



Lineux Toolchanger



LINEUX

- lee-knee-yurks
(noun)

toolchanger that print things you never know
you need in a way you never imagine

- see also wizardry, mesmerizing

Lineux r2.1 Build Guide

2025-06-27



<https://discord.gg/Xwqbjj4VjH>



<https://github.com/Bikin-Creative/Lineux-Toolchanger>

**A big thank you to everyone who
made this project possible.**



CAUTION



- Please take careful precautions with safety in mind when attempting to build Lineux.
- Only attempt the build if you are knowledgeable with 3d printer mechanics and electronics.
- Failure to follow safety precautions may result in things going against you, or even harm you.
- Magnets are extremely strong and may cause injuries. Please handle them with extra care.
- If things start to get confusing or you're stuck at some point during the build, do ask questions on our discord.
- We try to keep things as simple and as clear as possible for a fun and enjoyable build for everyone.
- We are humans and are prone to mistakes. If you encounter any issues/faults with the build guide, please raise them on our Discord.

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Part Printing Recommendations

Recommended setting/material to print your parts.

Material
ABS

Layer Height
0.2mm

Extrusion Width
0.4mm

Infill
40% (Grid, Gyroid, Honeycomb, Triangle, Cubic)

Number of Walls
4

Number of Top/Bottom
5

Parts Filename Guide

Primary Colour

Eg. carriage_A.stl

These are to be printed with your primary/base colour.

Accent Colour

Eg. [a]_locking_plate.stl

Files with [a] in front are to be printed with your secondary/accent colour. Parts will be indicated with the Lineux Logo beside it in this guide.

Quantity Required

Eg. belt_tensioner_x2.stl

Files ending with x# indicate the quantity required to be printed

To make your build easier, we recommend you to download the cad from our github to enable you to visualize the whole assembly.



Button Head Cap Screw
(BHCS)



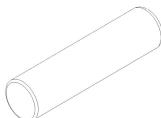
Socket Head Cap Screw
(SHCS)



Heat Insert



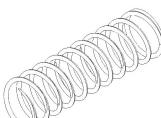
n52 Magnet



Dowel Pin



Stainless Steel Spacer /
Bushing



Compression Spring



Hex Nut



Ring Terminal



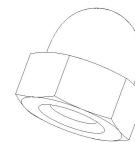
Set Screw / Grub Screw



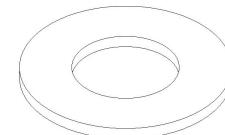
T-Nut



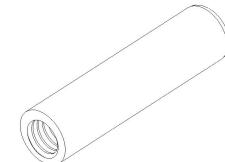
AA Battery Terminal



Cap Nut / Dome Nut



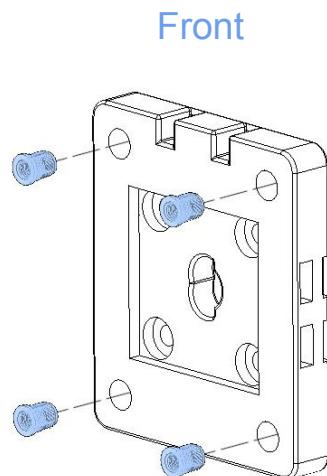
Washer



Threaded Dowel Pin

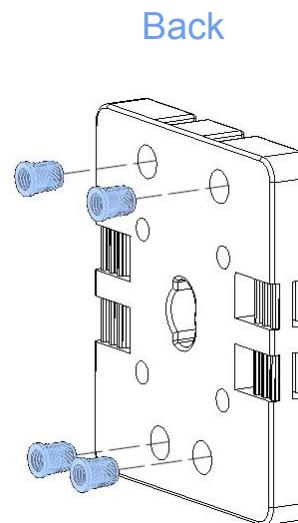
Lineux was first developed on a Vzbot 330 printer.

It is recommended to install all heat inserts first on all the parts prior to starting the build.



Carriage Voron

m3 heat insert

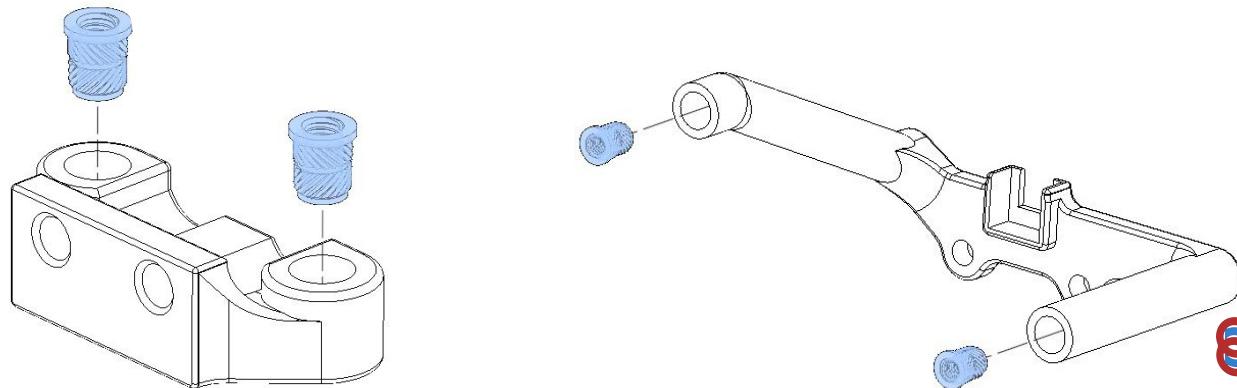


Preparation

Insert the heat insert to Carriage A in the respective slots as shown.

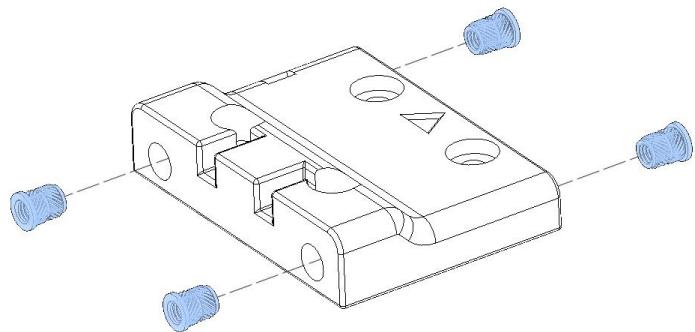
Carriage Voron

m3 heat insert



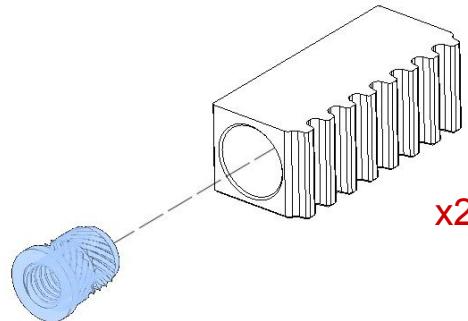
Preparation

Insert heat inserts to both 5015 Mount and 5015 Standoff.



Carriage Vzbot

m3 heat insert



Preparation

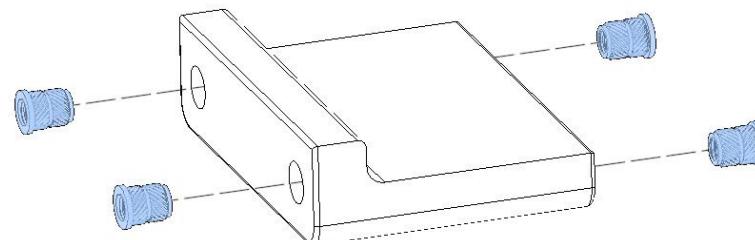
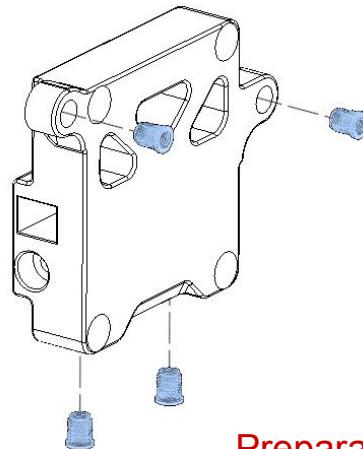
Insert the heat insert to Carriage Top in the respective slots as shown.

Preparation

Insert the heat inserts to both Belt Tensioner.

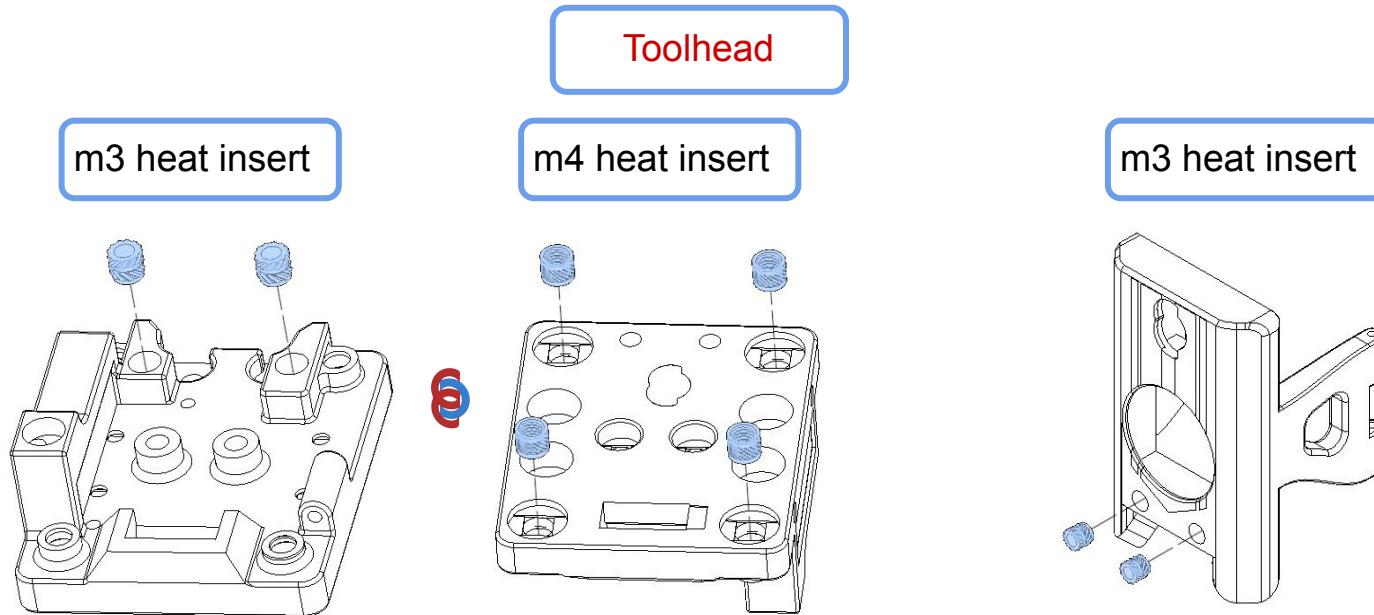
Carriage Vzbot

m3 heat insert



Preparation

Insert the heat insert to Carriage A and Carriage Bottom in the respective slots as shown.



Preparation

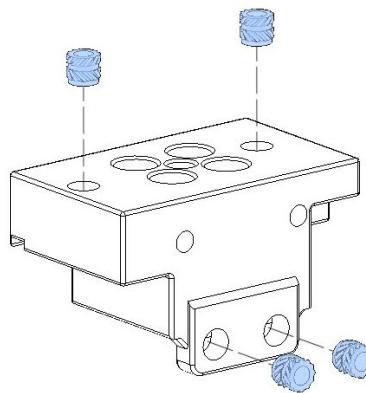
Insert the heat insert to the Backplate in the respective slots as shown.

Preparation

Insert the heat inserts to the Cowl Klicky.

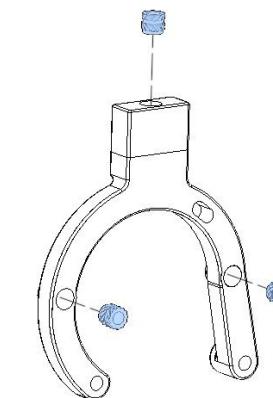
Toolhead

m3 heat insert



Preparation

Insert the heat inserts to the
Revo Voron Plate.

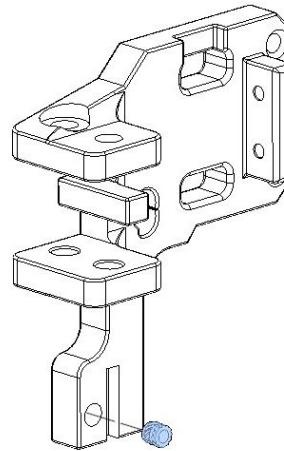


Preparation

Insert the heat inserts to the
Sherpa Micro Ebb Mount.

Dock

m3 heat insert

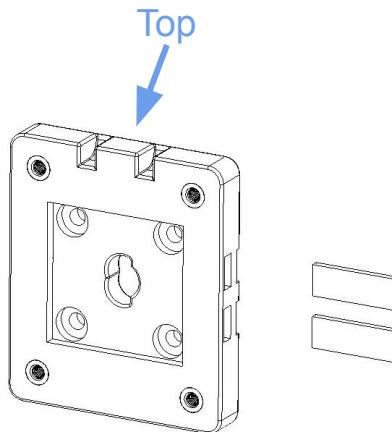


Preparation

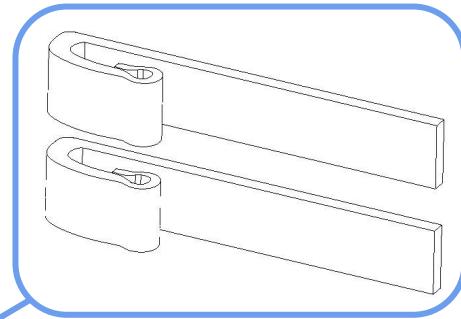
Insert the heat insert to the
Dock Body.

Lineux started with a modified Dragonburner as its toolhead but has since uses its own Lineux One toolhead.

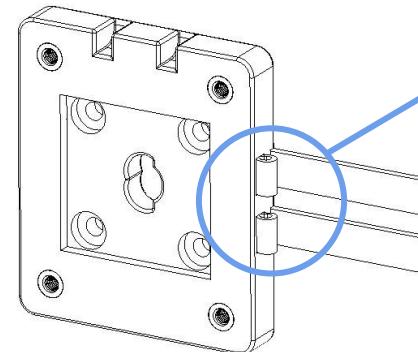


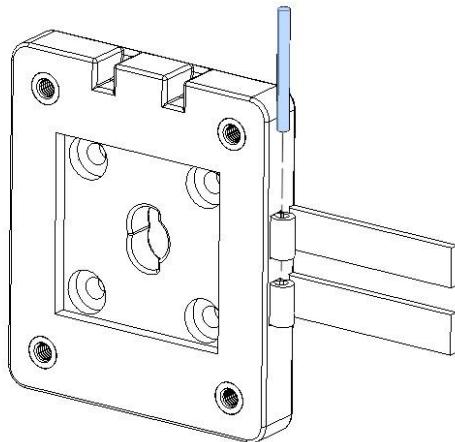


Thread both A belt and B belt from the right through the back of Carriage A and into the belt slots. The 2 indentation will be at the top.

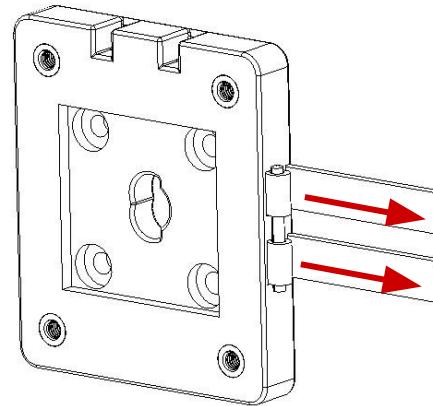


Make a loop and thread it back into the slots.

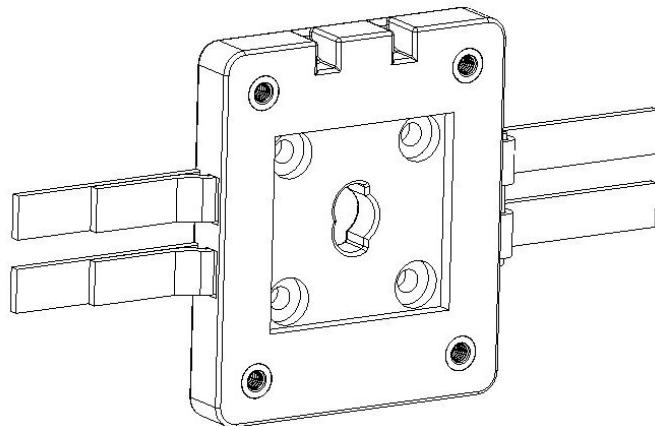




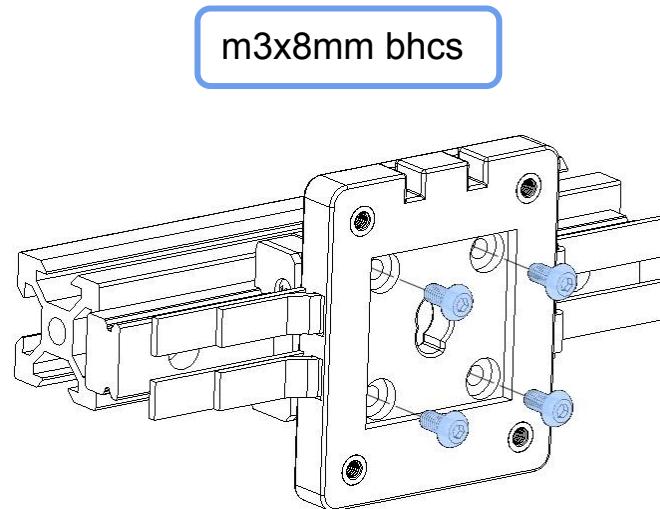
Cut a filament about 18mm and insert it through the belt loop.



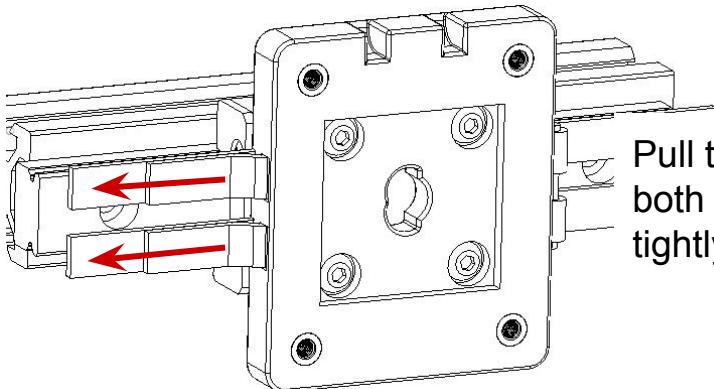
Pull the belt tight and the belt will be secured on Carriage A.



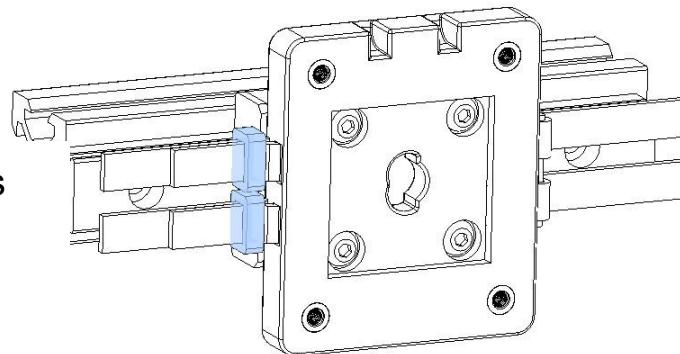
Thread both belts on the left the same way you did for the right side. This time, you don't have to make a loop. Do not cut the belts yet and leave them as is for now.



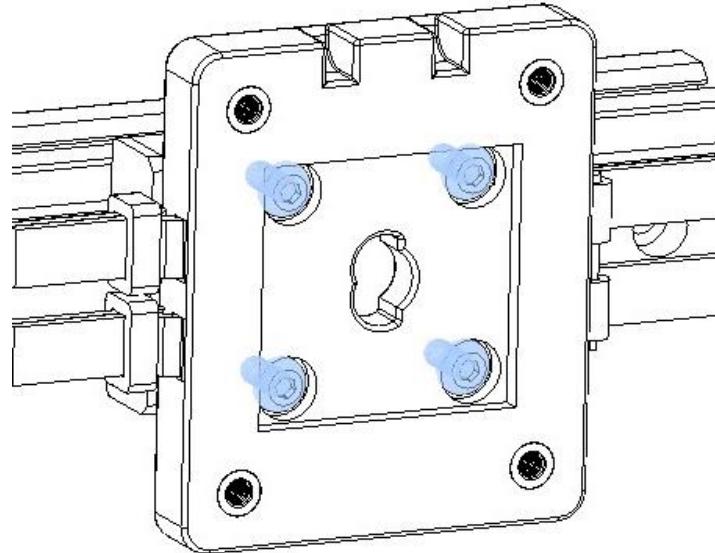
Screw in the bolts but leave them loose for now.



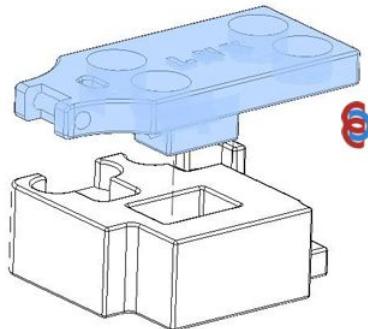
Pull the ends of
both belts
tightly.



