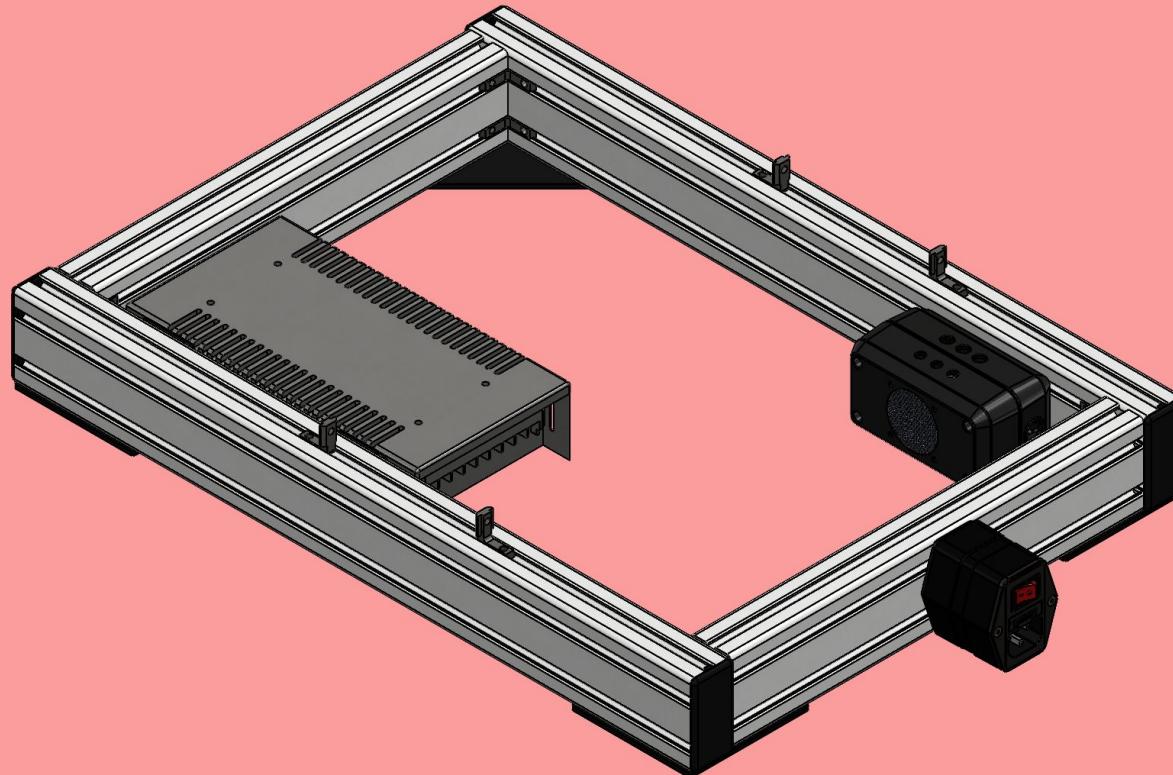
Before closing and fastening the cover using M3x20mm screws, double check your connections as both the fan and the bed signal use similar 2-pin JST plugs.

PSU 12V in

Heatbed out

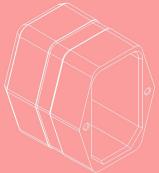


Mains Box



Mains Box

1 pcs - Mains Box



2 + 2 pcs - M6 12mm + M6 Sliding Nuts



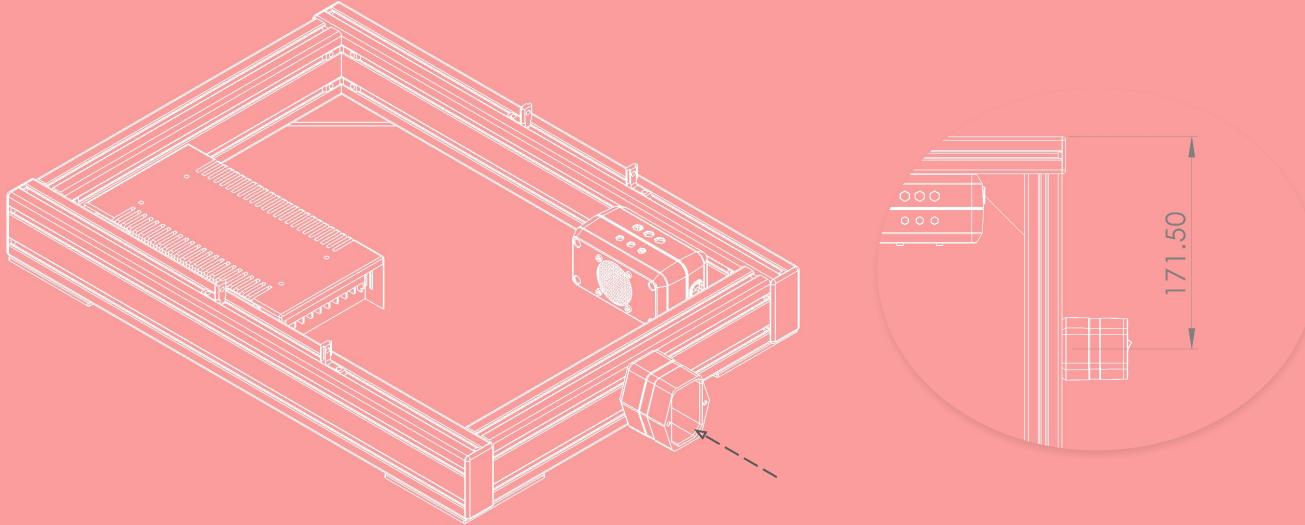
1 pcs - C13/14 w/Fuse



2 pcs - M3x20mm Countersunk

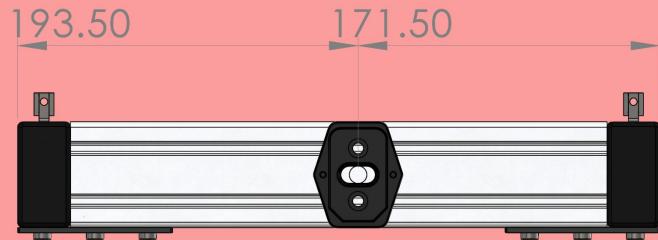


Mains Box

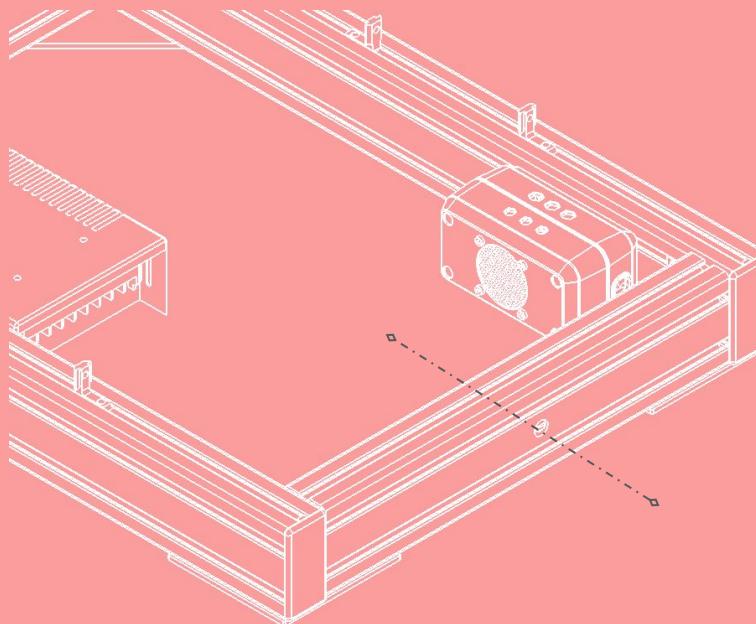


Align the Mains box with the back of the bottom frame at the indicated distance.

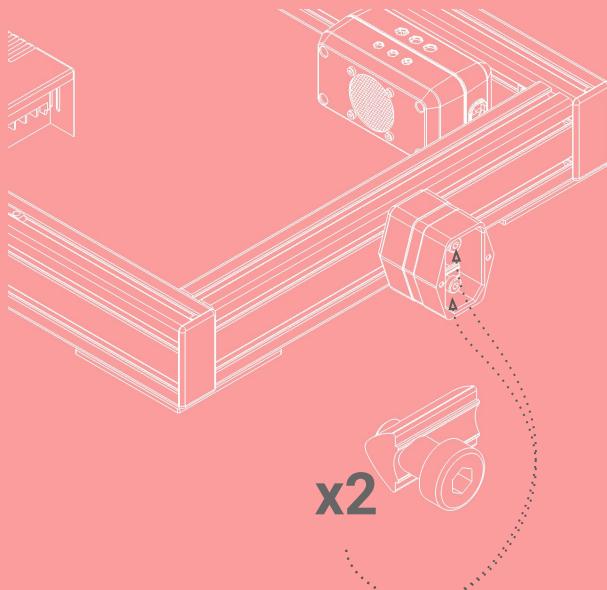
Mains Box



Using the center-hole of the mains box as a template, mark and drill a 10mm hole at the indicated distance.

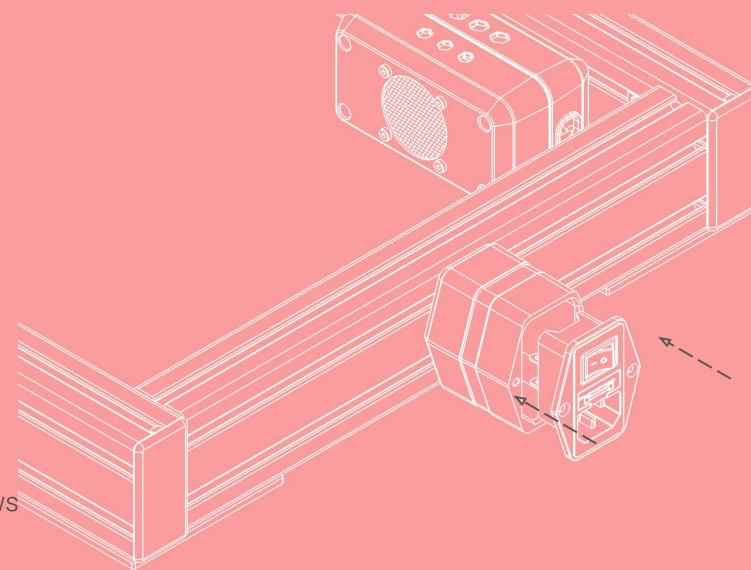


Mains Box

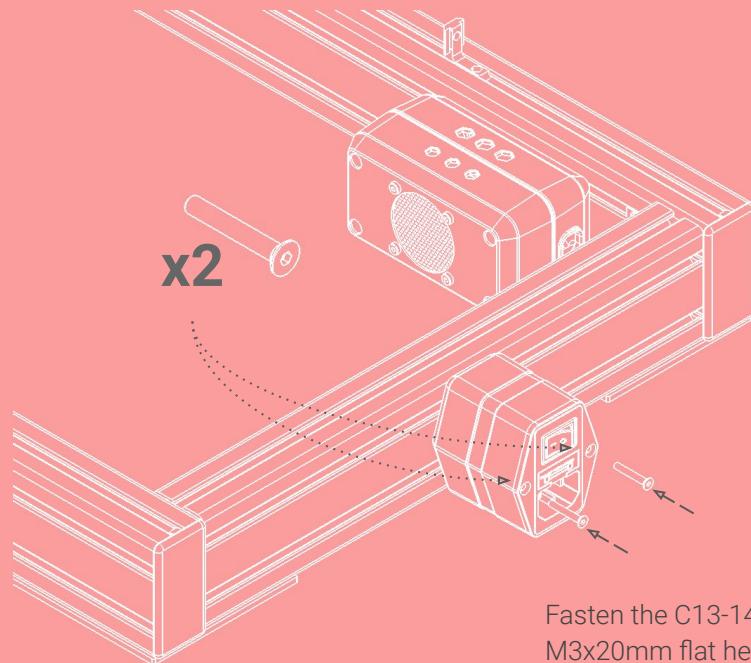


Fasten the mains box to the chassis using M6x12mm screws and M6 sliding nuts.

Wire the C13-14 Fused switch and slide it into the Mains box cavity.

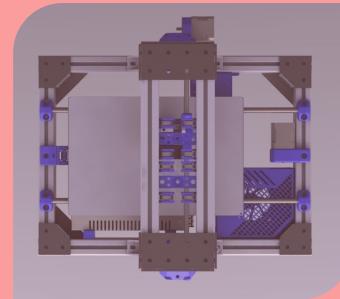
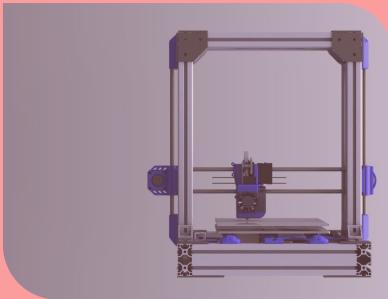


Mains Box



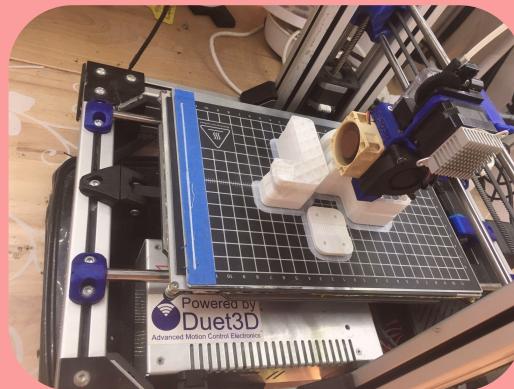
Fasten the C13-14 fused switch to the Mains box, using M3x20mm flat head hex screws.

R&D Insights

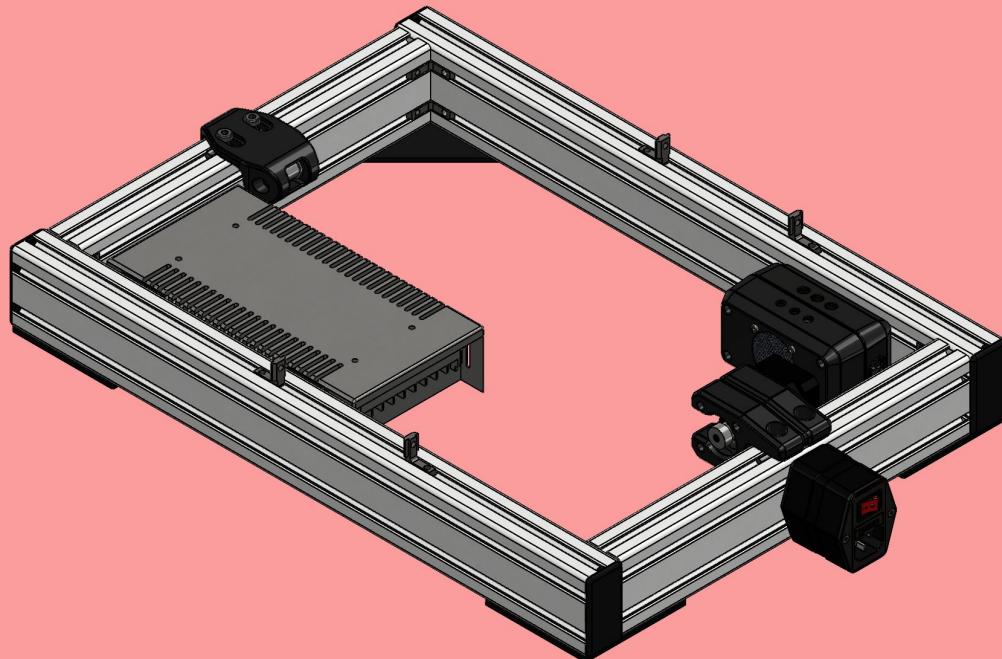


I-3030 V3 - was the first iteration made available to the public on May 2019 and was released on thingiverse under /thing:3623101.

All parts were redesigned from the ground up for the V4 release in 2023.



Y Motor and Y Idler Brackets



Y Motor and Y Idler Brackets

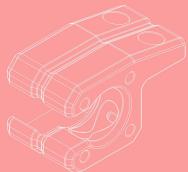
1 pcs - Nema 17 Motor



5 + 5 pcs - M6 12mm + M6 Sliding Nuts



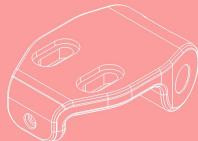
1 pcs - Y Motor Arm



1 pcs - GT2x12mm 20T pulley



1 pcs - Y Idler Arm



1 pcs - M3 nut



Y Motor and Y Idler Brackets

3 pcs - M3x20mm



1 pcs - M3x10mm



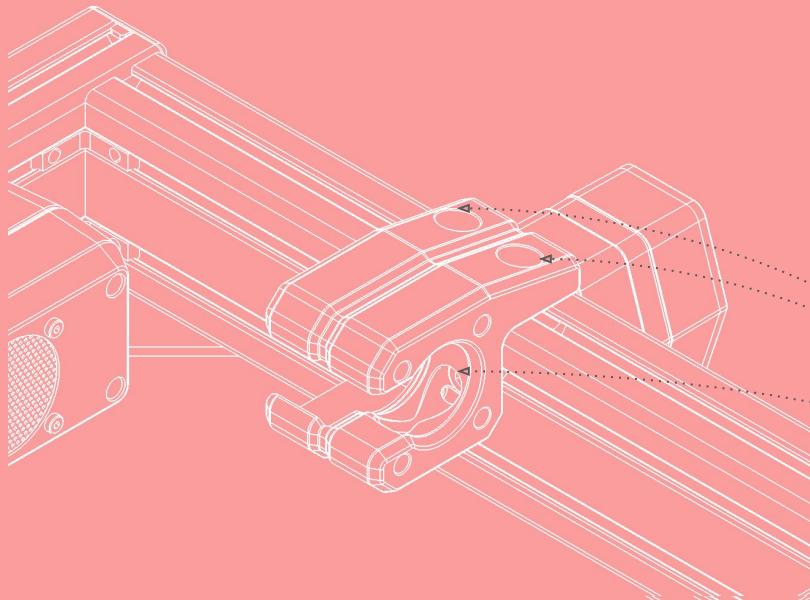
1 pcs - M5x25mm



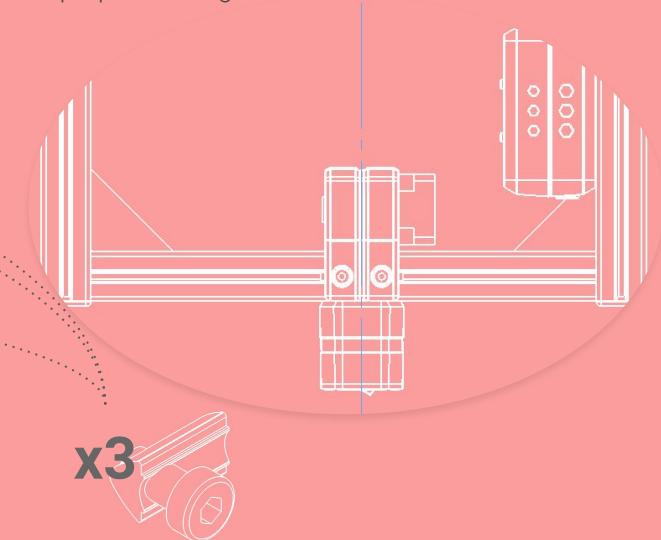
1 pcs - M3x16mm



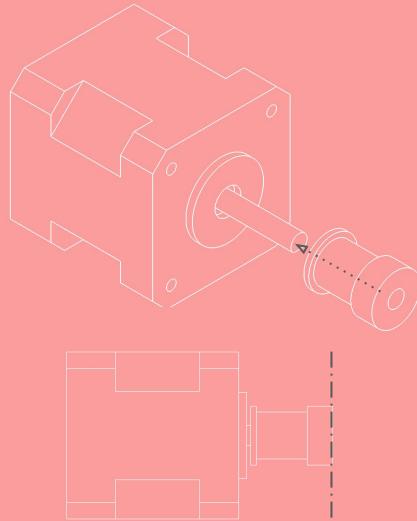
Y Motor and Y Idler Brackets



Y motor bracket needs to be centered with the mains box and should be located exactly opposite of Y Idler bracket for proper belt alignment.

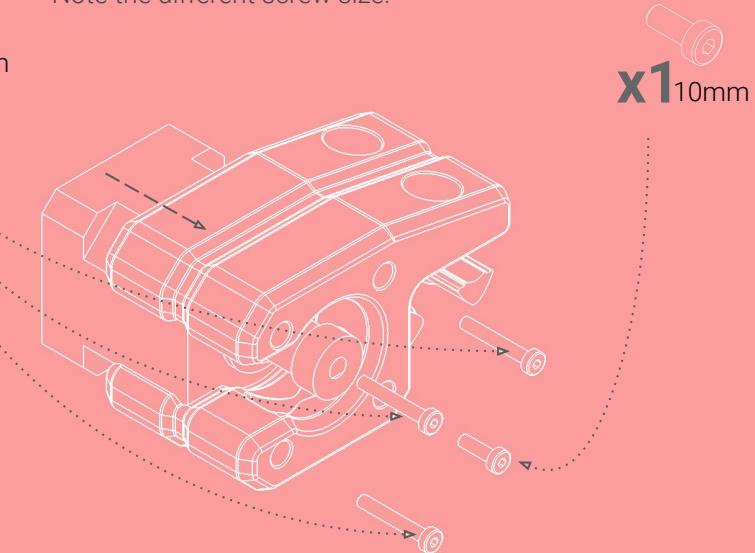


Y Motor and Y Idler Brackets



x3 20mm

Mount the Y motor to the Y motor bracket using M3 screws.
Note the different screw size.

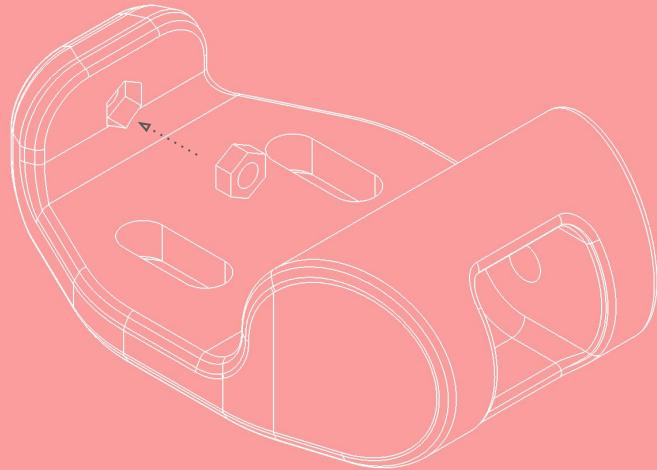


x1 10mm

Align the pulley with the motor's shaft so that it's flush, and tighten both grub-screws, starting with the one facing the flat face on the motor's shaft.

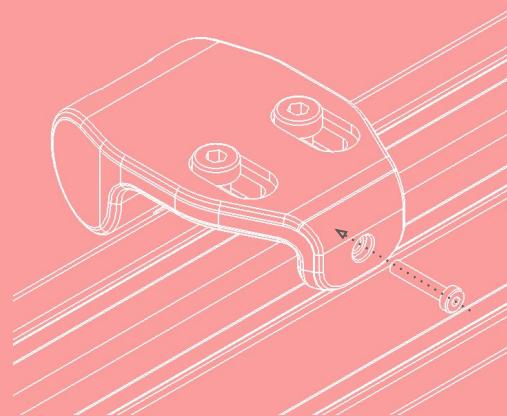
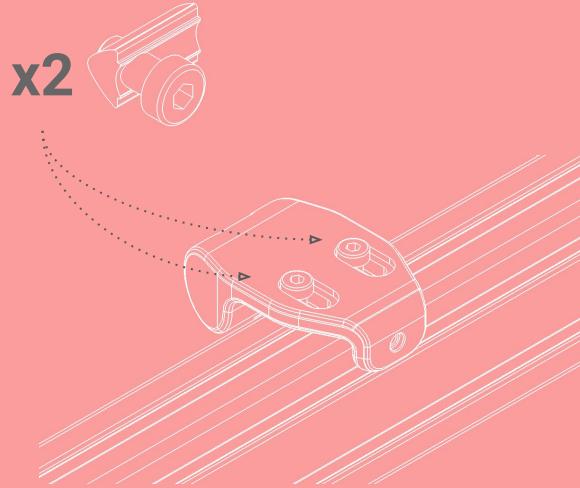
Y Motor and Y Idler Brackets

Fully press the M3 nut into the crevice of the Idler arm.



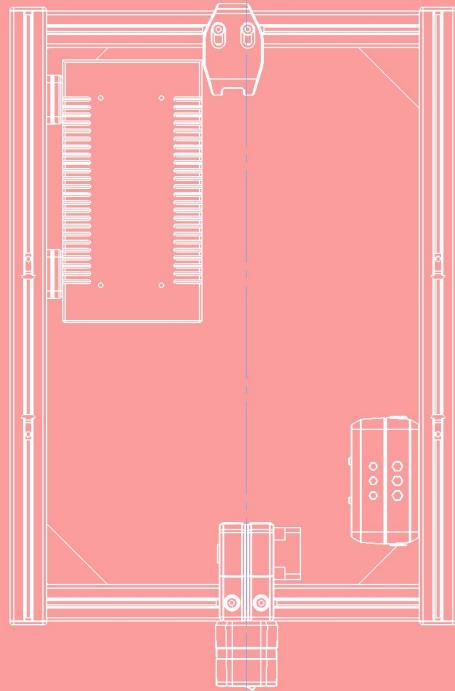
Y Motor and Y Idler Brackets

Assemble the Idler arm to the frame using M6 12mm SCHC and then gently tighten the M3x16mm screw by hand.

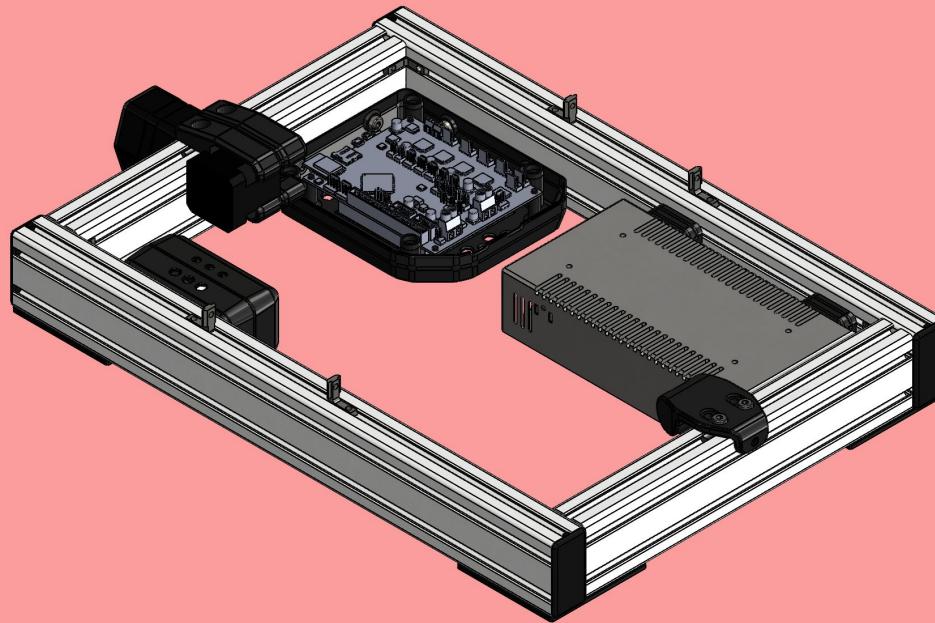


Y Motor and Y Idler Brackets

Align the Idler arm and the motor bracket as shown below. Do not tighten the M6 screws yet.

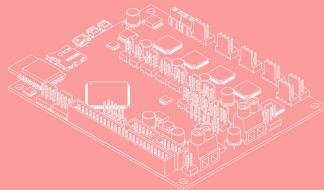


ECU and ECU enclosure

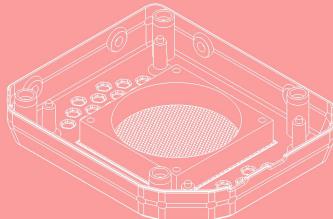


ECU + ECU enclosure mounting

1 pcs - Duet Wifi



1 pcs - Bottom ECU Cover

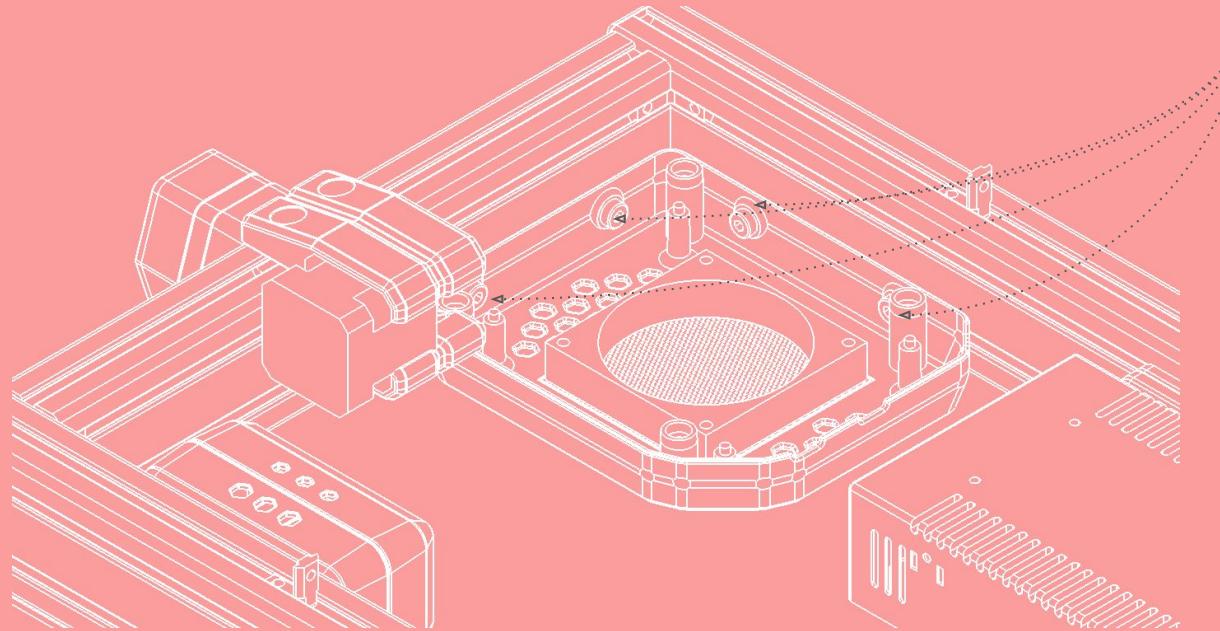


4 + 4 pcs - M6 12mm + M6 Sliding Nuts



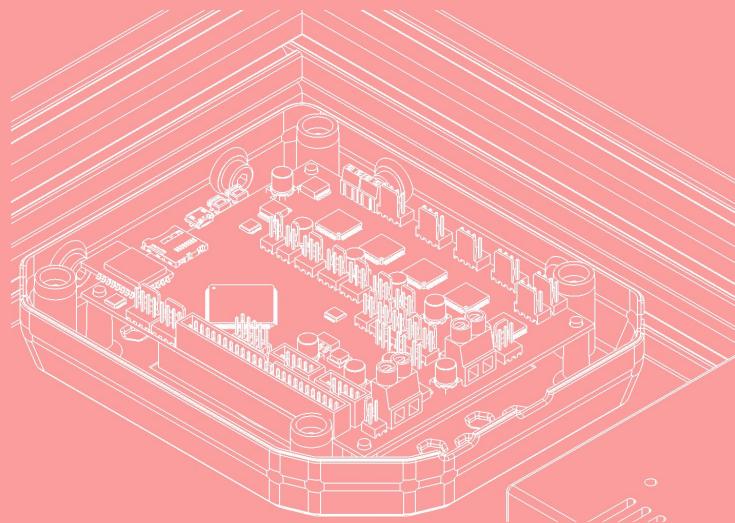
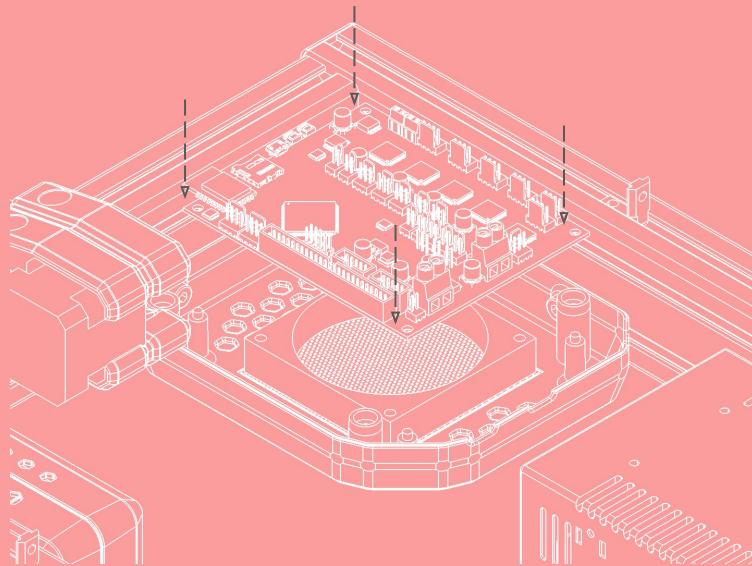
ECU + ECU enclosure mounting

Fasten the bottom ECU enclosure to the Frame using M6x12mm screws and sliding nuts.



