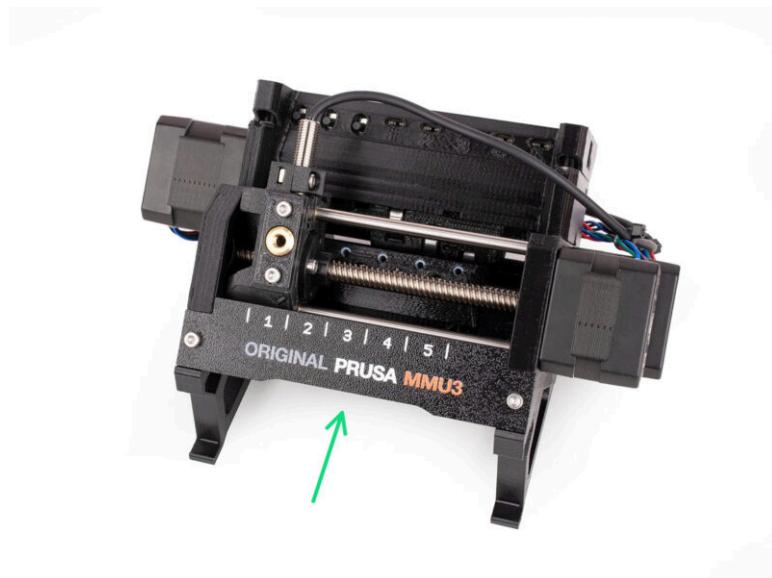


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1. Conversion

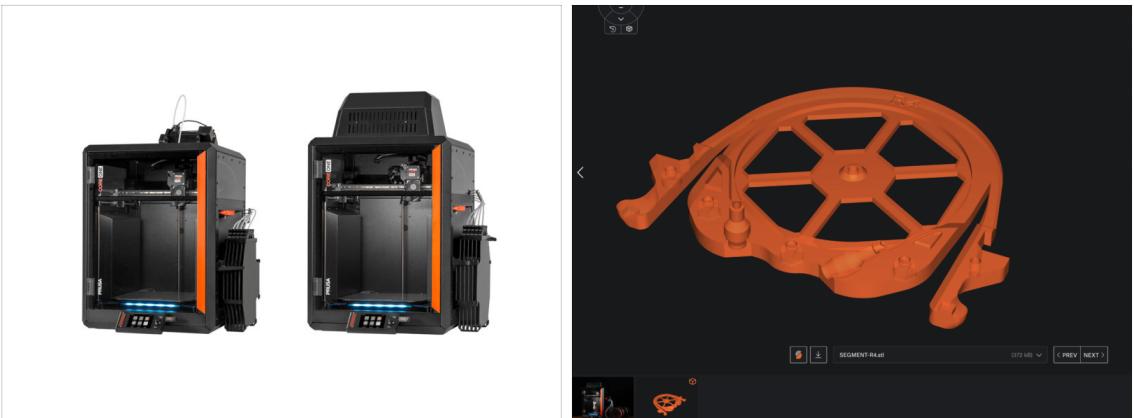


STEP 1 Introduction



- In this guide, we will be upgrading the MK4S MMU3 setup into CORE One MMU3.
- MMU3 installation requires extruder modifications. However, we need to make a few other adjustments before proceeding with that.
- Let's quickly review the key points we'll cover in this guide:

STEP 2 Conversion Printable parts INFO



- ⚠ You might need to print some parts, before proceeding with the upgrade, depending on the MMU3 version you are planning to build.
- MMU3 Enclosed (for CORE One) Conversion kit contains all the printed parts.
- ⚠ MMU3 Lite (for CORE One) Conversion kit requires you to print a few plastic parts for the Buffer and the Unit. Download these from Printables.com

STEP 3 MMU3 Version Check



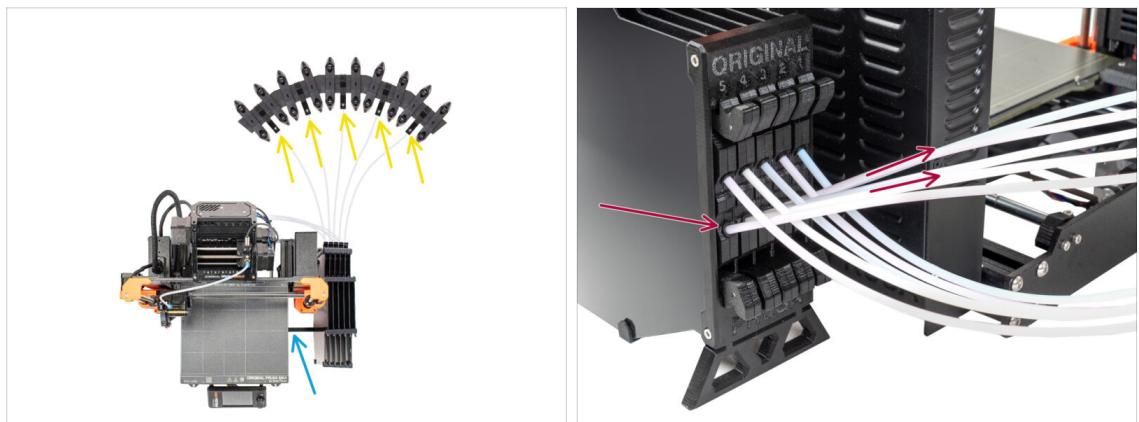
- ◆ Multiple hardware changes occurred during the MMU3 production.
- ① **CORE One** is only compatible with the latest versions of the MMU3 units, specifically those used on the MK4/S. MMU units from other printer models may not be compatible with CORE One!
- ◆ Check the PTFE fittings. The black version is compatible, but not all blue fittings are.
 - ◆ The compatible blue fittings are only the ones with the internal diameter of 2.6mm, shipped from April 2024. (shipped with MK4/S MMU3)
- ⚠ One fitting should be reused from your older MMU3 setup. If you have doubt, we recommend getting the black fitting from [Prusa E-shop](#).

STEP 4 Buffer Check



- ◆ The MK4S MMU3 should already use the **compatible** newer **buffer cartridges, version B**. Version A is not compatible but can be updated.
- ◆ Check the back of your MMU3 unit. If it has a cover over the PD board addon, your unit uses the latest revision of the plastic parts.
 - ◆ If you have an older revision, we recommend updating the electronics cover to the latest version and adding the PD-board cover.

STEP 5 PTFE tubes disconnecting



- ◆ Disconnect the PTFE tubes from the spool holders.
- ◆ Disconnect the PTFE tubes that lead to the MMU3 unit, from the buffer cassettes.
- ◆ Remove the buffer from the printer.

STEP 6 PTFE tube disconnecting 2



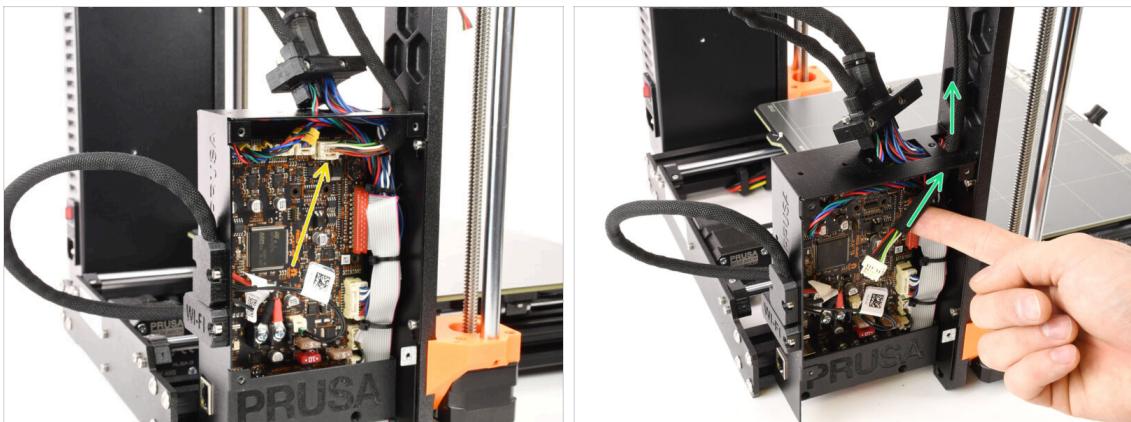
- ◆ Disconnect the PTFE tube between the MMU unit and the extruder.
- ⚠️ Discard this 360mm PTFE tube. The MMU3 on CORE One requires a PTFE tube either 390mm or 450mm long, so the old one can't be reused!
- ◆ Remove the fitting from the extruder. Set it aside, as it will be replaced with a new one.

STEP 7 xBuddy box opening



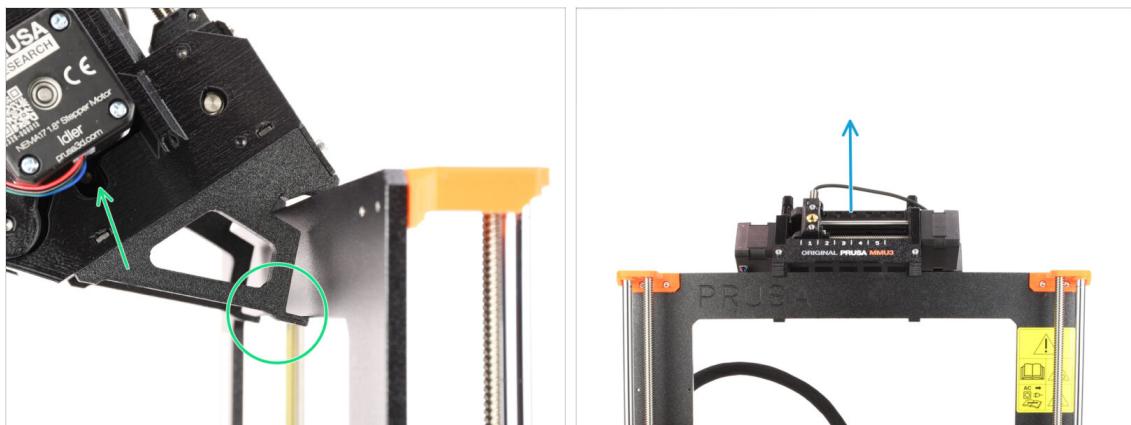
- ◆ On the left side of the printer, remove the four M3x6 screws holding the xBuddy box cover in place. Then, take off the cover.
- ◆ Remove the two M3x18 screws holding the ext-cable-holder.

STEP 8 Cable Disconnecting



- ◆ Disconnect the MMU cable from the xBuddy board. Note that there is a safety latch that must be pressed, in order to disconnect the cable.
 - ⚠ The connector has a safety latch. It is necessary to press the latch before disconnecting. Otherwise, the connector may get damaged.
- ◆ Remove the cable from the xBuddy box.

