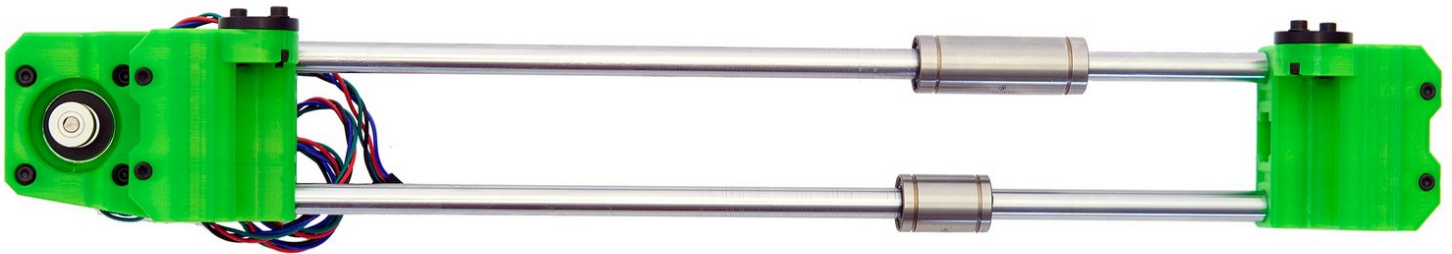


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12. Assembly of the x-Axis

Written By: Katja Aller

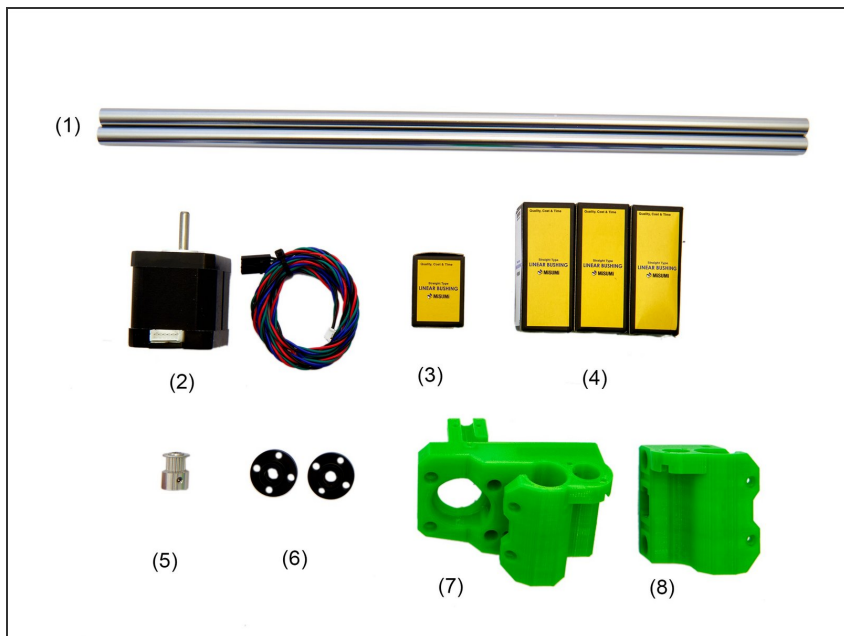


Step 1 — Required Tools



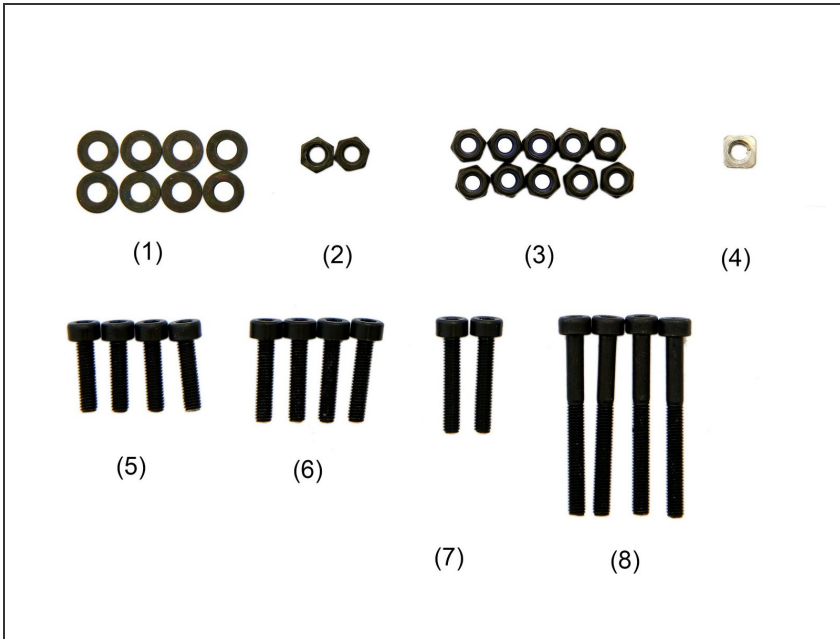
- (1) [1.5x60mm Hexagon Socket Head Screwdriver for Electronic Applications](#)
- (2) [2.5x75mm Hexagonal Screwdriver](#)
- (3) [Electronics Pliers](#)
- (4) [Engineer Scriber](#)
- (5) [Soft-faced Hammer with Cellidor Head Sections](#)
- (6) [Super Lube](#)
- (7) [Injectors](#)
- (8) [Isopropanol \(optional\)](#)

