MINGDA

User Manual

[Raptor 450 3D Printer]

*Please read this guide carefully before using this printer

Shenzhen MINGDA Technology Co.,Ltd

V2.0

Thank you for choosing MINGDA Technology's products!

For the best experience, please read this user manual carefully and follow the instructions to operate the printer. If you encounter any issues with the printer, please contact us using the contact information provided at the end of this user manual. Our team is always ready to provide you with high-quality service.

Cautionary Notes

1. Please do not place the printer in environments with significant vibrations or instability, as machine shaking can affect the print quality.
2. Avoid touching the nozzle and heated bed while the printer is in operation to prevent potential burns from high temperatures, resulting in personal injury.
3. Refrain from moving the device during the printing process to prevent accidents and injuries.
4. Do not dismantle the equipment or alter circuit settings without authorization.
5. Avoid using the device in high-temperature or humid environments to prevent compromising device performance or creating safety hazards.
6. In case of an emergency, immediately cease using the device and power it off.

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1. Overview

This manual provides instructions on the usage of the 3D printer, covering aspects such as an overall introduction to the device, operational procedures, maintenance, and care. The aim of this manual is to assist you in correctly using and maintaining the 3D printer, ensuring device performance and safety, extending the lifespan of the equipment, and enhancing print quality. We hope that you follow the requirements and recommendations outlined in this manual during usage, and maintain attention to and care for the equipment. Thank you for choosing our product, and we wish you a pleasant experience!

2. Device Introduction

Device Parameters

Basic Parameters	
Product Model	**Raptor 450**
Machine Dimensions	877*799*125 mm
Printing size	450*450*500mm
Print Technology	Fused Deposition Modeling (FDM)
Rated Voltage	220 V
Rated Power	3200 W
Extruder Type	Independent Dual Extruders (IDEX)
Nozzle Temperature	Max 500 °C
Hot Bed Temperature	Max 150 °C
Constant Chamber Temperature	Max 120 °C
Spool Box Drying	Max 60 °C
Print Speed	Max 600 mm/s
Spool Size	1 kg x 2
Auxiliary Feed	Yes
Thermal Insulation	Bellows Cover
Firmware	Klipper
Build Plate Movement	Z-axis (Vertical)
Extruder/Heat Break Cooling	Water Cooling
Screen	10-inch
Support Filaments	PEEK, ABS, ASA, PETG, ABS-CF, PC, PA, PC-CF, PET-CF, PET-GF, etc

Tool List

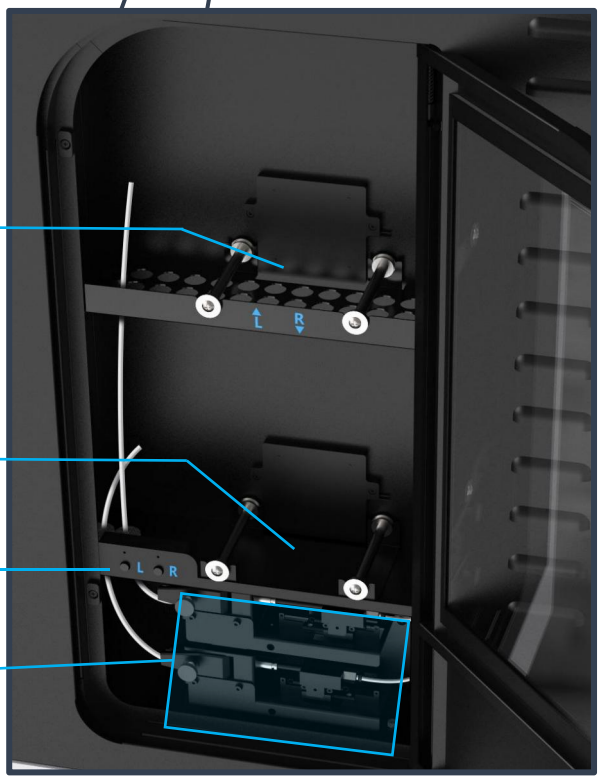
U-disk

Allen wrench

Antenna

Note: **The picture is for reference only. When the real thing is inconsistent with the picture, the actual object shall prevail.**

Machine Components Overview



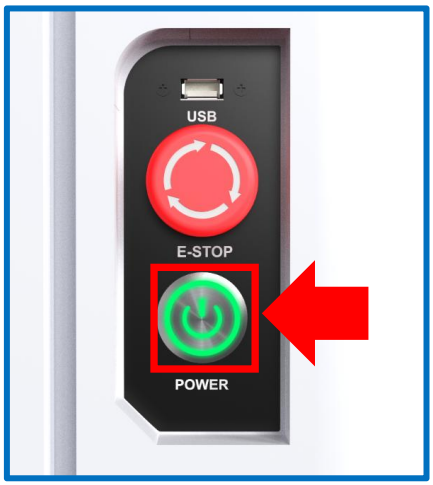
3. Operational Steps

1. Install the Antenna

2. Power on

Please make sure the voltage is correct before plugging in.

Insert a power socket, Press the switch



Press the power button to turn on the printer

2. Indicator light

Standby Mode: Acts as a general status indicator.

Green light: Indicates that the printer is working properly.

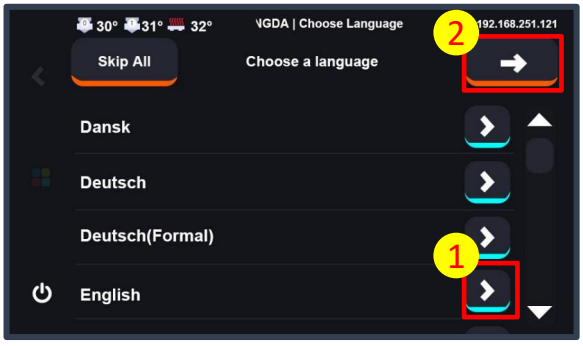
Red light: Indicates that the printer is in an emergency stop or fault state, requiring immediate attention or repair by the user. For example, overload, short circuit, or error message on the screen.

Yellow light: Indicates that the printer is in a warning or abnormal state, requiring user attention or intervention. For example, insufficient filament or paused printing.

Printing Mode: Transforms into a dynamic progress bar, Green LEDs indicate the completed portion, while yellow LEDs indicate the remaining portion.

Startup Configuration

3. Select Language



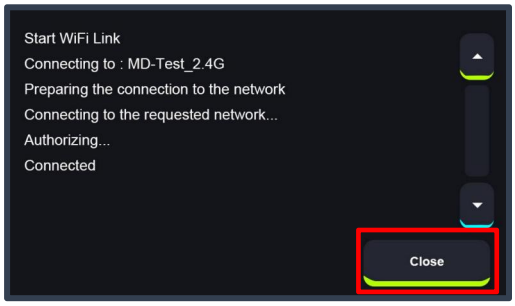
Click to choose the language, and click to proceed to the next step.

4. Wi-Fi

Note: If you find that the printer cannot detect your WiFi signal, you can click to skip this step for now. After completing the startup wizard, move the printer to a location closer to a stronger signal source, and then reconnect to WiFi.

Select the WiFi and click
(If your WiFi network does not appear within 20 seconds, click the refresh button to search again.)

Enter the WiFi password and click

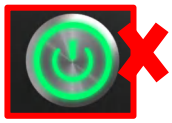


Once the connection is successful, click

Upon successful connection, click the in the upper right corner to enter the main interface of the machine. If you do not need to connect to the network, you can also click the to skip this step.

3. Power off

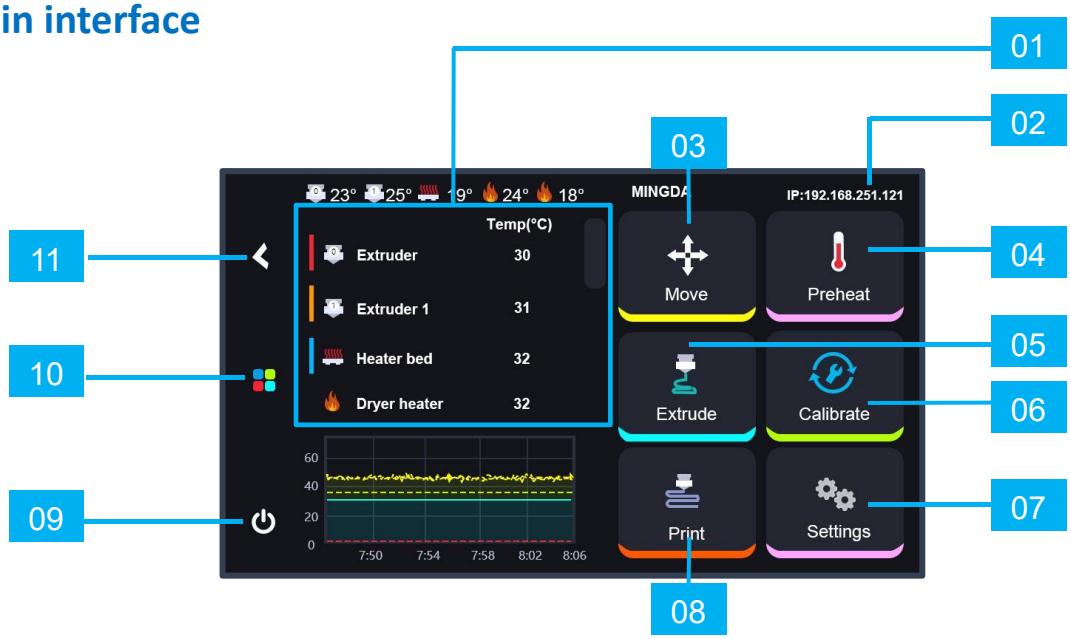
When you turn off the printer, please don't press the power directly!
Click " Shutdown " to turn off the printer



Click the "**Shutdown**"

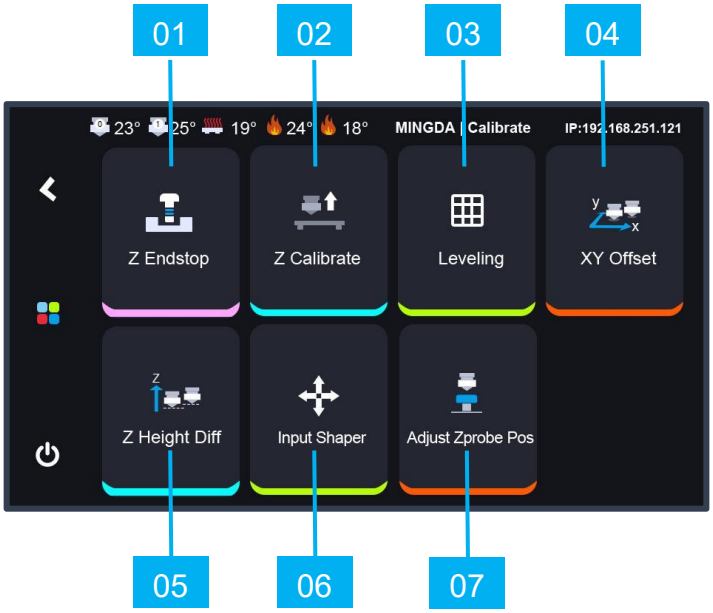
4. Operating interface introduction

Main interface



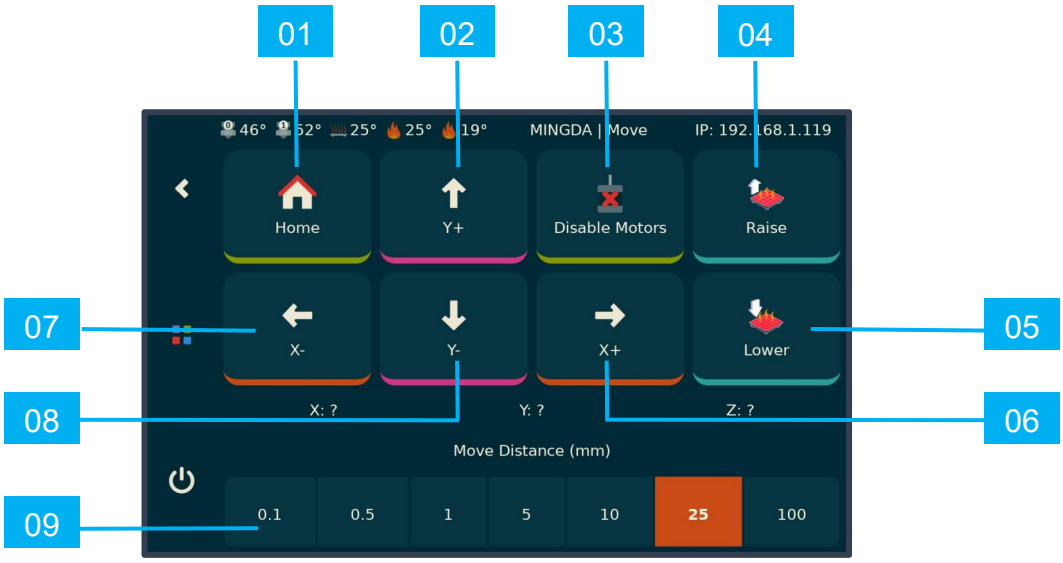
	Primary interface	Explain
01	**Temperature**	Temperature display area ▶ Right extruder ▶ Left extruder ▶ Hotbed ▶ Dryer heater ▶ Temperature-controlled chamber
02	**IP**	Network IP address
03	**Move**	Move or home XYZ axis
04	**Preheat**	Pre-set nozzle & hotbed's temperature
05	**Extrude**	Load/Unload filament.
06	**Calibrate**	Printer Calibration
07	**Settings**	Printer settings, hardware controls, and system tools.
08	**Print**	Start printing
09	**Shutdown**	Shutdown, restart, and emergency stop.
10	**Homepage**	Return to the main page
11	**Return**	Return to the previous page