STEP 9 MMU Removal



- ◆ Lift the back of the MMU unit to unclamp it from the printer's frame.
- ◆ Remove the MMU3 unit from the printer.

STEP 10 Frame Holders Removal



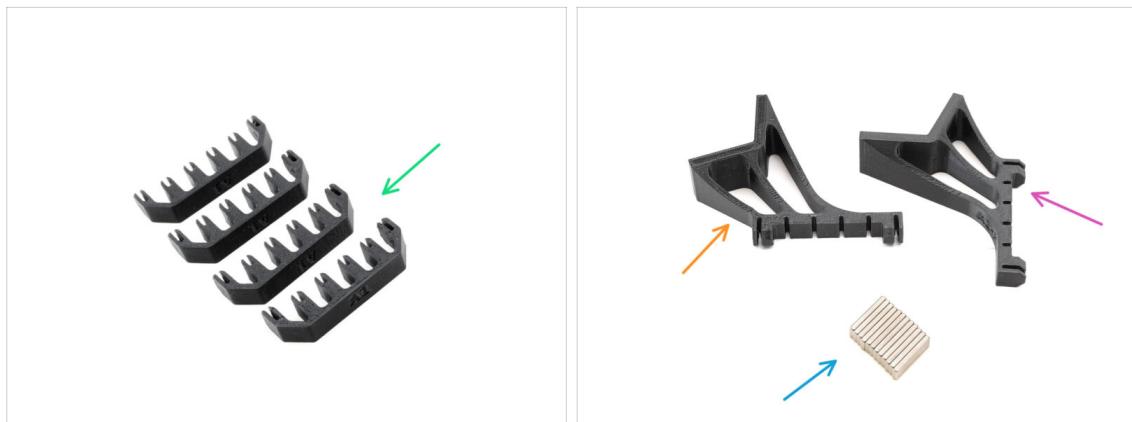
- ◆ Undo the two M3 screws holding the label plate.
- ◆ Remove the label plate and save it for possible later use.
- ◆ Remove the four M3x10 screws holding the Frame Holders. Set the frame holders aside as they will not be used.
- ◆ Save the MMU unit with the PTFE tubes for later use.

STEP 11 Buffer Rebuild



- ◆ MMU3 on CORE One necessitates the use of a slightly different Buffer design, compared to the other printer models.
- ① In the upcoming steps, we will be upgrading it.
 - ◆ Remove all the cassettes from your MK4S buffer and prepare the bare buffer body.

STEP 12 Plate Holders Preparation



- ◆ For the following steps, prepare:
 - ◆ Plate Holders (4x)
 - ◆ Plate holder L (1x)
 - ◆ Plate holder R (1x)
 - ◆ Magnet 2x6x20 (12x)

STEP 13 Magnet Installation



- Install all twelve magnets into the marked openings on both the Plate holder L and R parts.

- i** Make sure all the magnets are fully inserted.

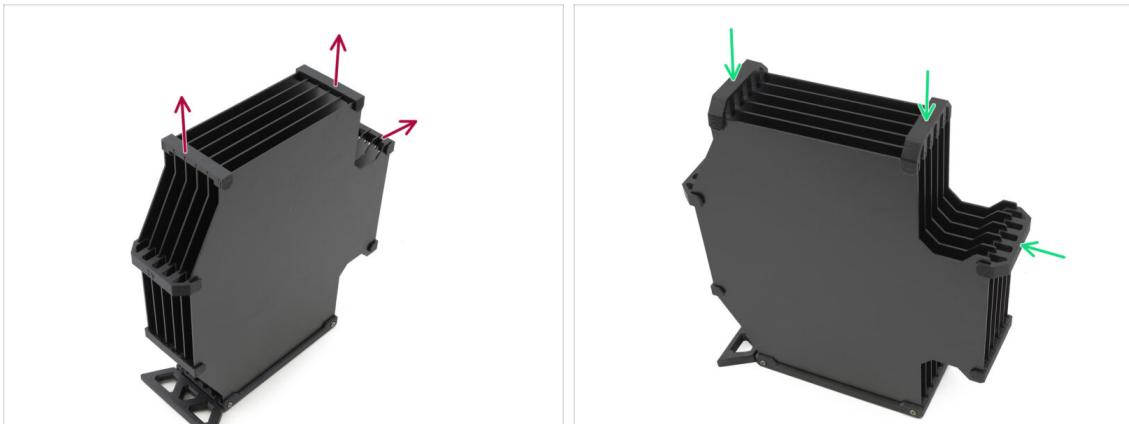
The orientation of the magnets is not important.

STEP 14 Buffer Rebuild 2



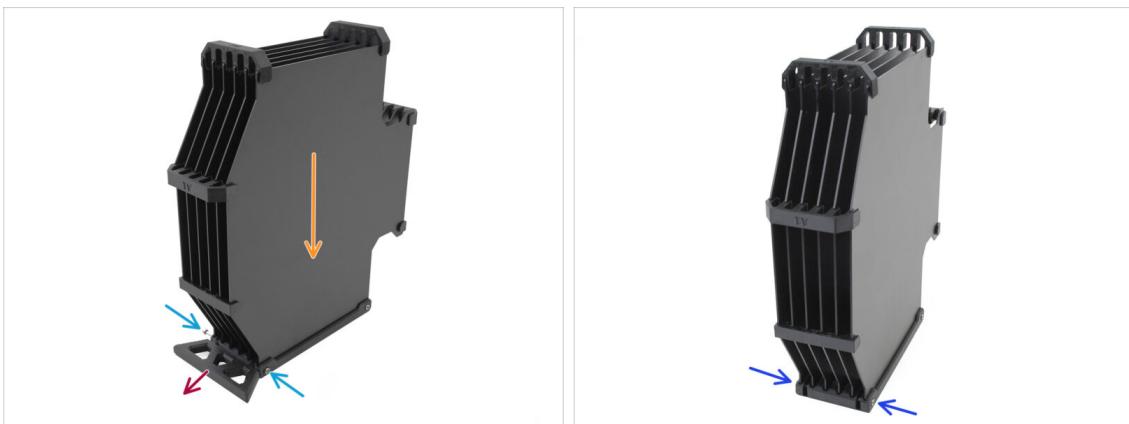
- Remove the M3x30 screws holding the Printer holder part.
 - Remove the Printer Holder and discard it.
- Install the new plate holder as indicated, so that it faces away from the buffer. Make sure it clicks in place and all the plates are properly aligned into the recesses.

STEP 15 Buffer Rebuild 3



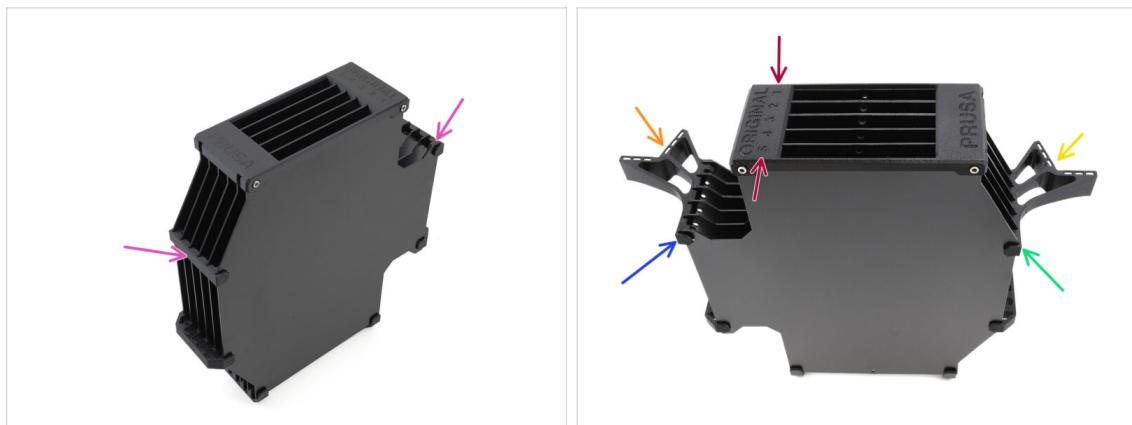
- Remove the marked three old-type plate holders.
- Replace the plate holders with the three remaining pieces of the new type.

STEP 16 Buffer Rebuild 4



- Keep the buffer positioned as in the picture, with the cassetter part facing down. This will keep the N3nS nuts from falling out in this step.
- Remove the two M3x30 screws holding the Buffer Leg part.
- Remove the Buffer Leg.
- Reinstall the M3x30 screws back into place. Tighten them very lightly to prevent warping the plates.

STEP 17 Buffer Rebuild 5



- ❖ Remove the remaining two old-type plate holders.
- ❖ Orient the assembly so that the segmenter is on top, with the position labeled 1 facing away from you and position 5 toward you.
- ❖ Install the Plate Holder L onto the left side of the assembly.
- ❖ The magnets should face away from you, toward position 1.
- ❖ Install the Plate Holder R onto the right side of the assembly.
- ❖ The magnets should face away from you, toward position 1.

STEP 18 Buffer Ready To Roll



- ❖ Insert all the cartridges into the buffer body.
- ❖ Make sure the inserted PTFE tubes are on the right side, when the magnets are facing away from you.

STEP 19 MK4S to CORE One Conversion



- ◆ Update the printer according to the [MK4S to CORE One Conversion guide](#).
 - ◆ **The only major difference is that your Nextruder is still modified for MMU use.** You may need to bypass the filament sensor calibration during self-test by manually pushing the idler tension bolts instead of loading a filament when you reach that stage.
 - ◆ **After converting the printer to CORE One, disconnect the PTFE tube and hook it to the extruder_PTFE_holder plastic part.**
- ⚠ **Then, continue to the chapter: 10D. CORE One Setup and Calibration**

10D. CORE One Setup and Calibration



STEP 1 Top Cover



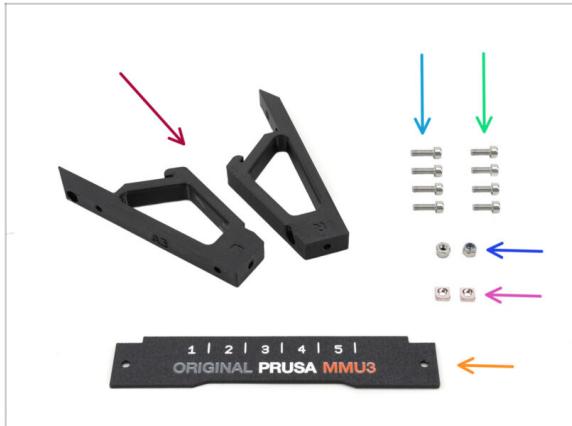
- Before installing the MMU unit, remove the printer's top cover if it hasn't been removed already.