Step 2 — Required Parts



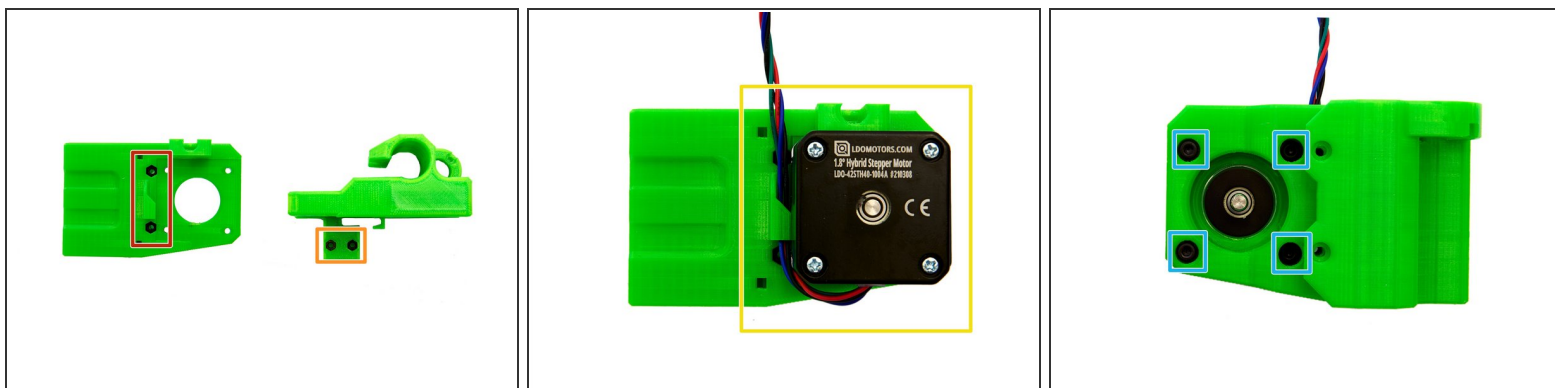
- (1) [2x x-Rod 380mm](#)
- (2) [Stepper Motor](#)
- (3) [LMU10 Bushing](#)
- (4) [3x LMUW10 Bushing](#)
- (5) [GT3 Toothed Pulley](#)
- (6) [2x POM Nut](#)
- (7) [x-Motor Holder](#)
- (8) [x-Idler](#)

Step 3 — Required Screws



- (1) **8x** Black M3 Washers
- (2) **2x** [M3 Nuts](#)
- (3) **10x** [M3 Self-Securing Nuts](#)
- (4) [M3 Square Nut](#)
- (5) **4x** [M3x12mm Hexagon Socket Head Cap Screws](#)
- (6) **4x** [M3x14mm Hexagon Socket Head Cap Screws](#)
- (7) **2x** [M3x16mm Hexagon Socket Head Cap Screws](#)
- (8) **4x** [M3x30mm Hexagon Socket Head Cap Screws](#)

Step 4 — Assembling the x-Motor Holder (1 / 4)



i To prepare for later, 3x LMUW10 bushings and one LMU10 bushing must be placed in isopropanol for 15min.

- Insert **2x M3 Self-Securing Nuts** into the back of the x-motor holder.
- Insert **2x M3 Nuts** into the bottom of the cable guide at the back of the x-motor holder.

i Tighten the **2x M3 Self-Securing Nuts** and the **2x M3 Nuts** with a screwdriver or an engineer scribe if necessary.

