

#### 4.7.3 Command Line

Command line refers to the mode in which the printer is open to developers. It is mainly used for debugging and fault diagnosis of the printer and does not need to be enabled during normal printing. In command line, the printer can be controlled and fault diagnosis can be conducted by sending G-code.

You can enter "Command Line" through Settings interface.

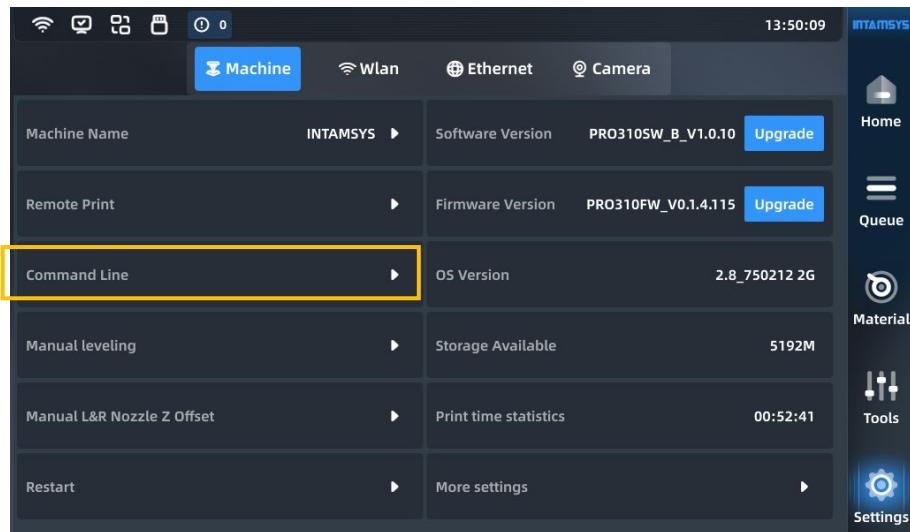


Fig. 4.73 Command Line Interface

# 5 Operating the Printer

This chapter describes the basic operational steps for operating FUNMAT PRO 310 NEO.

## 5.1 Startup and Shutdown of Device

### 5.1.1 Power on the Printer

1. The power socket is located on the lower right side of the machine. Connect the two ends of the power cord to the AC power supply plug (printer voltage: 110V and 220V) and the power socket of the printer, respectively;
2. Insert the power plug, then switch the power switch next to the power socket of the printer to the (I) position;

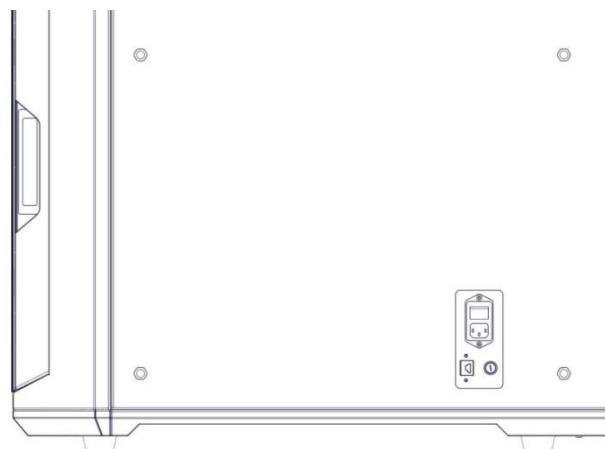


Fig. 5.1 Printer Power Supply Port and Switch

3. Turn on the front ON/OFF button on the right side of the screen in the front of the printer, and the button indicator is on. At the same time, operate the screen to enter the start interface, and the printer starts.

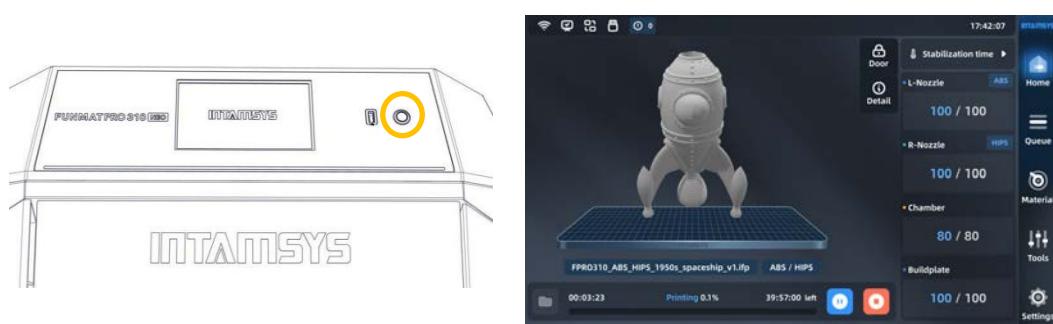


Fig. 5.2 Start/Stop Botton and Startup Interface

### 5.1.2 Power off the Printer

Press the power switch (which is also used to turn on the printer) on the front side of the

printer. Note: This operation is only to turn off the printer. To power off the printer, the power switch must be switched to the (O) position.

**Note: If the printer is not in use for a long time, disconnect the power cord from the AC power supply socket.**

## 5.2 Preparation of Print Materials

This section guides you on how to load filaments into nozzles. When completing the required steps, be sure to follow the operation prompts displayed on the touch screen.

The printer is supplied with an independent filament box (INTAMBox) that can hold up to two rolls of 1 kg material. The left compartment is used for printing by the left extruder, mainly for model materials, and the right compartment is used for printing by the right extruder, mainly for supporting materials.

**Note:** Make sure that there are no print parts or other debris on the printing platform when loading or unloading filaments. Because the X-axis, Y-axis, and Z-axis will be reset during this operation, and any print parts or other debris on the printing platform can collide with the extruder or X beam.

1. The filament box is placed on the right side of the printer, as shown in the figure. Insert one end of the feeding pipe in the accompanying accessories of the filament box into the quick connector and the other end into the quick connector located on the right side of the printer. The feeding pipe should be inserted to the bottom for smooth feeding.

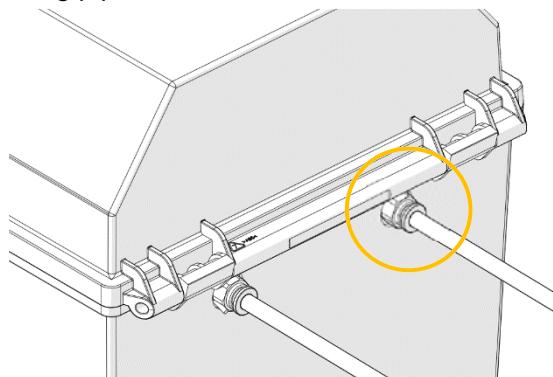


Fig. 5.3 Schematic Diagram for Installation of Feeding Pipe

2. Unbuckle the upper cover of the filament box, place the drying box in the front slot of the filament box, put the wire rod on the roller of the filament box as shown in the figure, and then thread the wire rod through the quick connector at the rear end until the material protrudes from the feeding pipe of the printer. After manual loading is completed, buckle the upper cover.

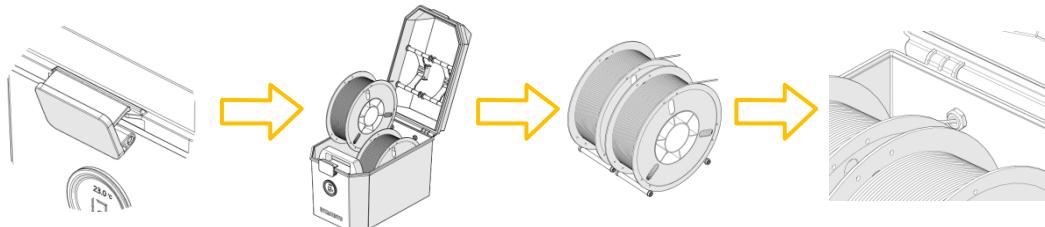


Fig. 5.4 Schematic Diagram of Wire Rod Loading

- Click the "Material" button on the screen operation interface, click the left or right wire coil icon to select the extruder to be loaded with materials. The highlighted icon indicates the extruder is activated;

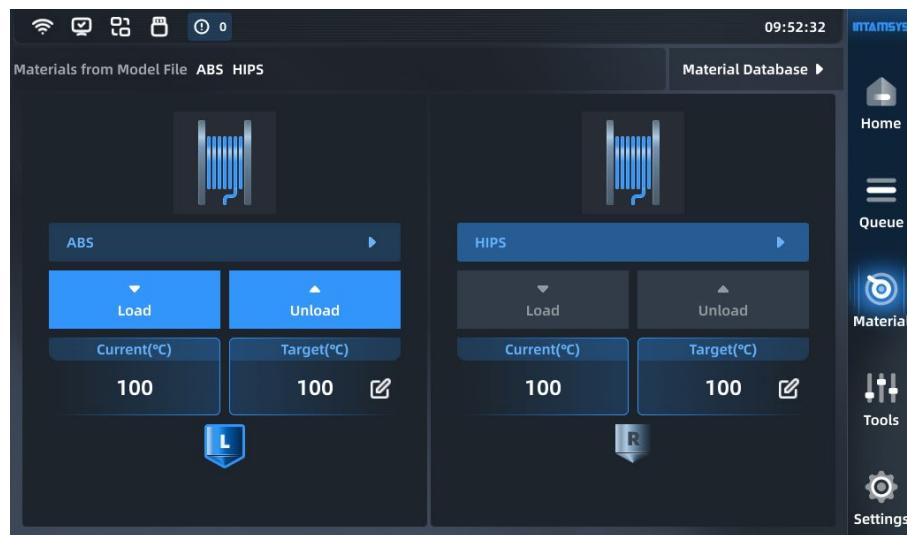


Fig. 5.5 Material Interface

- Pressing the "Material Database" button will display INTAMSYS materials and user-defined materials. Materials used recently and frequently will be at the top, where you can scroll down to select available materials. User-defined materials can be configured in the material database.

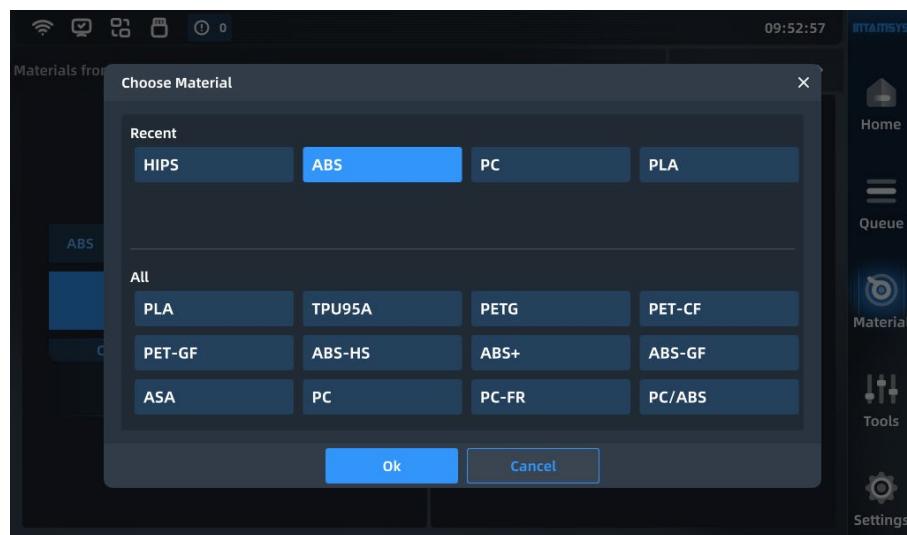


Fig. 5.6 Material Database Interface

Specifically, if the material on the printer is inconsistent with the material settings in the G-code print file, the system will alert the user to check the material. Click "Apply". Then the material will be automatically applied to the L&R Nozzle.

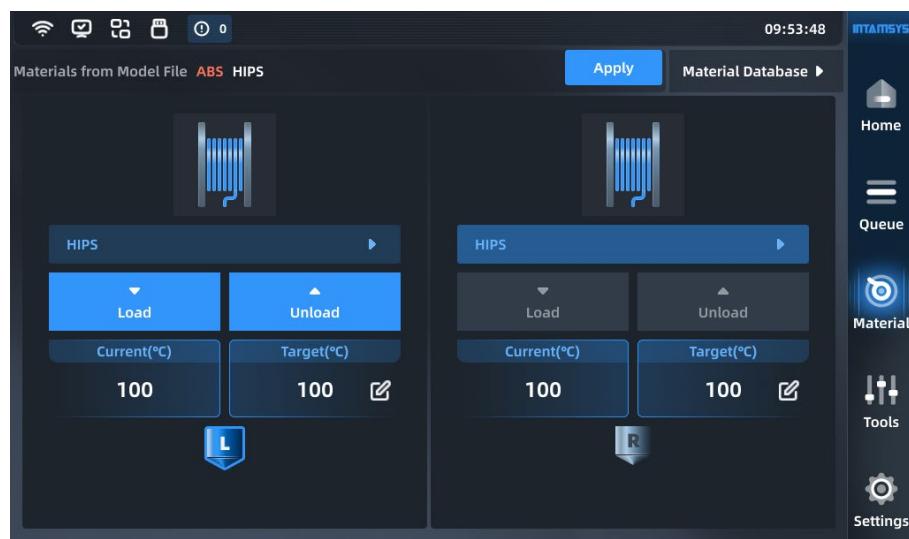
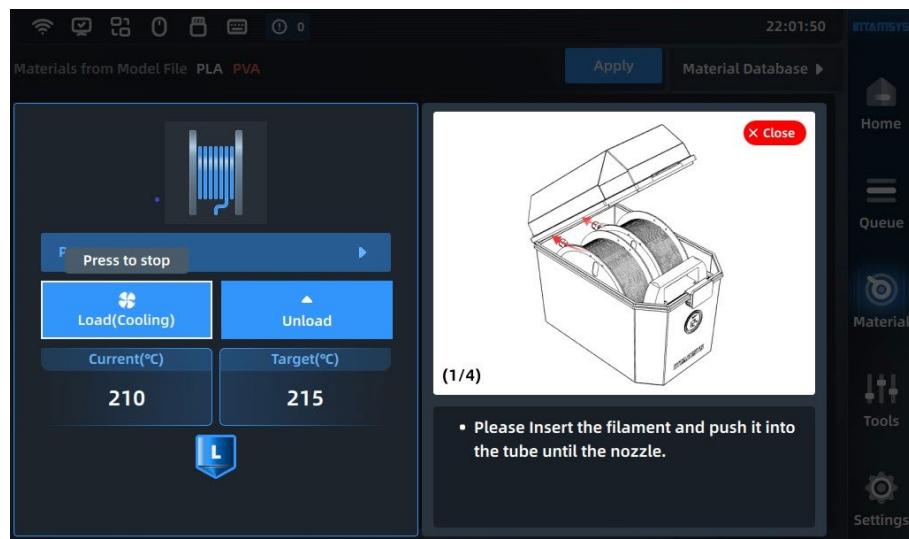


Fig. 5.7 Extruder T Settings Interface

5. After selecting the material, press the Load button to load the filament step by step according to the pop-up wizard.

- After heating the nozzle to the target temperature, you can prepare the filament according to the prompts on the right;
- The user can click the "Unload" button or other blank areas to exit the feeding process;
- The user can close the prompt window, which will be collapsed for later viewing.



