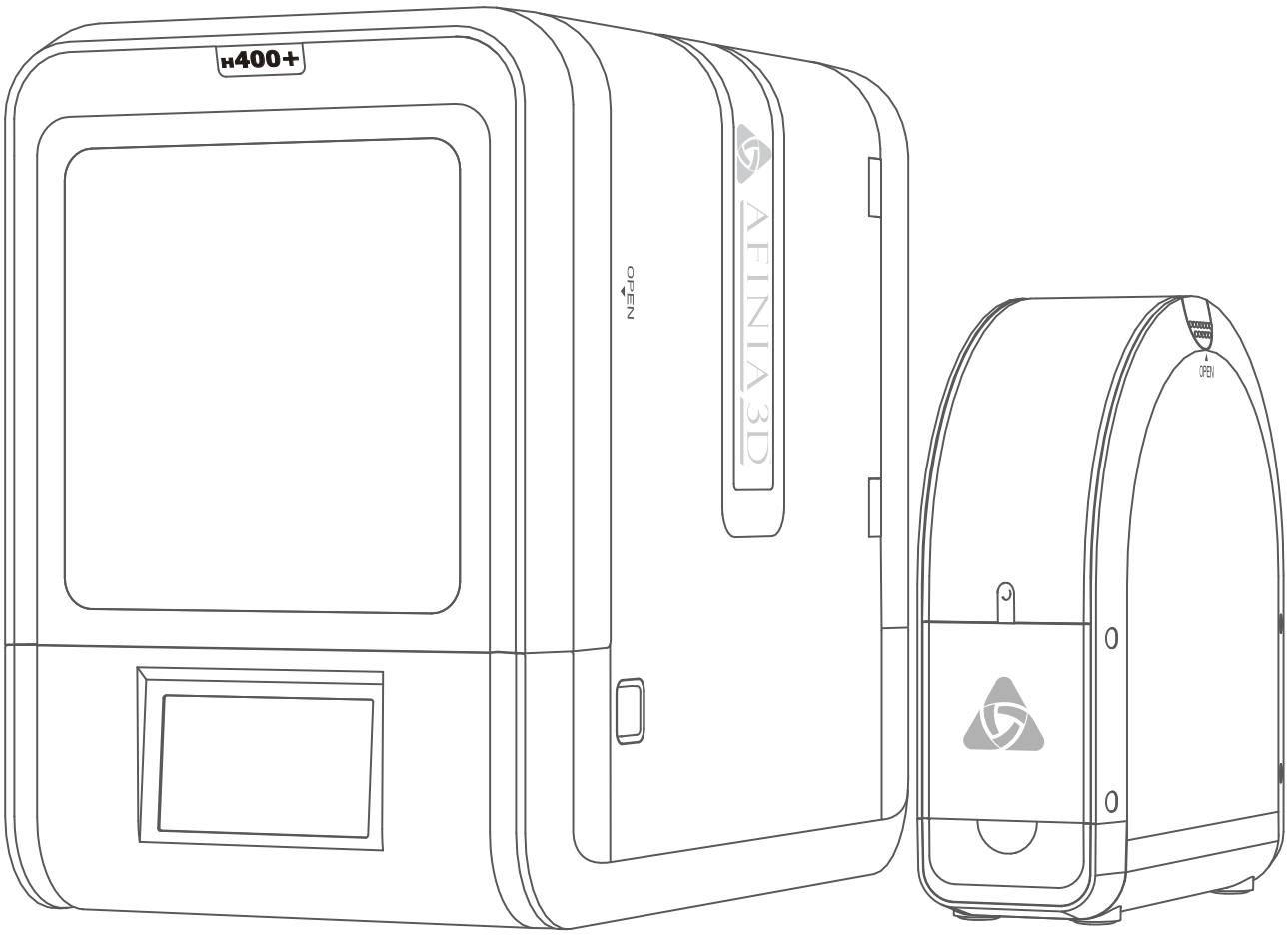
H400+
User Manual

V 0.1



Download full user manual at www.afinia.com/support

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Chapter 2 Prepare for Your First 3D Print

Chapter 3 Machine Settings

Chapter 4 Print Settings

Chapter 5 Calibration and Other Options

Chapter 6 Techniques and Troubleshooting

WARNING: This 3D Printer - when used with styrene filament (ABS / HIPS / PC-ABS) - can expose you and others in the same room to styrene, a chemical known to the State of California to cause cancer. www.P65Warnings.ca.gov

ALWAYS OPERATE THIS PRODUCT IN A WELL-VENTILATED AREA.

Safety Precautions

1\ The Afinia H400+ 3D printer requires the power adapter provided by the original manufacturer, otherwise the machine could be damaged or even cause are hazard. Please also keep the power adapter away from water and out of high temperature environments.

2\ During printing, the nozzle of the printer will reach 260°C and the print platform could reach over 70°C. Please do not touch these parts with your bare hands while they are hot not even with the heat resistant gloves included with the machine as the temperature could damage the gloves and injure your hands.

Warning label:
High Temperature,
do not touch!

3\ During printing, the printhead and other mechanical parts move at high speeds. Touching these parts while they are moving could cause injuries.

Warning Label:
Moving parts, do not touch!

4\ Please wear goggles when removing the support material from models and detaching models from the perf board.

5\ When printing with ABS and PLA, the plastics will create a light odor. Please run the printer in a well ventilated environment. We also suggest you put the printer in an environment with a stable temperature as unwanted cooling could cause adverse effects to the print quality. When the printer is extruding filament, make sure there is enough space between print nozzle and the platform. Otherwise the nozzle could become blocked.

Printing Environment

The Afinia H400's ideal working enironment is temperature between 15°C and 30°C, relative humidity between 20–50% and altitude below 2000 meters.

Printing at temperatures out of this range could cause adverse effects to the printing process. When using the “Extrude” function, keep at least 50mm between the nozzle and the platform. If too close, the nozzle may get blocked.

Afinia 1-Year Limited Warranty

Below is the one-year limited warranty included with this Afinia product. Afinia prides itself on its outstanding product line and its technical support. If for some reason, your product fails, Afinia, a division of Microboards Technology, LLC, stands behind its warranty and assures you the best service possible in a quick and timely manner.

Afinia warrants to the original purchaser that this product is free from defects in material and workmanship. Afinia will for one year, at its option, repair or replace at no charge for parts and labor from the date you purchased the product from an authorized Afinia reseller. Nozzles and Cell/Perf Boards are warranted for ninety (90) days.

- Warranty registration must be completed within 30 days of receipt of the product in order to validate the warranty.
- Afinia, a division of Microboards Technology, LLC, reserves the right to determine the validity of all warranty claims.
- Warranty is void if the product serial number has been altered or removed.
- Warranty is void if the product has been misused or damaged or if evidence is present that the product was altered, modified, or serviced by unauthorized service people.

The above stated warranty is exclusive and replaces all other warranties, express or implied, including those of merchantibility and fitness for a particular purpose. Afinia, a division of Microboards Technology, LLC, will not be liable for any other damages or loss, including breach of warranty or negligence.

This product has been thoroughly tested and inspected at the factory prior to shipment. Nevertheless, inspect your product completely for any damage or loss of parts that may have occurred during shipment. Notify the delivering carrier promptly if damage claims are to be filed.

Afinia reserves the right to modify or update its product without obligation to replace any equipment delivered prior to any such change.

Compliance FCC CE ROHS

FCC ID:

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

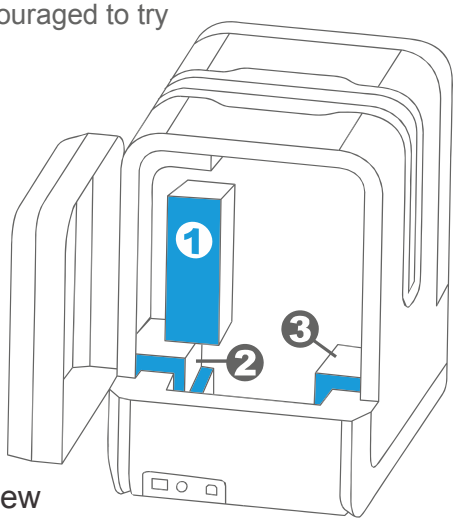
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

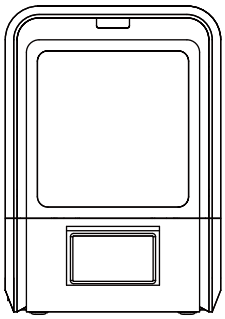
Unpacking

Remove the cushioning foams from the inside the printer before use.