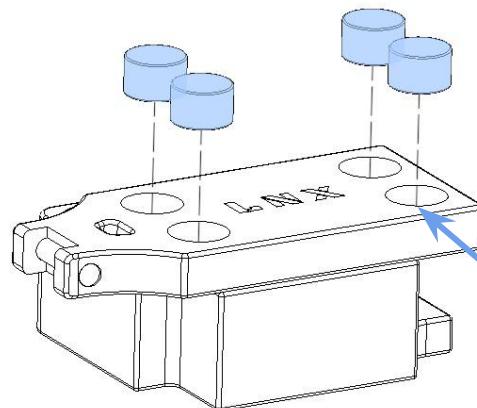
Tie each belts
with cable tie.



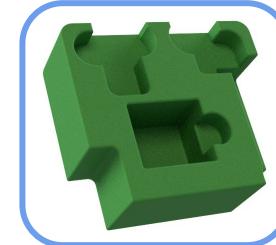
Tighten all 4
bolts now.



Place the Locking Plate on the Magnet Mounting Tool. This will make installing the magnets easier.

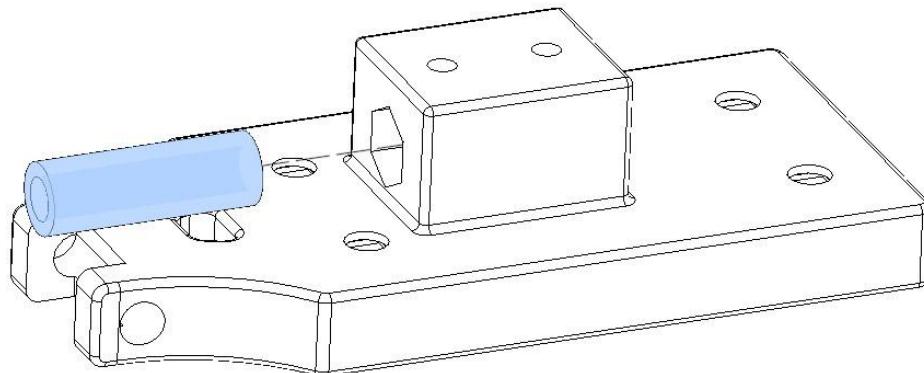


Insert the magnets in the respective slots. Apply a bit of epoxy or glue before inserting the magnets. You may use a mallet or a wrench to push the magnets in and ensure they are flushed with the top surface. **Take note of the magnet polarity configuration.**



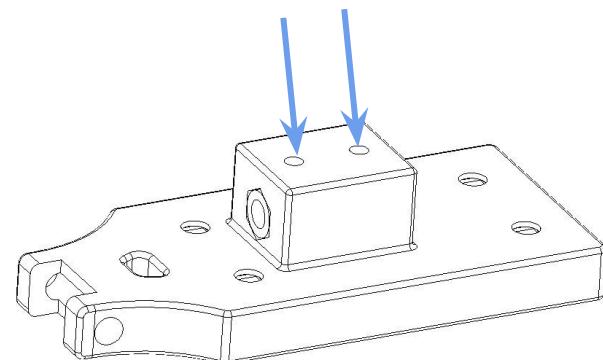
Magnet Polarity Configuration

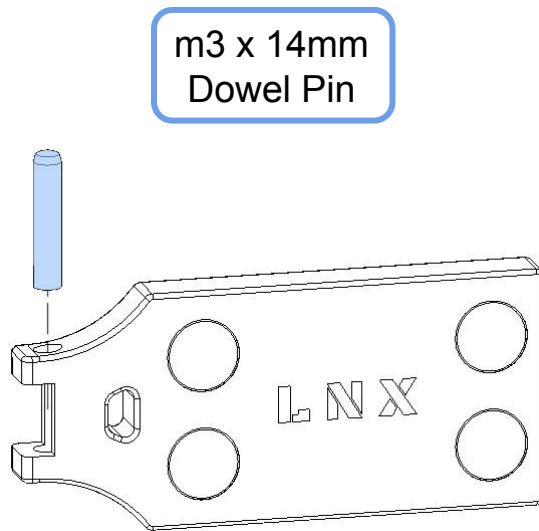
ID3 OD5 15mm
Stainless Steel
Bushing



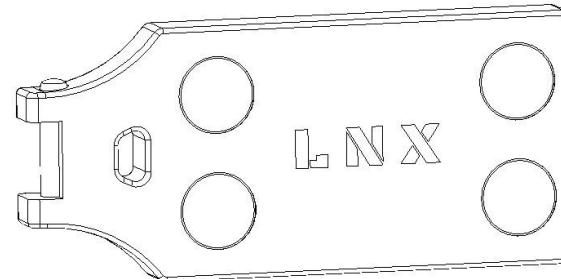
Slide in and keep
both ends flushed.

Apply drop of glue here.

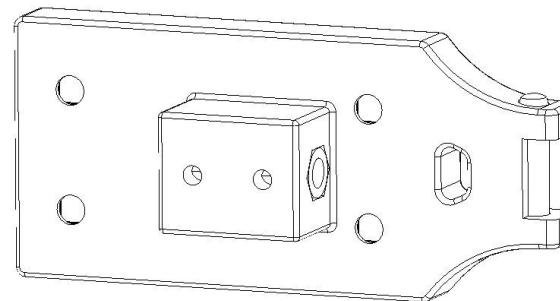


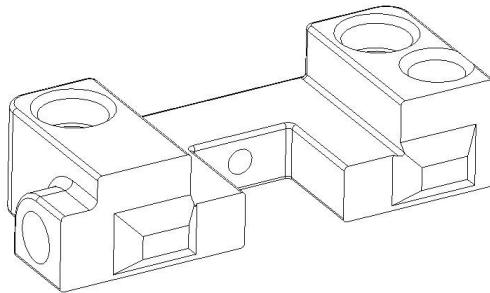


Slide in the dowel pin
and keep both ends
equal.

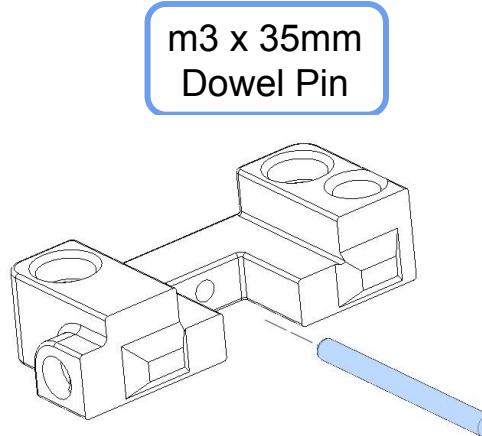


Completed Locking Plate Assembly

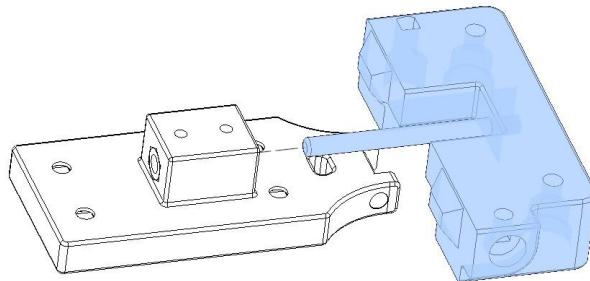




Place Carriage B Left on its back on a flat surface.

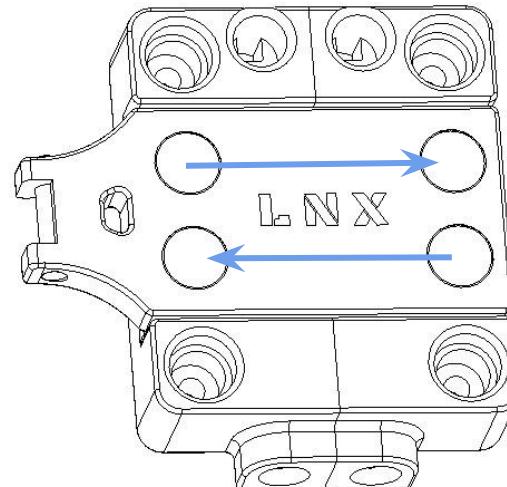
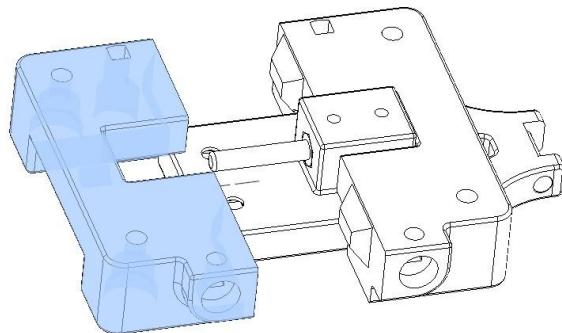


Push the dowel all the way in. It should be a tight fit.



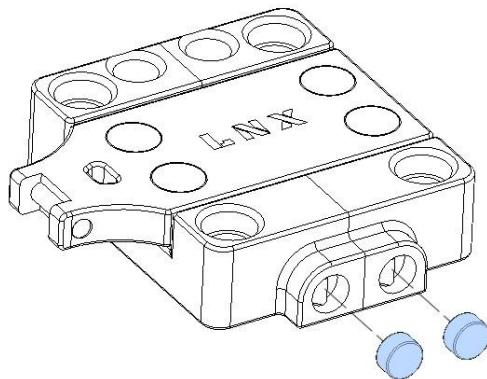
Turn the assembly over. Apply some grease/lubricant on the dowel pin before sliding the Locking Plate in.

Join Carriage B Right together with the assembly. The tabs should aligned and the parts should be flushed together.



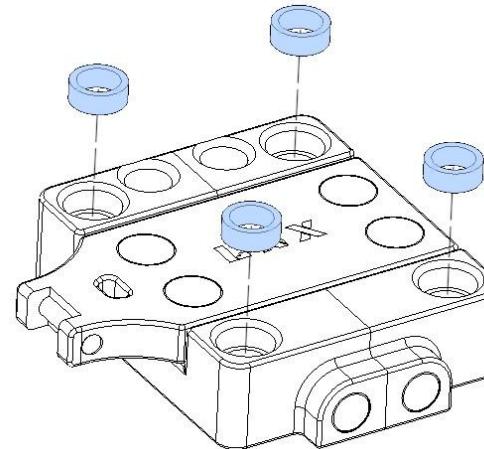
The Locking Plate should be able to slide freely.

6x3mm n52 magnet



Apply glue before pushing in the magnets. Ensure they sit flushed in the slots. **We recommend to reverse the polarity of both magnet to each other.**

od8 id6 3mm stainless steel bushing

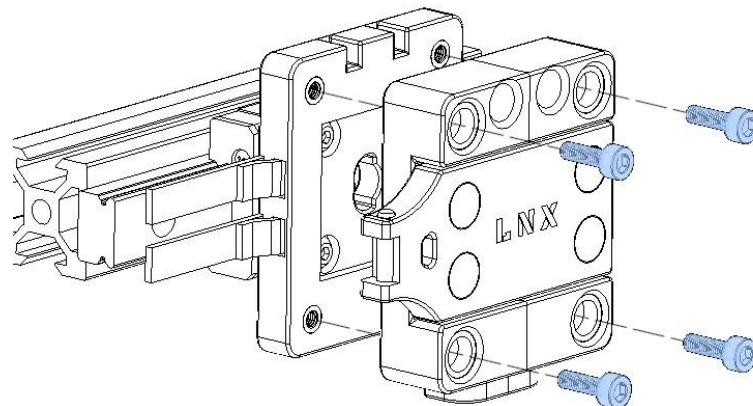


Apply glue before pushing in the bushings. Ensure they sit all the way in the slots.

od6 id5 spring 10mm



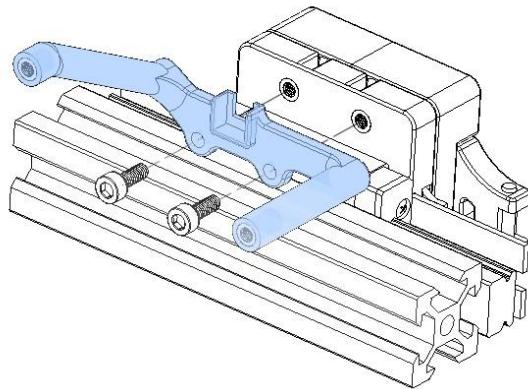
m3 x 10mm shcs



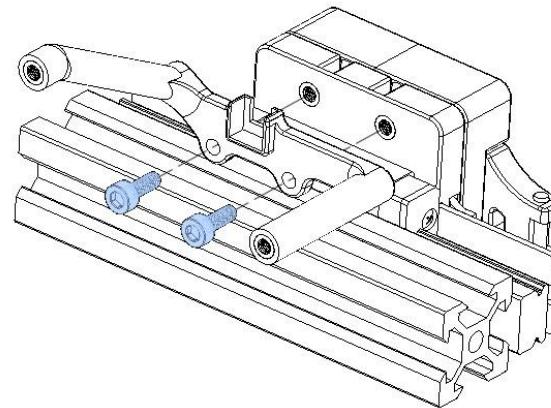
Preparation

Solder about 50mm red and black wire to the end of both springs. Stainless steel solder flux will help to make the soldering easier.

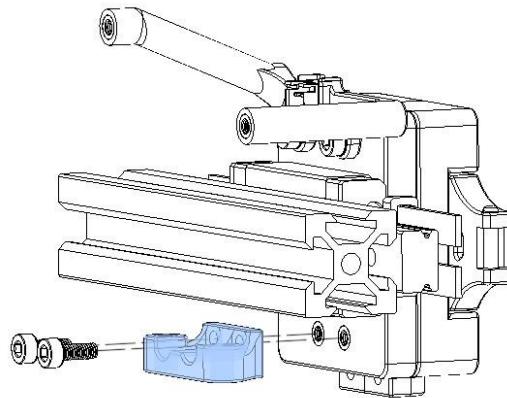
Attach Carriage B to the carriage as shown. Ensure the Locking Plate can still slide freely.



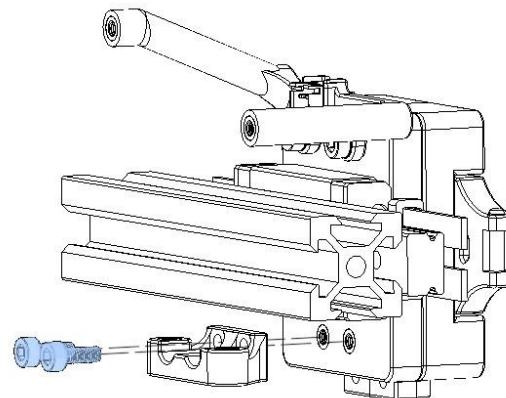
m3 x 8mm shcs



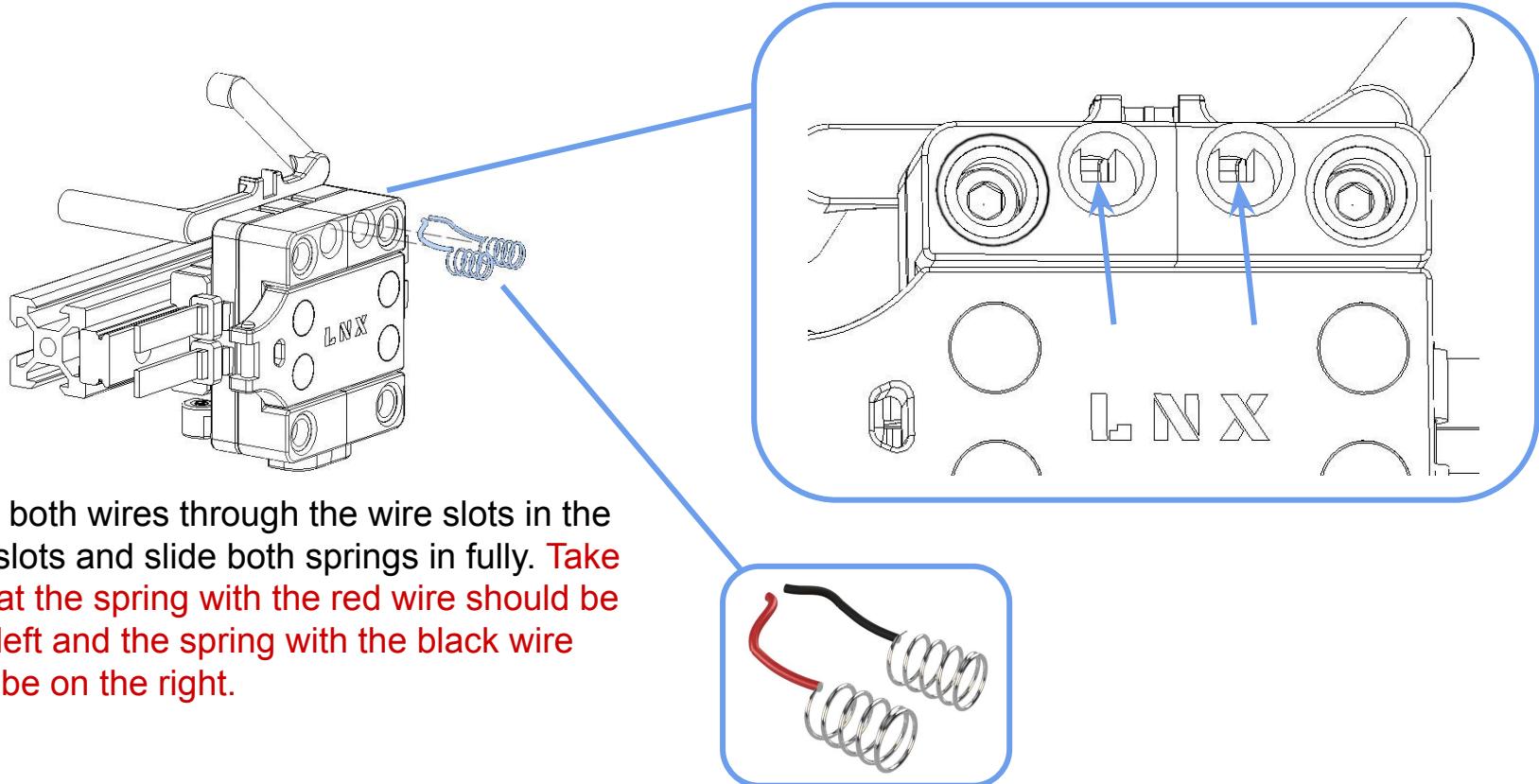
Attach the 5015 Standoff to the back of Carriage A as shown.

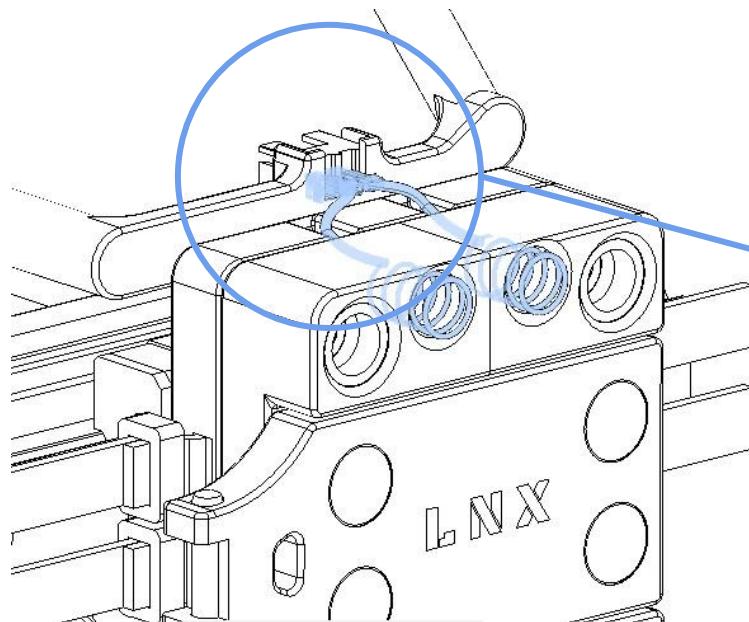


m3 x 8mm shcs

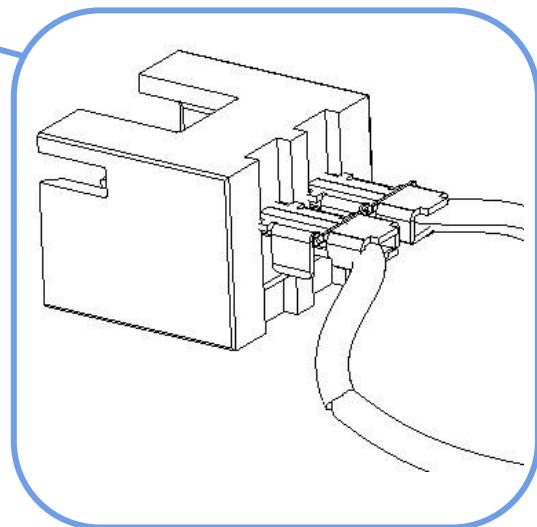


Attach the 5015 Mount to the back of Carriage A as shown.

