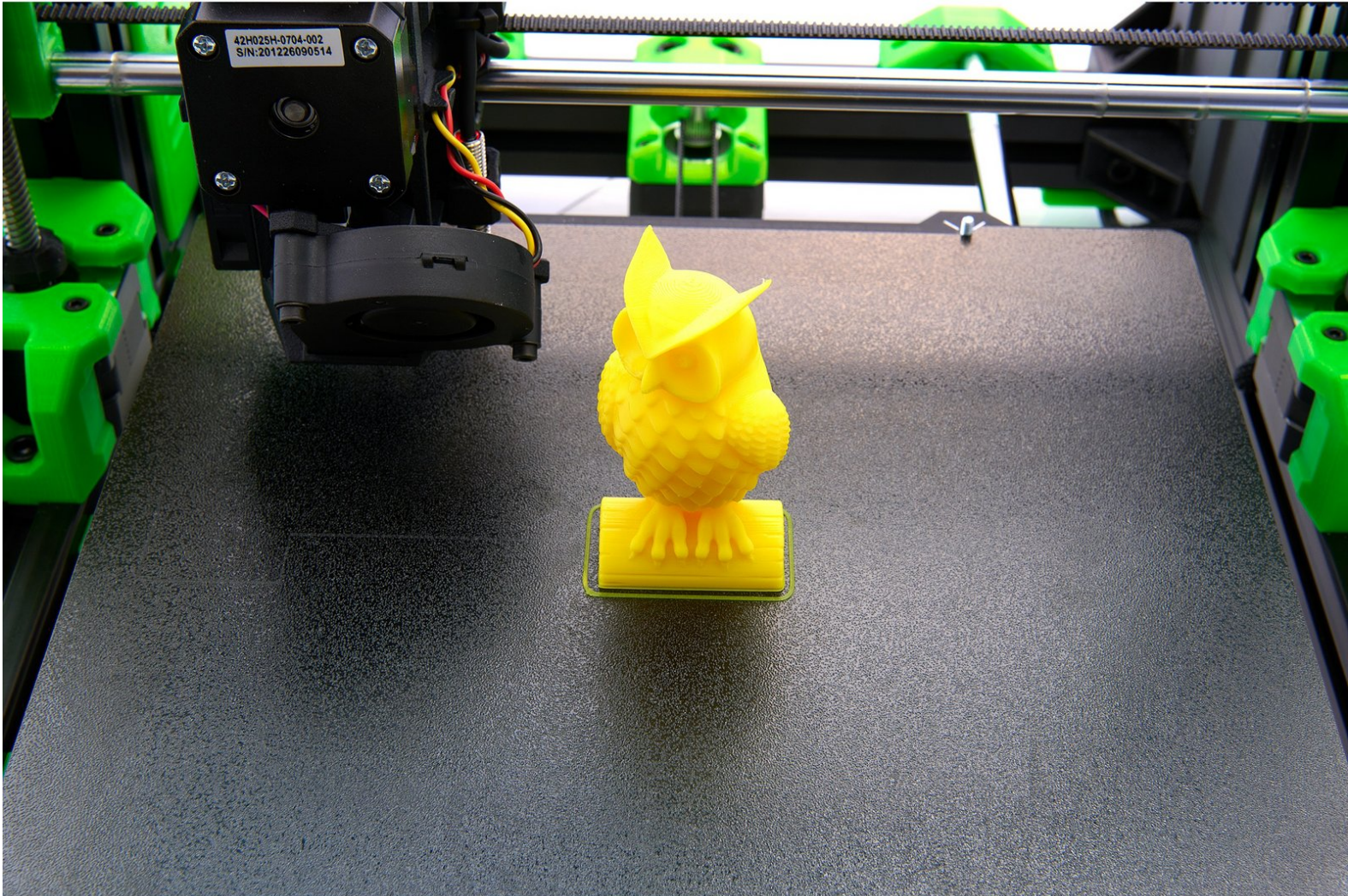


caribou3d

19. Setup und Calibration

Written By: Katja Aller

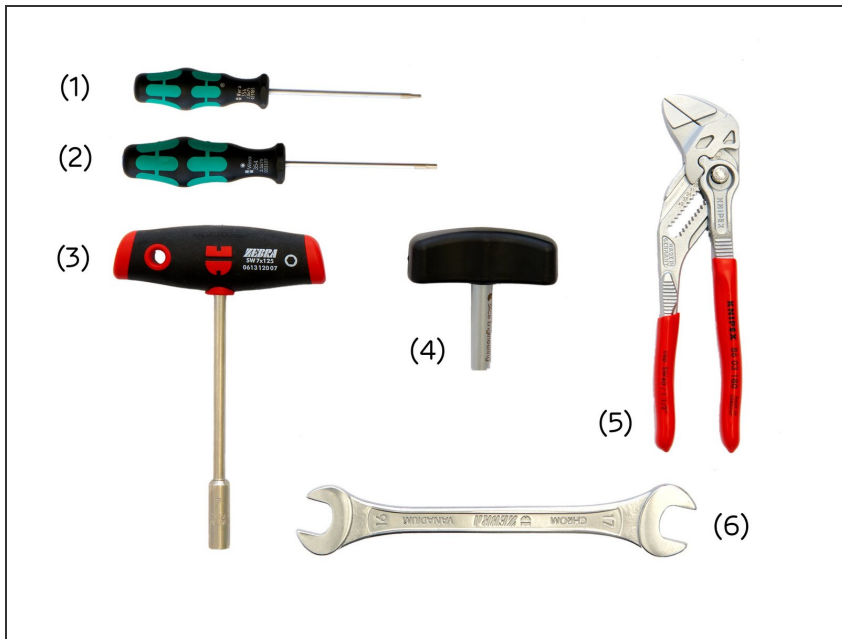


Step 1 — Required Tools



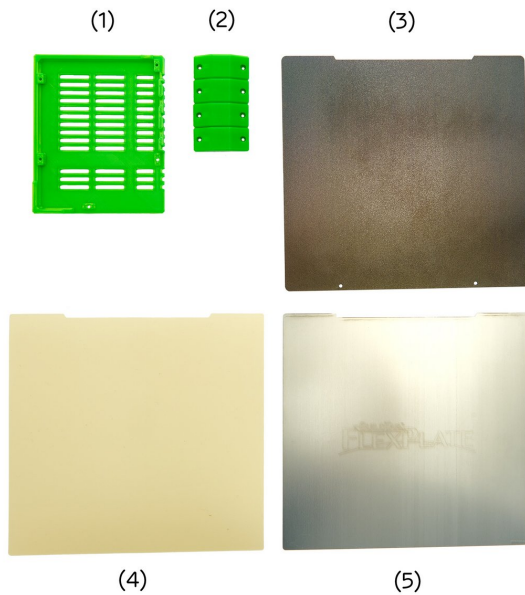
- (1) Computer
- (2) PSU cable
- (3) USB cable
- (4) [Zip Ties](#)
- (5) [Silicone Sock](#) (only required if the *E3D Hotend* is installed)
- (6) [Foil Squeegee with Alcantara Cover](#) (only required for *BuildTak*)
- (7) Isopropanol

Step 2 — Required Tools



- (1) [2.0x75mm Hexagonal Screwdriver](#)
- (2) [2.5x75mm Hexagonal Screwdriver](#)
- (3) [7x125mm T-Handle Socket Wrench](#)
- (4) [Torque Wrench 1,5Nm](#) (only required if a vanadium nozzle is installed)
 - ⓘ Alternatively, a 6mm Cross-Handle Socket Wrench can be used.
- (5) [Pliers Wrench](#) (only required for *E3D Hotend*)
 - ⓘ Alternatively, you can use a...
- (6) 16mm Open-End Wrench