Calibrate:



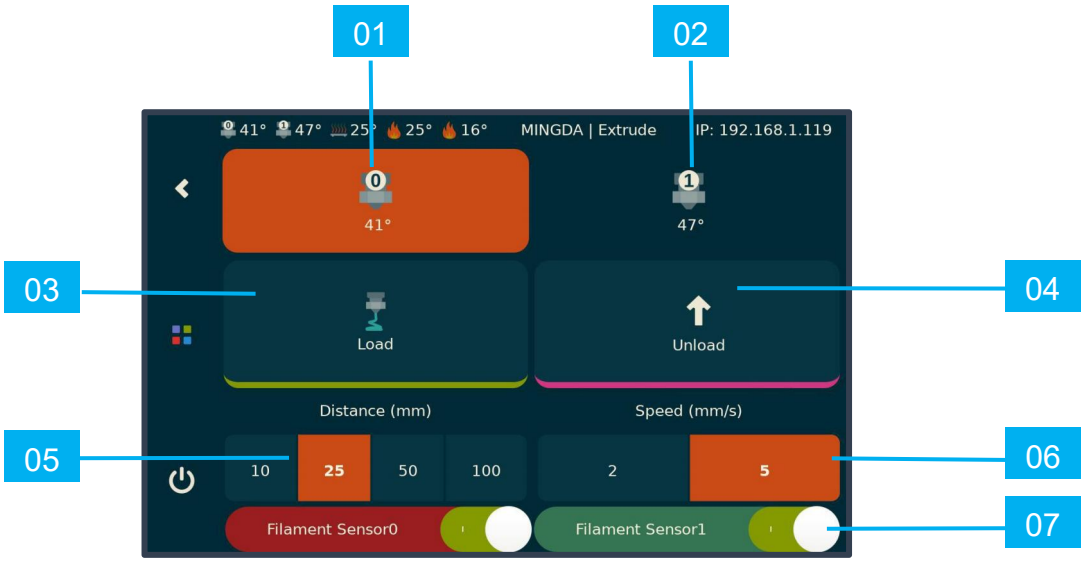
	Secondary interface	Explain
01	**Z Endstop**	Adjust the position of the photoelectric switch.
02	**Z Calibrate**	Leveling sensor calibration
03	**Leveling**	Auto-leveling
04	**XY Offset**	Calibrate X/Y offsets to align left and right nozzles
05	**Z Height Diff**	Calibrate Z offsets to align left and right nozzles.
06	**Input Shaper**	Test the resonance compensation value.
07	**Adjust Zprobe Pos**	Confirm the position of the Z-height difference calibration probe.

Move:



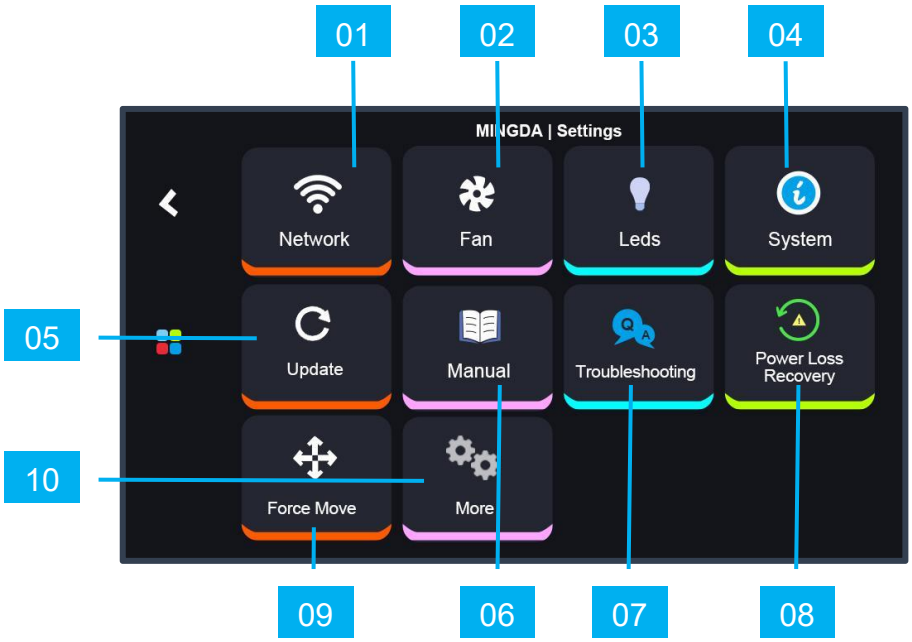
	Secondary interface	Explain
01	**Home**	Restore XYZ axis positions
02	**Y+**	Adjust Y-axis position
03	**Disable Motors**	Unlock motor restriction
04	**Raise**	Raise platform
05	**Lower**	Lower platform
06	**X+**	Adjust X-axis position
07	**X-**	Adjust X-axis position
08	**Y-**	Adjust Y-axis position
09	**Move Distance**	Select the distance to move

Extrude:



	Secondary interface	Explain
01	**Extruder**	Switch to left extruder
02	**Extruder1**	Switch to right extruder
03	**Load**	Extrude filament
04	**Unload**	Unload filament
05	**Distance**	Distance(mm) settings
06	**Speed**	Speed(mm/s) settings
07	**Filament Sensor**	Check for filament presence

Settings:



	Secondary interface	Explain
01	**Network**	To connect Wi-Fi
02	**Fan**	Cooling fan adjustment
03	**Leds**	Turn on/off Light
04	**System**	Machine shutdown, restart, reset function
05	**Update**	Update Klipper and Klipperscreen
06	**Manual**	Manual
07	**Troubleshooting**	Troubleshooting
08	**Power Loss Recovery**	Resume the print after a power failure or system error
09	**Force move**	Move the toolhead if necessary before resuming the print
10	**More**	Includes some basic settings such as language, screen timeout, notification sound toggle, and automatic shutdown after printing completion.

Printing Interface:

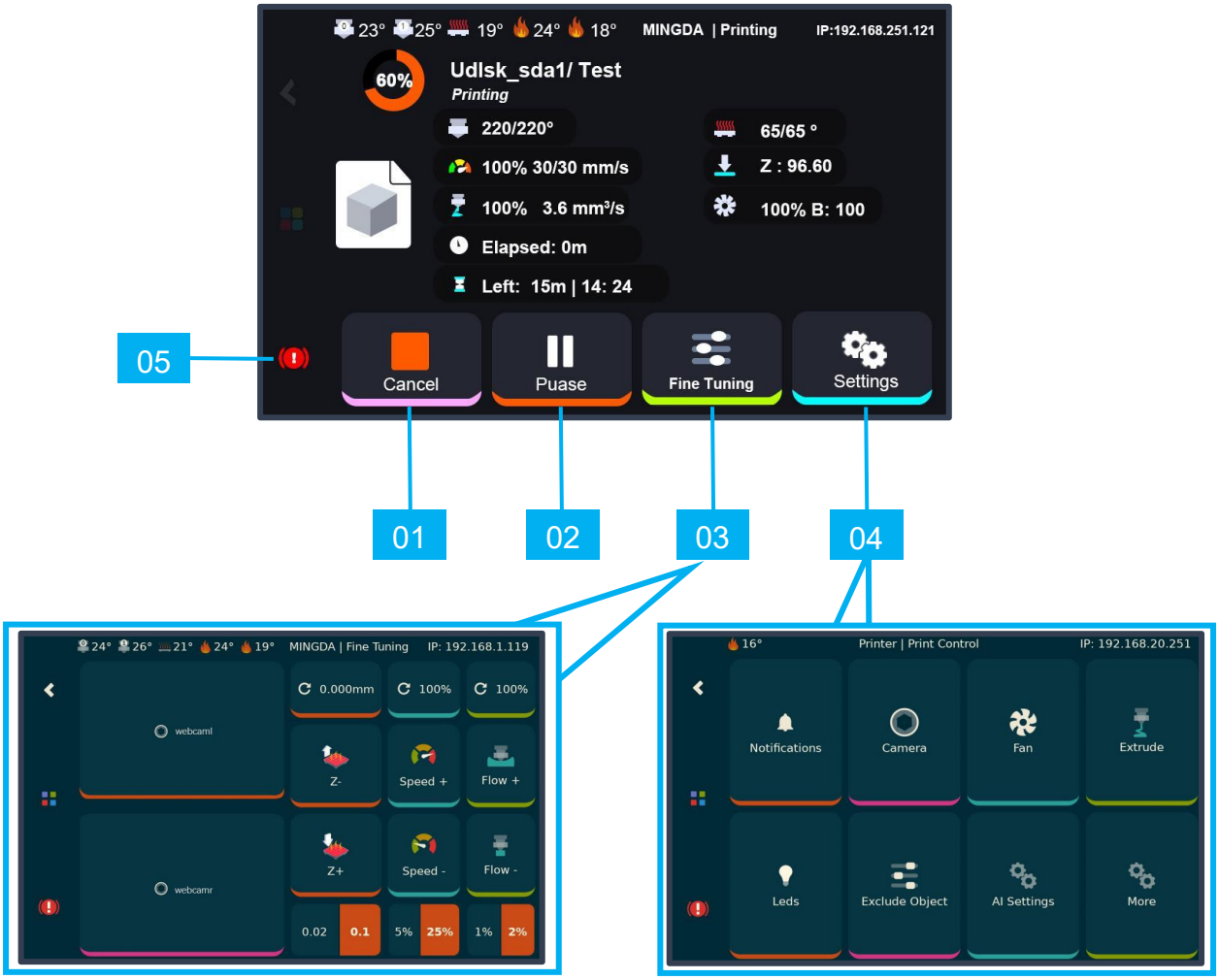
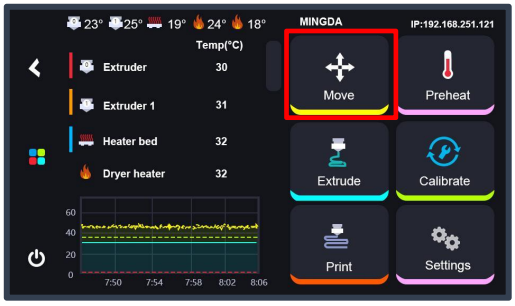


Figure 1

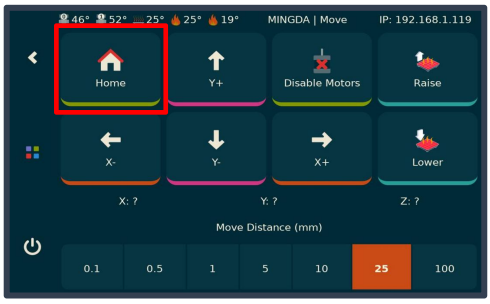
Figure 2

	Secondary interface	Explain
01	**Cancel**	Stop printing
02	**Pause**	Pause printing
03	**Fine Tuning**	Adjust Z-offset, Printing Speed, Printing Flow [Please refer to Figure 1.]
04	**Settings**	Basic setting, browse camera, adjust cooling fan, light , Extrude and Exclude object. [Please refer to Figure 2.]
05	**Stop**	Emergency stop .