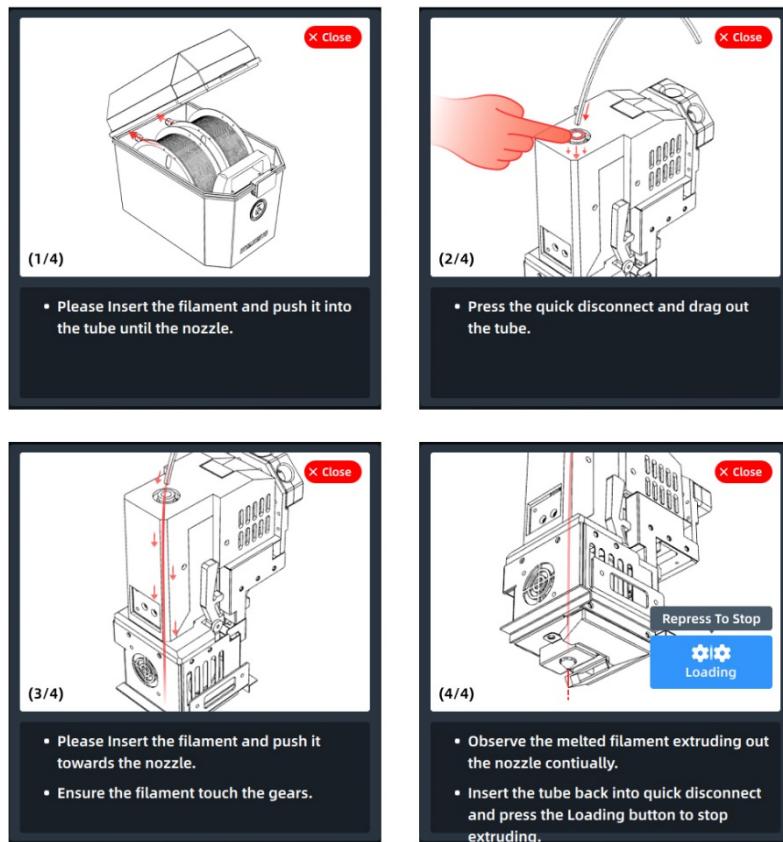


Fig. 5.8 Material Loading Guidance Interface

Please refer to section 4.4 "Material" for operations such as material unloading, material process template modification and material database modification.

### 5.3 Nozzle Replacement or Material Change

There are two types of printing nozzles: The integrated silver-white nozzle is made of CuCrZr and can print all materials except fiber-containing materials (PA6-CF/PA12-CF, etc.), such as ABS+, ABS-HS, ASA, HIPS, PA6/66, PC, PC/ABS, PC-FR, PC-PBT, PLA, PVA, SP3030, TPU-95A, PETG, PPS; the combined silver-white nozzle is mainly made of CuCrZr and high-hardened steel at the tip and mainly prints fiber-containing materials, such as PA6-CF/PA12-CFPET-CF, PET-GF, PPA-CF/GF, PPS-CF/GF, SP3050, and SP5010.

**It is strongly recommended that one nozzle prints only one material, which is conducive to stable operation of the device and easy management.**



Fig. 5.9 Schematic Diagram of Nozzle Structure

### 5.3.1 Replace the Nozzle

The procedure of nozzle replacement is as follows:

1. Click the "Material" button on the main interface to enter the Material interface.
2. If there is still material in the nozzle, click the "Unload" button first to unload the filament according to the prompts.
3. Click "Target Temperature" and set it to the extrusion temperature of the material. After confirmation, the nozzle will be automatically heated to the target temperature. Remove the nozzle with a 7 mm socket wrench.
4. Take out the high-temperature nozzle in the socket with tweezers, replace it with a new one and install it on the extruder.
5. After replacing the nozzle, hotbed leveling, XY offset are recommended.

### 5.3.2 Change Material before Printing

To change material type before printing, you shall not only change the material on the Material interface, but also selectively replace the printing nozzle. Different nozzles shall be used to print different materials. If you want to use one nozzle to print different materials, the nozzle temperatures for printing of such materials must be very close, and an extrusion temperature difference of no more than 50°C is recommended.

**Note:** Do not use nozzles for printing overhigh melting point materials to print low melting point materials. For example, printing PLA with nozzles that have already printed PC will cause blockage of the extruder and printing failure.

- If the old and new material types are consistent or the nozzle temperatures for printing of different materials are close, it is not necessary to replace the nozzle. The procedure is as follows:
  1. Unload the old material.
  2. Select the new material to be loaded, and perform the loading operations.
- If the old and new material types are inconsistent or there is a big difference between the nozzle temperatures for printing of different materials, the nozzles shall be replaced; accordingly, leveling and XY offset shall also be done. The procedure is as follows:
  1. Unload the old material.
  2. Replace the nozzle.
  3. Select the new material to be loaded, and perform the loading operations.
  4. Perform again the step of hotbed leveling and XY offset.

### 5.3.3 Pause to Change Material

If you need to change material while the printer is printing, follow these procedures:

1. Click the "Pause" button at the bottom of the main interface and wait until the movement

of the extruder stops completely.

2. Unload the old material.
3. Load the new material.
4. After the material is loaded, click the "Start" button on the lower part of the interface to continue printing.

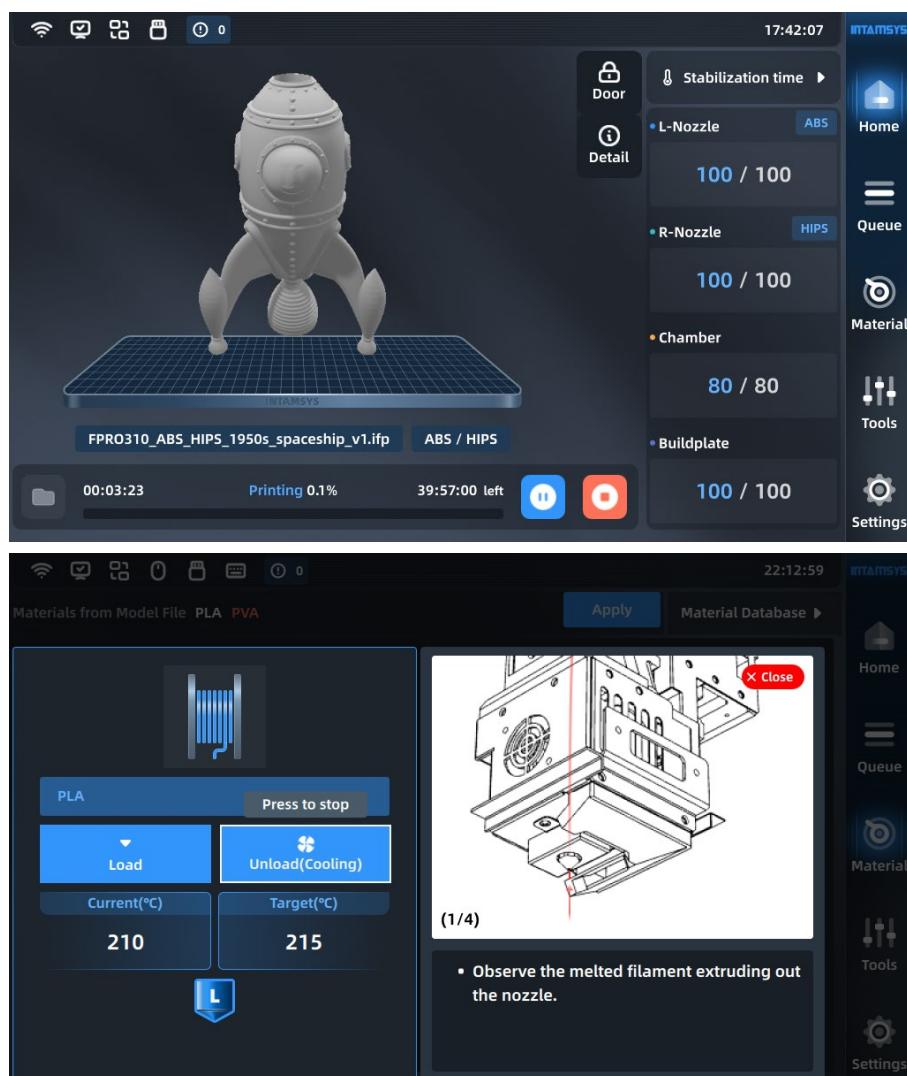


Fig. 5.10 Interface of Pausing to Change Material

## 5.4 Basic Printing and Prototyping Operations

### 5.4.1 Prepare the Printer

Prepare the printer for prototyping:

1. Power on the printer (refer to section 5.1.1 for details);
2. Use an extruder brush to remove materials left on the extruder;
3. Clean the residues or impurities on the printing Build Plate and magnetic platform base plate;

4. Place the printing buildplate on the platform base plate along the left and right guide grooves of the magnetic platform base plate;

**Note:** The magnetic platform base plate has a large suction force. When placing, hold the printing platform handle tightly with both hands, tilt the printing buildplate, let it to contact the magnetic base plate on the rear side first, and then slowly lay it on the platform by magnetic attraction to avoid hand pinching.

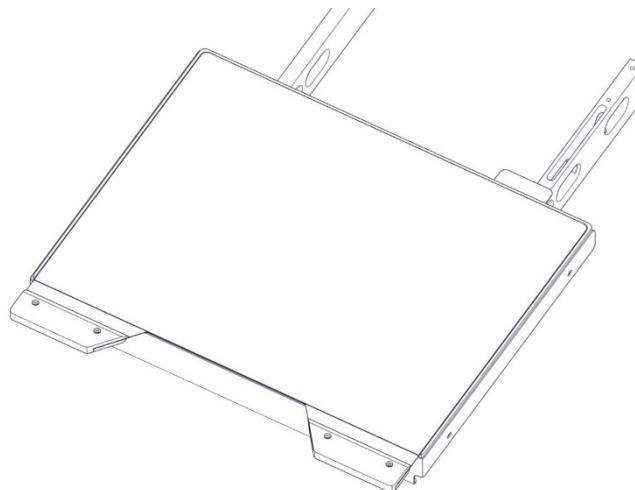


Fig. 5.11 Installing the Printing Platform Buildplate

5. Load materials according to the print task requirements.
6. Perform leveling and extruder XY offset. This step can be skipped if leveling and calibration have been done.
7. When ready, the printer can perform print tasks formally.

#### 5.4.2 File Slicing

If G-code is unavailable, you can slice the file using INTAMSUITE NEO. If G-code is available, skip this step.

1. Download: Through the official website at <https://www.intamsys.cn/> download the slicing software INTAMSUITE NEO



INTAMSUITE NEO

2. Import Model: Create a new project and import the model in the format of .stl, .step, .obj, .x3d, .oltp, .stp, .iges, or other intermediate CAD files.

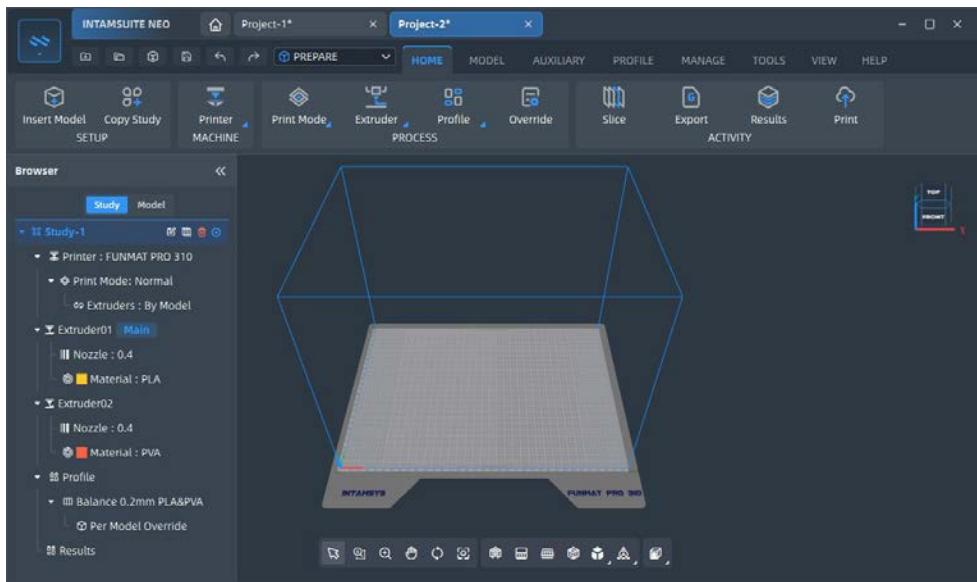


Fig. 5.12 Import Model

3. Model operation: Right-click "Arrange All Models" to arrange all models and move them to the center of the printing platform.

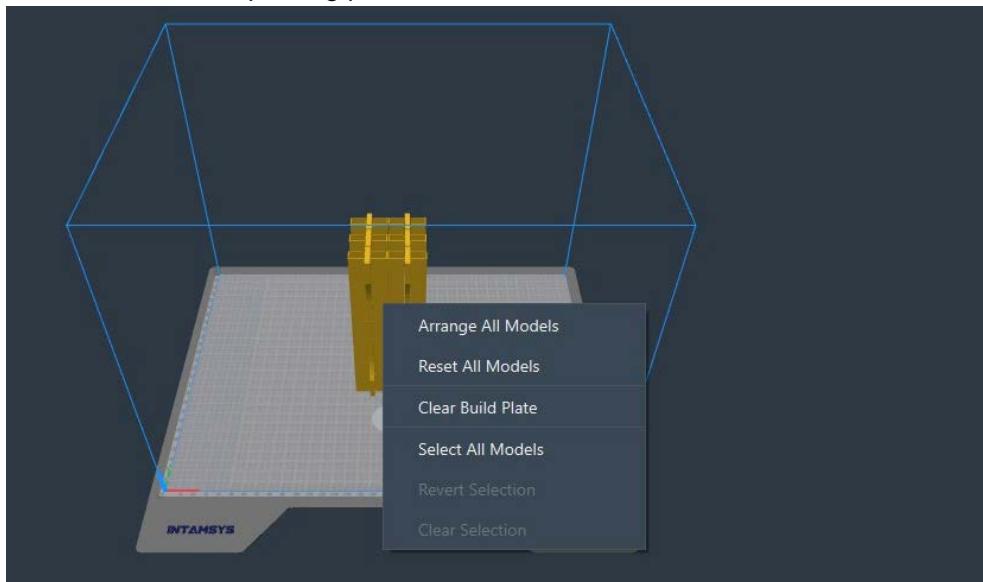


Fig. 5.13 Model Operation

4. Print settings: Select the printer model (select FUNAMT PRO 310 NEO here), and click the "Print Mode" command to select the print mode. FUNAMT PRO 310 NEO provides mirror print and copy print.