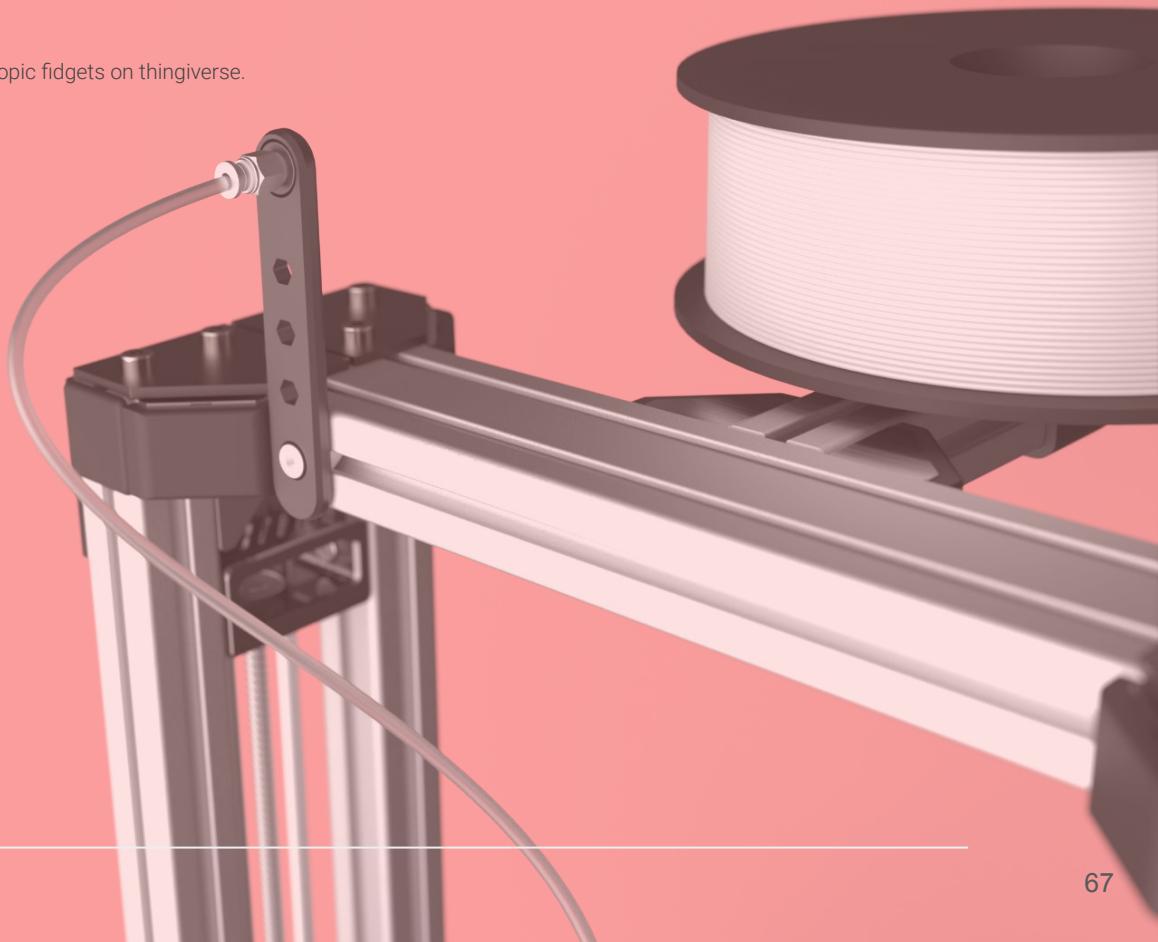
ECU + ECU enclosure mounting

Align the Duet-Wifi Board with the mounting pins and mount the ECU on top of the 60mm fan.

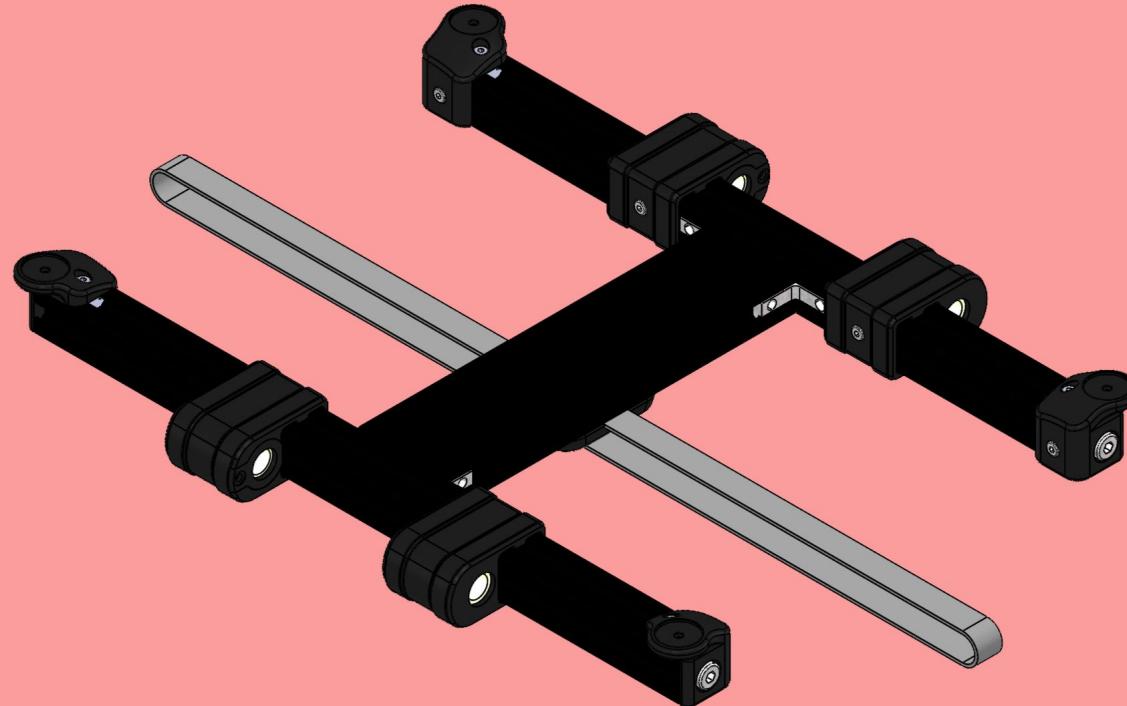


R&D Insights

The filament guide design was inspired by the many gyroscopic fidgets on thingiverse.



Bed Frame Assembly



Bed Frame Assembly

2 pcs - 2020Bx315mm



1 pcs - 2040Bx174mm



4 pcs - LM10UU Bearing



1 pcs - GT2x12mm Timing Belt



4 pcs - 2020B Inner bracket



8 pcs - M3 Sliding Nut



Bed Frame Assembly

4 pcs - M3x10mm



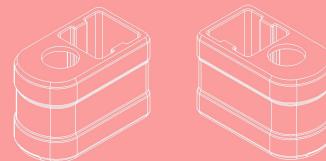
8 pcs - M3x8mm



1 pcs - Y Belt Clamp



4 pcs - Y Bearing Housing



4 pcs - Bearing Housing Cap



4 pcs - Bed Frame Corners



Bed Frame Assembly

1 pcs - GT2x20Tx12mm Idler



1 pcs - M5x25mm



4 pcs - M3 Insert

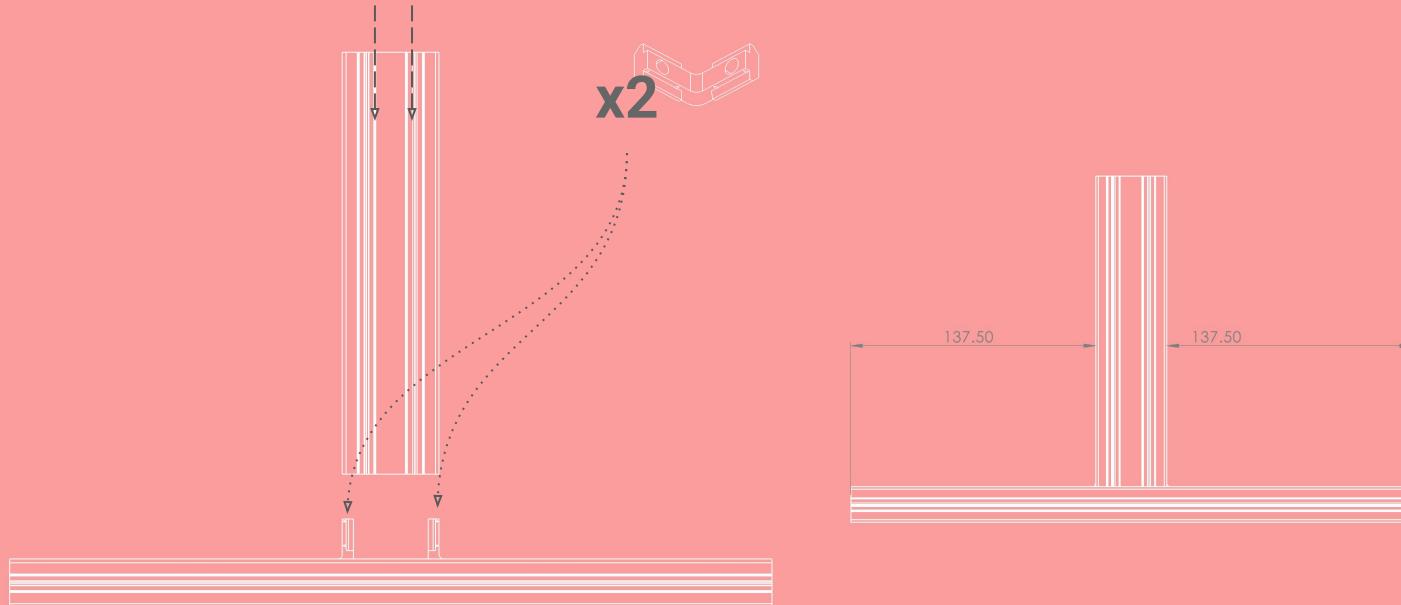


8 pcs - M3x6mm



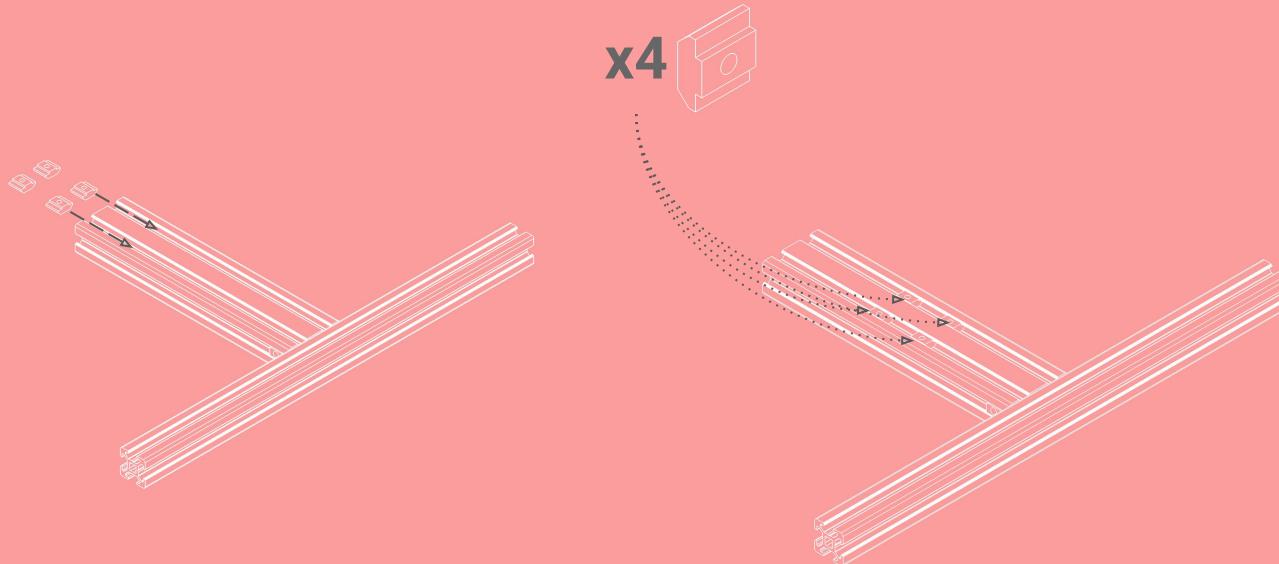
Bed Frame Assembly

Using inner corner brackets, mount the 2040 profile directly at the middle of the 2020 profile.



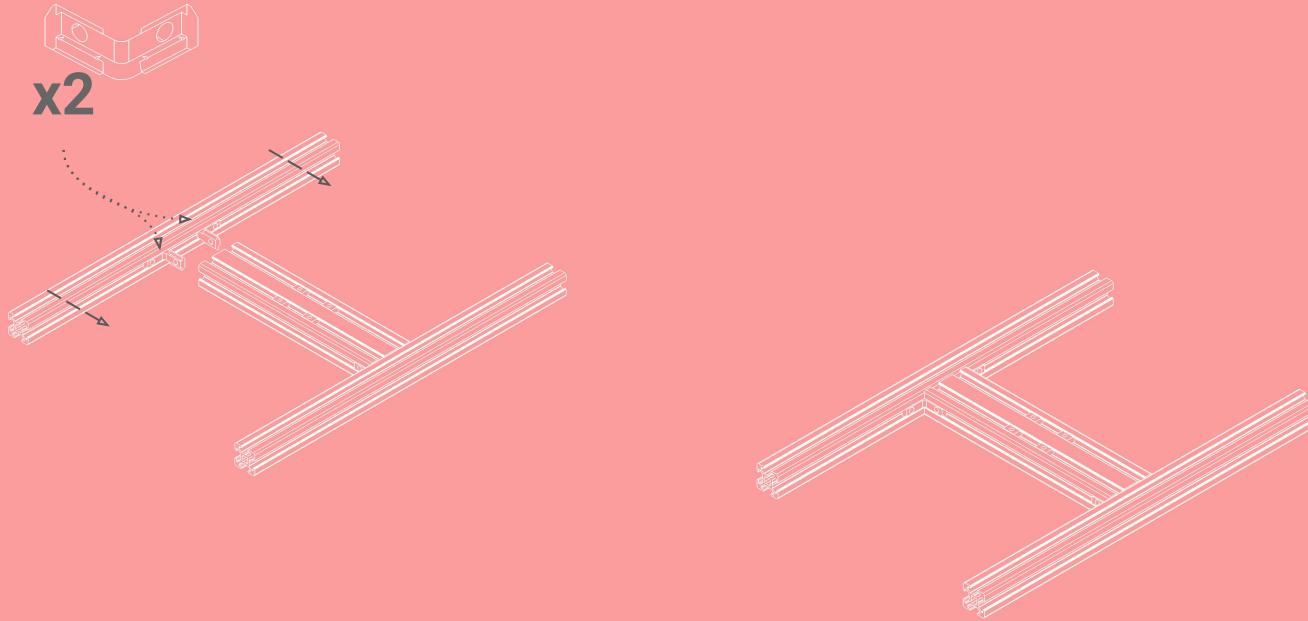
Bed Frame Assembly

Before proceeding to the second 2020 profile - assemble the M3 sliding nuts onto the 2040 profile as shown below.



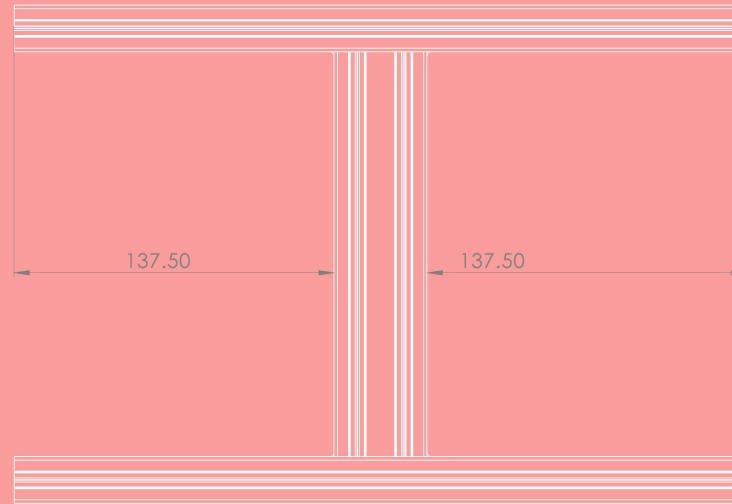
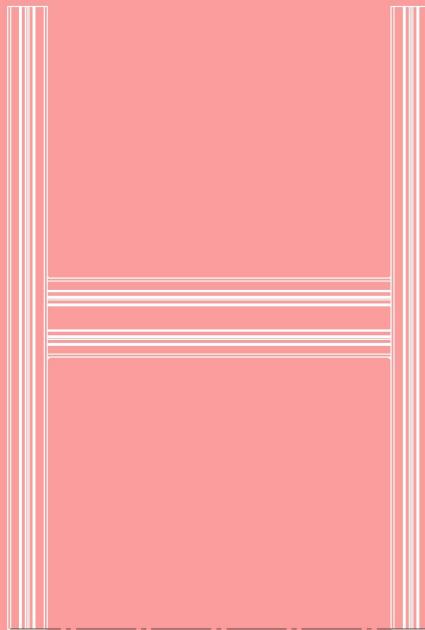
Bed Frame Assembly

Using inner corner brackets, connect the remaining 2020 profile to the other side of the 2040 profile, creating an 'H' shape.



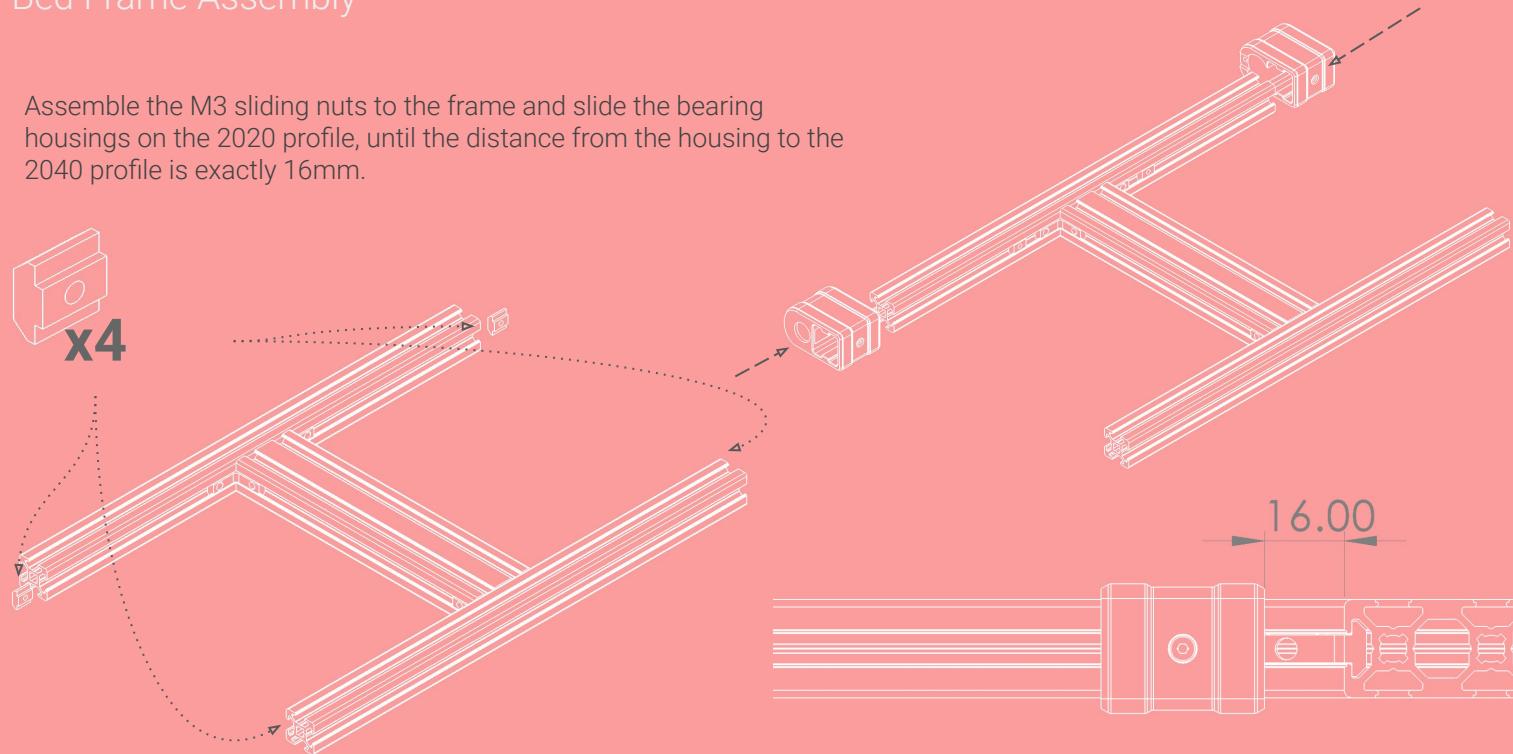
Bed Frame Assembly

Before tightening the screws of the bed frame - check that the profile distances match those in the image below, and make sure the assembly is true and square. Use the try-square tool here.



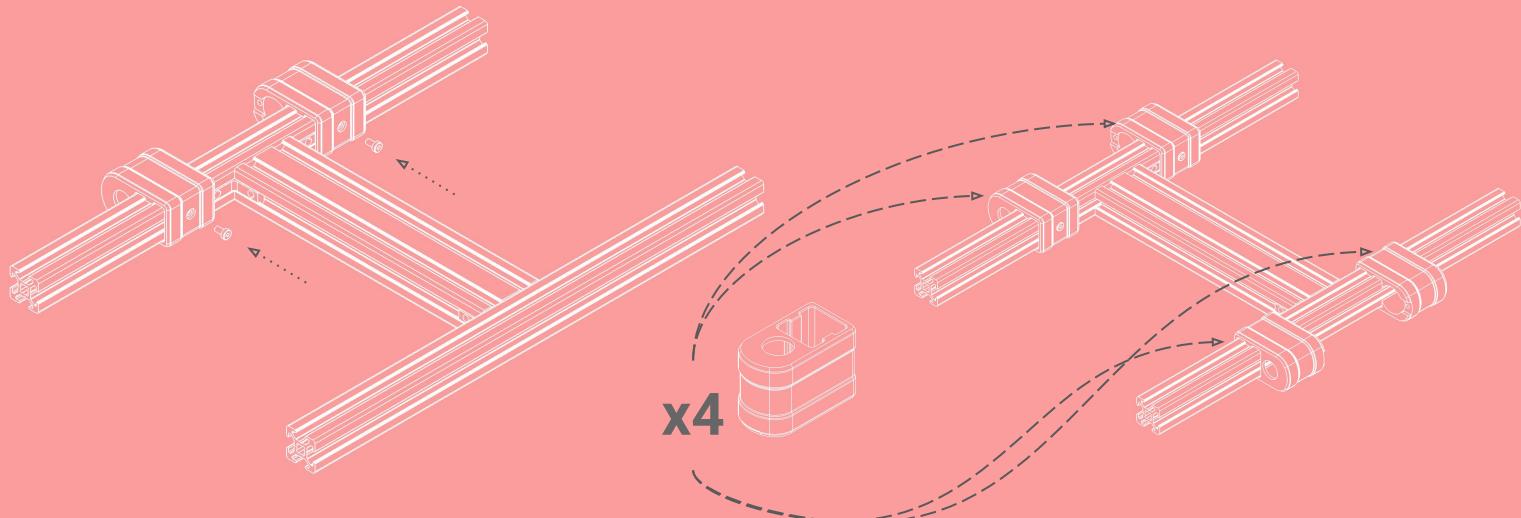
Bed Frame Assembly

Assemble the M3 sliding nuts to the frame and slide the bearing housings on the 2020 profile, until the distance from the housing to the 2040 profile is exactly 16mm.



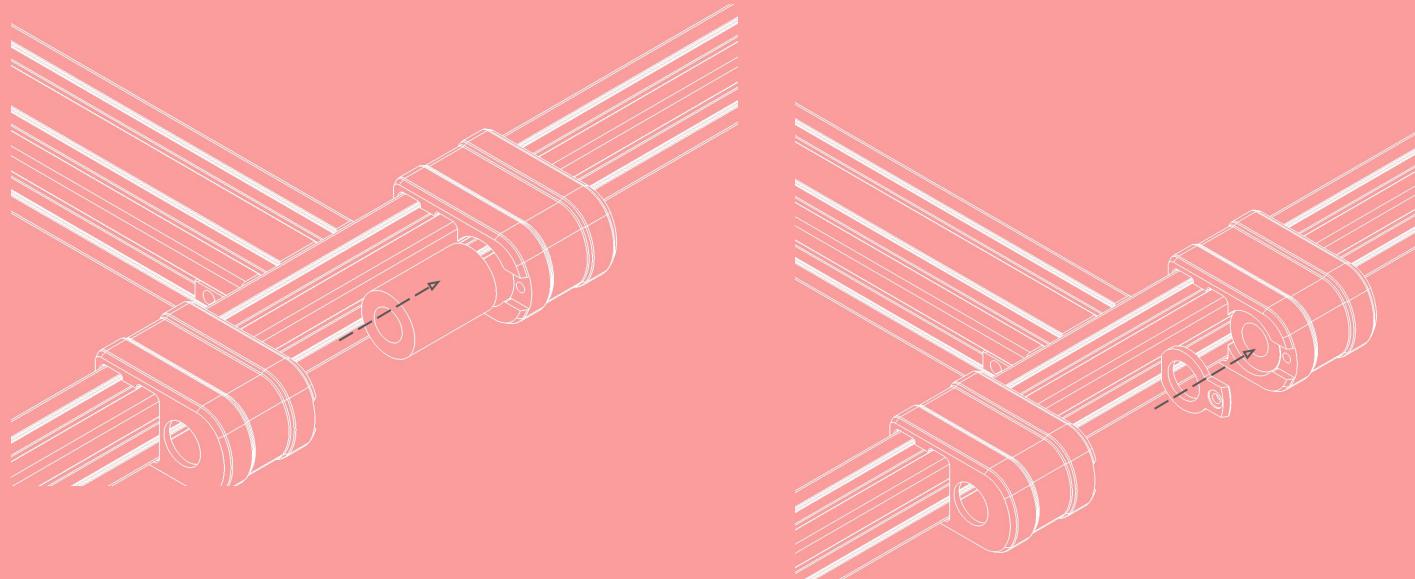
Bed Frame Assembly

Fasten the Bearing housing to the bedframe using M3x8mm screws and the M3 sliding nuts from the previous step, and repeat for the remaining three housings.



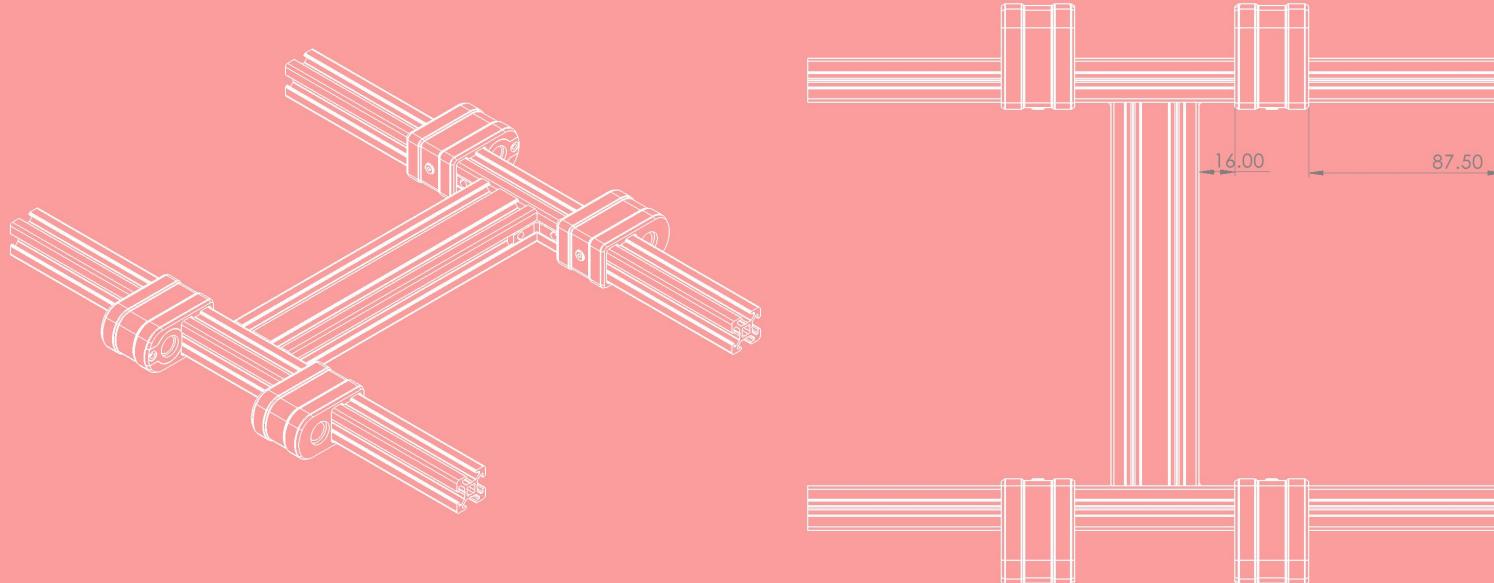
Bed Frame Assembly

Fully Insert the LM10UU bearing into the bearing housing by sliding it in and fastening it with its cap.



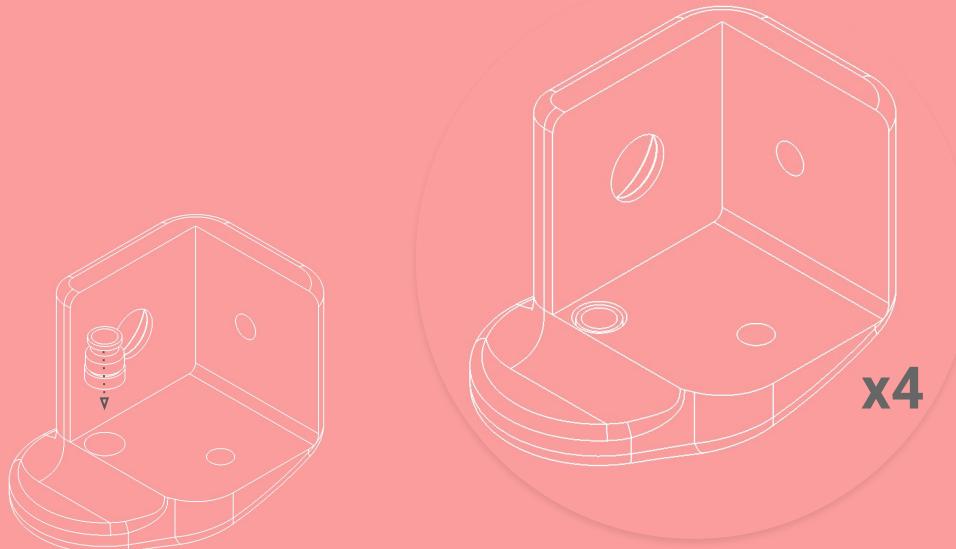
Bed Frame Assembly

Repeat for all four 10mm bearings and adjust the housing distances from the middle 2040 profile as shown below.