STEP 2 Core One MMU3 Types



- ⚠** There are **two official versions** of the MMU3 for CORE One:
 - the Lite**
 - ⚠** If you have this version, continue to the next step.
 - the Enclosed *with the Top Cover*.**
 - ⚠** If you have this version, continue to the Top Cover Preparation.

STEP 3 (LITE) MMU Holder Preparation



⚠ These steps are valid for the Lite version.

- For the following steps, prepare:
- CO_MMU_Holder (2x)
- M3x10 screw (4x)
- M3x8 screw (2x)
- M3nS nut (2x)
- M3nN nut (2x)
- Label Plate (1x)

STEP 4 (LITE) M3nS Installation



- Turn the unit around.
- Insert the two **M3nS** nuts into the marked openings on the side of the unit. Push the nuts all the way in using the 1.5mm Allen key.
- Check the nut alignment from above. Use the 1.5mm Allen key to center the nut, if necessary.

STEP 5 (LITE) MMU Holder Installation 1



- ➊ Insert the M3nN nuts into the hexagonal openings in the Holders. Make sure the flat part goes in first!
- ➋ Add the Holders onto the unit and align them with the assembly.
 - ➌ Ensure the holder marked R is on the unit's right side (sides are reversed when the unit is upside down).
 - ➍ Ensure the part with the M3nN nuts faces the back.
 - ⚠ Watch out! the nuts might keep falling out.

STEP 6 (LITE) MMU Holder Installation 2



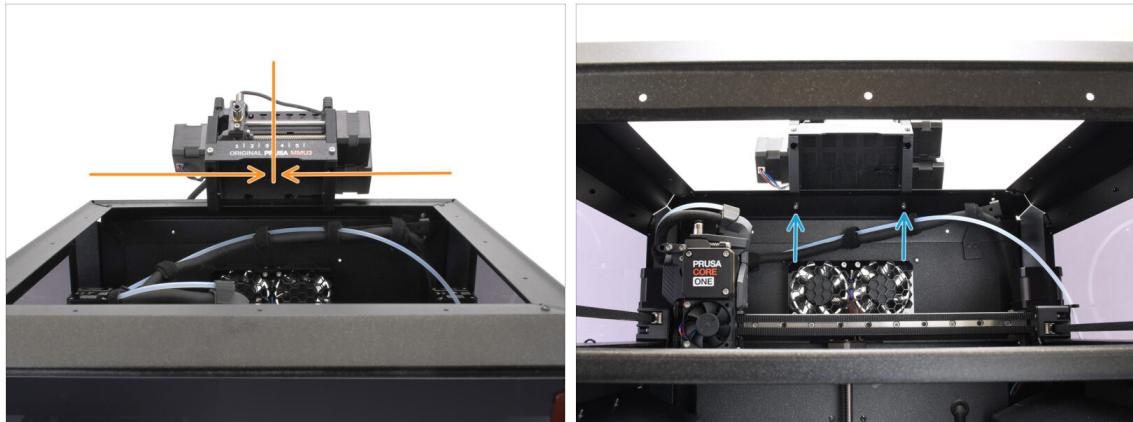
- ➊ Fix the holders to the unit using four M3x10 screws.
- ➋ Align the Label plate with the front part of the MMU unit. Fix it to the holders using two M3x8 screws.

STEP 7 (LITE) MMU Placement 1



- ◆ Now, we will place the MMU assembly onto the top back part of the printer.
- ◆ Hook the notch on the MMU holders to the front part of the metal profile.
- ◆ Lean the MMU against the profile.

STEP 8 (LITE) MMU Placement 2



- ◆ Center the unit on the printer to align the screw holes.
- ◆ Reach inside the printer to secure the unit with the two M3x8 screws.

⚠️ Your MMU3 Lite is now securely attached.
Continue to the Back Cover Removal step.

STEP 9 (ENC) Top Cover Preparation



⚠ These steps are valid for the Enclosed version.

Skip if you use the Lite.

- For the following steps, prepare:
 - ◆ MMU Top Cover (1x)
 - ◆ Vent Cover (1x)
 - ◆ CORE ONE ASSEMBLY MULTI TOOL (1x) version *E2 or newer*
 - ◆ Vent Nut (2x)
 - ◆ Top Cover Lock (2x)
 - ◆ M3x10rT (4x)
 - ◆ O-ring (2x)

STEP 10 (ENC) Top Cover Assembly 1



- ◆ Take the Vent Cover part.
- ◆ Push the two M3x10rT screws through the openings.
- ◆ Install the Vent Cover to the inside of the Top Cover, making sure the screws go all the way through.
 - ◆ From the other side, attach the o-rings onto the screws.

STEP 11 (ENC) Top Cover Assembly 2



- ◆ Tighten the screws against the Vent Nuts
 - ◆ Use the Assembly Multi Tool to hold the nuts while tightening.
 - ◆ Tighten the screws just so that the vent cover holds in place when moved to a side. Make sure it is still easy to slide.

STEP 12 (ENC) Top Cover Assembly 3



- ◆ Attach the Locks onto the bottom part of the Top Cover.
 - ◆ Make sure the Locks are oriented as seen in the picture. Then, fix them in place using two M3x10rT screws.
 - ◆ Tighten the locks just until snug. They should be movable with reasonable force.

STEP 13 (ENC) MMU Holder Preparation



- For the following steps, prepare:

- CO_MMU_Holder (2x)

- M3nS nuts (2x)

- M3x10 screw (4x)

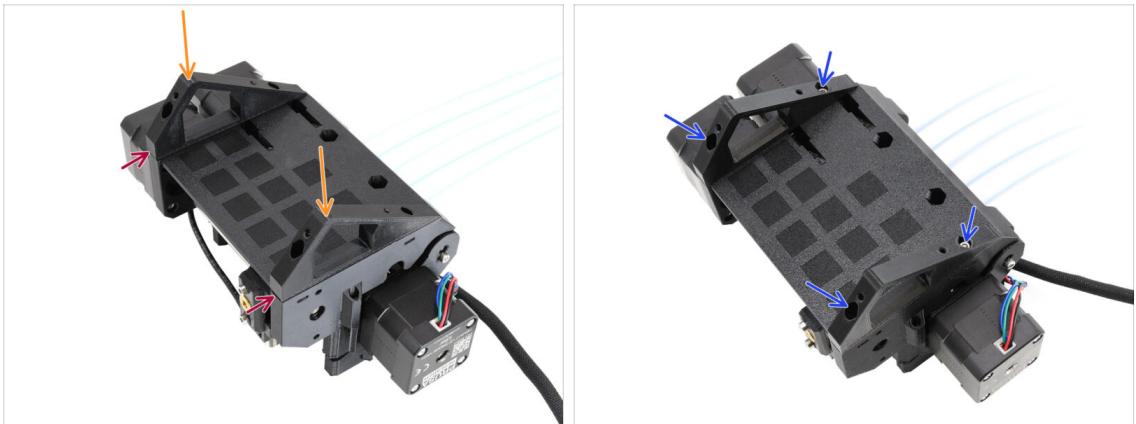
⚠ Some versions of the assembled unit may already have these holders pre-installed. If so, you can skip the holder installation steps.

STEP 14 (ENC) M3nS Installation



- Turn the MMU unit around.
- Insert the two **M3nS** nuts into the marked openings on the side of the unit. Push the nuts all the way in using the 1.5mm Allen key.
- Check the nut alignment from above. Use the 1.5mm Allen key to center the nut, if necessary.

STEP 15 (ENC) MMU Holders Installation



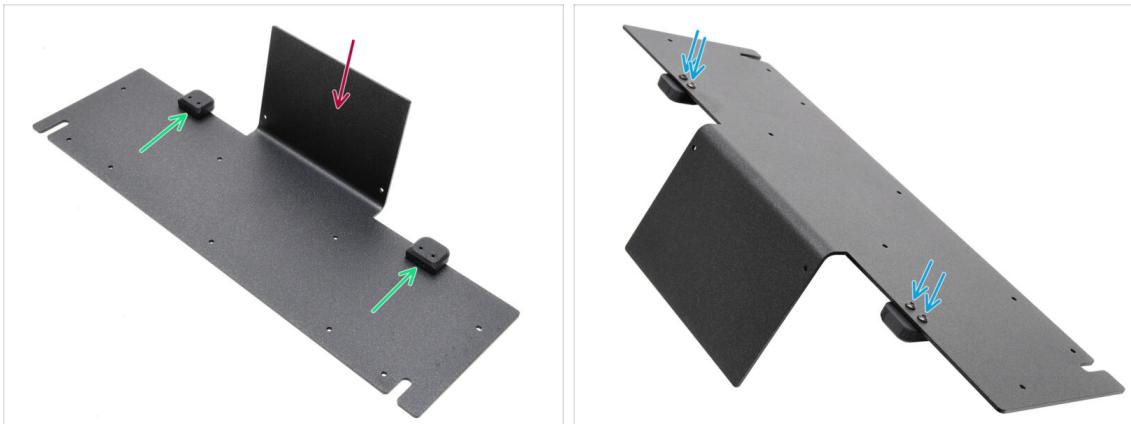
- ◆ Take the MMU unit and flip it upside down.
- ◆ Add the holders onto the bottom part.
- ◆ Align the flat front of the holders with the unit.
- ◆ Attach the holders using four M3x10 screws.

STEP 16 (ENC) Metal Holder Preparation



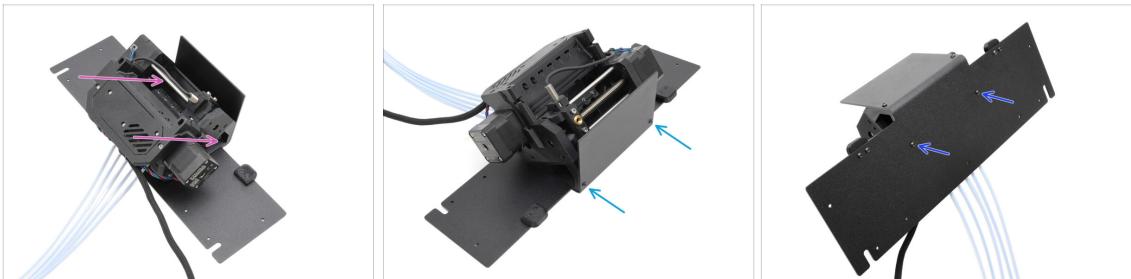
- ◆ For the following steps, prepare:
 - ◆ MMU Metal Holder (1x)
 - ◆ Top Cover Holder (2x)
 - ◆ M3x10rT screws (8x)

STEP 17 (ENC) Metal Holder Assembly



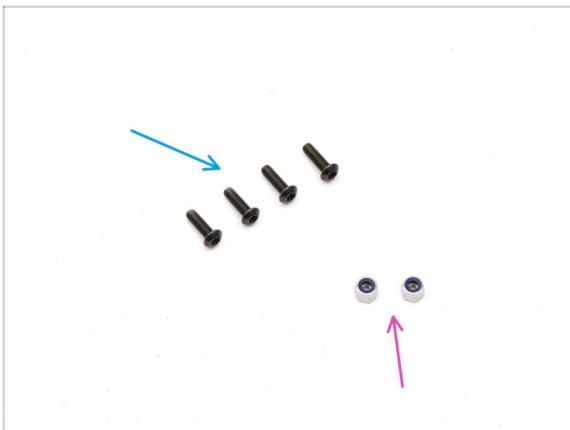
- ◆ Orient the metal holder with the bent part facing up as shown.
- ◆ Instal the plastic holders onto the metal using the four M3x10rT screws.
-  Ensure the rounded part overhangs, as in the picture.
- ◆ Tighten the screws.