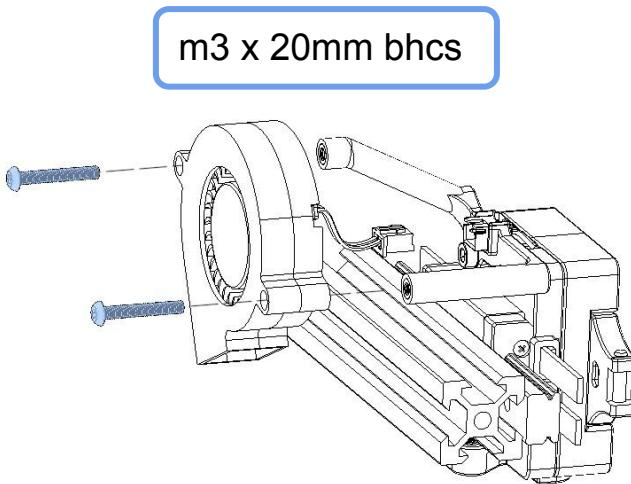




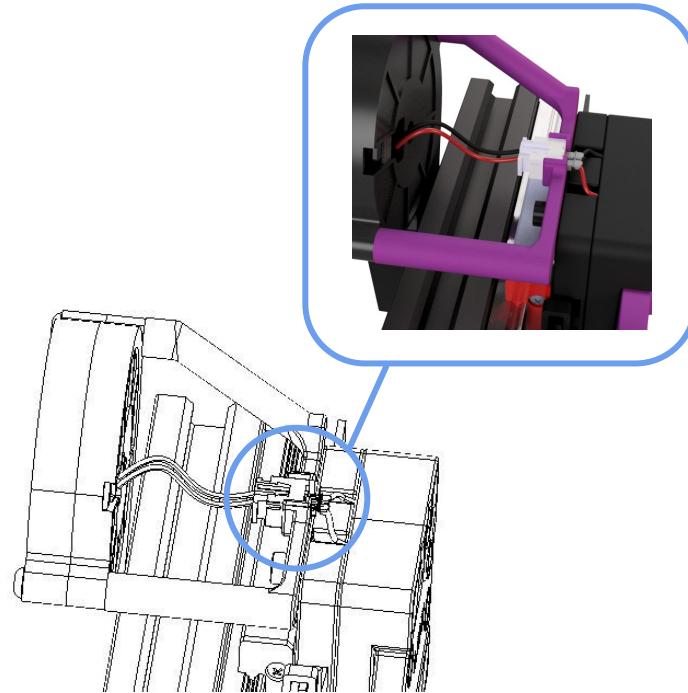
2-pin JST XH2.4 female connector

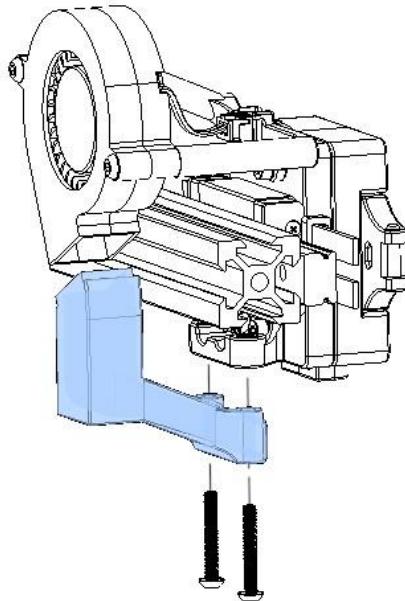


Cut the spring wires to length and crimp them with the appropriate connector. Insert them into the jst female connector. Slot the connector in position on the 5015 Standoff. You can apply a drop of glue to keep it in place.

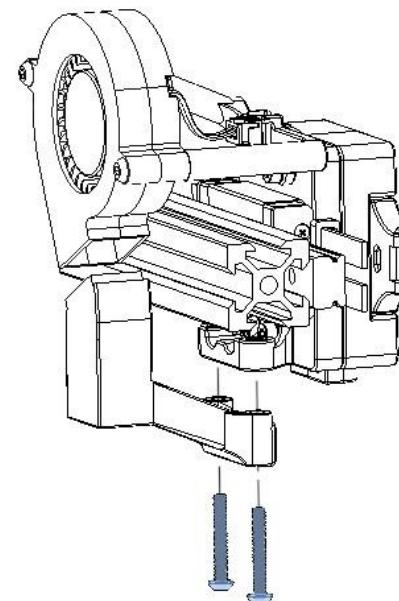


Attach the 5015 fan to the carriage as shown.



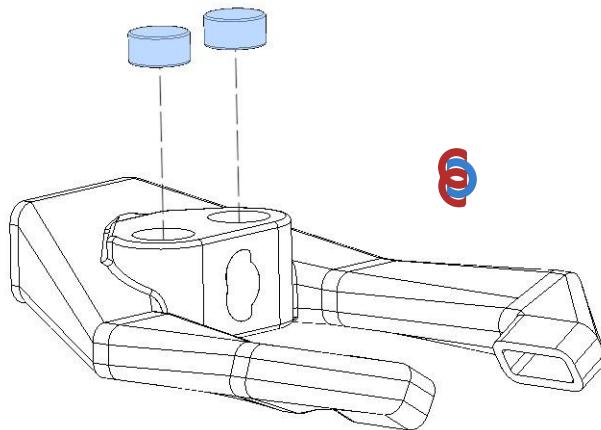


m3 x 20mm bhcs

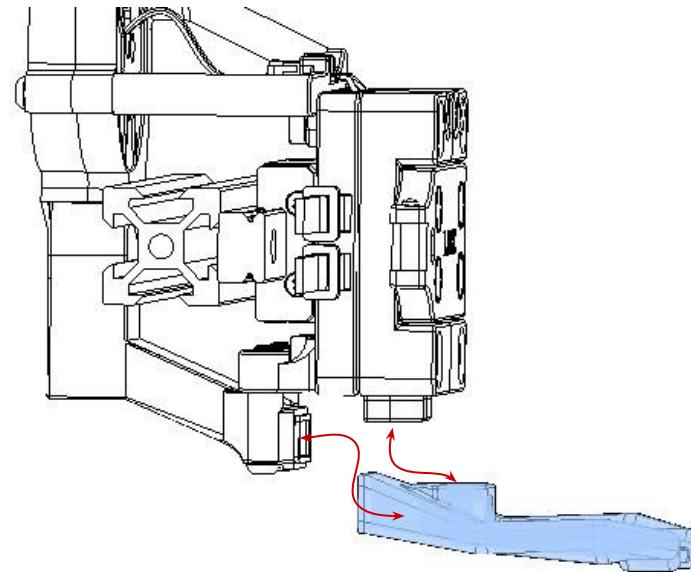


Attach the 5015 Adapter to the 5015 mount as shown.

6x3mm n52 magnets



Apply glue before inserting the magnets in the Duct. Push them in until they are flushed in the slots. **Take note of the polarity of the magnets. Make sure they matched the polarity on Carriage B that you installed earlier.**



Align the intake of the Duct to the 5015 Adapter. The magnets will automatically pull them together and hold them in place. You can tilt the Duct a bit to help make the assembly easier.

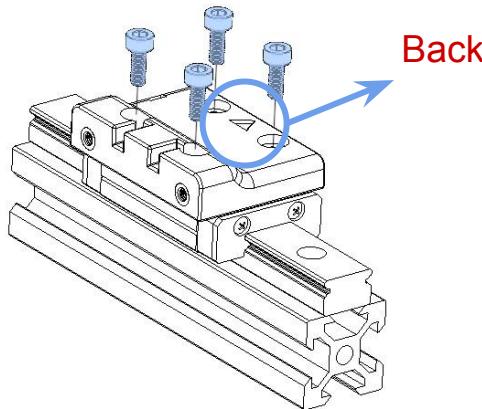


Completed Voron Carriage Assembly

Lineux is a derivative of 2 words, Linear and Flux.

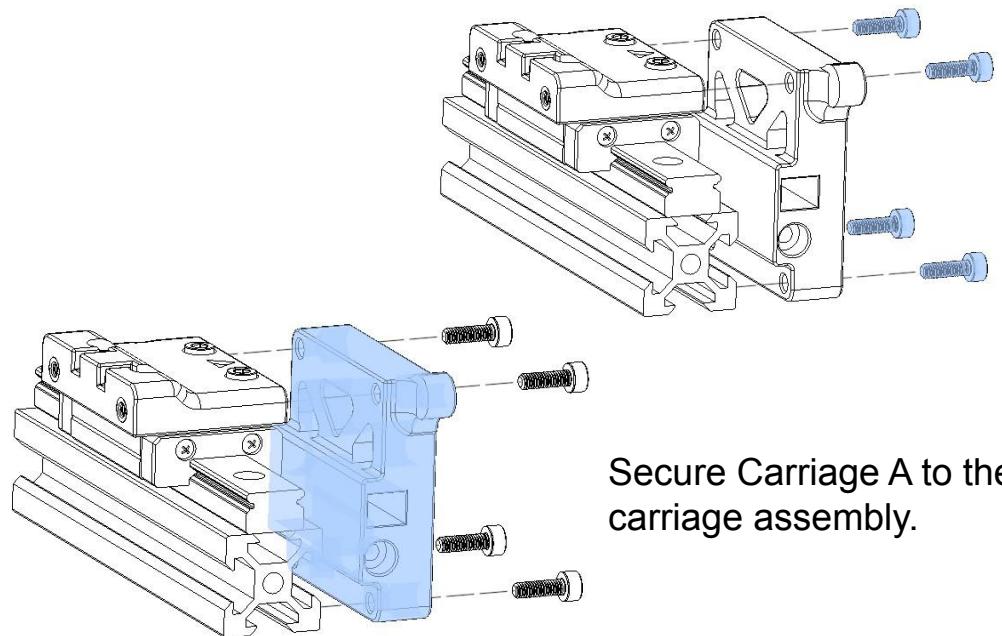


m3 x 8mm shcs

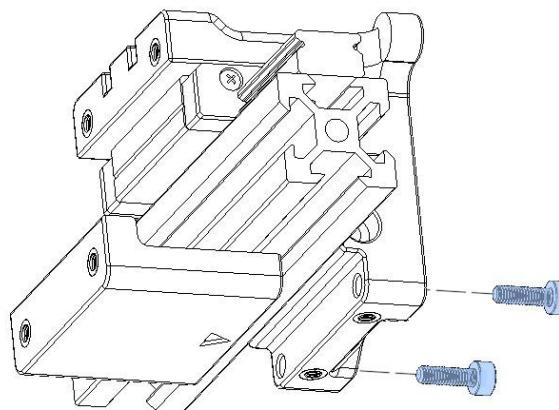
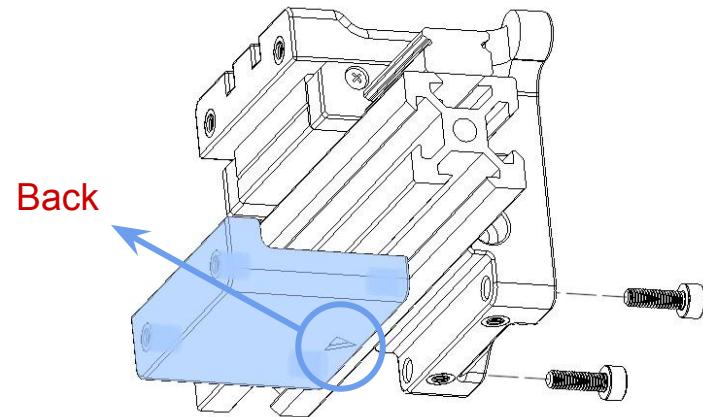


Secure Carriage Top to the mgn block.
The arrow will be pointing to the back.

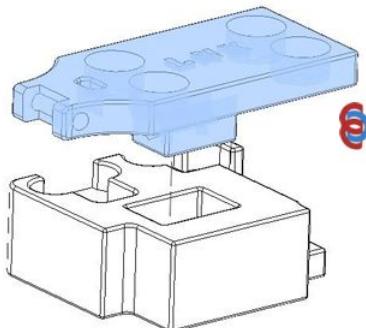
m3 x 10mm shcs



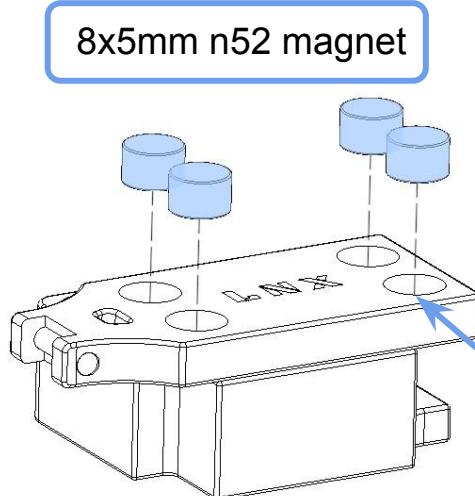
Secure Carriage A to the
carriage assembly.



Secure Carriage Bottom to the carriage assembly. **The arrow will be pointing to the back.**



Place the Locking Plate on the Magnet Mounting Tool. This will make installing the magnets easier.



Insert the magnets in the respective slots. Apply a bit of epoxy or glue before inserting the magnets. You may use a mallet or a wrench to push the magnets in and ensure they are flushed with the top surface. **Take note of the magnet polarity configuration.**

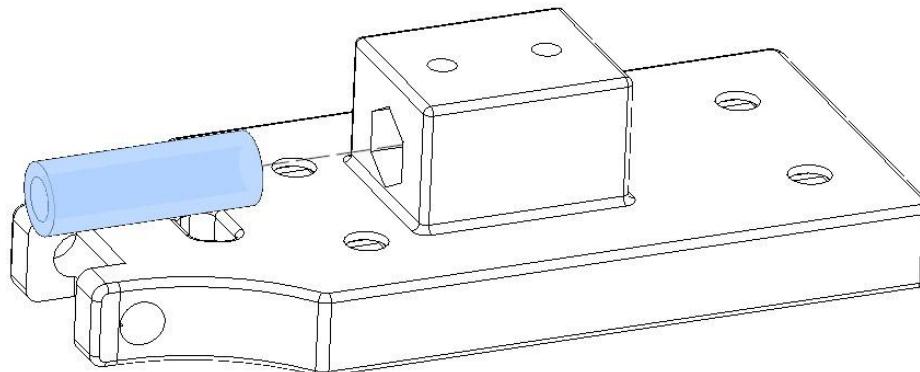


Magnet Mounting Tool



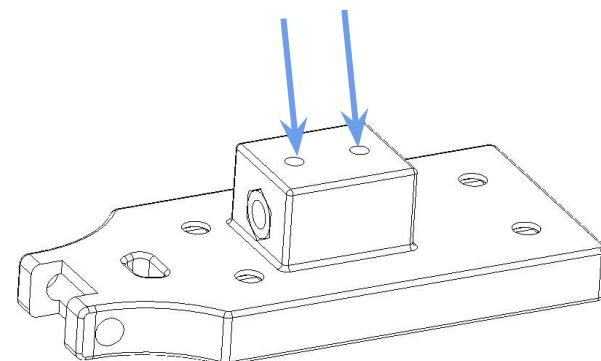
Magnet Polarity Configuration

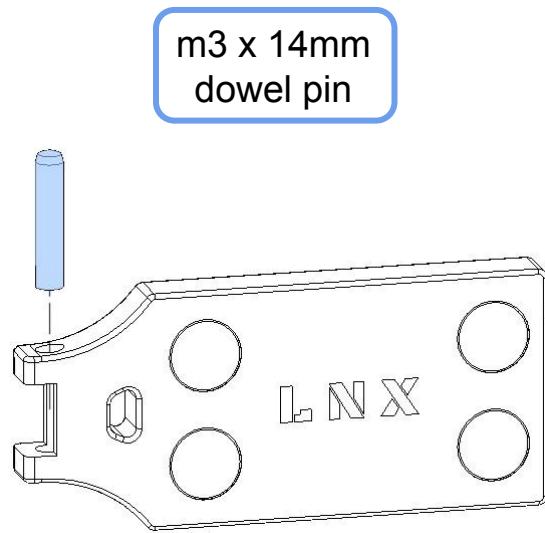
id3 od5 15mm
stainless steel
bushing



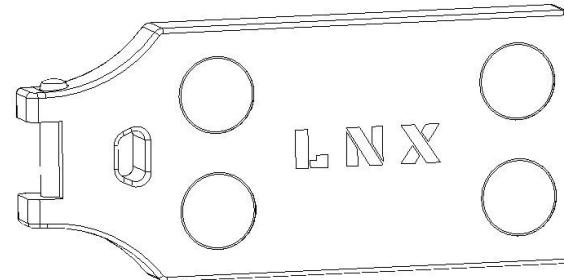
Slide in and keep
both ends flushed.

Apply drop of glue here.

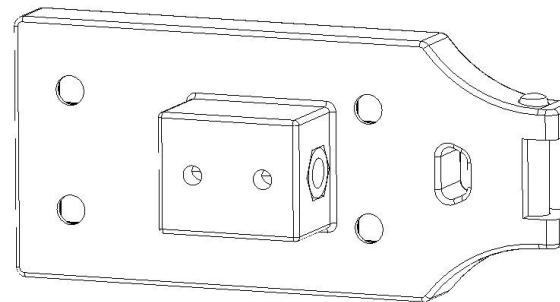


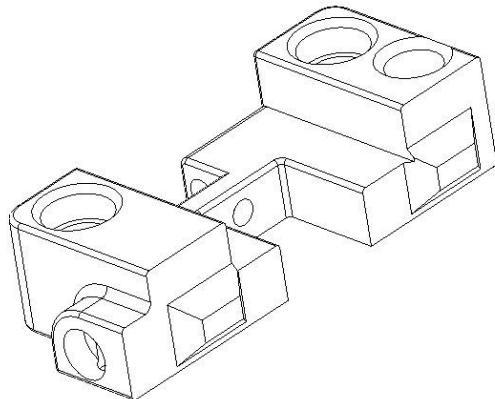


Slide in the dowel pin
and keep both ends
equal.

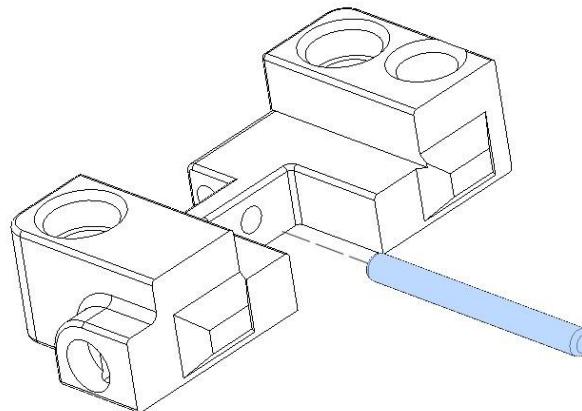


Completed Locking Plate Assembly

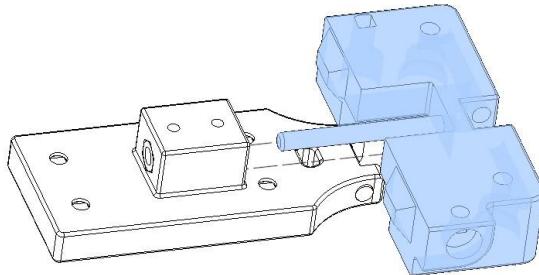




Place Carriage B Left on its back
on a flat surface.

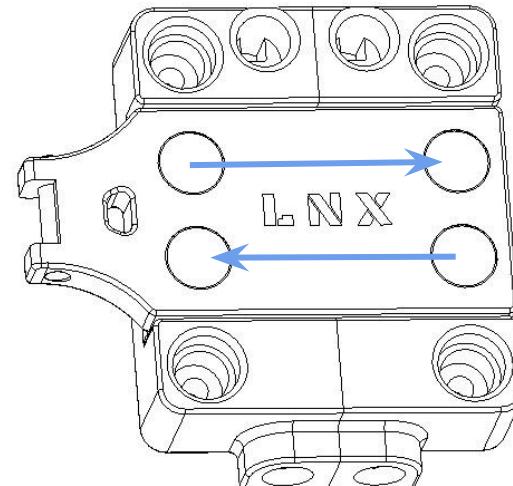
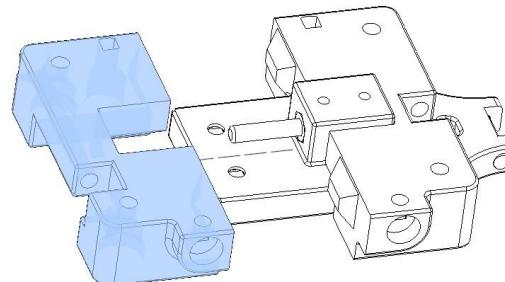


Push the dowel all the way in. It
should be a tight fit.



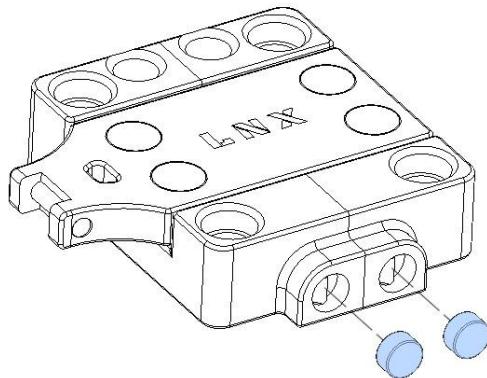
Turn the assembly over. Apply some grease/lubricant on the dowel pin before sliding the Locking Plate in.