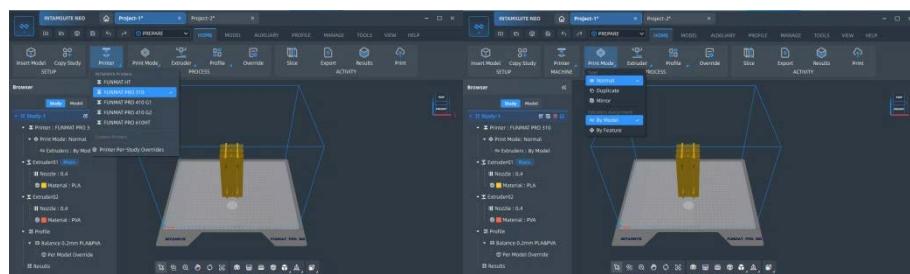


Fig. 5.14 Print Settings

Select the material and nozzle diameter required for the print head. For double-head print, switch to the extruder 02. After selecting the material for the extruder 01, proper supporting material can be automatically recommended for selection.

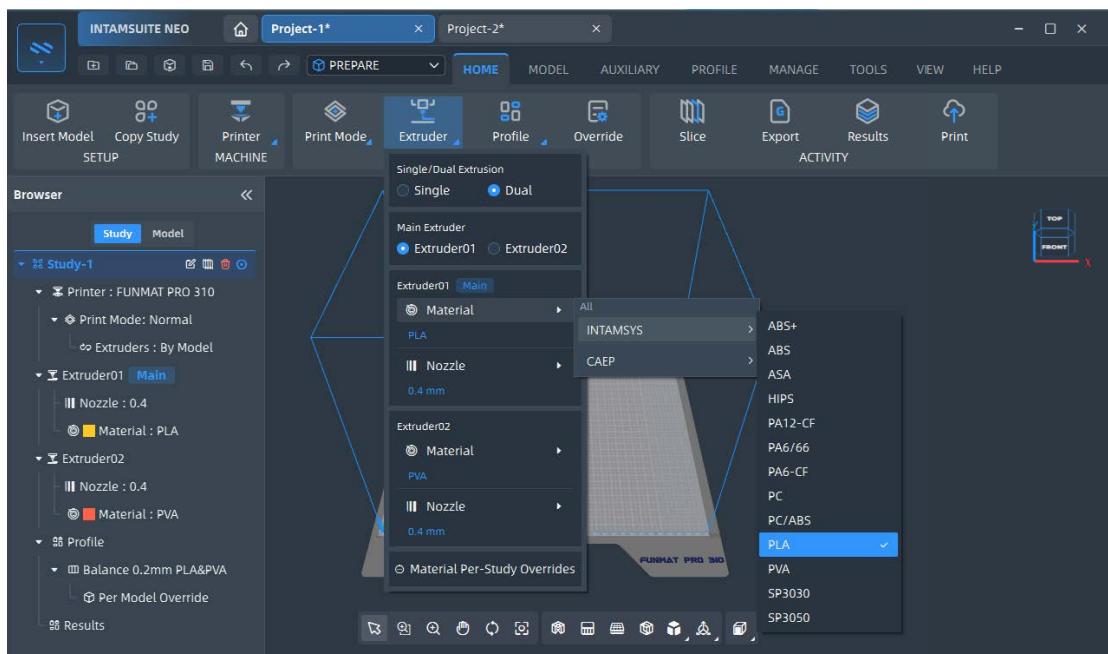


Fig. 5.15 Extruder Material Settings

The slicing software is pre-configured with various print profile templates, which can be selected as required, with the required process parameters adjusted in the detailed settings dialog box before slicing.

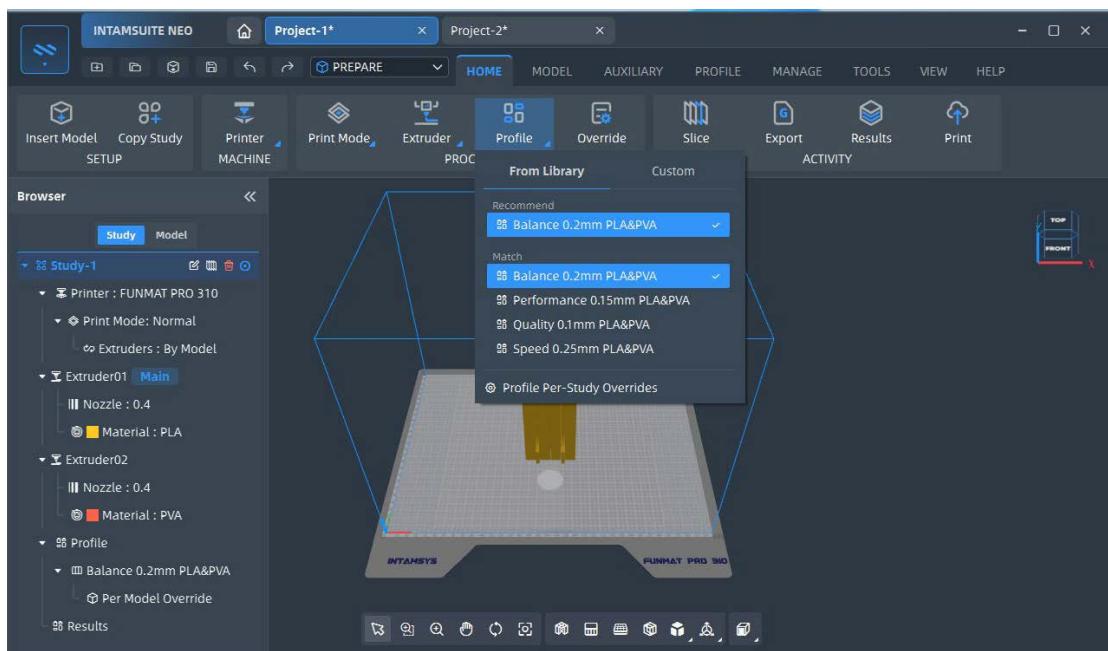


Fig. 5.16 Process Parameter Settings

5. Print preview: Wait for slicing to be completed. After the operation is done, you can preview the slicing results by clicking "Preview" to view the print path and direction on each layer. You can even simulate the whole print process after checking the material

color, line type, feeding speed, temperature, fan speed, and layer thickness in detail.

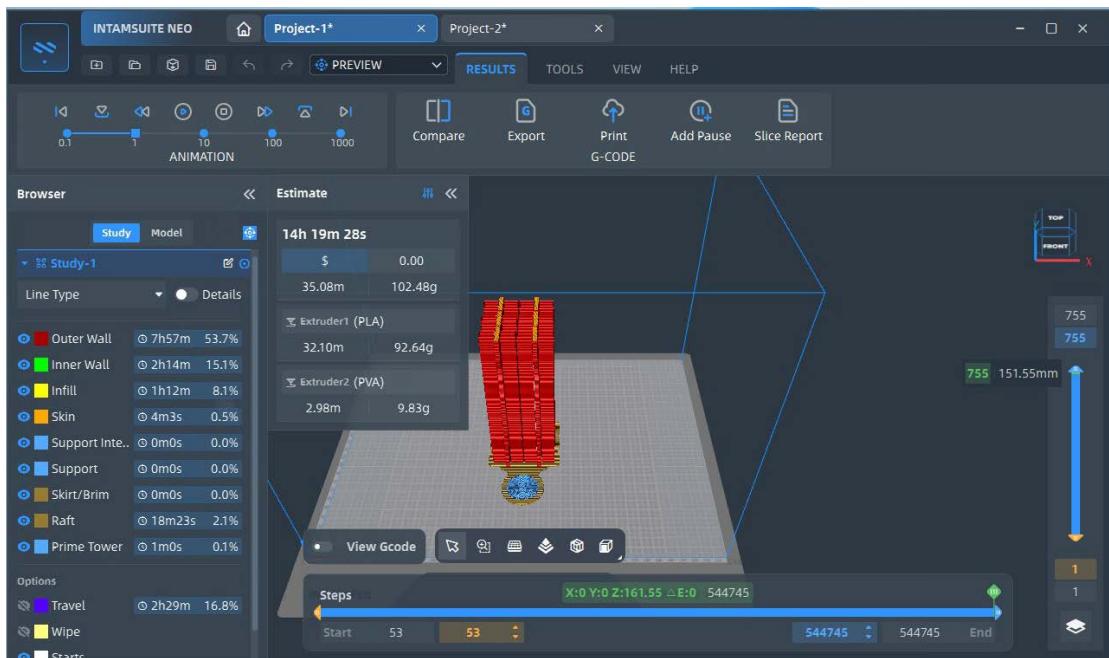


Fig. 5.17 Previewing the Print Results

- File saving: When you are satisfied with the previewed slicing results and save the print file to your defined location, the software will save g-code or ifp print file for direct remote print. You can also save it in the U-disk and later insert the disk to the printer for selective file printing or send it to the printer remotely. Refer to the following text for the operation mode.

**Note: As the naming format for .gcode file is imported into the U-disk, names with Chinese characters or special characters are not supported for now.**

For more detailed function operation of the slicing software, refer to:

[https://help.intamsys.com/zh/home/INTAMSYS\\_NEO/New\\_User\\_Guide](https://help.intamsys.com/zh/home/INTAMSYS_NEO/New_User_Guide)

### 5.4.3 Import the Print File to the Printer

#### 5.4.3.1 Insert the U-disk for Printing

- Select the location of the print file. Select the location where the file is stored in the drop-down bar in the upper right corner of the screen, such as USB storage or local storage (for remote print).

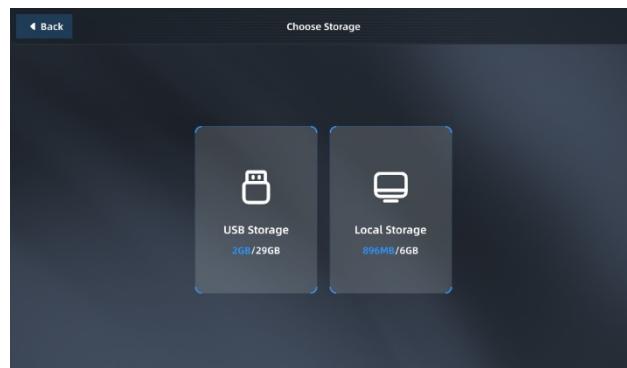


Fig. 5.18 Selecting File Storage Location

- Click the Open icon in the lower left corner of the screen, and the print file list will pop

up;

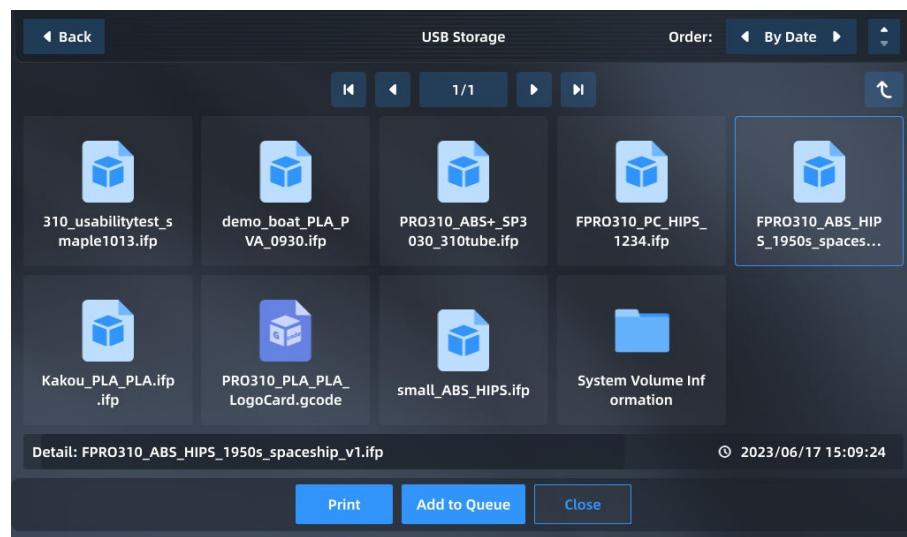


Fig. 5.19 Print File Interface

3. Select the print file, and click the "Print" button to load the print file. You can also select "Add to Queue" to add print files to the print queue. If you import the file through U-disk, after the print file is loaded, you can pull the U-disk out of the USB port without affecting the printing.



Fig. 5.20 Print File Loading Completion

#### 5.4.3.2 Remote Print

In the device information interface, click the "Remote Print" button to enable remote print and select the IP address on this page. You can view the log after connection.

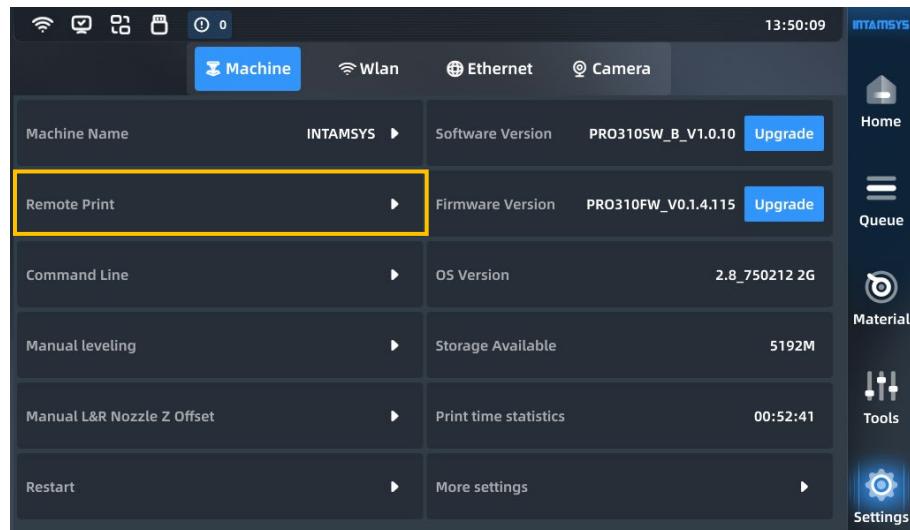


Fig. 5.21 Remote Print Settings

Click "Remote Print Enabled", click the "IP Address", and select the IP address for remote connection of the device. The remote connection password will be displayed on the right side. Click "Refresh" to randomly change the remote connection password. When the "Server State" is displayed as "ON", the device has remotely connected for remote print.