STEP 18 (ENC) Unit Assembly



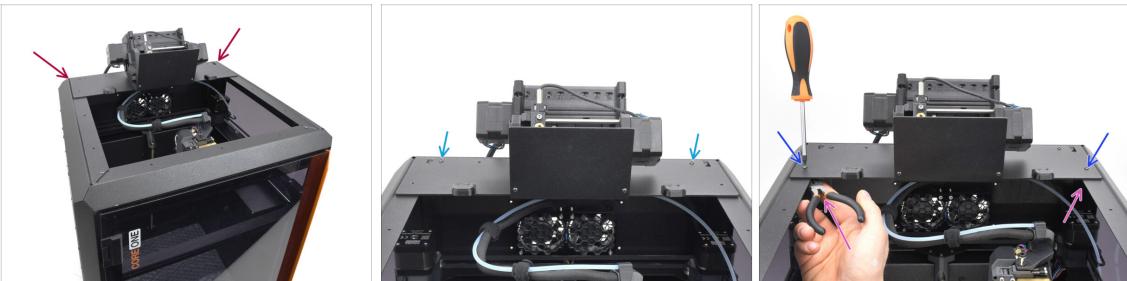
- ◆ Move the MMU unit onto the Metal holder, aligning its plastic holders with the bent part.
- ◆ Attach the MMU unit to the metal with two M3x10rT screws at the front.
-  (i) Tighten the screws with reasonable force to avoid stripping the self-tapped plastic thread.
- ◆ Fix the unit using the other two M3x10rT screws at the bottom.

STEP 19 (ENC) MMU Placement Preparation



- For the following steps, prepare:
 - M3x10rT screws (4x)
 - M3nN nuts (2x)

STEP 20 (ENC) MMU Assembly Placement



- Place the MMU assembly with the metal holder onto the printer. Make sure it sits in the back of the top recess, with the MMU facing the front of the printer.
 - Fix it to the metal profiles in the back using two M3x10rT screws.
 - Tighten two M3x10rT screws on sides against the M3nN nuts held with needle-nose pliers.

STEP 21 Back Cover Removal 1



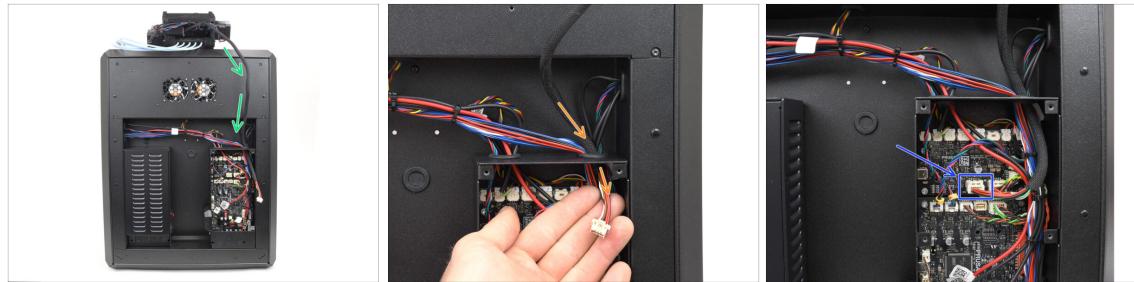
- ◆ On the inside of the printer, remove the two screws holding the back cover.
- ◆ On the back of the printer, slide the center cover downwards.
- ◆ Pull the bottom part of the cover outward while tilting the top toward the printer. This will unhook it from the cable bundle behind. Remove the cover.

STEP 22 Back Cover Removal 2



- ◆ Remove the six screws holding the xBuddy cover.
- ◆ Remove the cover by sliding it out.

STEP 23 MMU Cable Connection



- ◆ Guide the MMU cable towards the electronics box.
- ◆ Pull the cable through the top cable opening into the xBuddy box.
- ◆ Connect the cable to the dedicated MMU port on the xBuddy Extension board.

STEP 24 Back Cover Installation 1



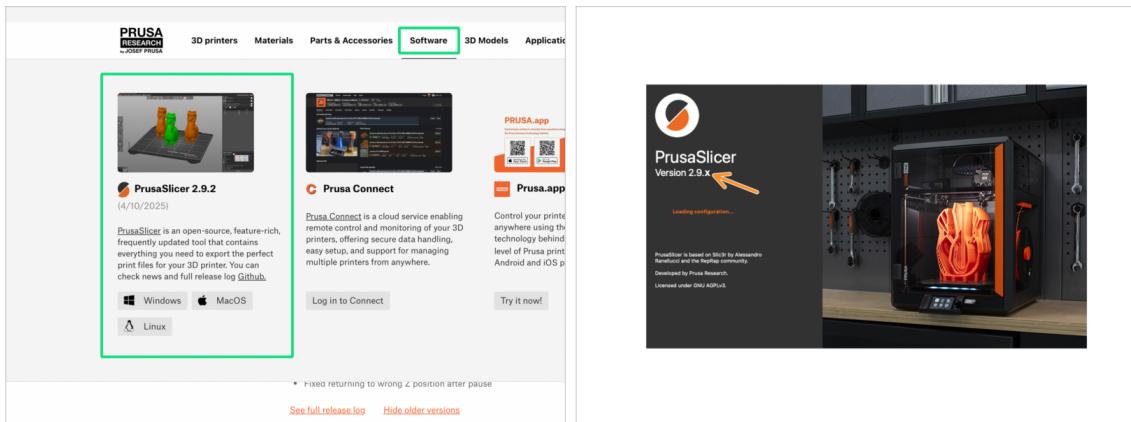
- ◆ Attach the xBuddy box cover using the 6 M3x4rT screws.
- ① Make sure no cable is getting pinched.
- ◆ Re-install the back cover, making sure the MMU cable fits through the mousehole opening on top.

STEP 25 Back Cover Installation 2



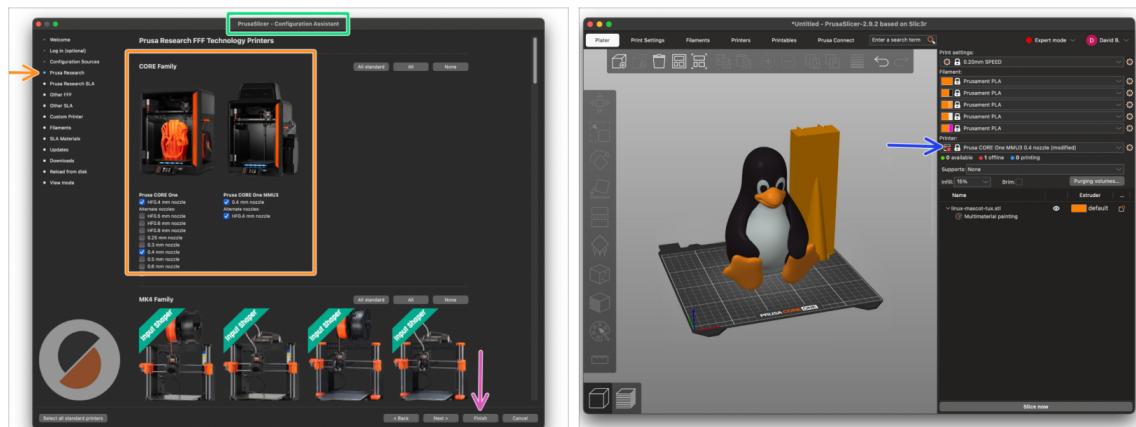
- ◆ Push the cover up, so that the four tabs on top engage into the recesses.
- ◆ While pushing the cover up, fix it in place using two M3x4bT screws from the inside of the printer.

STEP 26 Software Download



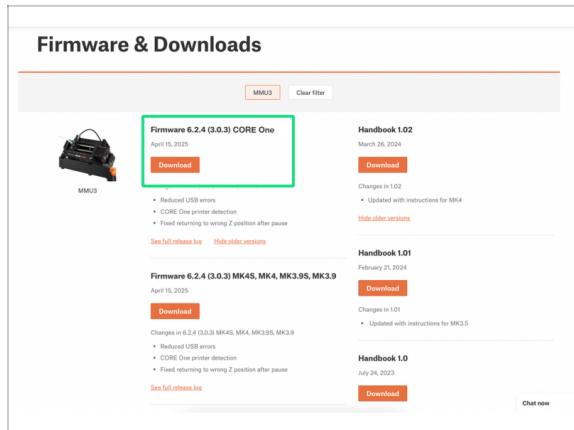
- ◆ Visit Prusa3D.com
- ◆ Download the latest **PrusaSlicer** from the Software tab.
- ⚠ **MMU3 on CORE One requires PrusaSlicer version 2.9.2 or newer.**
- ◆ Install the latest **PrusaSlicer** and open it.

STEP 27 PrusaSlicer setup for MMU3



- ◆ Open the PrusaSlicer Wizard/Assistant. (from the menu **Configuration > Configuration Wizard/Assistant**)
- ◆ Open the **Prusa Research** printer list and select **MMU version** of your printer.
 - ◆ **Select the nozzle** type and size in the list below.
- ◆ Click **Finish** to save the settings.
- ◆ In **Printer:** menu, select the **MMU3** printer profile for future slicing.

STEP 28 Firmware files download



- ⚠ You will need to update the **firmware** for both the **printer** and the **MMU** unit. Each device has a **separate firmware file** that needs to be flashed. Always use only the **newest compatible firmware versions** together.
- ⚠ For more info, see the **MMU3 Firmware Compatibility** article.
- ◆ Visit the **MMU3 Downloads** page on Help.Prusa3D.com
- ◆ Download the **lastest Firmware** package for your printer model.

STEP 29 Firmware Upgrade: Printer



- ◆ **Printer's firmware - .bbf file**
for the CORE One control board:
(e.g. COREONE_firmware_6.x.x.bbf)
- ◆ **MMU3 control board firmware:**
(e.g. MMU3_FW3.0.3+896.hex)
 - ◆ This firmware update must be applied directly to the MMU unit using a computer. **We will flash the MMU unit firmware in the upcoming steps.**
- ◆ **Update the printer's firmware.** First, transfer the firmware file onto a USB drive.
- ◆ Turn on the printer and connect the USB drive into it. Press the RESET button to restart it. Then, select the FLASH option on the screen to begin the update.