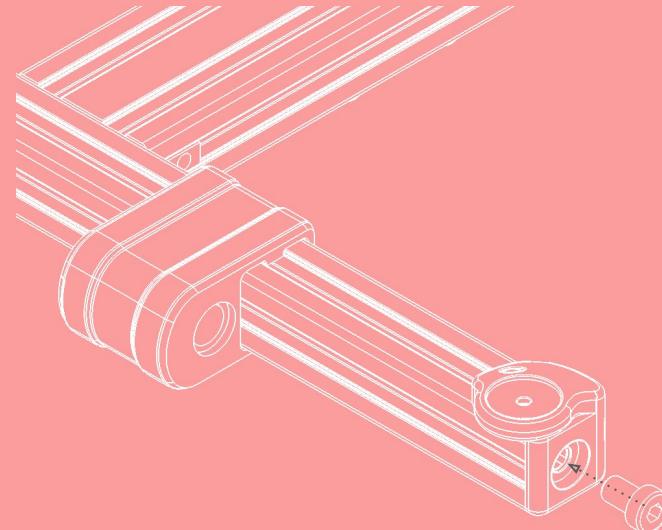
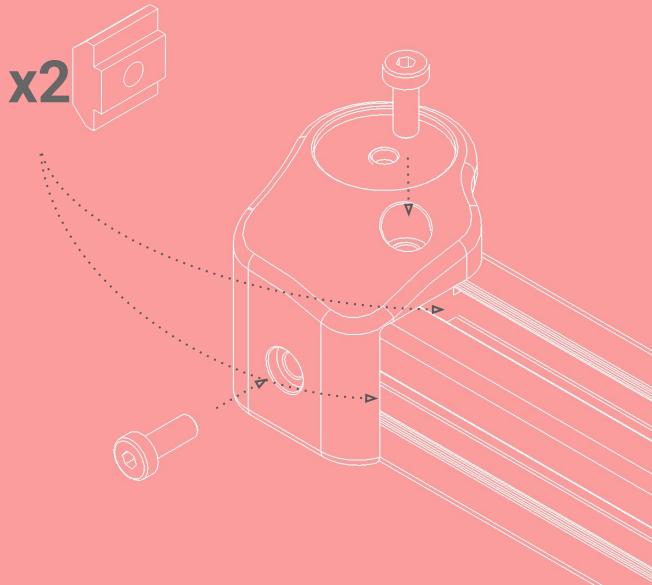
Bed Frame Assembly

Push-fit an M3 insert into the bottom slot of Y Frame Corner and repeat for all four bed corners.



Bed Frame Assembly

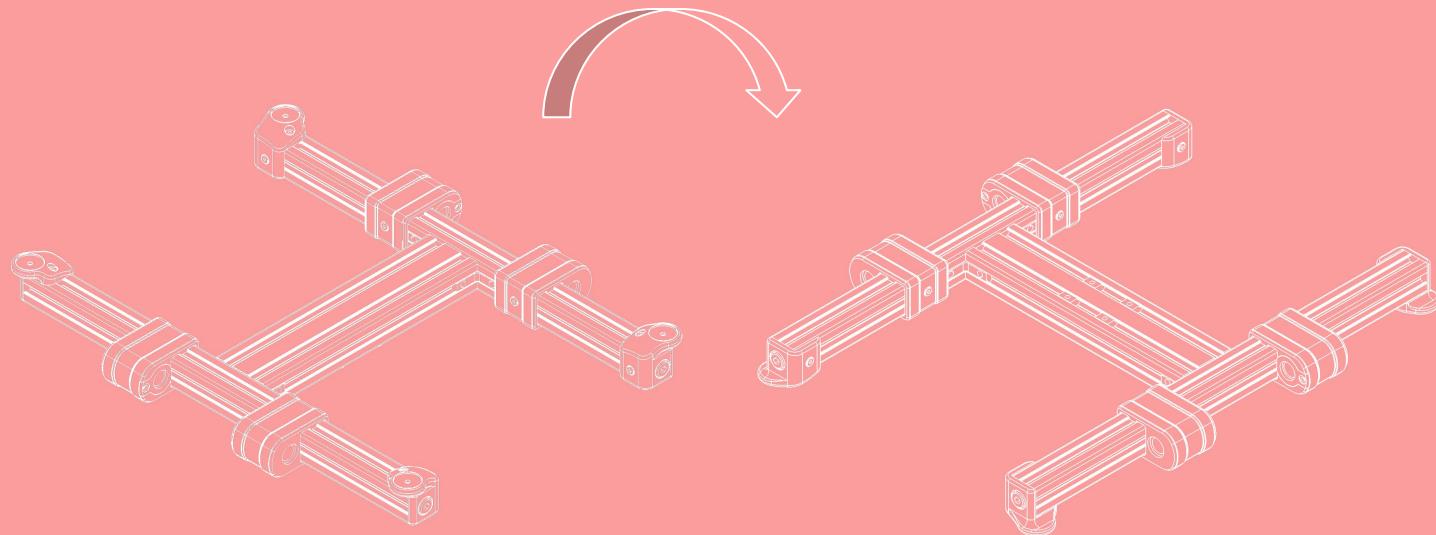
Assemble the corners to the bed frame using M3x8mm screws, M3 sliding nuts and a M6x12mm screws.



The M6x12mm screws directly into the 2020 profile.

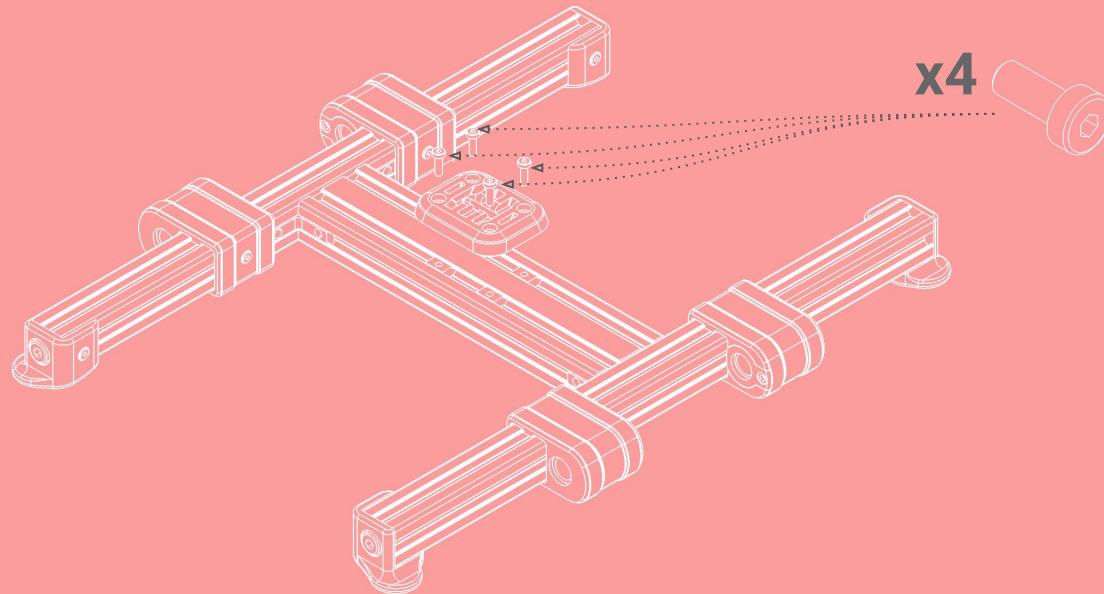
Bed Frame Assembly

Flip the frame over, so that the bottom is facing up and you can see the previously assembled M3 sliding nuts.



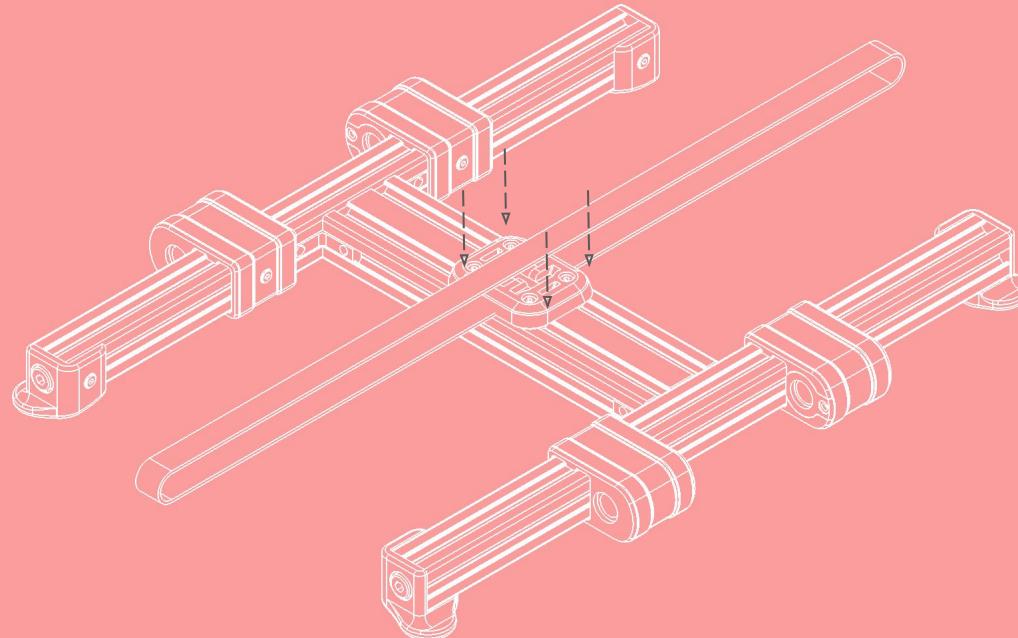
Bed Frame Assembly

Using M3x10mm screws and previously assembled M3 sliding nuts, mount the belt clamp to the 2040 profile without fully tightening the screws yet.



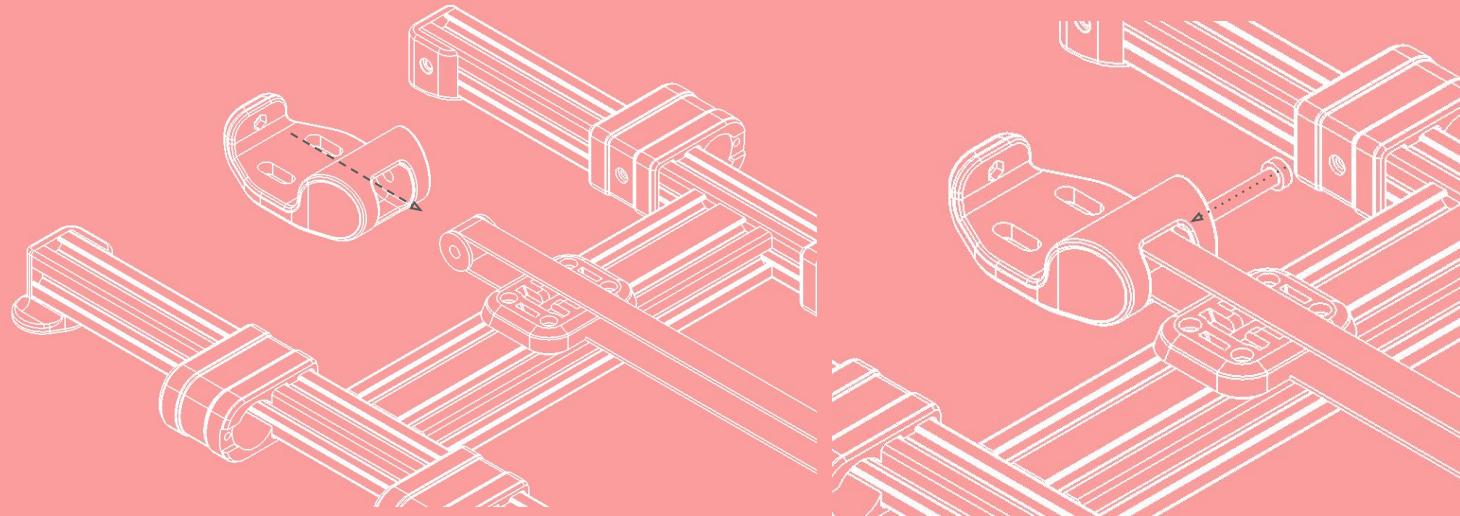
Bed Frame Assembly

Measure cut and assemble a 825mm(82.5cm) piece of GT2x12mm Belt and insert the two ends of the belt to the bed clamp to align the belt so that it is parallel to the 2020 extrusions.

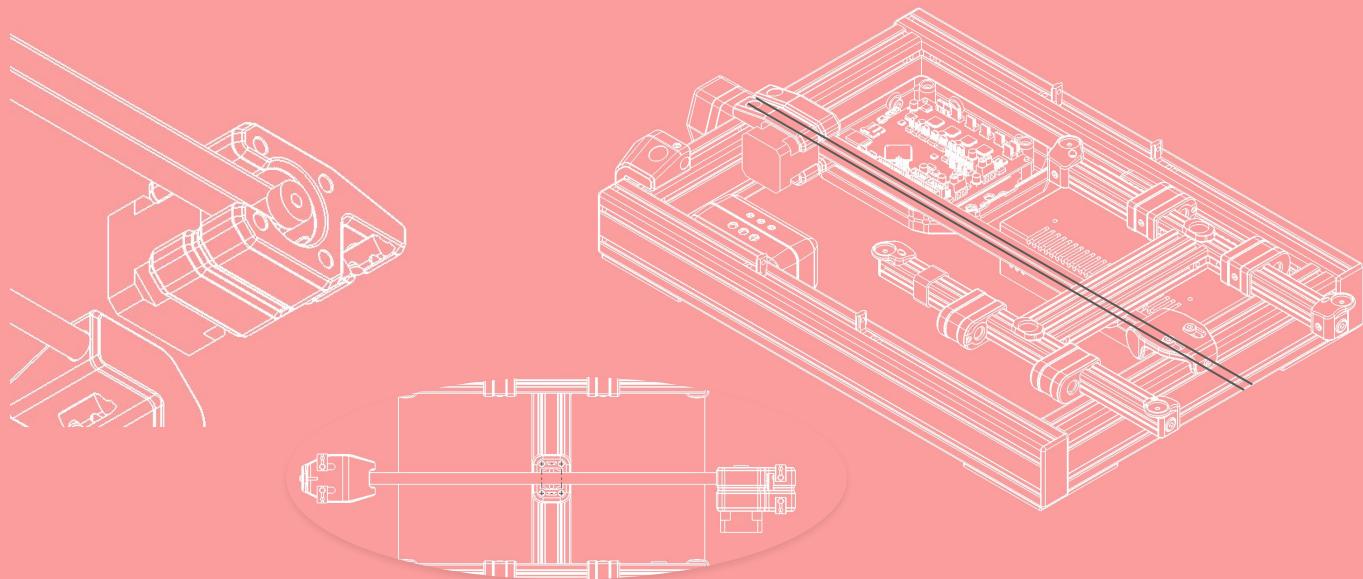


Bed Frame Assembly

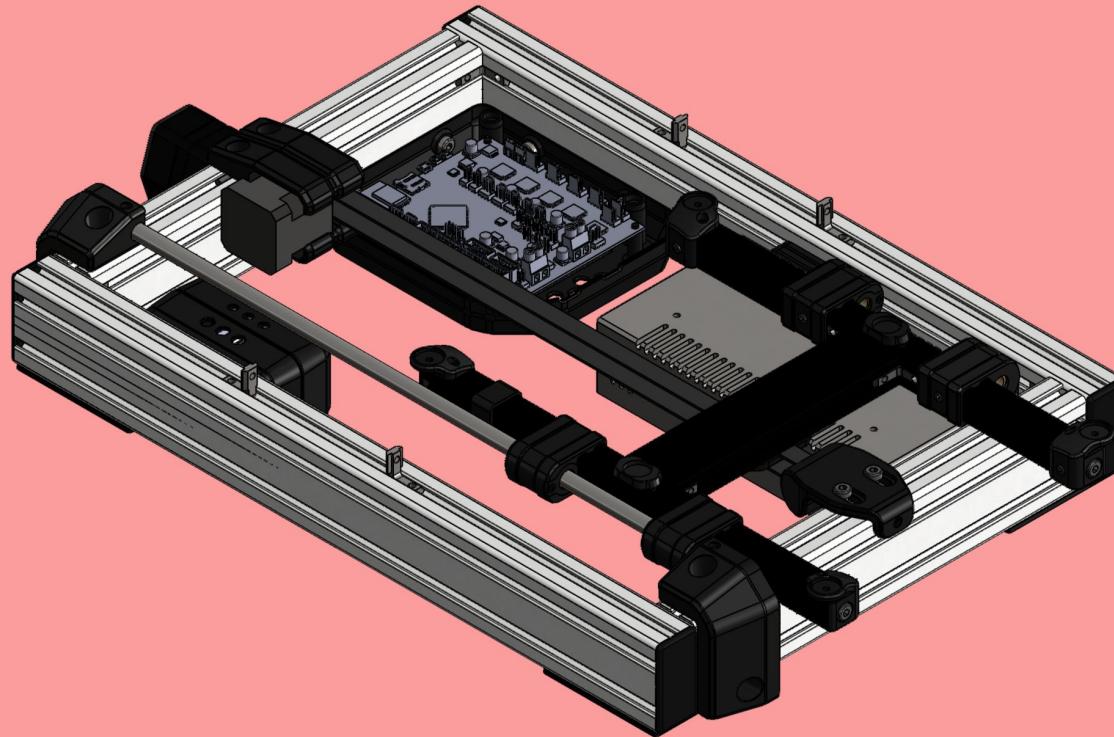
Engage the GT2x12mm 20T Idler with one end of the belt and assemble it to the Idler arm, using a M5x25mm screw.



Engage the belt on the other side with the Y motor and make sure that the Motor, belt and the Idler brackets are all aligned.



Bed Frame Partial Assembly



Bed Frame Partial Assembly

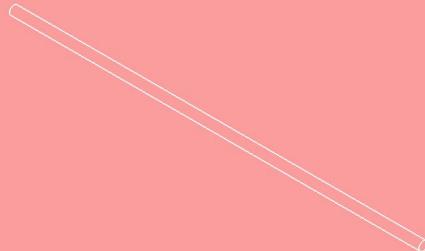
2 pcs + 2 pcs - Y Frame Brackets



8 + 8 pcs - M6 12mm + M6 Sliding Nuts



2 pcs - 10x470mm h6 smooth rod

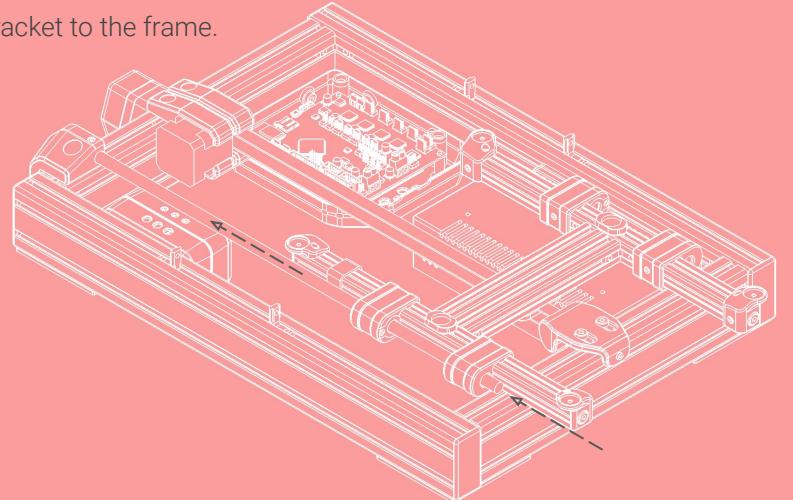
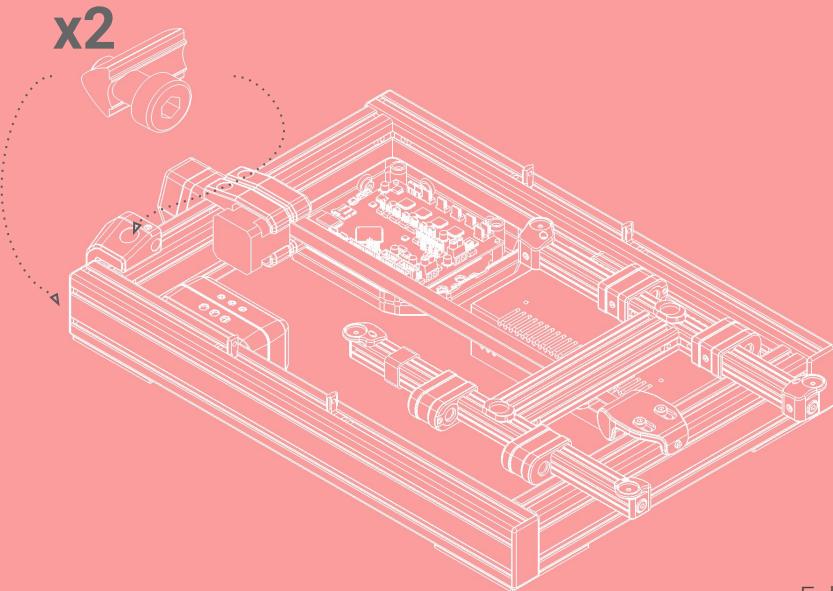


4 pcs - M3x10mm



Bed Frame Partial Assembly

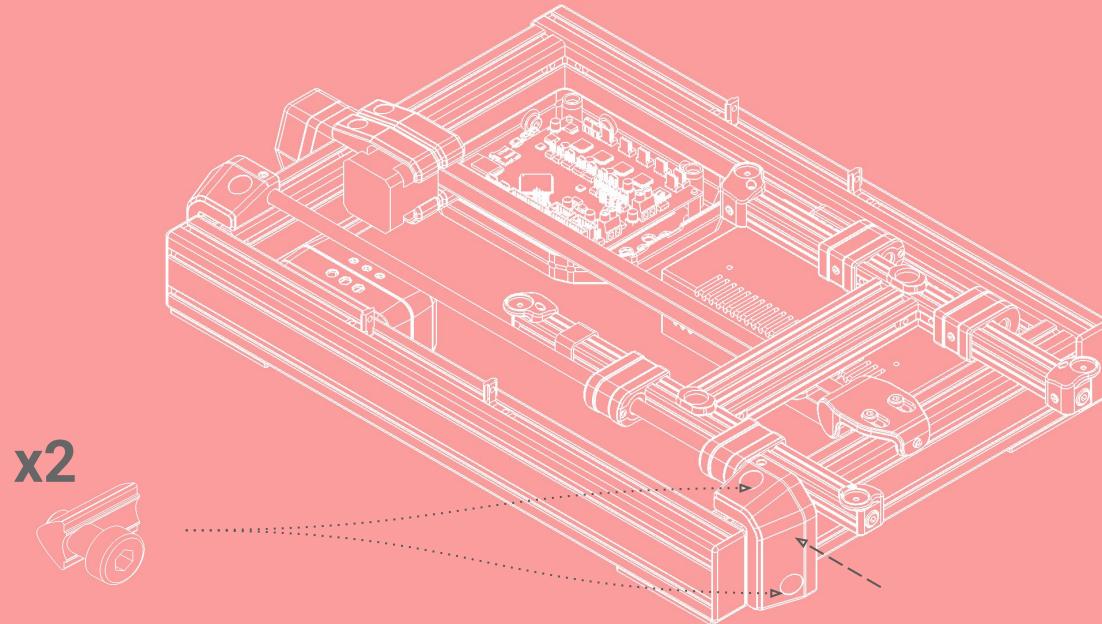
Using M6x12mm screws and M6 sliding nuts, mount the first Y bracket to the frame.



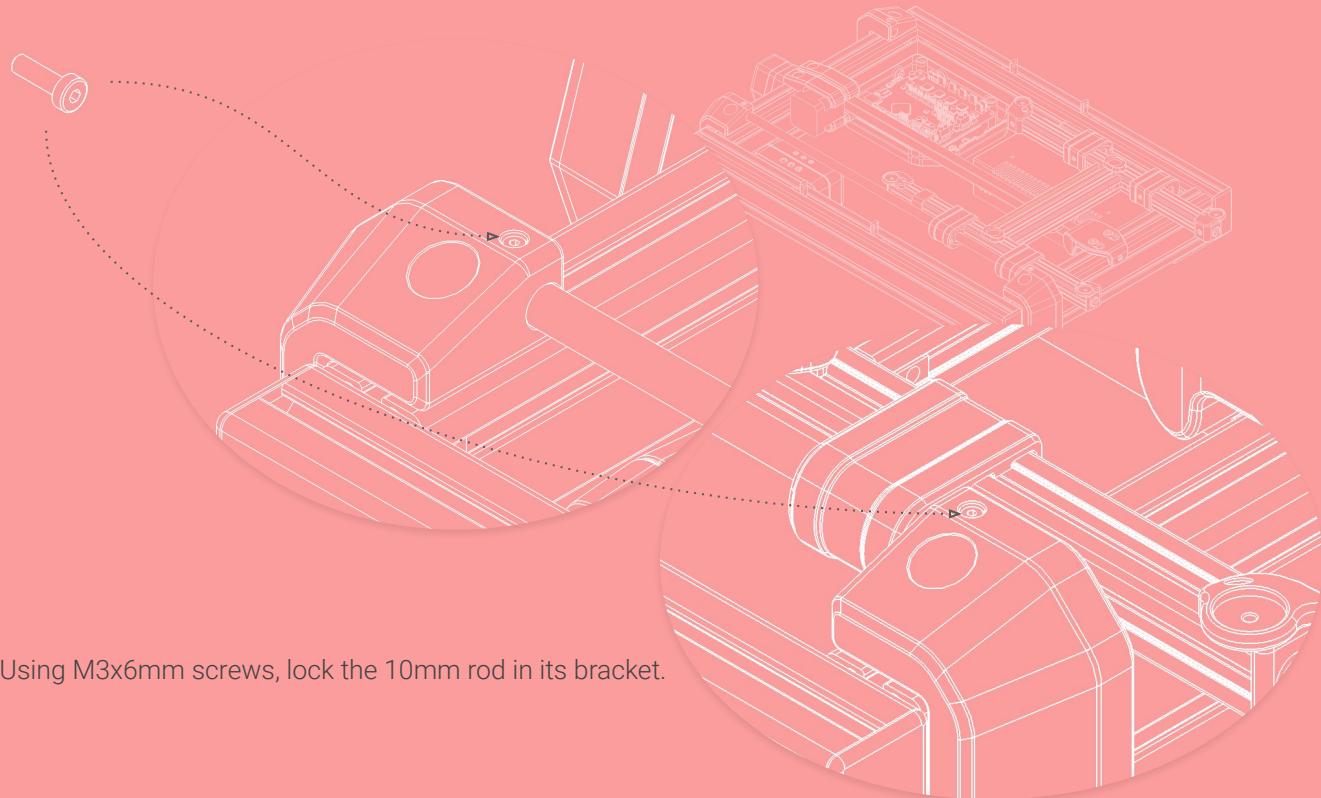
Fully insert the first 10mmx470mm smooth rod into the Y bracket by sliding it through the 10mm Heatbed frame bearings.

Bed Frame Partial Assembly

Using M6x12mm screws and M6 sliding nuts, mount the opposing Y bracket to the frame by sliding it onto the 10mm rod.

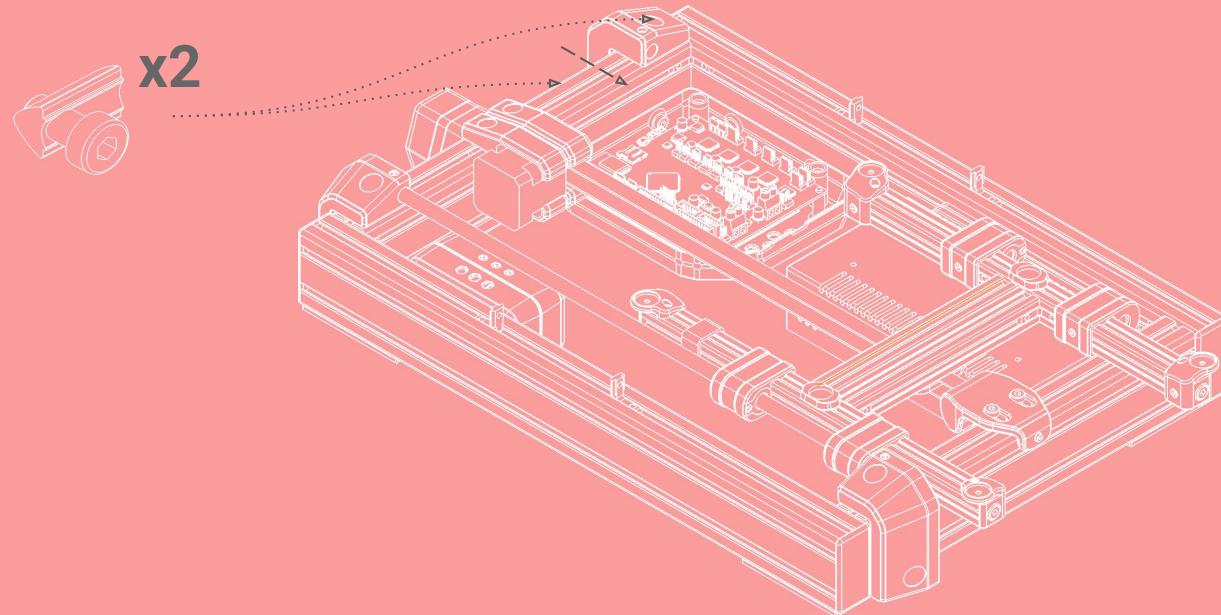


Bed Frame Partial Assembly



Bed Frame Partial Assembly

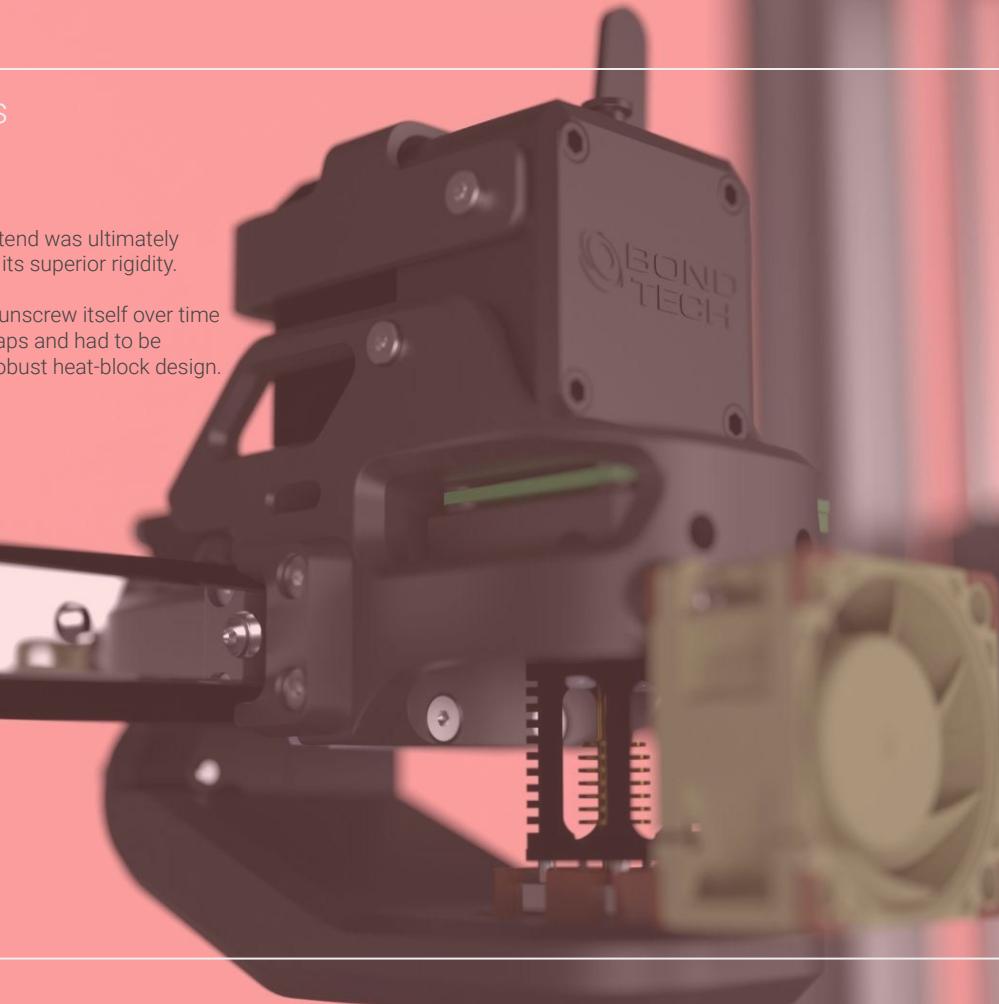
Using M6x12mm screws and M6 sliding nuts, mount the third Y bracket to the frame.