- Place a stepper motor on the back of the x-motor holder. When doing so, pay close attention to the alignment (see Fig. 2).

! Make sure that the cables are routed through the cable holder.

- Hold on to the stepper motor and turn the x-motor holder. Place **4x M3 Washers** in the four openings of the x-motor holder. Then, fasten the stepper motor to the x-motor holder with **4x M3x12mm Hexagon Socket Head Cap Screws**.

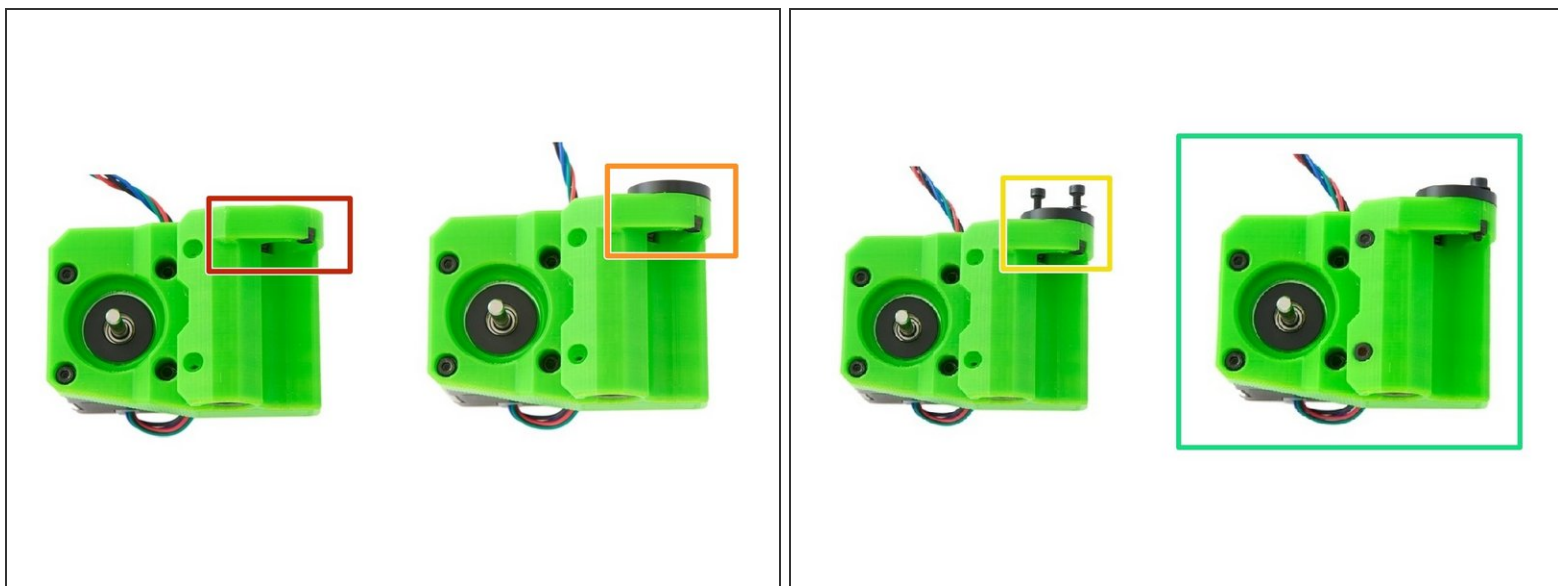
Step 5 — Assembling the x-Motor Holder (2 / 4)



- Now, you need the bushings you have prepared in the first step. They must be dried and then greased with Super Lube.
- One of the greased LMUW10 bushings is pushed into the x-motor holder so that it is centered. Then the bushing is fixed with **2x M3x30mm Hexagon Socket Head Cap Screws**.

⚠ When doing so, make sure that you only tighten the **M3 Hexagon Socket Head Cap Screws** *minimally* so that the screw is flush with the **M3 Self-Securing Nuts**.

Step 6 — Assembling the x-Motor Holder (3 / 4)



⚠ Check the hole for the POM nut for filament protrusions and remove them with a knife or scalpel if necessary.

● Insert **2x M3 Self-Securing Nuts** into the designated slots.

ⓘ Insertion can be made easier with the help of an engineer scribe.