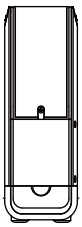


Rear View

Package Content



H400+

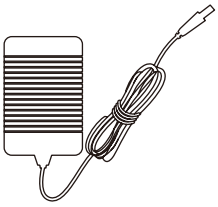


Spool and Toll Holder

Calibration Card

Nozzle

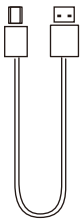
Protective Gloves



Power Adapter

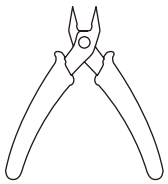
Power Cable

Scraper

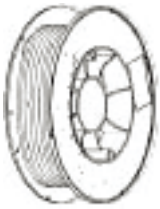


USB Cable

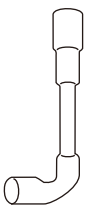
Hex Keys
2.0mm, 2.5mm



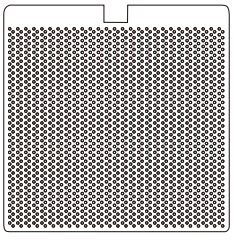
Pliers



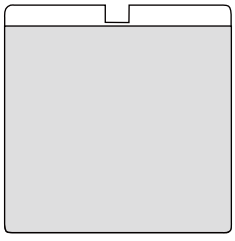
ABS Filament



Nozzle Wrench



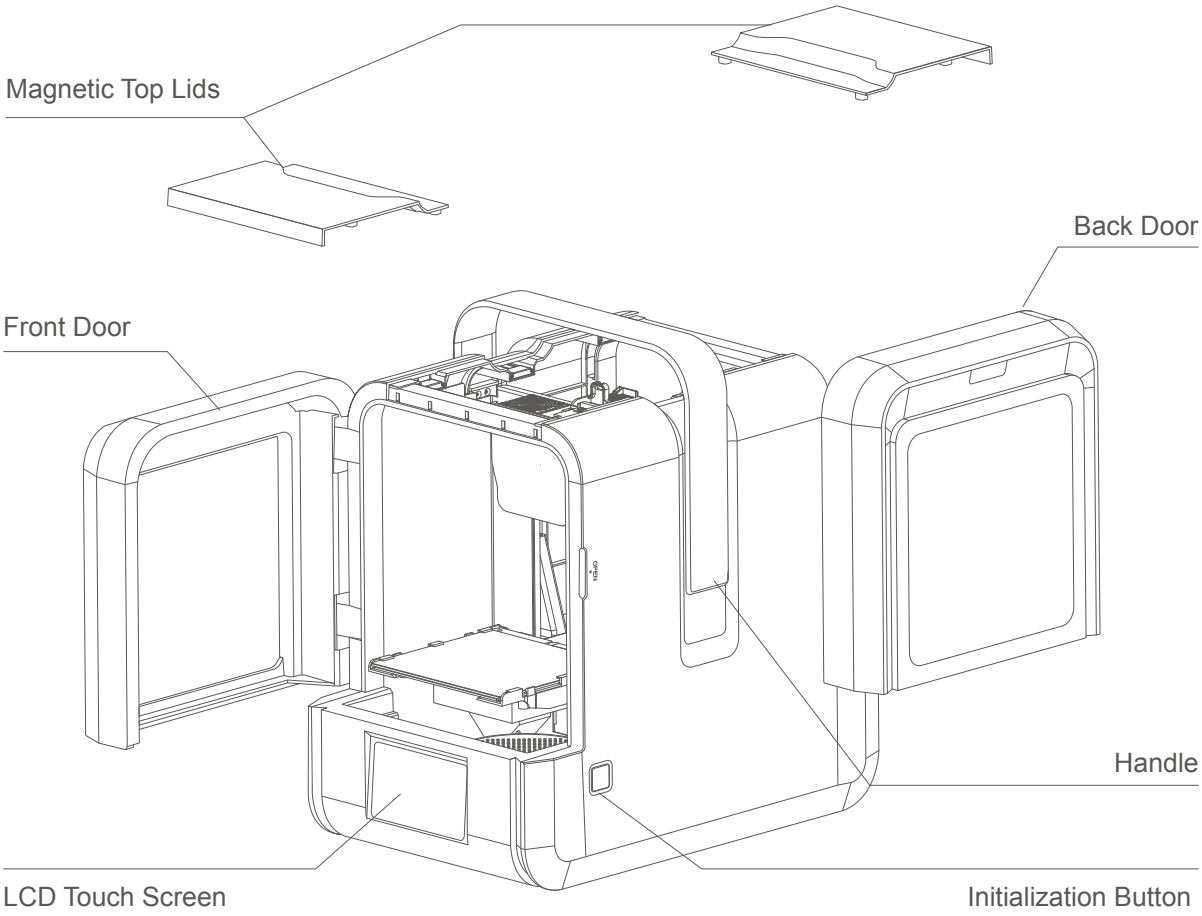
Perforated Print Board
(Perf Board)