5. Insert filament

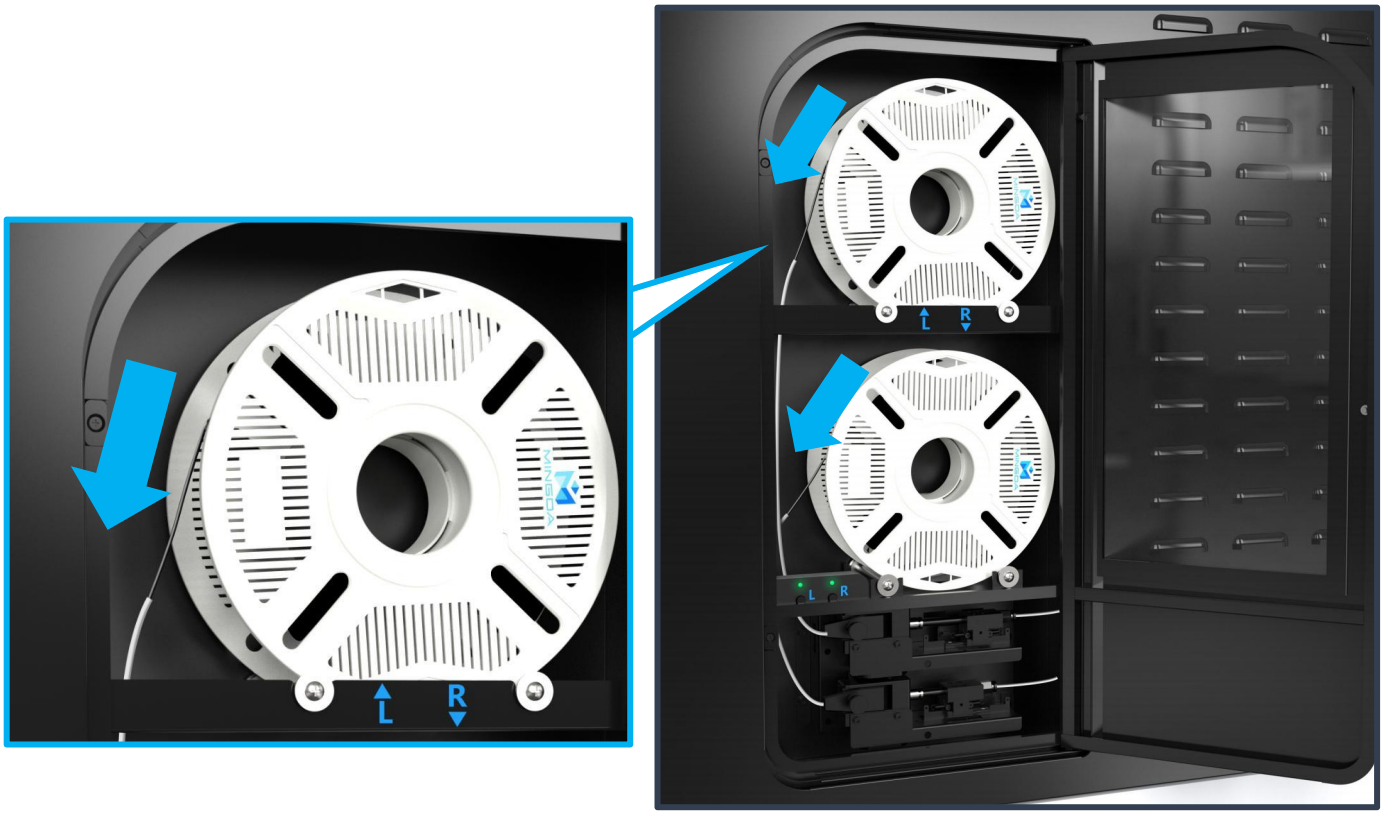


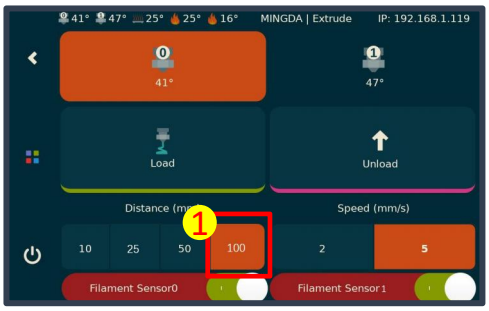
1. Click the "Move"



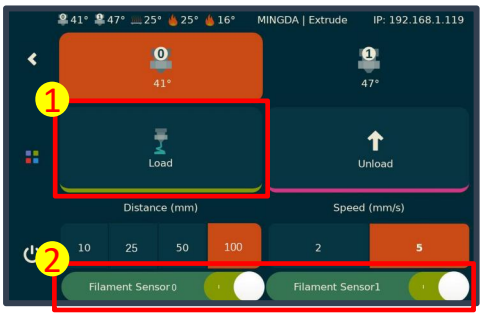
2. Click the "Home" - "Home All"

3.Hang the filament onto the filament holder as shown in the picture, and insert the filament into the corresponding tube and push it until it cannot be pushed anymore. The internal gears will automatically pull the filament in.





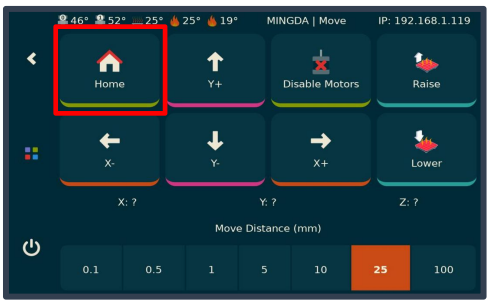
6. Select a length of 100mm,



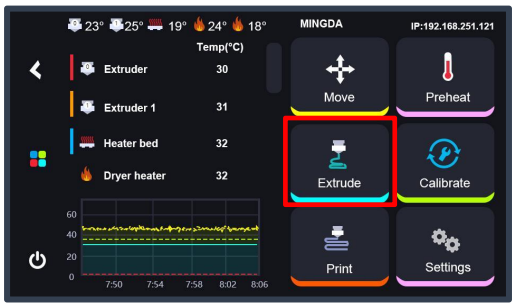
7. Click the "Load" button until the filament sensor indicator changes from red to green.

Unload Filament

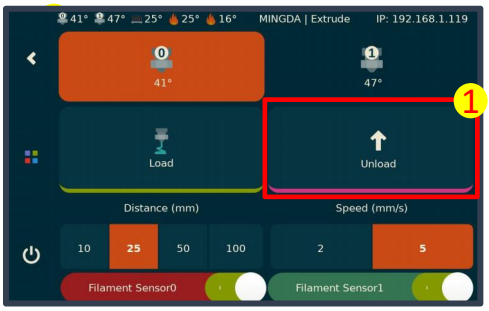
1. Click the "Move"



2. Click the "Home" - "Home All"



3. Click the "Extrude"



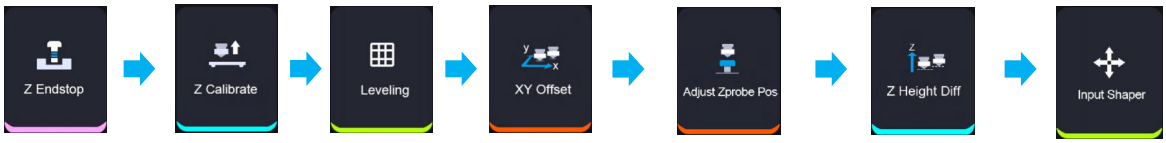
4. Select the extrude for unload; Click the "Unload" button; Wait for retraction to complete.

5. Press the button corresponding to the print head on the auxiliary feeding plate until the consumables are completely removed

6. Printer Calibration

Click "**Calibrate** "

Tip: **Please follow the sequence shown in the diagram to calibrate step by step.**



Z Endstop → Z Calibrate → Leveling → XY Offset → Adjust Zprobe Pos → Z Height Diff → Input Shaper

Note：

1. Z-Endstop,Z-calibrate, Auto-leveling, XY offset and Z height diff must be performed after replacing the nozzle, hotend, or removing/reinstalling the extruder.

2. Before starting the **Z-Endstop,Z-calibrate, Auto-leveling** process, heat the bed to the target printing temperature, and wait for 20 minutes. This allows for thermal expansion of the PEI to stabilize, ensuring accurate leveling.

Printing Tips:

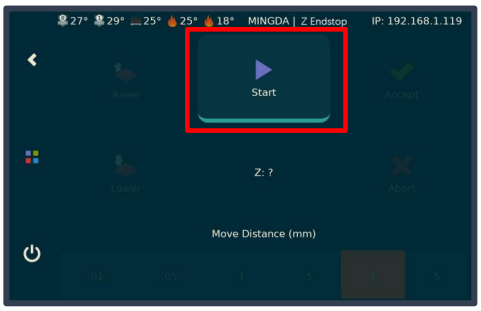
If the bed calibration temperature is set to 60°C. Before printing, keep the bed temperature at 60°C and wait for 20 minutes to ensure optimal first layer adhesion and print quality.

1. Z Endstop

Note: Clean the nozzle thoroughly before calibration.

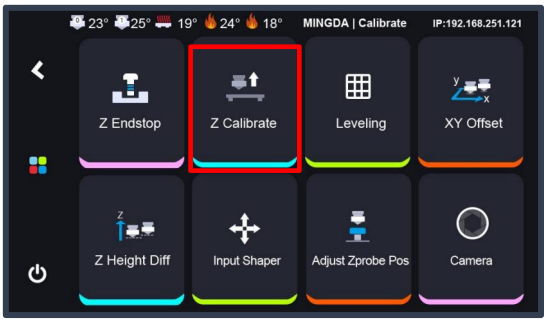
Adjust the position of the photoelectric switch.

Click "**Z Endstop**"

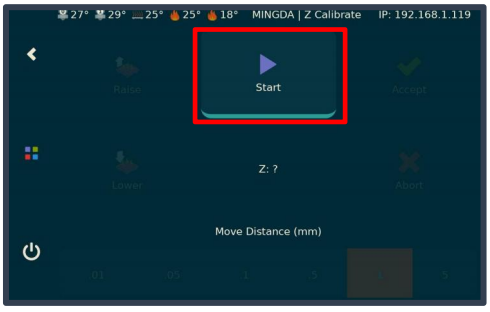


Click "**Start**" , waiting for automatic calibration to complete.

2. Z Calibrate



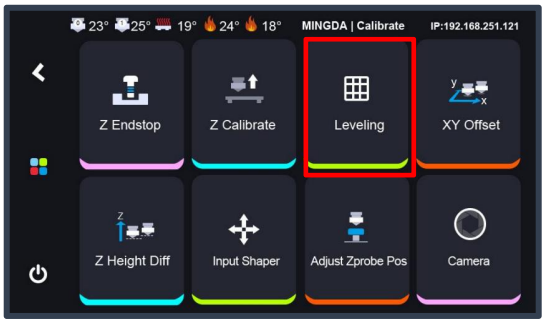
1. Click "**Z Calibrate**"



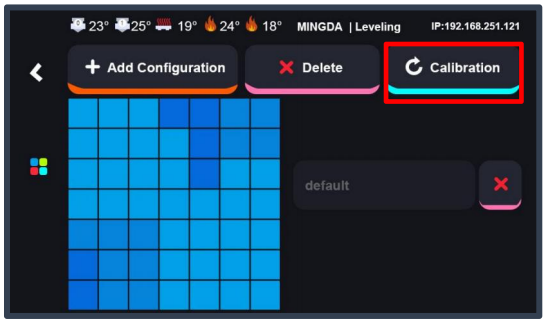
2. Click "**Start**" , waiting for automatic calibration to complete.

3. Click "Save" and confirm

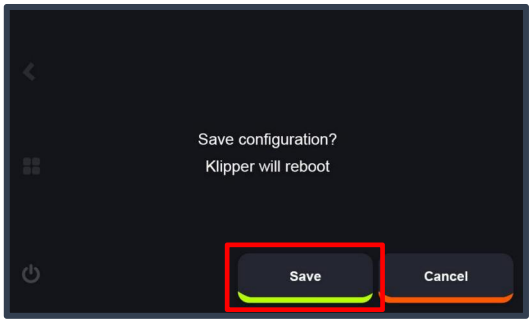
3. Auto Bed Leveling

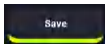


Click "**Leveling**"



Click to start auto-leveling, which will take approximately 3 minutes



Click  to save the value, the printer will reboot automatically.

Tips: It is better to heat up the bed to the target degrees and keep it warm up for 5-10 minutes before leveling.

Printing Tips:

1. Bed Leveling Frequency:

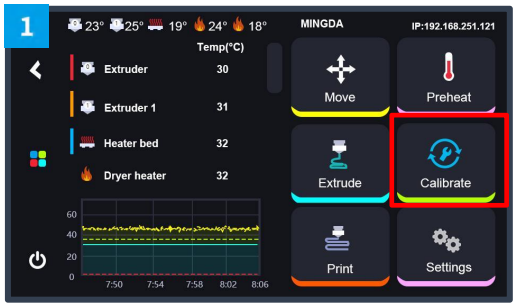
It is recommended to perform bed leveling every 20–25 print jobs. The Frequent removal and repositioning of the heated bed can gradually lead to positional deviation. Timely leveling ensures consistent print quality.