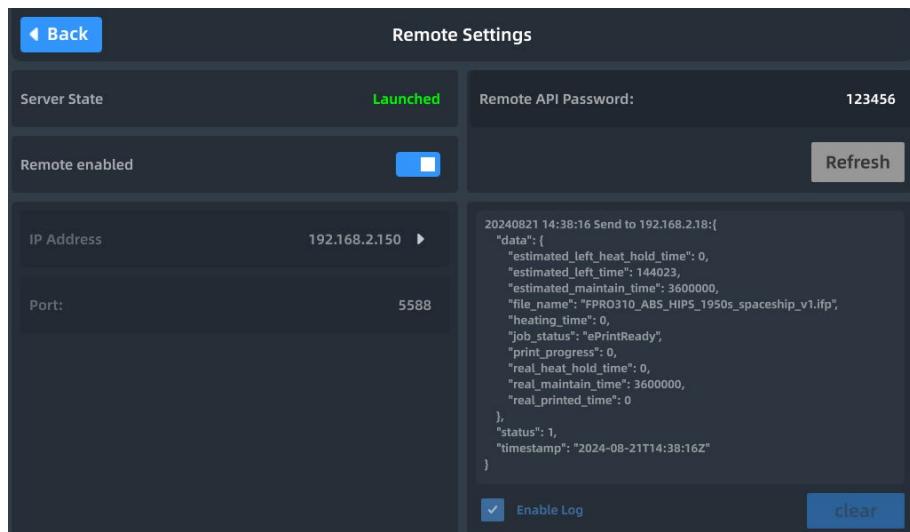


Fig. 5.22 Enabling and Setting Remote Print

There are three modes for remote operation. Before remote print, make sure that both the printer and computer work on the same LAN and the printer is remotely connected with the computer through IP address.

#### 1. FTP transfer mode:

- (1) Enter the IP address of the printer's remote client in the local Windows folder.



Fig. 5.23 FTP Transfer Settings for Remote Transfer

(2) Enter "root" as the username and "intamsys" as the password in the prompted dialog box to log in to the printer.



Fig. 5.24 FTP Password Login for Remote Transfer

(3) Import the file to be printed to the .gcode folder, and the printer receives the uploaded file and prints the local file selected on its screen.

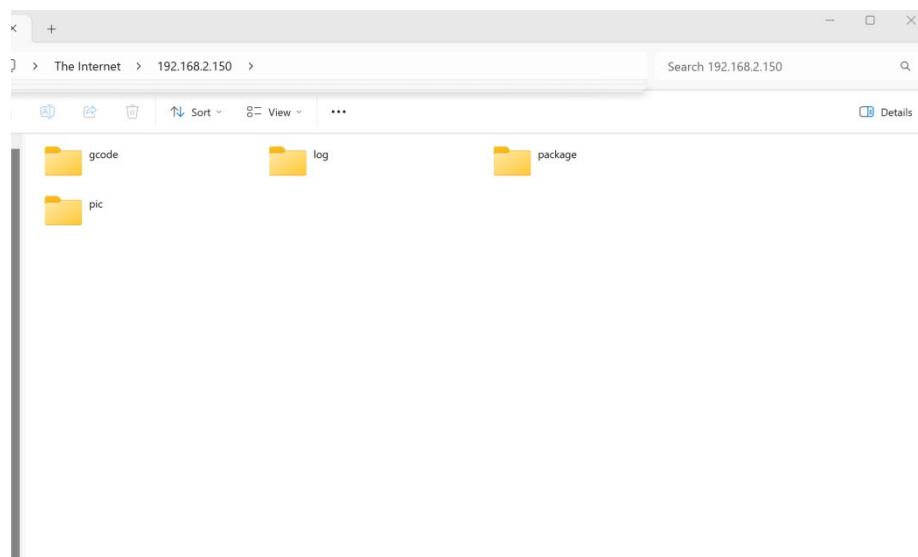


Fig. 5.25 Remote File Transfer Interface

## 2. Remote print with INTAMSUITE NEO

(1) Install and open the computer software INTAMSUITE NEO



INTAMSUITE NEO

(2) In the toolbar interface, select "Print".

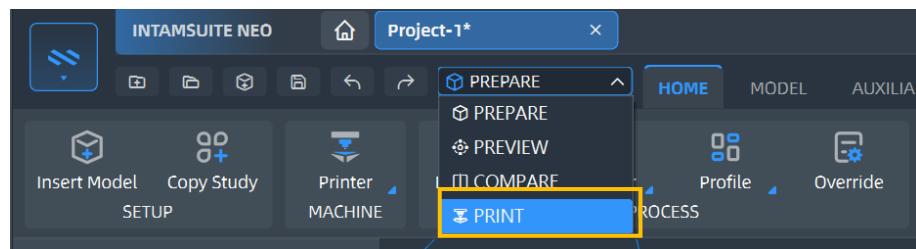


Fig. 5.26 Print Interface

(3) Click "Add Printer" and select SFTP or FTP as the "Type IP Address". You can also click the "Search & Select" button to search for the IP address.

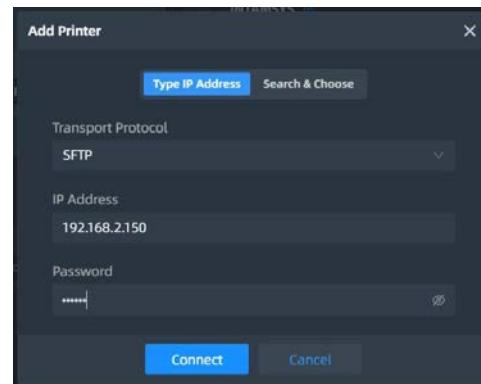


Fig. 5.27 Adding the Printer

(4) Enter the IP address and remote connection password of the current printer, and click "Connect" to create a connection.

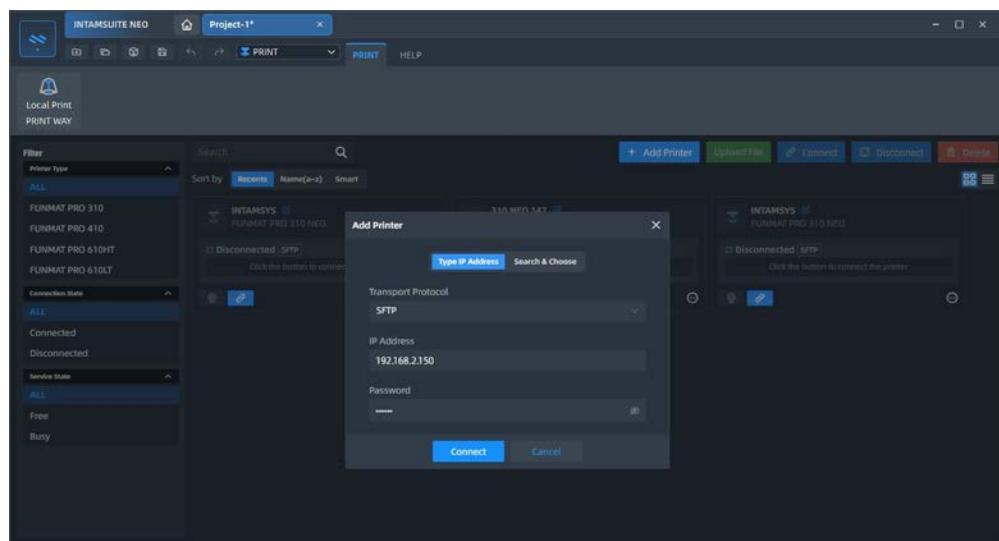


Fig. 5.28 Remote Connection through IP Address

(5) Click "Upload File", and select the local file or the file of the slicing software.

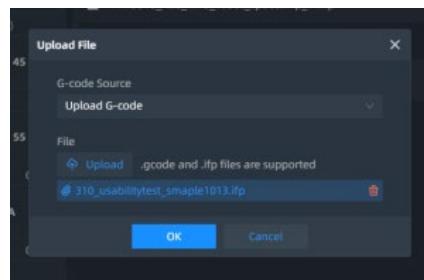


Fig. 5.29 Uploading or Synchronizing the File

(6) Click "Get to Print" to directly print the file on the slicing software or on the printer as it would also receive the print file.

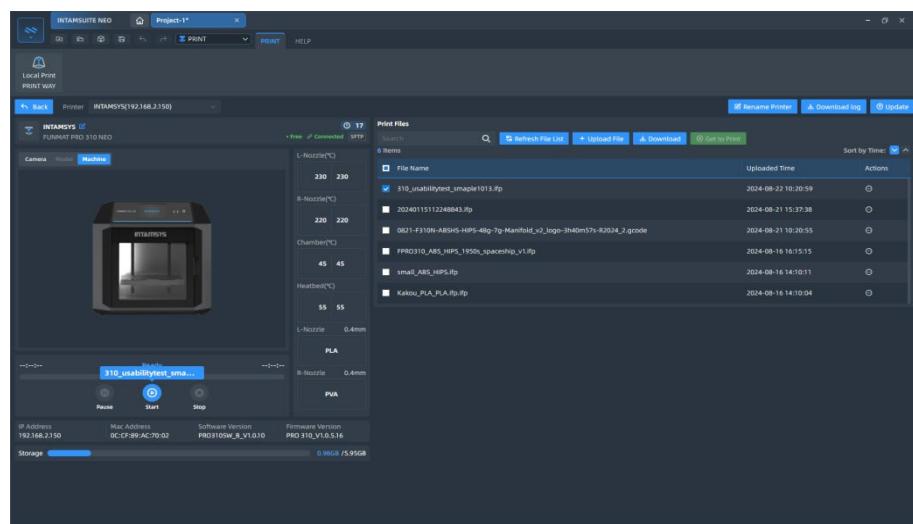


Fig. 5.30 Remote Print Interface

(7) Start the G-code print task remotely, and the display screen of the printer will enter the print interface accordingly. For other remote operations, the screen interface will also display corresponding actions.

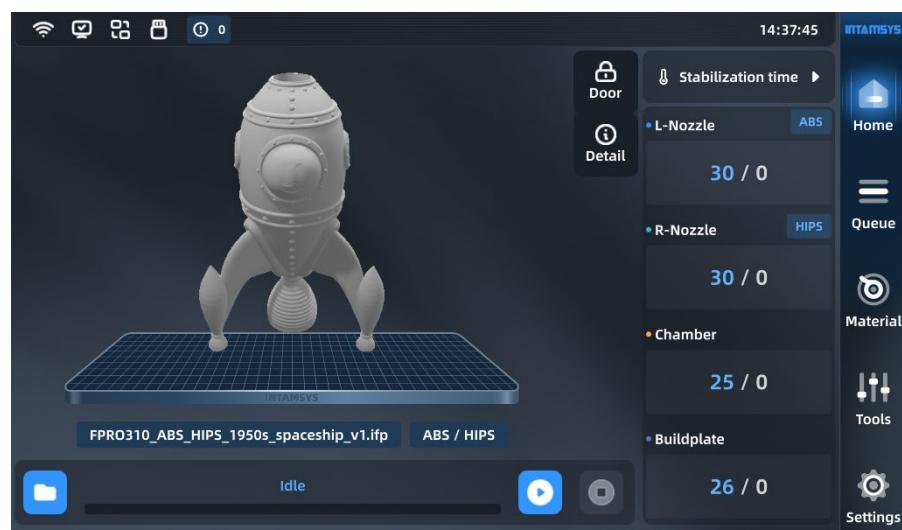


Fig. 5.31 Print File Loading Completion Interface

### 3. INTAMSUITE Local Print

Besides application in INTAMSUITE NEO, remote print can also be independently applied after starting the program named INTAMSUITE Local Print (installed together with INTAMSUITE NEO).

The INTAMSUITE Local Print tool is not disturbed by many slicing-related functions. It has a user-friendly interface for ease of operation.

Download the INTAMSUITE Local Print tool  and connect it to the printer through the IP address. You only need to select the print file to print in the same operation mode as that for remote print with INTAMSUITE NEO. For detailed steps, refer to: [https://help.intamsys.com/zh/home/INTAMSUITE\\_NEO/Remote\\_Print](https://help.intamsys.com/zh/home/INTAMSUITE_NEO/Remote_Print)

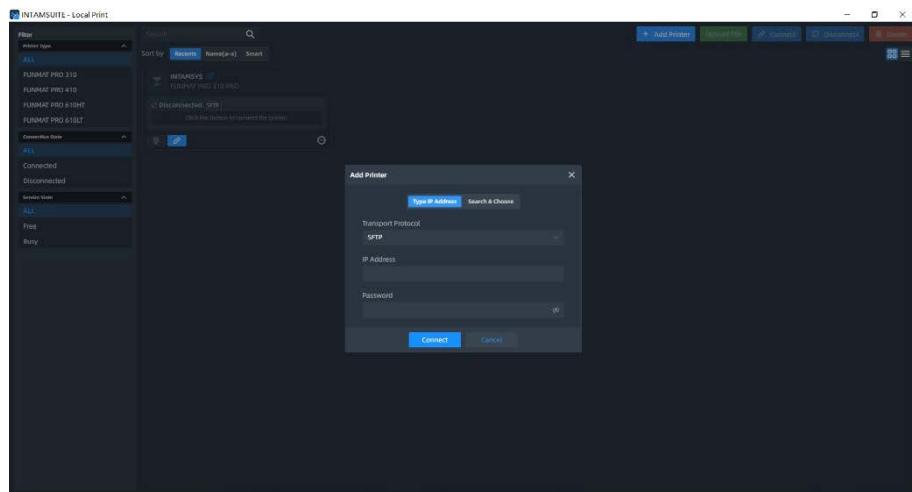


Fig. 5.32 Interface of Adding INTAMSUITE Local Print to the Printer

## 5.4.4 Printing and Prototyping Process

### 5.4.4.1 Main Printing and Prototyping Process

Click the "Start" button on the screen to start printing and prototyping. If remote print is conducted through INTAMSUITE NEO or INTAMSUITE Local Print, manual operation is not required. The printing and prototyping process has three steps: "preheat - print - heat preservation":

1. Preheat. Preheat the printing platform and the chamber before printing. The preheating temperature and time are the platform temperature, chamber temperature and preheating time of the material in the left extruder on the printer (it is necessary to confirm whether the material setting of the material interface is consistent with G-code). When the platform temperature and chamber temperature reach the target values, preheating timer starts;
2. Print. After the preheating time lapses, the printer starts to read the G-code file to perform formal printing.
3. Preserve the heat. After printing, the nozzle cools down and the printing platform and chamber shall maintain heated. The heat preservation temperature and time

are based on the platform heat preservation temperature, chamber heat preservation temperature and heat preservation time of the material in the left extruder.