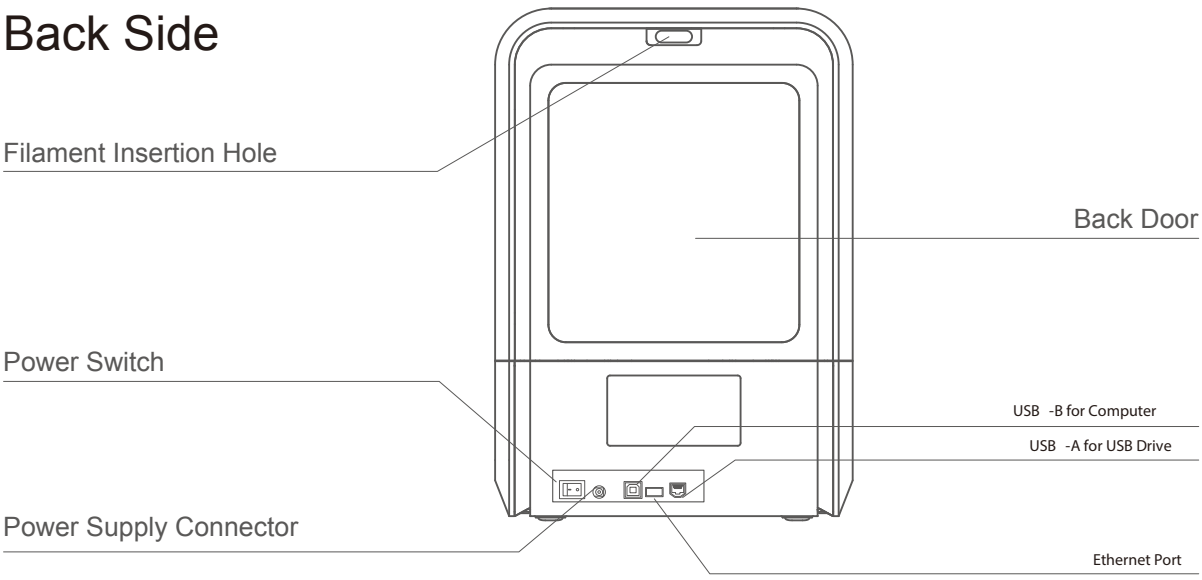
Flex Print
Board

If anything is missing, please contact Afinia 3D support at support@afinia.com

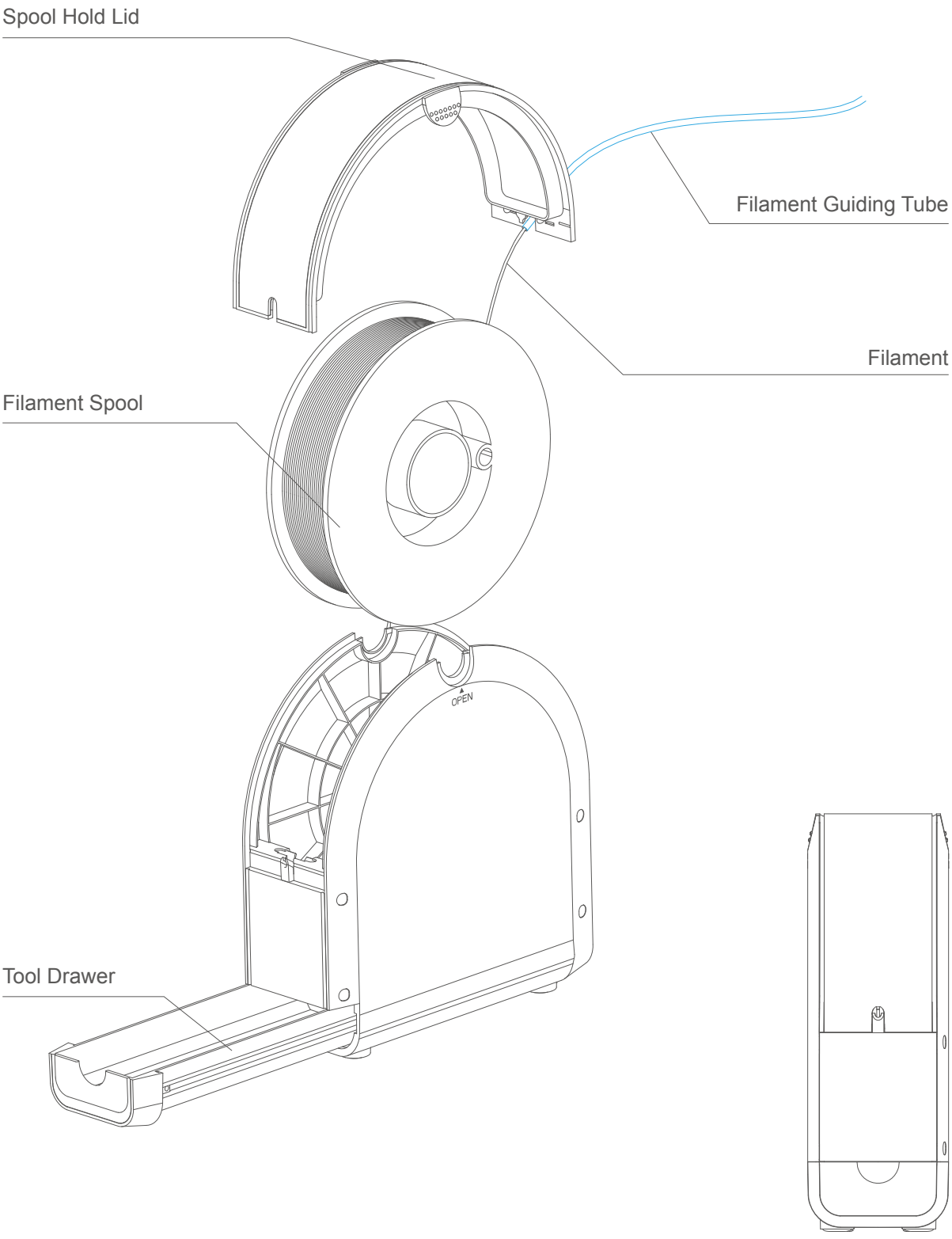
Front Side



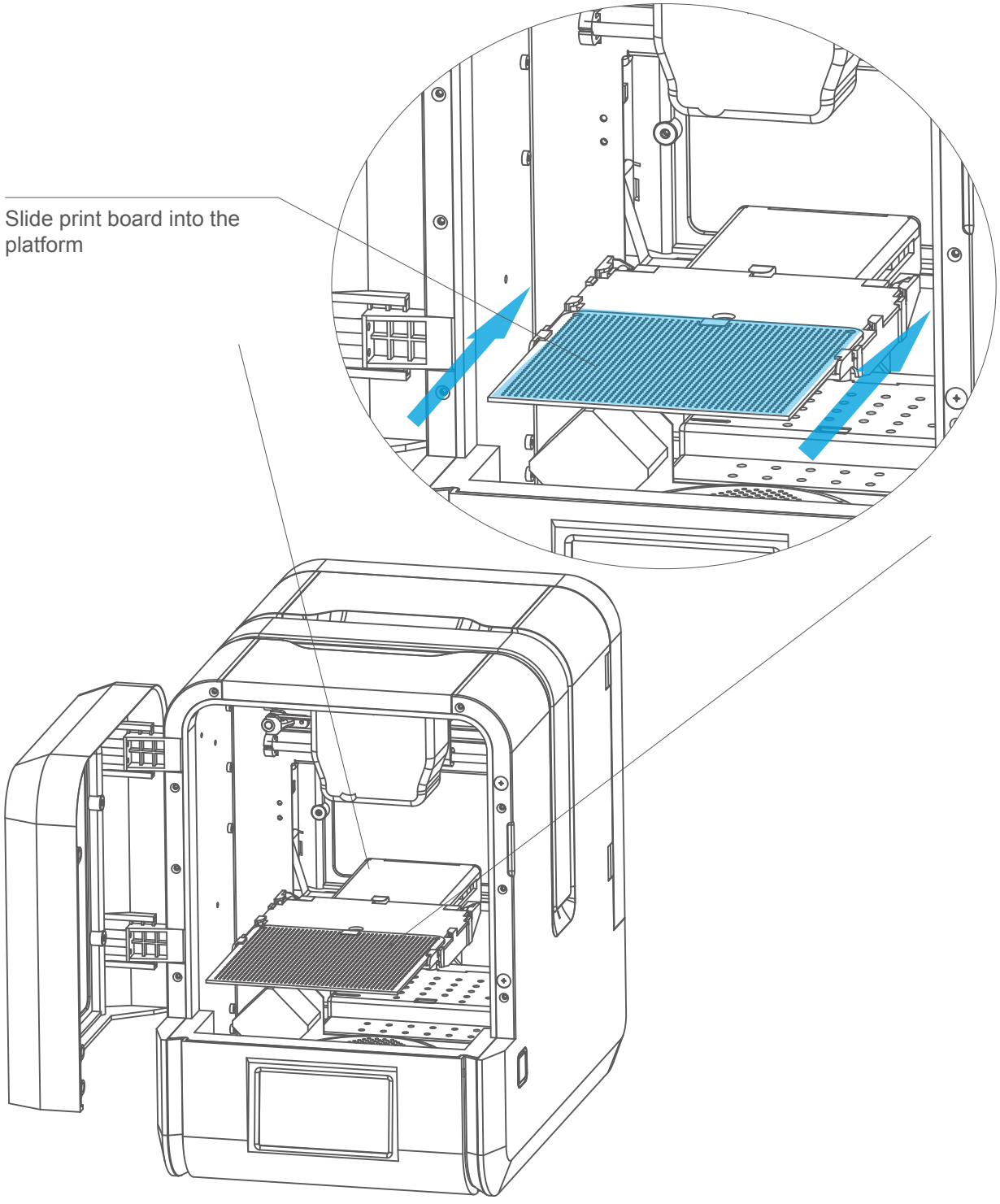
Back Side

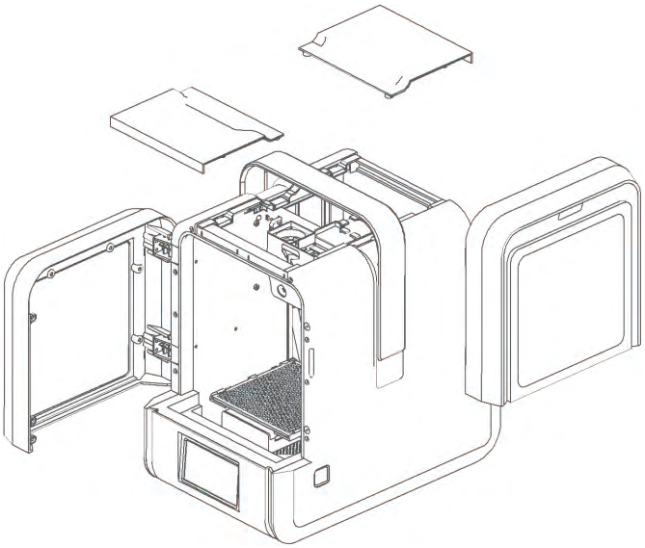


Filament Spool Holder 1-3

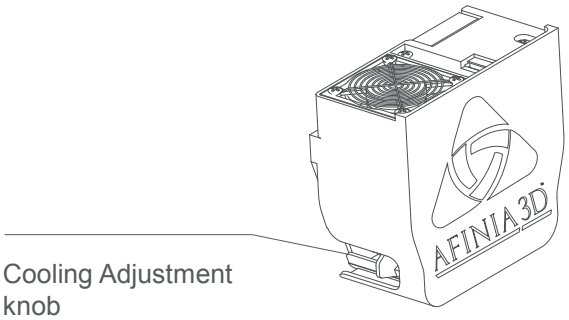


Installation of Print Board 2-1



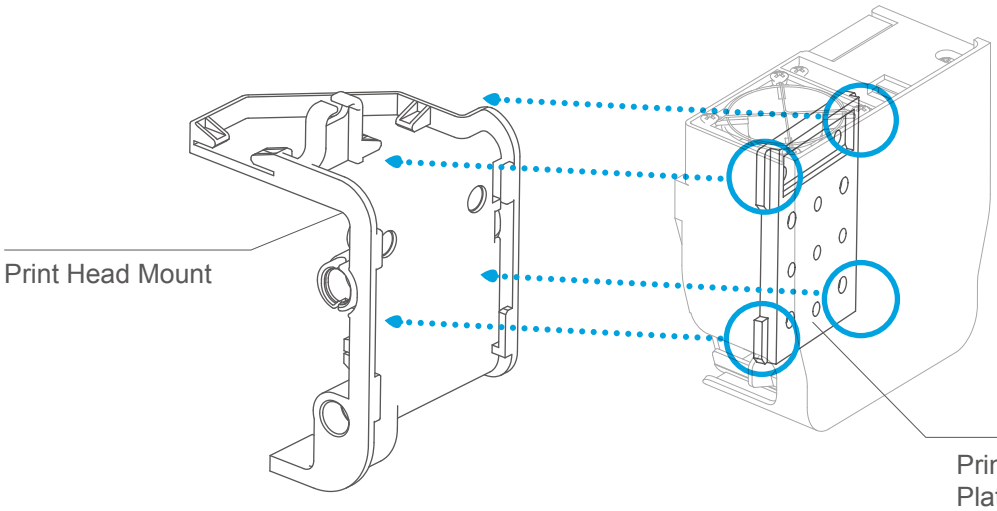


Open front door, back door and top covers



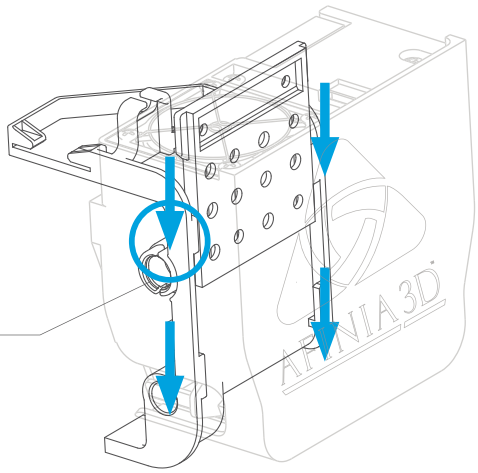
Cooling Adjustment knob

Nozzle

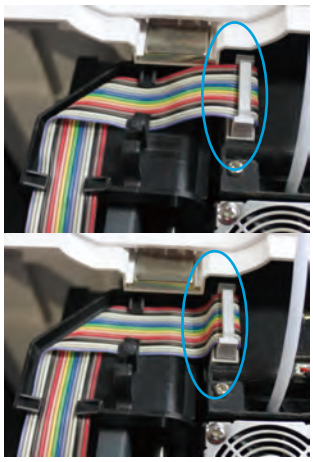


Print Head Mount

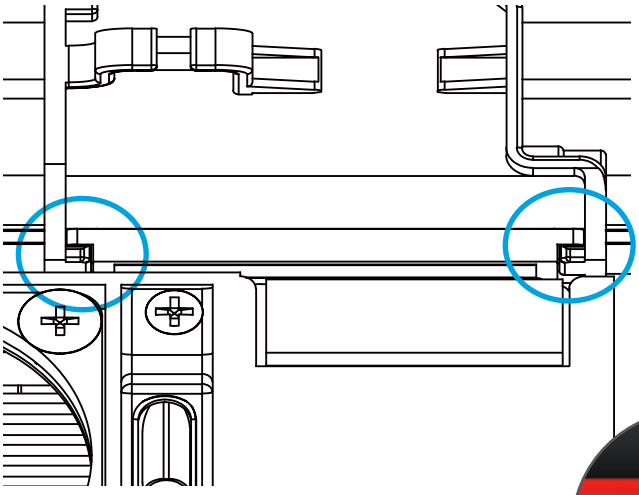
Print Head Mounting Plate

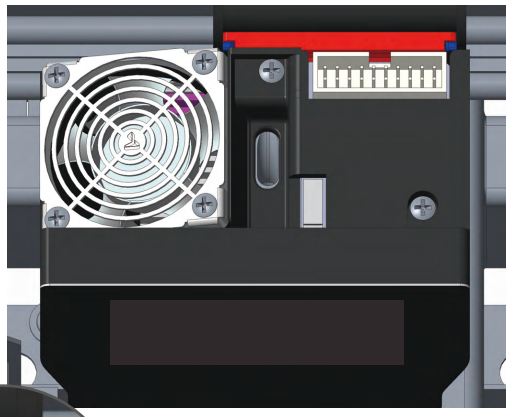


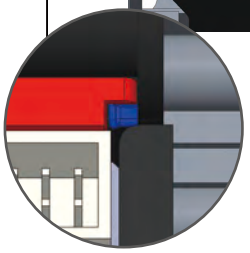
Slide the print head into the slots.