2. How to Determine if Leveling is Needed during printing:

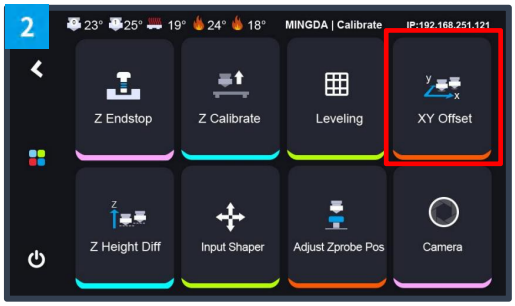
Carefully observe the first layer when starting a new print. If there is a large gap between the nozzle and the heated bed, poor adhesion, warping, curling, or uneven extrusion (e.g., some areas too thick, others too thin, or broken lines), it indicates that bed leveling is required.

4. XY Offset Calibration

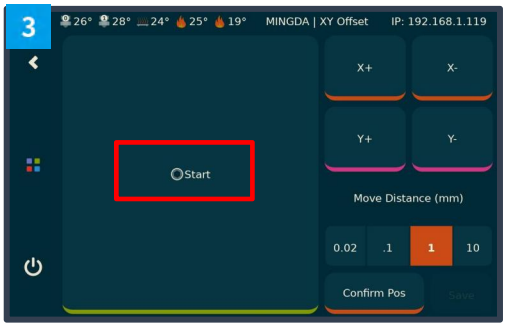
Tips: Wipe the nozzle clean before calibration to avoid any interference during the process.



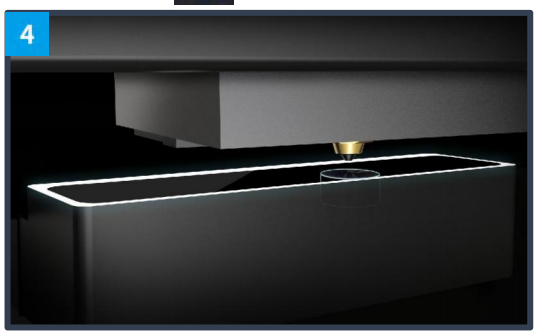
Click the "**Calibration**"



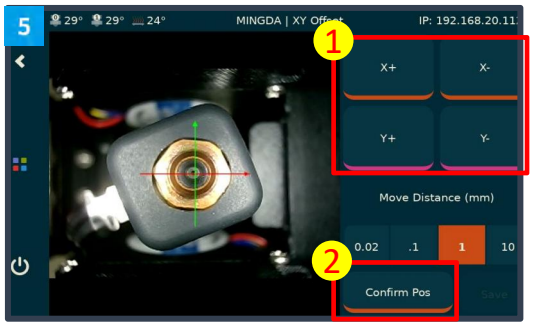
Connect the calibration device's wiring. Click "**XY Offset**"



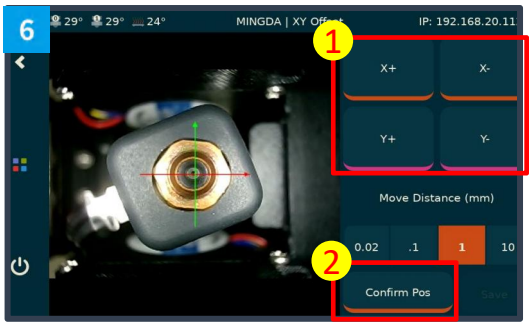
After the camera Led light up, Click "**Start**" , and the left extruder will move to the calibration camera's position.



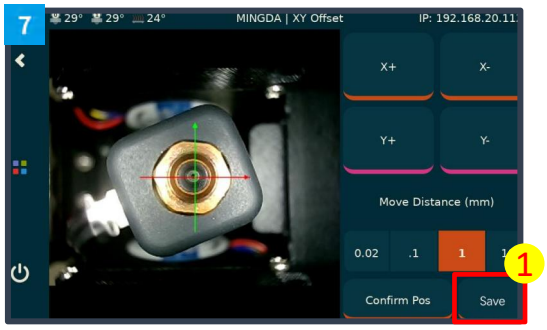
Wait for the left extruder will move to the calibration camera's position.



Adjust the left extruder nozzle to align with the crosshairs of the screen and click "**Confirm Pos**" Confirm Pos

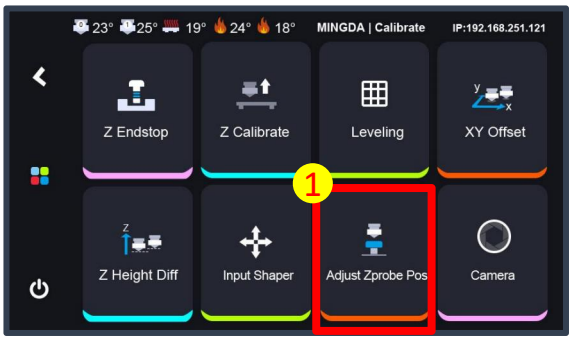


Adjust the right extruder nozzle to align with the crosshairs of the screen click Confirm Pos

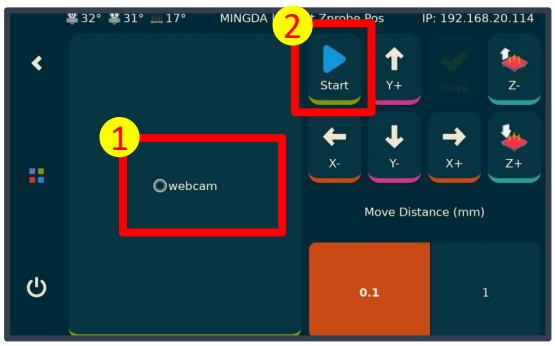


Click the "**Save**" Save

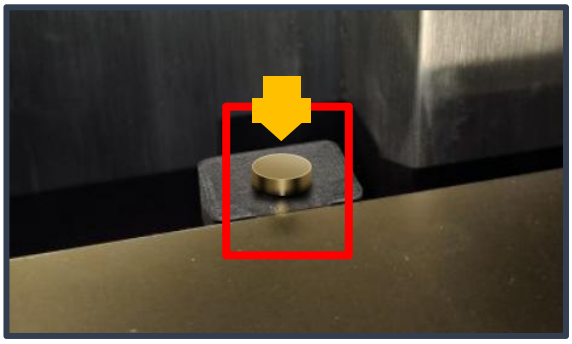
5. Adjust Z probe Pos



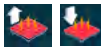
Click the "**Adjust Z probe Pos**"



Open the " **camera**" button; Click the "Start" button;



Wait for the printhead to move to the calibration position.

Click the  button to raise or lower the hotbed while observing whether the nozzle contacts the probe; If contact is not made, manually adjust the position of the calibration device; After calibration is complete, click "**Save**" , then proceed to the "**Z Height Diff**" page.

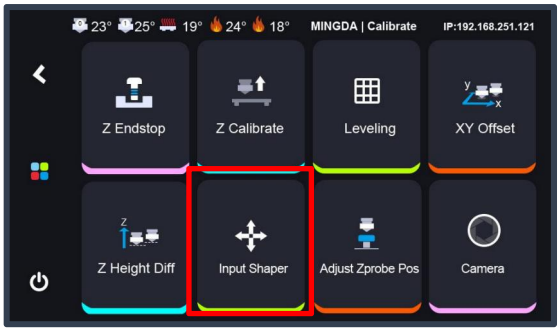
6. Z Height Diff Calibration

Click "**Z Height Diff**"

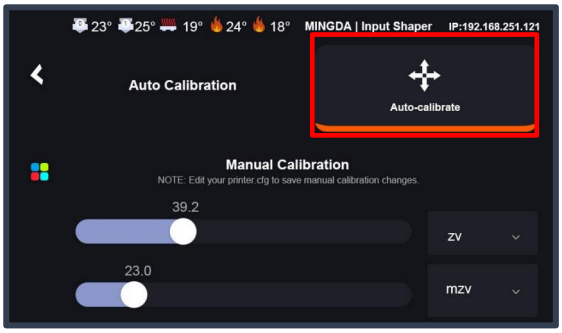
Click "**Start**" to start Z offset automatically.

Wait for calibration to complete, then click the "**Save**".

7. Input Shaper



Click "**Input Shaper**"

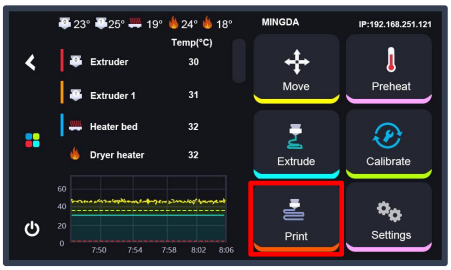


Click "**Auto-calibrate**", After calibration is complete, click the save button.

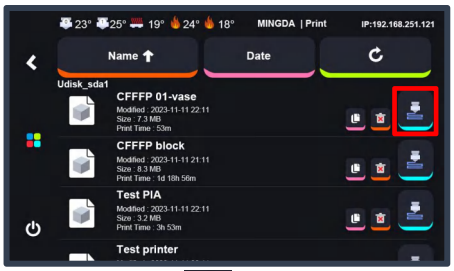
7. Printing

Test Printing

Before printing, please test the gcode which shipped from the printer first

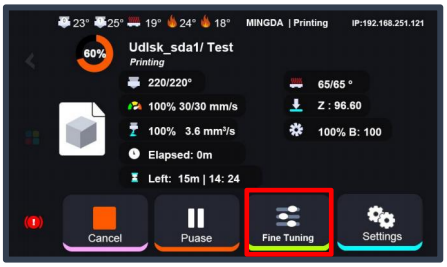


Click “Print”



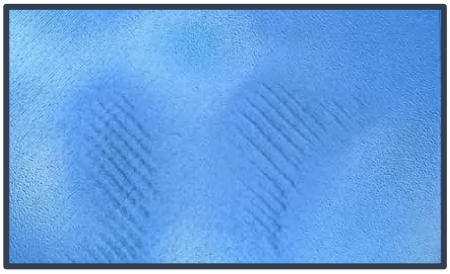
Click Print icon

Click “**Printing**”

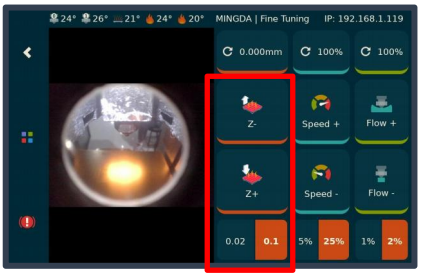


Click Fine-tuning

Open the “**camera**”



Observe the first layer during printing



Select the distance at 0.02 and increase the Z-offset until the line is smooth

The final result after adjusting

Explain:

The first layer very important

1. There are gaps between each lines, that means the Z-offset need to be lower.

2. There are waves on the printing surface, that means the Z-offset need to be higher

Printing Tips:

During printing, if the model is too close to or too far from the build plate, you can use the fine-tuning function to adjust the nozzle height:

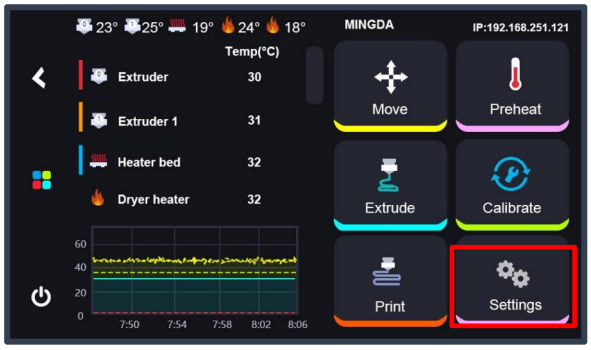
1. Tap "Fine Tune".

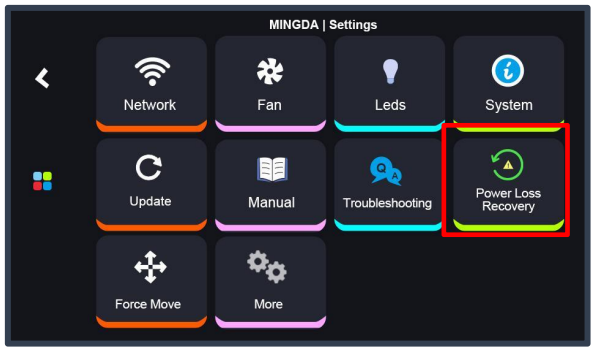
2. Select a tuning step of 0.02, then use Z+ (raise the nozzle) or Z− (lower the nozzle) to adjust the height until the extrusion lines are evenly laid and properly aligned.

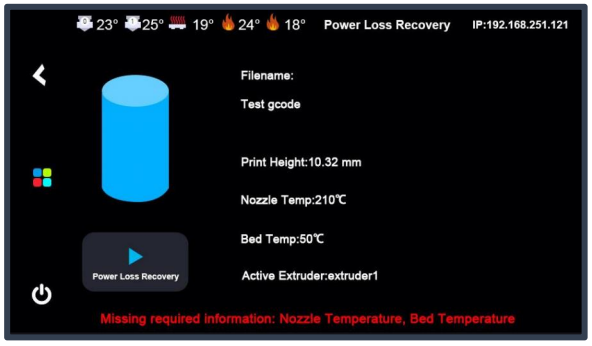
Proper fine-tuning helps achieve optimal first-layer adhesion and print quality.