#### 5.4.4.2 Modification of Preheating Time and Heat Preservation Time

During the printing and prototyping process, you can modify the preheating time and heat preservation time.

1. Click the "Heat Preservation Time" button on the right side of the main interface to display the modification interface of preheating time and heat preservation time.
2. You can enable or disable "Heat Hold" and "Maintain" options.
3. Modify the time by clicking "-"/"+", and click the "OK" button to save the modification.

Note: Preheating and heat preservation need to be set before printing, and the settings during printing will not take effect; preheating can only be disabled or preheating time can be reduced when the heat preservation of chamber has been maintained for a long time, otherwise it will affect the next printing effect.

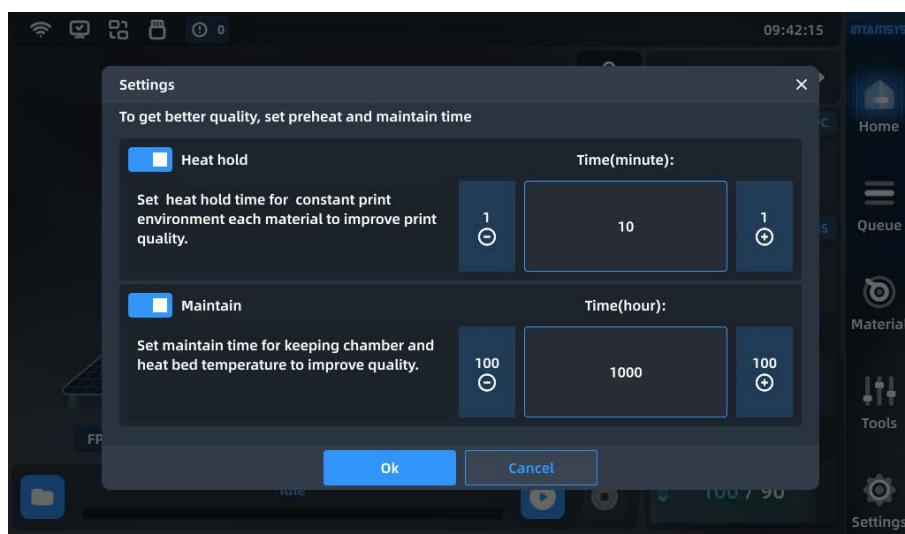


Fig. 5.33 Preheating and Heat Preservation Interface

#### 5.4.5 Duplicate/Mirror Print

FUNMAT PRO 310 NEO supports single-extruder print/regular dual-extruder print/duplicate print/mirror print.

Single-extruder print: Perform printing with an extruder at a time.

Regular dual-extruder print: Perform printing with two extruders in turn, one for model printing and the other for auxiliary structure or support.

Duplicate print: It means that a printer with dual independent extruders can print two models with identical dimensions, angle, and direction at the same time during 3D printing to improve the production efficiency. Copy print is very useful for the mass production of the same components or objects, significantly improving efficiency. Copy operation only needs to be performed for the existing model in the slicing software.



Fig. 5.34 Duplicate Print

**Mirror print:** It means that a printer with dual independent extruders can print two symmetrical models at the same time during 3D printing. Through mirror print, the re-design of a symmetrical model can be avoided, and mirror operation only needs to be performed for the existing model in the slicing software.

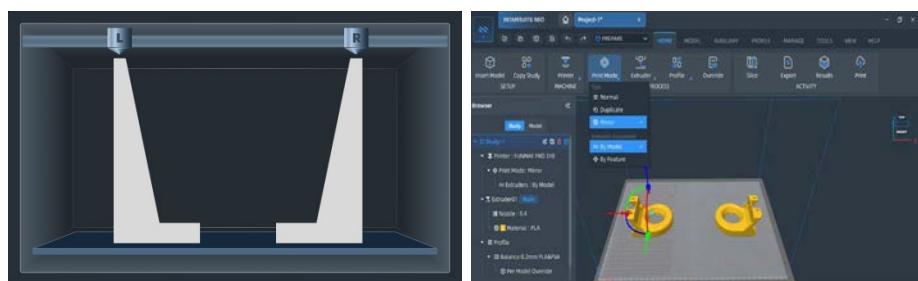


Fig. 5.35 Mirror Print

The duplicate/mirror print is as follows:

1. Import the model file and select duplicate/mirror print.

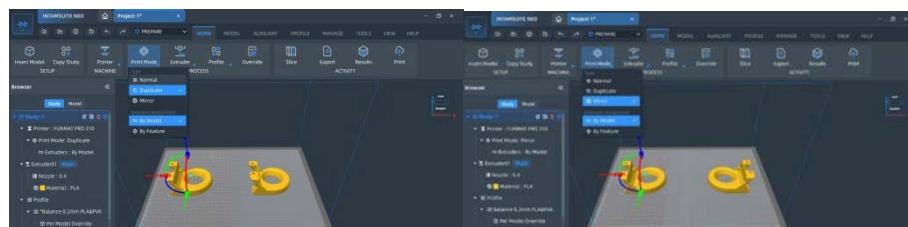


Fig. 5.36 Duplicate/Mirror Print

2. According to individual print requirements, set the print parameters such as extruder and process template for the model, and preview slicing.

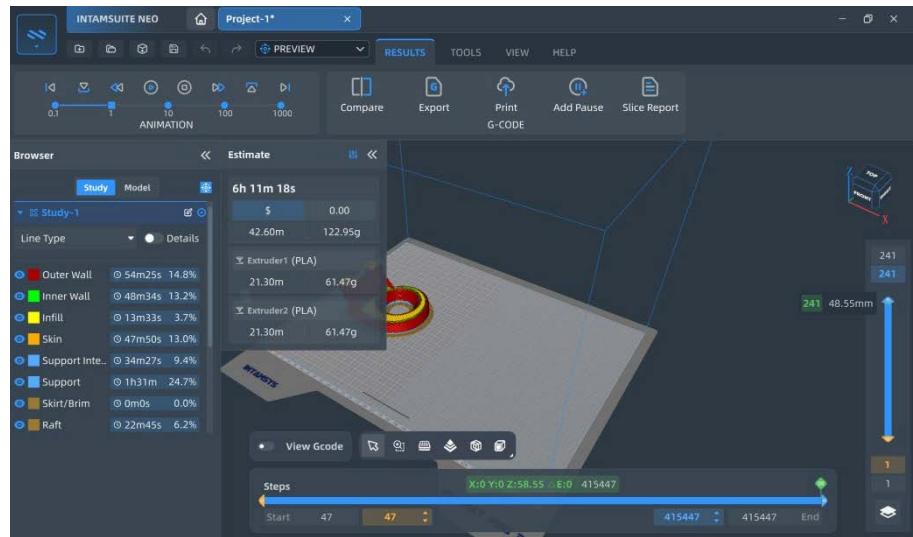


Fig. 5.37 Previewing the Print Results

3. Transfer the sliced file to the machine which shall meet the following conditions at this point:

- (1) Ensure the same print materials or similar process parameters for dual left and right extruders for duplicate/mirror print.
- (2) Perform manual calibration of L&R nozzle Z offset before copy/mirror print.

If the difference between the left extruder offset and the right extruder offset is less than or equal to 0.2 mm, it means that the printer can directly perform duplicate print or mirror print; however if it is greater than 0.2 mm, you need to manually adjust L&R nozzle height and manually calibrate L&R nozzle Z offset, test and calibrate it with a 0.2 mm-thick feeler gauge, and perform operations as prompted on the screen in turn with reference to 4.6.7.

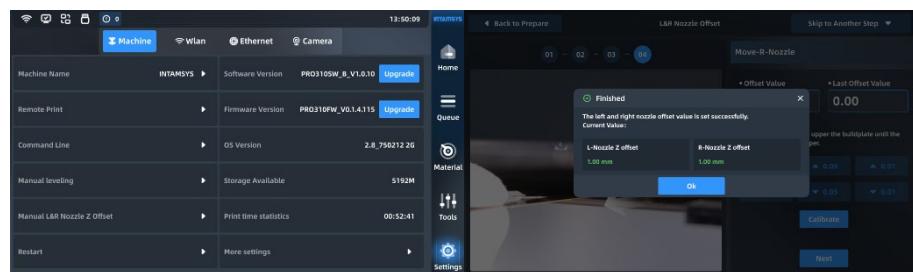


Fig. 5.38 Manual Adjustment of Left and Right Extruder Offsets

**Note: For mirror/duplicate print, do not disable the raft layer settings. You only need to set mirror print in the slicing software (the raft layer is printed by default) and directly print the required file by sending the file remotely or inserting the U-disk.**

## 5.4.6 Continue Printing

### 5.4.6.1 Continue Printing after Material Shortage

When the printer detects that the printing wire rod is used up, it pauses printing and continues printing after material reloading. This technology is very useful especially for long-term or large-scale printing tasks as it can prevent print failure due to materials use-

up during printing, with the operation steps as follows:

Click the "Supply Filament" button on the screen, and then change the material according to the prompts on the screen. The procedure is as follows:

1. Unload the old material.
2. Load the new material.
3. After the material is loaded, click the "Print" button on the screen to continue printing.

#### 5.4.6.2 Continue Printing after Power Failure

In the case of power failure or other interruptions during printing, the function of continuing printing after power failure records the printer status at the time of power failure and prompts whether to continue printing after the device is powered on again. This technology is particularly important for long-term important printing tasks as it can prevent print failure due to power failure in the midway and reduce energy and material waste, with the operation steps as follows:

1. Power on the machine after power failure during printing, and click "Clear" or "Close" for the 406 alarm displayed in the interface.

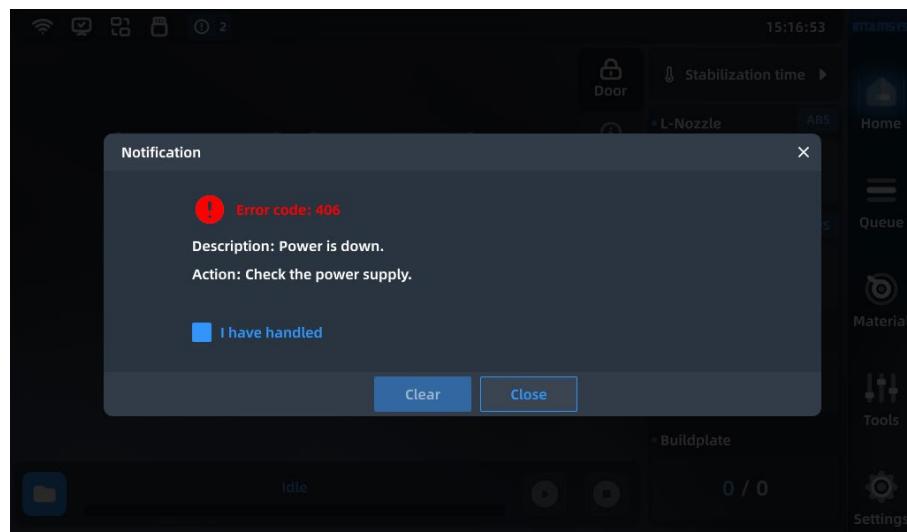


Fig. 5.39 Interface 1 of Continuing Printing after Power Failure

2. The prompt window of continuing printing after power failure pops up. Click "OK", and the machine reads the last printing progress and recovery temperature and automatically opens and continues printing the print file before power failure; click "Cancel", and the machine does not continue printing after power failure.

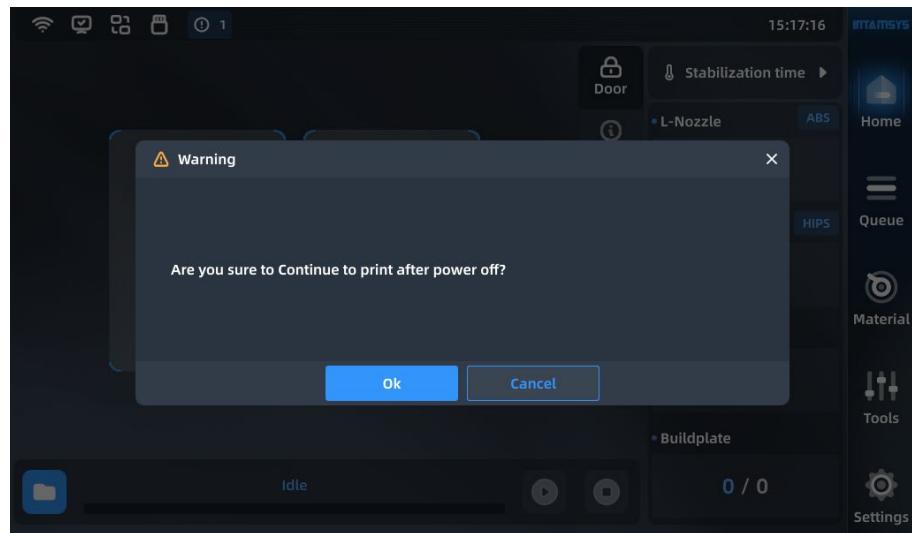


Fig. 5.40 Interface 2 of Continuing Printing after Power Failure

3. The machine starts to resume printing.



Fig. 5.41 Interface 3 of Continuing Printing after Power Failure

Note: Continuing printing after power failure poses the failure risk as the device is incapable of heating to make the Build Plate temperature and chamber temperature drop quickly after power failure and the model can be separated from the buildplate after long-term power failure. Therefore, the function can be applied within 10 mins after power failure.

### 5.4.7 Pause Printing

During printing, the Pause button on the main interface is activated. The printer can automatically pause or you can use this button to manually pause it.

#### 5.4.7.1 Automatic Pause

1. When a red alarm is detected, the breathing light turns red and an automatic pause command is sent.
2. The Z-axis platform is slightly lowered, then the extruder resets to the zero position, the heating of the nozzle stops while an alarm dialog box pops up, indicating the reason for

pause.

3. You need to correct the corresponding error first, then click the "Clear" button to clear the alarm.
4. To restore printing, press the "Start" button on the main interface, and a restoration command will be sent to the printer to instruct it to restore printing.

#### **5.4.7.2 Manual Pause**

1. Click the "Pause" button to manually pause the printer.
2. The Z-axis platform is slightly lowered, then the extruder resets to the zero position, and the heating of the nozzle stops.
3. To restore printing, press the "Start" button on the main interface, and a restoration command will be sent to the printer to instruct it to restore printing.

#### **5.4.8 Stop Prototyping**

After a print task is started, the "Stop" button in the main interface is activated. The printer can automatically stop or you can use this button to manually stop it:

##### **5.4.8.1 Automatic Stop**

When a red alarm is detected, the printer will automatically stop. After the printer receives the stop command, the heating of nozzle, platform and chamber will be disabled.

##### **5.4.8.2 Manual Stop**

When the printer receives the stop command, a dialog box for confirming or canceling the stop will pop up. Press "OK" to stop the printer. After the printer receives the stop command, the heating of nozzle, platform and chamber will be disabled.

#### **5.4.9 Prototyping Alarm**

If the printer detects a fault that might affect the printing, a warning will be given on the screen. The alarm status button will turn red according to the warning severity.

When you press the alarm status button, a dialog box that indicates the alarm reason will pop up. The dialog box shows information about the alarm reason.

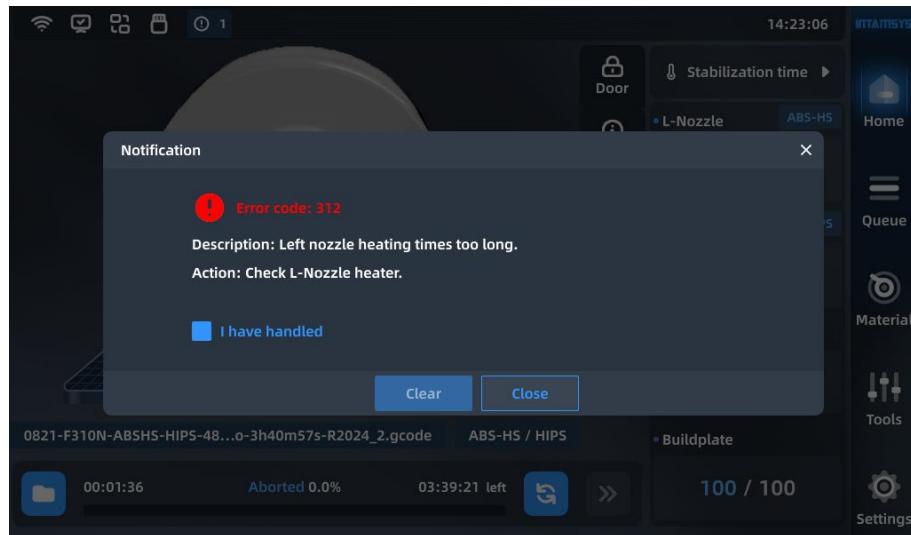


Fig. 5.42 Error Alarm

In some cases, the alarm will prevent your attempted start to print, and the printing will not start until you eliminate the error. Various warnings might be displayed when the printer performs print tasks, and some warnings will pause and stop printing. Whether the prototyping process can be restored depends on the warning severity.

Refer to Chapter 7 for the fault alarm list and processing methods.

#### 5.4.10 After Prototyping is Completed

After prototyping is completed, the print head resets and stops, the printing platform automatically descends to the bottom and the screen will show 100% print progress, indicating that the printing prototyping has been completed. The model needs to be removed from the printer together with the Build Plate.

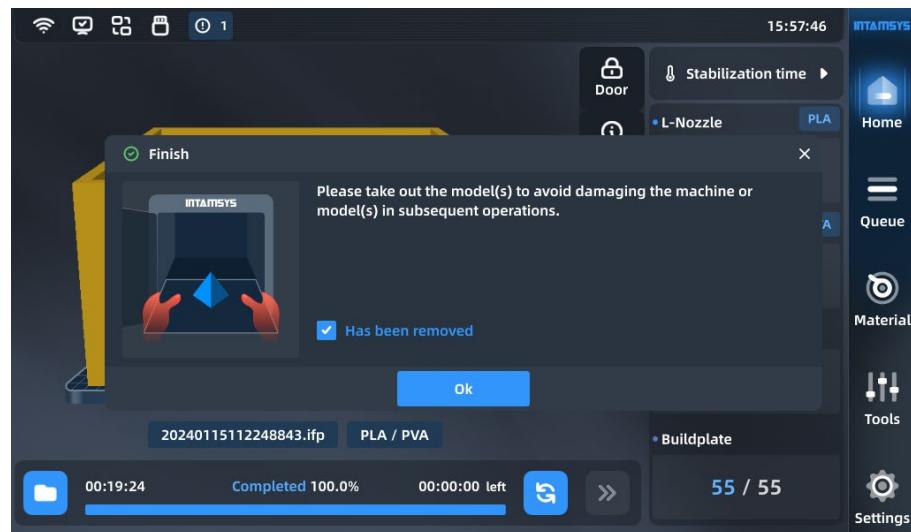


Fig. 5.43 Model Printing Completed

1. Unlock the door and open the front door of the chamber. If you want to end the heat preservation, enter the "Stabilization time" interface and disable the Heat Preservation option. At this time, the front door and top cover are unlocked; if you want to continue heat

preservation, click the door lock button on the status bar of the screen to unlock the front door and top cover;

2. Wear gloves and take out the flexible printing Build Plate;
3. Bend the flexible printing buildplate up and down with both hands, and the print part will be separated from the buildplate.
4. Remove excess supporting material from the print part.

#### 5.4.11 Locking of Front Door and Top Door

The printer is equipped with front door electromagnetic lock and top door electromagnetic lock. During the heating and printing process of the device, the front door and top door shall be closed. The door will be automatically locked after it is closed. Users can click the door lock icon on the main interface to unlock or lock the door.

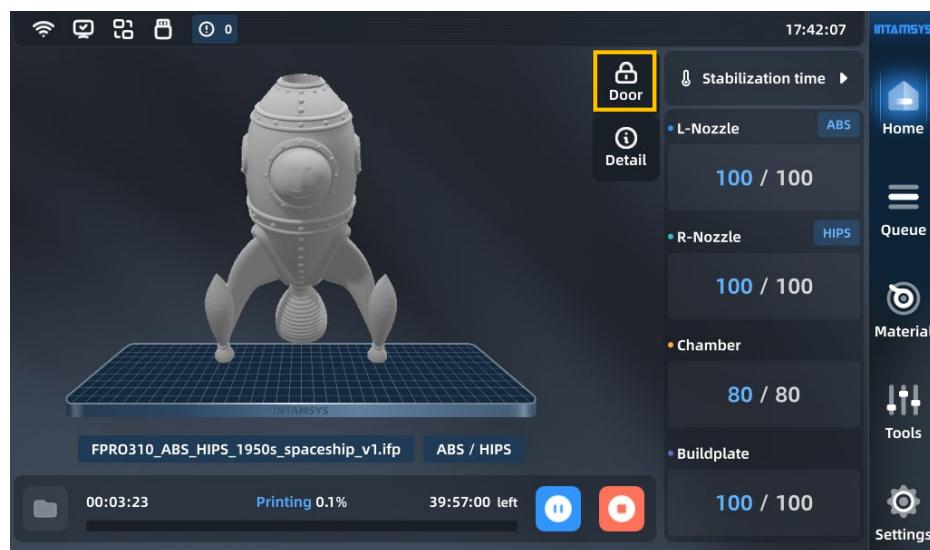


Fig. 5.44 Door Lock Switch

For the safety of users, the printer always locks the front door and top lateral plate when the printing starts or the chamber starts to heat, and they cannot be opened after being locked. If you need to force unlock during this process, click the door lock button to unlock the front door and top lateral plate.

Note: Do not put your hands into the chamber after forced unlocking to avoid being scalded or pinched.

### 5.5 Printer Status

#### 5.5.1 Temperature Status

You can view the temperature status of the printer on the main interface in real time, including target temperature and real-time temperature of left extruder; target temperature and real-time temperature of right extruder; target temperature and real-time temperature of chamber; target temperature and real-time temperature of hotbed.

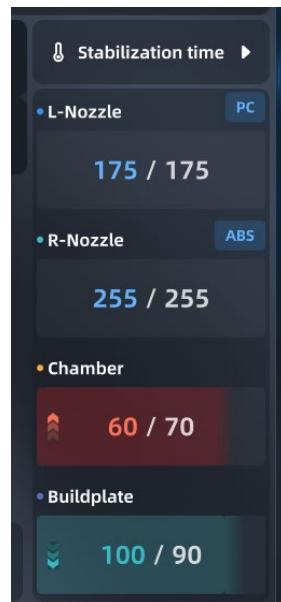


Fig. 5.45 Printer Status

## 5.6 Software/firmware Update

### 5.6.1 Update through LAN

You can update the software and firmware to the latest version through LAN to improve your usage and printing experience.

The software/firmware is updated in the following steps:

1. Download the soft/ware/firmware package to the computer.

Software package: PRO310SW\_B\_Vx.x.x.tar

Firmware package: PRO310FW\_Vx.x.x.bin

2. Connect the computer and printer to the same LAN through Wi-Fi or network cable.

Refer to 4.6.2 "Remote Print".

3. When the printer is "Connected", click the card title to enter the printer details page.

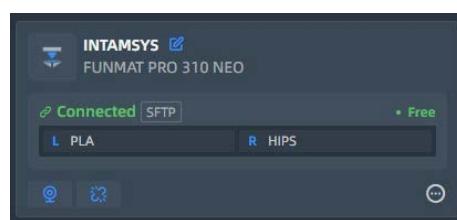


Fig. 5.46 Remote Connection Interface of Printer

4. Click "Update" and select "Update Software" or "Update Firmware".

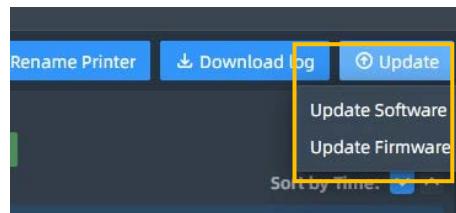


Fig. 5.47 Software/Firmware Update Interface

5. Users confirm software/firmware update without the prompt window when the printer is idle.

6. Select the software for update.

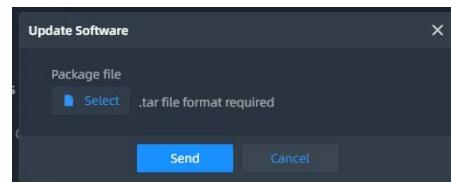


Fig. 5.48 Software Update Interface

7. Select the firmware for update.

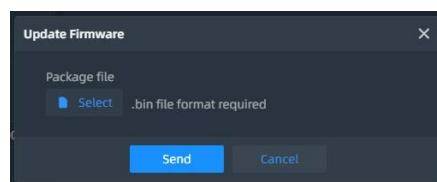


Fig. 5.49 Firmware Update Interface

8. Click the "Select" button to select the file in the computer.

Software package: PRO310SW\_B\_Vx.x.x.tar

Firmware package: PRO310FW\_Vx.x.x.bin

**(Note: For the package downloaded from the Internet repeatedly, remove the brackets behind its name to avoid update failure.)**

For example, modify PRO310SW\_B\_V1.0.4(1).tar to PRO310SW\_B\_V1.0.4.tar.)

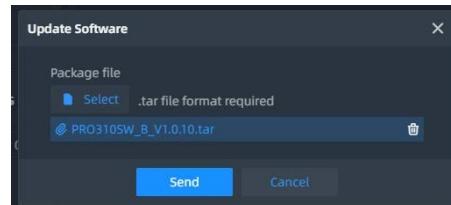


Fig. 5.50 Software update Interface 1

9. Click the "Update" button, and the package file begins to be transferred. At this point, click "Cancel" or close the prompt window, and the transfer will be interrupted.

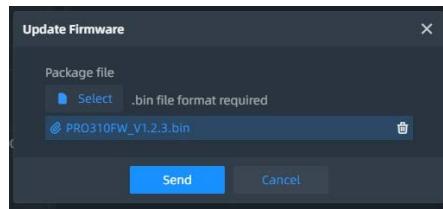


Fig. 5.51 Software Update Interface 2

10. The upper machine automatically disables remote print and starts to install the package file for update after receiving it.

Installation of package file for software update: Just wait for the upper machine to restart.

Installation of package file for firmware update: A prompt window pops up during update, and the prompt of update completion appears in about 30 s.

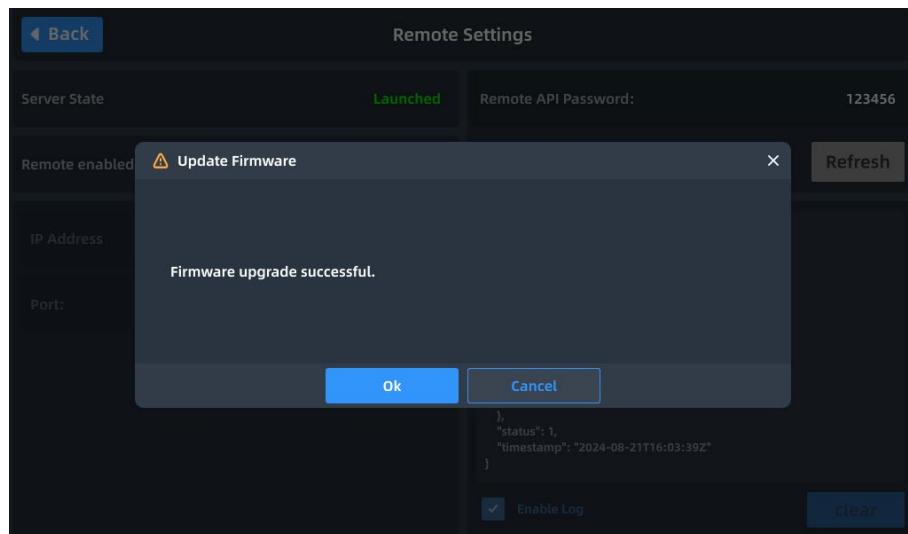


Fig. 5.52 Firmware Update Succeeded

There are three prompts during firmware update:

- (1) Firmware update succeeded.
- (2) Firmware update failed. Please re-update it. (Update failed due to power failure or unstable network connection during update.)
- (3) Firmware package corrupted, please re-update it. (At the beginning of the update, the update package is detected to find that the file is corrupted. Please re-download and copy it.)