The Correct Installation of Printhead FFC cable for the H400+







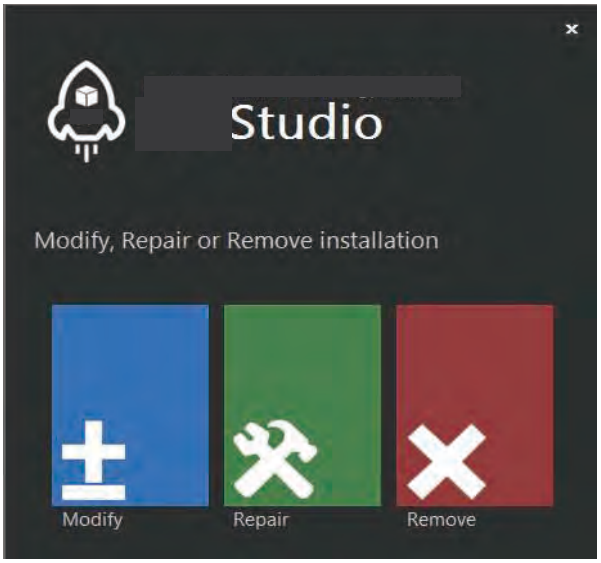
The print head must be pushed to the bottom of the mount.

Notice: When installed correctly, the red and the blue parts should be at the same level.

Download and Install Afinia Studio 2-4

Obtain Afinia Studio

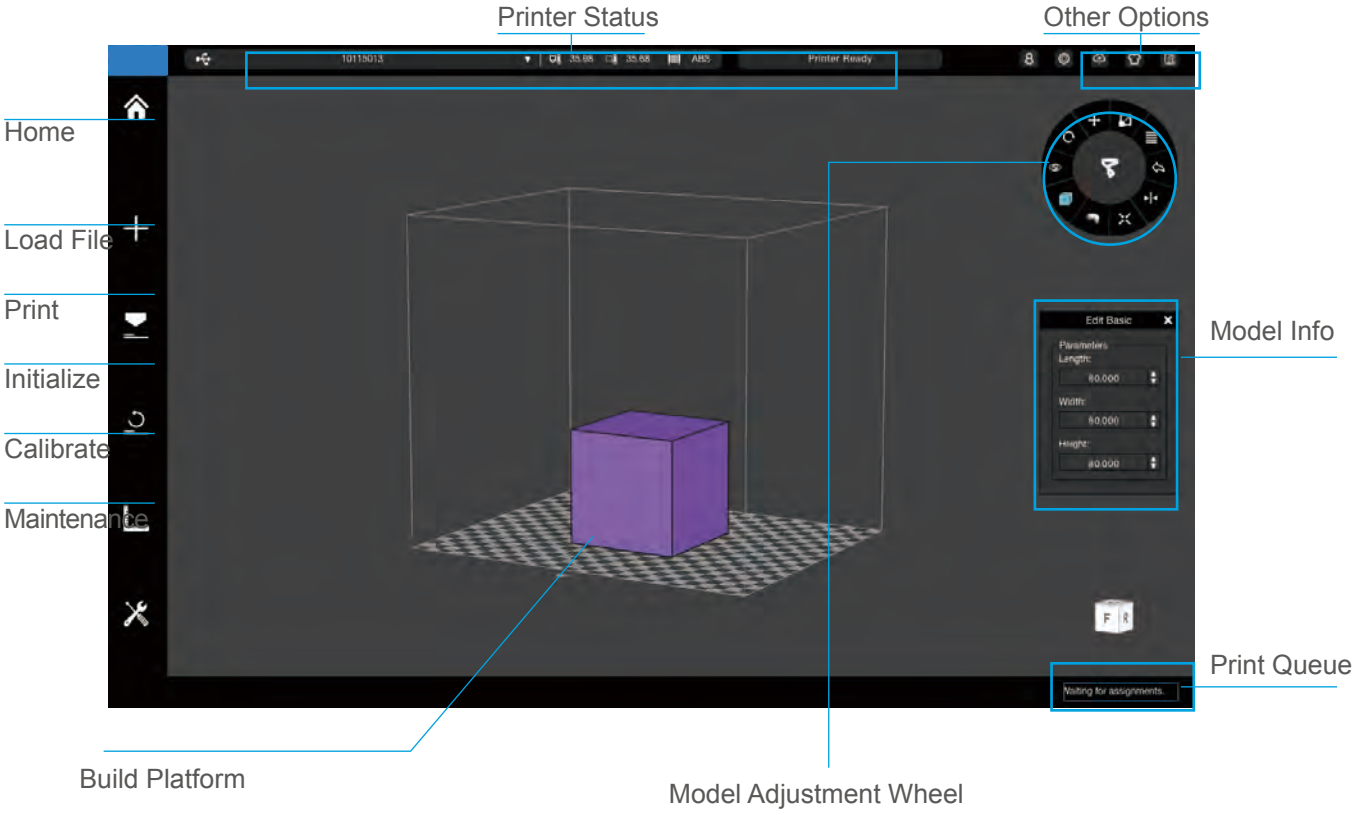
Download the Studio software by going to www.afinia.com/support/downloads, then install it on your computer.

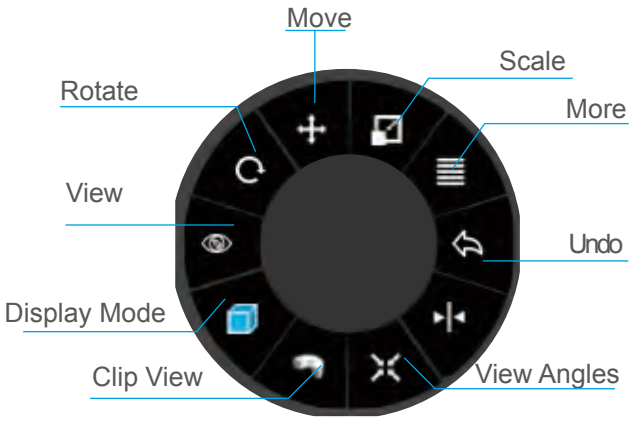


Minimum hardware requirements

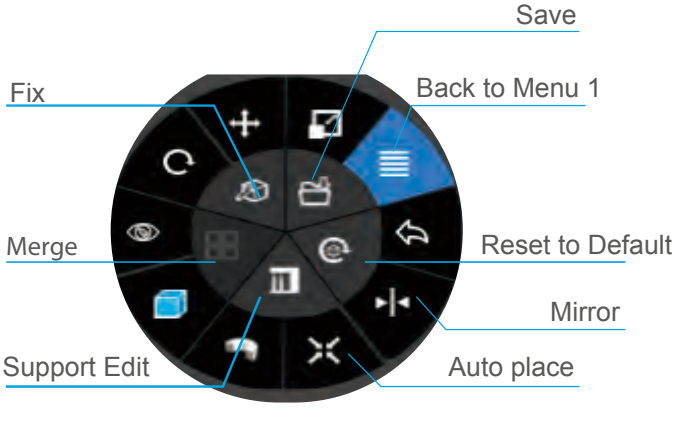
Intel Pentium 4 or better CPU 4GB RAM

Display card support OpenGL 2.0


Printer Status
Other Options
Home
Load File
Print
Initialize
Calibrate
Maintenance
Model Info
Print Queue
Build Platform
Model Adjustment Wheel

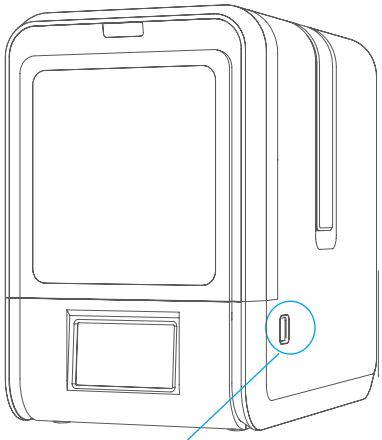

Move
Scale
Rotate
More
View
Undo
Display Mode
Clip View
View Angles

Menu 1


Save
Fix
Back to Menu 1
Merge
Reset to Default
Mirror
Support Edit
Auto place

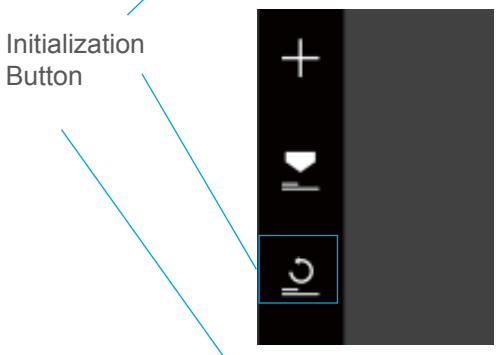
Menu 2

Initialization is required for every time the machine is switched on. During initialization, the print head and print platform move slowly and hit the endstops of the XYZ axes. This is essential as the printer needs to find the end point of each axis. Many software options will light up and become available for use only after initialization.



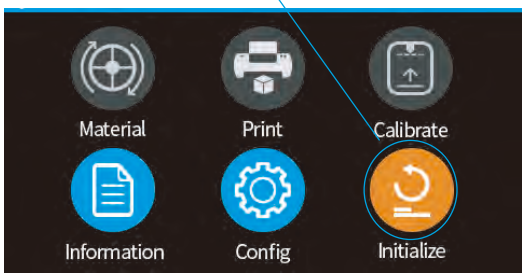
There are three ways to initialize your printer:

1. Hold the initialization button on the printer.
2. Clicking the "Initialize" option in the software menu (shown above).
3. When the printer is idle, press the initialize button on touch screen.