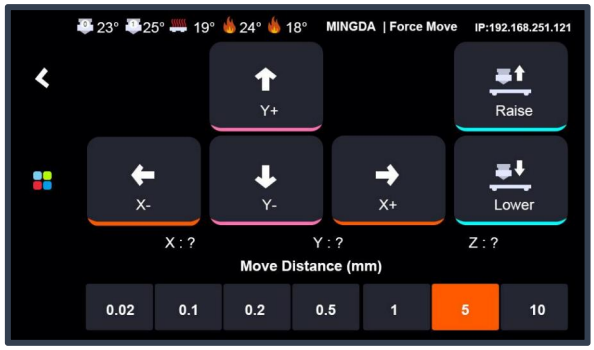
8. Resume Printing

1. Resume printing after power off









Once power is restored, turn on the printer. It will perform a self-check automatically.

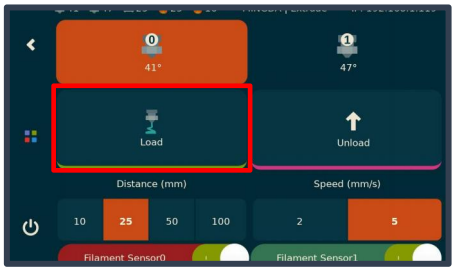
Then go to Settings > Power Loss Recovery to resume printing.

Note:

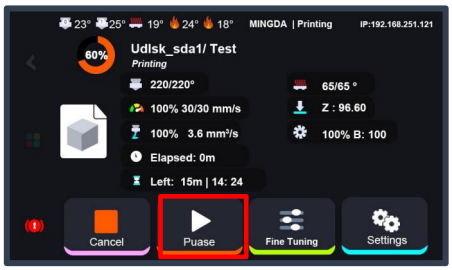
1. If the printed height is less than 1 mm, resume printing is not supported.
2. Prior to resuming the print, verify whether the nozzle has dropped. If so, use the "Force Move" function to position it approximately 0.1 mm above the model surface.
3. After resuming the print, closely monitor the printing process and adjust the Z-offset via fine-tuning if necessary.

2. Resume printing after filament run out

The printer will pause, and the yellow indicator light will turn on



Replace new filament into the extruder, click load till the filament was feed out.



Click "Resume" , continue to print from the point of interruption.

9. Slicing Software Installation and Usage

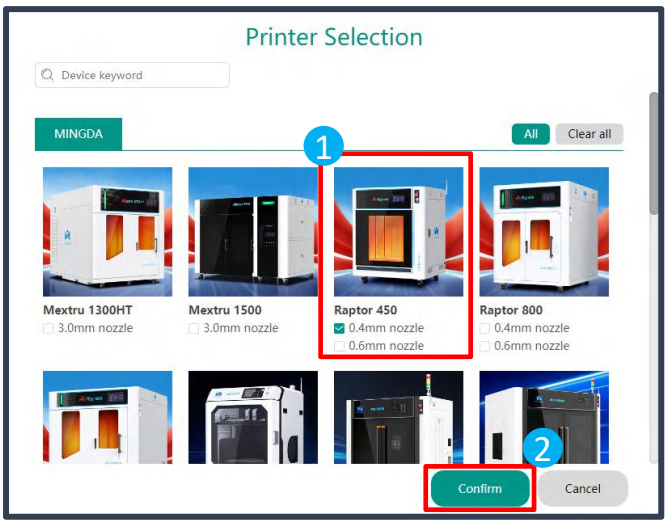
Installation:

Search "www.3dmingda.com/download" in any browser.

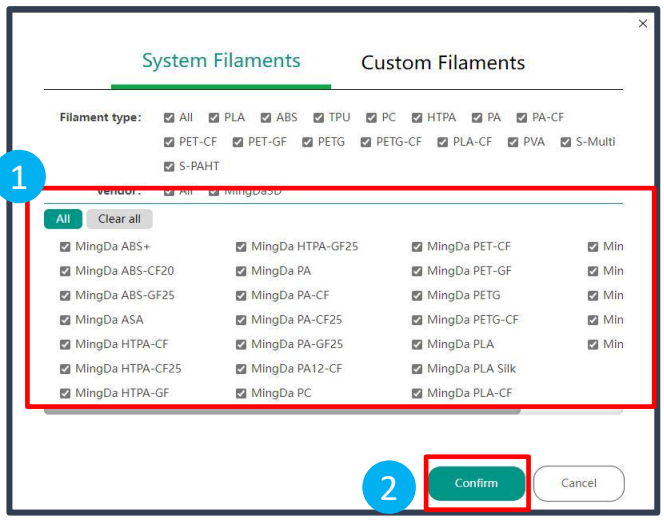
Download "**MINGDA OrcaSlicer**"

Configuration:

Upon the first run of Mingda OrcaSlicer, you will enter the configuration wizard.



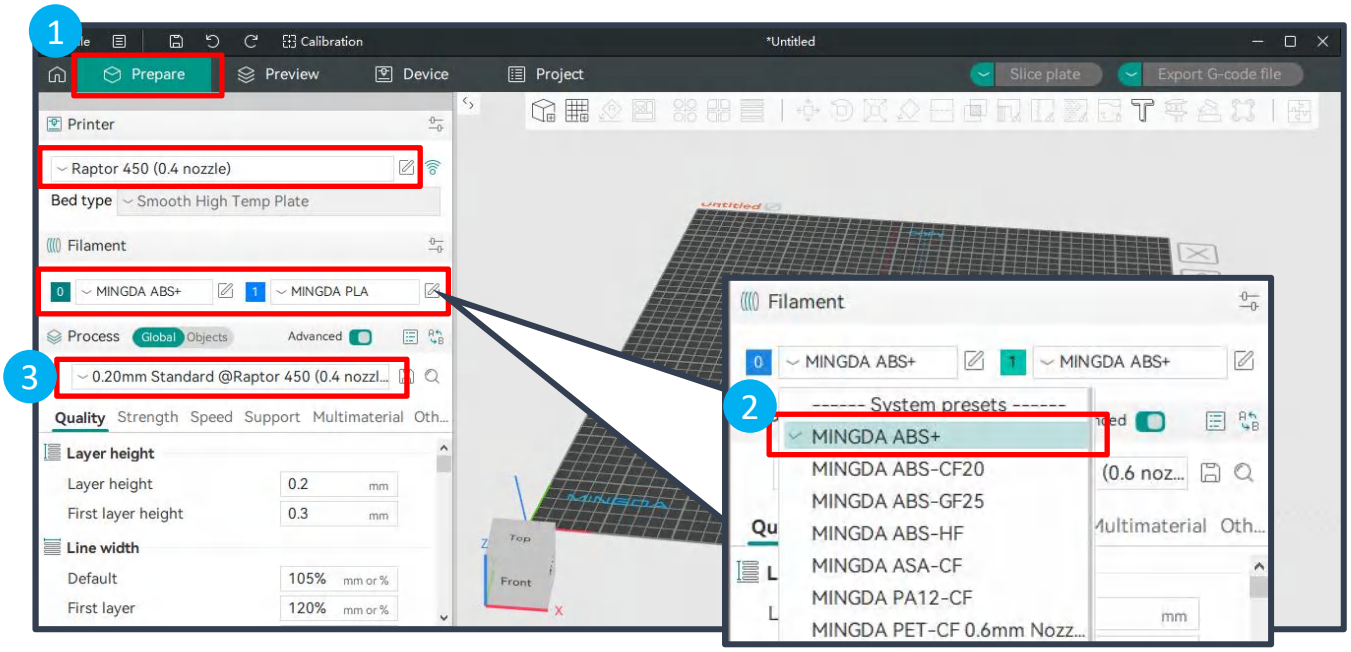
Choose the Raptor 450 model and click "**Confirm**."



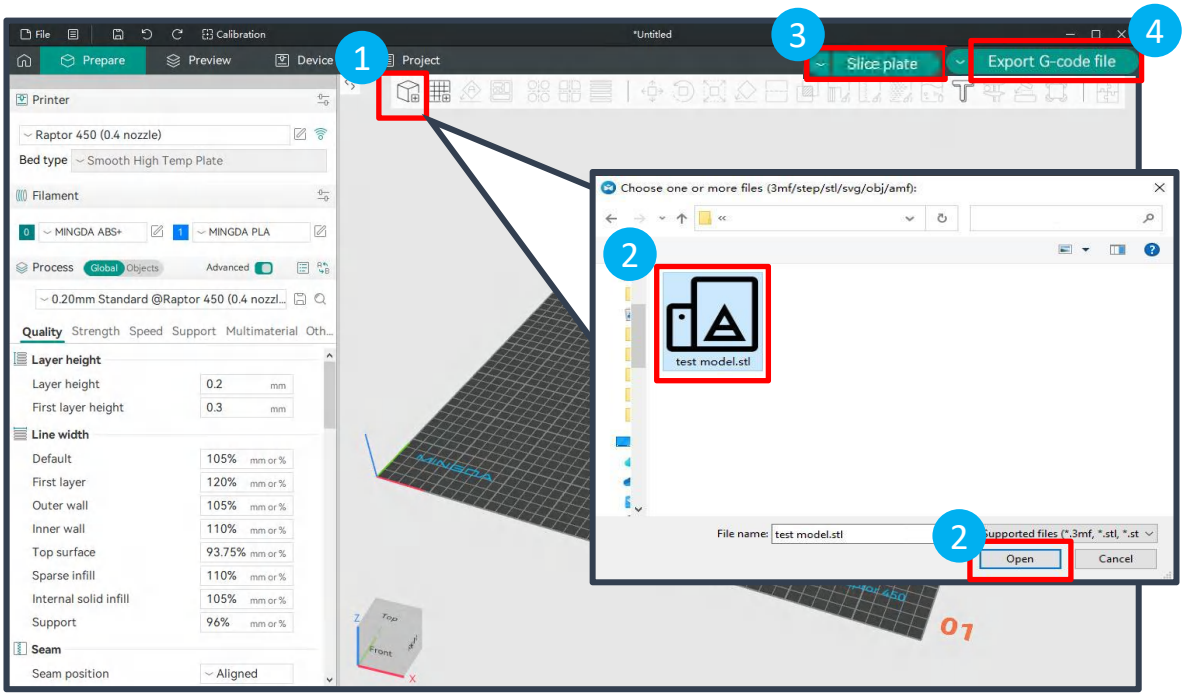
Select the desired filament type.

Usage

Click the "**Prepare**"



Select the printer model, filament type and printing parameter.



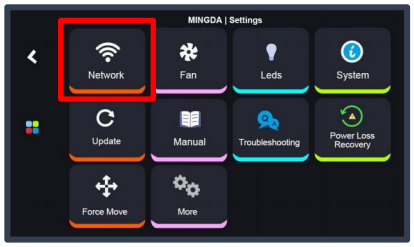
Click , upload your STL in the slicer, adjust your model parameter, after finishing, click “Slice plate” to create the Gcode file.

Printing method

LAN Printing (Recommend)

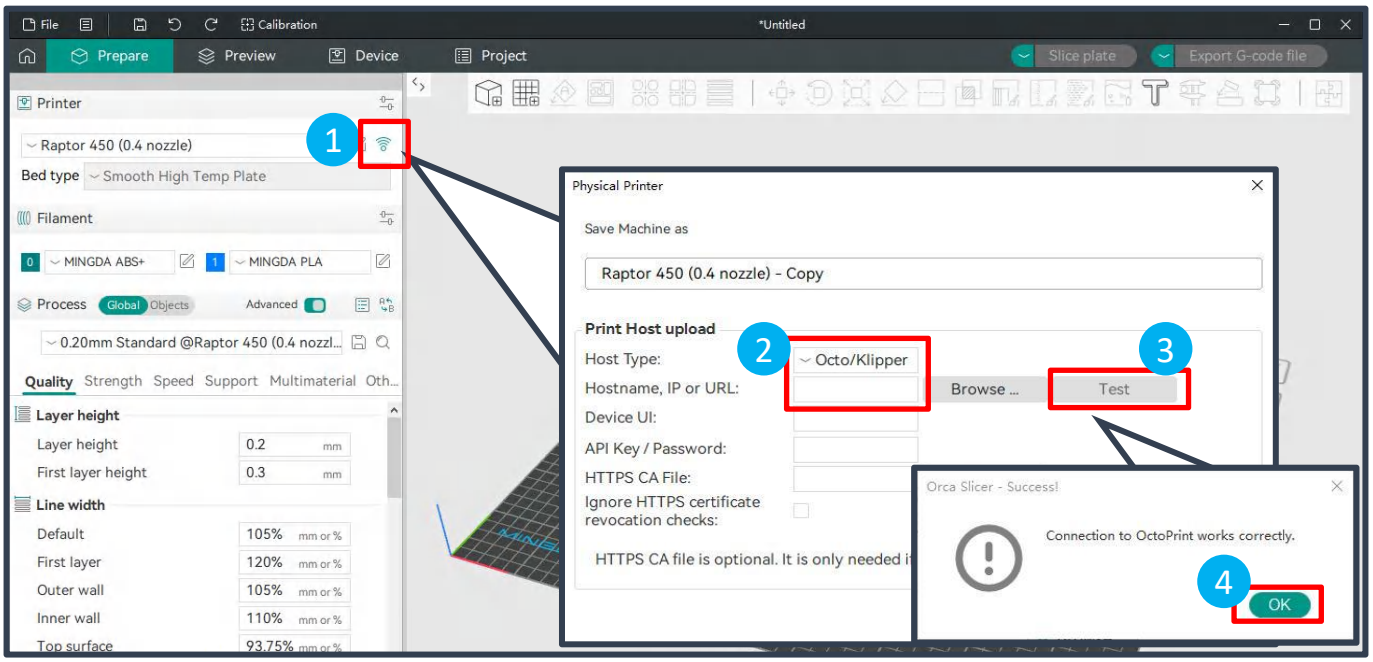
Ensure that the printer and the computer host are on the same local network.