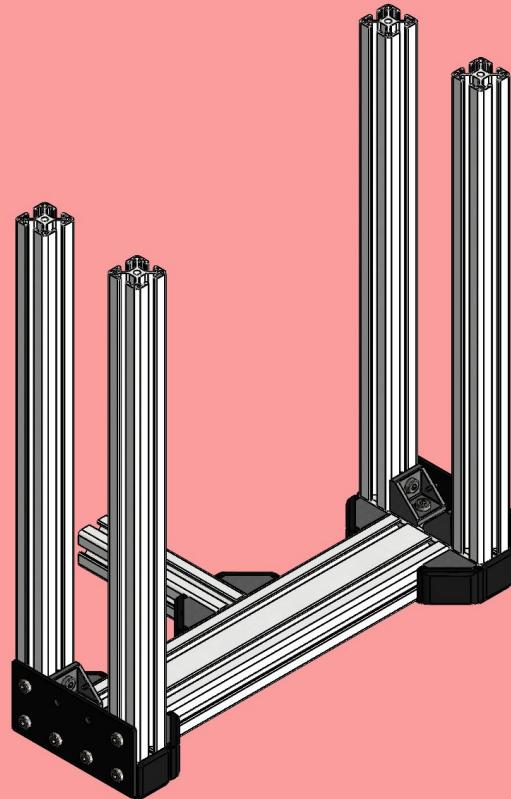
R&D Insights

Phaetus HF Dragon hotend was ultimately chosen over the V6 for its superior rigidity.

The V6's nozzle would unscrew itself over time from the bed probing taps and had to be replaced with a more robust heat-block design.



Top Frame Assembly



Top Frame Assembly

6 pcs - 12v 16A PSU



X + x pcs - M6 12mm + M6 Sliding Nuts



4 pcs - 400mm 3030-L Extrusion



2 pcs - 125mm 3030-L Extrusion



1 pcs - 305mm 3060-L Extrusion

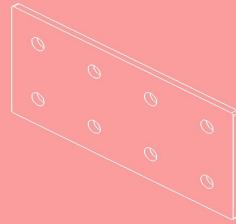


Top Frame Assembly

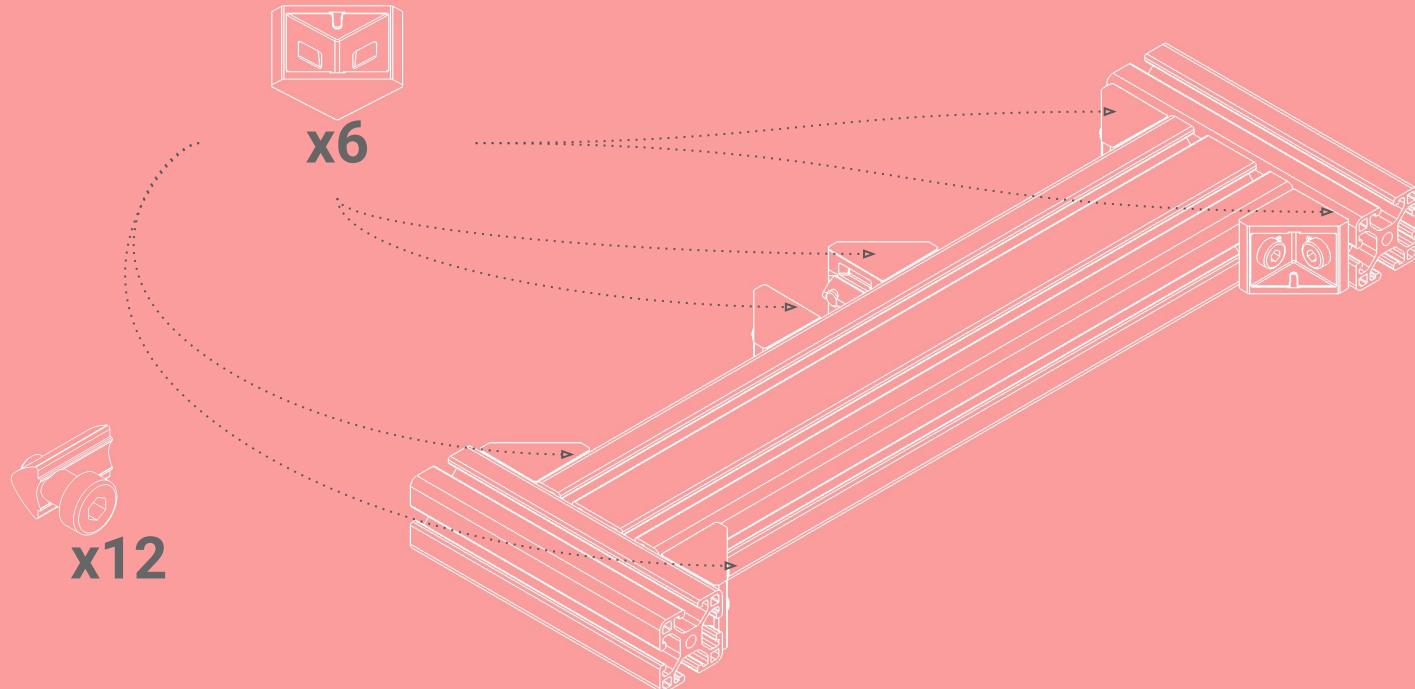
4 pcs - 3 Hole Plate



12 + 12 pcs - 8 Hole Plate

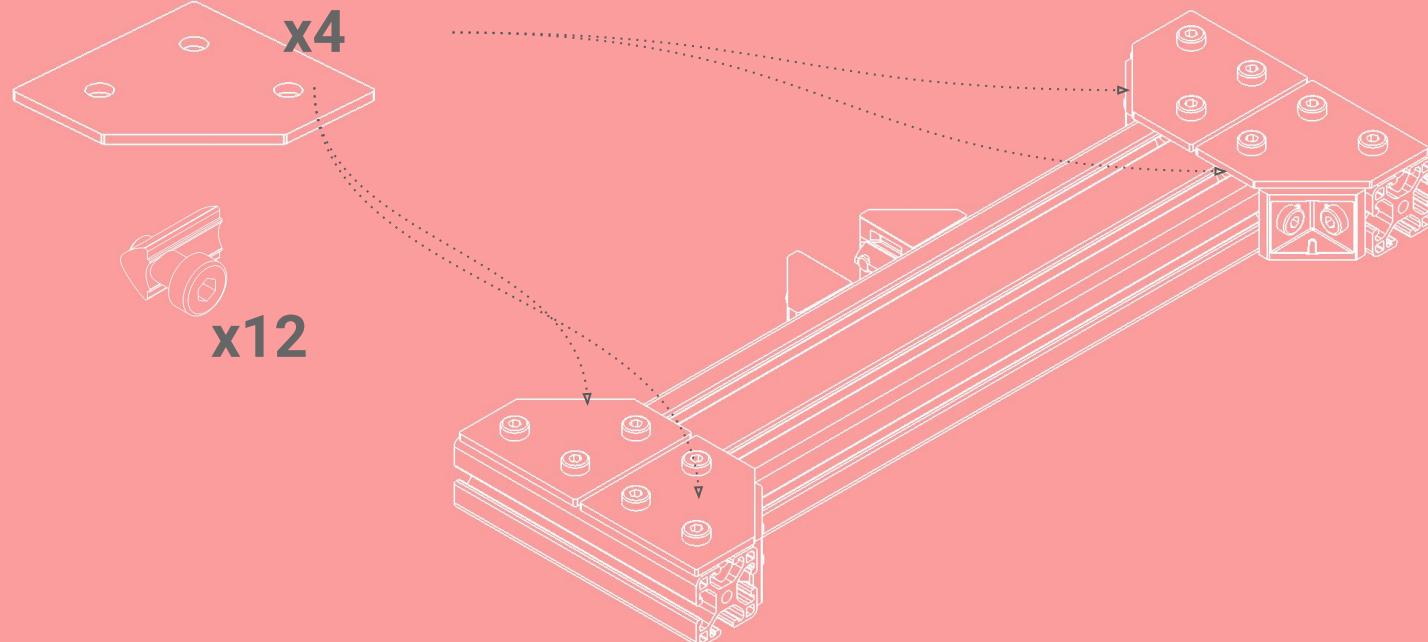


Top Frame Assembly



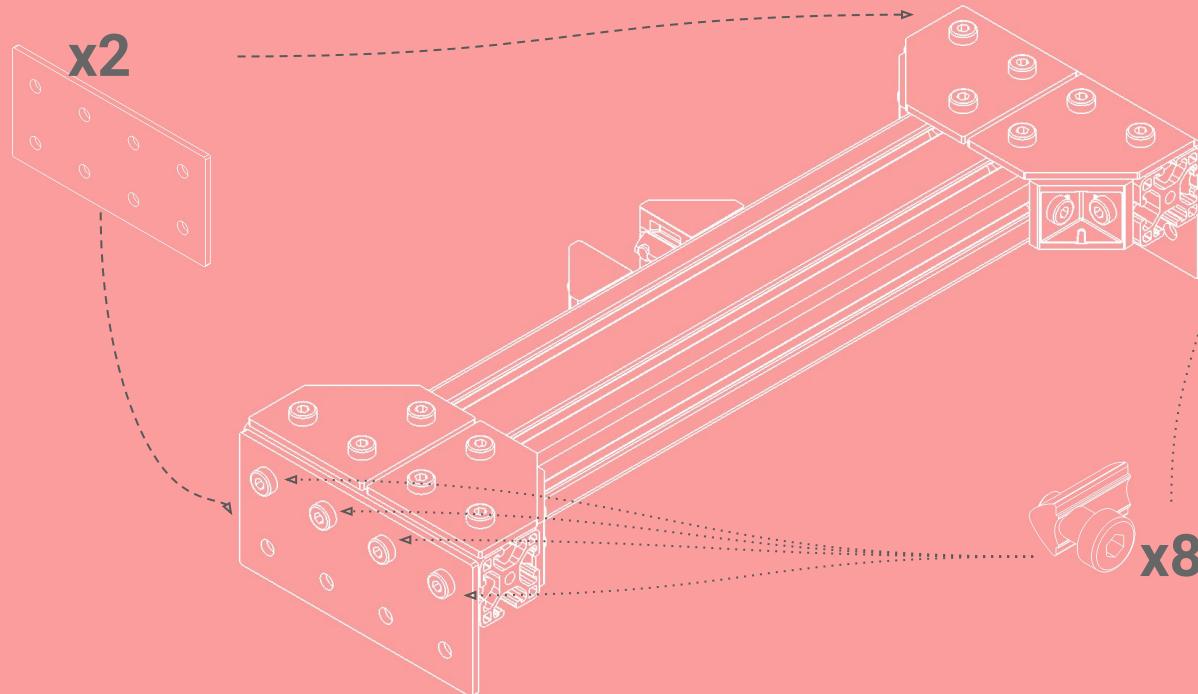
Using 3030 corner brackets and M6x12mm screws and sliding nuts, assemble the two 120mm 3030 profiles to the remaining 3060 305mm profile.

Top Frame Assembly



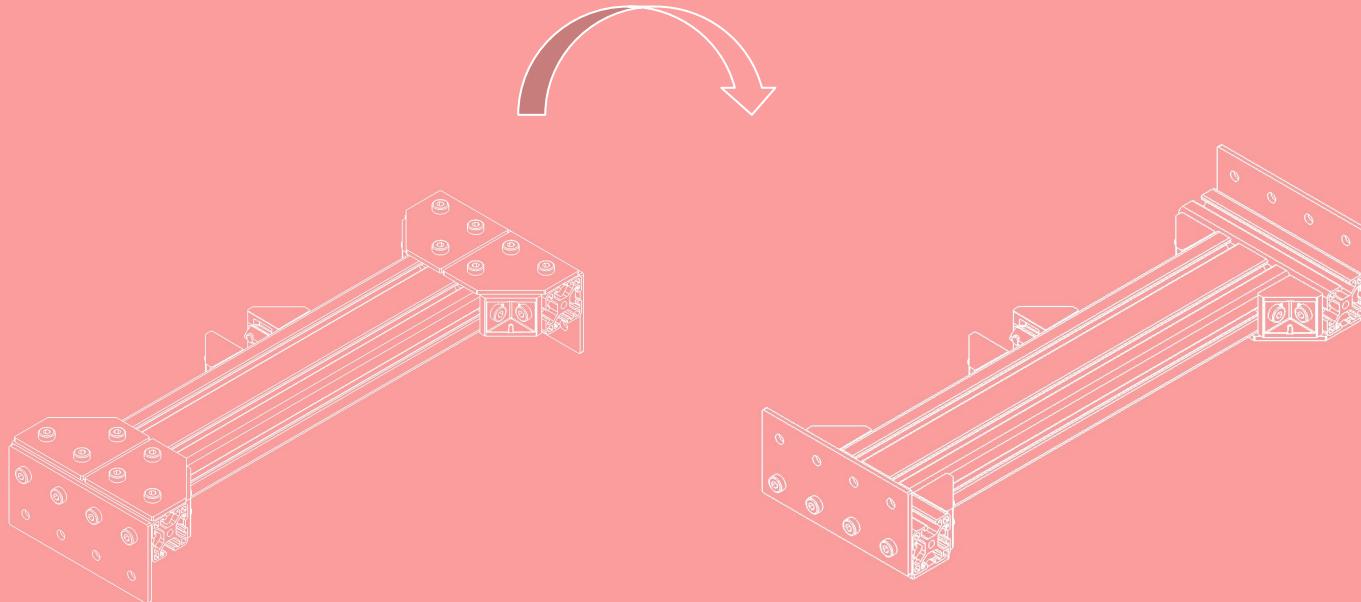
Assemble the 3-hole corner brackets using M6x12mm screws and sliding nuts, as shown above.

Top Frame Assembly



Assemble the 8-hole corner brackets using M6x12mm screws and sliding nuts, as shown above.

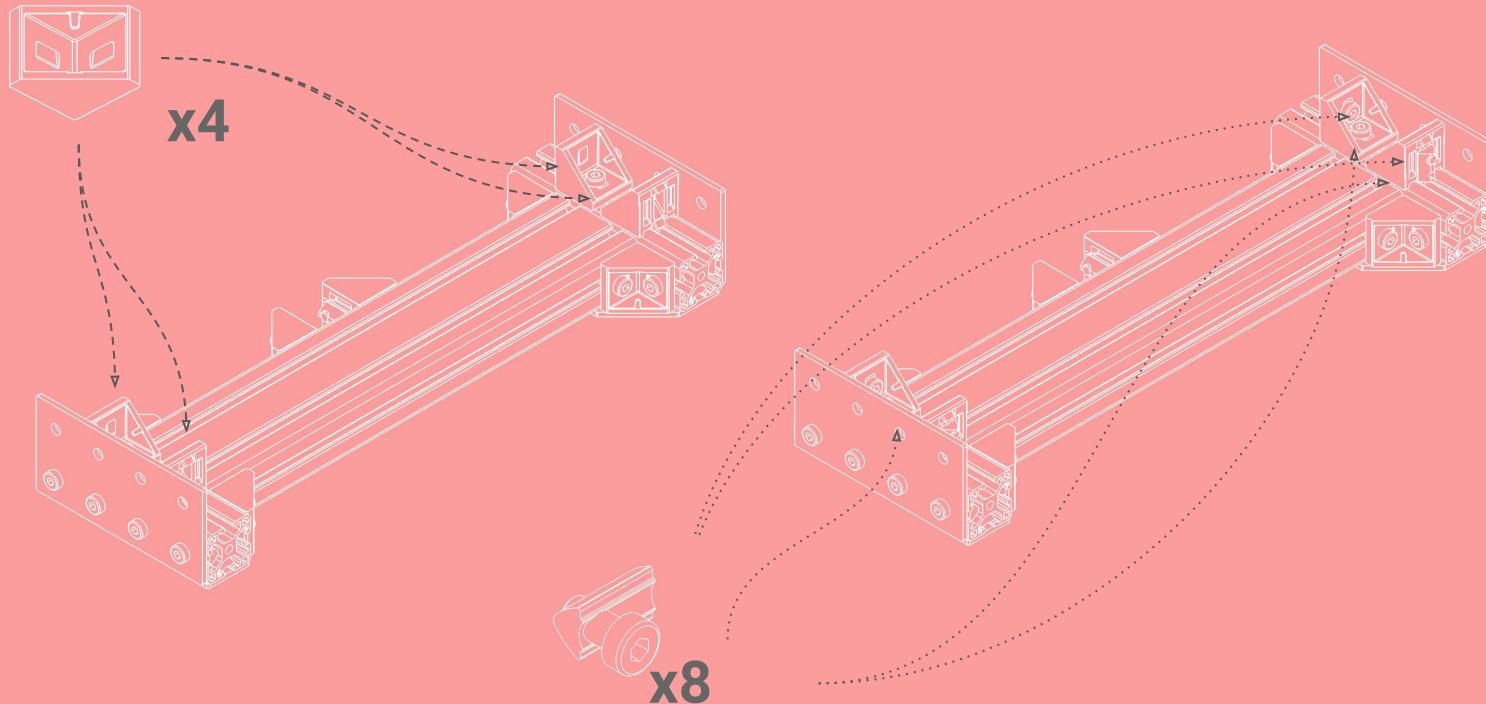
Top Frame Assembly



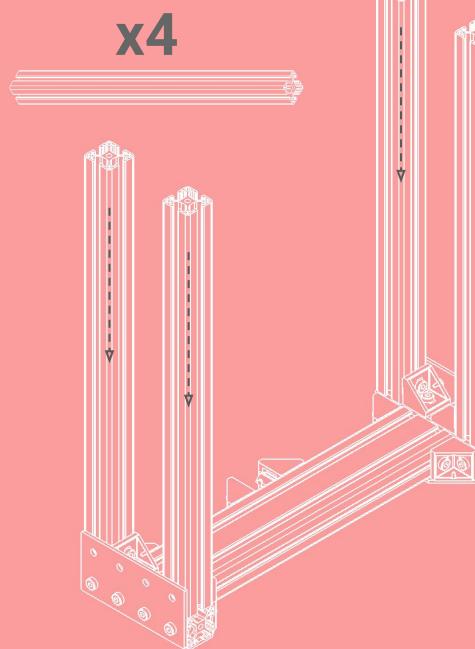
Flip the sub-assembly over

Top Frame Assembly

Assemble the 3030 corner brackets using M6x12mm screws and sliding nuts, as shown below.

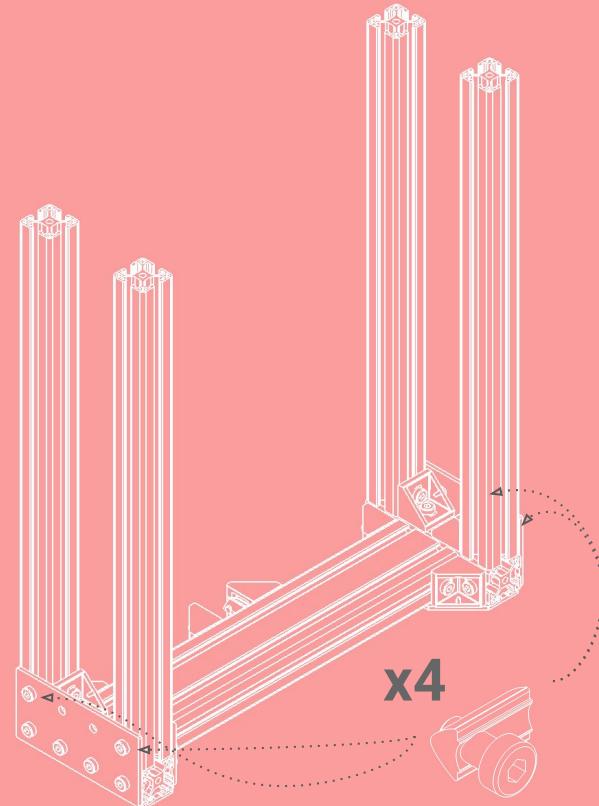


Top Frame Assembly

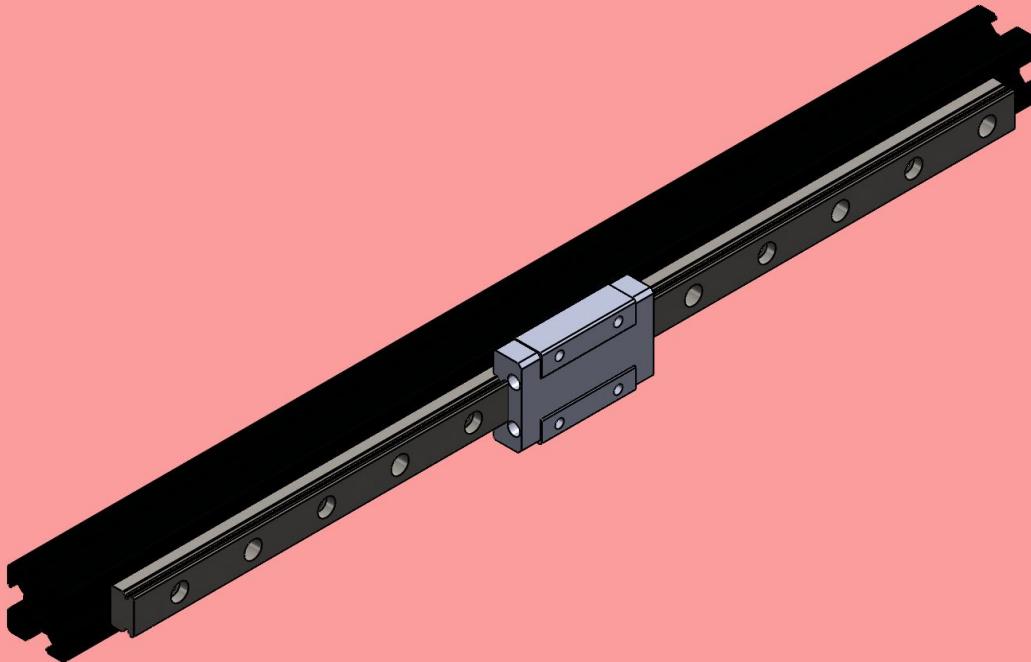


Assemble the 3030 400mm profiles and the remaining M6x12mm screws and sliding nuts.

Check that the assembly is square and true and tighten all M6 screws.



X Axis Assembly



X Axis Assembly

1 pcs - 2020-Bx315mm Extrusion Profile



6 pcs - M3x8mm



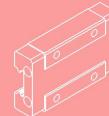
6 pcs - M3 Sliding nut



1 pcs - MGN12 Rail 300mm



1 pcs - MGN12 Linear Bearing



X Axis Assembly

Using M3x8mm screws and M3 sliding nuts, assemble the MGN12 Rail onto the 2020B profile alternating every other hole, as shown below.



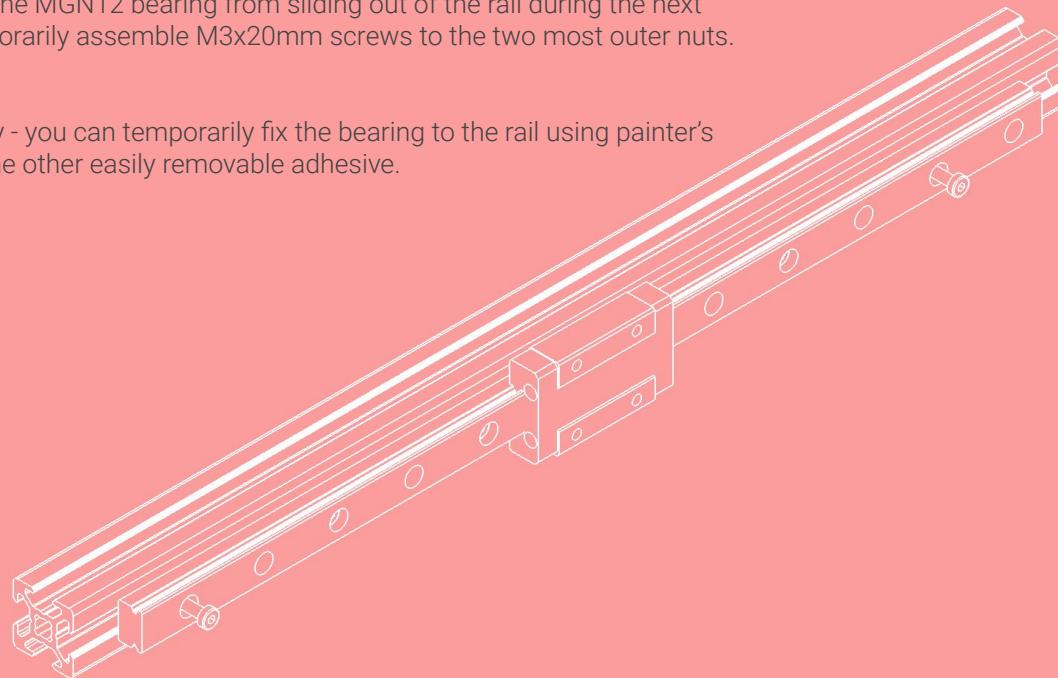
Using M3x8mm screws and M3 sliding nuts, assemble the MGN12 Rail onto the 2020B profile alternating every other hole, as shown below.



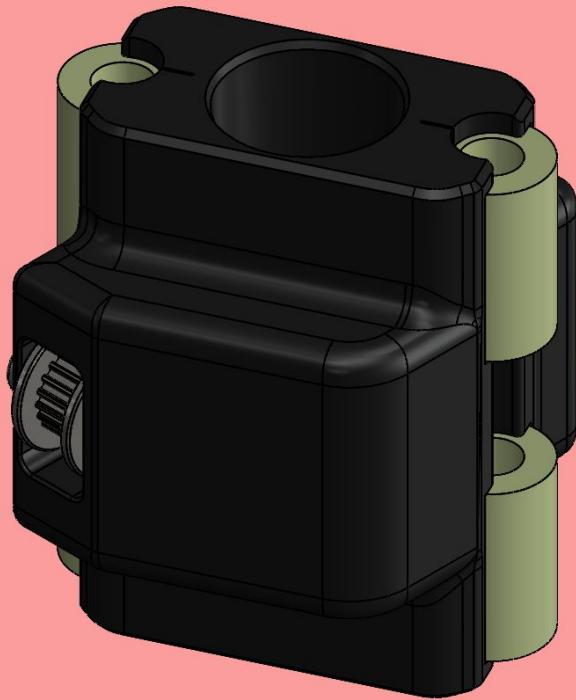
X Axis Assembly

To prevent the MGN12 bearing from sliding out of the rail during the next steps, temporarily assemble M3x20mm screws to the two most outer nuts.

Alternatively - you can temporarily fix the bearing to the rail using painter's tape or some other easily removable adhesive.



X Axis Assembly



X Axis Assembly

4 pcs - LME8UU



1 pcs - GT2 20T 6mm belt Idler



4 pcs - M3x20mm



1 pcs - M3 Sliding Nut



1 pcs - Anti-backlash POM nut 8x8



1 pcs - Frame clamp



1 pcs - M3x8mm



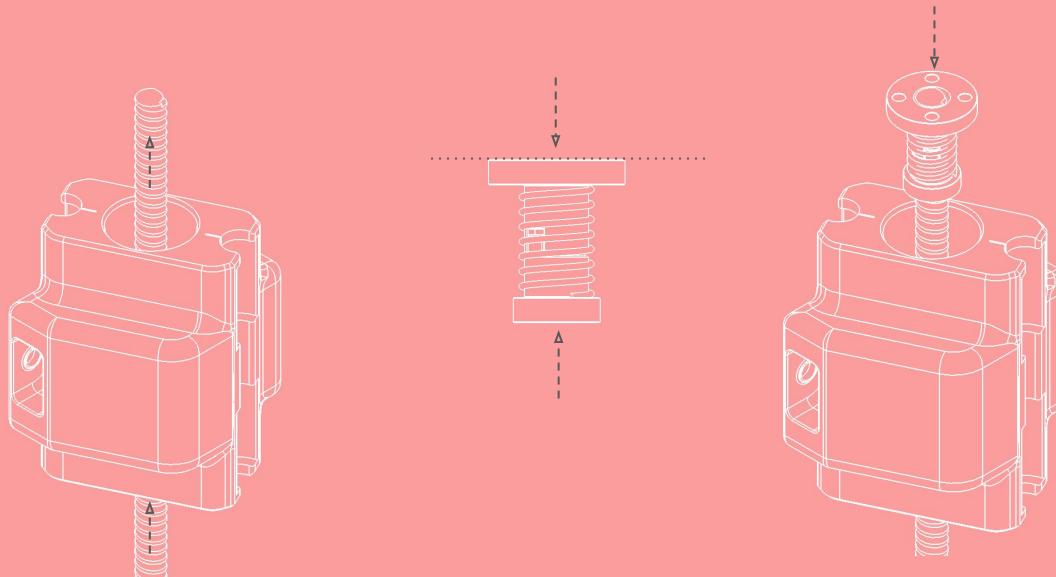
1 pcs - M5x20mm



X Axis Assembly

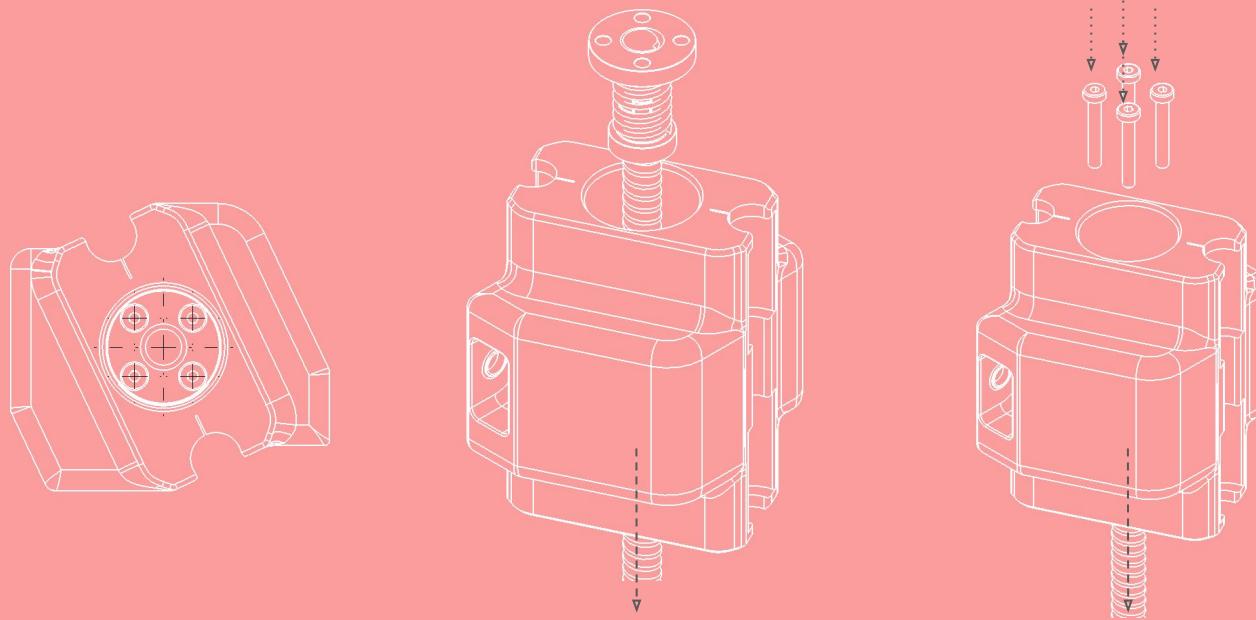
You'll need to use one of the Z motor lead-screws to assemble the anti-backlash nuts.

First, insert the Z lead-screw into the Left X Axis Bracket as shown below. Then, with the anti-backlash nut fully preloaded and engaged, screw it onto the leadscrew just enough so that top faces of the nut and the leadscrew are sitting flush.