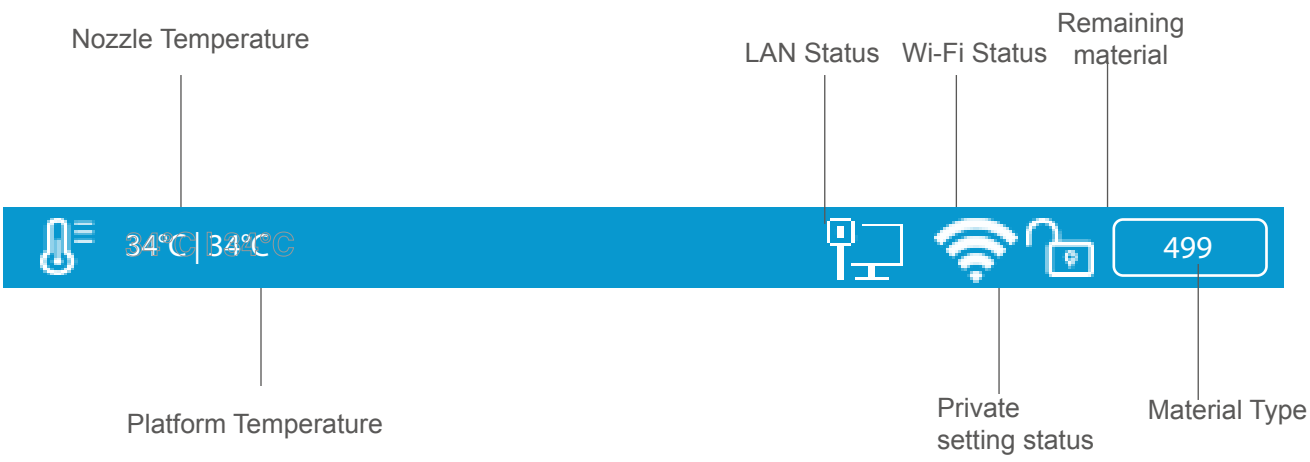


Other functions of Initialization Button on the side of the H400+:

1. Stop a print: Press and hold the button.
2. Reprint the last job: Double click the button.
3. Turn on/off internal lighting: Single click the button.



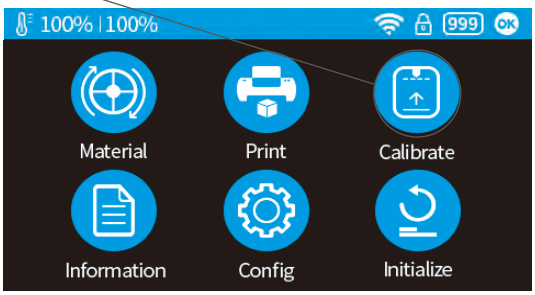
Change printing Material
Print a stored project
Machine settings including Wi-Fi
100% | 100%
999
OK
Material
Print
Calibrate
Information
Config
Initialize
Printer Info, reset to factory and choose language
Nozzle Height Detection
Initialize the printer


Nozzle Temperature
LAN Status
Wi-Fi Status
Remaining material
34℃ | 34℃
499
Platform Temperature
Private setting status
Material Type

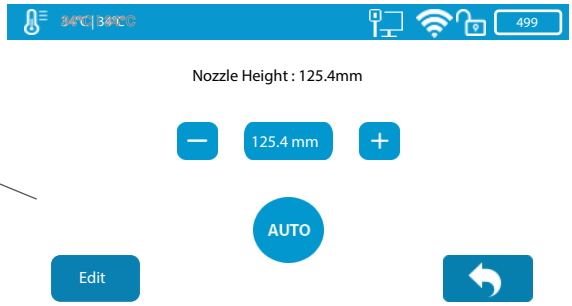
Prepare for Printing - Update Nozzle Height 2-8

The printer was calibrated before leaving the factory, but users are recommend to update the nozzle height value using the automatic nozzle height detection function on the touch screen

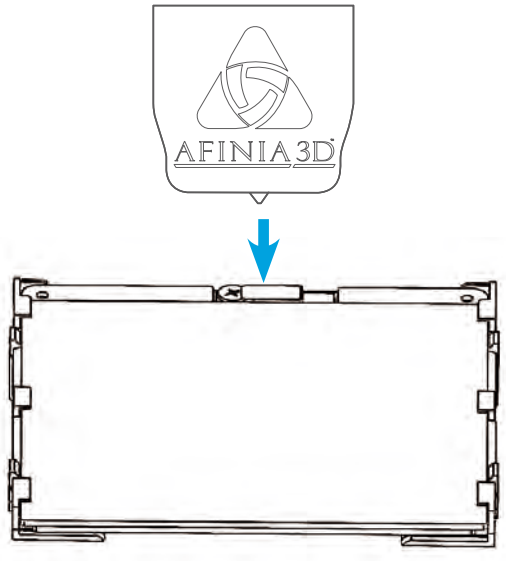
Press “Calibrate” button to enter Nozzle Height setup page.



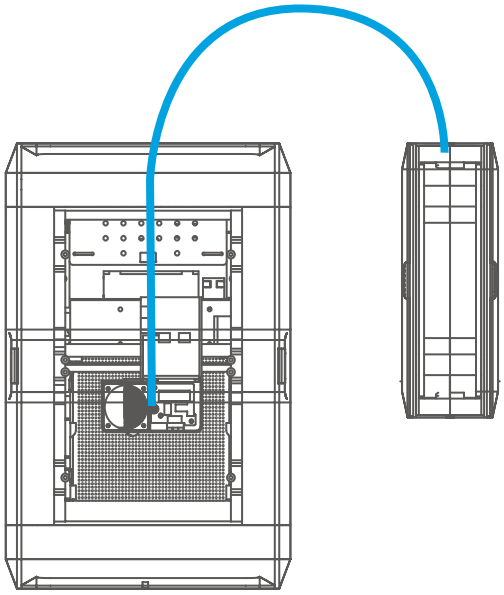
Press the “Auto” button to start the automatic process. Or click “Edit” to imput the height maually.



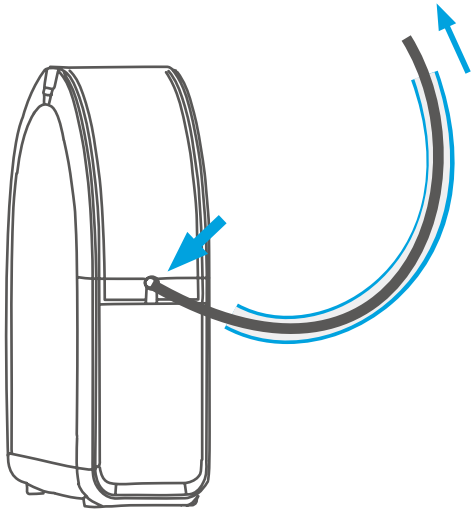
During nozzle height detection, the print head nozzle will touch the nozzle detector to measure the nozzle height.



Install the filament and guiding tube shown in blue.

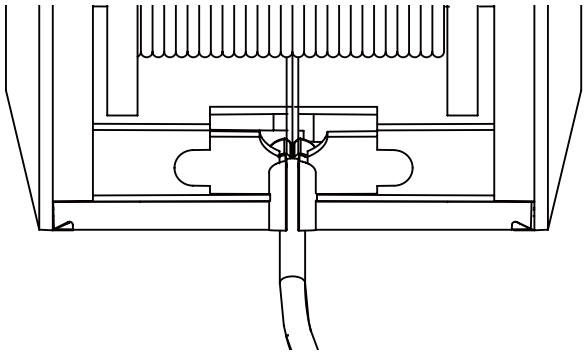


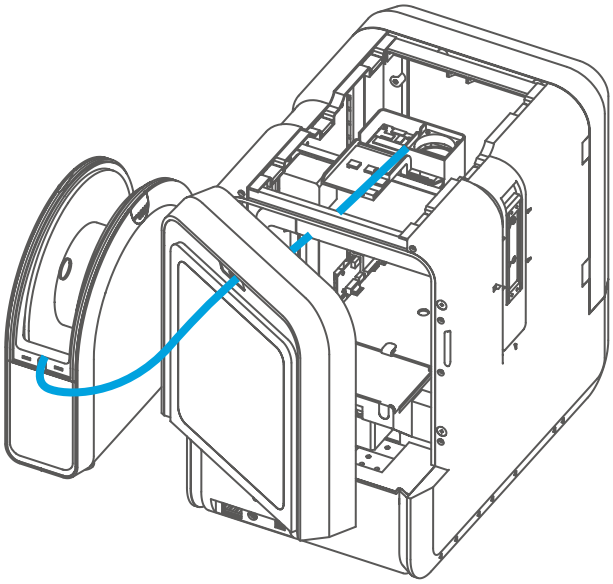
Front



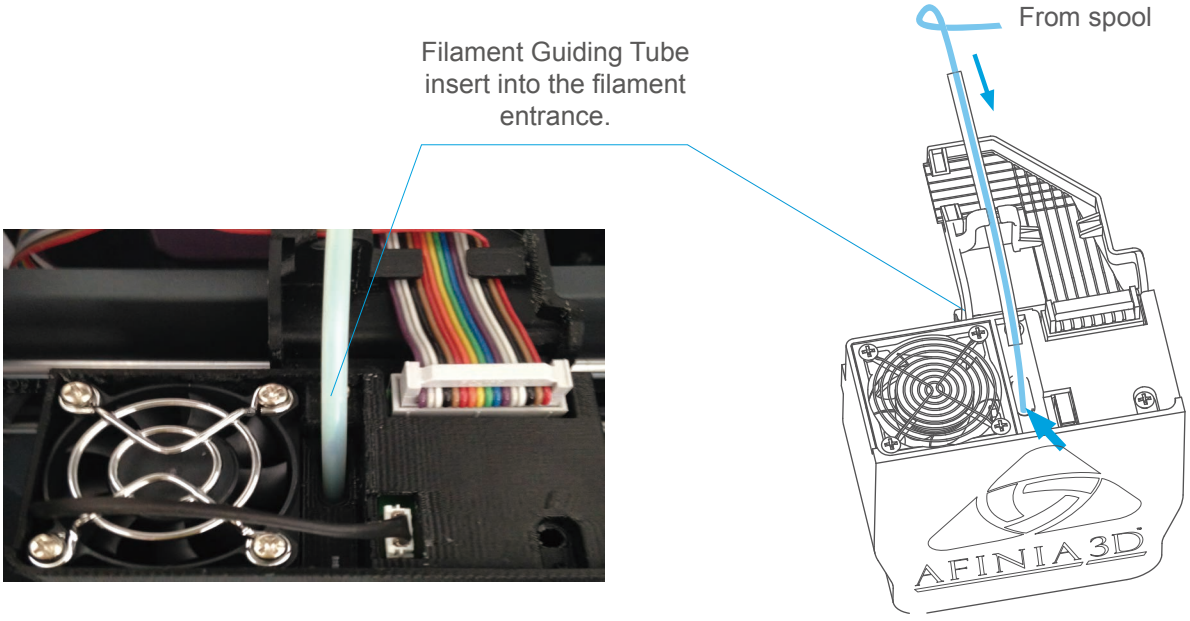
To printer

Push the guiding tube into the rubber ring as shown below.