Click "**Settings**" to enter the settings page.



Click "**Network**" to enter the network page.

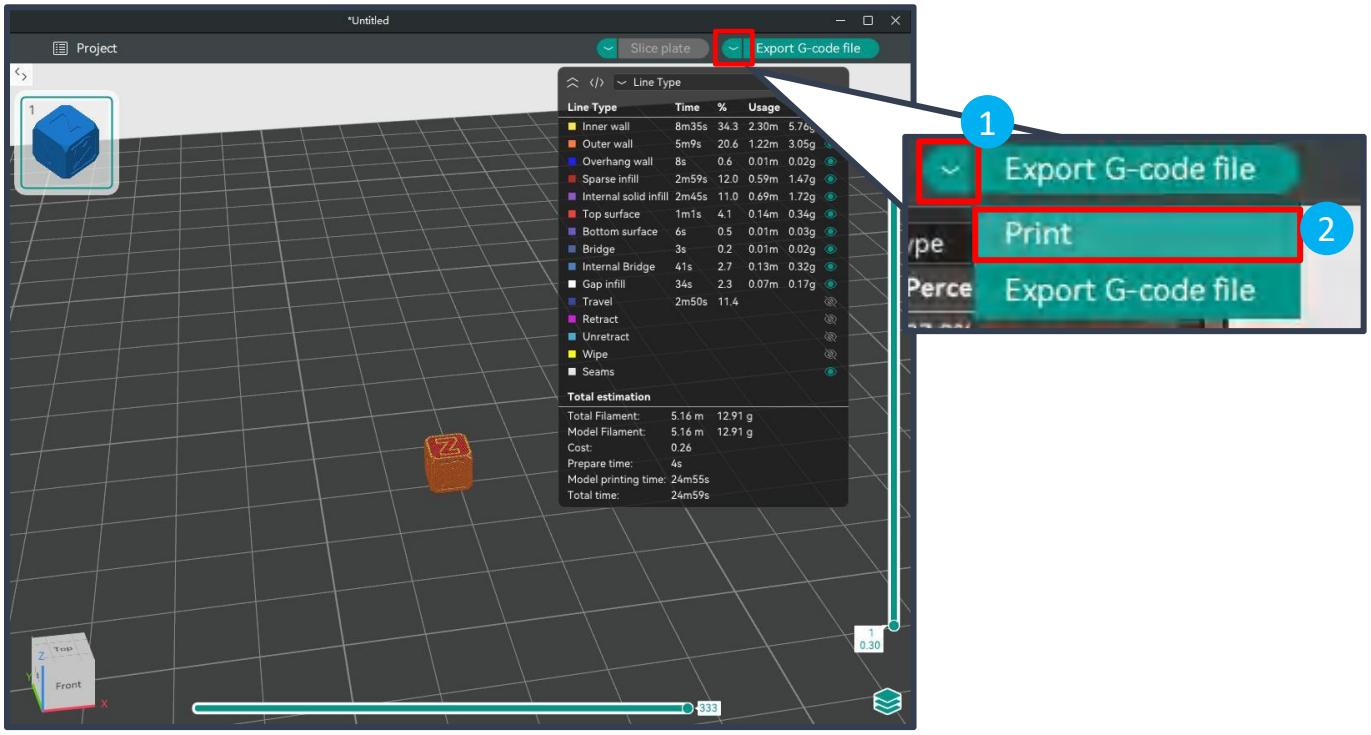
Check the printer's IP address.



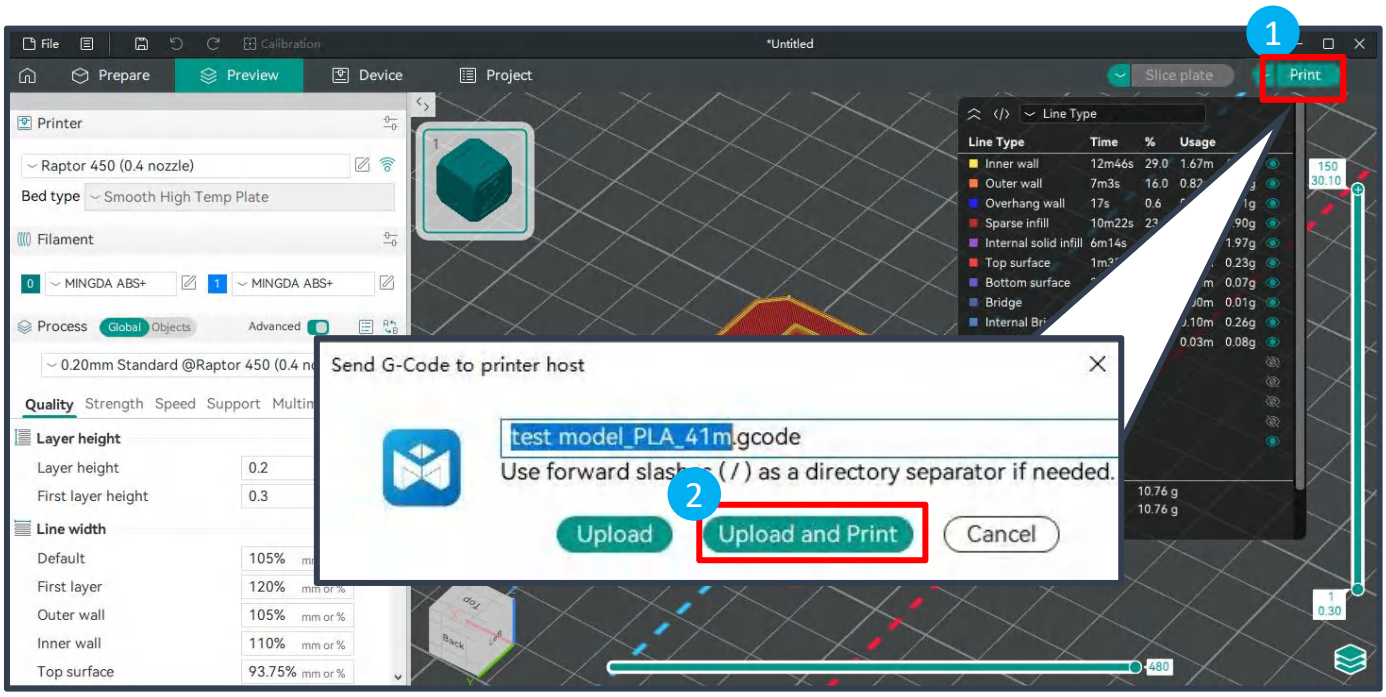
Click WIFI , select Host type as Octo/Klipper, enter the printer's IP address, and click "Test" and "OK"

LAN Printing

File Transfer:



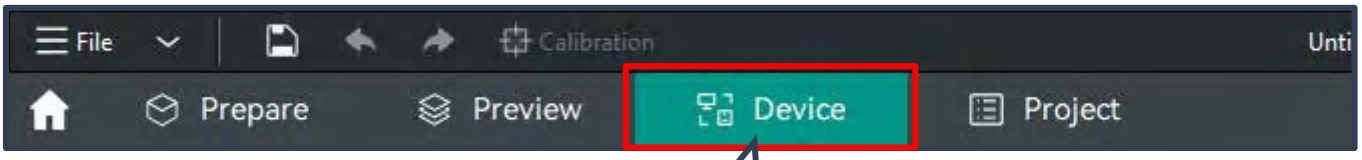
Click the dropdown icon in the top right corner , select "**Print**."



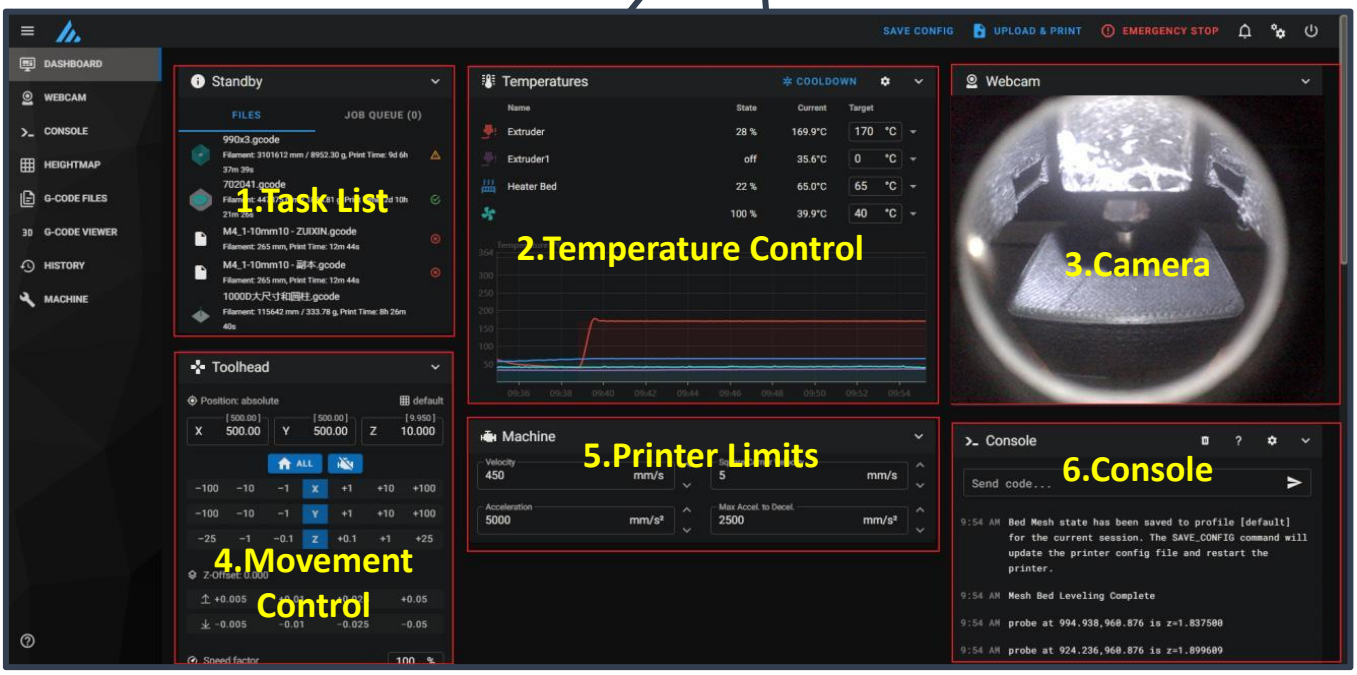
Click "**Print**" and choose "**Upload and Print**".

Device Connection

After successful connection, click on "Device"



Enter the control interface below the diagram



1. **Task List:** Drag G-code files to this task list for printing.

2. **Temperature Control:** Displays machine temperature changes and allows pre-setting nozzle and bed temperatures.

3. **Camera:** Monitors the printing status.

4. **Movement Control:** Controls the movement of each axis and allows compensation settings after leveling.

5. **Printer Limits:** Controls the maximum acceleration of the printer, usually doesn't need to be changed.