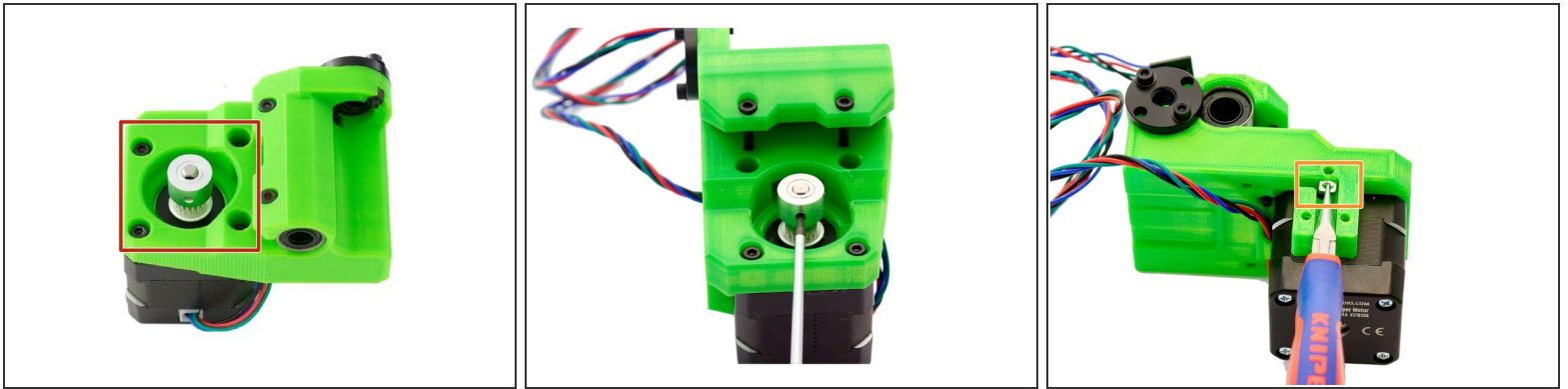
● Now place a POM nut in the hole on the top.

● Use **2x M3 Washers** and **2x M3x14mm Hexagon Socket Head Cap Screws** to fix the POM nut.

⚠ Here, make sure that you screw the screws into the *threaded* holes of the POM nut.

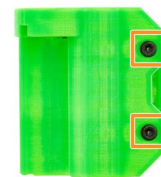
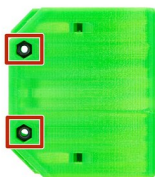
⚠ Do not tighten the **2x M3x14mm Hexagon Socket Head Cap Screws** completely at this stage.

Step 7 — Assembling the x-Motor Holder (4 / 4)



- Slide the GT3 pulley onto the shaft of the stepper motor.
 - ⚠ The motor shaft has two grub screws. Make sure that one of them is aligned with the flat surface of the shaft and tighten both grub screws.
 - ℹ Leave a narrow gap between the pulley and the motor surface to avoid friction.
- Insert a **M3 Square Nut** into the slot on the back of the x-motor holder using electronics pliers
- The x-motor mount is now fully assembled.

Step 8 — Assembling the x-Idler (1 / 2)



- Insert **2x M3 Self Securing Nuts** into the back of the x-idler.
 - Insert **2x M3 Self-Securing Nuts** into the two slots on the top and bottom of the x-idler and *lightly* tightened them with **2x M3x16mm Hexagon Socket Head Cap Screws**.
 - Push one of the greased LMUW10 bushings into the x-idler and ensure that it is centered.
 - Fasten it with **2x M3x30mm Hexagon Socket Head Cap Screws**.
- ⚠ Make sure that you tighten the Hexagon Socket Head Cap Screws only minimally, as they should fit flush with the M3 Self-Securing Nuts.

Step 9 — Assembling the x-Idler (2 / 2)



⚠ Check the hole for the POM nut for filament protrusions and remove them with a knife or scalpel if necessary.

- Insert **2x M3 Self-Securing Nuts** into the designated slots.

i Insertion can be made easier with the help of an engineer scribe.

- Now, put a **POM Nut** into the hole on the top.
- Take **2x M3 Washers** and **2x M3x14mm Hexagon Socket Head Cap Screws** to fix the POM nut.

⚠ Make sure that you screw the screws into the two threaded holes of the POM nut.

⚠ Do not tighten the 2x M3x14mm Hexagon Socket Head Cap Screws completely for the time being.

- The x-idler is now fully assembled.