Step 3 — Assembling the Parts



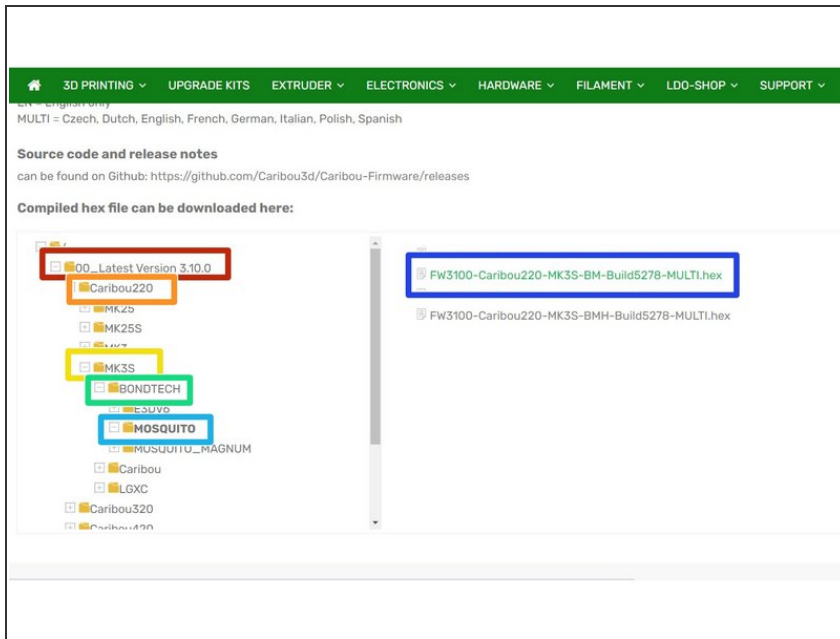
- (1) Einsky Box Cover
- (2) 4x Rod Holder Cover
- Printing Surface
 - (3) [Thekkiinngg Powder-Coated Spring Sheet V4](#)
 - *or*
 - (4) [BuildTak PEI Sheet](#)
 - *and*
 - (5) [BuildTak Flexible Steel Sheet](#)

Step 4 — Assembling the Screws



- (1) 8x [M3x10mm Hexagon Socket Head Cap Screws](#)
- (2) 5x [M3x14mm Hexagon Socket Head Cap Screws](#)

Step 5 — Flashing the Firmware (1 / 4)



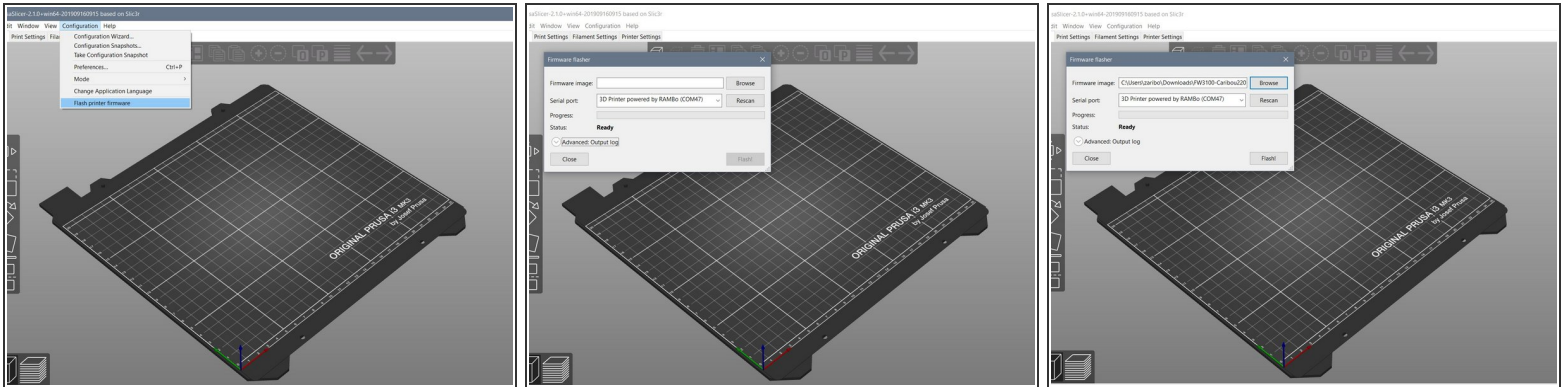
- Visit [Caribou3d.com](https://caribou3d.com) to select the matching firmware for your printer model:
- In the file manager, first select the folder "01_LatestVersion x.x.x".
- Now, select your printer model and download the appropriate firmware. In our example we select a German firmware for a *Caribou 220 MK3S* with a *Bondtech Mosquito* and an *SL Thermistor*.
- Printer height
- Printer model
- Extruder
- Hotend
- Finally, you have to choose a language ("EN" or "MULTI") and a thermistor version ("BM" or "BMH").


Step 6 — Flashing the Firmware (2 / 4)



- Download the program "[Prusa Slicer](#)" to your computer and install it on your PC / laptop.
- Connect the power cable to the printer and turn it on.
- ① The display should show the words "Caribou Research and Development" and the two fans should be activated.
- Connect your printer to your computer using the supplied USB cable.

Step 7 — Flashing the Firmware (3 / 4)



- Open *Prusa Slicer*.
- Select the following buttons in the top bar:
 - *Configuration*
 - *Flash Printer Firmware*
 - For *Serial Port* select "3D Printer powered by RAMBo".
 - At *Firmware image* select the firmware you downloaded.
 - Lastly, select "Flash".
-  This process may take a few minutes.

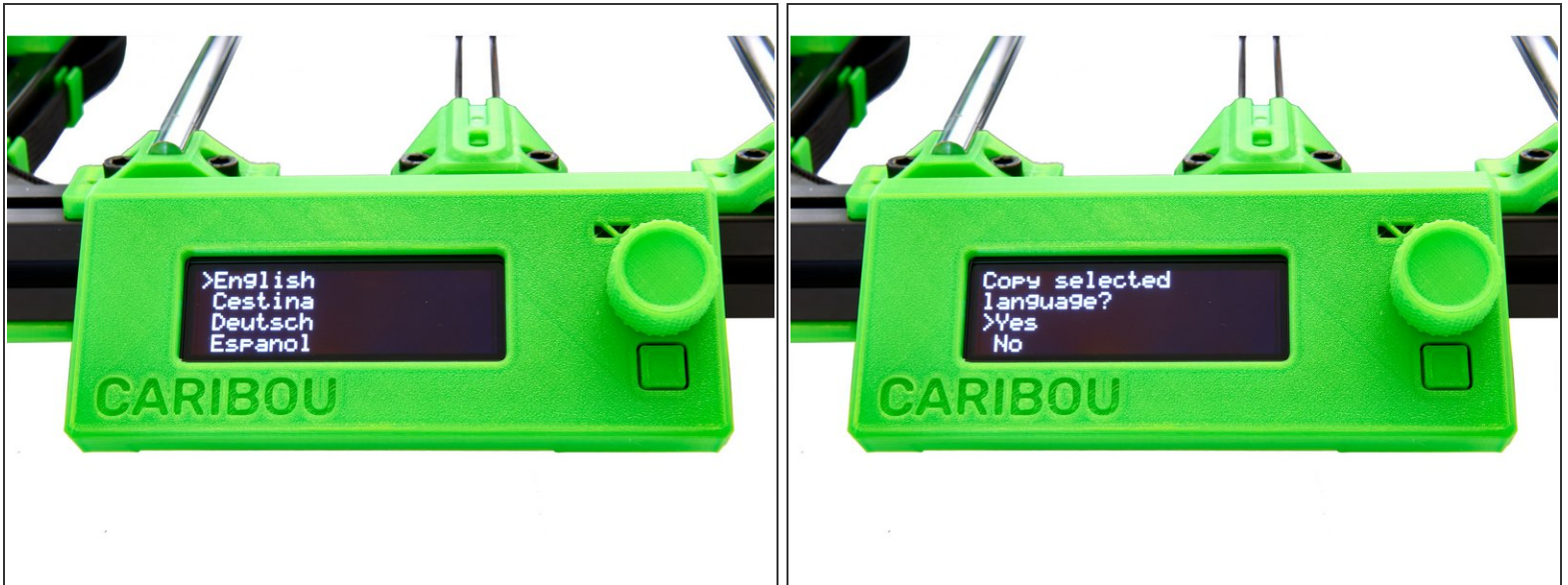
Step 8 — Flashing the Firmware (4 / 4)



- In the first step, the firmware is written.
- In the second step, it is verified.

⚠ Do not interrupt this process! Damage to the Einsy board may occur.