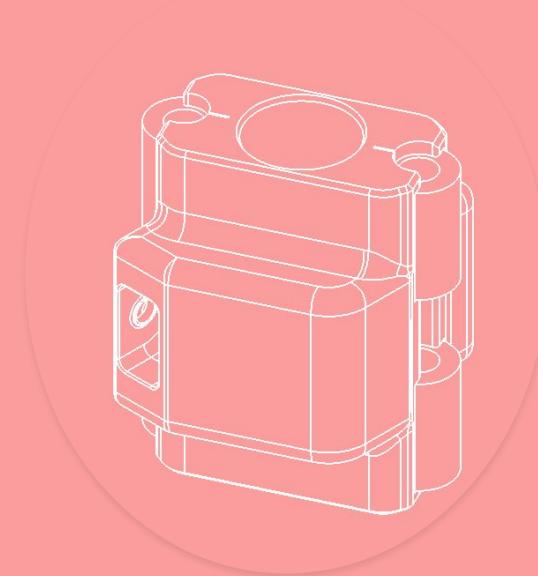
X Axis Assembly

Align the holes of the anti-backlash nut with the holes of the bracket and pull down on the lead-screw until the nut is fully inserted into the bracket. Then fasten the anti-backlash nut using M3x20mm screws.



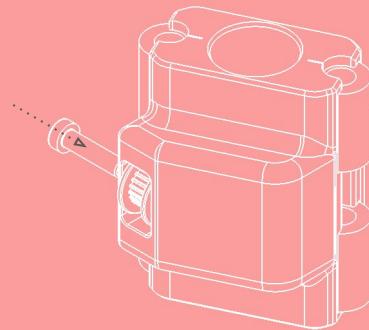
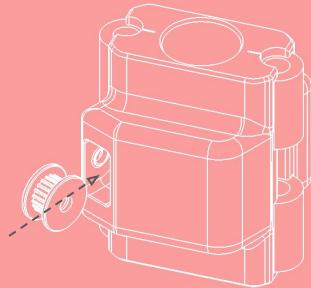
X Axis Assembly

Assemble the four LME8UU Bearings to the Left X Axis Bracket. Make sure to insert the bearings fully.

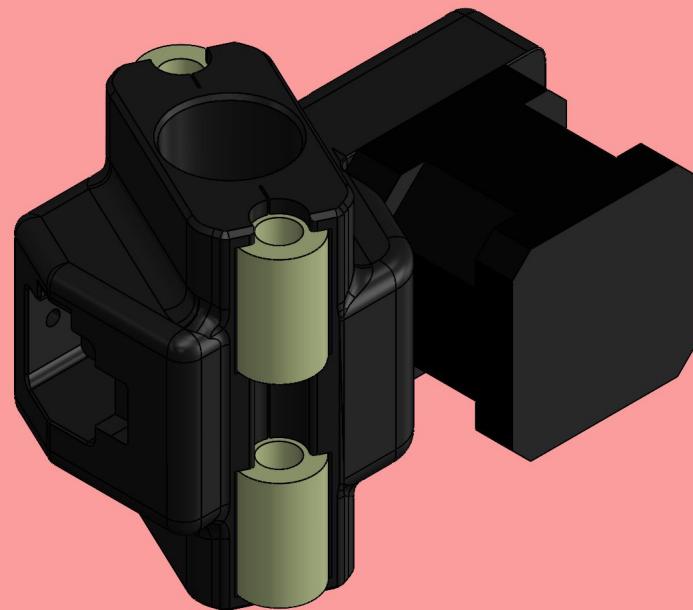


X Axis Assembly

Align the GT2x20T idler with the M5x20mm screw as shown below and fasten the screw directly into the Left X Carriage. Make sure to not overtighten the screw and that the Idler spins freely once assembled.



X Axis Assembly



X Axis Assembly

4 pcs - LME8UU



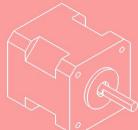
8 pcs - M3x20mm



1 pcs - M3x8mm



1 pcs - Nema 17 X Motor



1 pcs - Anti-backlash POM nut 8x8



2 pcs - Frame clamp

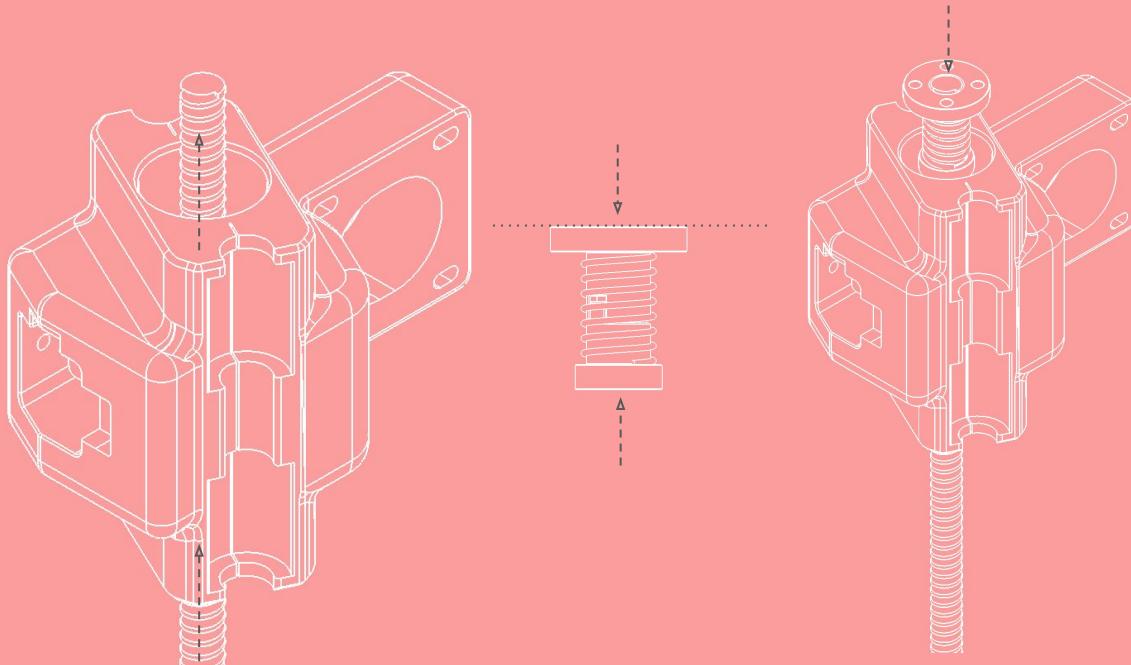


1 pcs - M3 Sliding Nut



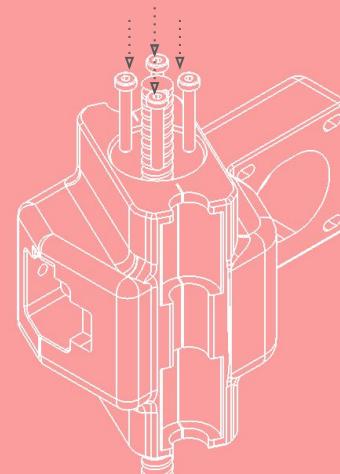
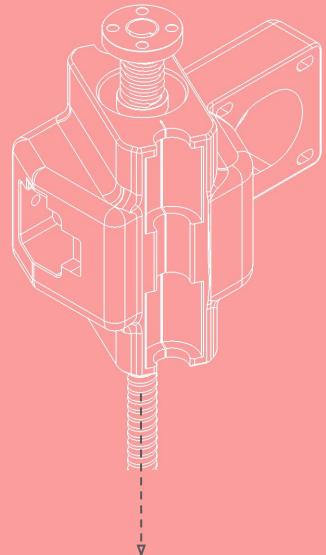
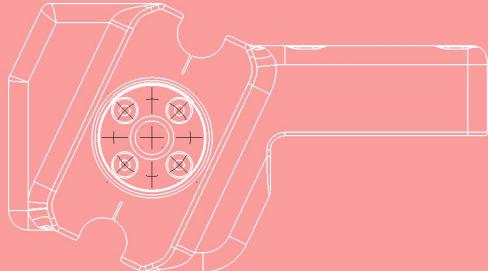
X Axis Assembly

First, insert the Z lead-screw into the Right X Axis Bracket as shown below. Then, with the anti-backlash nut fully preloaded and engaged, screw it onto the leadscrew just enough so that top faces of the nut and the leadscrew are sitting flush.



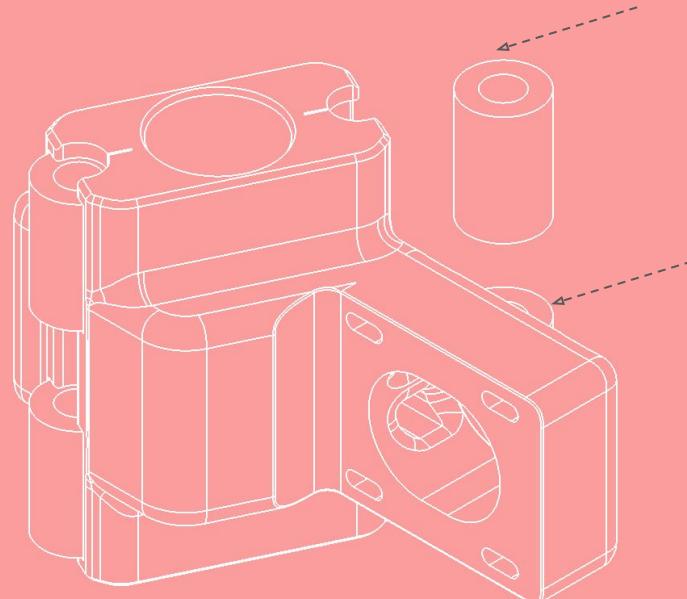
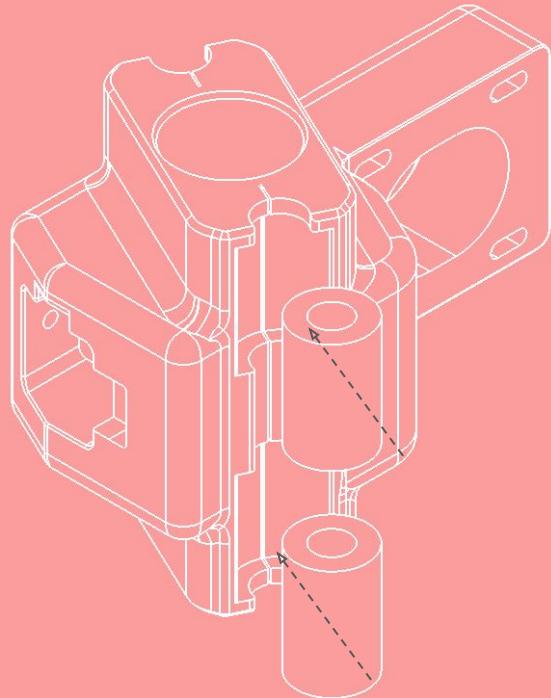
X Axis Assembly

Align the holes of the anti-backlash nut with the holes of the bracket and pull down on the lead-screw until the nut is fully inserted into the bracket. Then fasten the anti-backlash nut using M3x20mm screws.



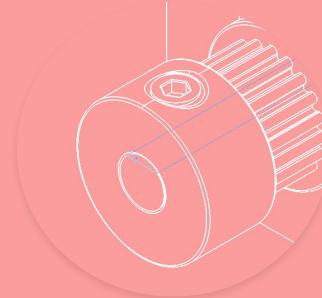
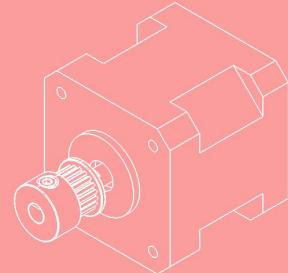
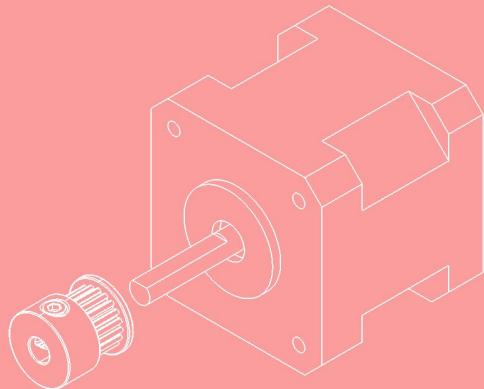
X Axis Assembly

Assemble the four LME8UU Bearings to the Right X Axis Bracket. Make sure to insert the bearings fully.



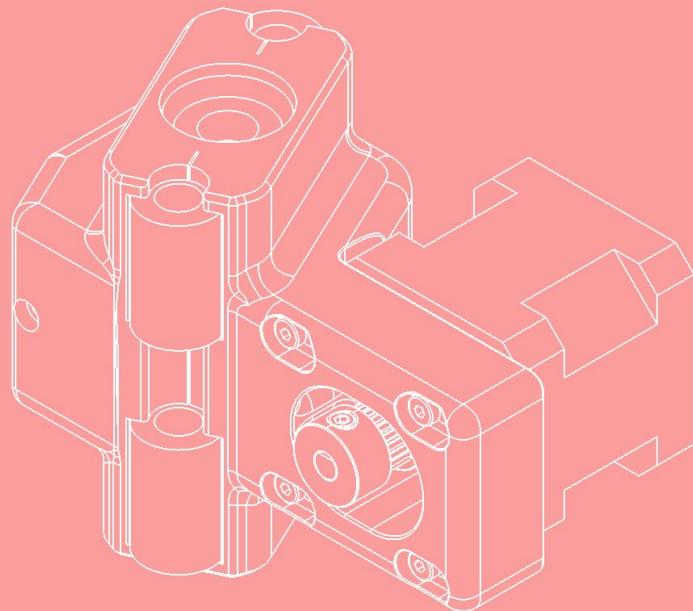
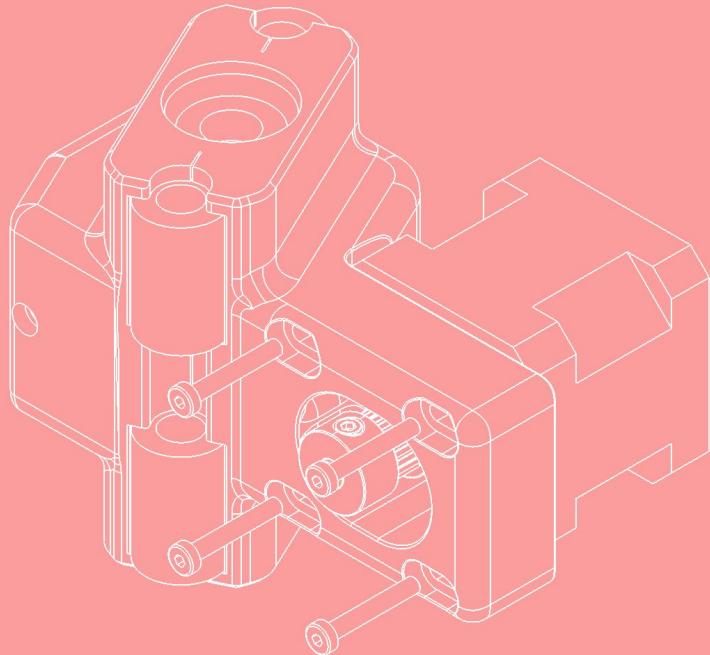
X Axis Assembly

Align the GT2 20T pulley to the Y motor so that the motor's shaft end is flush with the Pulley and tighten the two grub screws, starting with the screw that points to the flat part of the motor shaft.



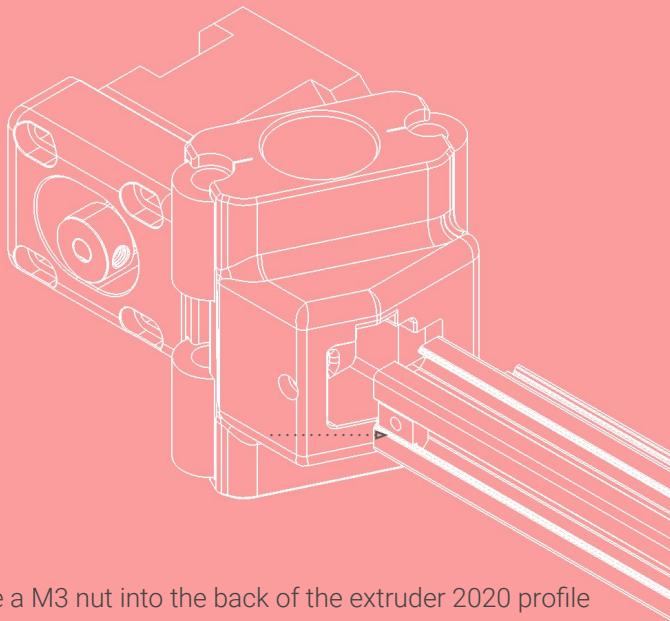
X Axis Assembly

Assemble the X motor to the Right X Axis Bracket using M3x20mm screws.

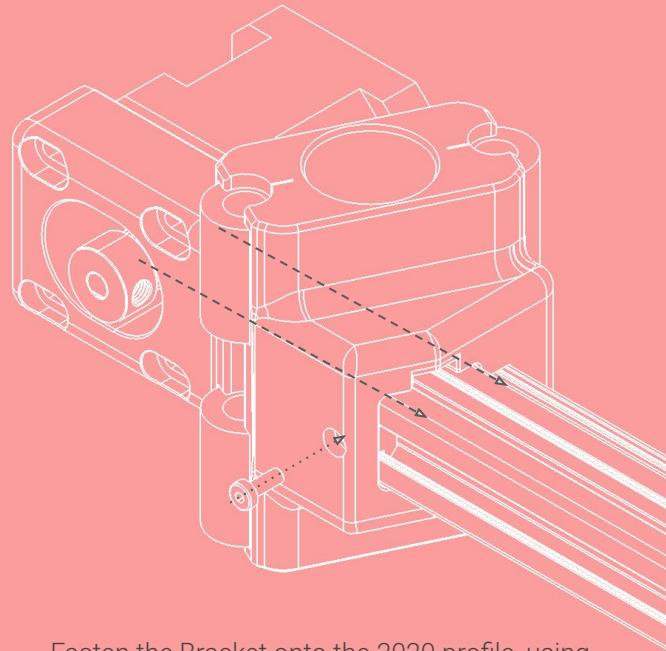


X Axis Assembly

Slide the Right X Axis Bracket onto the 2020 profile.

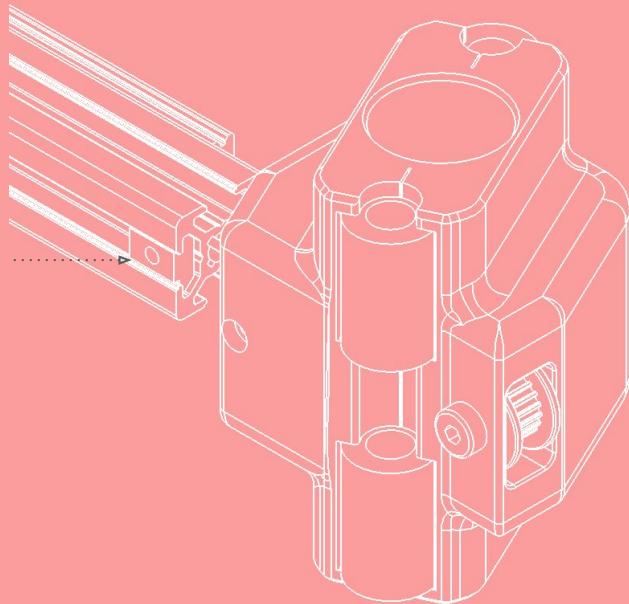


Slide a M3 nut into the back of the extruder 2020 profile

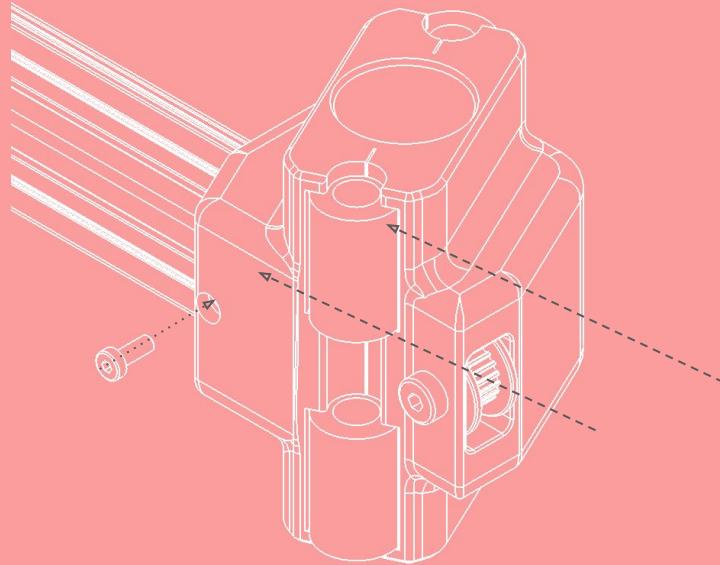


Fasten the Bracket onto the 2020 profile, using
M3x8mm screw. Do no tighten yet!

X Axis Assembly



Slide the Left X Axis Bracket onto the 2020 profile.



Slide a M3 nut into the back of the extruder 2020 profile

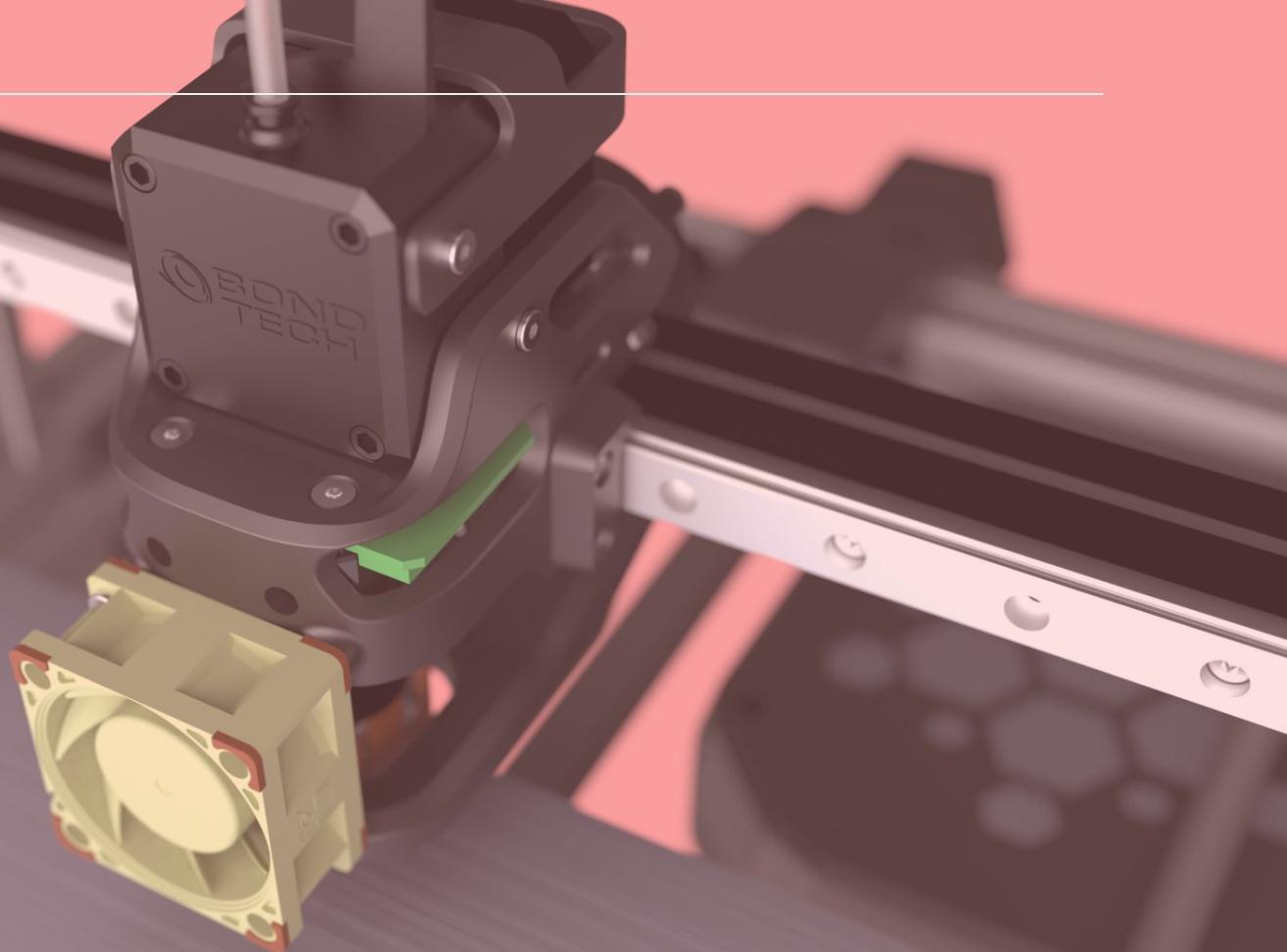
Fasten the Bracket onto the 2020 profile, using M3x8mm screw.
Do no tighten yet!

X Axis Assembly

Push in on the brackets from both sides to make sure the extruder rail is inserted fully and proceed to tighten the two M3x8mm screws from the previous two steps.

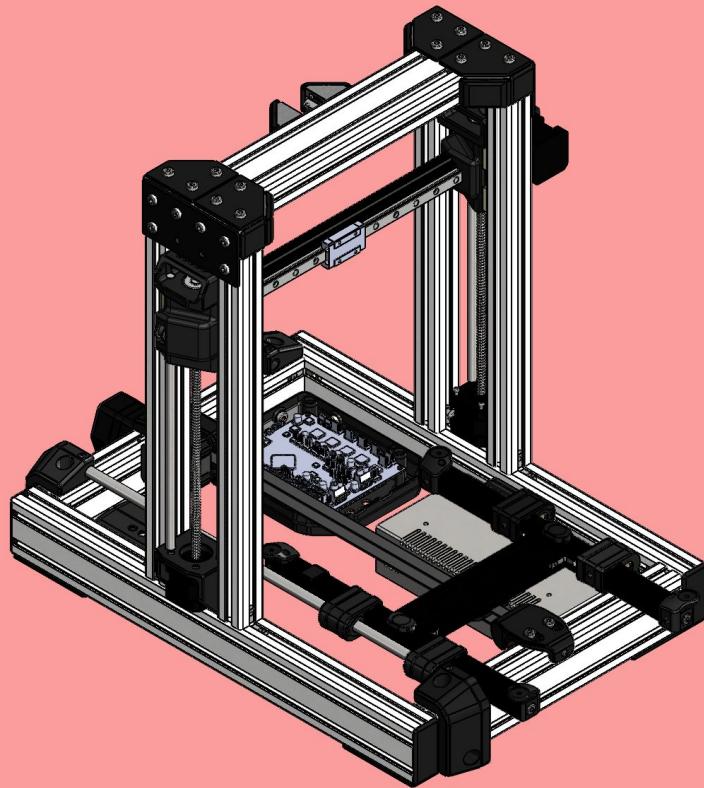


R&D Insights



Using the nozzle as a sensor allows for 0.05mm repeatable probing across the bed, so that the first layer always comes out perfect!

Z Axis Assembly



Z Axis Assembly

2 pcs - Z Top Brackets



8 + 8 pcs - M6 12mm + M6 Sliding Nuts



2 pcs - 608 Bearing



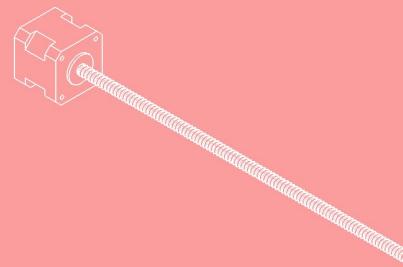
2 pcs - 8x300mm Smooth Rod



8pcs - M3x8mm



2pcs - Nema17w_integrated 8x8 leadscrew



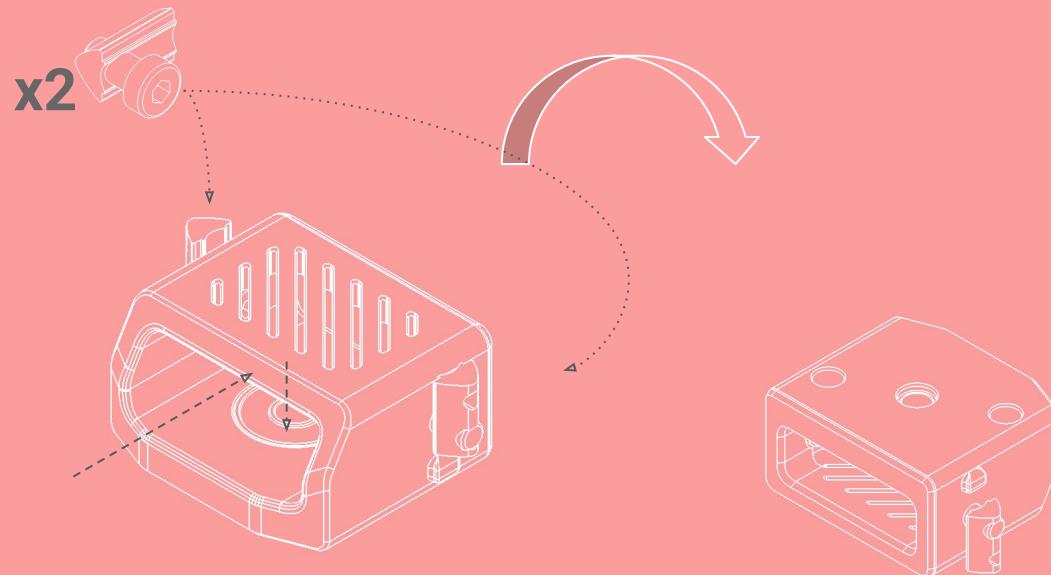
2 pcs - Z Bottom Brackets



Z Axis Assembly

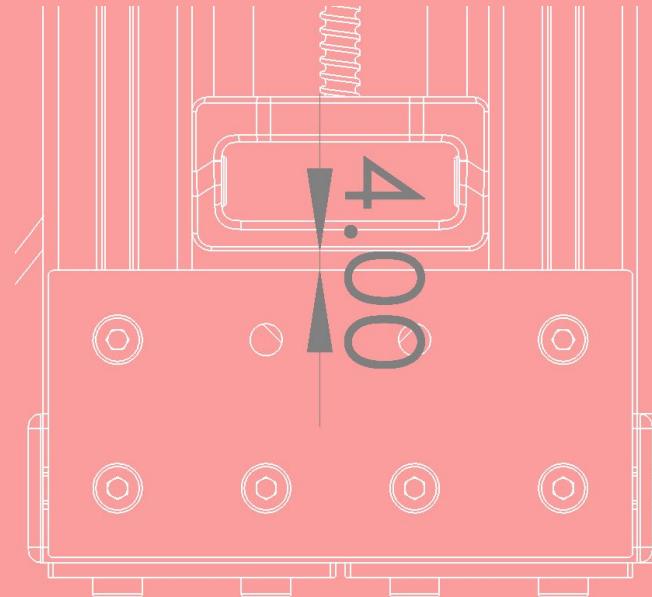
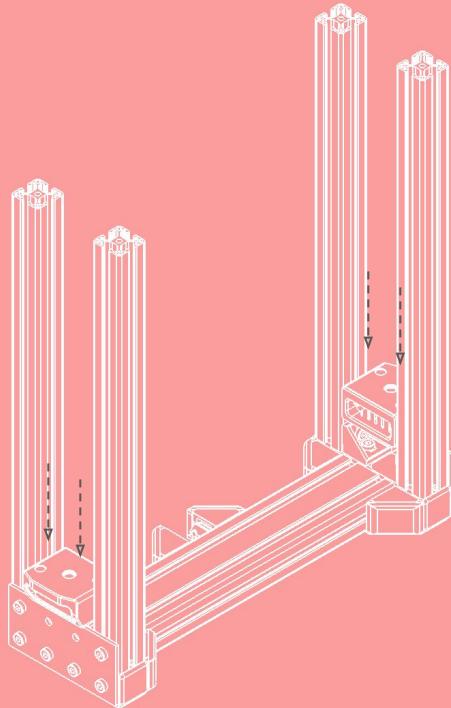
Preassemble the M6x12mm screws with sliding nuts and Insert the 608 bearing into the slot of the top Z bracket.

Repeat for the second Z bracket and turn the parts over.