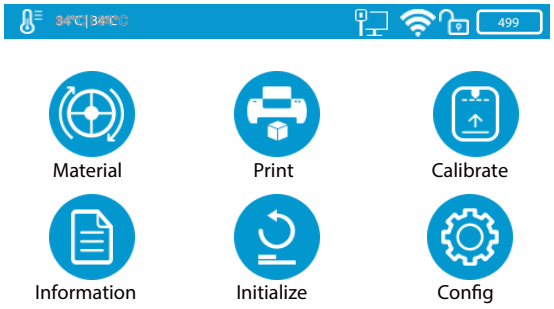


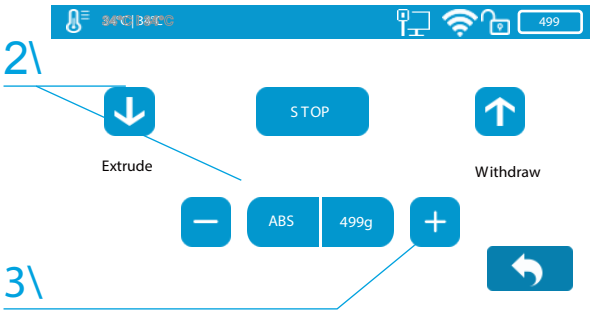
Back Side


From spool
Filament Guiding Tube
insert into the filament
entrance.
AFINIA 3D

Prepare for Printing - Load Filament 2-11

1\ Insert the filament from the spool into guiding tube, arrange the guiding tube as shown in previous page. Press the Material button on the touch screen.

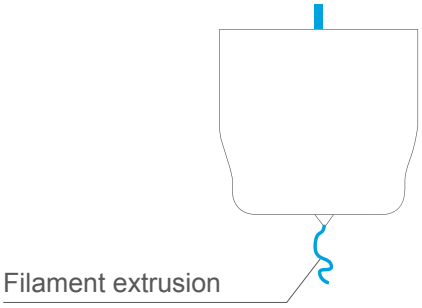


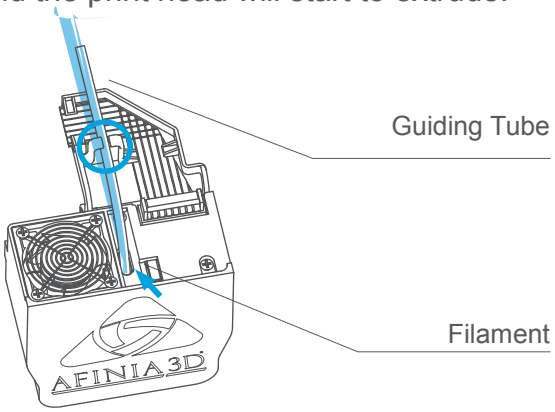


2\ Choose the printing material as ABS by press the Wheel button to switch between different materials input the filament weight by using the +/- buttons.

3\ Click "Extrude." The print head will start to heat up, within 3 minutes. Its temperature will reach 260°C, then the printer will buzz and the print head will start to extrude.

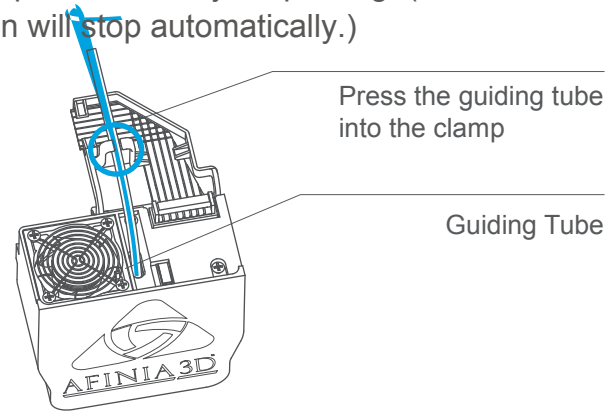
4\ Gently insert the filament into the small hole on the print head. The filament will be fed into the print head automatically when it reaches the extruder gear inside the print head.

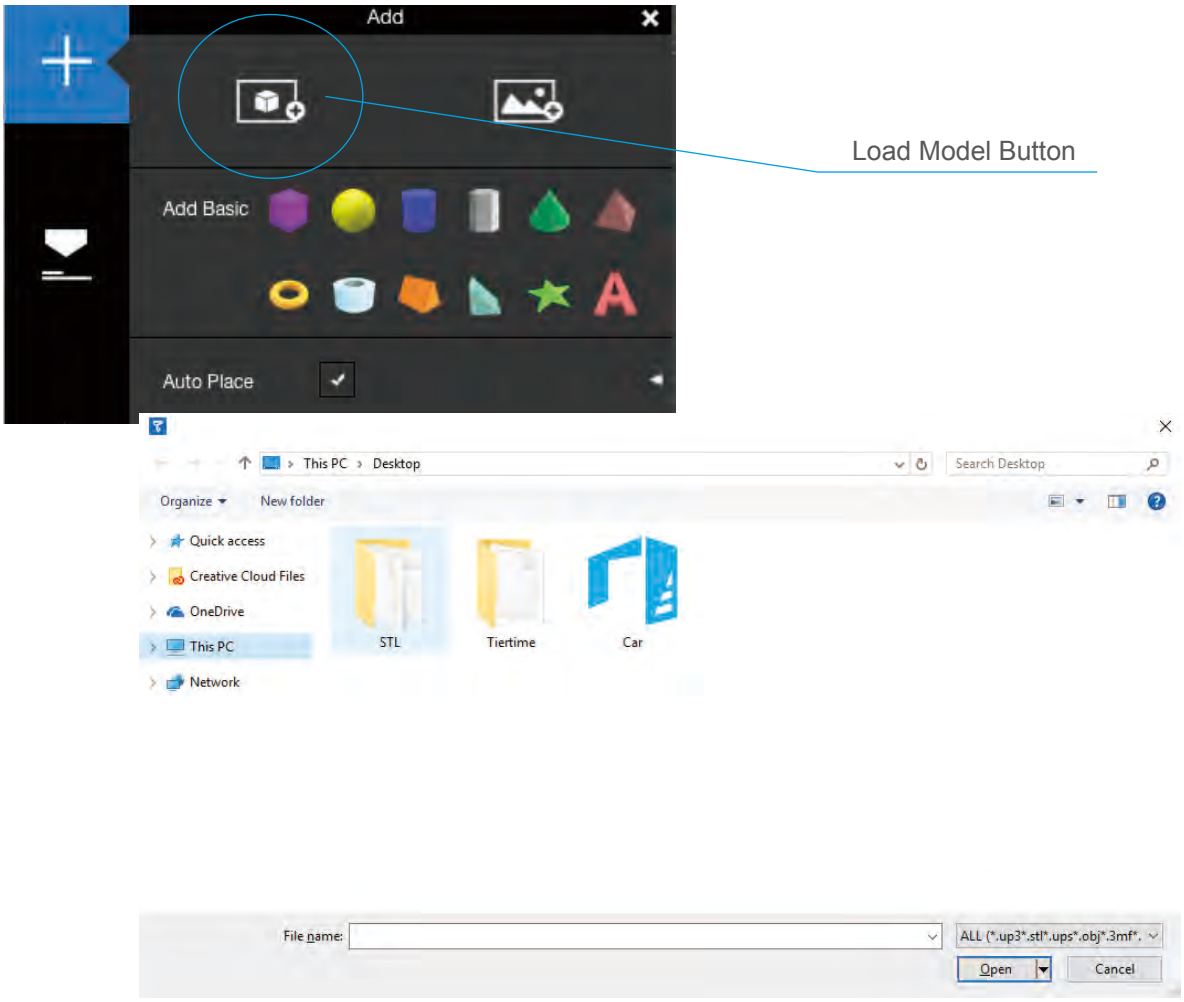


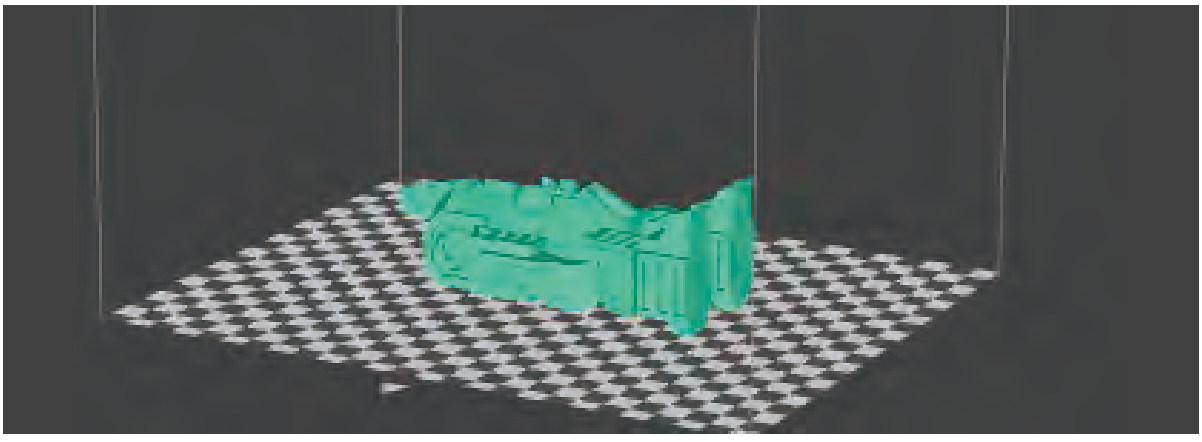


5\ Check the nozzle for plastic extrusion. If plastic is coming out from the nozzle, that means the filament is loading correctly and the printer is ready for printing. (The extrusion will stop automatically.)