STEP 30 Turning the MMU on



⚠ After finishing the firmware update, **make sure there are no filaments loaded** neither in the extruder, or in the MMU unit.

- ➊ Navigate to the **LCD menu > Settings > MMU**

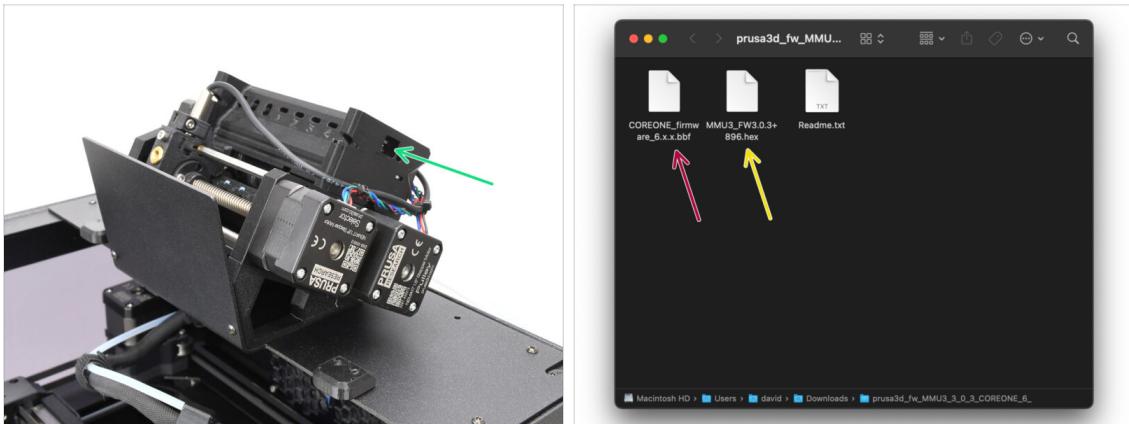
and make sure the **MMU** is turned **on**.



This option enables the MMU functionality in the firmware and turns on the power for the MMU unit, which is needed for a firmware update.

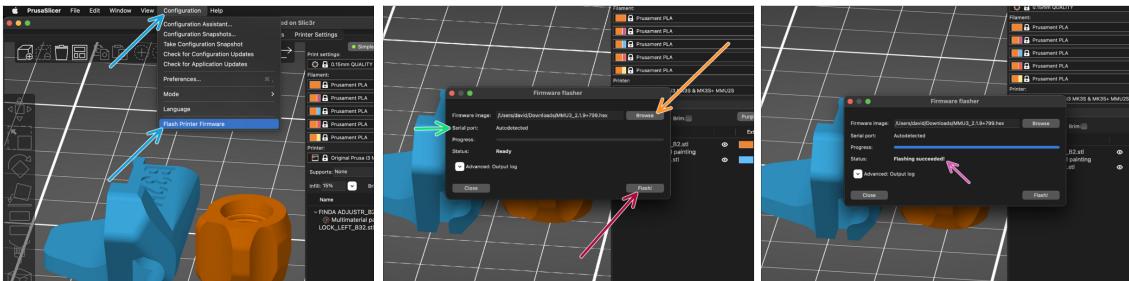
- ➋ The MMU unit will now perform a self-test (flashing LEDs). **Wait until it boots up completely** before issuing any commands. By the way, from now on, the printer's reset button will also reset the MMU unit.
- ➌ Since you've converted the extruder to the MMU version, when prompted to reconfigure the filament sensor's behavior, which should appear immediately, choose '**Continue**'.

STEP 31 MMU3 Firmware flashing (part 1)



- ◆ The MMU3 firmware file needs to be flashed into the MMU unit itself. Find the **microUSB** connector on the right side of the MMU3 unit.
- ◆ Connect the unit to your computer using the bundled microUSB cable.
- ◆ On your computer, select the appropriate **MMU firmware file** compatible with your printer model.

STEP 32 MMU3 Firmware flashing (part 2)



- ◆ Open PrusaSlicer and select **Configuration -> Flash Printer Firmware** from the top menu.
- ◆ Hit **Browse** and select the MMU3 firmware image file on your computer. (e.g. MMU3_FW3.0.3+895.hex)
- ◆ Serial port should be auto-detected.
- ◆  Hit **Rescan** if your printer is not listed in the Serial port: column
- ◆ Hit the **Flash** button.
- ◆ Wait until the **Flashing Succeeded!** message appears.
- ◆ After the flashing finishes, disconnect the USB cable.
- ◆ **(i)** In case of any issues with flashing the firmware please visit our [troubleshooting article](#).

STEP 33 Gears calibration



- Now, we need to calibrate the planetary gearbox in the Nextruder.
- Go to the Home screen and navigate to *Control -> Calibrations & Tests*, scroll down and select **Gears Calibration**.
- Once you get to the Gearbox Alignment part, select **Continue** and follow the on-screen instructions.

STEP 34 Gearbox Alignment



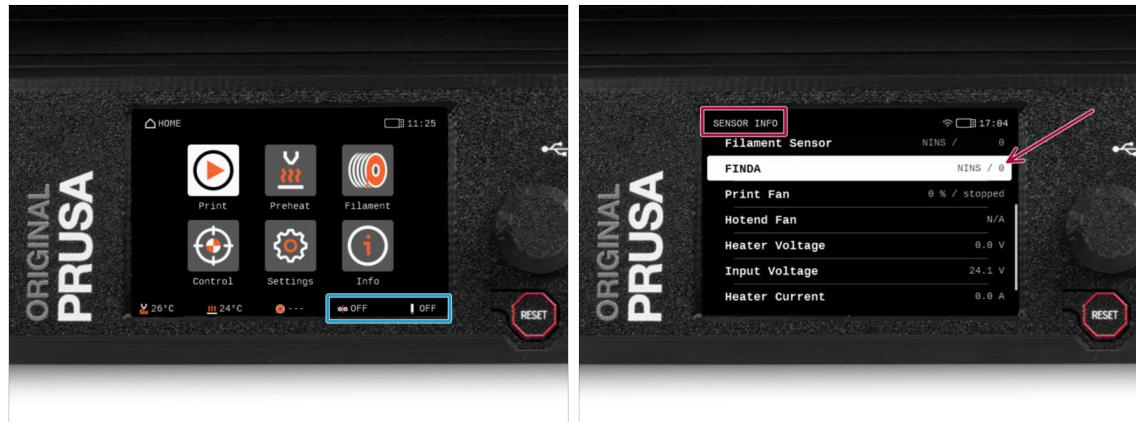
- During the **Gear calibration** process, you will be prompted to:
 - Make sure the **Idler lock** (swivel) is in the open position - lifted up.
 - Loosen the three screws on the front of the gearbox by 1.5 turns.
- i** The printer will go through the automatic gearbox alignment. This process can't be seen from the outside.
- Once prompted, tighten the screws in the pattern indicated on the screen.

STEP 35 MMU Filament sensor calibration



- ◆ After completing the Gearbox Alignment, you should be prompted to continue to the **filament sensor calibration**.
 - ⓘ Start with no filament in the extruder.
 - ⚠ Close the **Idler lock** (swivel).
 - ◆ For the calibration, prepare a filament and hit **Continue**.
 - ⚠ **Don't insert the filament before being prompted to do so!**
 - ⓘ Once prompted to, insert the filament.
 - ◆ After successful calibration, remove the filament.

STEP 36 Footer Status Bar



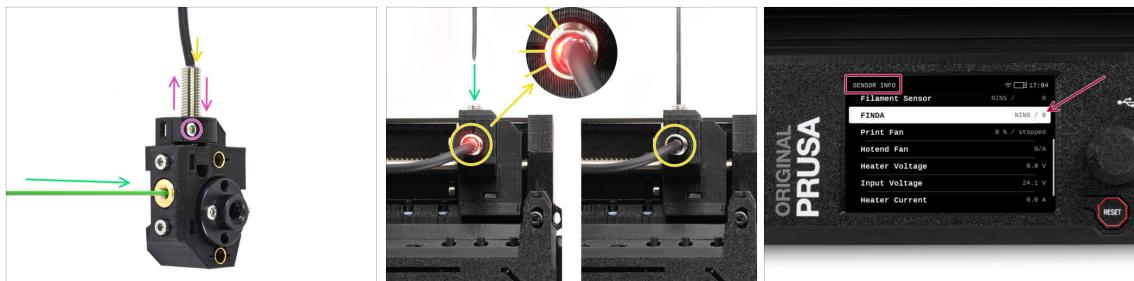
- ⓘ Turning on the MMU unit automatically displays the filament sensor and Finda sensor information on the footer status bar.
 - ◆ To change the settings, visit **Settings > User Interface > Footer** menu.
 - ◆ The sensor values are also shown in the **Info > Sensor Info** menu.

STEP 37 SuperFINDA sensor calibration info



- ◆ If you built the MMU3, the **SuperFINDA sensor** inside the selector must be calibrated.
- ⓘ For **factory-assembled MMU3** units, you can skip the calibration steps.
- ◆ In the next step, we'll calibrate the sensor's position.
- ⚠ **It is CRITICAL that both the filament sensor in the extruder and the SuperFINDA sensor function accurately.** Otherwise, you will have trouble with the device.
- ◆ Use the inspection window on the selector to align the bottom of the sensor with the top of the window, as a starting point.
- ◆ When filament is in the selector, the steel ball rises and should be detected by the SuperFINDA sensor. Ensure the distance between the ball and the sensor is perfectly calibrated.

STEP 38 SuperFINDA calibration



- ◆ Insert filament with a sharp tip into the brass opening at the front.
- ◆ Take a look at SuperFINDA from above and watch for the little red light inside the sensor to turn off when the filament raises the steel ball inside.
 - ◆ Red light = no filament detected = **FINDA 0 / OFF**
 - ◆ No light = filament detected = **FINDA 1 / ON**
- ◆ If the light is still on, lower the SuperFINDA slightly.

If the light doesn't ever go on, raise the SuperFINDA probe by releasing the screw by its side, moving the probe, and tightening the screw back up.
- ◆ Watch the **sensor readings on the LCD** (Info > Sensor Info -> FINDA) Note, there is a slight lag in the sensor's readings on the LCD; proceed slowly.
- ⚠️ Repeat the test, adjusting SuperFINDA height **until consistent readings occur when inserting and removing filament.**

STEP 39 Side Filament Sensor Check



- ◆ Visit the menu **Settings > Filament Sensors** and verify the **Side Filament Sensor** is turned on.
 - ⓘ Even if the sensor is not used, it must remain enabled; otherwise, the printer may falsely trigger the FSENSOR TOO EARLY error.
- ◆ Make sure no filament is physically inserted into the side sensor.