Z Axis Assembly

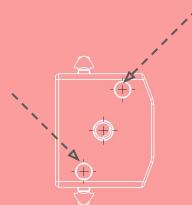
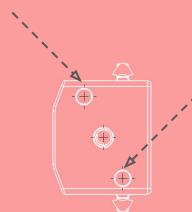
Slide the two Z Top Brackets down the 400mm profiles as shown below, leaving a ~4mm gap from the 8 Hole Plate and tighten the M6 screws, fixing the Z Top Brackets in place .



Z Axis Assembly

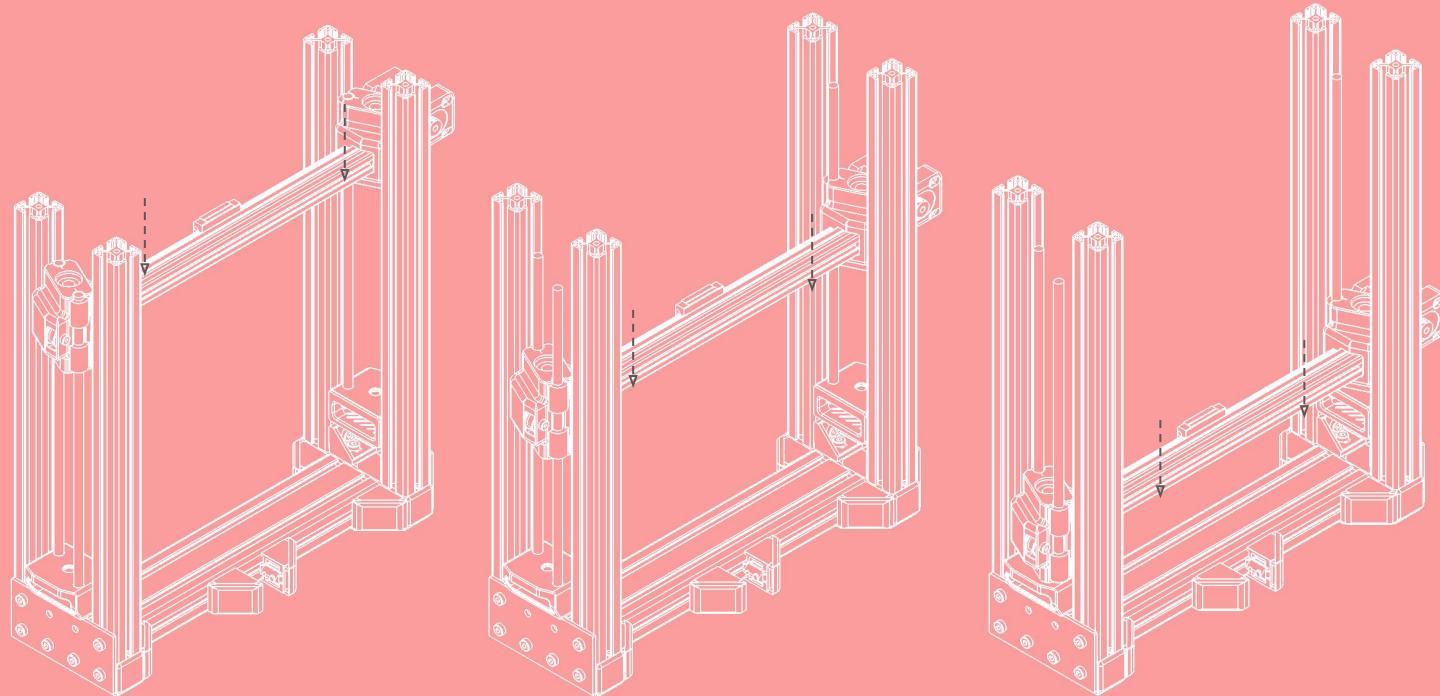


Slide the four 8x300mm rods fully into the Z Top Bracket.



Z Axis Assembly

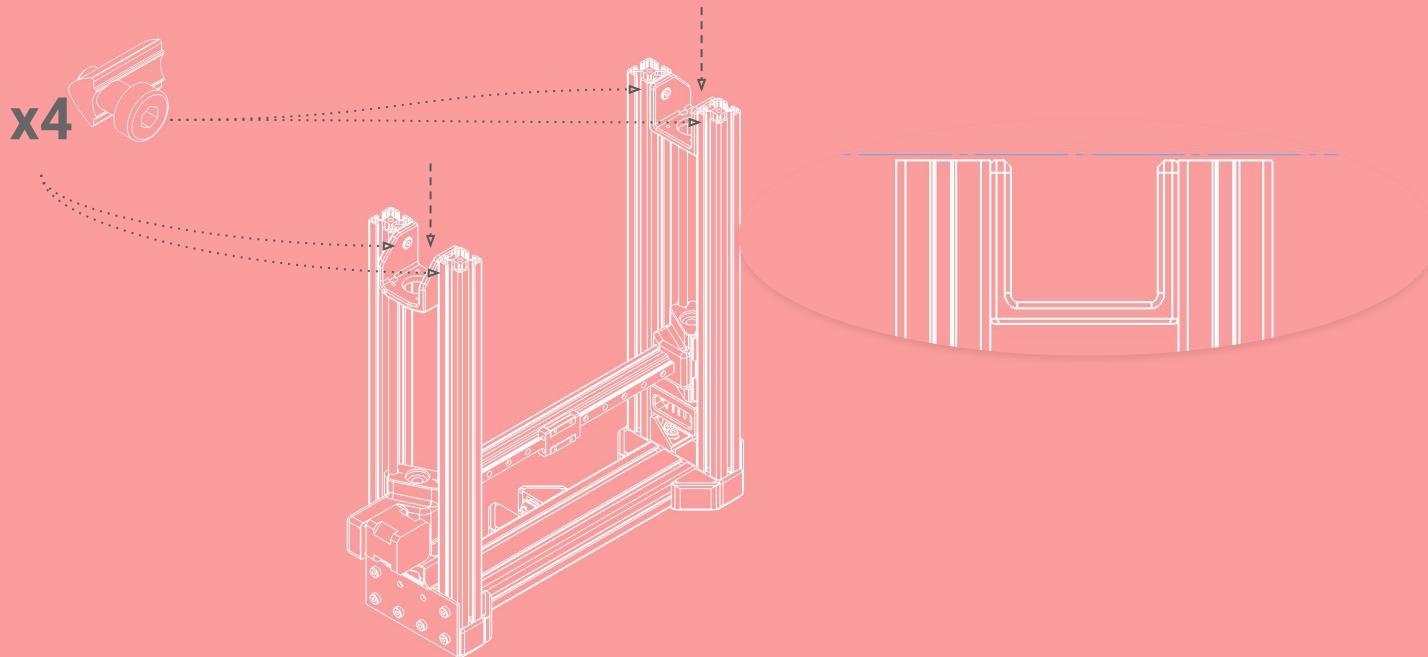
Align the X Axis Assembly with the 8mm rods and slide it all the way down until the X brackets are resting on the Z top brackets on both sides, as shown below. Note the orientation of the linear bearing.



Z Axis Assembly

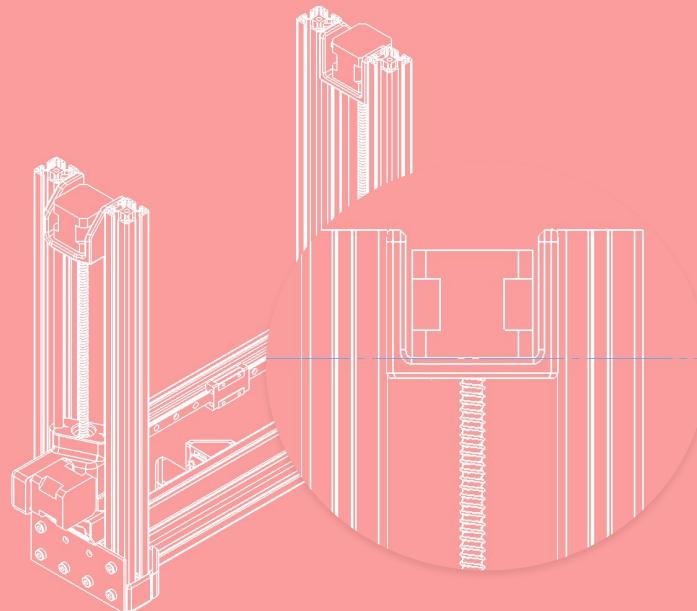
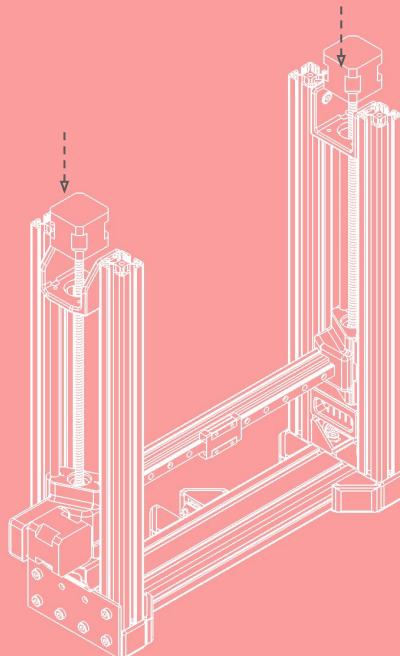
Assemble the Bottom Z Brackets to the top frame using M6x12mm screws and M6 sliding nuts.

Make sure that the Bottom Z brackets do not protrude out from the frame.



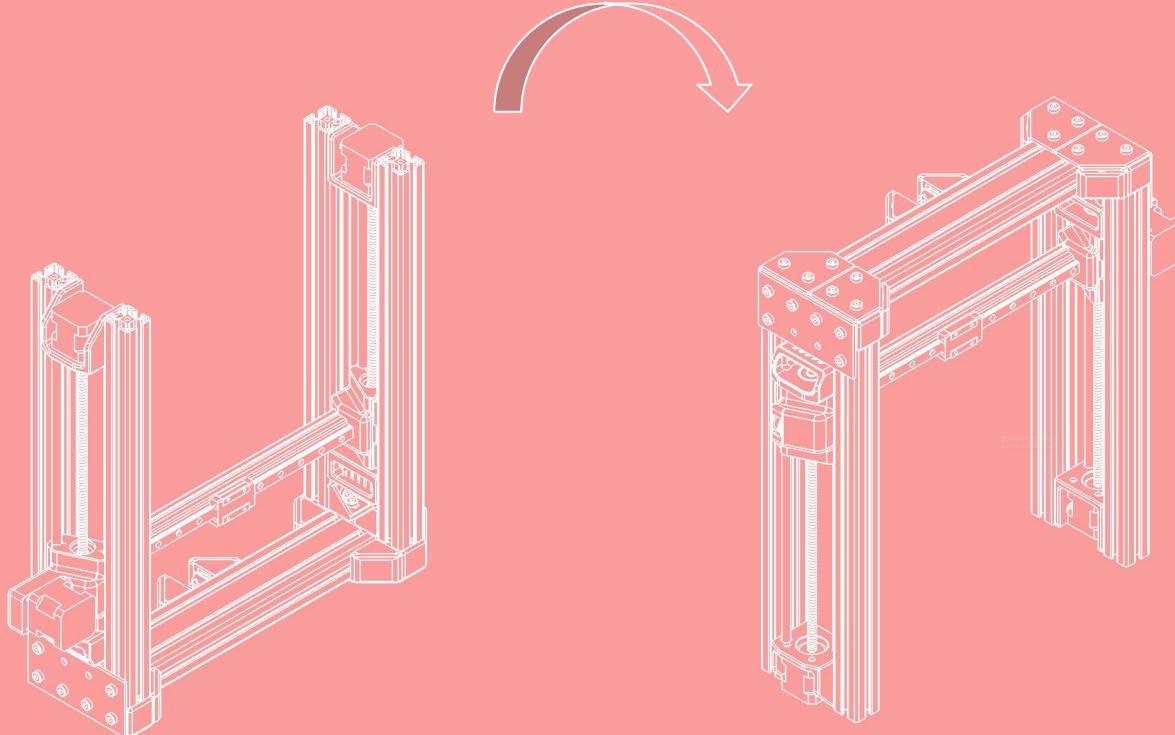
Z Axis Assembly

Slide down the Z motors until the lead-screws are resting against the POM nuts, and then manually rotate the lead-screws by hand until the motors sit flush with the Bottom Z Brackets, as shown below.



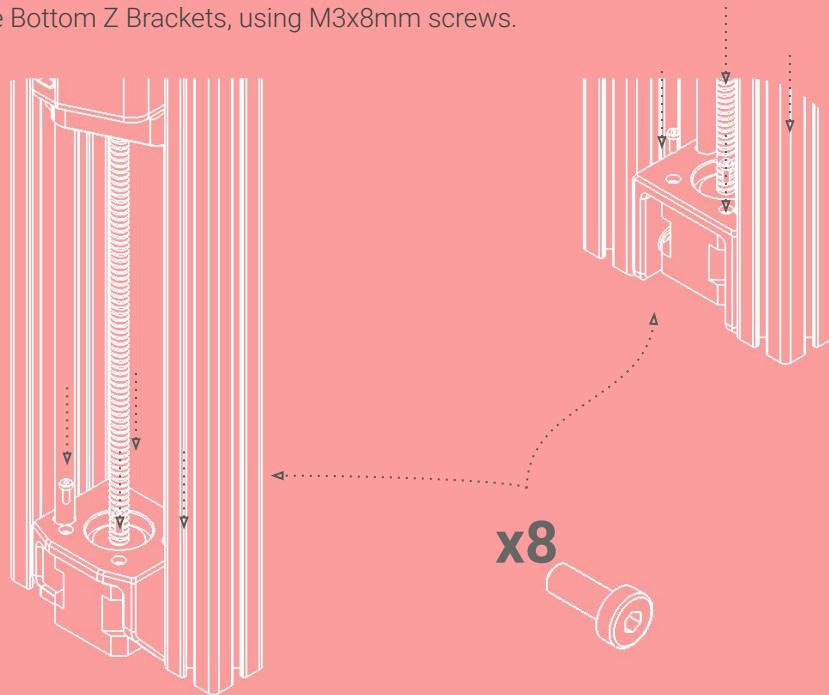
Z Axis Assembly

Flip the sub-assembly over.

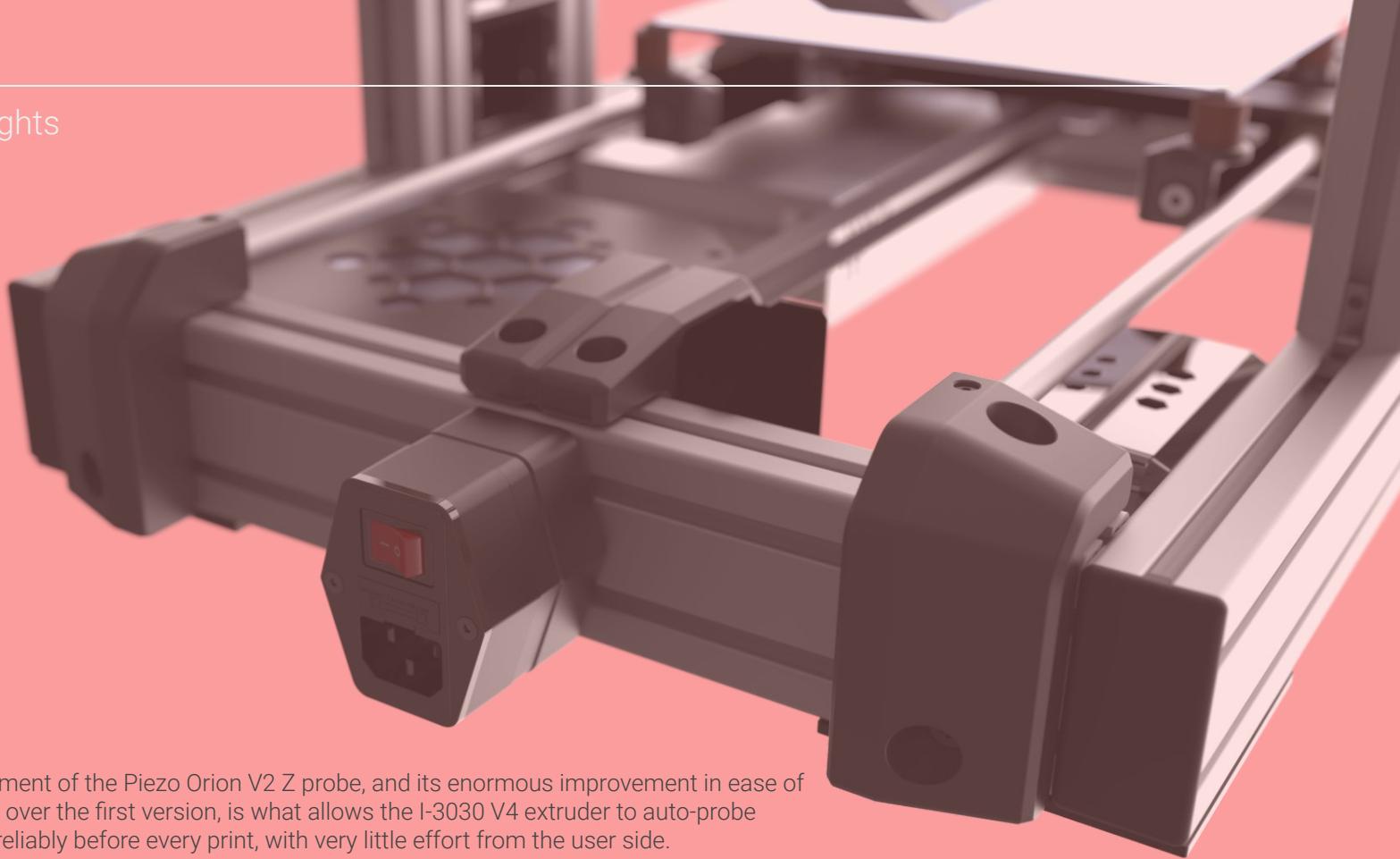


Z Axis Assembly

Fasten the Z motors to the Bottom Z Brackets, using M3x8mm screws.

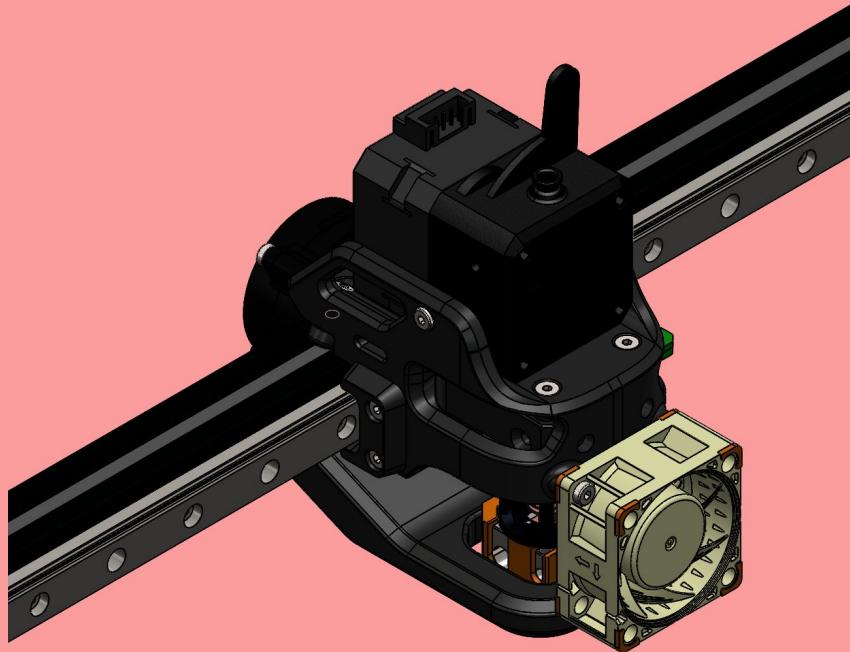


R&D Insights



The development of the Piezo Orion V2 Z probe, and its enormous improvement in ease of Z calibration over the first version, is what allows the I-3030 V4 extruder to auto-probe quickly and reliably before every print, with very little effort from the user side.

Extruder Assembly



Extruder Assembly

1 pcs - V4 Extruder Carriage



1 pcs - Phaetus Dragon HF Hotend



1 pcs - Piezo Orion V2 PCB



1 pcs - Piezo Orion Groove Mount



1 pcs - 4020 Axial Fan



1 pcs - 4020 Radial Fan



Extruder Assembly

4 pcs - M3x10mm Countersunk



3 pcs - M3x20mm



4 pcs - M3x20mm Countersunk



4 pcs - M3x10mm



1 pcs - M3x6mm



2 pcs - M3x8mm



Extruder Assembly

4 pcs - M3x10mm Countersunk

3 pcs - M3x20mm

4 pcs - M3x20mm Countersunk

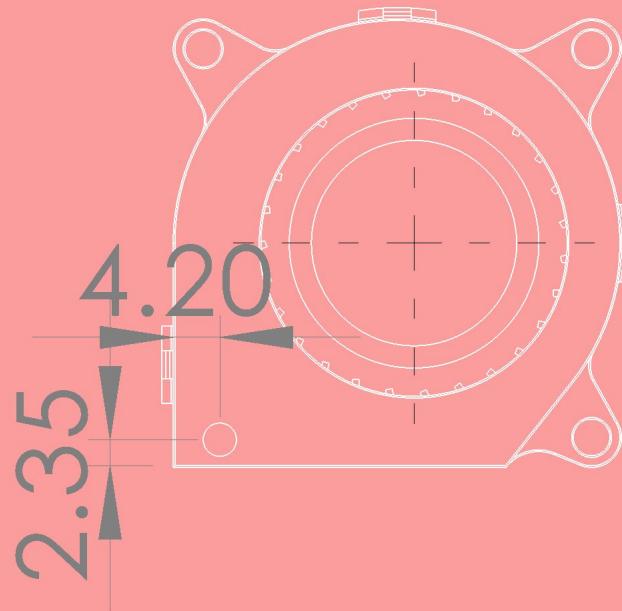
2 pcs - M3x10mm

1 pcs - M3x6mm

2 pcs - M3x8mm

Extruder Assembly

Drill a 3mm hole in the 4020 front fan casing at the indicated location.



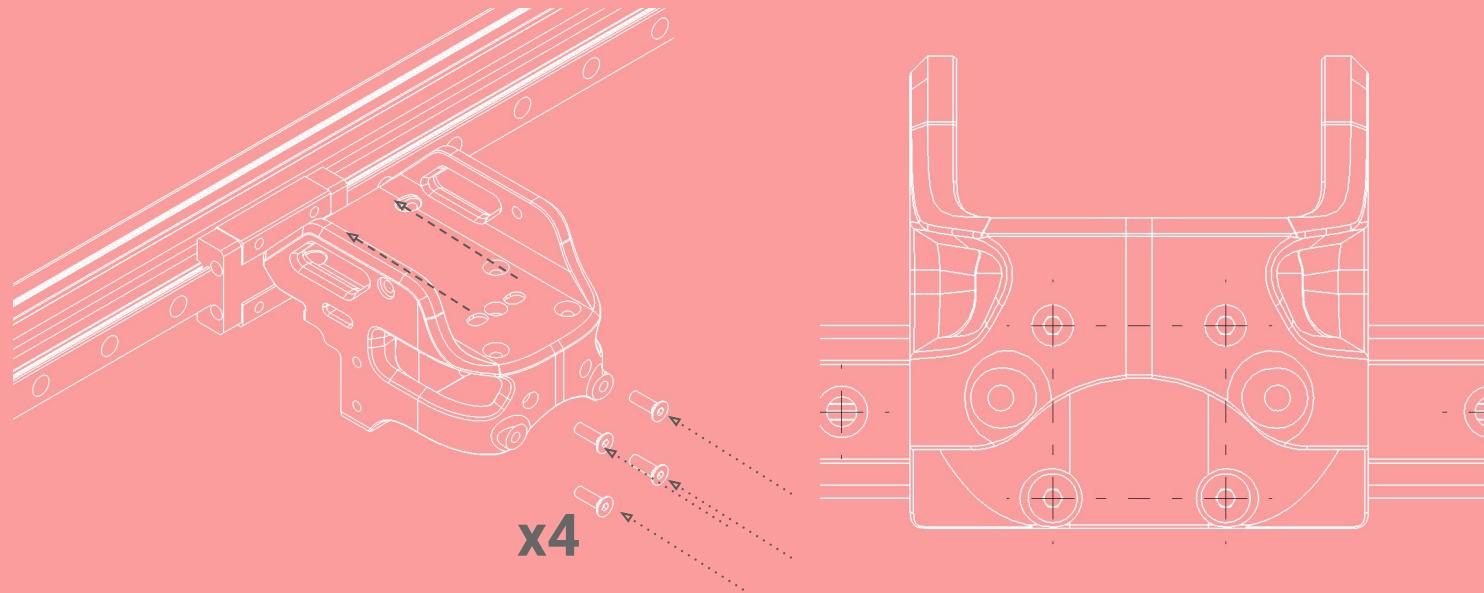
Extruder Assembly

Slide the fan onto the fan shroud and fasten the two together using M3x6mm and M3x20mm screws.



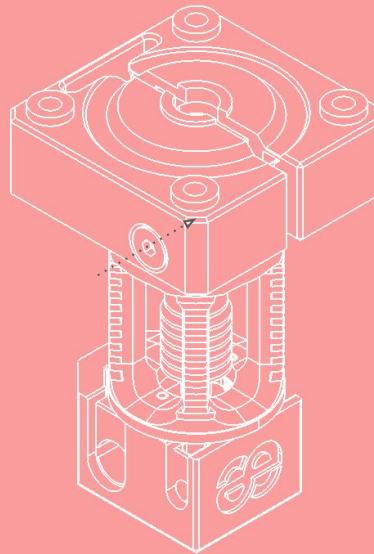
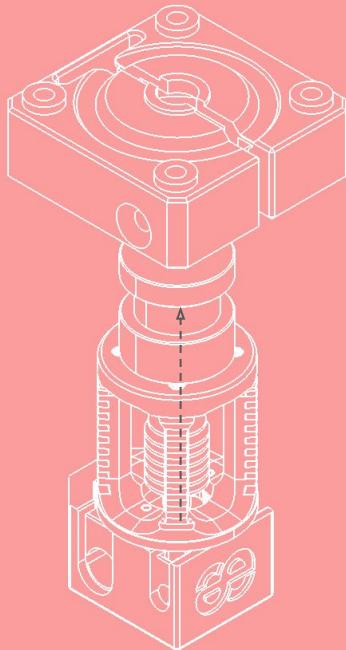
Extruder Assembly

Assemble the Extruder Carriage to the MGN12 Linear Bearing using M3x10mm countersunk screws.



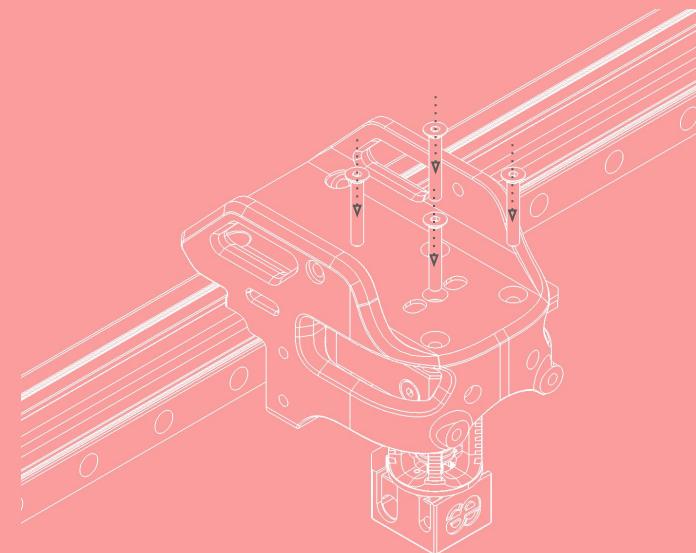
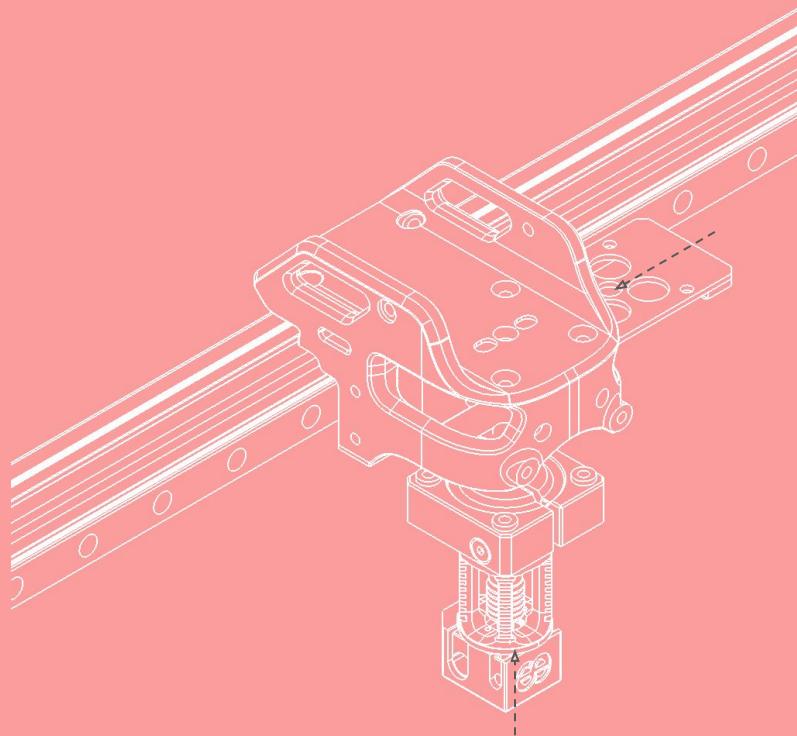
Extruder Assembly

Assemble the Piezo Groove Mount to the Dragon hotend and tighten the M3 countersunk screw to fully lock the hotend in place.



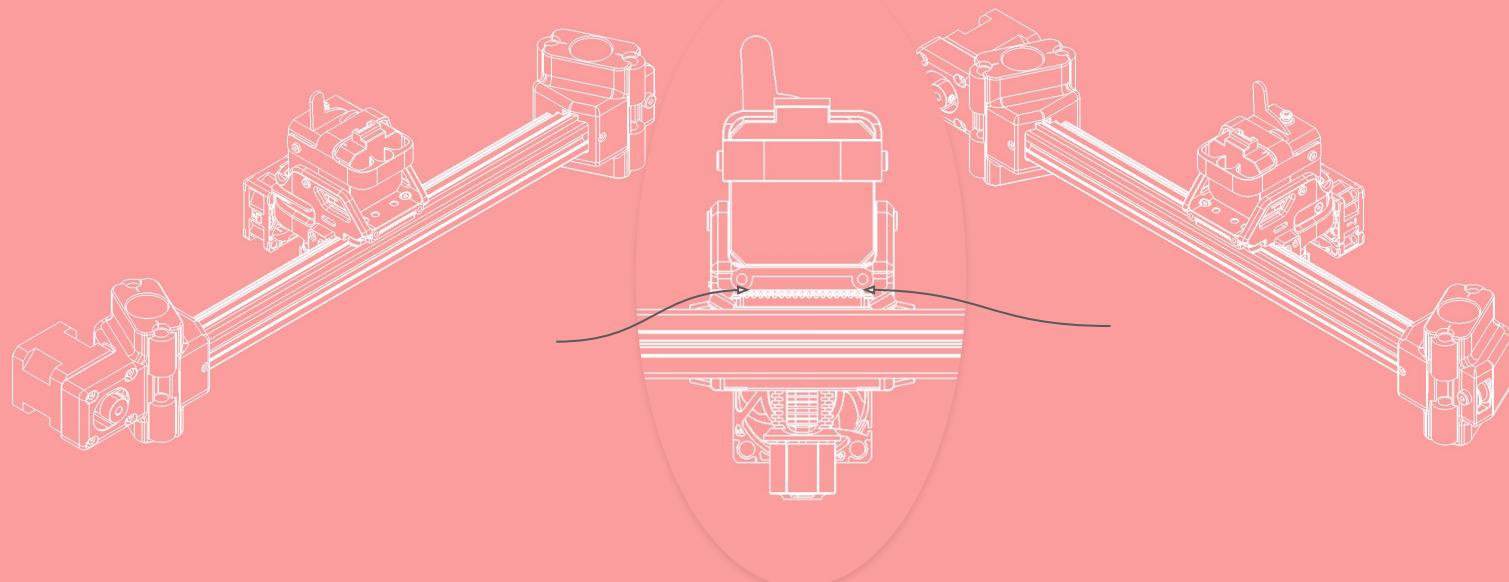
Extruder Assembly

Assemble the piezo Orion PCB and the Hotend assembly to the Extruder carriage, using M3x20mm countersunk screws.