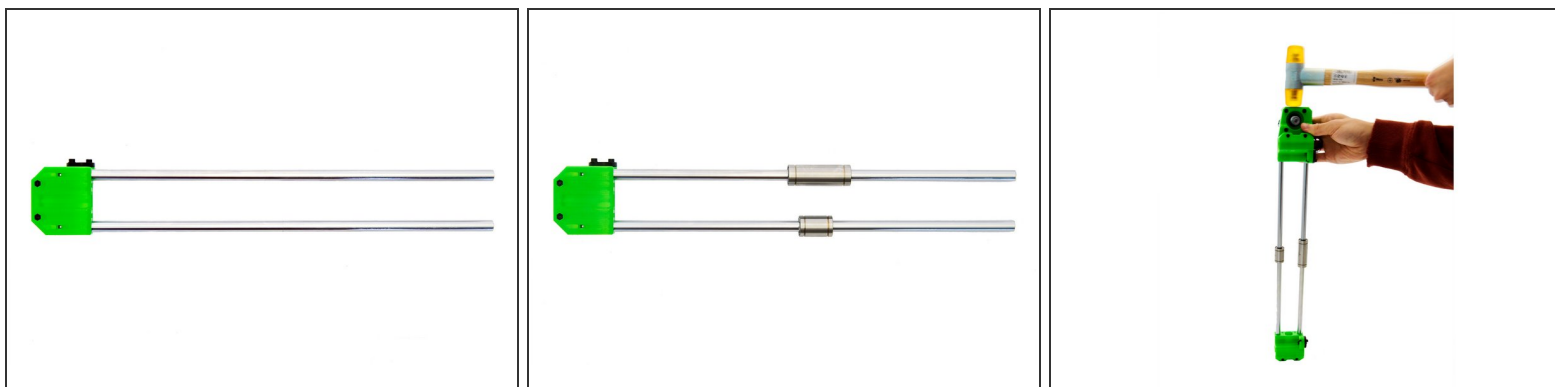
Step 10 — Assembling the x-Axis (1 / 2)



- Place one of the **380mm x-Rods** into one of the designated holes. *Carefully* tap the rod into the x-idler with a soft-faced hammer.
- Repeat this step with the second rod.

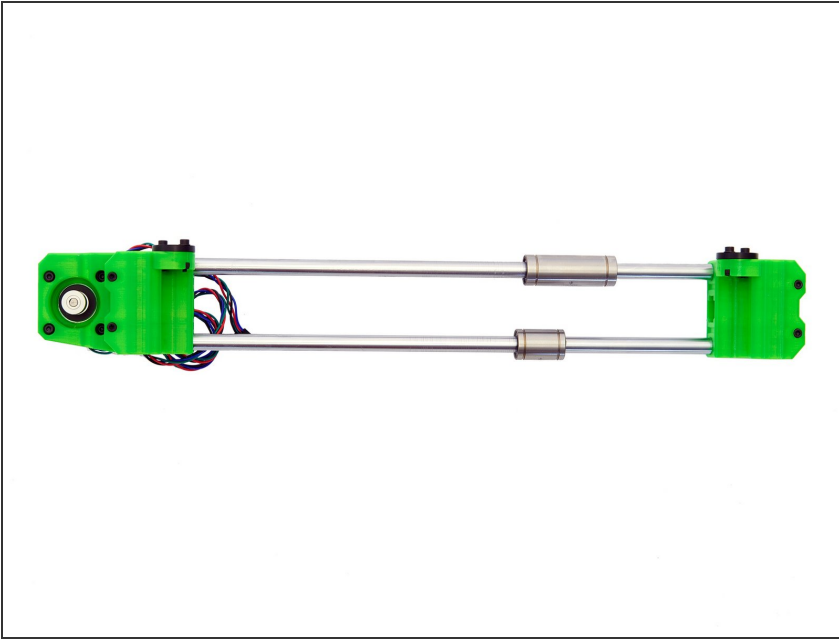
⚠ Make sure the rods are pushed in all the way down by looking through the small window on the back of the x-idler.

Step 11 — Assembling the x-Axis (2 / 2)



- Align the x-axis as shown in the first picture. Slide an LMUW10 bushing onto the upper x-rod and an LMU10 bushing onto the lower x-rod.
- ☞ Remember to grease the bushings with Super Lube beforehand.
- Align both x-rods with the holes in the x-idler and gently tap the x-idler with a soft-faced hammer.
- The x-Idler has a small window on the back that allows you to check whether the rods are properly positioned.

Step 12



- i The assembly of the x-axis is completed now.
- Continue with instructions [13. Installation and Wiring of the x-Axis.](#)