STEP 40 Error code details (Part 1)

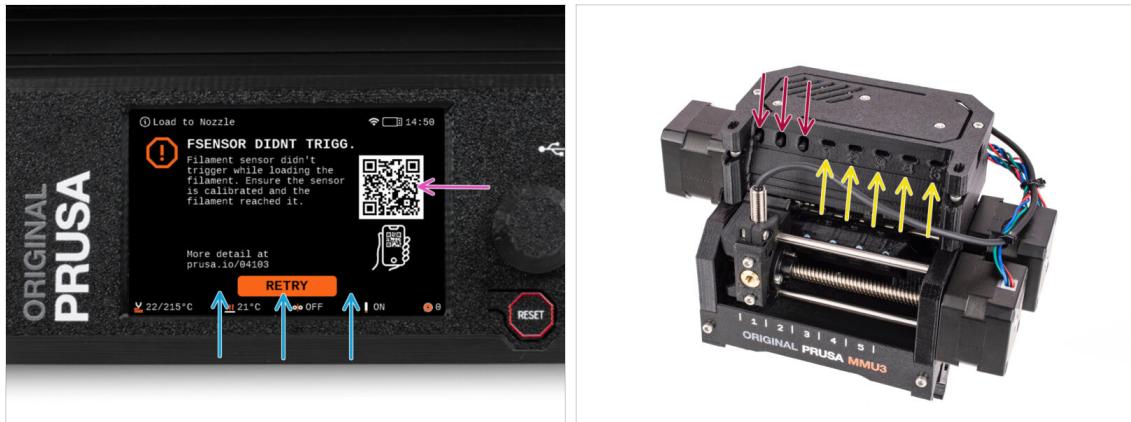


- ➊ Later on, an **MMU error screen** will show up if something goes wrong during the operation. See the example image; the first line describes briefly, what's the error about.
 - ➊ prusa.io/04101 is a web address, where you can view a detailed article about the exact issue, and how to fix it.
 - ➋ The QR Code gets you the detailed description.
 - ➌ The status of the filament sensor is always displayed in the Footer section of the error screen to assist in diagnosis.
 - ➍ Adjacent to it, you will find the status of the Finda sensor.



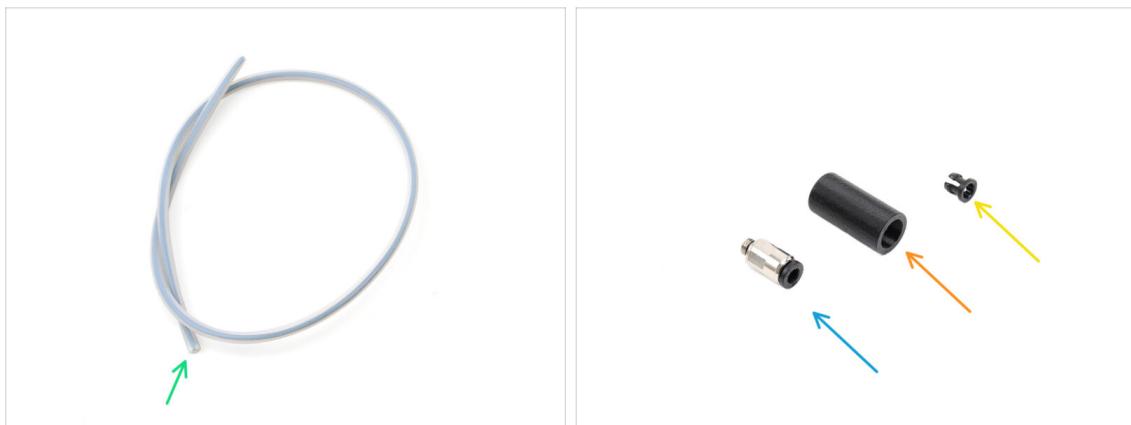
(Note the FINDA status reading on the LCD has a slight delay.)

STEP 41 Error code details (Part 2)



- ◆ The bottom line are the **solution buttons**. Some errors have multiple solutions.
- ❖ You can also visit a detailed error description page via the QR code.
- ❖ MMU unit being in an **error state** is also indicated by its LED lights flashing.
- ❖ While in an **ERROR state**, the buttons on the MMU unit can be used to resolve the error too.
 - ◆ The **middle button** usually replicates the LCD solution buttons function.
- ⚠ Note, if the MMU unit is in **IDLE state**, the buttons **have a different functions**; For example; If there is no filament loaded, the side buttons can be used to move the selector right and left. But more on that later.

STEP 42 MMU-to-Extruder PTFE tube parts preparation



◆ For the following steps, please prepare:

- ◆ MMU-Extruder PTFE tube (1x)
 - ⚠ Use only the supplied PTFE tube.
Enclosed version: 390mm.
Lite version: 450mm.
Do not reuse the shorter 360mm tube from MK4/S or other printers!
- ◆ M5-4 fitting (1x)
 - ⓘ The fitting might look slightly different if you are reusing the one from the MK4S.
 - ⓘ Fitting Cover (1x) required for the Enclosed version only.
 - ⓘ Collet (1x) required for the Enclosed version only.

STEP 43 MMU-to-Extruder PTFE tube 1



- ◆ Attach the M5-4 fitting onto the Selector and tighten it up using the Uniwrench.
- ◆ Connect the MMU-Extruder PTFE tube into the Selector. Make sure to push the tube all the way into the fitting.
 - ⓘ Quick tip: If you need to remove the PTFE tube from the fitting, press the collet in. While the collet is pressed, first press the PTFE tube in, then pull it out entirely.

STEP 44 Fitting Cover. (ENC)



⚠️ This step is required for the Enclosed version only.

- ◆ Insert the collet into the smaller opening on the Fitting cover.
- ⓘ The individual fins on the collet must be pressed together in order to fit into the fitting cover.
- ◆ Attach the fitting cover onto the fitting on the extruder.

STEP 45 MMU-to-Extruder PTFE tube 2



- ◆ Attach the end of the tube into the extruder.
- ⓘ Make sure it is pushed all the way in.

STEP 46 PTFE Length Calibration



⚠ The MMU-to-Extruder PTFE tube length needs to be set in the firmware.

◆ Visit the menu **Settings>Hardware>MMU**

◆ Set the length:

 **Enclosed** version: **390mm**.

 **Lite** version: **450mm**.

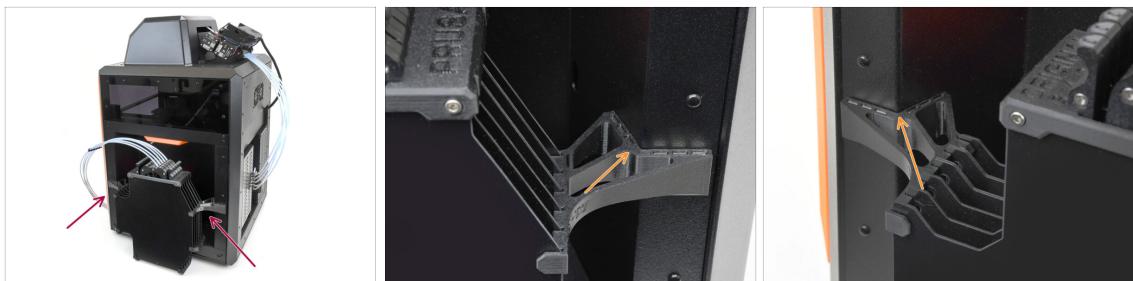
STEP 47 (ENC) Top Cover Installation



◆ If you use the Enclosed version, cover the printer with the Top Cover.

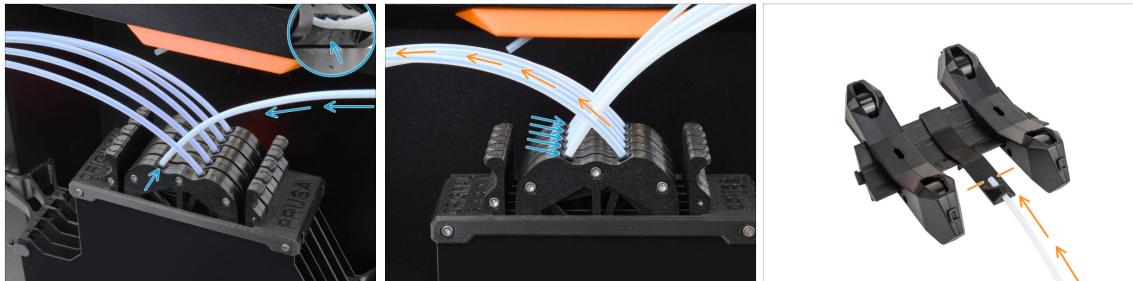
◆ First, hook it at the back, then lean it onto the printer.

STEP 48 Buffer Attachment



- ◆ Attach the buffer assembly onto the right side of the printer.
- ◆ Make sure the magnets are attached properly into the recessed side panel on the printer.

STEP 49 PTFE tubes connection



- ◆ Connect the five PTFE tubes **from the MMU** unit to the **free row of collets** on the buffer, ensuring you match the numbering on both the buffer and the MMU unit.
- ◆ The other PTFE tubes from the Buffer go to the Spool holders.
- ① We will attach the spool holders in the upcoming step.

STEP 50 Spoolholders setup



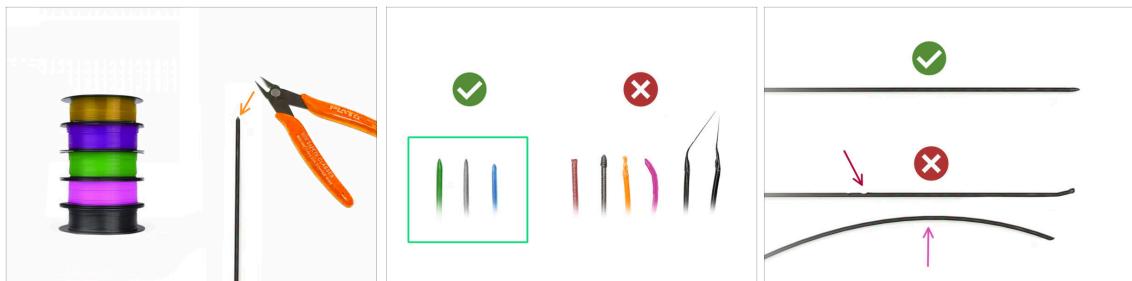
Congratulations! The hardest part is over.