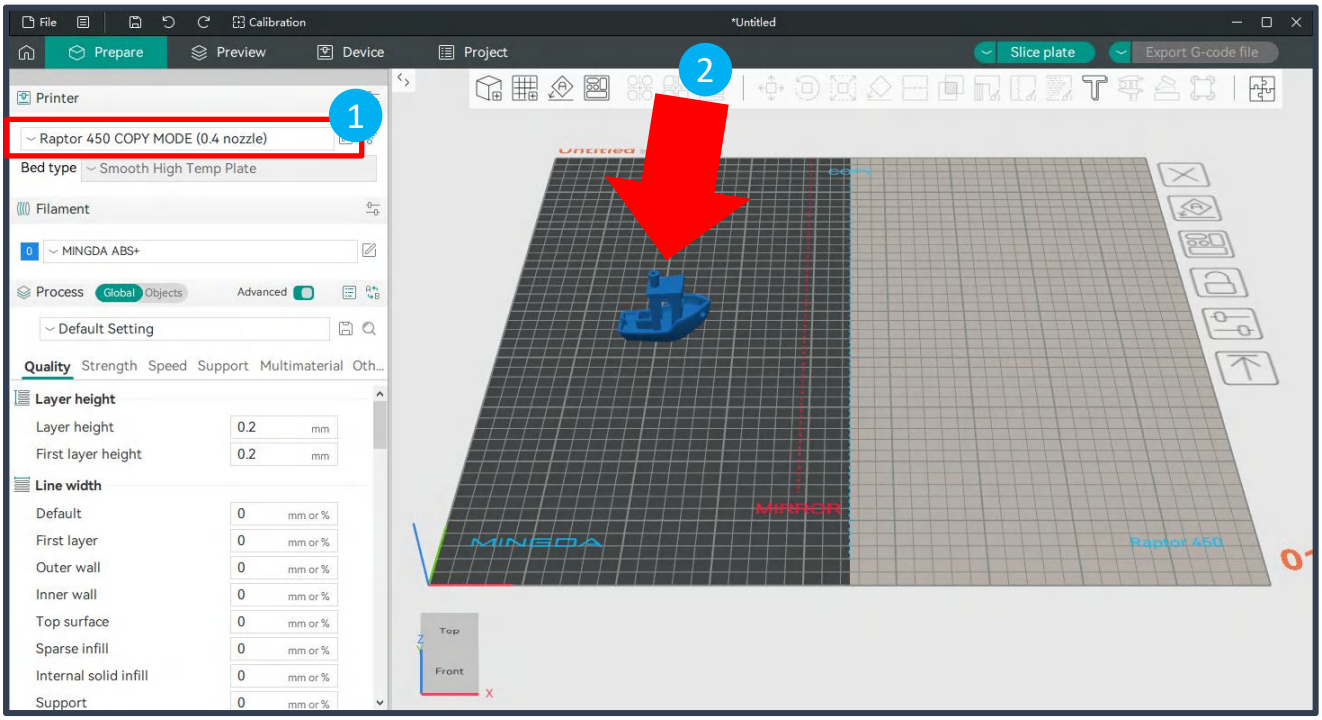
6. **Console:** Sends G-code commands to run the machine and displays error output.

Print Mode

Copy Mode

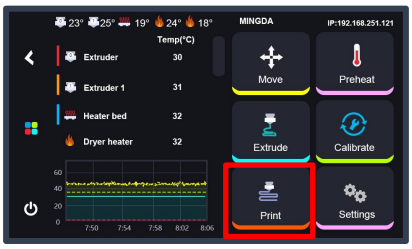
Print Size: X * Y * Z: (2*225) * 450 * 450mm

In duplication mode, select the **Raptor 450 COPY MODE (0.4 nozzle)** for slicing. Place the models on the left side of the build platform, ensuring they do not cross the blue line, as shown in the image. Then make a slicing directly and save the gcode inside Udisk.



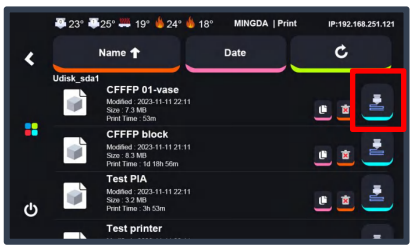
Note: The model must be placed on the left side and sliced by T0 extruder.

In the printer interface: Insert the U-disk on the printer, and follow the bellow operation to make a copy printing.

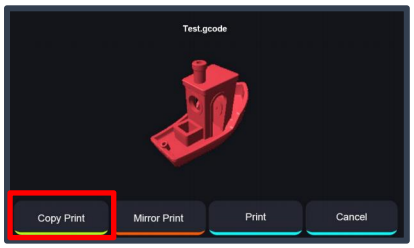


Select "**Print**."

Insert the U-disk.



Choose the print file for printing.

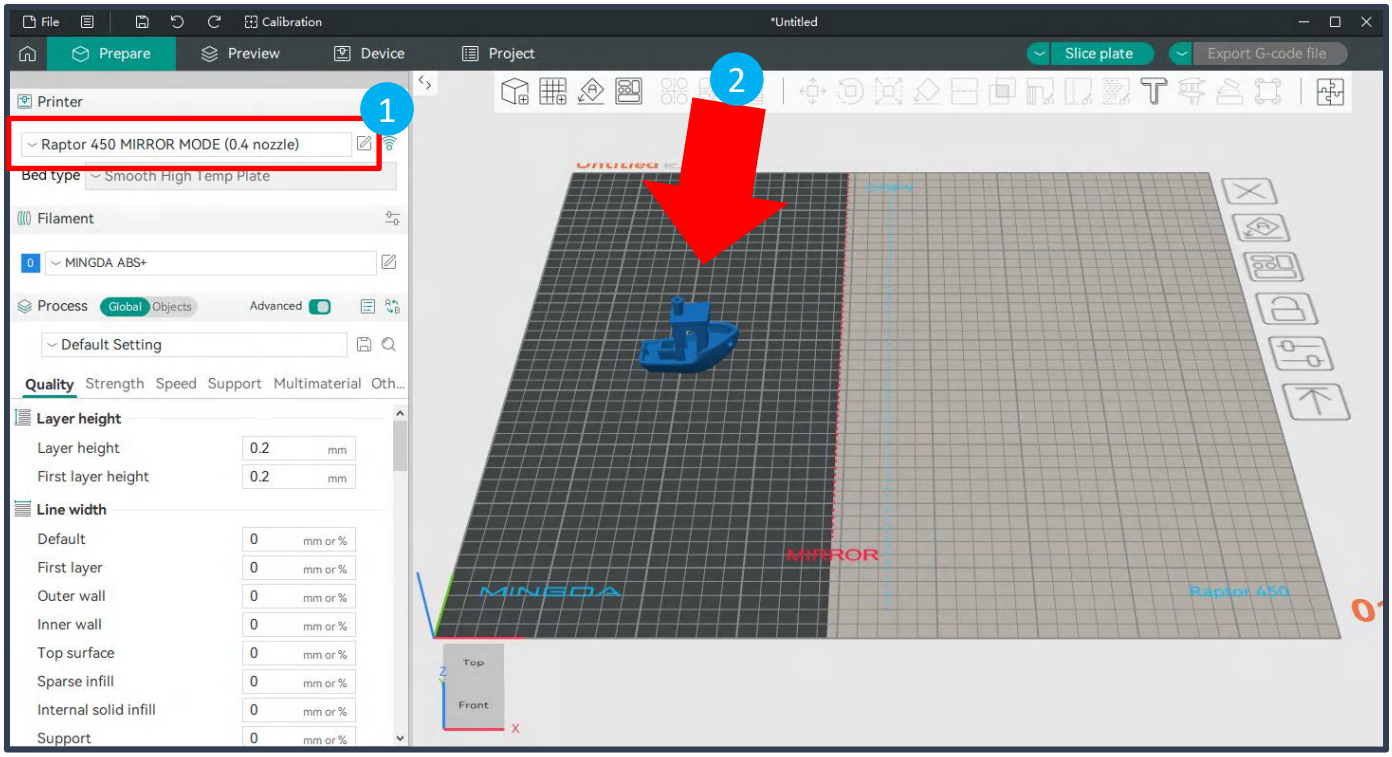


Choose "**Copy Print**".

Mirror Mode

Print Size: X * Y * Z: (2*195) * 450 * 450 mm

In mirror mode, select the **Raptor 450 MIRROR MODE (0.4 nozzle)** for slicing. Place the models on the left side, ensuring they do not exceed the red area on the platform in the image to prevent nozzle collisions.

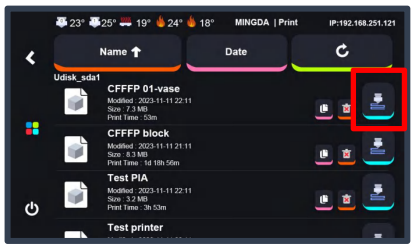


Note: The model must be placed on the left side and sliced by T0 extruder.

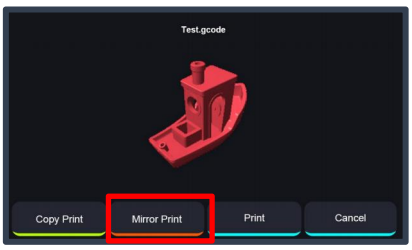
In the printer interface: Insert the U-disk on the printer, and follow the bellow operation to make a mirror printing.

Select "**Print**."

Insert the U-disk.



Choose the print file for printing.

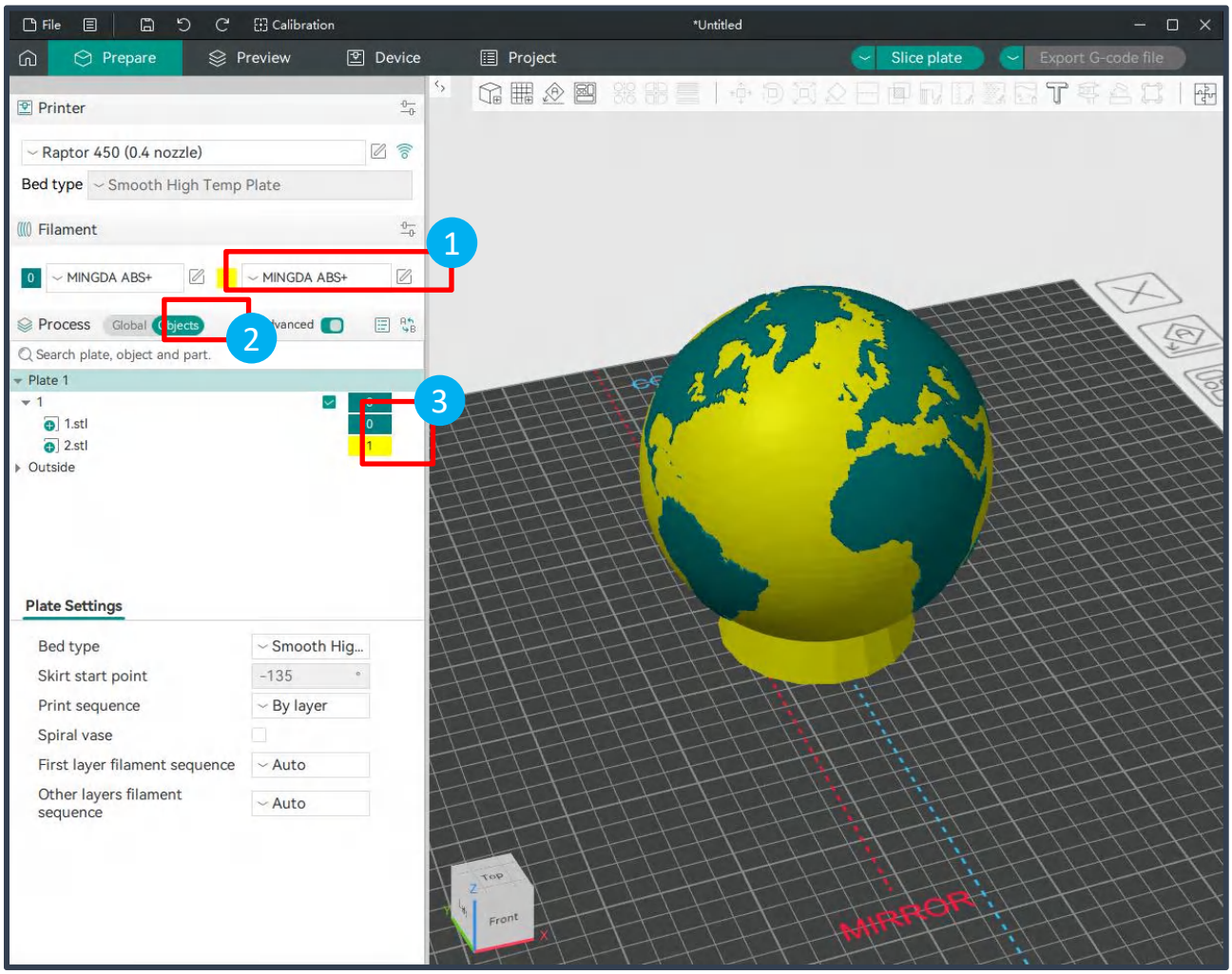


Choose "**Mirror Print**".