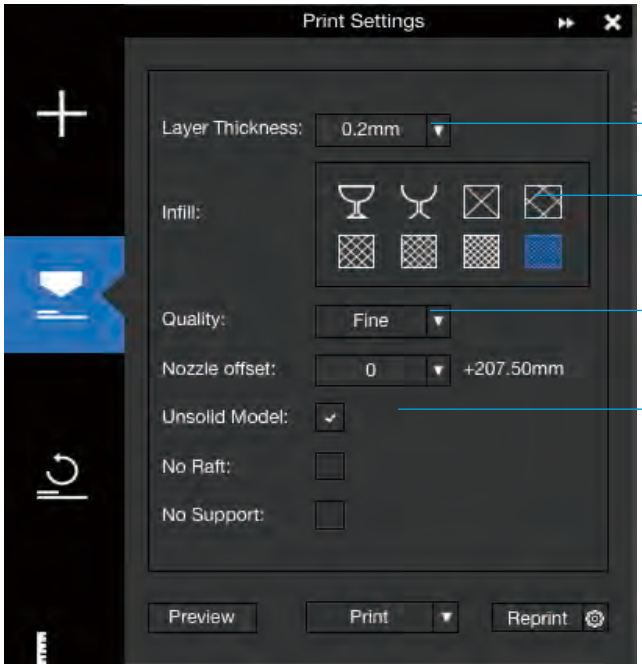
6\ Finally insert the guiding the tube in to the filament entrance and press the tube into the holding clip on the print head mount.




Add
Add Basic
Auto Place
Load Model Button
This PC › Desktop
Search Desktop
Organize
New folder
Quick access
Creative Cloud Files
OneDrive
This PC
Network
STL
Tiertime
Car
File name:
ALL (*.up3*.stl*.ups*.obj*.3mf*.
Open
Cancel



Make sure printer is connected to computer through USB, Wi-Fi (go to page 24 for details about Wi-Fi settings), or an ethernet cable, then load a model.

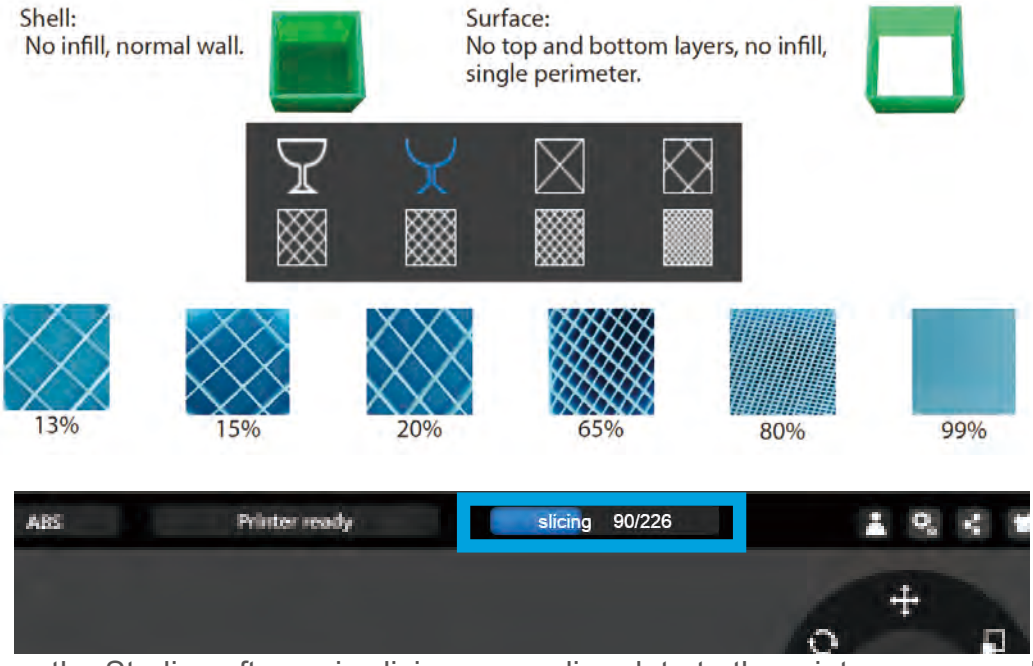


Set Layer Thickness

Select Infill Type

Select Print Quality/Speed

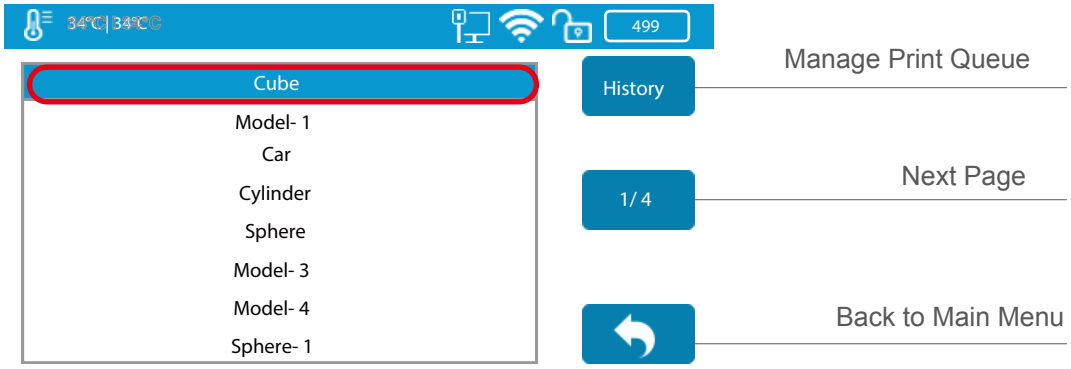
Nozzle Offset:
This value is permanently effective regarless nozzle height changed or not.

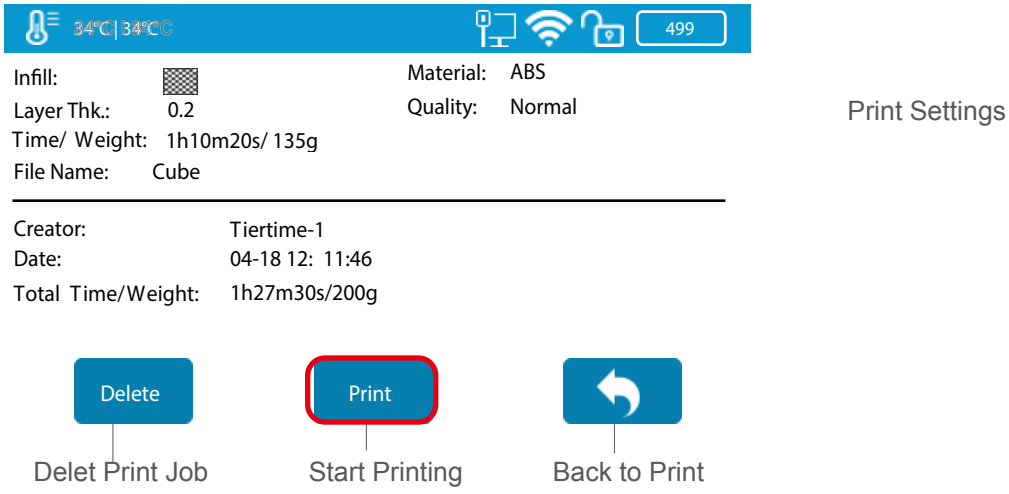


When the Studio software is slicing or sending data to the printer progress displayed on the status bar on top of the software interface do not unplug the USB cable as this will disrupt the data transfer and result in a print failure. The USB cable can be unplugged after the data transfer is finished.

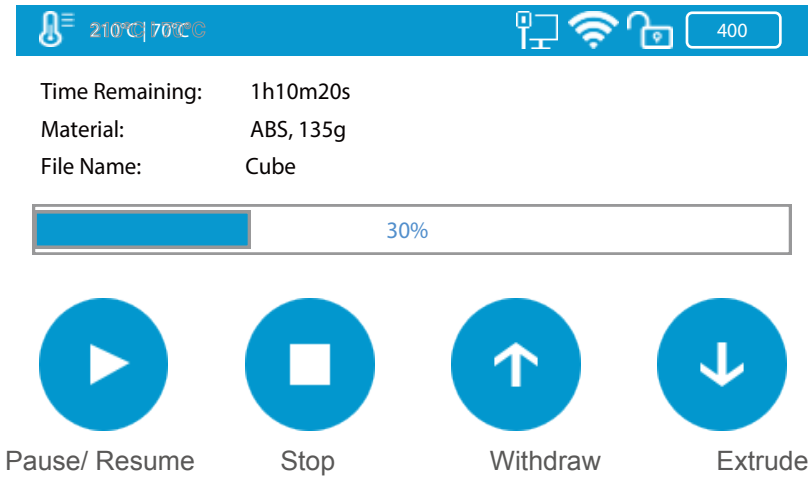
Printing Progress 2-14

Pressing the “Print” button in the main menu will bring up the Print Job Current List the same as the one in the software. Clicking the name of each print job will bring up the detail information of the print job for print.

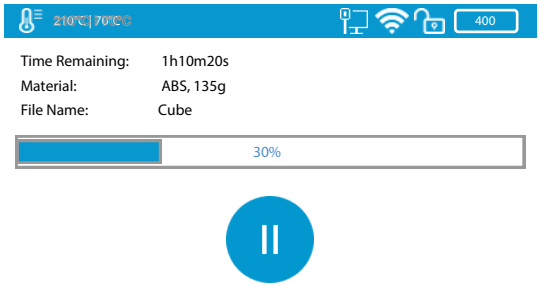




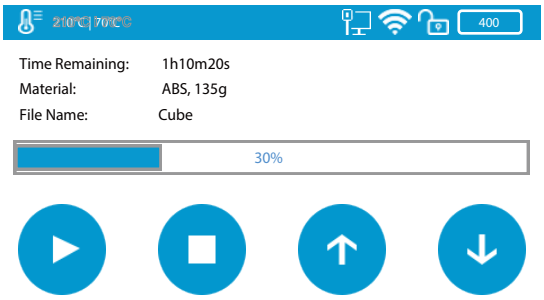
Print Settings



Change Filament During Printing 2-15



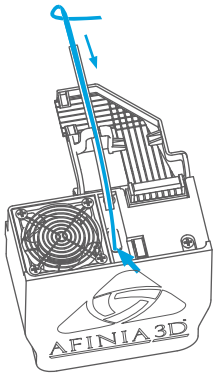
1. During printing, press the “Pause” button. The printing job will be paused.