Join Carriage B Right together with the assembly. The tabs should aligned and the parts should be flushed together.



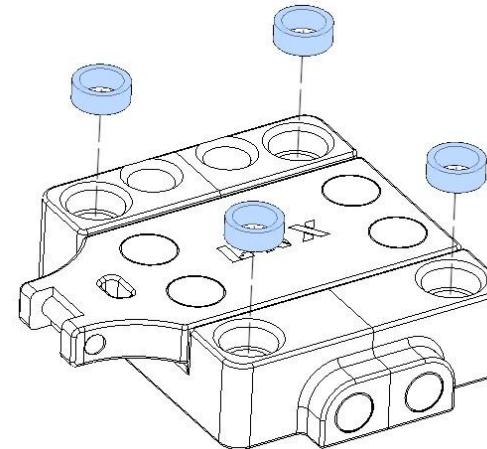
The Locking Plate should be able to slide freely.

6x3mm n52 magnet

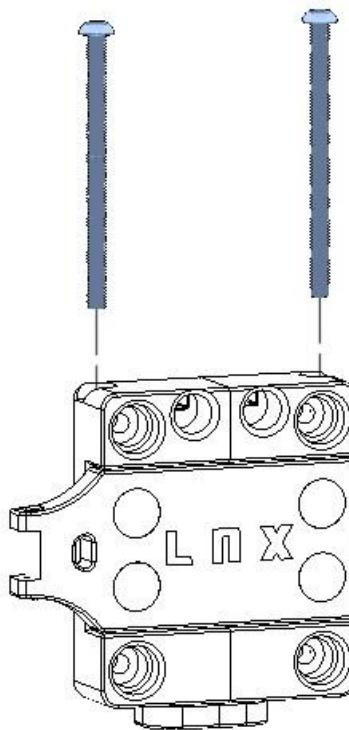


Apply glue before pushing in the magnets. Ensure they sit flushed in the slots. **We recommend to reverse the polarity of both magnet to each other.**

od8 id6 3mm Stainless steel bushing



Apply glue before pushing in the bushings. Ensure they sit all the way in the slots.



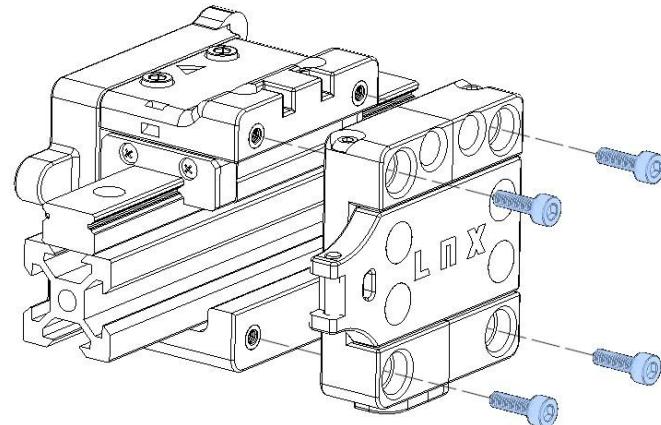
m3 x 45mm bhcs

Screw the bolts all the way in. Be careful as you will be screwing in to plastic towards the end of the bolt. Do not overtighten.

od6 id5 spring 10mm



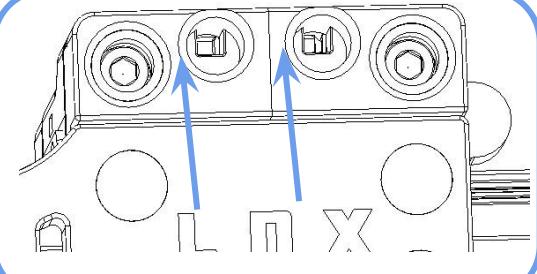
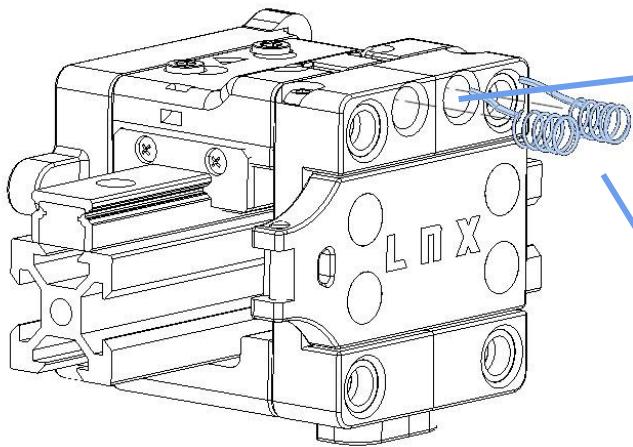
m3 x 10mm shcs



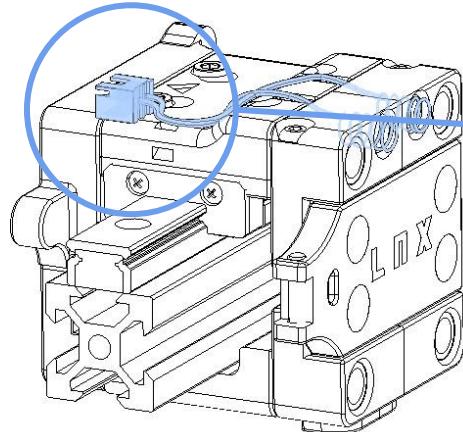
Preparation

Solder about 50mm red and black wire to the end of both springs. Stainless steel solder flux will help to make the soldering easier.

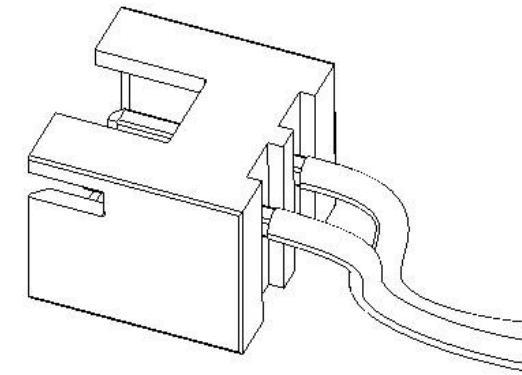
Attach Carriage B to the carriage as shown. Ensure the Locking Plate can still slide freely.



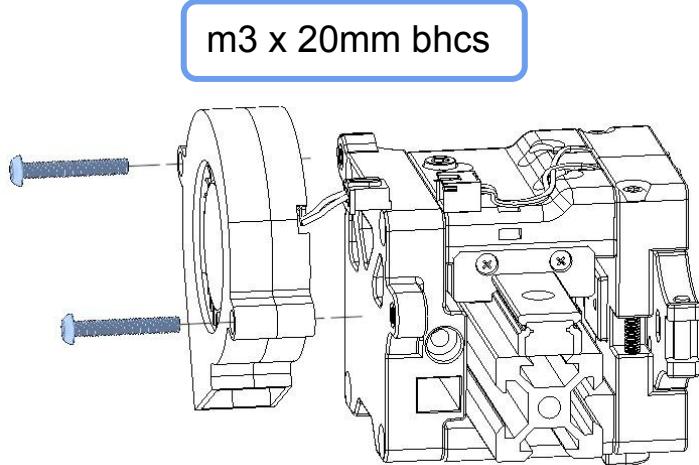
Thread both wires through the wire slots in the spring slots and slide both springs in fully. **Take note that the spring with the red wire should be on the left and the spring with the black wire should be on the right.**



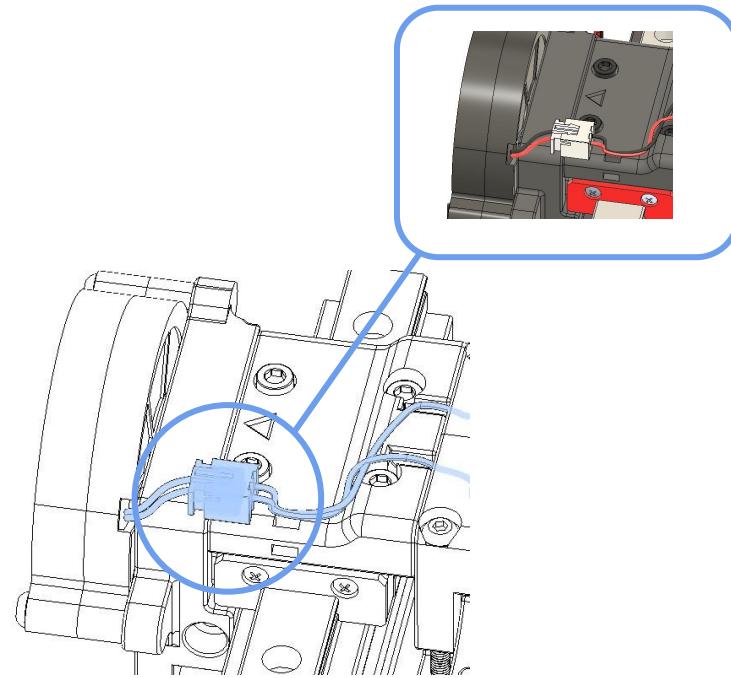
2-pin JST XH2.4 female connector

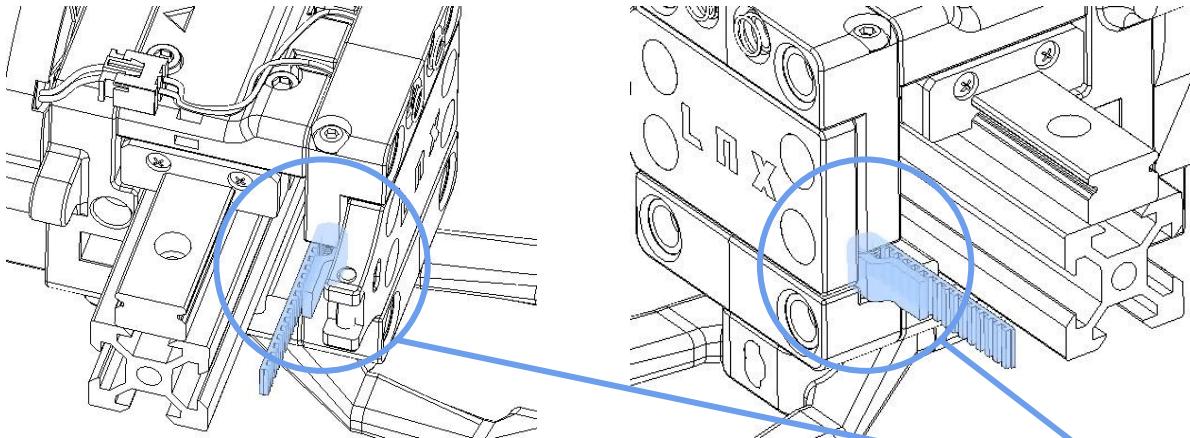


Cut the spring wires to length and solder them to the 2-pin jst connector.



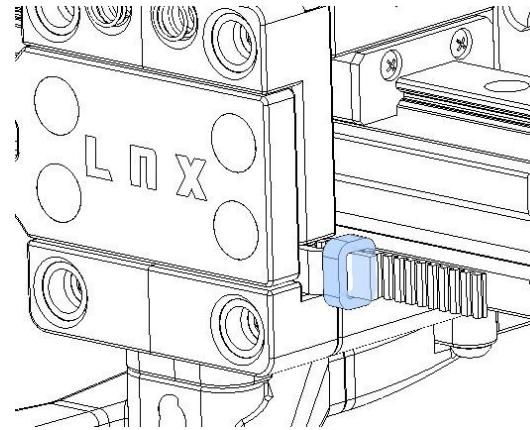
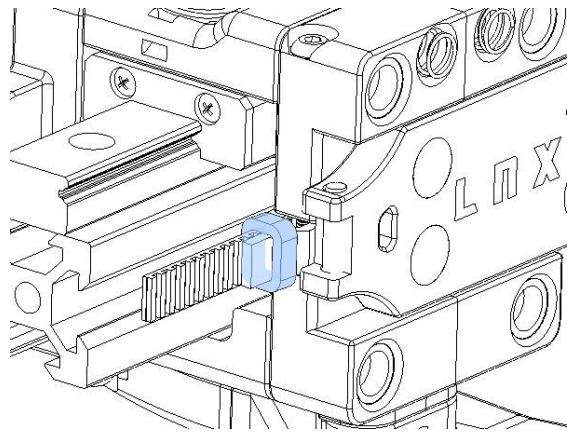
Attach the 5015 fan to the carriage as shown.





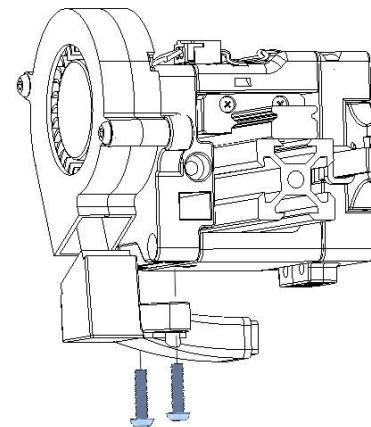
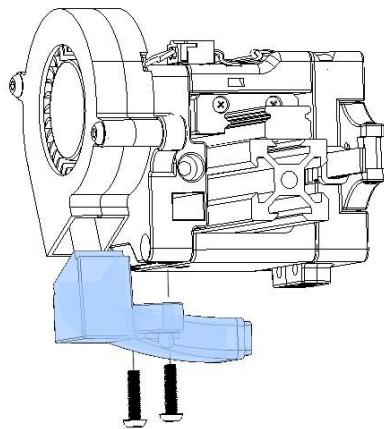
Thread both A and B front belts through the back of the bolts on Carriage B and back out making a loop. **You may unscrew the belt bolts first to make it easier and screw them back once the belt is in position.**



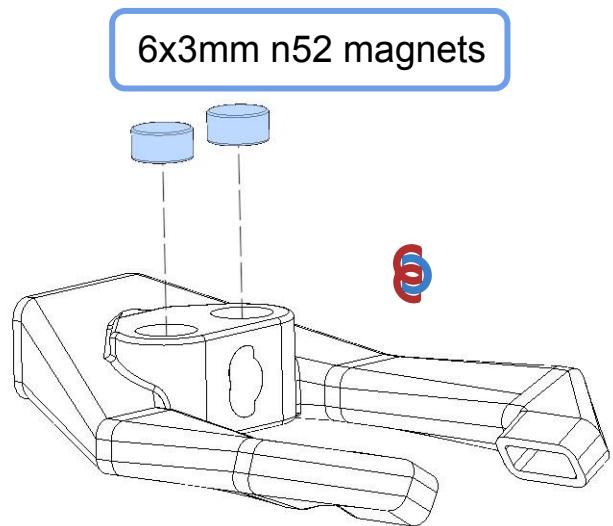


Secure both belts with cable tie.
Get the cable tie as close as
possible to the Carriage B body
before tightening them. Cut any
excess belt if necessary.

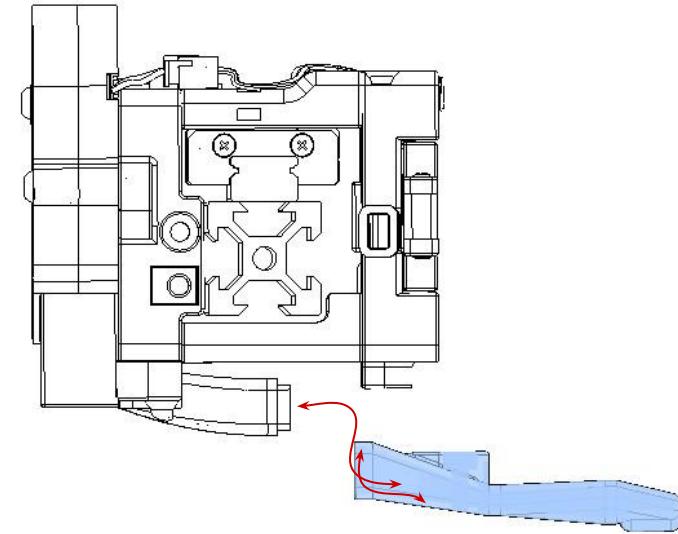
m3 x 12mm bhcs



Attach the 5015 Adapter to the
Carriage A as shown.

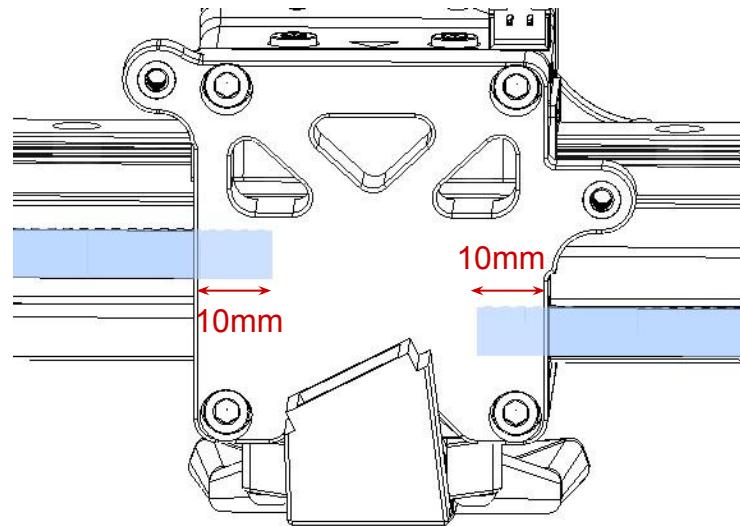


Apply glue before inserting the magnets in the Duct. Push them in until they are flushed in the slots. **Take note of the polarity of the magnets.** Make sure they matched the polarity on Carriage B that you installed earlier.



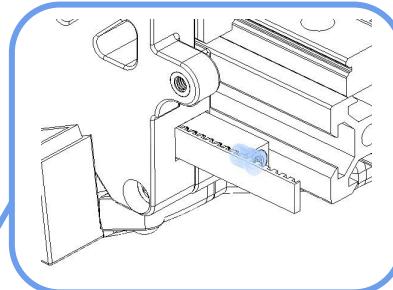
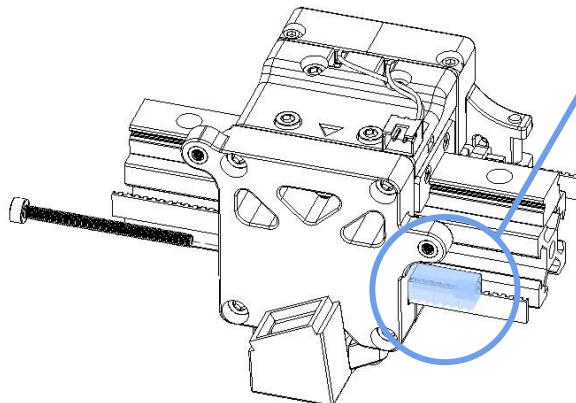
Align the intake of the Duct to the 5015 Adapter. The magnets will automatically pull them together and hold them in place. You can tilt the Duct a bit to help make the assembly easier.

* 5015 fan is removed for illustration purpose

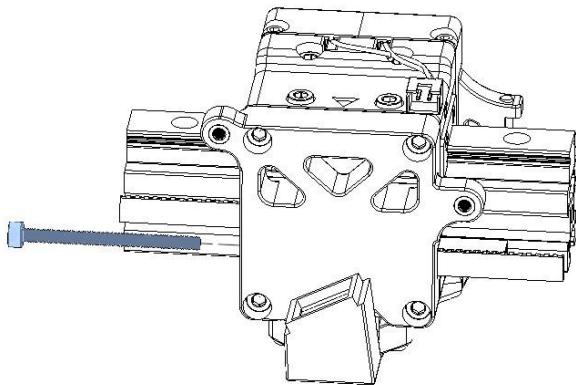


Cut the rear belts with an excess of about 10mm on both sides from the Carriage A body. Ensure the belts are riding correctly on all the pulleys and idlers before committing to the cut.

* 5015 fan is removed for illustration purpose

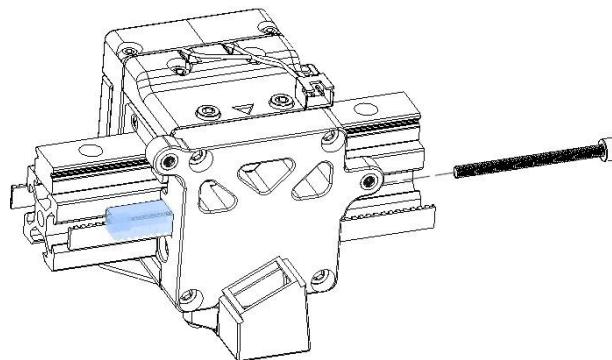


m3 x 40mm shcs

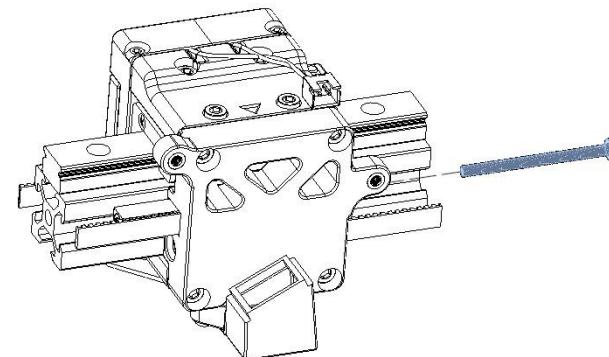


Align the Belt Tensioner at the slot with the teeth facing the belt teeth and secure them with the bolt. Keep them loose for now. **The heat insert should be facing outwards.**

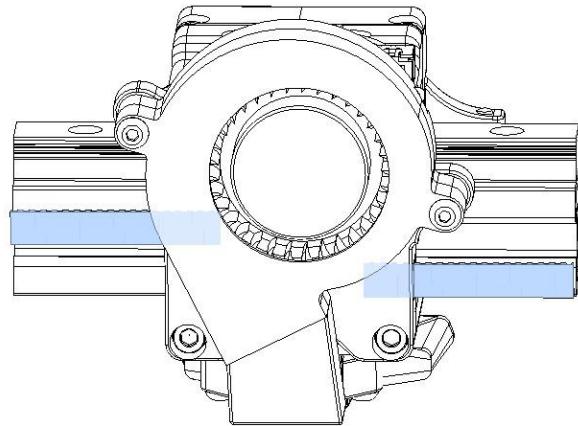
* 5015 fan is removed for illustration purpose



m3 x 40mm shcs



Repeat the same step for the opposite side.