Print Mode

Print Two Colors

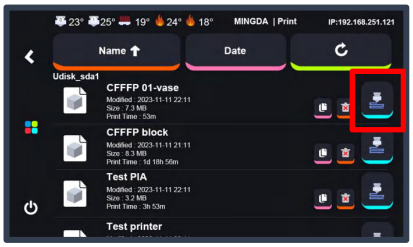
Selecting the [Raptor 450 (0.4 nozzle)] **Printing size: 450 * 450 * 450mm**



1. Choose and modify the filament information.
2. In the Process section, click to switch to the "Objects" option.
3. Click on the color box next to the STL file to select the desired filament.

In the printer interface:

Select "**Print**", Insert the U-disk.



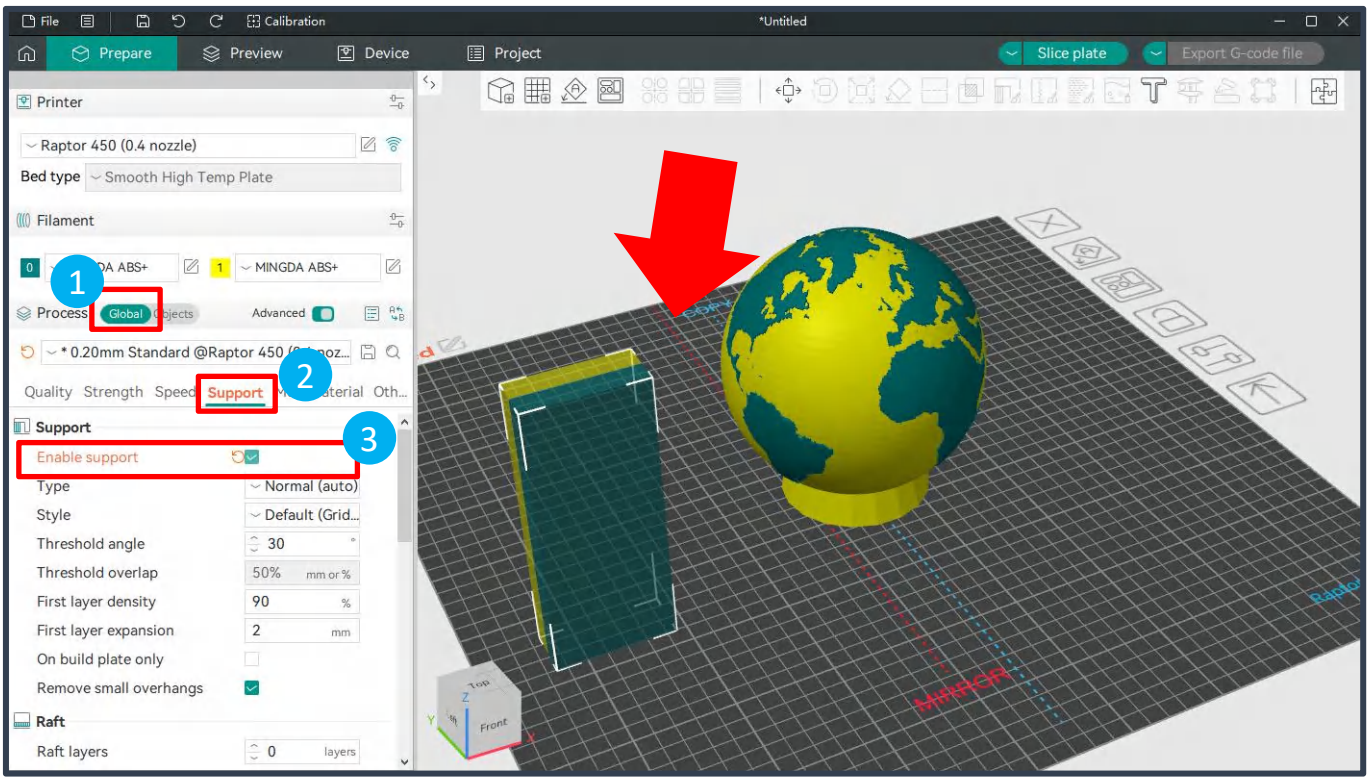
Choose the print file for printing.

Choose " **Print**".

Double extrusion: Start the Prime tower

Because there is always one printer in standby mode during the printing process, it is easy to cause defects such as wire drawing and material leakage. Prime tower can solve this problem, the extruder will print a prime tower before each layer printing. Any material leakage will be printed on the tower, effectively avoiding the phenomenon of material leakage when replacing the extruder.

If you want to print the following two modes, we recommend adding this option to your Gcode.



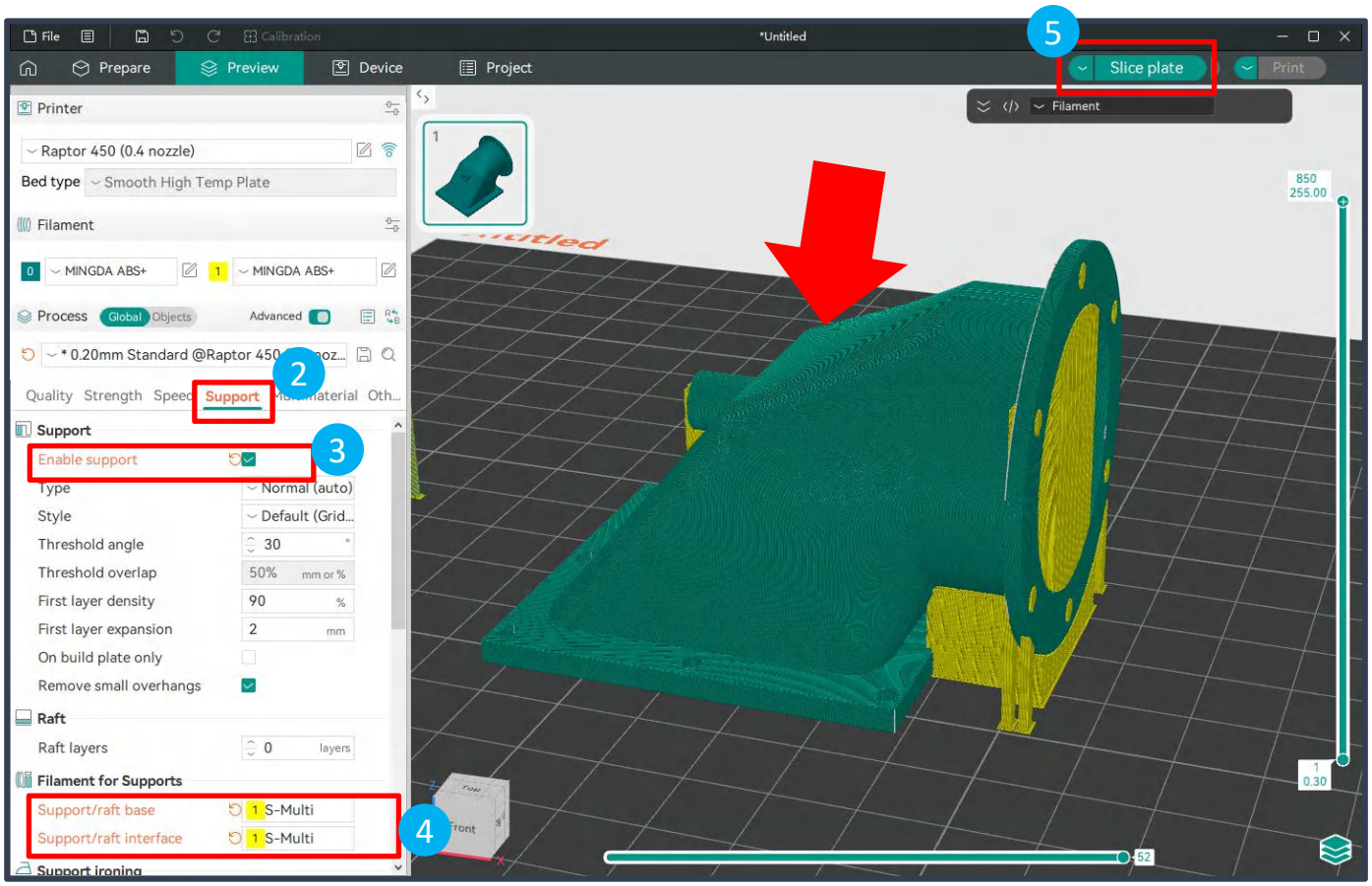
1. Select the "Global" section.
2. Select the "Multimaterial" section.
3. Check the "Enable" option in the "Prime tower" settings.

Cautions:

1. Avoid setting the wipe tower size too small, as insufficient purging may lead to filament mixing.
2. Ensure the prime tower is positioned away from the model to prevent overlap.

Printing Support

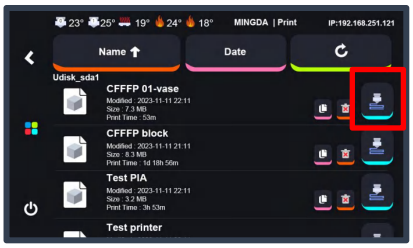
Selecting the [Raptor 450 (0.4 nozzle)](#) **Printing size: 450 * 450 * 450mm**



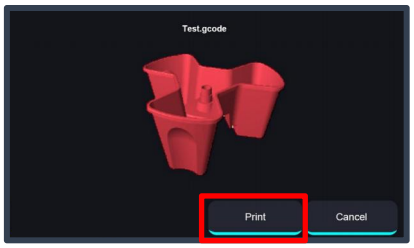
1. Choose and modify the filament information.
2. Then, select the "**Support**" section.
3. Check the "**Enable support**" option.
4. In the "**Filament for Supports**" option, choose the filament needed for supports.
5. Click "**Slice plate**" to preview.

In the printer interface:

Select "**Print**", Insert the U-disk.



Choose the print file for printing.



Choose " **Print**".

10. Maintenance and Care

Hotend:

If you print high-temperature materials or engineering materials for a long time, the inner wall of the hot end will gradually carbonize, which will ultimately affect the extruder out of the material is not smooth, if you find that the model has a fault or spitting material is not uniform, it may be this reason.

Replacing Filaments:

Timely replace filaments based on the type and actual usage. It is recommended to use filaments recommended by the manufacturer. Seal filament not in use for an extended period, as excessive exposure to moisture in the air can make the filament brittle.

PEI plate:

Please avoid touch the PEI bed by hand. It can be cleaned by dish soap with warm water and dry it by a clean cloth.

Regular Lubrication:

Once every 3 months. Home the printer first and grease it and move the Z+ to the top, then home the printer and grease again until the screw rods full with the grease, after that clean the excess grease. If there are noise during moving. You can grease the oil on the idler wheels when there are noise.

Software Updates:

Regularly update the printing software to improve print quality and efficiency.

11. Printing Tips for different filaments

1. Do not allow PET-GF, PET-CF, PA12-CF, HTPA-GF, HTPA-CF or S-Multi to absorb moisture.

1. Dry the filament before printing as long as you are not sure if the filament is damp.
2. After drying the filament, please store it in filament cabinet with driers
3. If the printer will not be used for an extended period, please store the filament in a sealed container, preferably in a dry cabinet.

2. Avoid PLA-HF/PETG-HF clogged during printing

1.When printing PLA with a bed temperature above 45 °C, open the front door to prevent heat buildup and extrusion issues.
2.When printing PETG with a bed temperature around 70 °C, open the front door to prevent overheating that may cause extrusion issues or nozzle clogging.

3. To prevent warping, take caution when printing with ABS-HF, PA12-CF, HTPA-GF, HTPA-CF, ABS-GF25, ABS-CF20, HtPA-GF25, and HtPA-CF25.

If the model size is large and the fill rate is set high, such as 60% (the default value is 15%), warping occurs and it can be adjusted down appropriately. In addition, change the fill pattern to a spiral to reduce the risk of shrinkage. For some structural parts with high strength requirements, you can set 5 layers of walls and a fill rate of about 25%, and try to avoid using a fill rate of more than 50% to reduce the shrinkage tendency; for most non-structural parts with low strength requirements, you can directly select the default 2 layers of walls and a fill rate of 15%.

4. After printing with high-temperature materials such as PA-CF, PET-CF, or PET-GF, and before switching to low-temperature, lower-hardness materials like PLA or PETG, it is recommended to follow these steps:

1. Set the nozzle temperature to 250–300 °C.
2. Manually unload the remaining high-temperature filament.
3. Load the new low-temperature filament and manually extrude it.
4. Continue extrusion until all residual high-temp material is flushed out and the new filament flows smoothly.
5. Lower the nozzle temperature to 220–240 °C, and continue extruding while the nozzle cools down to ensure smooth flow of the new filament.

If extrusion fails during the flushing process, increase the nozzle temperature and consider using a cleaning needle to clear the nozzle

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

-This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

MINGDA

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