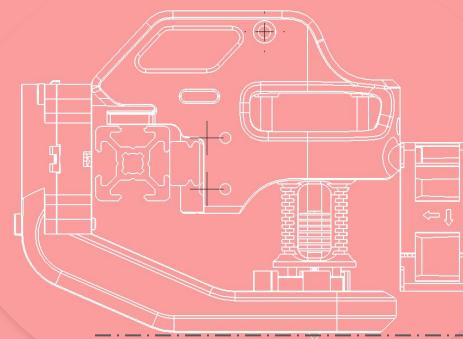
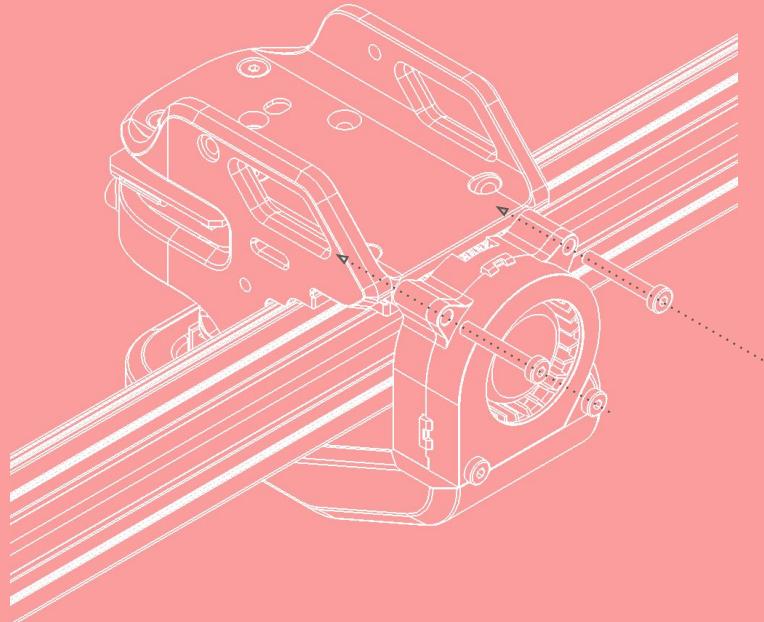
Extruder Assembly

Measure and cut a 900mm(90cm) piece of GT2x6mm timing belt and route it through both the X motor bracket and the X pulley, locking the ends on the extruder carriage, by sliding the belt into the carriage sideways and thus engaging it. Make sure to center the belt with the 2020 profile.



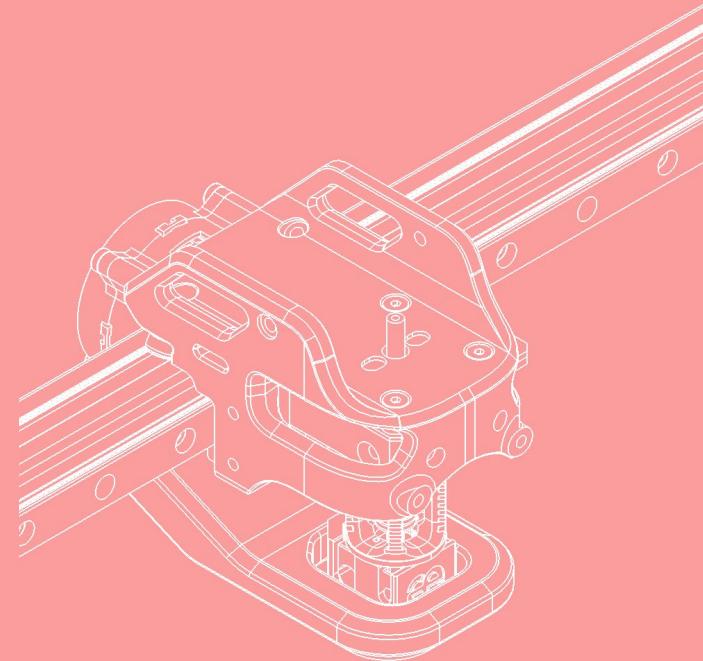
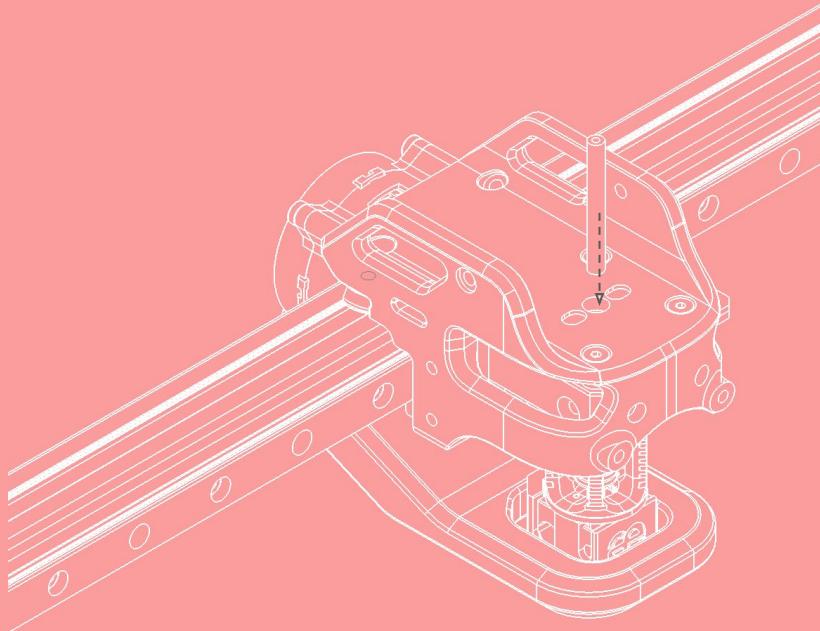
Extruder Assembly

Assemble the Blower Fan assembly to the extruder carriage, using M3x20mm screws.



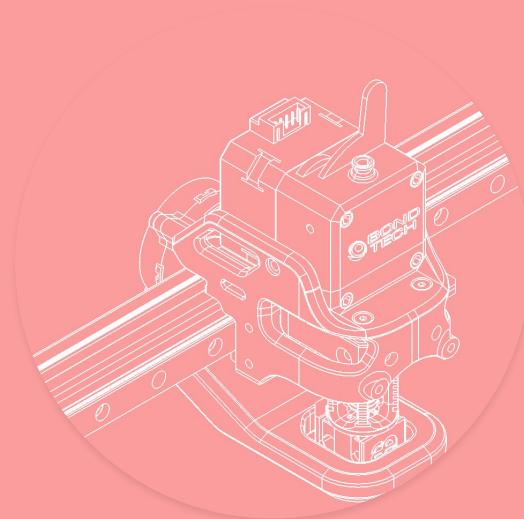
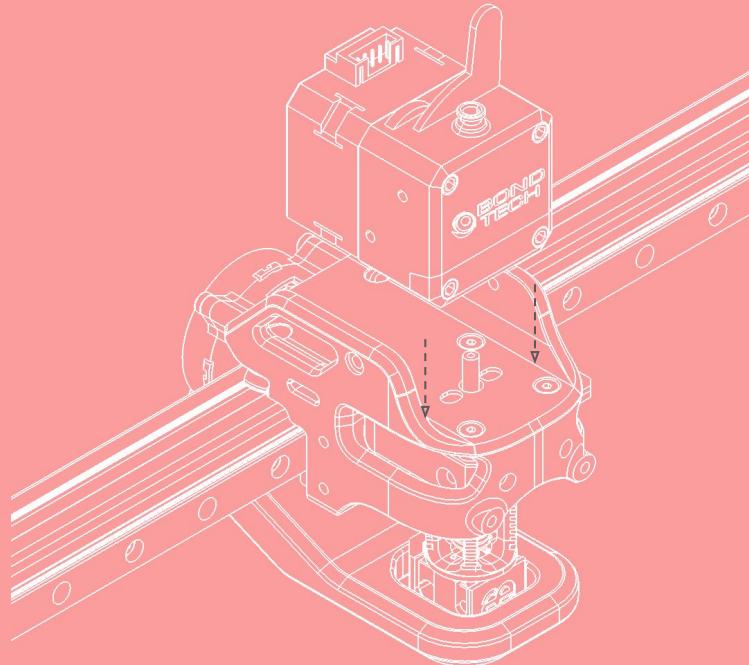
Extruder Assembly

Measure cut and assemble the 34.5mm PTFE tube.



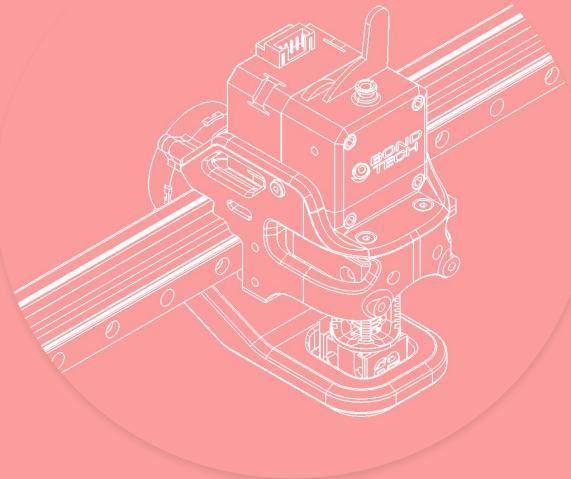
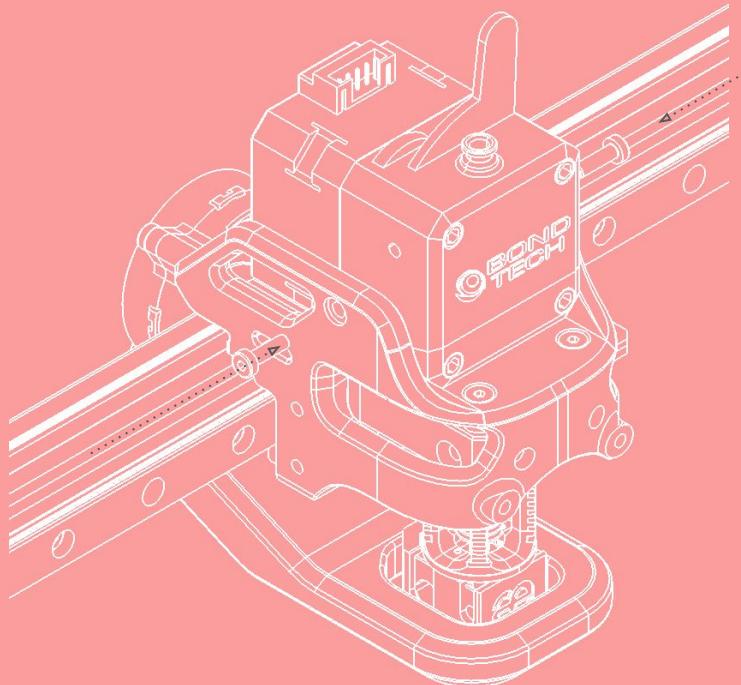
Extruder Assembly

Slide the Bondtech LGX extruder assembly down onto the extruder carriage and the PTFE tube.



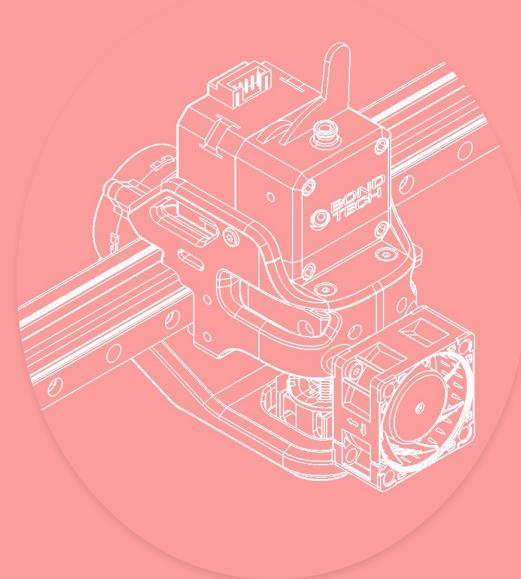
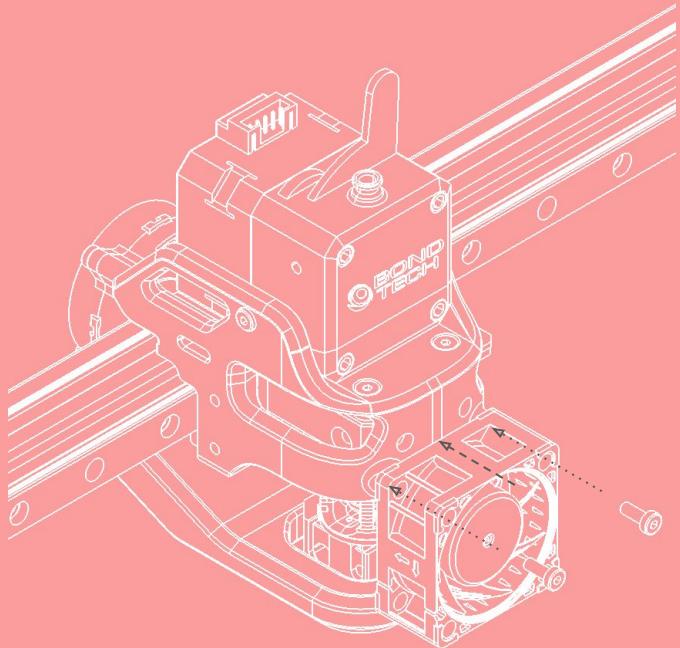
Extruder Assembly

Fasten the extruder to the extruder carriage from both sides, using M3x10mm screws.



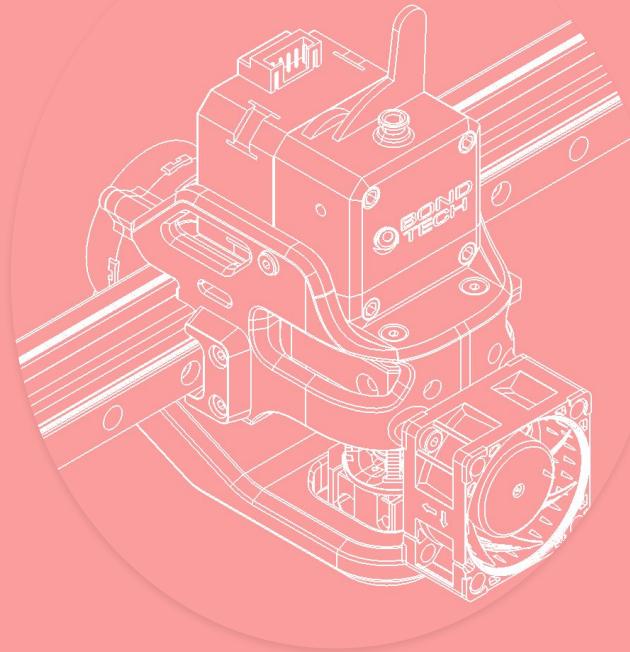
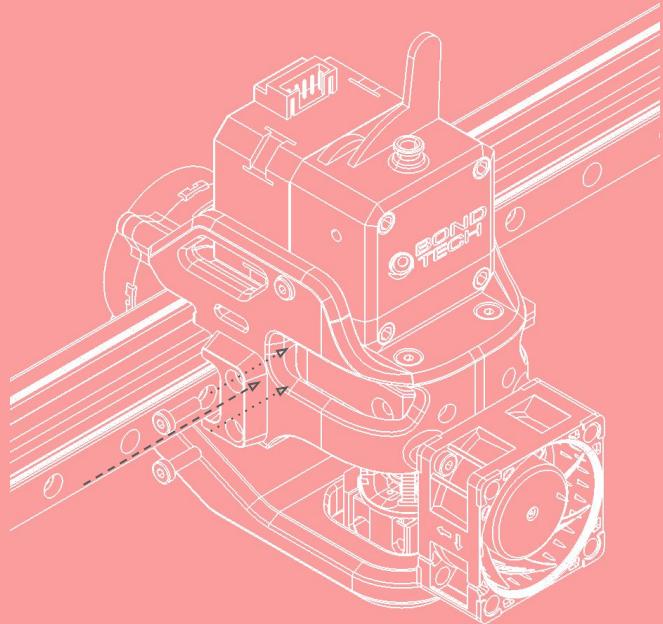
Extruder Assembly

Fasten the 4020 fan to the extruder carriage, using M3x8mm screws.

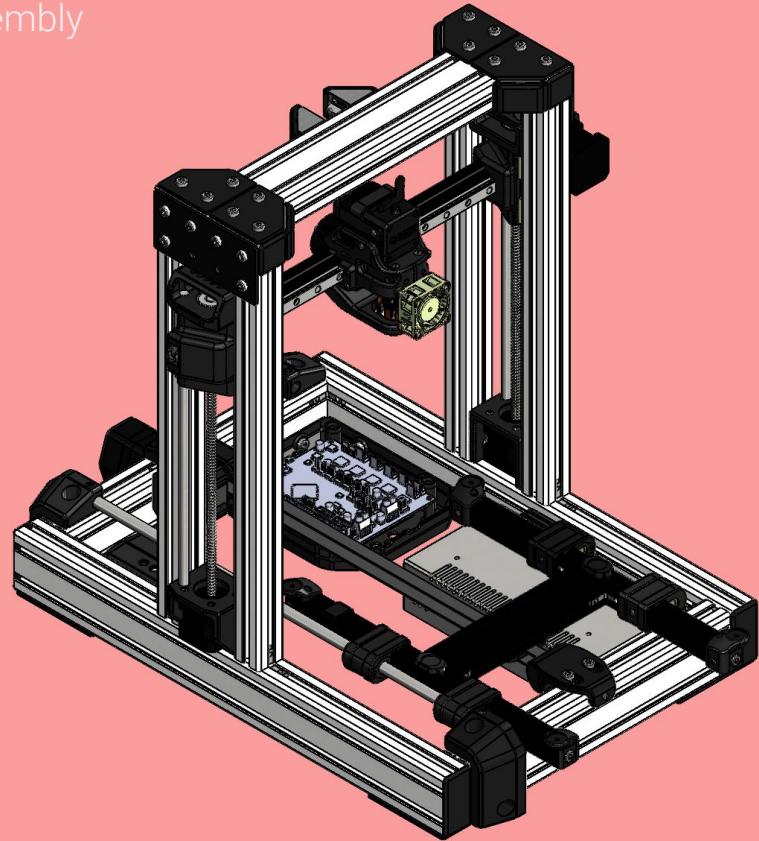


Extruder Assembly

Fasten the left extruder bumper to the extruder carriage, using M3x10mm screws.



Bed Frame Final Assembly



Bed Frame Final Assembly

4-6 pcs - 16mm silicone spacer



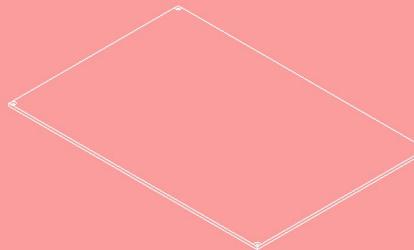
4 pcs - M5 washer



4 pcs - M3x20mm Countersunk

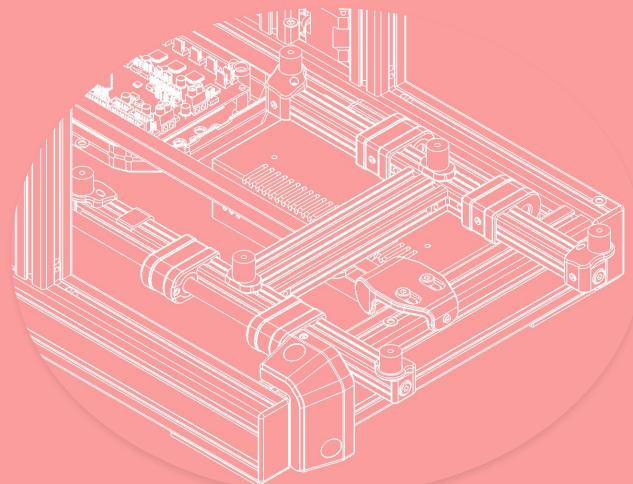
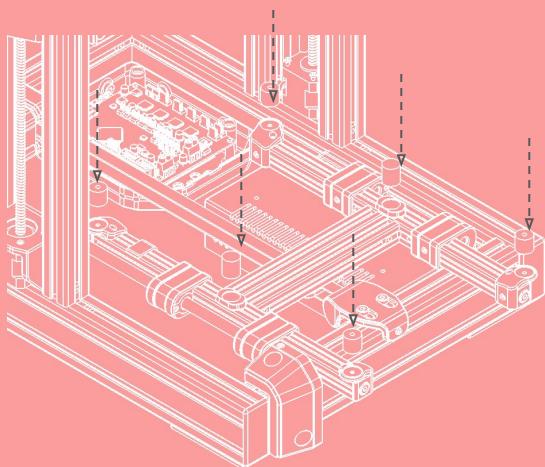


1 pcs - Mk2A HeatBed



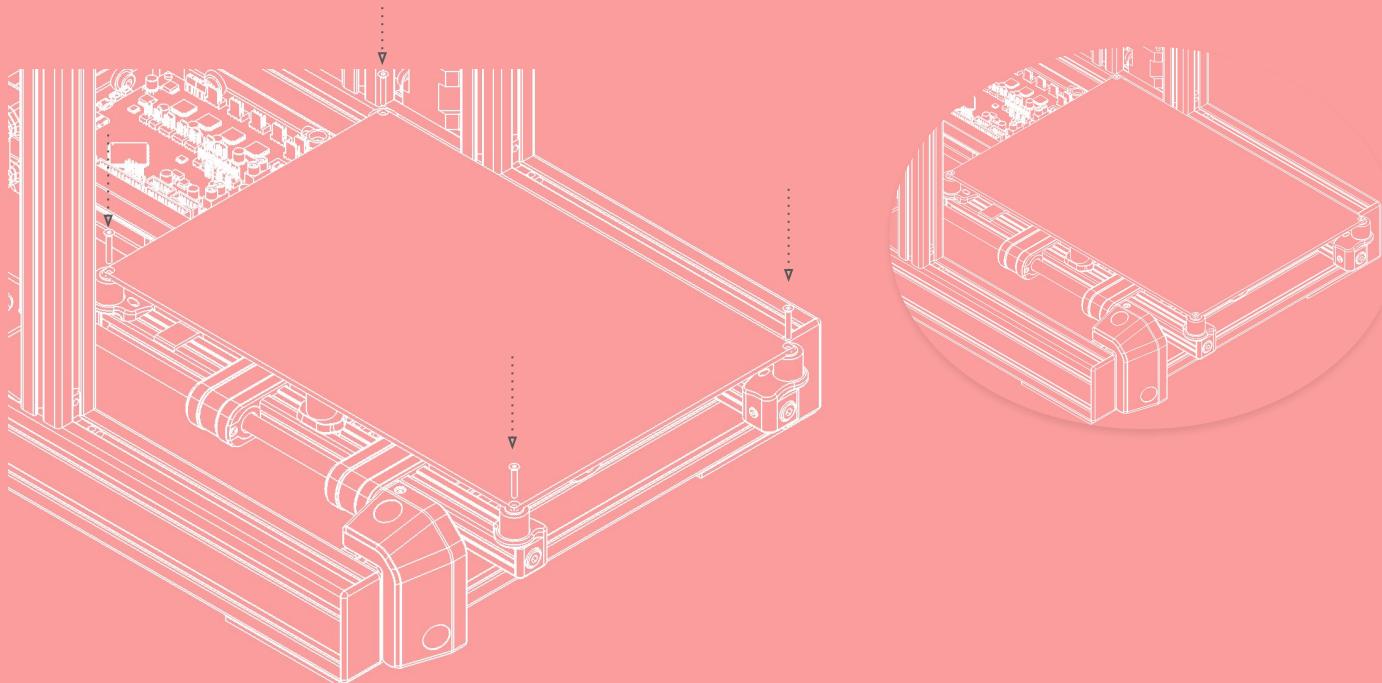
Bed Frame Final Assembly

Place the silicone spacers in their slots around the corners of the bed frame.



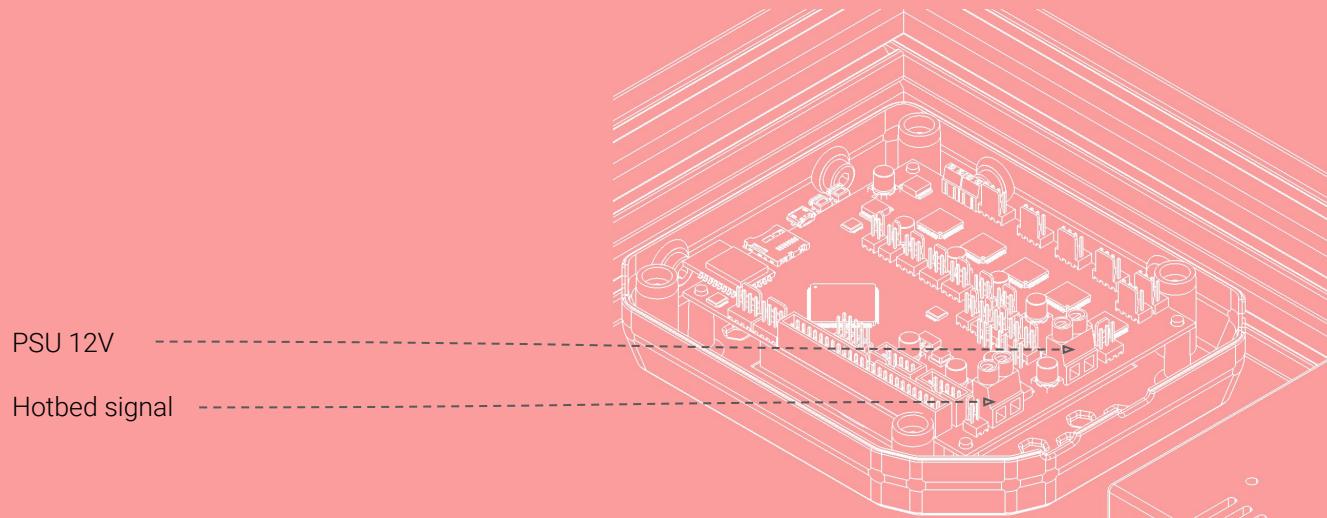
Bed Frame Final Assembly

With the wires facing down, place the MK2A heatbed on top of the previously arranged silicone spacers and fasten the heatbed to the bed frame using M3x25mm countersunk screws with M5 washers between the spacers and the bed.



ECU + ECU enclosure mounting

Connect the PSU leads, and the hotbed signal cable from the MOSFET box.

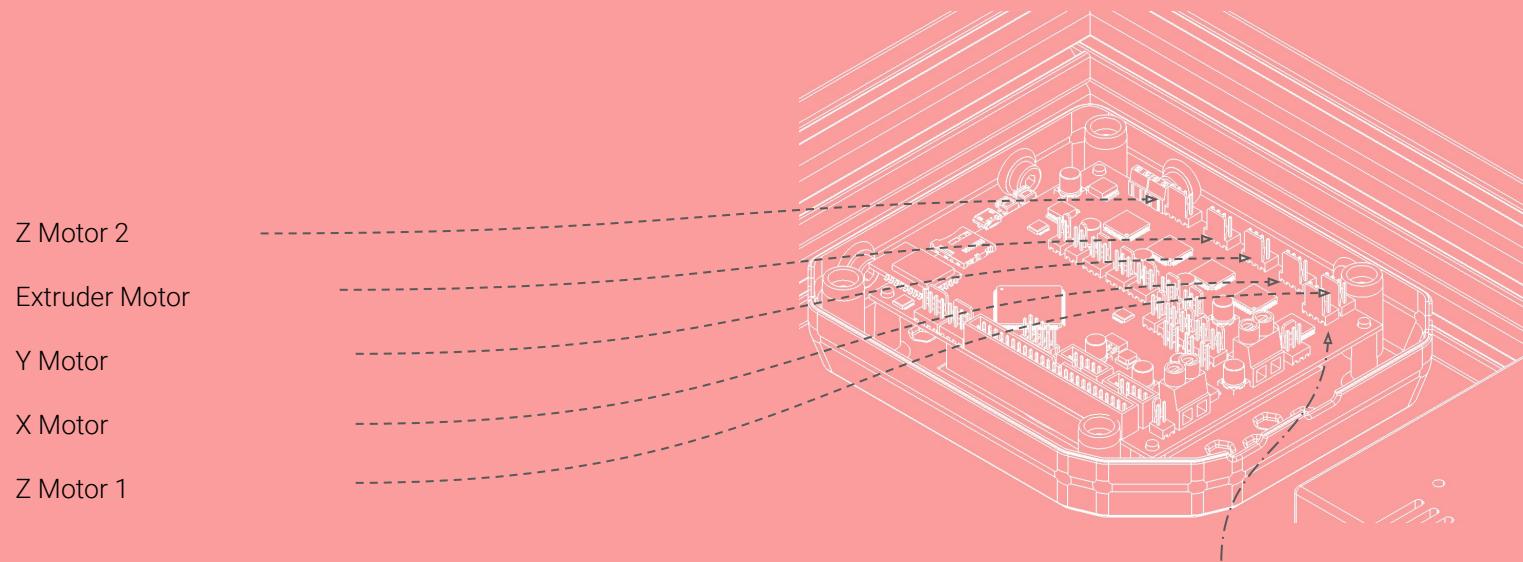


PSU 12V

Hotbed signal

ECU + ECU enclosure mounting

Connect the Motors as shown below.



Make sure to fill the second Z slot with two jumpers.

ECU + ECU enclosure mounting

Connect the fans, extruder heater and the Piezo Z Probe.

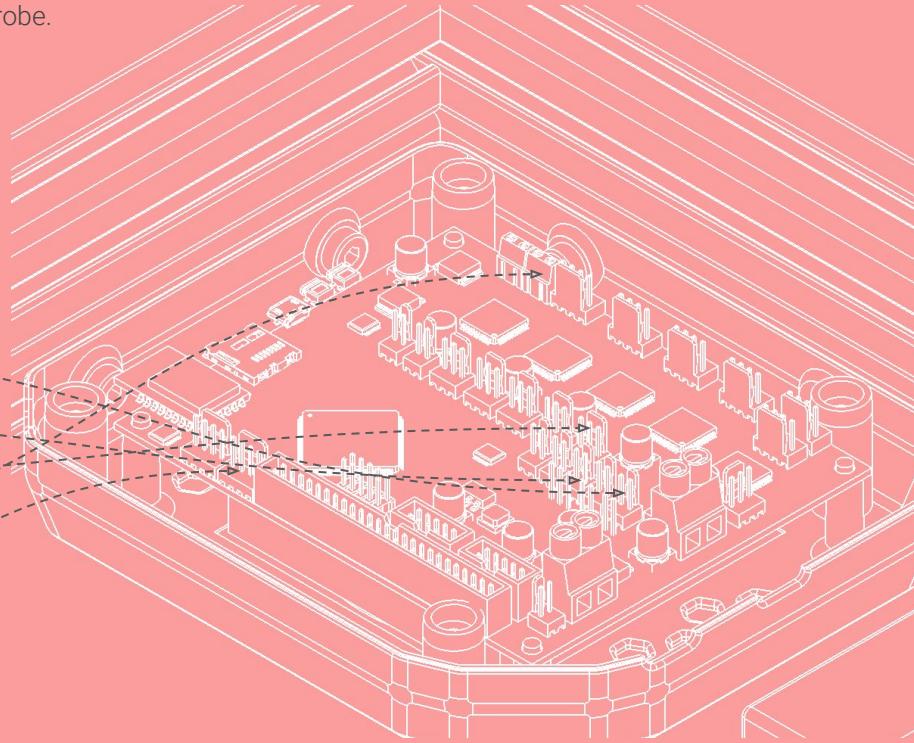
ECU 60mm Fan

Hotend Fan

Blower Fan

Extruder Heater

Z Probe



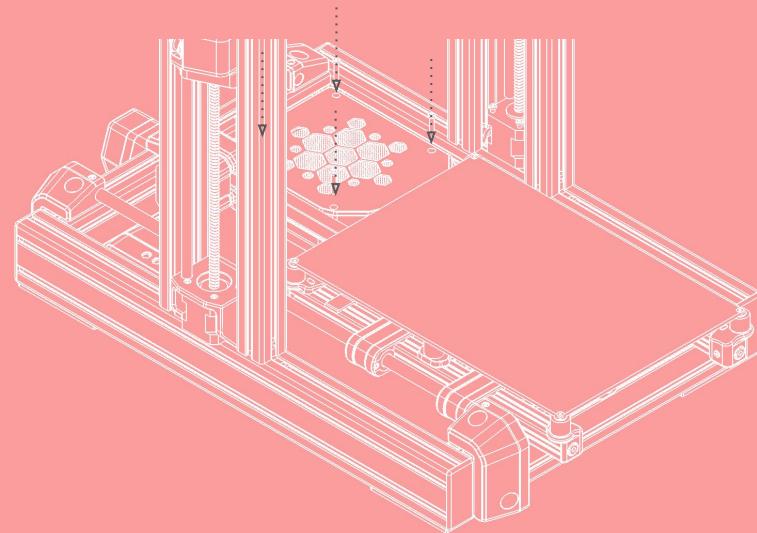
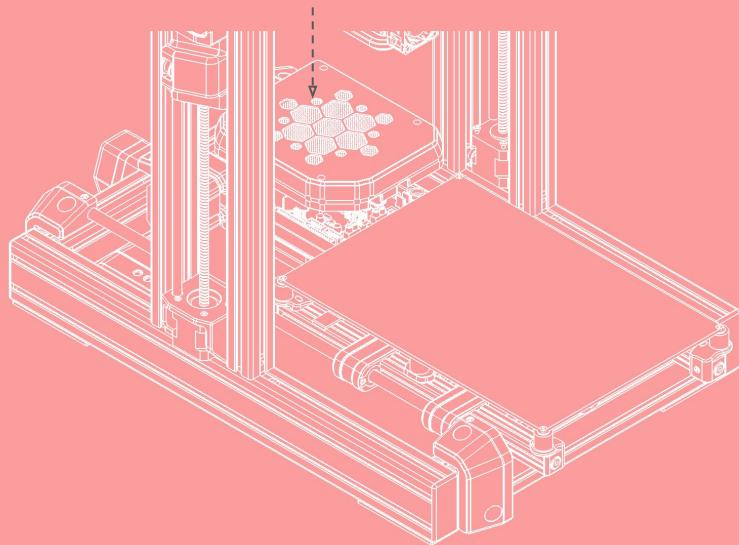
Bed Frame Final Assembly

Before moving on to the next step, test all your wiring connections and make sure the printer is accessible through WiFi.