- ◆ The Buffer and spools setup in the picture is the one we will be trying to achieve. Arrange the **spool holders** and the **buffer** as seen in the picture.
 - ◆ The PTFE tubes should go from the spoolholders to the buffer. Then, from the buffer to the back of the MMU.
 - ◆ Connect the PTFE tubes from the buffer onto each of the spool holder.
- ⚠ Note the spool holder positioning. It is important that filament has **as straight path as possible** and that nothing interferes. PTFE tubes should **not be bent too much**. Otherwise, the filaments will jam.

11. First Flight



STEP 1 Filament preparation



We can now move on to loading the filaments in and printing the test object! But first;

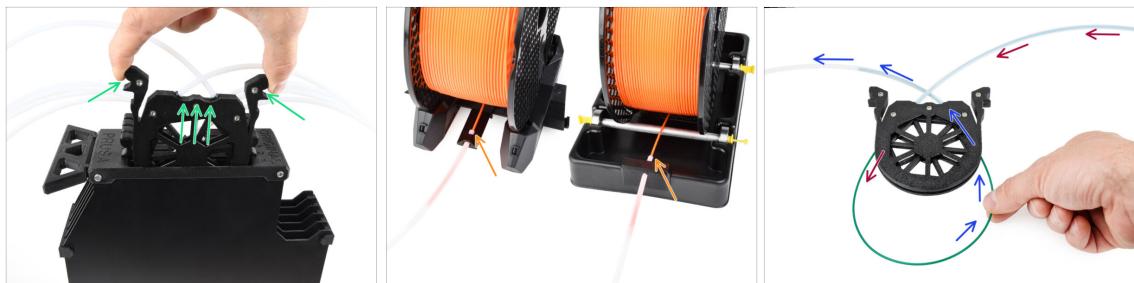
- ◆ Please prepare at least **five different PLA filaments** and **cut off the ends** to form a round **sharp tip** on each - as seen in the picture.
- ◆ The filaments must have a **sharp tip** in order to load properly into the MMU as well as into the printer. If the tip is deformed, bent or larger in diameter, it won't load properly.
- ◆ Inspect the last **40cm (15")** of each filament. Make sure there are **no dents** in it. Sometimes, if filament got jammed before, the pulley wheel makes an indent in it. This part of the filament can no longer be grabbed and moved by the MMU unit and must be cut off.
- ◆ If the filament end is bent, straighten it. **It must be perfectly straight.**
- ⚠ Use only high-quality filament with guaranteed low diameter deviation. In case you have filament loading / unloading issues in the future, re-visit this step as well. Make sure the filament is dried up. Moisture-sensitive filaments can be problematic during the MMU operation.

STEP 2 Suggested filament layout



- ◆ Lay down the five filaments onto the spool holders. Make sure the spools do not interfere one with another.
- ◆ Adjust each spool holder so that the spool fits the rollers correctly.
- ◆ Verify the spool is **able to rotate freely** and nothing interferes.
- ⓘ Keep in mind that the MMU3 works with several printer models, so the parts in the pictures might look slightly different from yours. However, the general steps are the same.

STEP 3 Loading a filament through the buffer



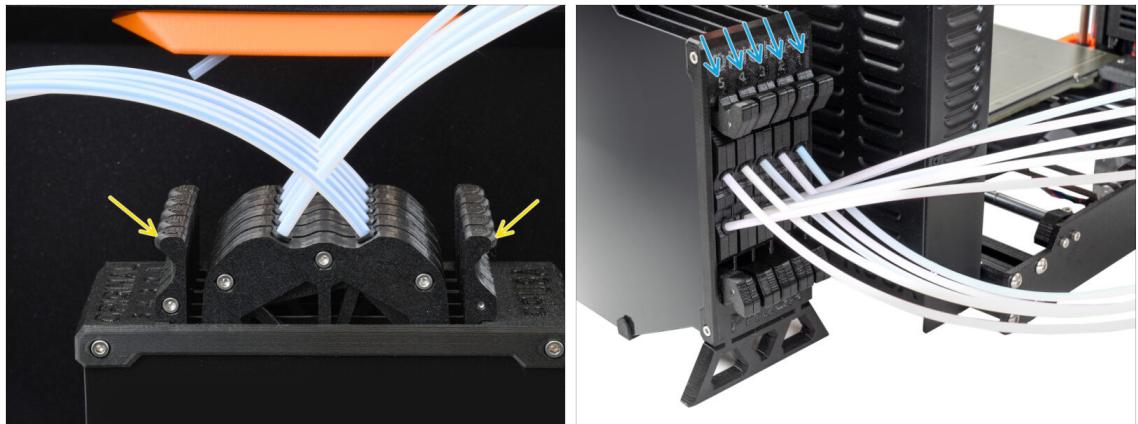
- ◆ Take the cassette for **filament 1** out of the buffer.
- ◆ Insert the **tip of the filament** into the bottom PTFE tube attached to the spoolholder.
- ◆ Keep pushing the filament into the PTFE tube until it appears in the corresponding buffer cassette.
- ◆ Take the tip and insert it through the cassette into the other PTFE tube, which goes into the MMU unit. Don't push it all the way into the MMU yet.

STEP 4 Preloading a filament to MMU



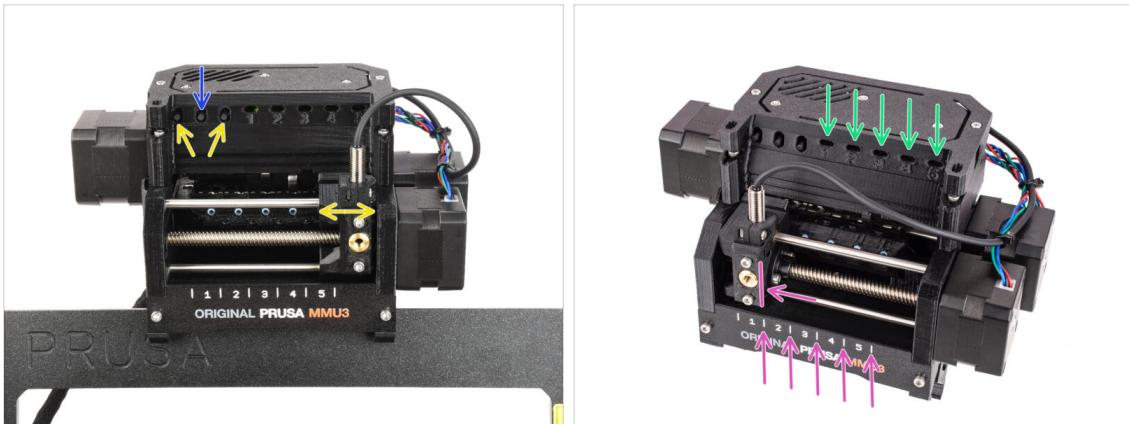
- ◆ On the printer, go to the **Filament -> Preload to MMU** (Menu -> Preload to MMU on MK3S/+)
- ◆ Select **Filament slot 1**. The MMU unit will engage the idler into the first position and start rotating the pulley until the filament is loaded in.
- ◆ Keep pushing the corresponding filament end into the PTFE tube from the buffer into the MMU, until you feel the filament being pulled in.
- ⚠️ Remember, the filament tip must be straight and sharp in order to load it properly.

STEP 5 Closing the buffer



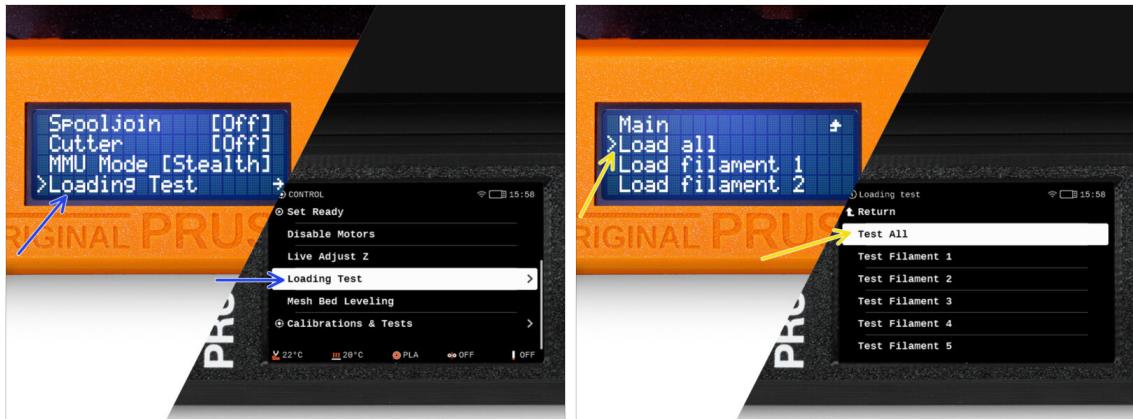
- After a given filament is successfully loaded into the MMU, return its cassette back into the buffer.
- Repeat the same process for the other filament positions, until you successfully load **all five filaments** into the MMU.

STEP 6 Pro tip: Loading using the buttons.



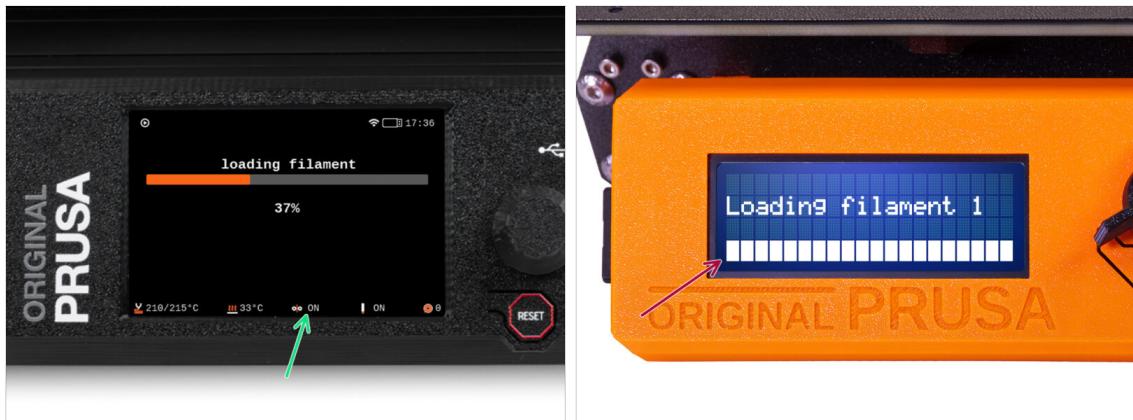
- ◆ You can also load a filament into the MMU using the buttons on the unit. Next time you load a filament, use the method you prefer. Either from the LCD menu, or using the physical buttons.
 - ◆ While the MMU is idle; (indicated by ALL LED lights OFF)
 - ◆ The middle button starts or aborts the filament preloading to MMU.
 - ◆ The side buttons move the selector left and right to switch filament positions.
- ◆ Use the side buttons to move the selector onto the desired filament position indicated by the selector being aligned with one of the lines on the label-plate.
- ◆ The ongoing loading process is indicated by a **blinking green LED** light for the respective filament position.
 - ① **Stable green LED** light means the given filament is loaded to extruder.
- ☞ Note, after you issue a command to the MMU unit, wait and let it finish the operation. Don't rush. Don't play around with the printer in the meanwhile. **Let it finish first if the MMU unit does something (homing, loading, unloading).**