Step 9 — Setting the language



- Once the firmware upgrade is complete, you can select your preferred language for multi-language firmware.
 - ① Turn the knob on the display to switch between entries and press once to select individual entries.
 - ① Press the lower button to restart your printer.
- You will then be asked if you want to use the "Wizard". Select "no" here.

Step 10 — Cancelling the Wizard



- You will then be asked if you want to use the "Wizard".
- Select "no" here.
- A message to restart the wizard will be displayed.
- After pressing the knurled knob again, the selection menu is displayed.

Step 11 — Aligning of the x-Axis



- After pressing the knob again, you will see the start screen.
- Press and hold the knurled knob for 2-3 seconds. The display should now show "Z: +0.2".
- Turn the knurled knob clockwise. This will cause the x-axis to move upwards.
- Move the x-axis all the way up against the top mounts to make sure the x-axis is parallel to the bed.

⚠ This will produce a loud noise, which is normal.

- Check whether both sides are touching the top mounts. If this is not the case, check to see why there is a blockage.
- By turning the knob counterclockwise, you now move the axis down 3-4cm.
- Press the knurled knob once to display the start screen.

Step 12 — Autohome



⚠ Before proceeding, make sure the pinda is level with or slightly lower than the nozzle.

- Press the knob again to go to the main menu.
- There you select the following buttons:
 - *Calibration*
 - *Autohome*
- The printer now moves each of the three axes to neutral position and then moves to the first reference point on the heatbed.
- ① The start position is on the front left of the heatbed.
- ① If the printer moves to a rear left position, you probably mounted the beltholder and the y-slide in the wrong direction and have to rotate it.

Step 13 — Self-Test (1 / 3)



- Press the knob again to go to the main selection.
- There you select the following buttons:
 - *Calibration*
 - *Selftest*

 Before proceeding, make sure the pinda is level with or slightly lower than the nozzle.

Step 14 — Self-Test (2 / 3)



- The firmware first verifies that both fans are spinning and connected properly.
- After the first fan is checked and running, you will be asked whether the extruder fan (fan on the left side) is spinning. Check this and answer accordingly.
- Now you are asked whether the part cooling fan (fan at the front) is spinning. Check this and answer accordingly.
- If the test shows that the fan connections on the Einsy board have been reversed, switch off the printer and replace them. Then run the self-test again. If the test shows that the fan connections on the Einsy board have been reversed, switch off the printer and replace them. Then run the self-test again.

Step 15 — Self-Test (3 / 3)



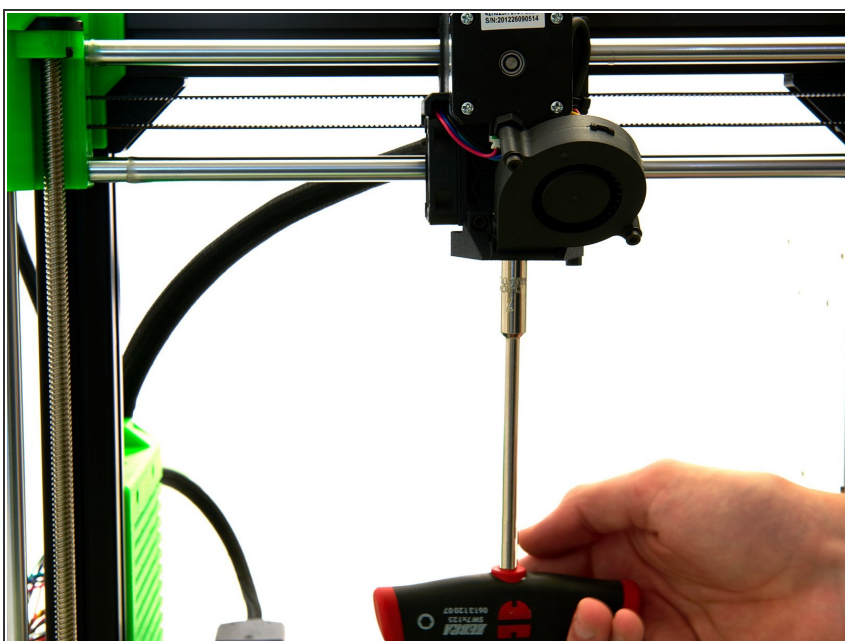
- The firmware now checks whether the length of the three axes is correct.
- First, the length of the x-axis and the y-axis is measured.
- ❗ If an error message appears, check if there are cables sticking out from the sides of the extruder which are blocking the axis. For the y-axis, check the installation of the bearing holders and the installation of the belt holder or pulley.
- ❗ If the SuperPINDA / PINDA does not activate properly, check the cables.
- The start position is then calibrated.
- The last part of the self-test is to check the heating of the heatbed and extruder.
- ❗ If an error occurs here, check the wiring.
- ❗ This completes the self-test successfully.

Step 16 — Tightening the Nozzle (1 / 3)



- Select the following buttons in the main menu under *Settings*:
 - *Temperature*
 - *Nozzle*
 - Set the temperature to 250°C. Press the control knob twice to return to the start screen.
- ❗ On the start screen you can monitor the temperature rise.

Step 17 — Tightening the Nozzle (2 / 3)



- If you have installed a **Mosquito Hotend**, tighten the nozzle *carefully* with a t-handle socket wrench.
- If you have installed a **Mosquito Hotend** with a **Vanadium Nozzle**, tighten the nozzle with a torque wrench.

- If you have installed an **E3D Hotend**, hold the heater block with a 16mm open-end wrench and

carefully tighten the nozzle with a t-handle socket wrench.

⚠ Make sure that the heating block is aligned straight.

Step 18 — Tightening the Nozzle (3 / 3)



- Select the following buttons in the main selection under *Settings*:

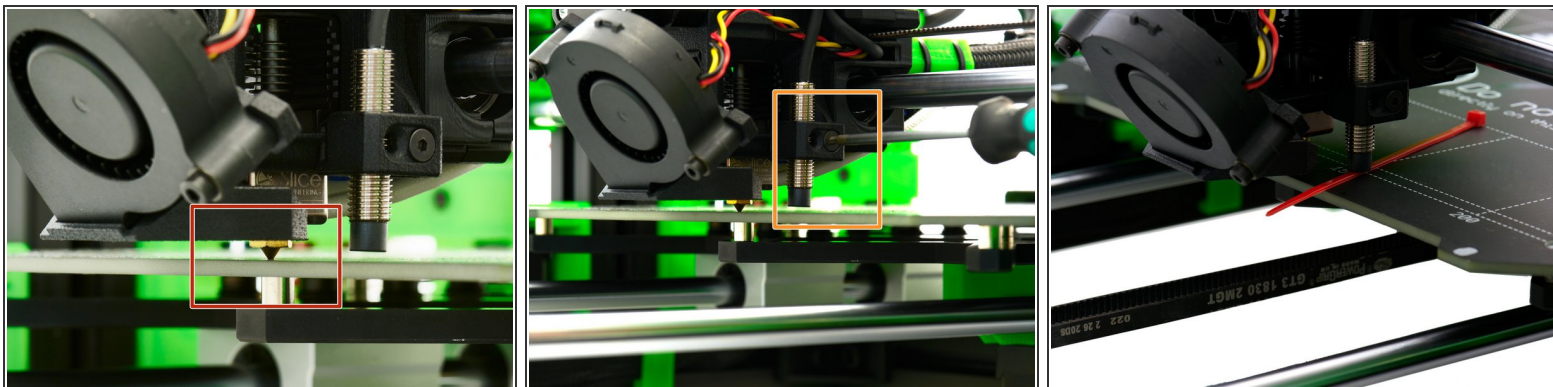
- *Preheat*
- *Cooldown*

⚠ Wait until the temperature has dropped below 50°C.

- If you have installed an *E3D Hotend* , you can insert the silicone sock.

⚠ Make sure that it is not sitting above the cables, but below them.

Step 19 — Aligning the SuperPINDA / PINDA



- Move the x-axis all the way down and turn off the printer.
- Turn the two spindles of the z-stepper motors simultaneously and evenly downward until the nozzle touches the bed.
- Loosen the **M3x16mm Flat Head-Head Socket Cap Screw** that holds the pinda in place.
- ⓘ For illustration purposes, the zip tie in Fig. 3 is colored red.
- Slide a zip tie beneath the PINDA and re-tighten the **M3x16mm Flat Head-Head Socket Cap Screw**.
- ⓘ The distance between the *PINDA* and the bed is now approximately 0.6mm. For a *SuperPINDA*, take a credit card or something similar. The distance should be about 1mm.
- Turn the printer back on and realign the x-axis (see [Step 11](#)).

Step 20 — Tensioning the Belt (1 / 2)



- Press the knurled knob again to get to the main selection.
- There, select the following buttons:
 - *Calibration*
 - *Belt Test*
- ① Now the tension of the x- and y-belts is measured. The value should be between 225 and 250. A smaller value means higher tension.
- ① If necessary, adjust the tension of the belts by loosening or tightening the set screw on the front belt holder and on the side of the middle screw on the x-Idler. After a readjustment, you must repeat the test.

Step 21 — Tensioning the Belt (2 / 2)



- You can check the current value of the belt tension as follows:
- Press the knurled knob again to get to the main selection.
- There, select the following buttons:
 - *Support*
 - *Belt Status*
- ❗ Only the value of the last measurement is displayed. If an adjustment has been made, the belt test must be performed again.

Step 22 — BuildTak (1 / 2)



- Remove the sticker from the BuildTak steel sheet and clean the sheet with isopropanol.
- Remove the protective foil from the MK52 PEI Sheet by approx. 2-3cm.
- ❗ Stick the MK52 PEI on the BuildTak Sheet side *without* logo.
- Align the MK52 PEI Sheet on the BuildTak steel sheet (see Figure 3).

Step 23 — BuildTak (2 / 2)



- Now use the foil squeegee (or a spatula with a microfiber cloth) to apply the MK52 PEI Sheet to the Flexible Steel Sheet.
- Remove the protective film piece by piece and squeegee the MK52 PEI Sheet to the Flexible Steel Sheet.
- Always work in the direction of the not yet adhered MK52 PEI Sheet or towards the outer edges of the sheet.

⚠ Be especially careful around the edges. Only squeegee outwards. Otherwise, there is a risk that you will lift the MK52 PEI Sheet.

- If necessary, remove the protruding parts of the MK52 PEI Sheet *carefully* with e.g. a knife.
- Finally, clean the surface with isopropanol.

Step 24 — Calibrating XYZ (1 / 3)



- Select the following buttons in the main selection:
 - *Calibration*
 - *Calibration XYZ*
- Make sure that there is no printing sheet on the heating bed. If the printer asks you about this, select "No".

⚠ Be careful that the Nozzle does not scratch the heatbed while the printer is measuring the 4 dots in the heated bed.

- After measuring, the x-axis is moved up slightly. Now place your printing sheet on the heatbed to continue with the calibration.
- The printer then measures 9 points on the bed.

Step 25 — Calibrating XYZ (2 / 3)