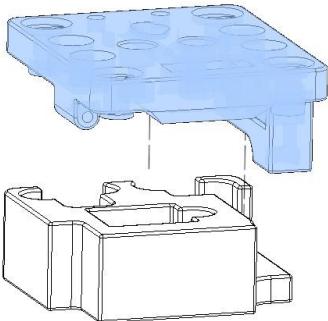
You can now tighten the belts as per your printer's recommended settings.



Completed Vzbot Carriage Assembly

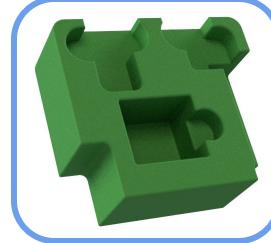
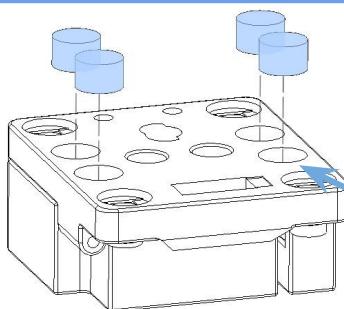
Lineux (toolchanger), BTC Klipper (macros), Dockslide (stowable dock) and Tubby (nozzle offset calibration tool) are created by Bikin Creative Team.



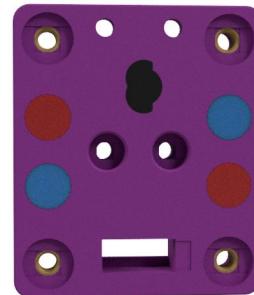


Place the Backplate on the Magnet Mounting Tool. This will make installing the magnets easier.

8x5mm n52 magnets



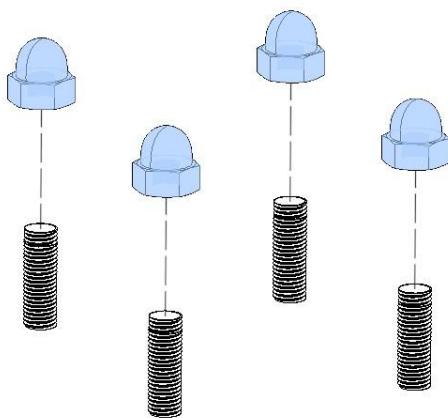
Magnet Mounting Tool



Magnet Polarity Configuration

Insert the magnets in the respective slots. Apply a bit of epoxy or glue before inserting the magnets. You may use a mallet or a wrench to push the magnets in and ensure they are flushed with the top surface. **Take note of the magnet polarity configuration.** Ensure they are the opposite polarity to the configuration on your Locking Plate. This will enable the respective magnets to attract when the Toolhead is engaged to the Carriage.

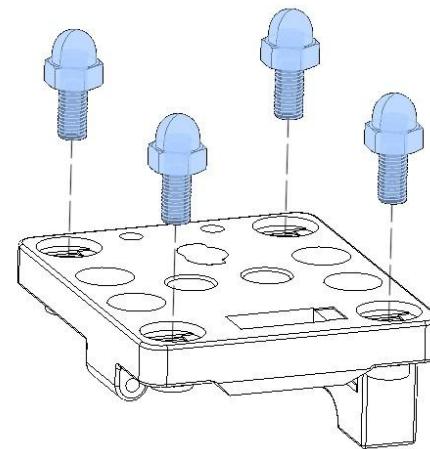
m4 cap nut



m4 x 12mm set screw

Preparation

Screw in the set screw to the cap nuts. Apply loctite before screwing.



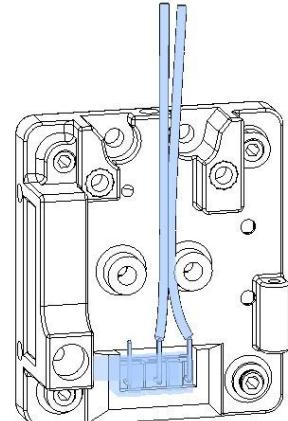
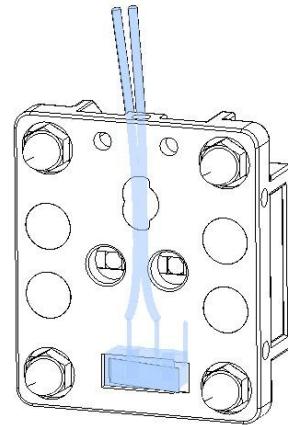
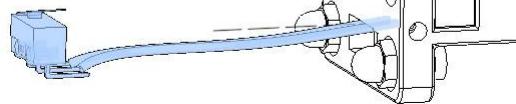
Apply just a bit of Loctite on the set screw thread close to the cap nut before installing. The set screw will screw through the heat insert and into plastic. **Be careful not to allow the Loctite to touch any printed part of the Backplate as it will degrade the material.**

Carriage Sense

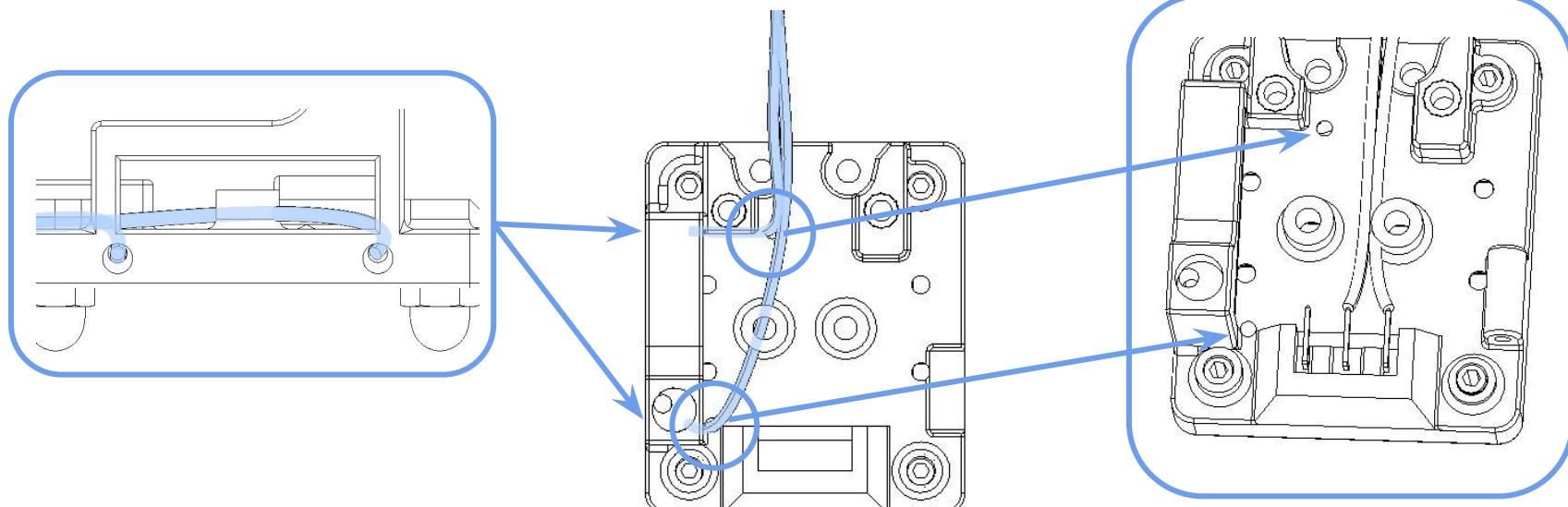


Preparation

Solder 2 wires to the 90deg micro switch. **Take note to solder the wires to C and NC pin on the micro switch.** Different supplier may have different pin array.



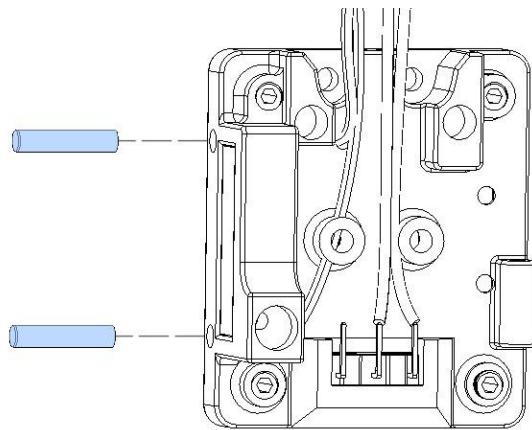
Thread the wire into the cutout slot and rotate the switch as you push it in. It should sit all the way in the slot.

Dock Sense

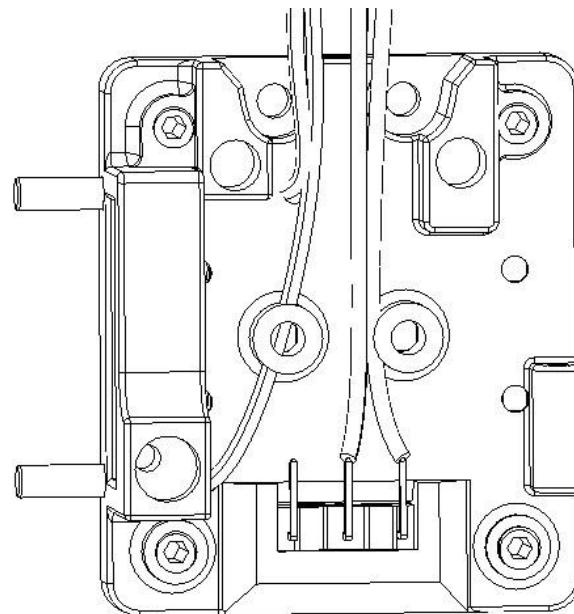
Strip the end of 2 wires and
thread them into the wire slot.
Ensure the stripped ends exit
into the dowel slots.

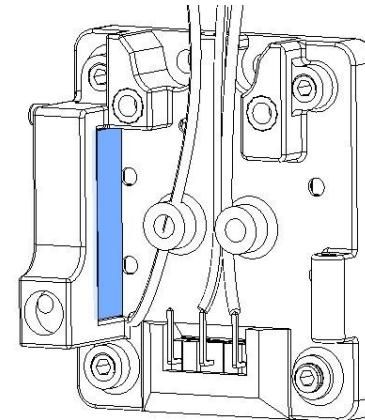
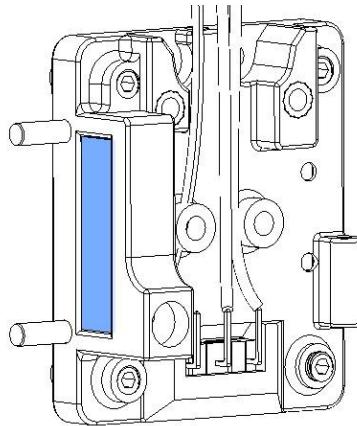
m3 x 14mm dowel pin

Dock Sense



Apply a bit of glue before inserting the dowel pins. Ensure the dowel pins are resting and pushed against the stripped end of the 2 individual wires. Use a multimeter to check for continuity.



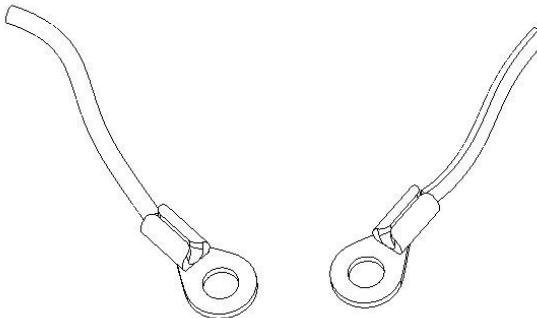


Remove the 2 cutaway support included in the Backplate during printing.

Part Cooling
Fan Connector

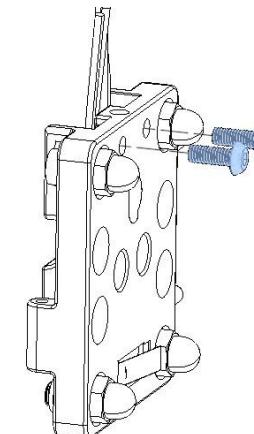
ring terminal ot1.5-3

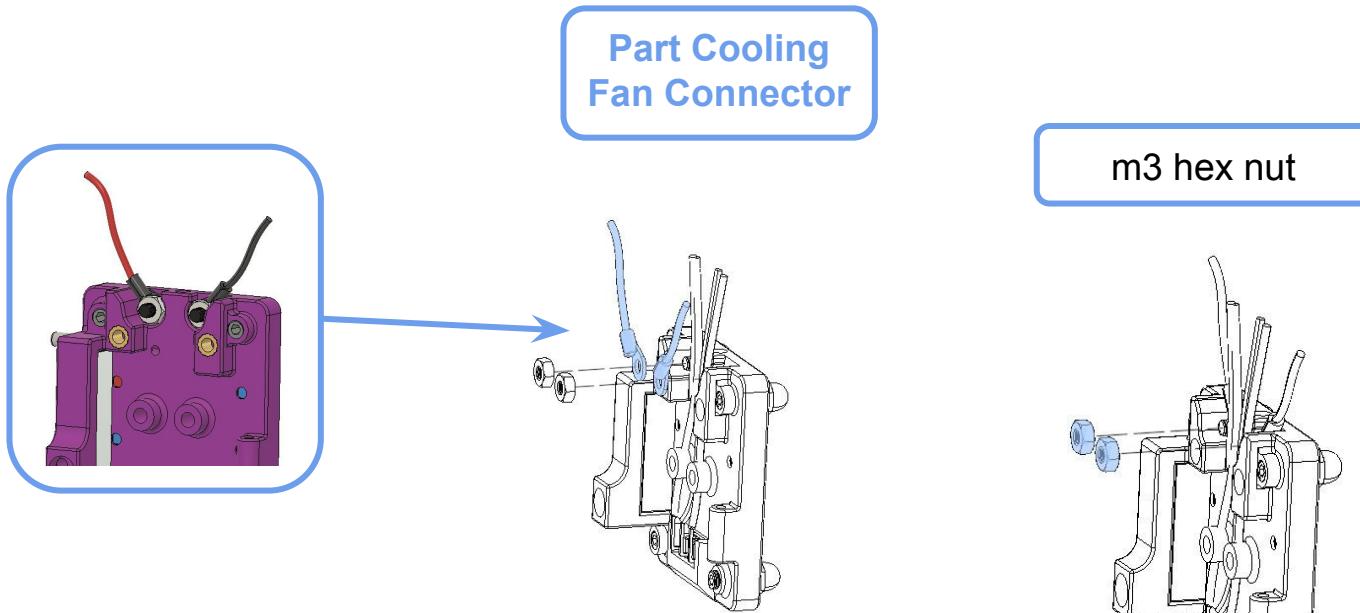
m3 x 8mm bhcs



Preparation

Crimp 2 wires to both ring terminals.

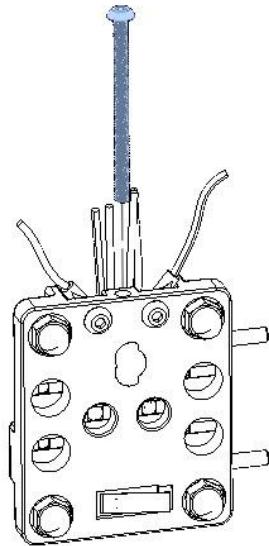




Slide the ring terminals on the bolt.
Ensure the wires colours matched
the spring wires on the carriage that
you installed earlier as these will
determine voltage and ground for
the part cooling fan.

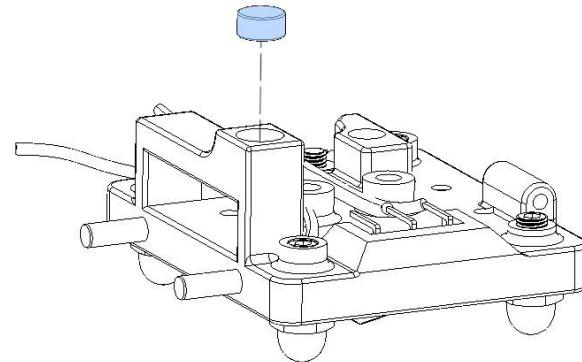
Secure the ring terminals.

m3 x 40mm bhcs

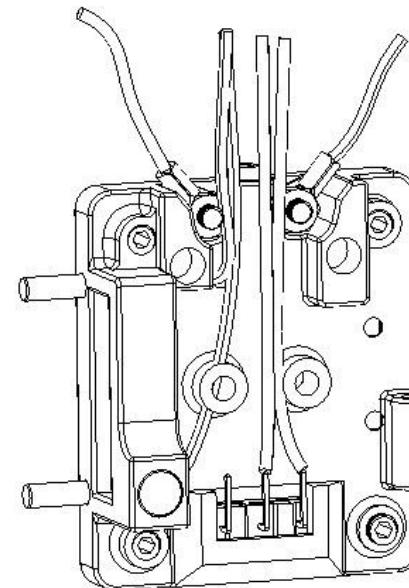
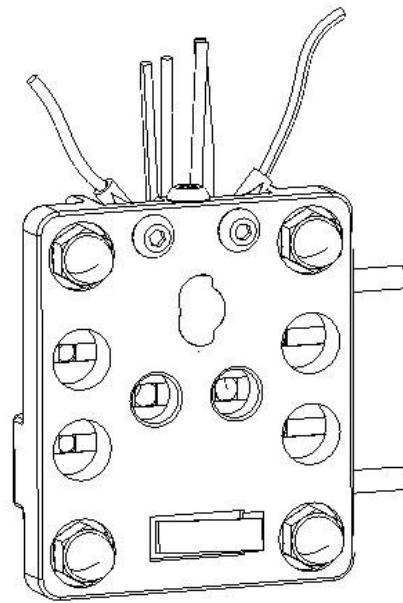


Do not overtighten as you are
screwing into plastic.

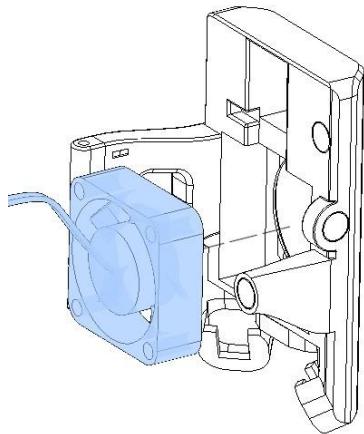
6x3mm n52 magnets



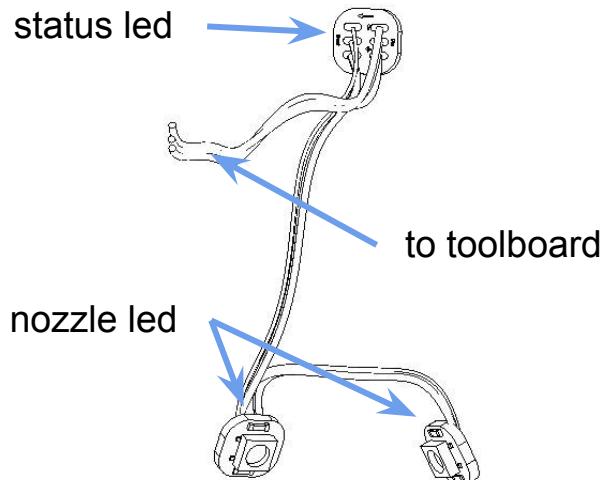
Apply glue before pushing in the
magnet. Ensure they sit flushed in
the slot.



Completed Backplate assembly.

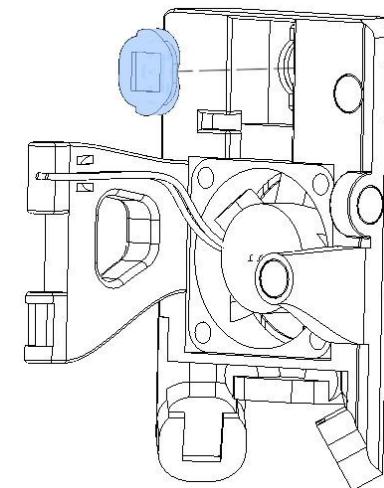


Slot in the 3010 fan into position.