If update failed due to power failure or unstable network connection during remote update, the software and firmware will remain the version before update and be re-updated after the device restarts.

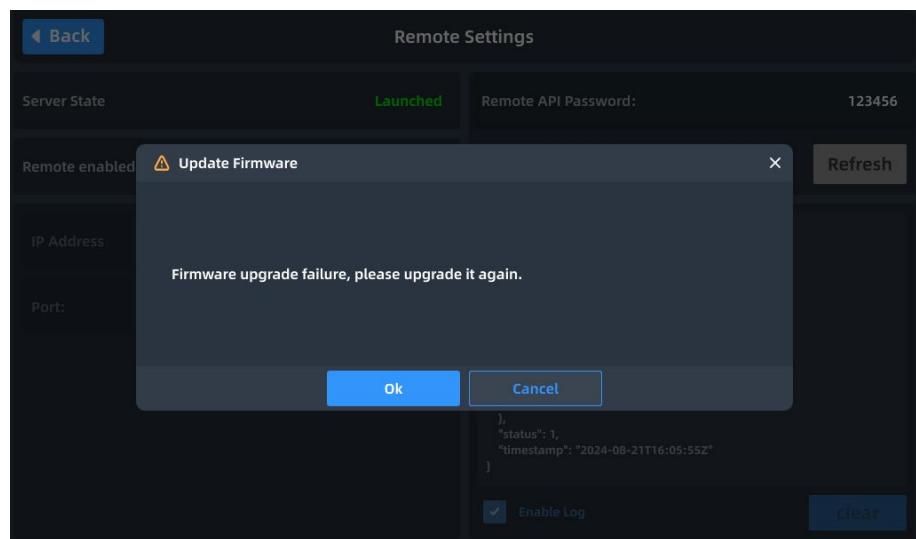


Fig. 5.53 Firmware Update Failed

## 5.6.2 Update through U-disk

Software update:

1. Decompress "PRO310SW\_B\_V\*.tar" to get two folders (namely, "openssl" and "resources") and three files (namely, "desktop", "ReleaseNote.txt", and "README.txt").
2. Copy "openssl", "resources", and "desktop" to a U-disk, and then insert the U-disk into the machine.
3. In the touch screen interface of FUNMAT PRO 310 NEO, enter the "Settings" interface, click the "update" button in the "Software Version" field, and perform operation as prompted step by step.

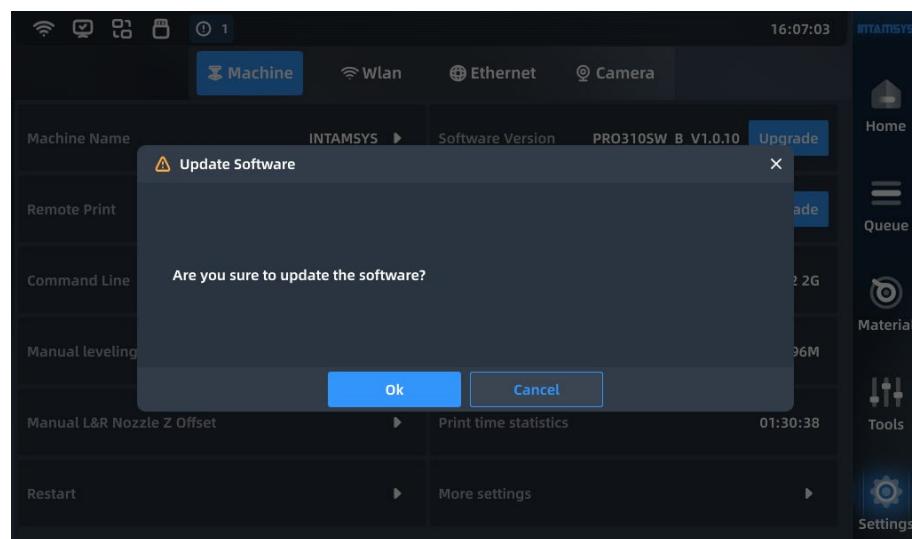


Fig. 5.54 Prompt of Software Update

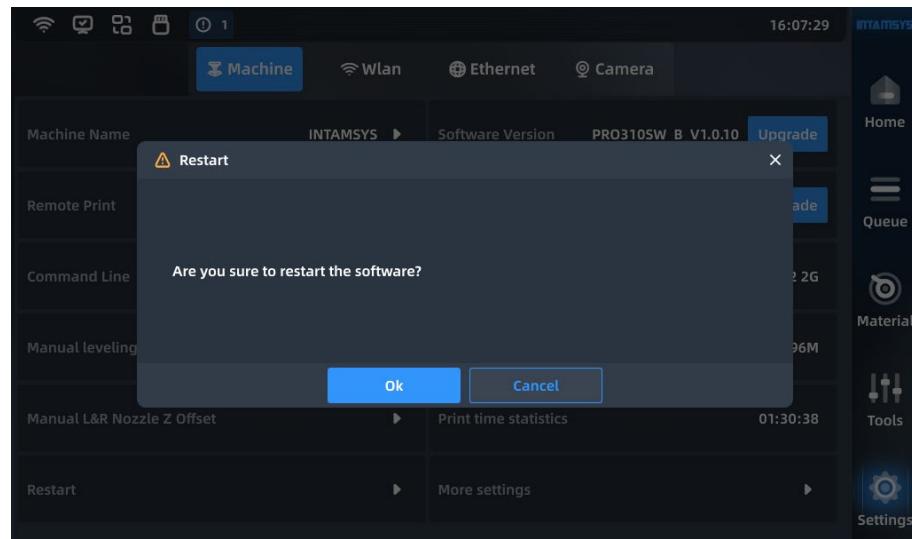


Fig. 5.55 Prompt of Software Restart

Firmware update:

1. Copy PRO310FW\_Vx.x.x.bin of the firmware to a U-disk, and then insert the U-disk into the machine.
2. In the touch screen interface of FUNMAT PRO 310 NEO, enter the "Settings" interface,

click the "Update" button in the "Firmware Version" field, and perform operation as prompted step by step.

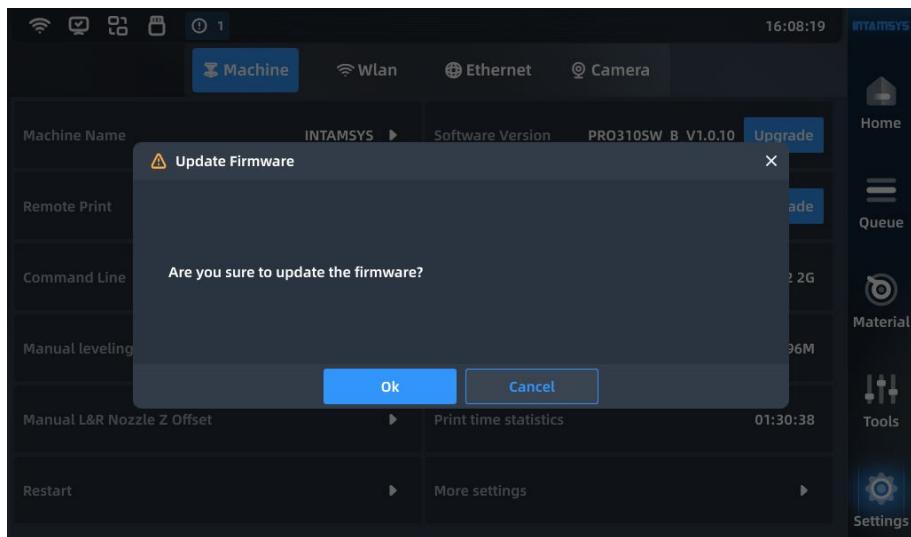


Fig. 5.56 Prompt of Firmware Update

## 6 Maintenance

Proper and regular maintenance not only helps to extend the service life of your printer, but also greatly improves your printing success rate and prototyping effect every time. This chapter describes various maintenance tasks of FUNMAT PRO 310 NEO that you need to perform.

### 6.1 Inspection Before Each Printing

Inspection before printing ensures the safety during printing and improves the print success rate.

#### 6.1.1 Inspect the Printing Platform

Inspect the platform and flexible printing buildplate:

1. To ensure that the magnetic platform is free of foreign matters, there are no adsorbed debris on the magnet, and the screws for installing the magnet are not loose or protruding;
2. To check whether there is any foreign matter or damage on the surface of flexible printing Build Plate;
3. To correctly adsorb the printing buildplate on the printing platform.

#### 6.1.2 Clean the Printing Chamber

The material filaments remaining on the buildplate of the chamber may melt in the heated chamber and stick to the buildplate, and the sundries in the chamber under the platform may occupy the movement space of Z-axis. Therefore, clean all the debris and material chips inside the printing chamber carefully before printing.

### 6.1.3 Inspect the Nozzle

To prevent the residual materials on the nozzle from affecting the prototyping quality of printing works, you should inspect whether the nozzle is clean before each printing. If it is not clean, you need to heat the extruder to the temperature that can melt the residual materials, then clean the extruder using a copper wire brush with wooden handle.

If the material sticks to a higher position and enters the rubber sleeve near the nozzle, you need to remove it, clean the nozzle and then install it back.

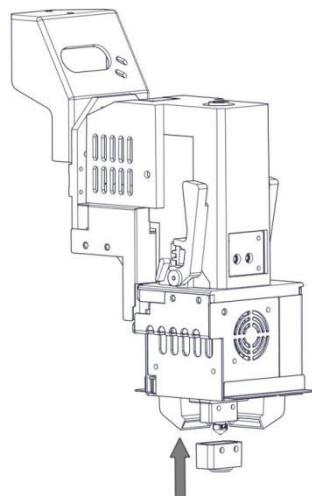


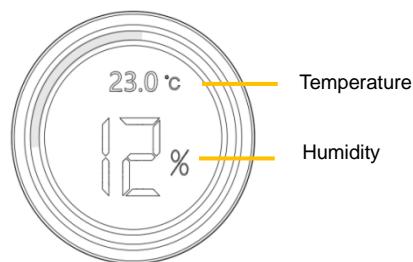
Fig. 6.1 Cleaning the Nozzle

### 6.1.4 Check the Humidity of the Material Chamber

Phenomena such as stringing and bubbles occur when printing with damp materials, which can affect the print success rate. Therefore, the humidity of the material chamber should be checked before each print task. If the humidity in the material chamber is too high, the molecular sieve drying box should be dried and then placed in the sealed filament box for use.

**Judging conditions:** When the material box is closed for more than one day, the temperature and humidity indicator shows that the humidity is over 20%.

**Note:** The filament box can play the drying role, and the wire rod shall be dried before usage according to the Print Process Guidelines.



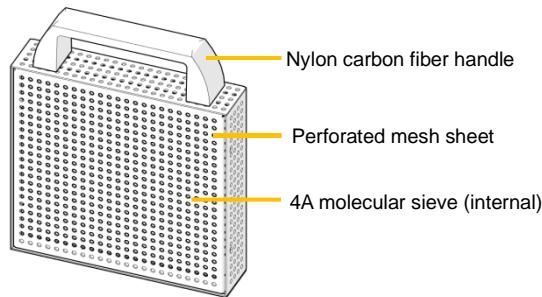


Fig. 6.2 Temperature and Humidity Indicator and Drying Box

**Drying process:** Open the upper cover of the material box to take out the drying box, and place it in the 200°C blast drying oven for drying for 2 h or a longer time; wear heat-resistant gloves and take it out to prevent scalding, and place it in the material box after cooling down to the normal temperature.

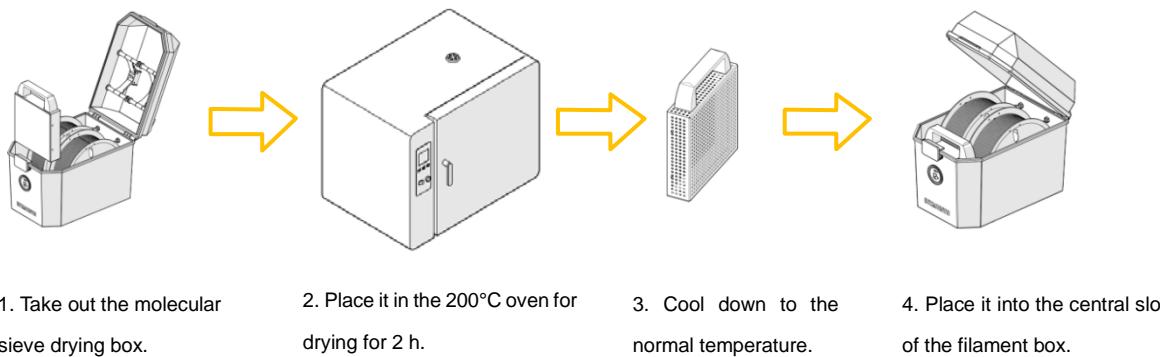


Fig. 6.3 Schematic Diagram of Molecular Sieve Drying Process

## 6.2 Maintenance after Each Printing

### 6.2.1 Clean the Printing Buildplate

After printing, lower the printing platform for a certain distance, then wear gloves to take out the printing Build Plate together with the print part from the printer, bend the flexible printing buildplate with both hands to separate the print part from the printing Build Plate, and then clean the printing Build Plate and put it back on the hotbed.

### 6.2.2 Clean the Nozzle

Inspect whether the nozzle surface is stuck with some print materials after each printing. If the nozzle is covered by residual materials for a long time, its service life will be affected. To prepare for the next printing, pay special attention to cleanliness of the nozzle surface. If the nozzle is stuck with too many residual materials, heat the nozzle to the set temperature of the material and then clean it using a copper wire brush with wooden handle.

**Note: Move the printing buildplate to the lowest position before cleaning the nozzle, and be careful to avoid scald burn risk when removing the protective sleeve to clean the nozzle.**

### 6.2.3 Clean the Chamber

The nozzle brush scrapes some material chips into the chamber during printing. Clean the chamber carefully every time after printing a work.

## 6.3 Regular Maintenance

### 6.3.1 Replace the Nozzle

After long term of printing, the inner and outer surfaces of the nozzle can be partially worn, which affects the printing quality, especially for the printing of fiber-containing materials. Therefore, it is recommended to pay close attention to whether the surfaces of print parts get rough or whether there is visible wear deformation at the tip of the nozzle after 10 kg of materials are printed with a single nozzle. If the above phenomenon occurs, it is recommended to replace with a new nozzle.

### 6.3.2 Clean Feeding Gears of the Extruder

After long-term use, more and more cut material chips accumulate in the tooth spaces of feeding gears, thus reducing the feeding force of the extruder. It is recommended to remove the front housing of the extruder every month, remove the front cover plate, and take out the feeding gear shaft 2 to inspect the accumulation of material chips in the tooth spaces of two feeding gear shafts. If necessary, you need to carefully clean each tooth space with tools such as small copper wire brush or tweezers.

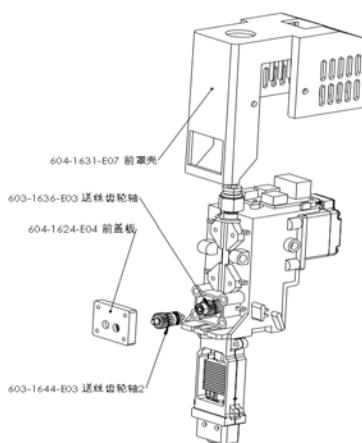


Fig. 6.4 Position of Feeding Gear

### 6.3.3 Clean the Fans

It is recommended to clean and maintain the fan at the printer mainboard and two exhaust fans on the upper rear side of the printer once every 12 months to prevent excessive dust from affecting device performance.

1. Clean the two exhaust fans on the upper rear side of the printer. Remove the rear cover of the printer, find the two exhaust fans at the upper part, and clean their blades with cleaning tools such as brushes, non-woven fabrics, and alcohol.
2. Clean the cooling fan at the printer mainboard. Remove the rear cover of the printer.

The cooling fan is located directly below the main board. Remove four fixing screws to slightly remove the fan (without the need to unplug the power supply), and clean its blades with cleaning tools such as brushes, non-woven fabrics, and alcohol.

#### 6.3.4 Maintenance of Moving Parts

It is recommended to re-apply PFPE grease or lithium soap based grease every 6 months for the X-axis and Y-axis motion guide components (The left and right lateral plates of the printer shall be removed when applying grease to the Y-axis guide rail).

1. Ensure that all relevant temperatures are set to "0" and the motor is disabled in System Settings ("Motor enable" is Off);
2. Manually move the extruder assembly to the center;
3. Clean the residual grease on the X/Y guide rail with a cloth;
4. Apply PFPE grease to the X/Y guide rail with a soft brush. Note: Excessive grease may have a negative impact on motion.
5. Move the extruder assembly back and forth several times on the X/Y axis for evenly applying the grease.

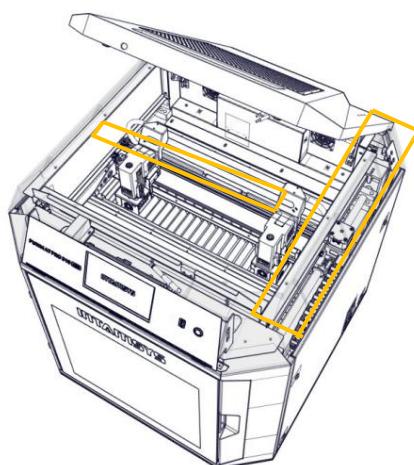


Fig. 6.5 Lubrication and Maintenance of X/Y Axis Linear Guide Rails

The Z-axis motion components include linear bearing and ball screw. It is recommended to re-apply PFPE grease or lithium soap based grease to the Z-axis motion components once every 6 months (The rear plates of the printer shall be removed).

1. Power off the printer and unplug the main power cord.
2. Remove the 4 locking screws at four corners of the rear cover with a wrench.
3. Apply PFPE grease or lithium soap based grease to the linear guide rail and ball screw with a soft brush. Excessive grease may have a negative impact on motion.
4. Install the rear cover back to its original position and fix it, plug in the main power cord, then turn on the printer, and move the Z-axis up and down 10 times to evenly smear the grease.

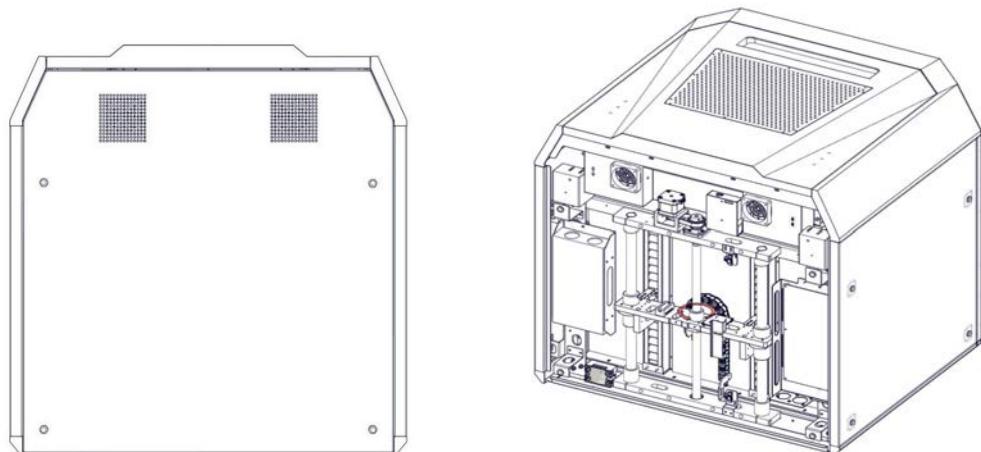


Fig. 6.6 Lubrication and Maintenance of Z Axis Linear Guide Rails

Note: Before re-applying grease on each component, wipe the surface of the kinematic pair clean with a dust-free cloth dipped in alcohol, then evenly apply grease on the surface.

### 6.3.5 Maintenance of Chamber Filter

Air filters are installed at the air inlets on both sides of the printing chamber. You can access the filters by unscrewing the screws of the filter cover plate and removing the cover plate. It is recommended to check or replace them every 6 months.

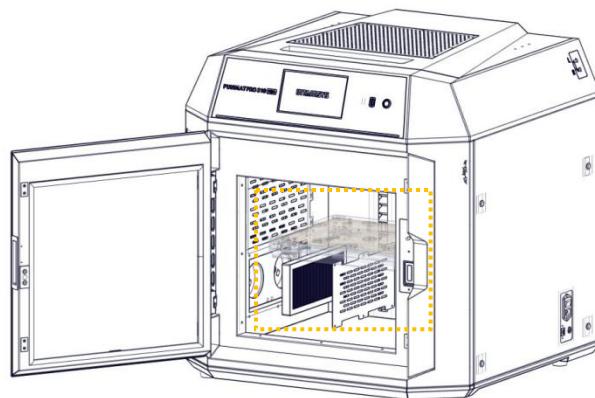


Fig. 6.7 Cleaning of Chamber Filter

### 6.3.6 Maintenance and Replacement of Feeding Pipe

The feeding pipe of the printer consists of two parts, one inside the printer and the other outside the printer. The external feeding pipe is connected to the printer from an independent filament box, and the internal feeding pipe is connected to the extruder by a material shortage detection mechanism.

As the internal feeding pipe works in a high-temperature environment, it is recommended

to replace it every 12 months to avoid possible aging that may reduce its flexibility.

1. Unload the filaments and ensure that all are returned to the material compartment.
2. Turn off the printer and open the top cover, and start maintenance after the temperature of all components drops to room temperature.
3. Move the extruder assembly to the center, press down the black collar with one hand and take out the feeding pipe with the other.
4. Take out the other end of the feeding pipe from the quick connector according to Step 3.

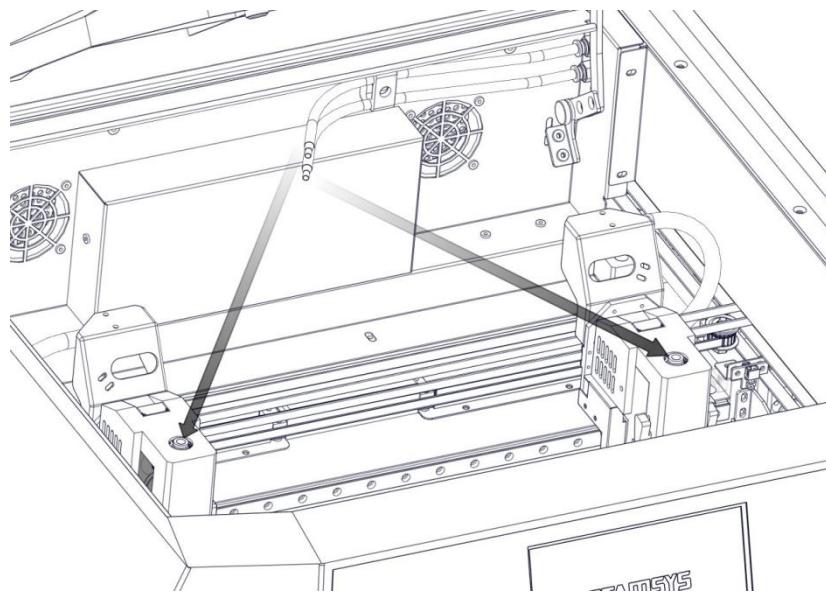


Fig. 6.8 Removal of Internal Feeding Pipe

5. Remove the external feeding pipe according to the same steps.
6. Prepare new pipes of the same length, install them in place.

**Note:** Both ends of the feeding pipe must be fully in place to ensure smooth threading.

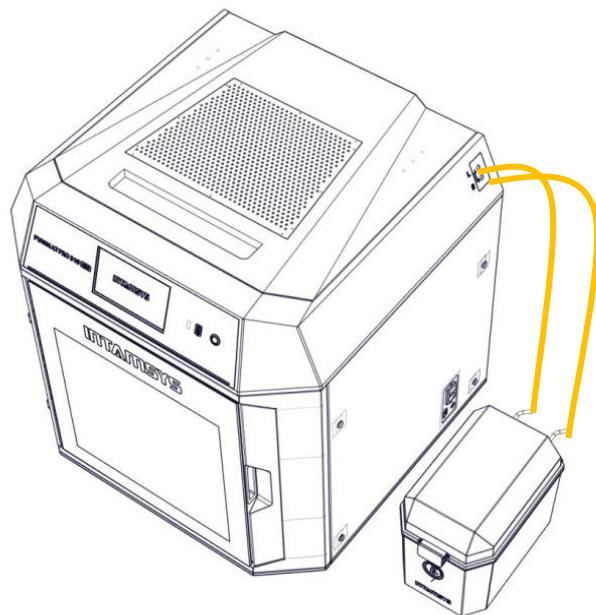


Fig. 6.9 Installation of New Feeding Pipe

## 6.4 Others

It is recommended to have a qualified professional conduct a thorough inspection of your printer before the one-year warranty period expires. The inspection should include checking whether the fans, heater, power supply, fuse, and other components are in normal condition. If any issues are found, contact our local agent, refer to the INTAMSYS Help Center: <https://help.intamsys.com/>

or scan the QR code:



Some protective components might need to be removed during inspection to make the components to be inspected observable. Be careful because these operations pose a certain safety risk.

In addition, you can download the latest version of firmware and screen software from the following website:

<https://www.intamsys.cn/>

## 7 Trouble shooting

This chapter lists some faults that might occur during printing and required troubleshooting measures after each fault occurs.

If you have any question during operation based on this user manual, contact the Customer Support in the region where you are located.

Table 8.1 Fault Code List

S/N	Code	Fault	Category	Measures
1	171	Serial port communication error	error	If possible, please continue printing. If there is no response for a long time, please shut down and restart the printer
2	217	Material shortage of left extruder	warning	Please replace the material or insert the material into the out-of-filament detection sensor
3	218	Material shortage of right extruder	warning	Please replace the material or insert the material into the out-of-filament detection sensor
4	221	Opening of chamber front door	warning	Close the front door.
5	222	Opening of chamber top door	warning	Close the top door.
6	235	Extruder leveling sensor abnormal	warning	Extruder calibration and automatic leveling cannot be carried out. Please check whether the extruder leveling sensor is disconnected or whether the connector is loose
7	301	Overhigh temperature of L-Nozzle	error	Check the L-Nozzle sensor or heater.
8	302	Overhigh temperature of R-Nozzle	error	Check the R-Nozzle sensor or heater.
9	303	Overhigh temperature of hotbed	error	Check for exception in the cable or connector of hotbed sensor
10	304	Overhigh temperature of chamber	error	Check for exception in the cable or connector of chamber sensor
11	306	Damaged circuit of L-Nozzle temperature sensor	error	Check the circuit of L-Nozzle temperature sensor.
12	307	Damaged circuit of R-Nozzle temperature sensor	error	Check the circuit of R-Nozzle temperature sensor.
13	308	Damaged circuit of hotbed temperature sensor	error	Check the circuit of the hotbed temperature sensor.
14	312	Too slow temperature rise of L-Nozzle	warning	Check whether the heater is damaged or the wiring has exceptions

15	313	Too slow temperature rise of R-Nozzle	warning	Check whether the heater is damaged or the wiring has exceptions
16	314	Hotbed heating timeout	error	For heating timeout, check for exceptions in the heating circuit
17	315	Chamber heating timeout	error	For heating timeout, check for exceptions in the heating circuit
18	332	X-limit sensor triggered	error	Please confirm whether the printing is staggered or the model exceeds the printing size of the printer
19	333	Y-limit sensor triggered	error	Please confirm whether the printing is staggered or the model exceeds the printing size of the printer
20	334	Z-limit sensor triggered	error	Please confirm whether the leveling is normal or whether the model exceeds the printing size of the printer
21	391	The instruction cannot be completed without resetting	error	Resetting operation is required in axis control
22	366	Motor driver alarm	error	Check the XYZ motor driver.
23	368	Motor drive alarm	error	Check the E motor drive for any problems.
24	369	SPI error of motor drive	error	Check the E motor drive for any problems.
25	397	Extruder temperature update error	error	Check whether the extruder temperature is updated.
26	398	Incorrect G-code motion data	error	Check whether G-code motion exceeds the maximum single motion criterion.
27	406	Power-off protection triggered by the system for the power supply voltage is lower than 90% of the supply voltage	error	Continue printing after power failure. The firmware detects power failure during printing, and 406 alarm will be given after the device is powered on again.



[www.intamsys.cn](http://www.intamsys.cn)

[info@intamsys.com](mailto:info@intamsys.com)



Follow us for more information

Shanghai Headquarters

Shanghai INTAMSYS  
Technology Co., Ltd.

Address: E11, No. 3188 Xiupu  
Road, Pudong New Area,  
Shanghai

Germany Branch

INTAMSYS TECHNOLOGY  
GmbH

Address: Zeppelinstr. 35,  
73760 Ostfildern  
Deutschland

U.S. Branch

INTAMSYS Technology, Inc.

Address: 11479 Valley View  
Road  
Eden Prairie, MN 55344

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