STEP 7 Loading test (part 1)



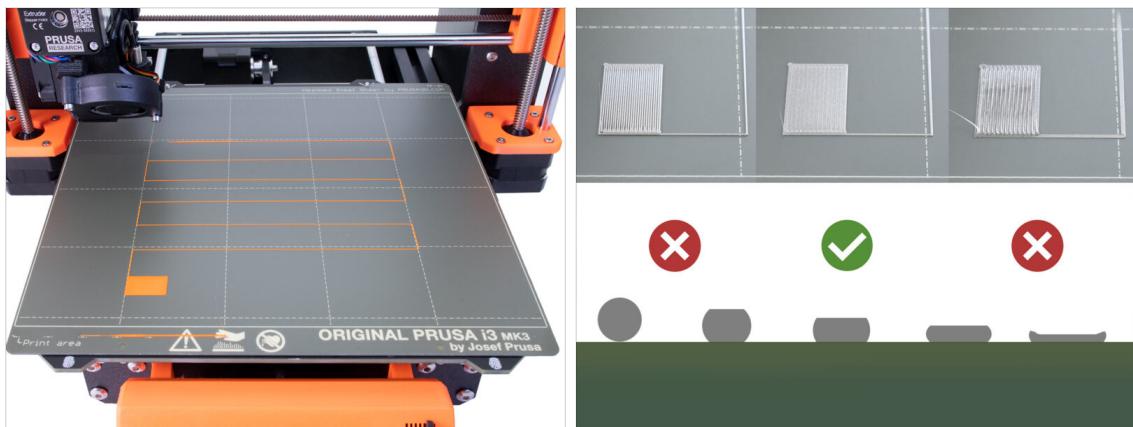
- ➊ Go to the **Control > Loading test**
(Menu > Settings > Loading Test on MK3S/+)
- ➋ Select the filament type to preheat (PLA)
- ➌ Select **Test All / Load all**
Or test all the filaments from 1 to 5 manually
- ⍔ The MMU unit will now load and then unload all five filaments to see if all work correctly.

STEP 8 Loading test (part 2)



- ➊ You can check the **filament sensor** status in the "footer" area of the LCD screen to see if it's detecting the filament correctly.
- ➋ On **MK3S+**, while loading a filament into the extruder, the loading check displays **solid blocks** at the bottom of the LCD if the IR filament sensor detects filament.
 - ➌ If **lines** appear instead of solid blocks, the filament sensor in the extruder is providing an intermittent reading and **may require additional tuning**.
 - ➍ In case several loading retries fail, a **corresponding error screen** is shown.

STEP 9 Z axis and first layer calibration (optional)



⚠️ IMPORTANT: This step is necessary for the **MK3S+ / MK3.5** if you worked on the extruder head previously. If you only upgraded the old chimney to the new one, you can skip to the next step and use the **Live Adjust Z** function as usual to fine-tune the first layer.

- ◆ Go to **LCD Menu - Calibration - Calibrate Z**.
- ◆ Then run the **First Layer Calibration**.

STEP 10 Printing a test object



- ⓘ We need to print a test object to verify that everything works correctly. Don't worry, it will be a quick print.
- ◆ Visit **MMU3 Test objects** on [Printables.com](https://printables.com)
 - ➂ In the Print files section, download a G-code file pre-sliced for your **printer model**.
 - ◆ Save the **.gcode** or **.bgcode** file onto a storage media and print the test object.

STEP 11 Tools Mapping (CORE/ MK3.5 / MK4S)



- When you start a print, the **Tools Mapping screen** appears. This allows you to reassign the extruders with the specified color to another one as needed.
 - On the left side, you'll see a list of the required materials and their colors, as specified in the G-code file.
 - On the right side, you'll find a list of materials currently available on the printer, that will be used to print the object.
- For example, if the G-code requires orange filament in the first position, but you have orange loaded in the fifth position, select the first position on the left menu and then assign it to the fifth position on the right.
- Double-tap the filament positions or use the encoder to select the filament number.

STEP 12 Printable 3D models



- To further test your new MMU3, have a look at [MMU3 Test Objects Collection on Printables](#).

We recommend printing the cute sheep, which has been the MMU mascot since the beginning.

STEP 13 Print & Follow the Handbook.

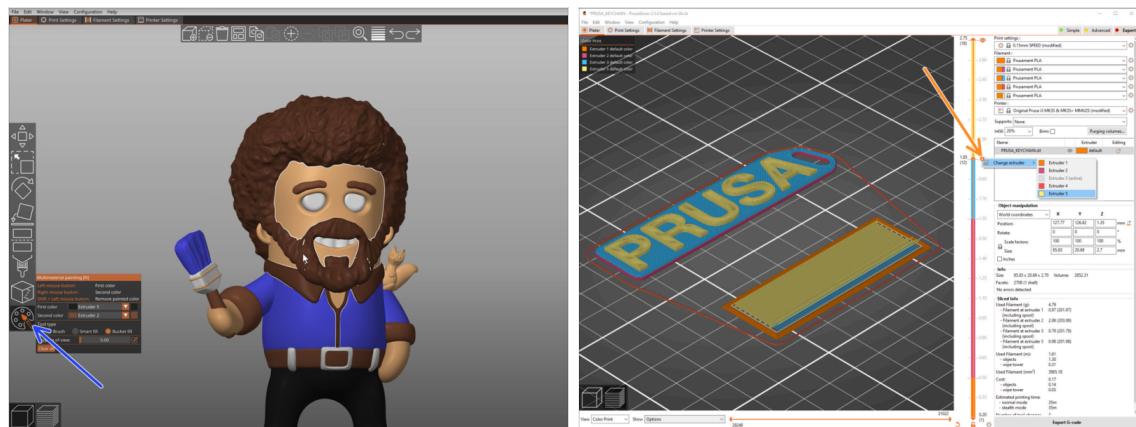


- Start the print and wait until it finishes. In the meantime you can take a look at the **printed Handbook**.
- All the information regarding calibration, how to organise the printer, buffer, spools, or troubleshooting tips are all in the printed or online Handbook.

To download the **Handbook** or if you encounter any issues, please visit our knowledge base at: <http://help.prusa3d.com/en/tag/mmu3/>

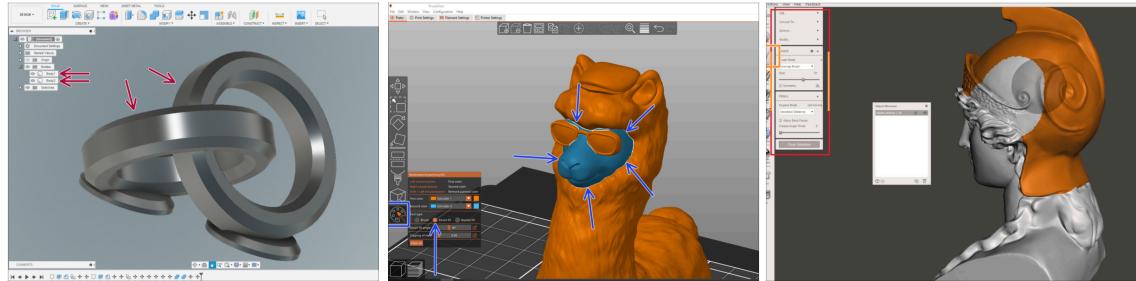
- If you are having any issues while printing, follow the on-screen instructions or visit the link from the LCD screen.

STEP 14 G-code preparation / Custom model preparation



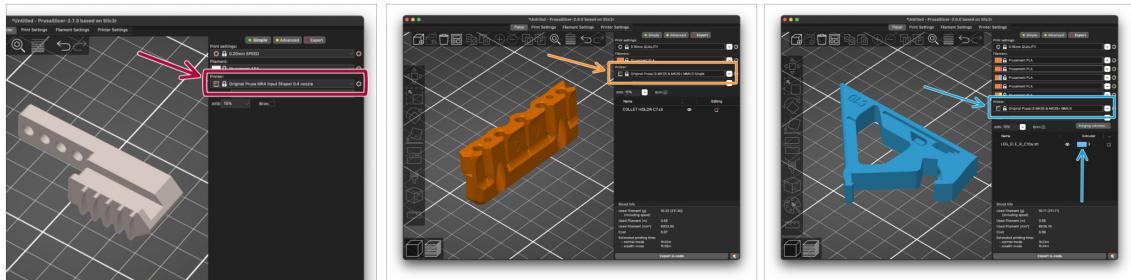
- Already printed all the bundled multi-material models from us as well as those seen at <http://Printables.com>? **Time to print your own designs!**
- The simplest way of making a single-body object colorful is the **MMU Painting function** in PrusaSlicer.
- Basic steps for the manual method are described in our **G-code preparation for multi material print** section.
- For printing logos or text labels, you might also find the **automatic color change at a given layer height** useful. Simply, slice an object, select a certain layer height, click the small orange "+" icon next to the height marker and select the desired MMU filament position (Extruder number).

STEP 15 Making your own Multi-material models



- If you have designed a model with multiple bodies, you may find the **Exporting model from Fusion 360** guide useful.
- If you are designing a single-body model, part of which should be MMU-Painted, make sure there is a sharp line surrounding each distinct part so that you can use the **MMU Painting's Smart-fill** function later on in **PrusaSlicer**.
- If you have an intricate STL file that can't be MMU-Painted easily, you can try the more sophisticated way of **Splitting STL with single compact part** or **Splitting STL into multiple parts using MeshMixer**.

STEP 16 MMU Single material operation



💡 Did you know that MMU3 unit can also be used to make **single-material printing** more convenient too?

- You can keep up to five of your favorite materials loaded into the MMU unit.
 - ◆ On the **CORE/MK3.5/MK4S**, use the regular **CORE/MK3.5/MK4S profile**, when slicing. The printer will allow you to choose which filament to use.
 - ◆ On the **MK3S+**, Slice an object with the MMU3 Single profile and start the print. Then, choose which filament to use from the LCD.
- ◆ If you know which of the five materials to use already while slicing, you can use the **MMU3 profile** and assign a single color (Extruder number) to the object.
- If a filament runs out, your print can continue automatically using the **SpoolJoin** function. For more information, refer to the [SpoolJoin article](#).

STEP 17 Reward yourself



We know you've been waiting for this! Sounds like a well-deserved break! Enjoy those Haribos and watching your printer in action. By the way, what are you printing?

Notes:

Notes:

Notes:

Notes: