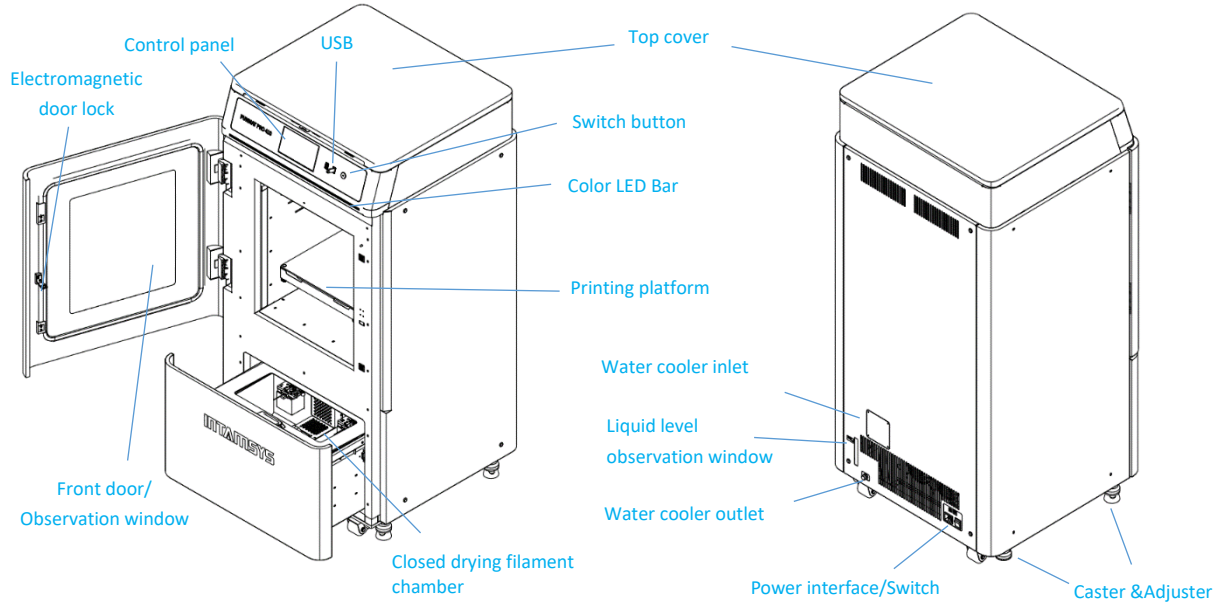













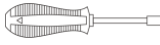








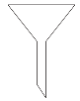
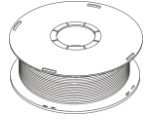