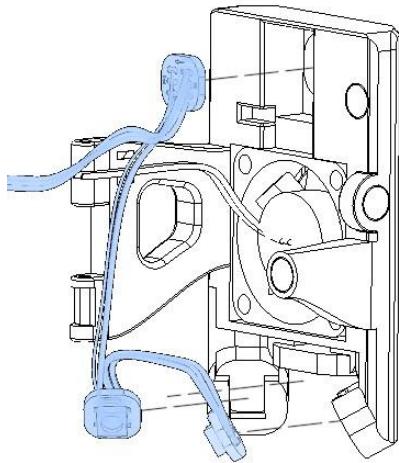


Preparation

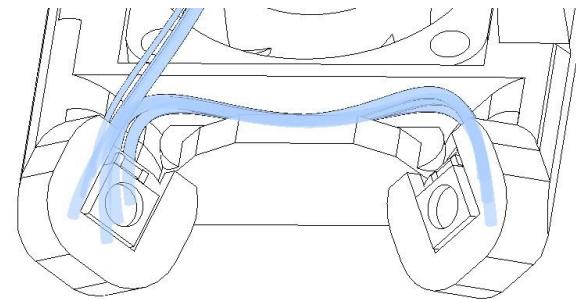
Wire the neopixel leds in this array. The first led from the toolboard will be the status led and the next 2 are the nozzle leds.



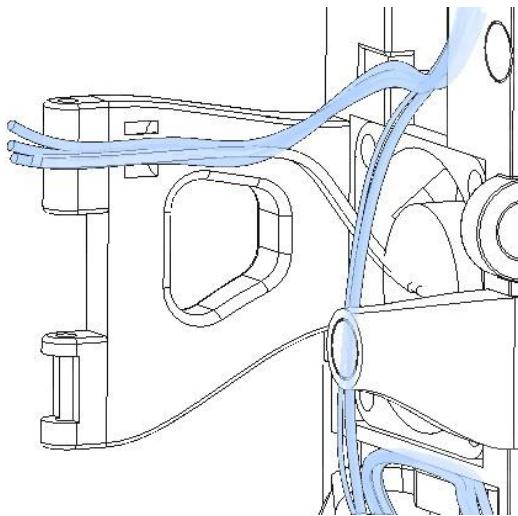
Slot in the Led Diffuser.



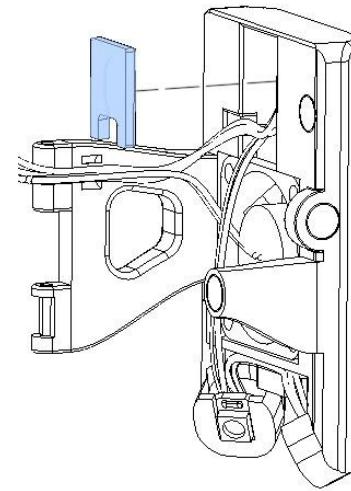
Insert the leds into position in their respective slots.



You can tuck in any excess wire in the wire channel.

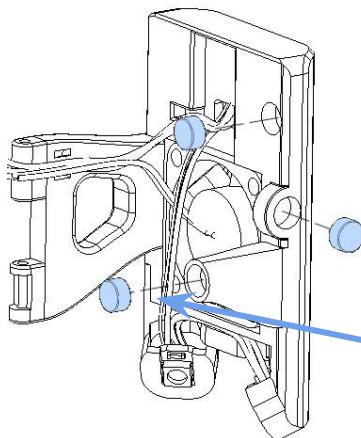


Route the wire along the side arm of the Cowl. You will cable tie the wires together later.

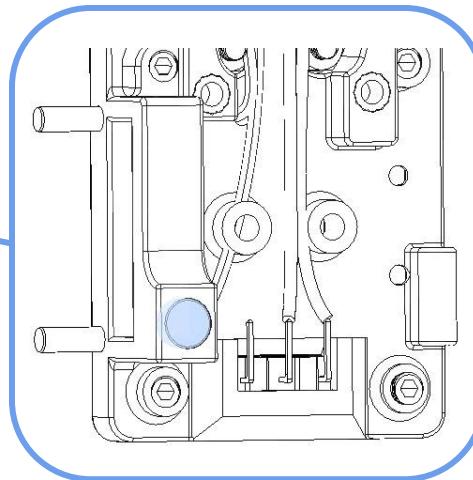


Cover the status led with the Led Stopper.

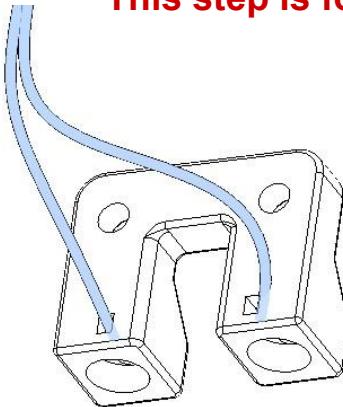
6x3mm n52 magnets



Apply a bit of glue/epoxy before inserting the magnets. **Take note of the indicated magnet.** Ensure the polarity matches the magnet on the Backplate that you install earlier. They should be attracted to each other.

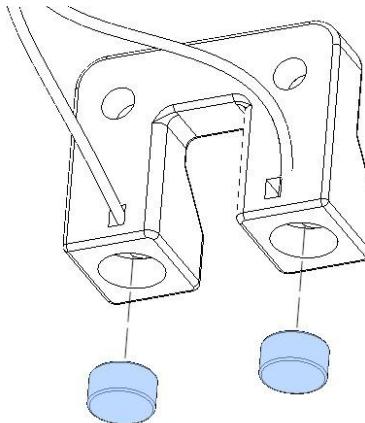


* This step is for Klicky Probe. You may skip this if you are not using Klicky Probe.



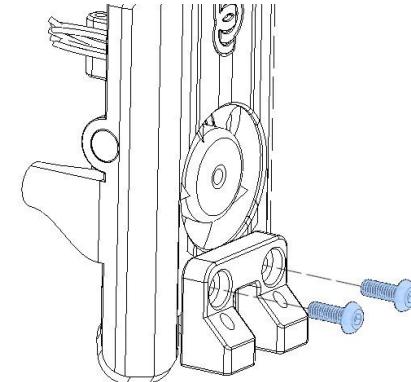
Strip the end of 2 wires and thread them into the 2 holes in the Klicky Mount. Ensure the stripped exposed end are fully inside the magnet slot.

6x3mm n52 magnets

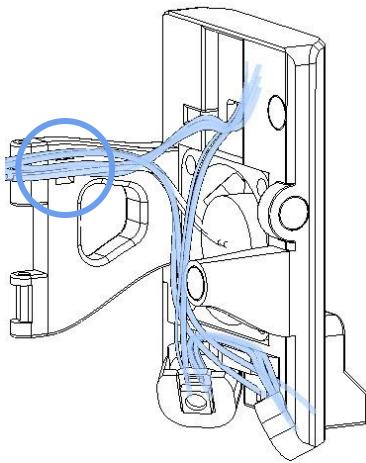


Apply a bit of glue before inserting the magnets. **Ensure the magnets are touching the stripped ends of the wires. Use a multimeter to check for continuity.**

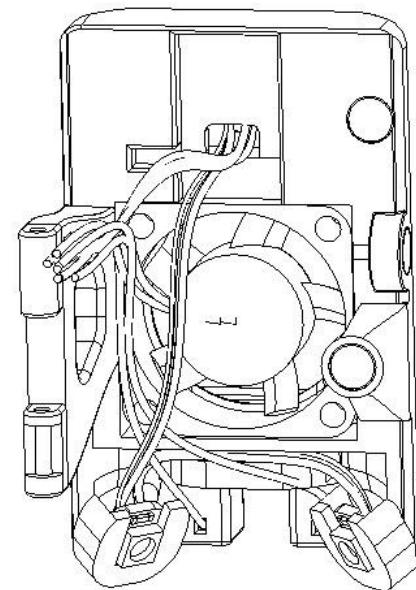
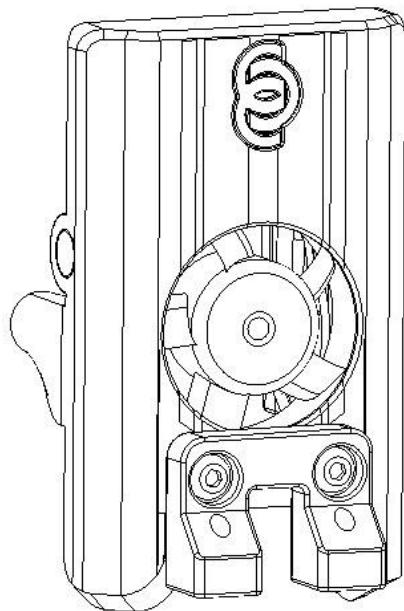
m3 x 8mm bhcs



Attached the Klicky Mount to the Cowl.

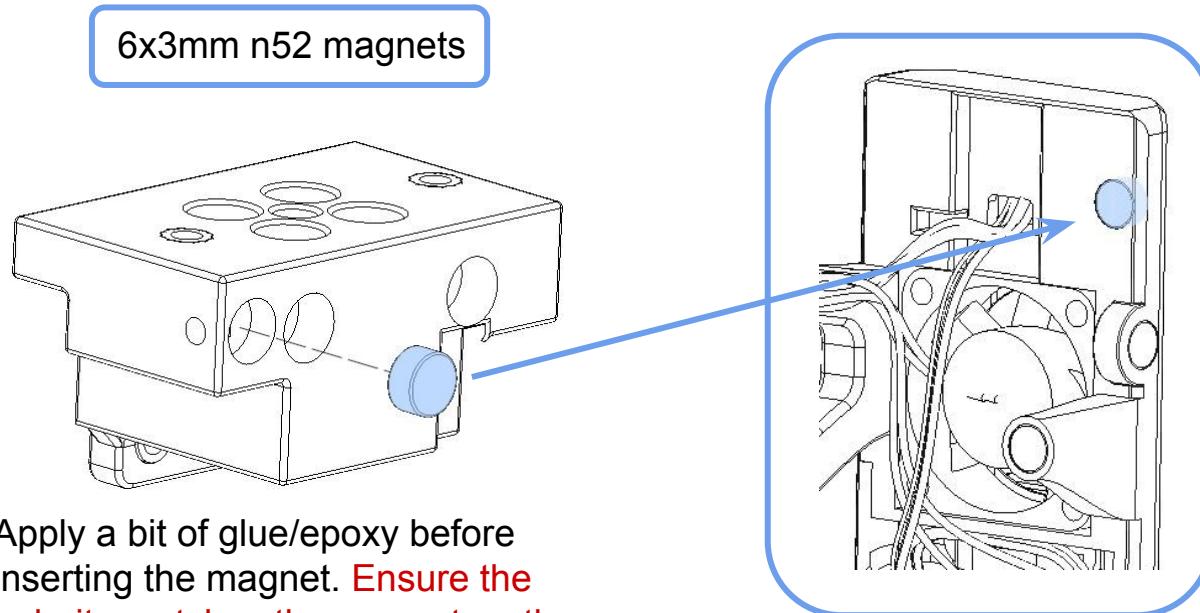


You can now cable tie the led wires, fan wires and klicky wires together on the cowl arm.



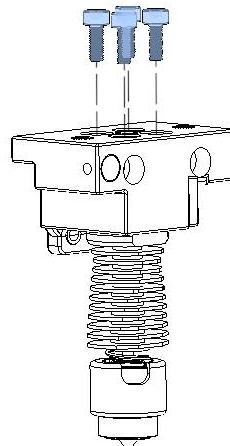
Completed Cowl Assembly

* This guide is showing the Revo Voron hotend. Other hotends may require different printed parts, hardware or steps.

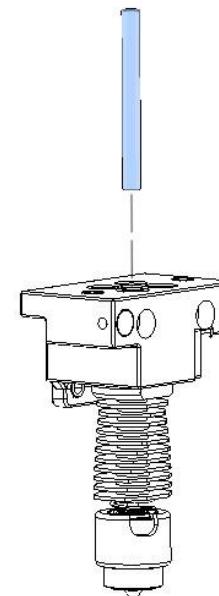


Apply a bit of glue/epoxy before inserting the magnet. Ensure the polarity matches the magnet on the Cowl that you install earlier. They should be attracted to each other.

m3 x 8mm shcs



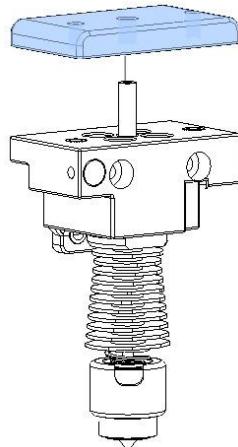
Ptfe tube 40mm



Attached the Revo Voron hotend.

Slide the Ptfe tube fully in.

* This guide is showing the Sherpa Micro Extruder. Other extruders may require different printed parts, hardware or steps.

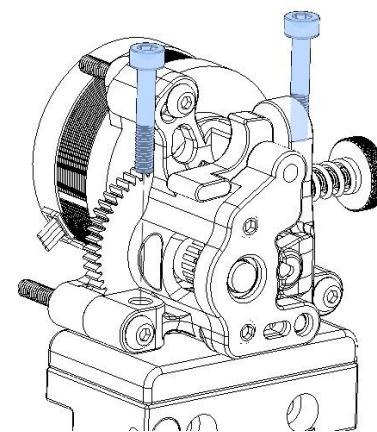


Place the Sherpa Micro Plate over the assembly.

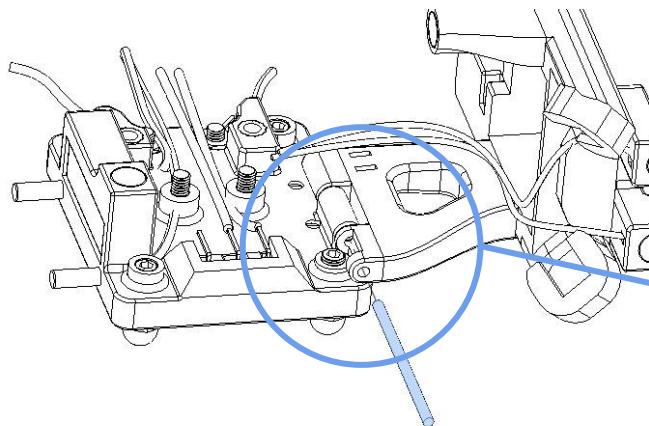


Secure the Sherpa Micro Extruder to the assembly.

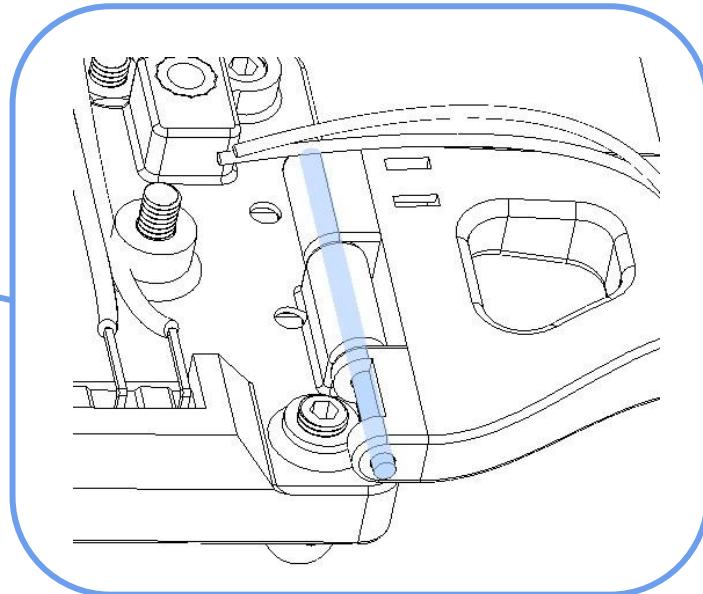
m3 x 18mm shcs

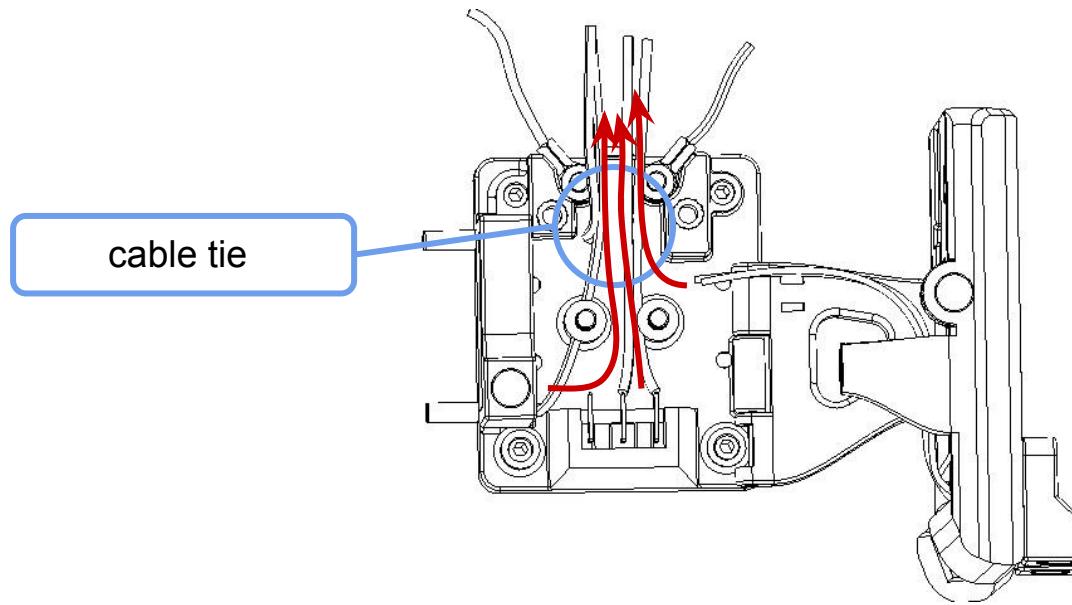


filament 37mm



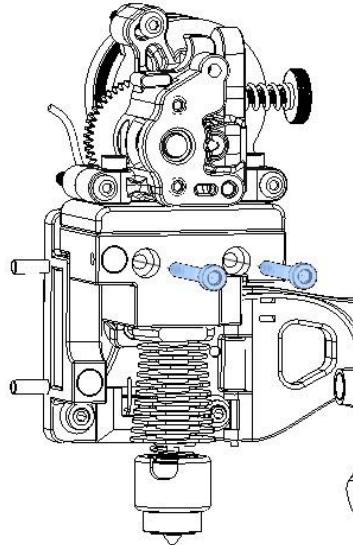
Rotate the Cowl assembly 90° and align the swivel hinge with the Backplate assembly. Slide in the filament to secure both assemblies together. You can pinch both ends of the filament using a plier to secure it in place.



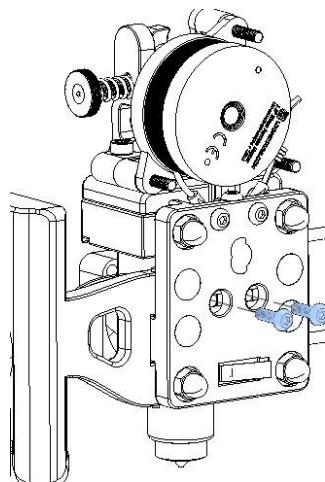


Route all the wires from the Cowl into the middle channel of the Backplate as shown. Keep the Cowl in the 90° position. Cable tie all the wires in the middle of the channel if needed.

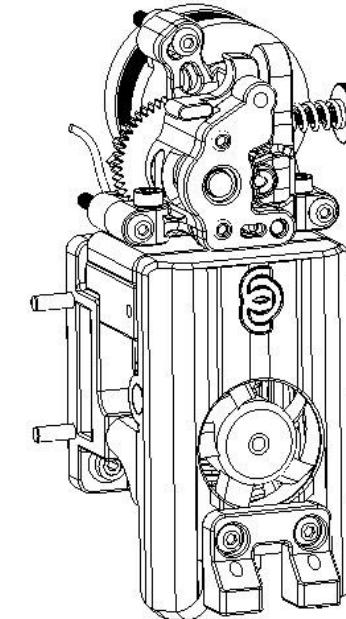
m3 x 25mm shcs



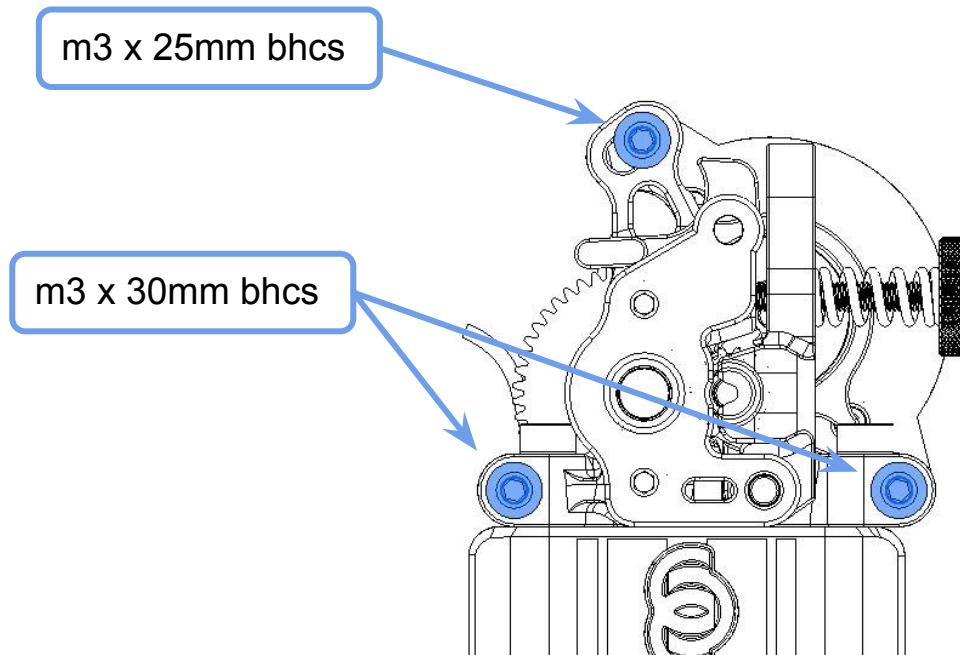
m3 x 10mm bhcs



Secure the hotend/extruder assembly to the Backplate.

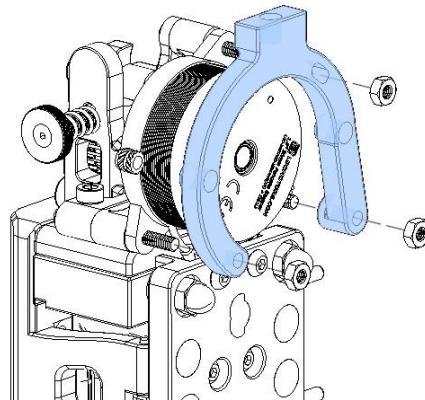


Close the Cowl. It should stay securely in place via the magnets.

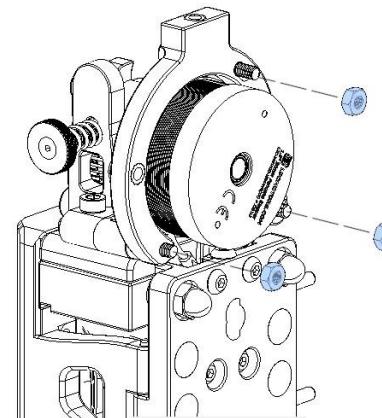


Replace the 3 bolts of Sherpa Micro extruder.

* This guide is showing the Bigtreetech Ebb36 toolboard. Other toolboards may require different printed parts, hardware or steps.

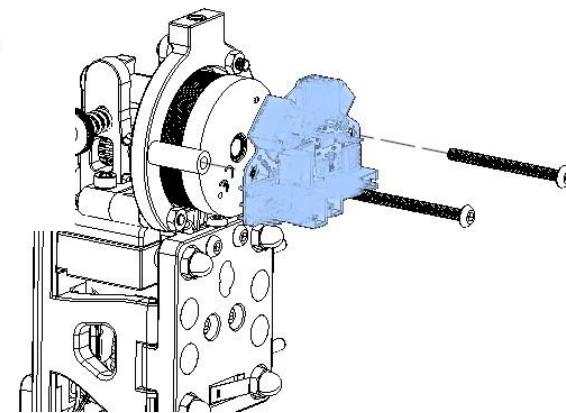
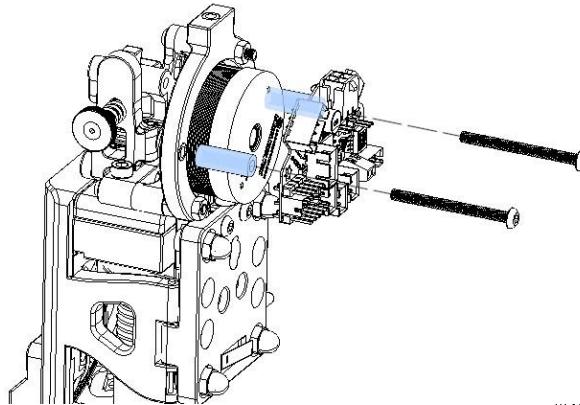


m3 hex nut

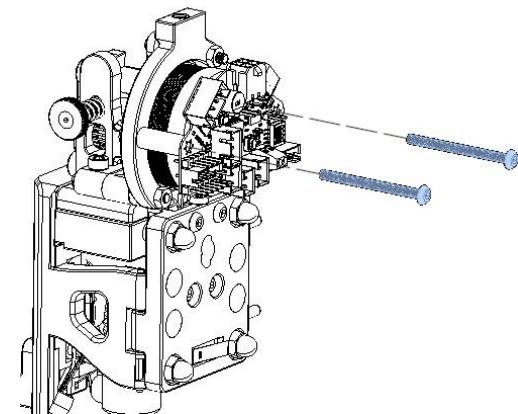


Attach the Sherpa Micro Ebb Mount to the extruder and secure them with the hex nuts.

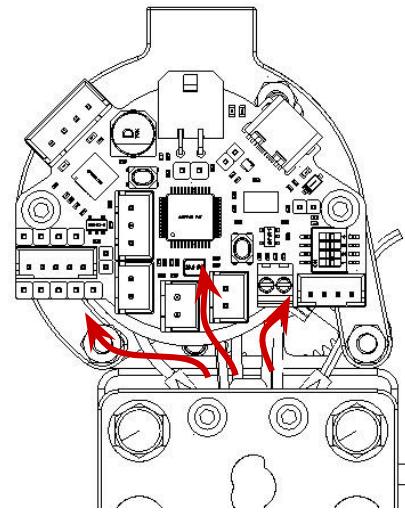
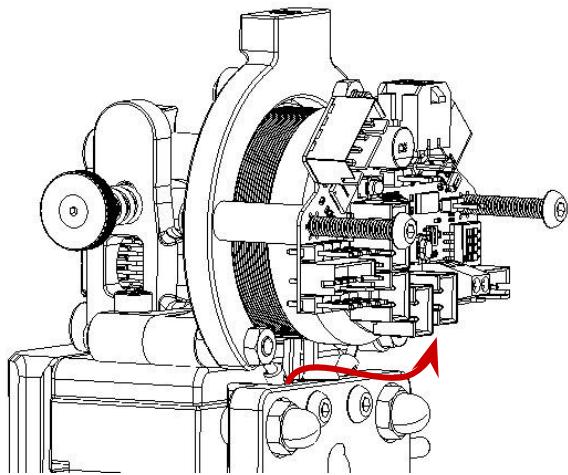
Toolboard Spacer



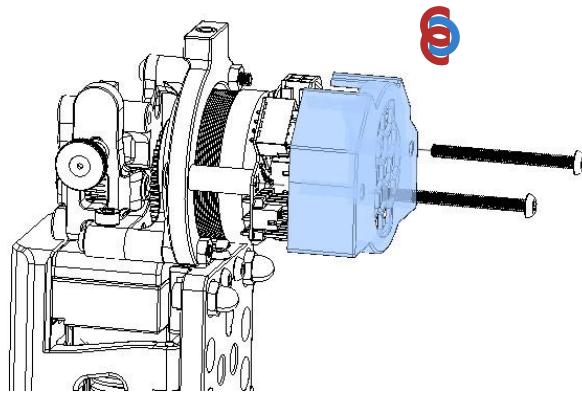
m3 x 25mm bhcs



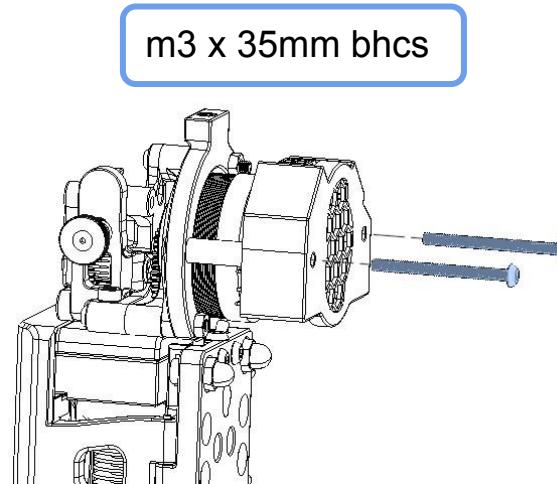
Temporary attach the Ebb36 to the
Ebb mount.



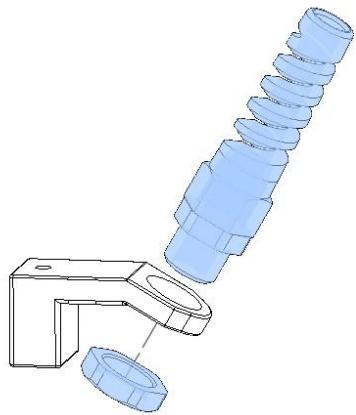
Route all the wires from the Backplate and connect them to their respective connectors/pins on the toolboard. Trim the wires as required and crimp their appropriate connector. **Refer to the toolboard wiring diagram (page 107) for reference.**



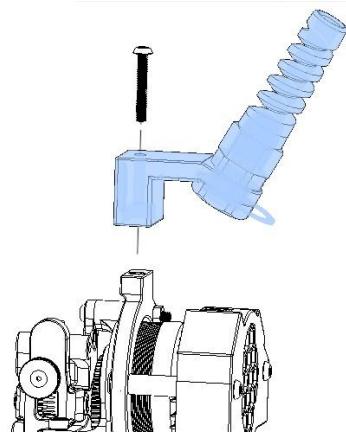
Remove the 2 bolts and attach the Toolboard Cover after you have connected all the wires.



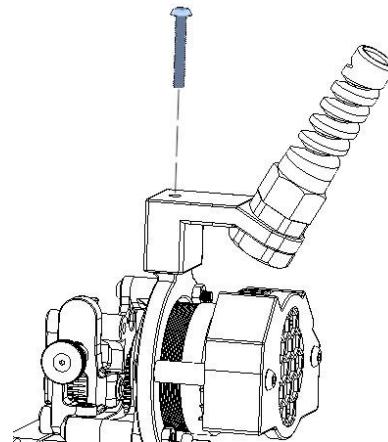
Use longer bolts to secure the assembly in place.



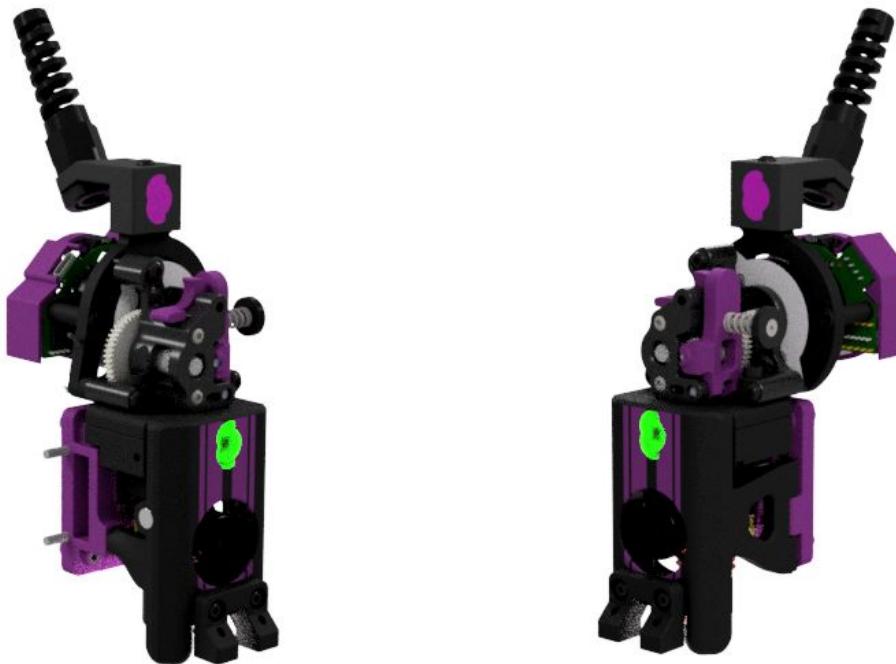
Attach the PG7 Flex Gland
to the Umbilical Adapter.



m3 x 20mm bhcs



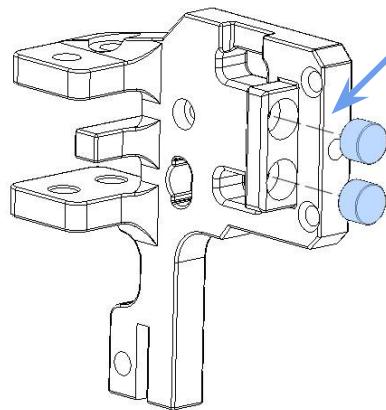
Secure the Umbilical Adapter to the
Ebb36 Mount.



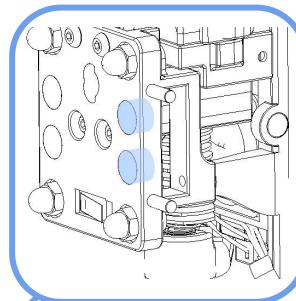
Completed Toolhead Assembly

Lineux has since been adapted on different printers eg, Ratríg Vcore 3.1, Voron Trident, Voron 2.4, Ender 5, BLV Mgn Cube, Flatland, etc, by the community around the world.

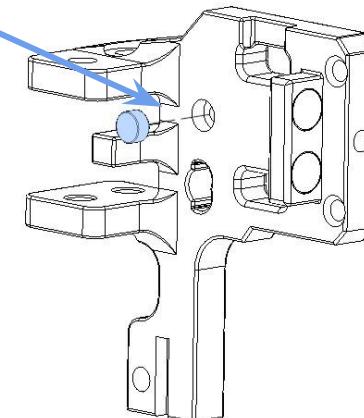
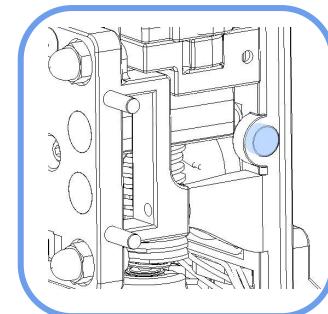




8x5mm n52 magnets



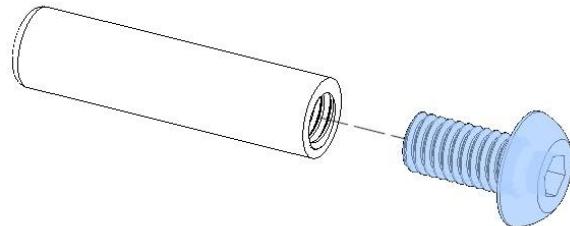
Apply a bit of glue/epoxy before inserting the magnets. **Ensure the polarity matches the magnet on the Cowl and Backplate that you install earlier.** They should be attracted to each other when the toolhead is on the dock.



6x3mm n52 magnets

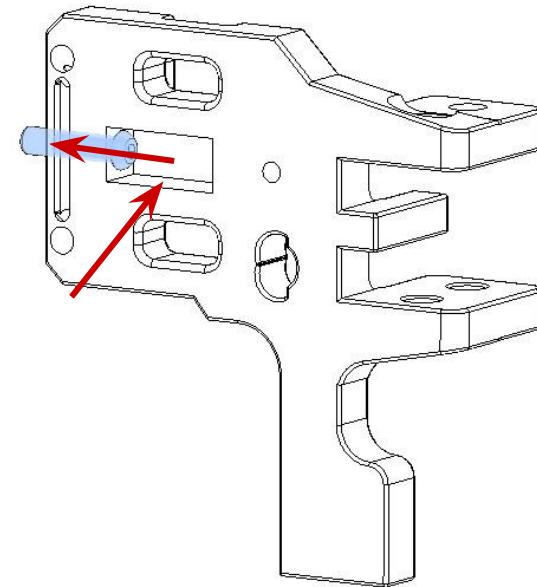
m3 od4 15mm
threaded dowel pin

m3 x 6mm bhcs



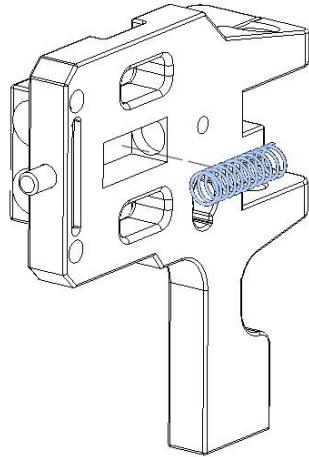
Preparation

Apply Loctite before screwing in fully.

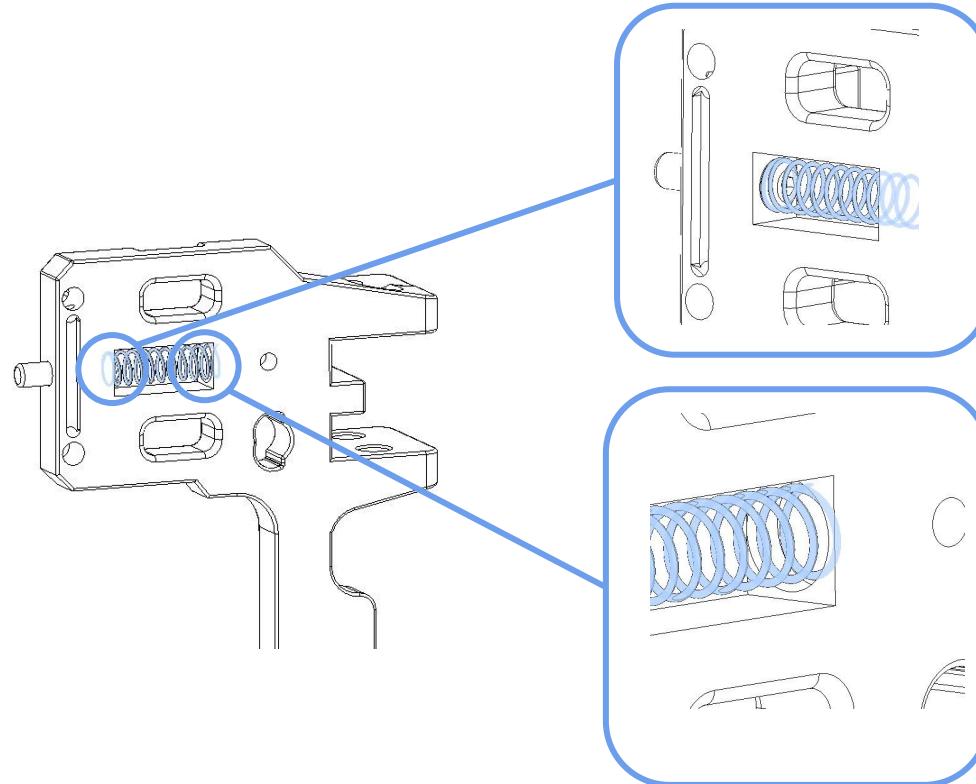


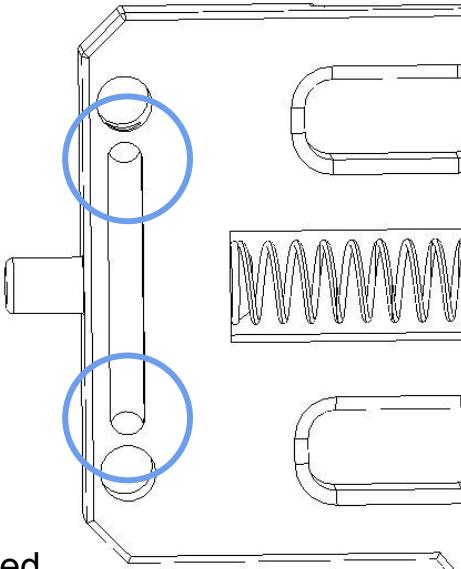
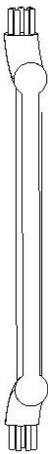
Slide the dowel pin in the slot and push it all the way to the front.

od6 id5 20mm spring

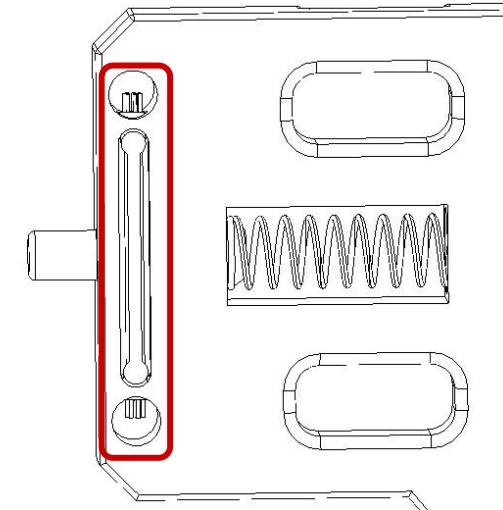


Slide the spring in the slot. Ensure the spring is seated properly on the buttonhead screw and the spring cutout.



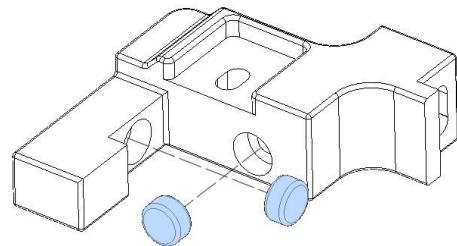


Strip the ends of a wire about 30mm long and thread the exposed ends into the 2 slots on the Dock. Ensure the exposed ends exit into the dowel slots as they will be forming the connection for the Dock Sense.



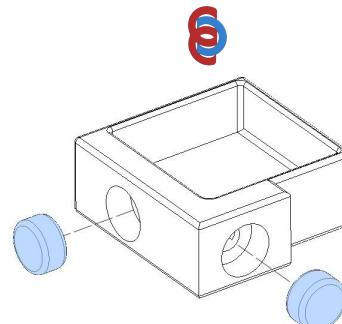
You may tape the wire down to secure it in place.

6x3mm n52 magnets

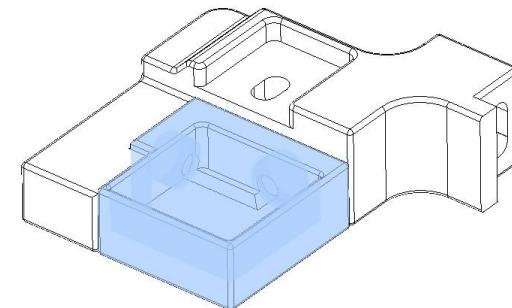


Apply a bit of glue/epoxy before inserting the magnets to the Nozzle Blocker Mount. **Ensure they are flushed with the surface.**

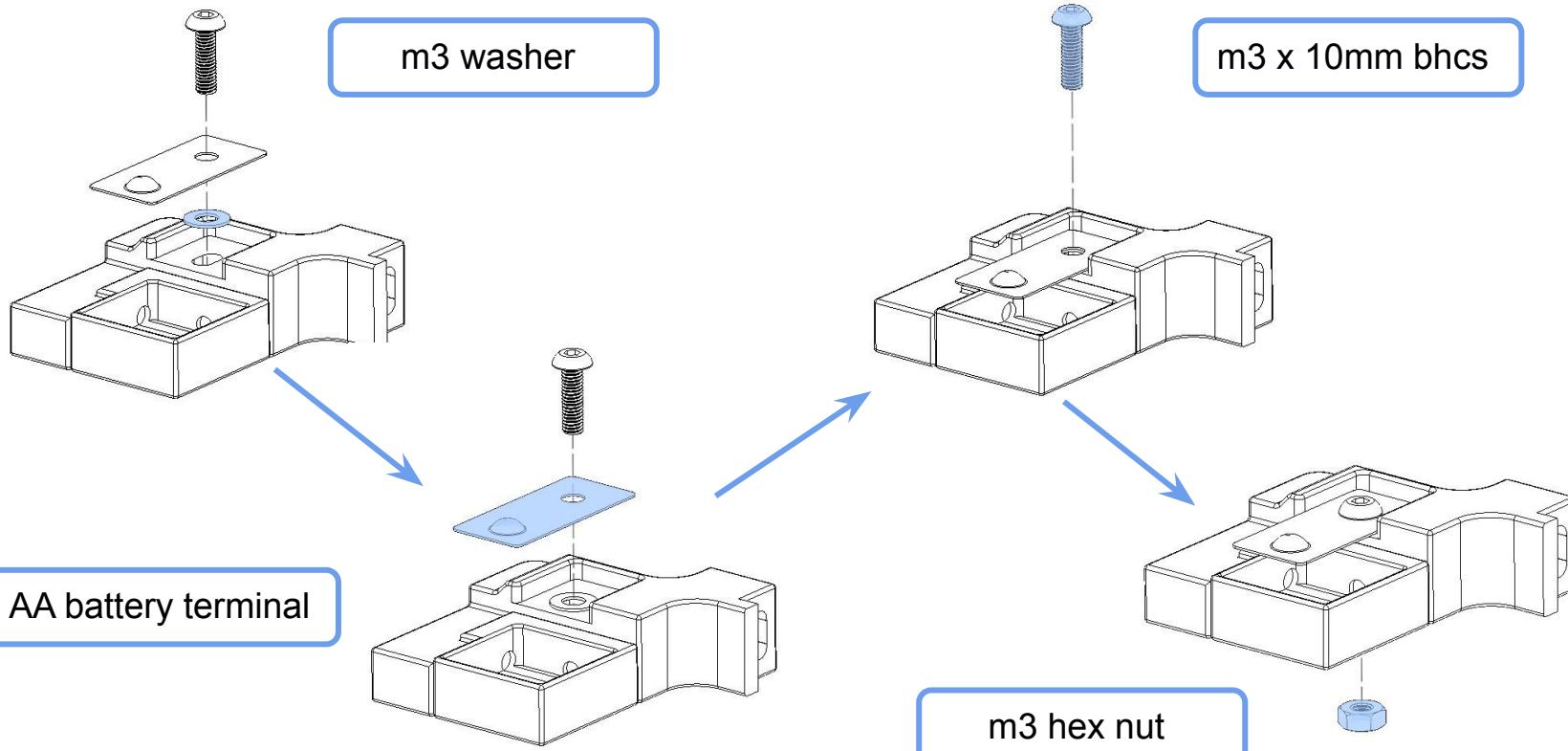
6x3mm n52 magnets

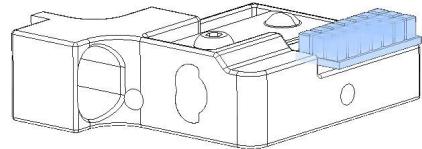


Apply a bit of glue/epoxy before inserting the magnets to the Drip Tray. **Ensure the polarity matches the magnet on the Nozzle Blocker Mount that you have just installed. They should be attracted to each other.**

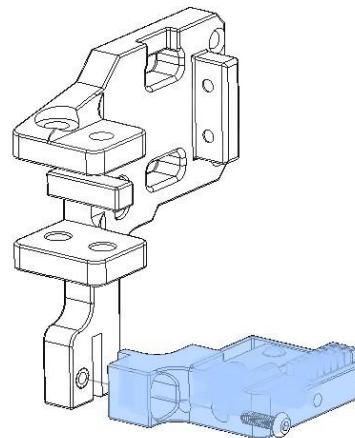


Attach the Drip Tray to the Nozzle Blocker Mount.

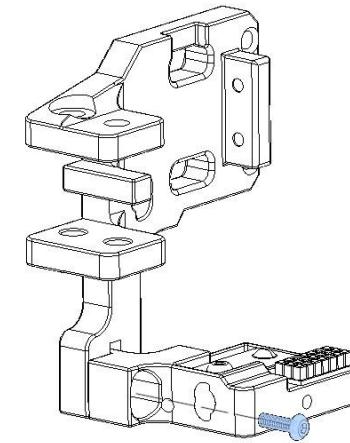




Attach the Bambulab
Silicone Wiper.

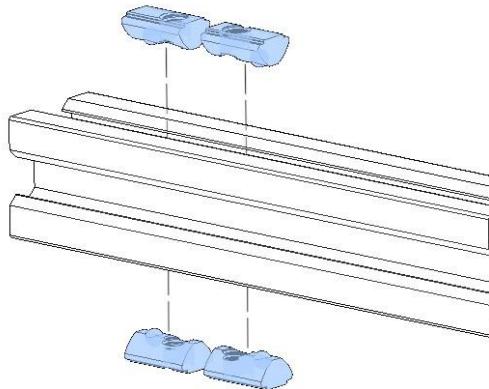


m3 x 10mm bhcs

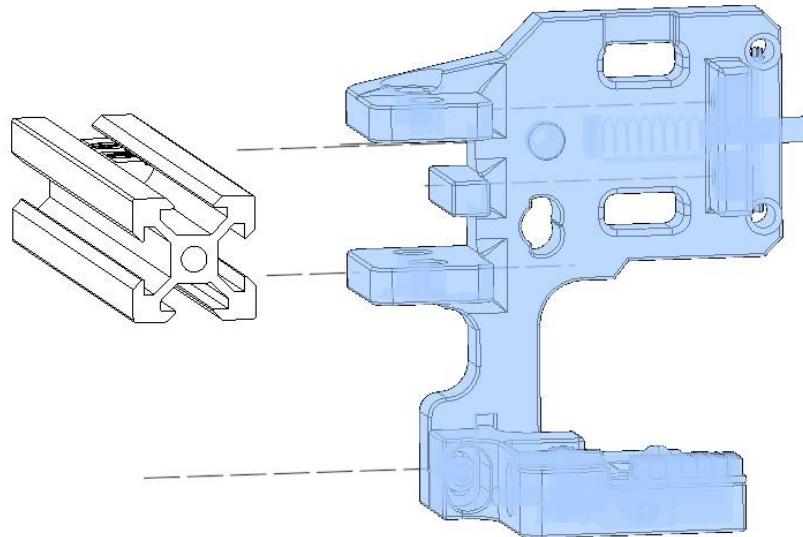


Attach the Nozzle Blocker assembly to the Dock.

m5 t-nut

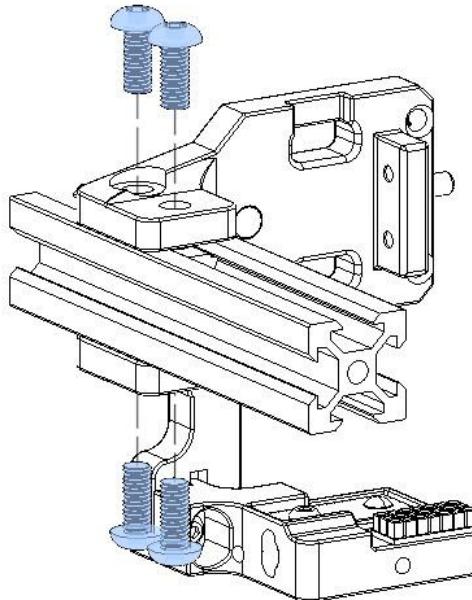


Slide in to both top and bottom of the dock extrusion bar.



Slide in the complete Dock assembly to the dock extrusion bar.

m5 x 12mm bhcs



Secure the Dock to the dock
extrusion bar.



Completed Dock Assembly.

Congratulations on completing your Lineux build. Your next step will be to setup the software configurations and calibrations. Do join us on Discord if you need help or have any questions.



<https://discord.gg/Xwqbjj4VjH>



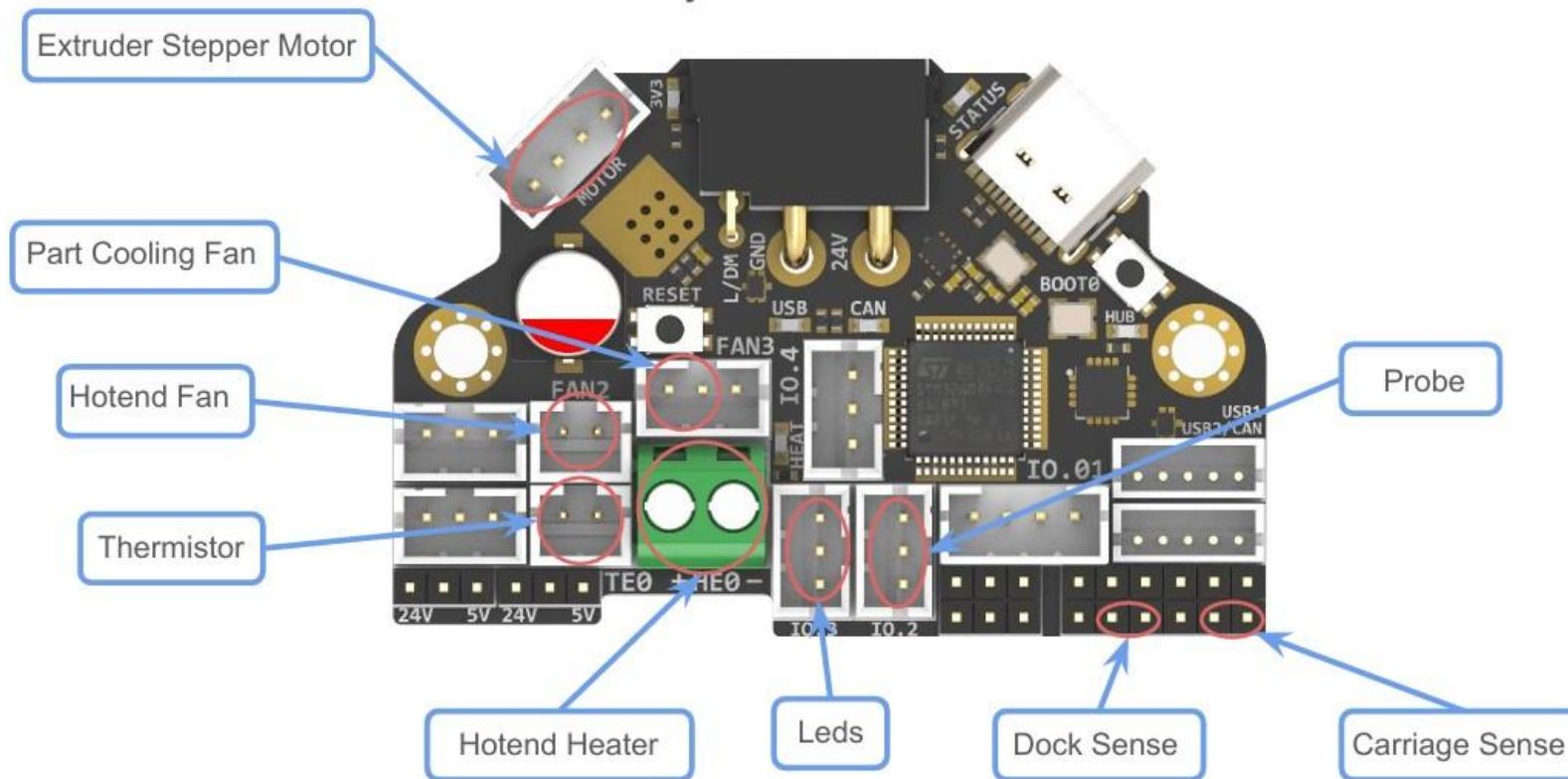
<https://github.com/Bikin-Creative/Lineux-Toolchanger>



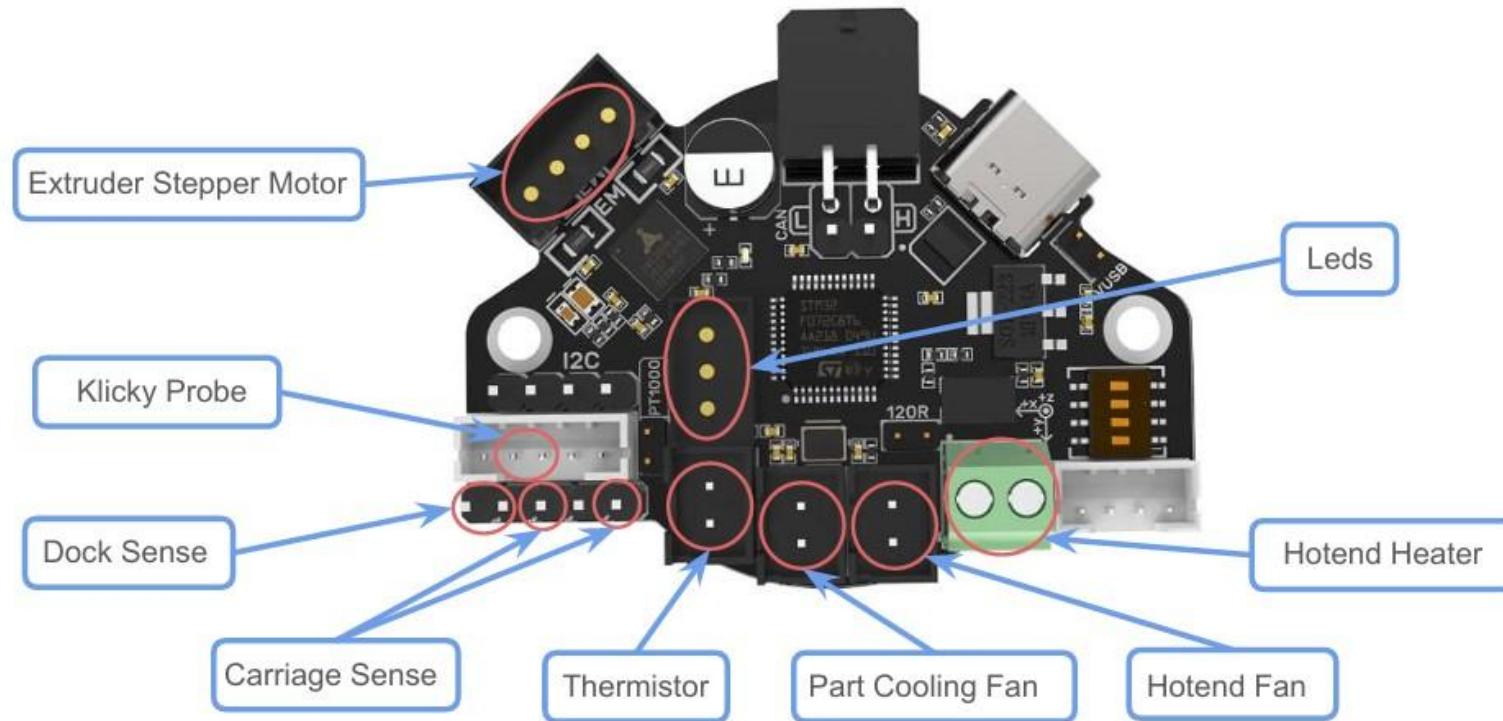
We are humans and are prone to mistakes. If you encounter any issues/faults with the build guide, please raise them on our Discord with the relevant page number or a screenshot of the issues/fault.

This guide may be subjected to changes regularly based on feedbacks from the community.

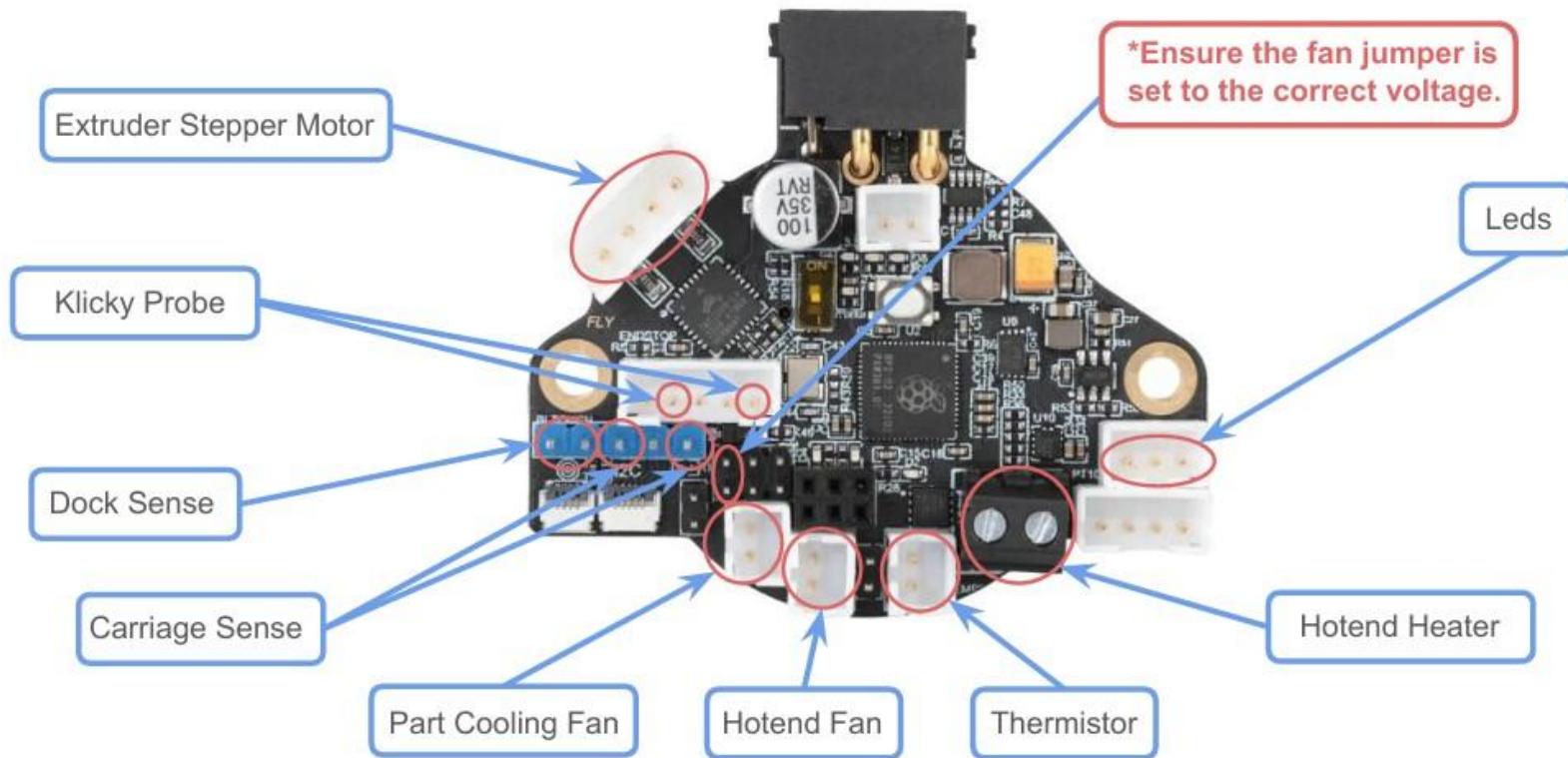
Fysect H36 v1.3

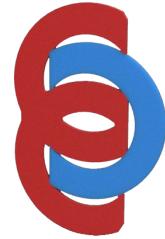


Bigtreetech EBB36 v2.1



Mellow SHT36 v3





Lineux Toolchanger