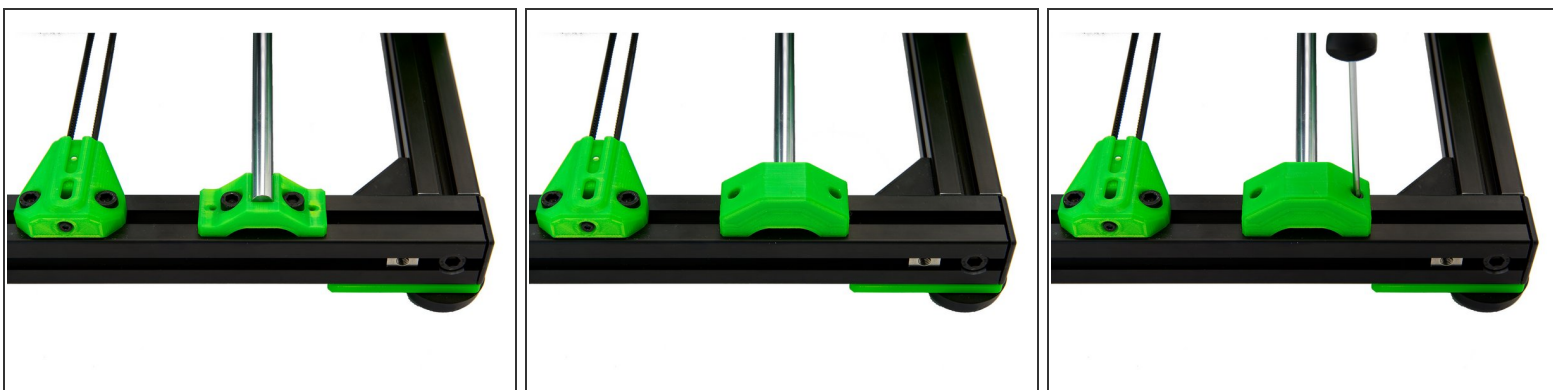
- The position of the four calibration points is measured.
 - After measuring, the x-axis is moved up slightly. Now, place your printing sheet on the heatbed to proceed with the calibration.
 - Now, the height of nine points on the printing bed is measured.
 - As the last step, the result of the calibration is displayed.
- i** If the bed is crooked or if there is a fault, check the installation of the heatbed and the carriage.

Step 26 — Calibrating XYZ (3 / 3)



- The details of the calibration can be viewed under the support menu.
- Select the following buttons in the main selection:
 - *Support*
 - *XYZ Cal. Details*
- The most important factor here is the skew (the smaller, the better). If the value is below 0.11°, the printer will not perform any adjustments.

Step 27 — Installing the Rodholder Covers



- Place the rodholder covers (top) on the rodholders (bottom).
- Now, tighten them with **2x M3x10mm Hexagon Socket Head Cap Screws**.

⚠ Be careful not to overtighten the screws or the nuts underneath the rodholders may fall out.

Step 28 — Loading the Filament (1 / 2)



- Select the following buttons in the main selection under Settings:
 - *Preheat*
 - *PLA*
- On the start screen you can monitor the temperature rise.

Step 29 — Loading the Filament (2 / 2)



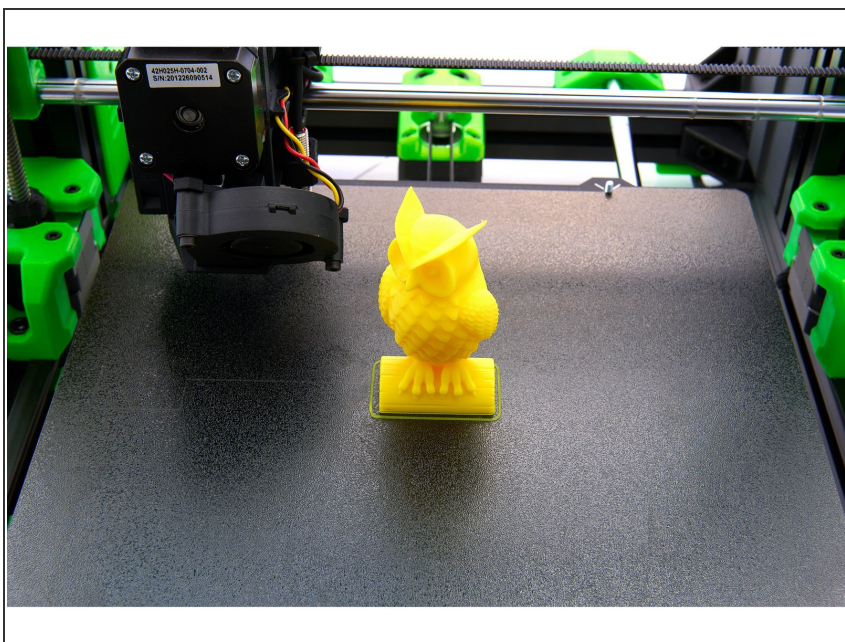
- Insert wisdom here.

Step 30 — Closing the Einsy Box



- Place the cover on the Einsy Box.
- Make sure that no cables are trapped between the cover and the box.
- Now, fasten the cover with **5x M3x14mm Hexagon Socket Head Cap Screws**.

Step 31



- Insert wisdom here.