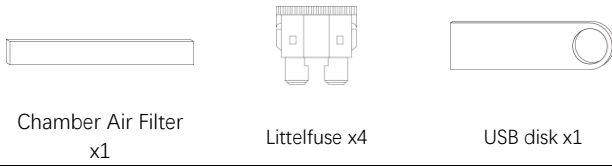
FUNMAT PRO 410 Quick Start Guide

Printer Components

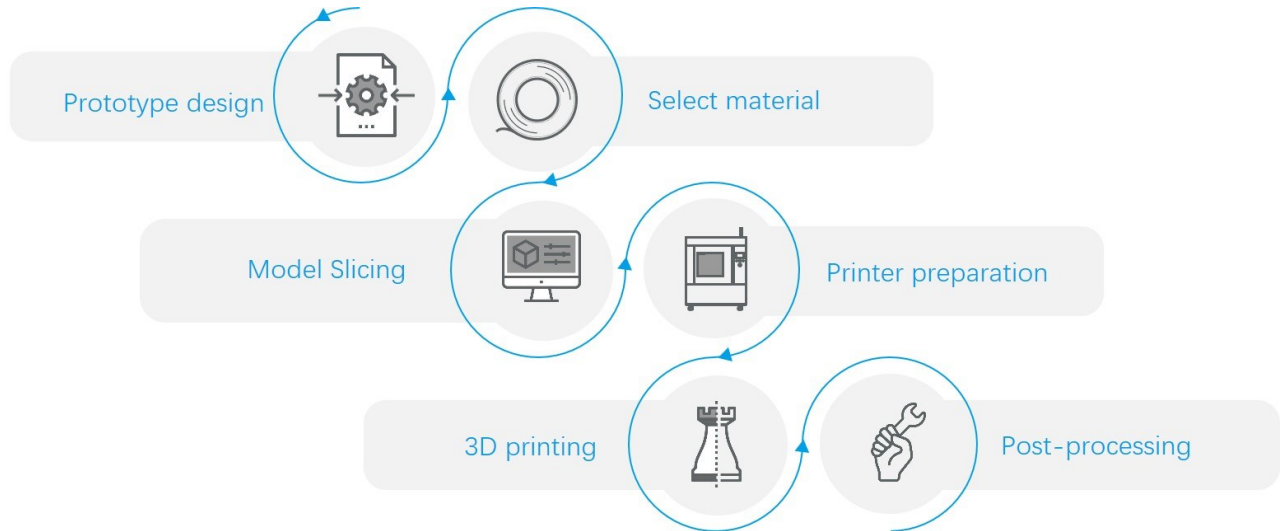


Packing List

					
Power Cord x1	USB Cable (Print) x1	USB Cable ((Firmware upgrade) x1	Ethernet Cable x1	SD Card x1	SD Card Adapter x1
					
Cutting Plier x1	Cooper Brush x1	Tweezer x1	Removal Tool x1	Allen Key Set x1	T-wrench x1
					
Spanner x1	Socket Wrench x1	Wrench x1	Leveling Card x1	Clamping Calibration Stick x1	High Temperature Resistance Glove x1
					
Cleaning Needle for Nozzle x1	Unclog Stick Handle x1	Unclog Stick x5	Cable Tie x15	Funnel x1	Filament x2
					
Glass Plate x1	Glass Plate Assembly x1	H Nozzle Assembly- 0.4mm x2	L Nozzle Assembly- 0.4mm x2	Nozzle Cleaning Set Brush x1	Liquid Pipe Connector x10



3D Printing Flowchart



1 Prototype design

3D printing starts with prototyping design, additive manufacturing is different from other traditional methods. We recommend the concept of DfAM(Design for Additive Manufacturing), in order to make better use of additive manufacturing(complex structure, lightweight, fast verification, etc.). The printable model file format should be .stl/.stp/ .obj/ .x3d/ .3mf/ .iges

2 Select material

Material selection is important for model and can affect the molding process and subsequent applications, and the table below is INTAMSYS recommended model material and support material matching.

Model material	PEEK	PEEK-CF	PEEK-GF	PEKK	PA12-CF	PA6-CF	PA6/66
Support material	SP5000				SP3050	PVA, SP3030	
Model material	PC	PC/ABS	ABS	ASA	ABS+	PLA	
Support material	HIPS				SP3030	PVA, SP3030	

The filament needs to be dried before using. The water absorption of the material will significantly reduce the printing success rate, resulting in abnormal phenomena such as stringing during the printing process. Preparation before printing: put the filament into the oven, dry it according to the preset temperature and time, then take it out for printing. The material will age at high temperature for a long time, which will affect the material performance.

PEEK	PEEK-CF	PEEK-GF	PEKK	PA12-CF	PA6-CF
150°C/5h	150°C/5h	150°C/5h	130°C/6h	100°C/12h	100°C/12h
PA6/66	PC	PC/ABS	ABS	ASA	PLA
100°C/12h	100°C/12h	100°C/12h	100°C/8h	100°C/8h	50°C/10h
SP5000	SP3050	PVA	SP3030	HIPS	
100°C/12h	100°C/12h	80°C/12h	60°C/8h	80°C/8h	

Note: For detailed printing process information of the filament, please referring to "FUNMAT PRO 410HT Printing Process Guide".

3 Model Slicing

<p>1. Model files of .stl, .obj, .3mf</p>	<p>2. Import INTAMSUITE to set printing parameters.</p>	<p>3. Complete model slicing and generate G-code file</p>

The INTAMSUITE slicing software needs to be installed on the computer(Win OS) in advance. The software can set the printing parameters of the model and plan the slicing path, then generating a G-code file that can be run and processed by the 3D printer. For software usage and parameter setting, please referring to "INTAMSUITE User Manual".

INTAMSUITE Slicing software downloading: <https://www.intamsys.cn/software.html>

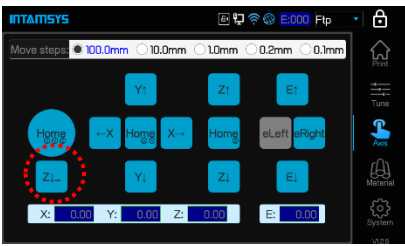
Note: After the G-code file is generated, it will prompt to estimate the material weight required for printing the model. The weight of the placed printing filament should be greater than the estimated weight. The placed printing filament should be heavier than the estimated.

4 Printer preparation

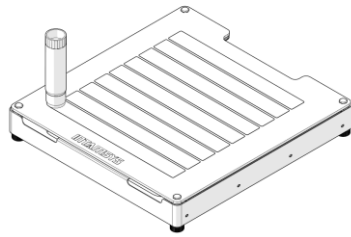
Equipment on/off and working mode selection

<p>1. Move to the back of the printer, check whether the power supply of the socket meets the 220VAC requirement, plug one end of the power cord into the printer, and the other end into the power outlet, turn on the power switch, and supply power to the device.</p>	<p>2. Move to the front of the printer, the Switch button to start printer, the indicator lights up, after about 30s, the screen enters the welcome interface, and the boot is completed.</p>	<p>3. If the printer needs to be shut down, press the switch button, the screen prompts "Do you want to confirm the shutdown?", click the confirmation button on the screen to enter the shutdown process</p>

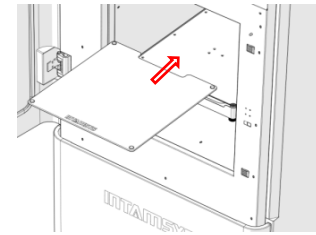
Buildplate Loading



1. Click the "Home XYZ" button on the "Axis" interface. After selecting the "100mm" option in the "Move steps" above, click "Z ↓" (no more than 3 times) and adjust the printing platform to a position that is convenient for the printing platform to install.



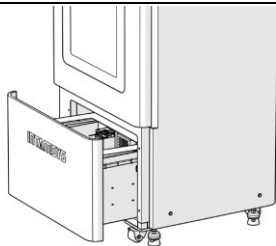
2. Use a solid glue stick to evenly apply 4 layers of primer to the printing area of the printing glass buildplate to increase the adhesion of the first layer during printing.



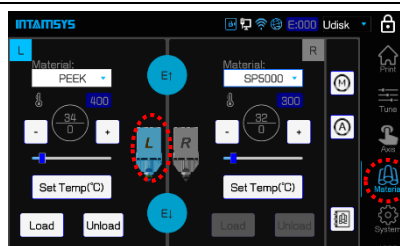
3. Install the buildplate according to the direction shown on the label on the printing platform (the notch position is inward), put the four magnetic suction blocks on the glass into the magnetic suction holes, press the four magnetic suction blocks with hands to confirm correct placement.

Note: Pay special attention to the placement direction of the printing plate, if reversed, it will cause the buildplate to collide with the cleaning brush.

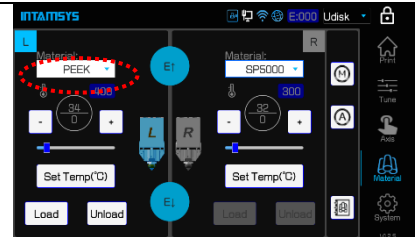
Printing filaments loading



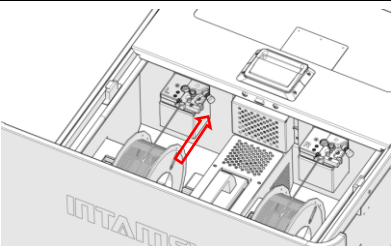
1. The material silo is located in the lower half of the printer. Push the silo door forward, and the silo will pop up automatically. Push the transparent top door of the silo forward to open the material silo.



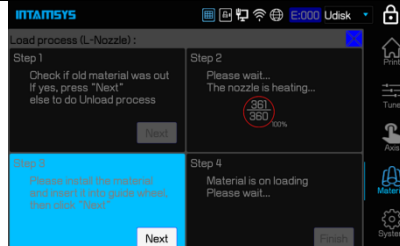
2. Click the **Material** icon and then the **L** icon to select the left nozzle. The icon will be highlighted when selected. (Same with the right nozzle)



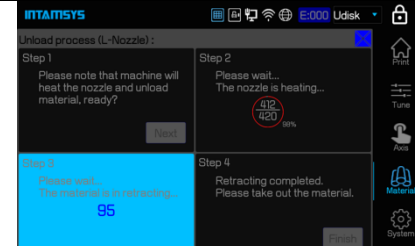
3. Click the **Drop-down** menu to select the filament. Make sure that the filament you select is the same as the filament you want to load. Click **Set Temp** to heat the nozzle to the set temperature.



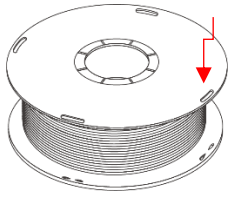
4. Cut the end of the filament into a pointed shape, insert the material pan into the material shaft as shown, and the tip should extend beyond the gear bite, and avoid filaments loose and knot when feeding.



5. Click the **Load** button. There are 4 steps in total to load the filament. When the loading process is finished, click the **Finish** button. (If the filament is not extruded from the nozzle, click the **E ↓** button until the filament is extruded)



6. To unload the filaments, click the **Unload** button to unload the material and then follow the instructions on the screen.

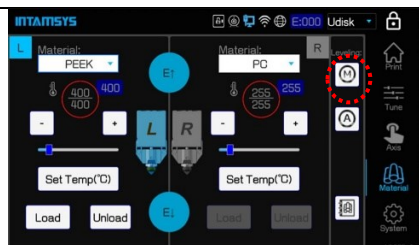


7. Take out the material pan, and rewind the exiting filament onto the spool. To prevent filament from tangling, insert the end of the filament into the small hole on the side of the material pan.

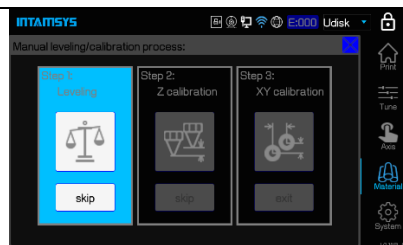
Manual/Auto Leveling

Notes:

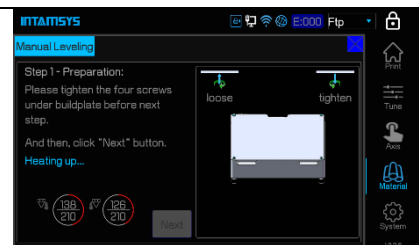
- Before leveling, put the four magnetic suction blocks on the glass into the magnetic suction holes, and press the four magnetic suction blocks with your hands to confirm correct placement.
- The residual material at the nozzle tip, the printing platform and the chamber should be cleaned up.
- Avoid high temperature burns during leveling.
- In the following situations, please give up automatic leveling and choose manual leveling to obtain higher leveling accuracy:
 - The leveling sensor cannot be triggered.
 - The left nozzle used for automatic leveling cannot rebound or rebound is not smooth.
 - Automatic leveling failure.
 - Printing failed due to auto-leveling errors.



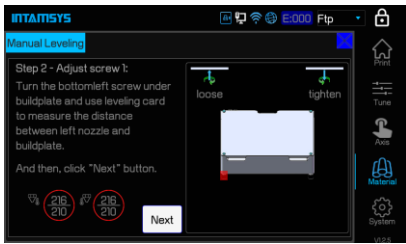
M1. In the Material interface, click the **M** icon to enter the manual leveling/calibration process.



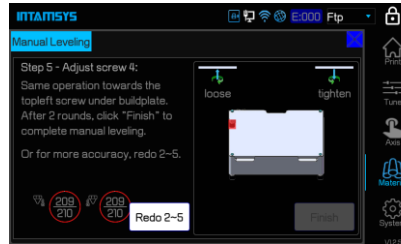
M2. Click the **Leveling** icon, and a prompt box will pop up to prompt you to clean the printing platform. After cleaning, click the **Leveling** button to enter the manual leveling.



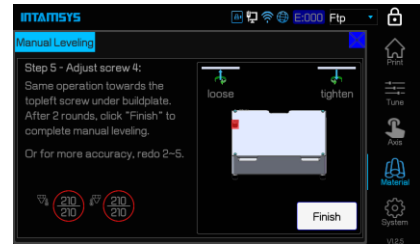
M3. First heat the nozzle, when heating finished, you can use tweezers or brushes to remove the residual material on the nozzle. Then tighten the 4 knobs under the printing platform to prevent the nozzle from hitting the glass plate during leveling. Finally, click the Next button.



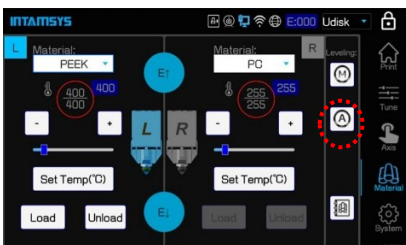
M4. According to the prompts on the screen, rotate the knobs under the printing platform by hand, and use a leveling card (thickness 0.2mm) to measure the distance between the nozzle and the glass plate of the platform. Then click the **Next** button.



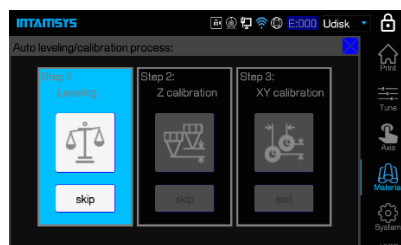
M5. After adjusting the 4 points on the platform, the screen will display the **Redo2-5** (repeat 2-5 steps) button, click this button to repeat the leveling again.



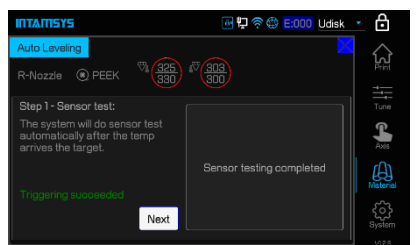
M6. After the second pass of manual leveling is completed, click Finish button, the platform will drop to the bottom, and then return to the end of manual leveling.



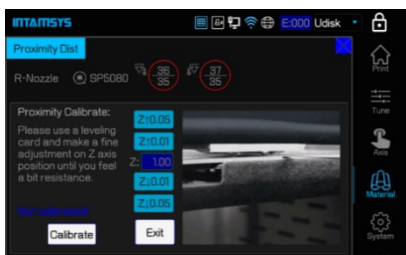
A1. In the Material interface, click the **(A)** icon to enter the auto leveling/calibration process.



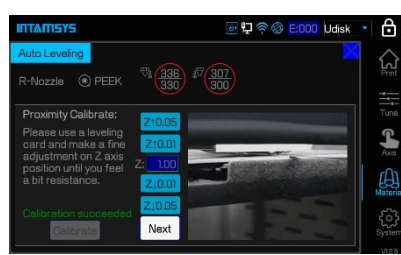
A2. Click the **Leveling** icon, and a prompt box will pop up to prompt you to clean the printing platform. After cleaning, click the **(Scales)** button to enter the auto leveling.



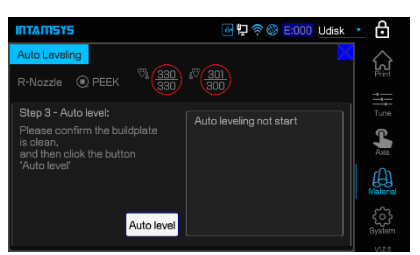
A3. The printer performs the sensor trigger test automatically, once the test passes, the screen will display triggering succeeded, click the **Next** button.



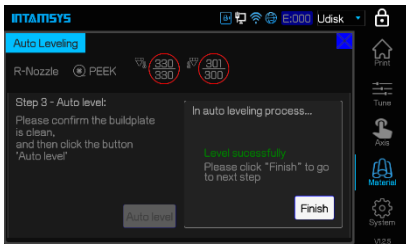
A4. Use a leveling card(0.2mm thickness) and click "**Z↑0.05**" or "**Z↓0.05**" to make preliminary adjustments, and click "**Z↑0.01**" or "**Z↓0.01**" to make fine adjustments, the distance between the nozzle and the buildplate just put in the card.



A5. Take out the card and click the **Calibrate** icon to complete the trigger distance calibration, click the **Next** button.

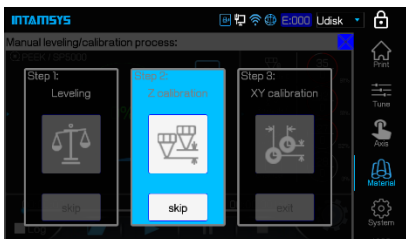



A6. The screen prompts to clean the printing platform. If it has been cleaned up, click the **Autolevel** button to prepare for the official implementation of automatic leveling;

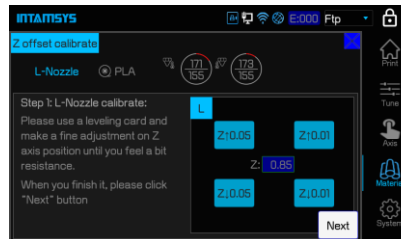


A7. The printing platform and chamber will be preheated first, the nozzles will be preheated after reaching a predetermined temperature, and finally automatic leveling will be performed. When auto-leveling, the nozzle will detect 3 points on the platform. After completion, the screen prompts that the automatic leveling is successful. It will also prompt to clean the chamber. If it has been cleaned, click the Finish button, the platform will descend to the bottom of the chamber and then return, and the automatic leveling is over.

Z-axis Deviation calibration



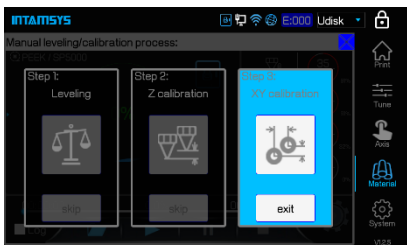
1. Click the  icon, a prompt box will pop up, prompting to clean the printing platform. If it has been cleaned up, click "OK" to officially enter the Z offset calibration operation;



2. First calibrate the left nozzle, use a leveling card(0.2mm thickness) and click "**Z↑0.05**" or "**Z↓0.05**" to make preliminary adjustments, and click "**Z↑0.01**" or "**Z↓0.01**" to make fine adjustments, the distance between the nozzle and the buildplate just put in the card. Then click **Next** button.

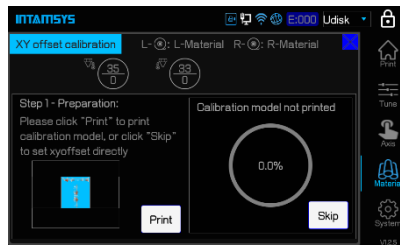
3. The calibration of the right nozzle is the same as the calibration of the left nozzle. After the calibration is completed, press the **OK** button.

XY deviation calibration

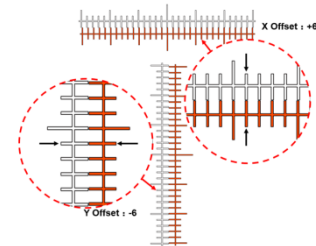


1. Calibrate the deviation of the left and right nozzles in the X and Y directions, the deviation value is obtained by actually printing the calibration model. Click **XY Calibration** to enter the sub-page, follow the prompts.

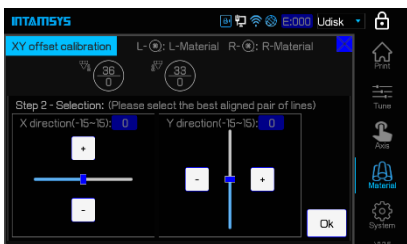
Note: Confirm whether the materials of the left and right nozzles have been loaded. Clean up the buildplate.



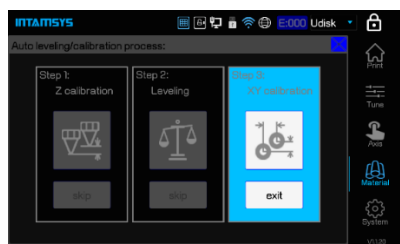
2. After selecting a suitable location, click the **Print** button to print. Use the left and right nozzles to print the model ruler. when printing is completed, click the **Next** button and the nozzle will move away.



3. Take off the glass plate with the printed reading ruler, check to obtain the X and Y deviation value.



4. Click the +/- button to input the calibration value. Check the print model and set the appropriate compensation value, then click the **OK** button.

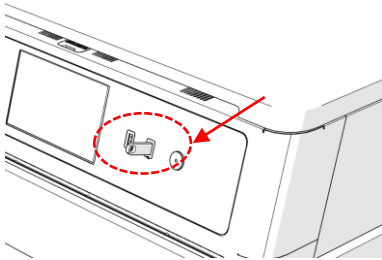


5. Finally, redo the print calibration, and click the **Finish** button to complete the calibration after the center line is fully aligned.

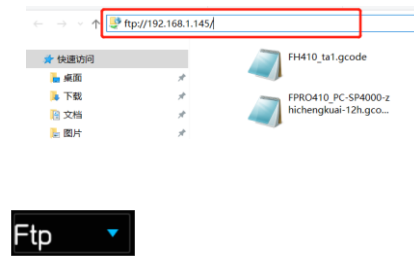
Note: If not aligned, set 15 in the corresponding direction, reprint and reset the offset value.

5 3D printing

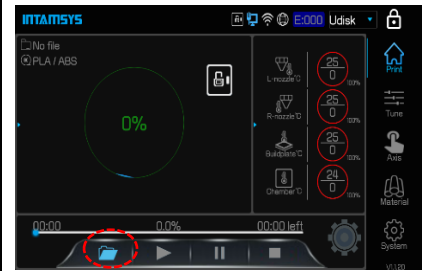
G-code file import and print




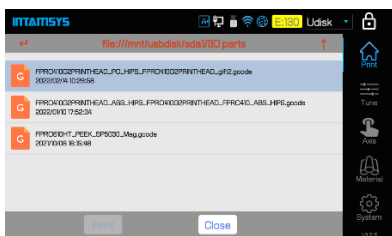
1-1. Insert a USB flash disk with printed files on the right side of the printer. Select the data source **Udisk** at the top right of the screen



1-2. **Ftp** (network): enter the IP address of the printer in the address bar of the window folder on the computer, and transmit the G-code file to the printer through the network.



2. Click the  button on the screen to enter the print file selection interface.

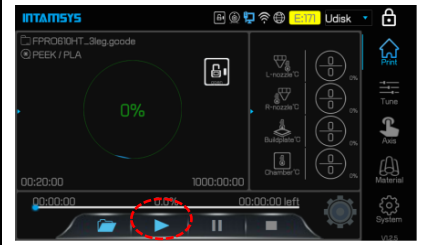



3. Select the file to be printed and click **Open** to confirm the opening;




4. On the main interface, click the extension button on the left to set the printing preheat and maintaining time.

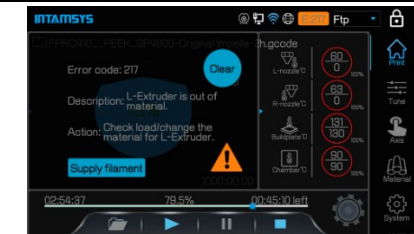
Note: Before printing, you can turn off the preheat or reduce the preheat time only if the chamber has been kept warm for a long time. Insufficient preheating time will lead to print failure.



5. Click  to start the print job. The right nozzle prints Raft and supporting materials, and the left nozzle prints the main material.



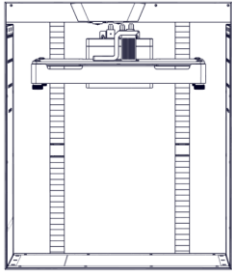

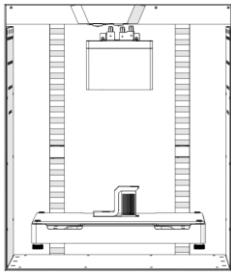
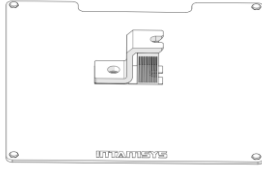
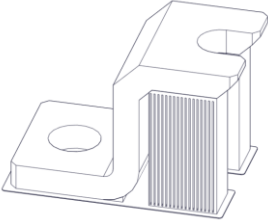
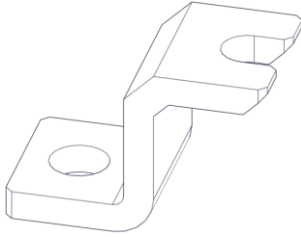
6. When the progress shows 100%, the printing is completed, after the temperature drops to a safe temperature, you can click  to open the door and take out the printed model.



7. A warning is given in the display if problem occurs during printing. Depending on the severity of the warning, the alarm status button will turn yellow, orange, or red. Clicking the Alarm Status button will open a dialog indicating the reason and action for the alarm.

Note: You can also try remote printing function, set the Wifi and remote monitoring of the printer in advance, select the corresponding printer through INTAMSUITE, transfer the G-code to the printer and start printing remotely.

Take out print parts

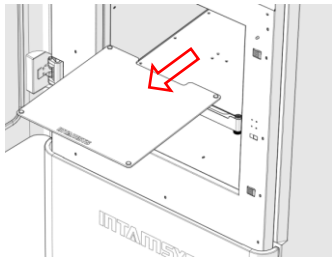
 <p>1. When printing finished, if you want to close the heat preservation, uncheck the Maintaining button, then the front door are unlocked; if you still want to keep the heat preservation, click  on the screen status bar to unlock the front door.</p>	 <p>2. Click the Axis, then click the "Z ↓ -" button to make the buildplate move to the bottom, so as to facilitate the removal of the printing sheet.</p>	 <p>3. Put on heat-resistant gloves and take out the buildsheet with printed part.</p>
 <p>4. Carefully peel the part from the buildsheet with removal tools after the printed part cools down.</p>	 <p>5. Remove the support material from the printed part.</p>	

6 Post-processing

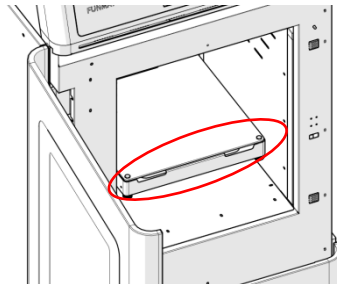
Parts manufactured by FDM technology may have obvious layers after printing, some model parts need to remove the support, which will cause the support contact surface to be rough. The printed parts can be post-processed as needed, on the premise of ensuring the size, structure, mechanical properties, etc., the appearance of the sample is improved. Common post-processing processes include support material removal and surface treatment.

Support material removal	Surface treatment
Water-soluble support material: can be removed by high-pressure water gun, ultrasonic cleaner, agitator cleaner, etc.	Grinding: manual grinding, sandblasting, shot blasting, pearlescent treatment, etc.
Peelable support material: Removal with hand tools (e.g., diagonal pliers, files, scissors, etc.)	Chemical preparation polishing: alcohol atomization polishing, acetone fumigation polishing, etc. Repair: Filling soil, gluing, scraping putty Machining: turning, milling, drilling, etc. Back-end process of parts: painting, biting, electroplating, etc.

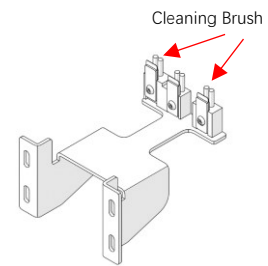
7 Common maintenance



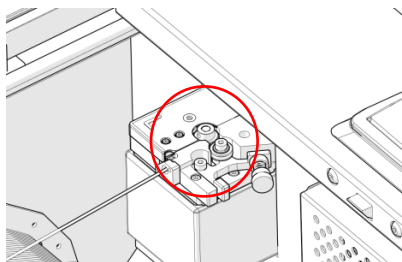
Clean the buildplate: Lower the printing platform to the bottom, lift the buildplate to release the magnetic attraction and pull it out (if the plate is in a high temperature state, you need to wear gloves), wash the glass surface with water, wipe or dry. Then put it back on the buildplate.



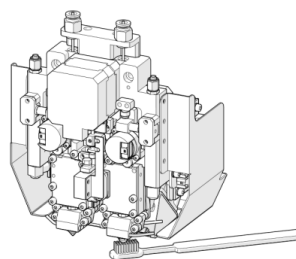
Cleaning the printing chamber: The materials left on the bottom plate or dropped during the printing process need to be cleaned up in time to avoid affecting the next printing. Use a vacuum cleaner and a removal tool to clean the waste and residue at the bottom of the chamber, side walls, etc.. Wipe with a cleaning cloth and alcohol if necessary.



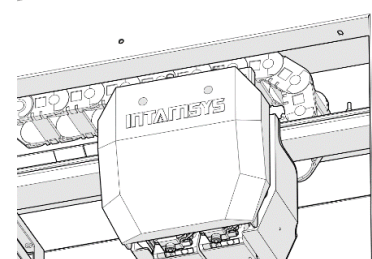
Cleaning nozzle brush: After one printing, the nozzle brush may stick to some materials. Please carefully clean up the materials and other sundries adhered to the nozzle brush. If more copper wire is found to be unable to remain upright, a new nozzle brush should be replaced.



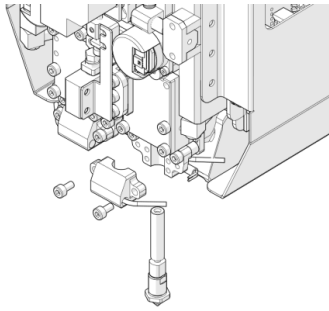
Cleaning the filaments chamber: The frequent contact between the feed gear of the auxiliary wire feeding mechanism and the filament produces debris. Use a sharp needle to clean the debris at the gap of the gear, then use a vacuum cleaner to clean up the debris of the filament, and wipe the residual dust with a cleaning cloth and alcohol.



Cleaning the printing nozzle: If the nozzle extrudes filament is too thin or the materials near the nozzle is clumped, and unable to extrude smoothly, use a brush or needle-nose pliers to peel off and clean the nozzle. If there is no obvious improvement, consider replacing the nozzle
 Note: To prevent high-temp. burns, need to wear heat-resistant gloves

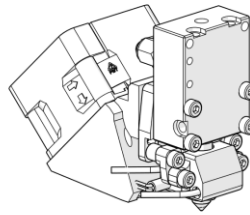


Nozzle disassembly #1: First disassemble the nozzle cover, preheat the nozzle to the melting temperature of the material (go to "Material" interface and click "Set Temp"), and press and hold the "E ↑" button for more than 3s to exit the nozzle.



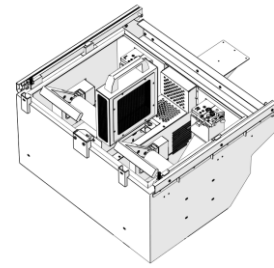
Nozzle disassembly #2: Use a 2.5mm Allen wrench to loosen the screws on the front and side of the fan cover, remove the fan cover, and then loosen the 2 fixing screws on the heating block to take out the nozzle.

Note: Pay attention to the high temperature of the nozzle and heating block, make sure to operate after cooling down to room temperature, or wear heat-resistant gloves to operate.



New Nozzle Installation: Follow the prompts to replace the nozzle and reinstall the fan cover and printhead cover.

Note: After replacing the nozzle, A recalibration and leveling operation is necessary.



Molecular sieve drying and dehumidification: When the humidity inside the filament chamber is too high, the equipment will alarm and prompt, and the molecular sieve box needs to be taken out and placed in an oven at 200 °C for more than 2 hours. After drying, the molecular sieve box can be cooled to room temperature and placed in the center of the box.



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