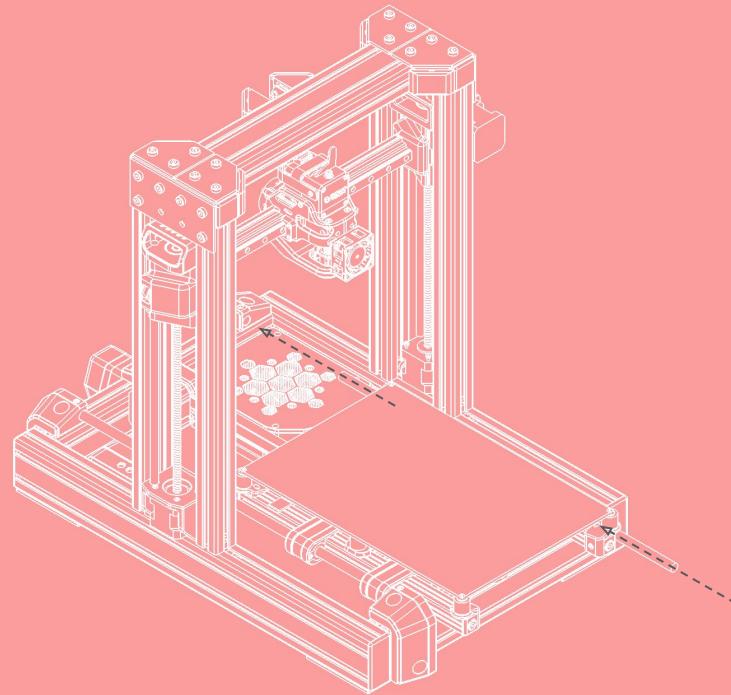
Bed Frame Final Assembly

Attach the ECU top cover and fasten it to the bottom cover using M3x20mm screws.



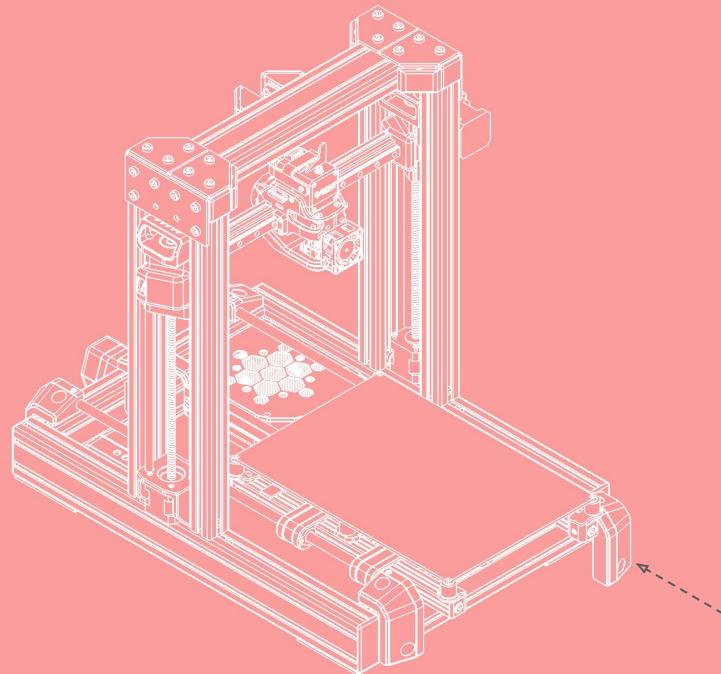
Bed Frame Final Assembly

Assemble the remaining 10mm rod by sliding it into the Y Frame Bracket



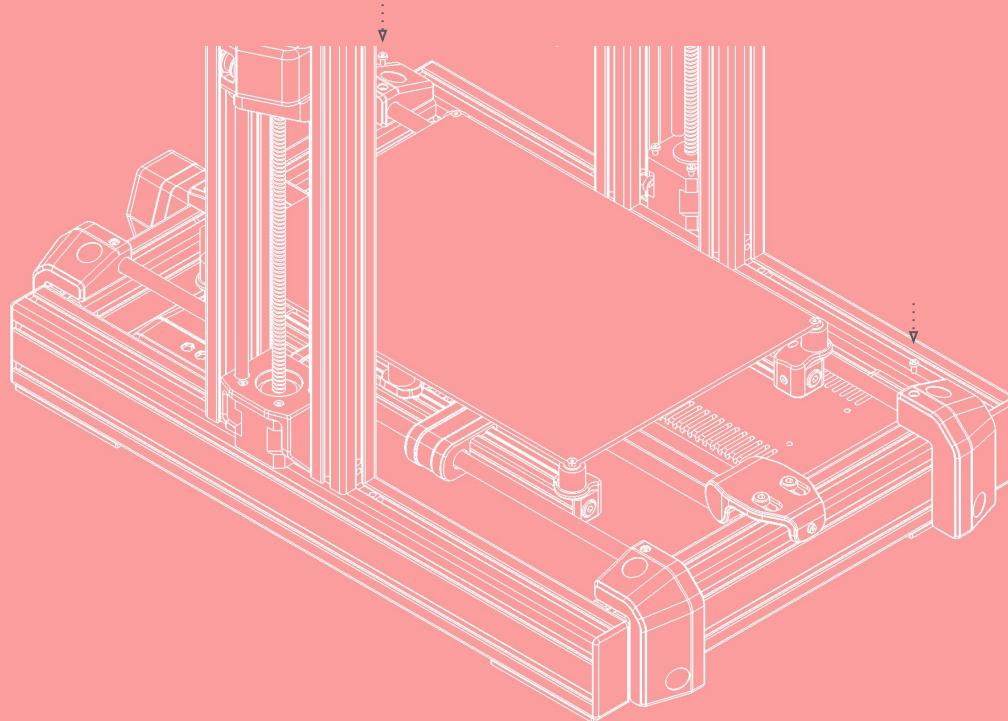
Bed Frame Final Assembly

Assemble the last Y Frame Bracket by sliding it onto the 10mm rod and fastening it to the frame, using M6x12mm screws and M6 sliding nuts.

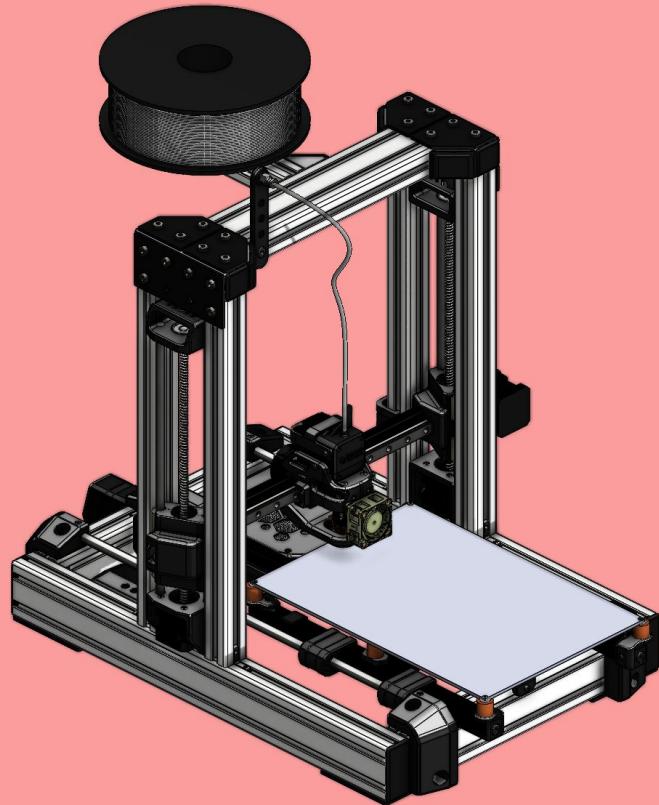


Bed Frame Final Assembly

Fasten the 10mm rod to the frame brackets using M3x6mm screws.



Filament Feeder



Filament Feeder

1 pcs - PC4-6 connector



1 + 1 pcs - M6 12mm + M6 Sliding Nut



1 pcs - M3x8mm

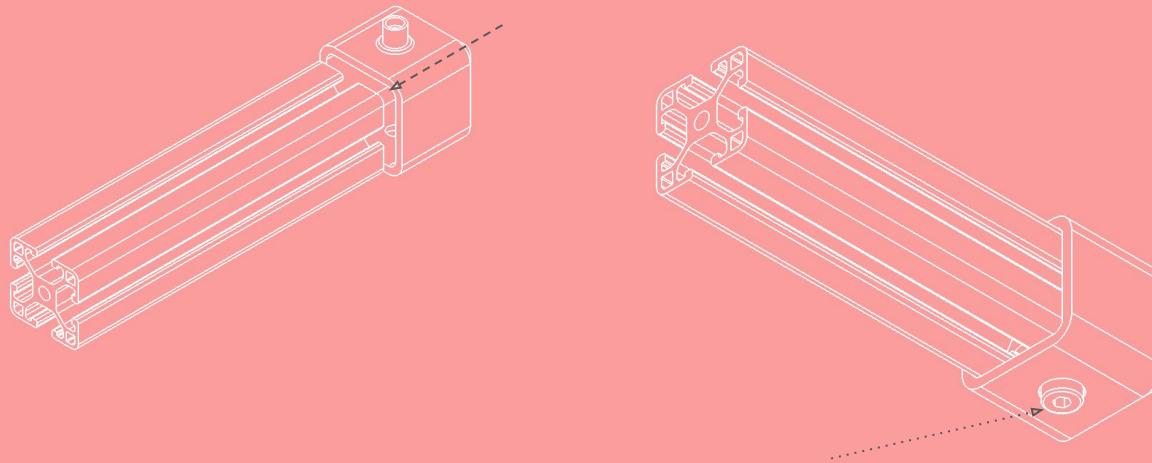


1 pcs - 608 Bearing



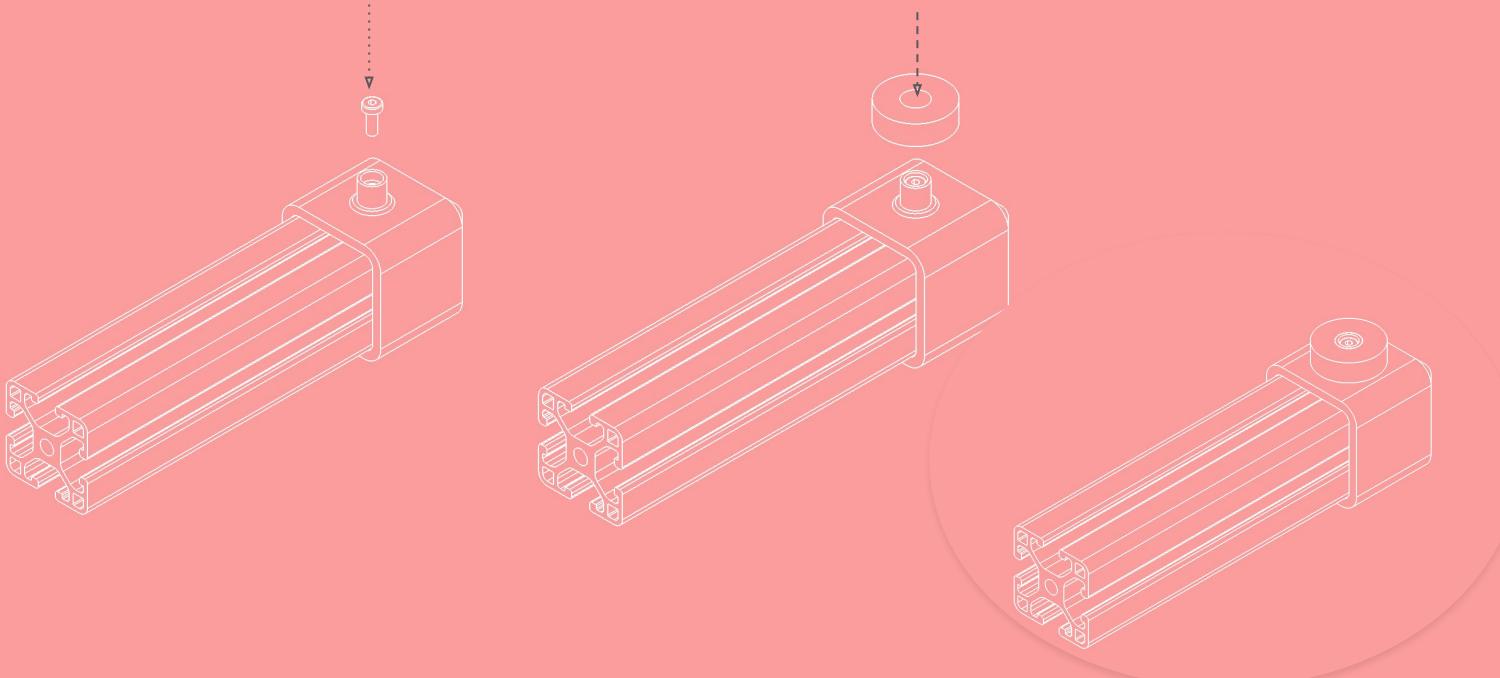
Filament Feeder

Assemble the filament bracket to the 135mm 3030-l extrusion and fasten it using a M6x12mm screw and a M6 sliding nut.



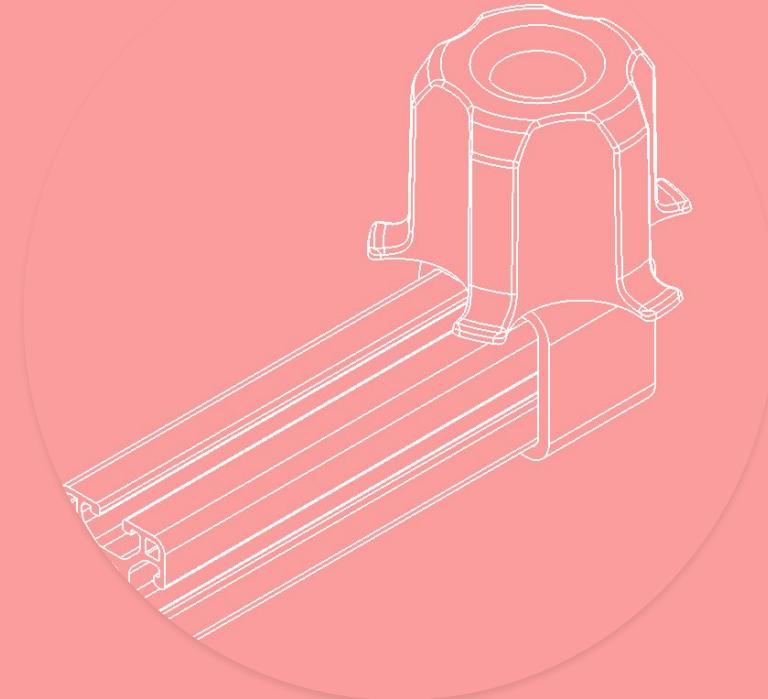
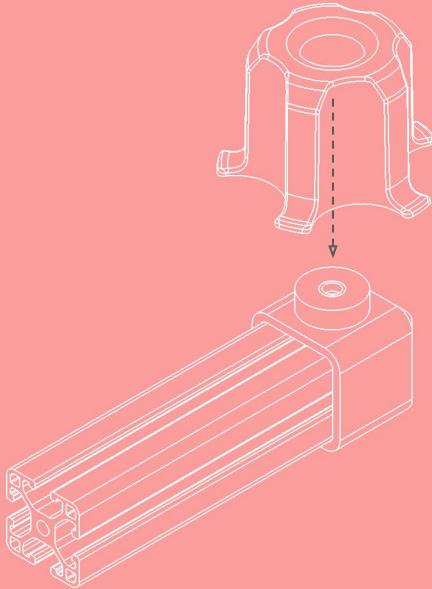
Filament Feeder

Fasten the M3x6mm reinforcement screw and assemble the 608 bearing on its shaft, as shown below.



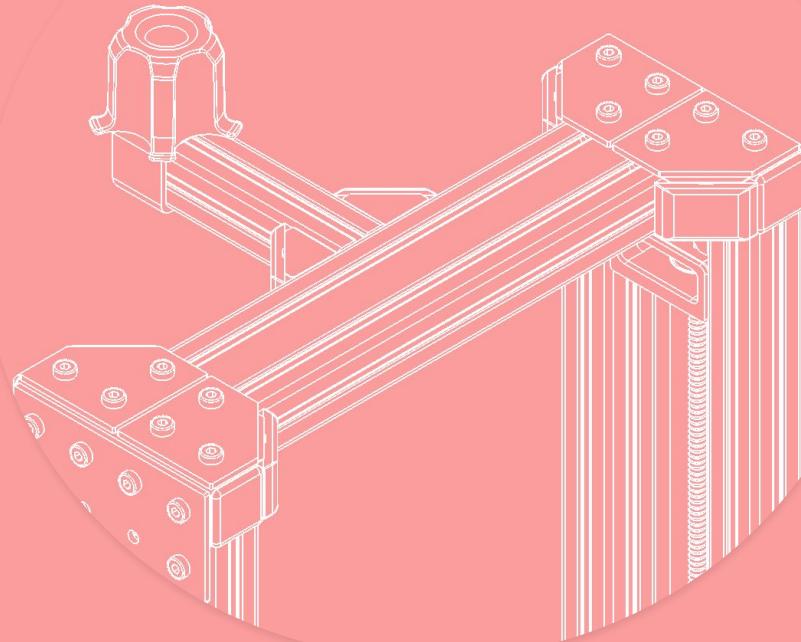
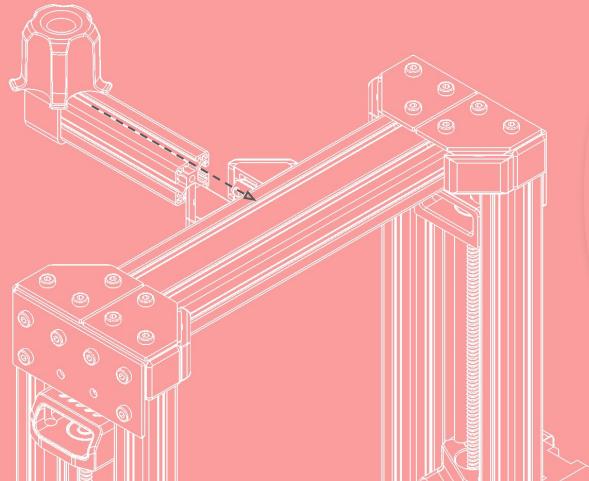
Filament Feeder

Assemble the Filament Roller on top of the 608 bearing.



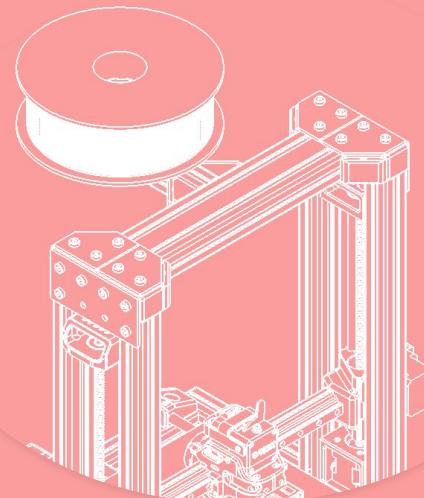
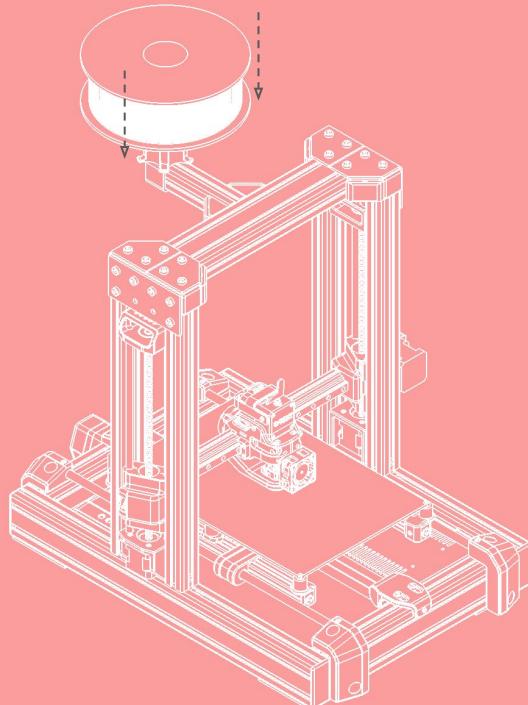
Filament Feeder

Fasten the subassembly to the two outer angles on the top frame, using M6x12mm screws and sliding nuts.

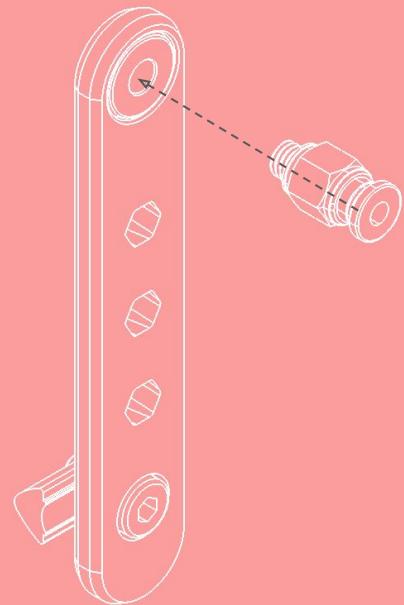


Filament Feeder

Mount the filament roll on the roller.

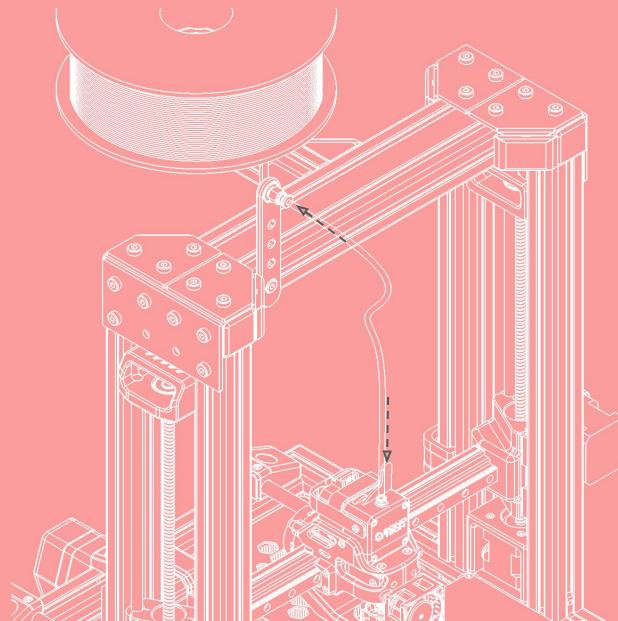
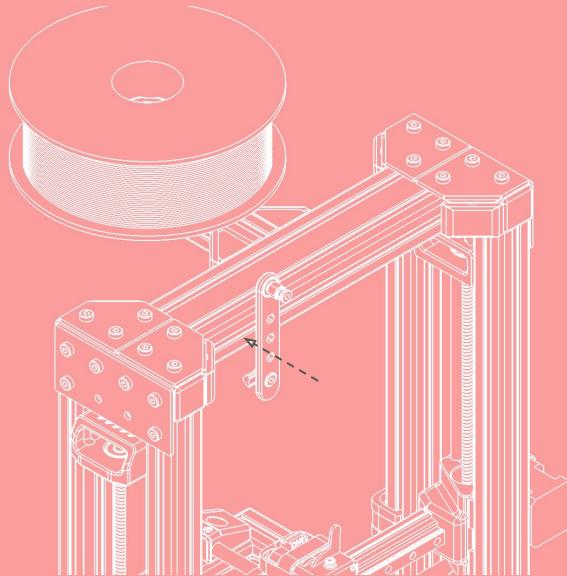


Fasten the PC4-M6 connector to the inner ring of the filament guide.



Filament Guide

Mount the filament guide to the top frame using a M6x12mm screw and a M6 sliding nut, and then assemble the PTFE tube; One end to the PC4-6 connector and the other to the LGX extruder.



Congratulations! Assembly Complete!

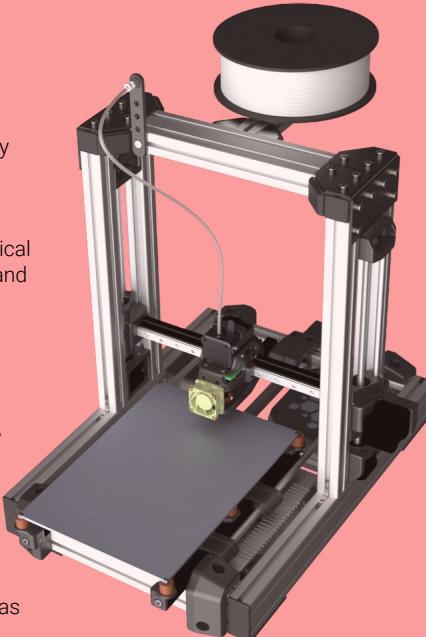
Your hard work and dedication have brought you one step closer to unlocking the full potential of your 3D printer.

Now that the mechanical assembly is complete, it is time to move on to calibration and while calibration can be a challenging and time-consuming process, it is also a crucial step in ensuring that your machine produces high-quality prints and does so for a prolonged period of time without your excessive intervention.

Although some of the calibration steps may seem daunting, it is an opportunity for you to further develop your technical skills and gain a deeper understanding of your 3D printer and its ecosystem. It requires patience, attention to detail, and a willingness to experiment and iterate until you achieve the desired results.

Remember. The calibration process is just another step in your 3D printing journey. It may take some time and effort, but once complete, you will be able to produce high-quality prints that meet your exact specifications.

Congratulations again on completing the mechanical assembly of your I-3030 V4, and good luck with the calibration process! I have no doubt that you will approach this step with the same level of dedication and technical proficiency as you did with the assembly, and I look forward to seeing the amazing things you will create with your 3D printer.



Helpful links for the next steps

[Printables Page](#)

[RRF3 documentation](#)

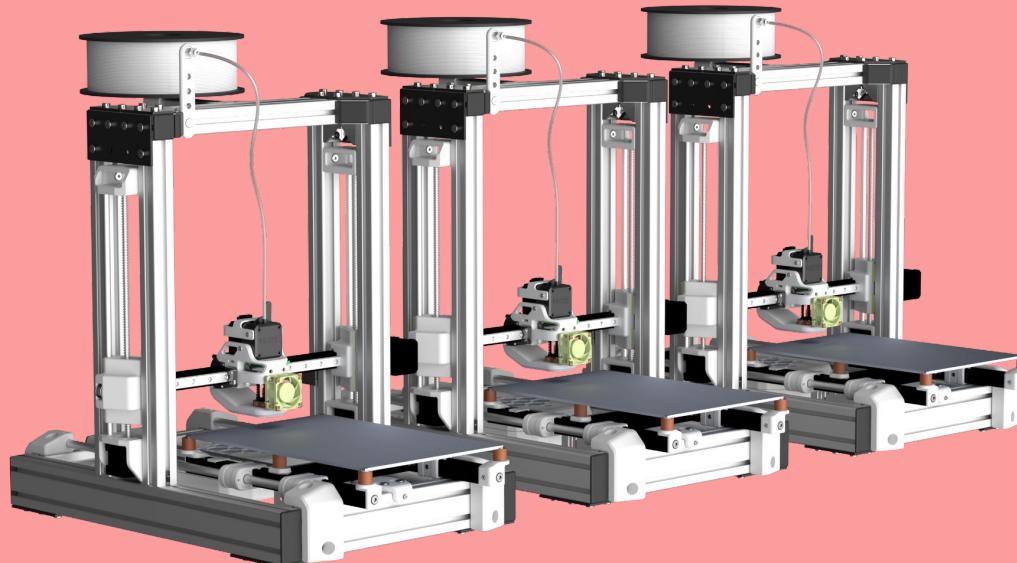
[DUET documentation](#)

[Piezo Orion V2 documentation](#)

[Bondtech LGX documentation](#)

[Prusa Slicer](#)

[Git Page](#)



Say [thanks](#) or consider becoming a direct [sponsor](#) if money is of no issue for you.

Component Calibration Order For A New Machine

1) - Sensorless homing for X and Y axii

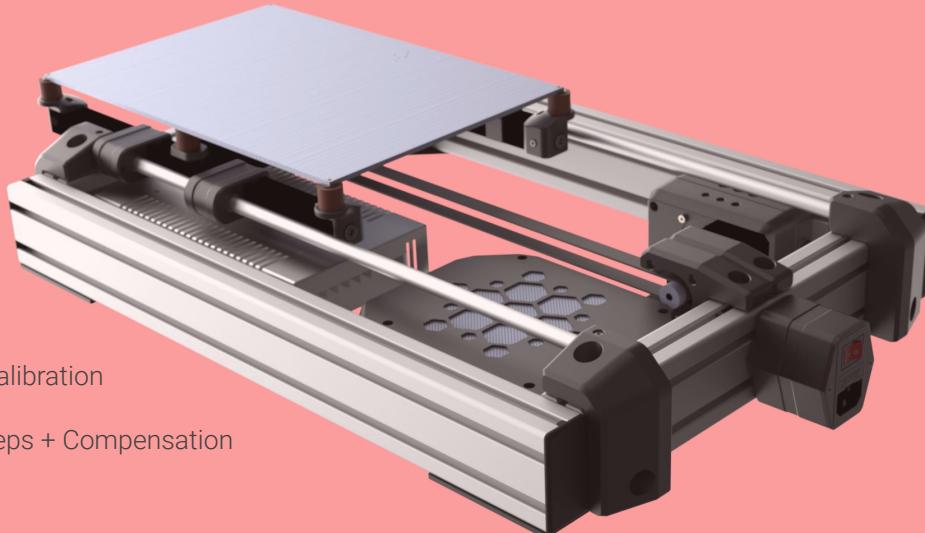
└ 2) - PID tuning for the heaters

└ 3) - Z probe sensitivity

└ 4) - Mesh bed leveling

└ 5) - True Z bed calibration

└ 6) - E-steps + Compensation



Reference Configuration File for RepRapFirmware 3 can be found on the I-3030 V4 git-[page](#).