2. When print head stops moving and the platform lowers Press the “Retract” button to remove filament.

Press the “Extrude button” to load the new filament

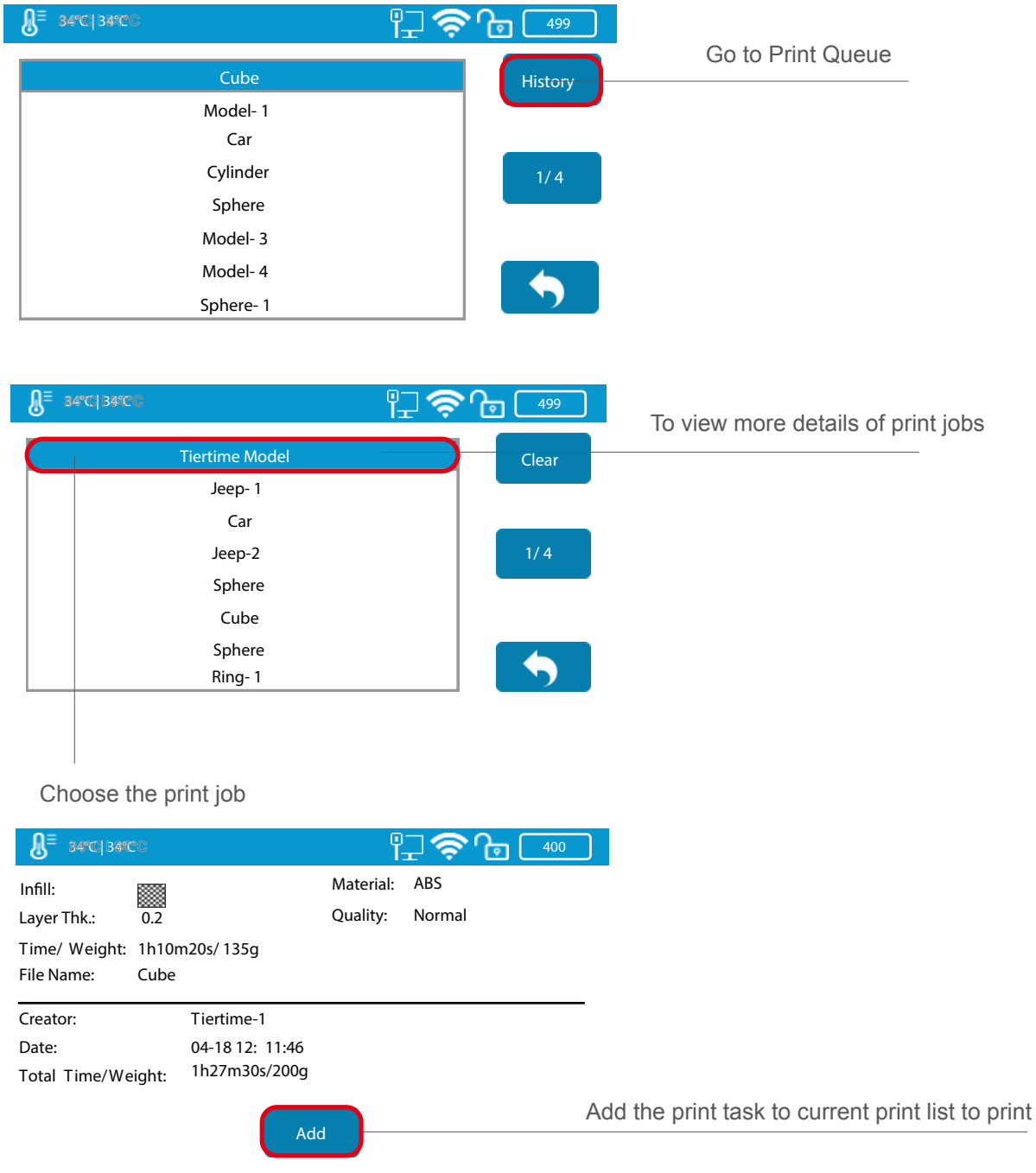
Press the “resume” button to resume printing.



After filament is removed, insert new filament to the print head as described in page 15.

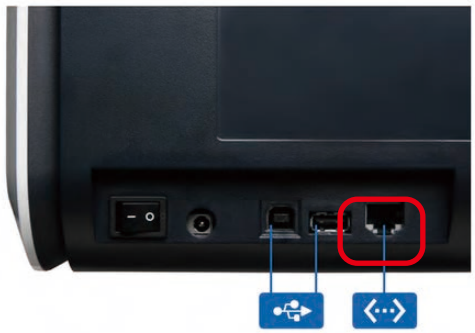
Print Queue 2-16

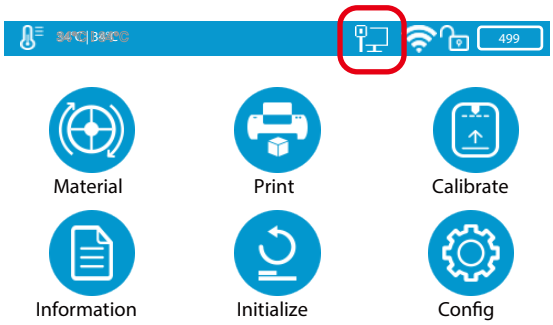
To start a print,click Print in the touchscreen. Select print job name to view prints settings and then choose print.



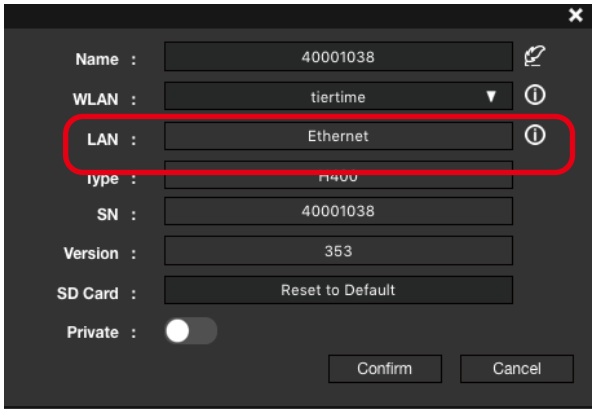
Machine Settings - Ethernet 3-1

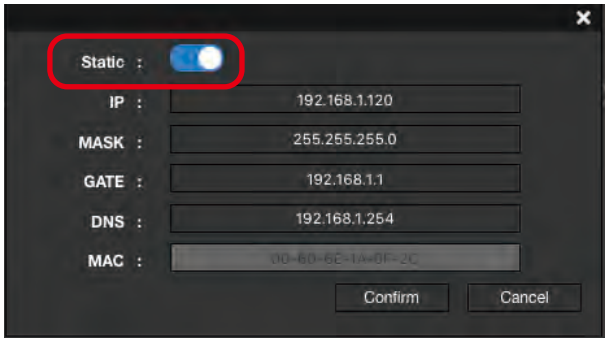
To connect the Afinia H400+ to ethernet, plug a connected ethernet cable into the LAN port. Make sure the ethernet icon appereas in the printer status bar on the touchscreen. Now your printer has successfully connected to your network.





To edit the ethernet details, go to Settings, click the Printer, choose the connect printer, choose the “i”, and then toggle on Staic. Now you can edit the details of the Afinia H400+. Click confirm to save.

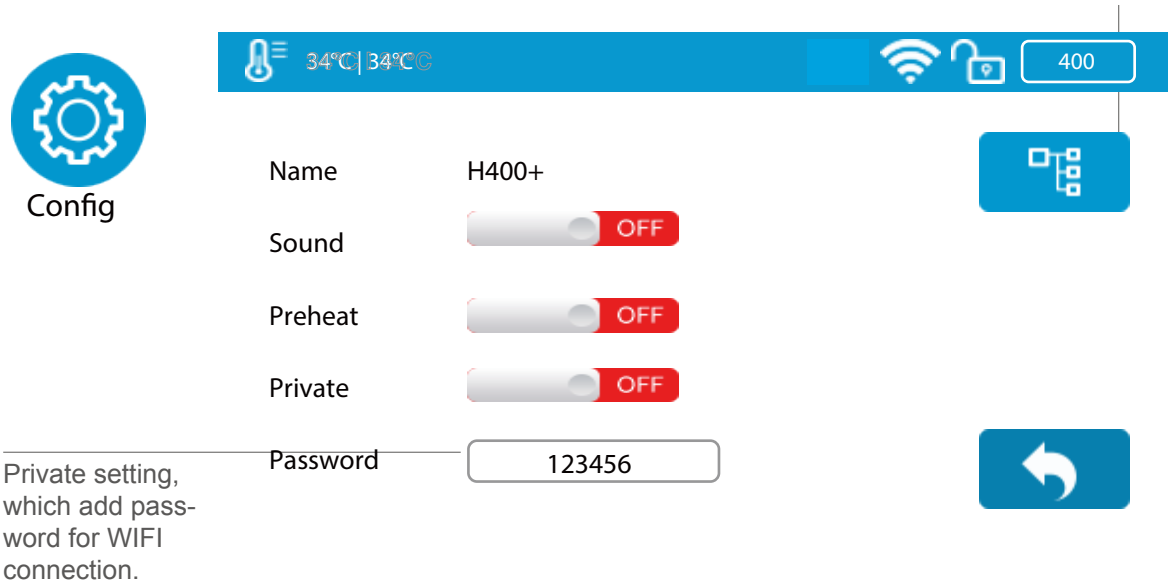




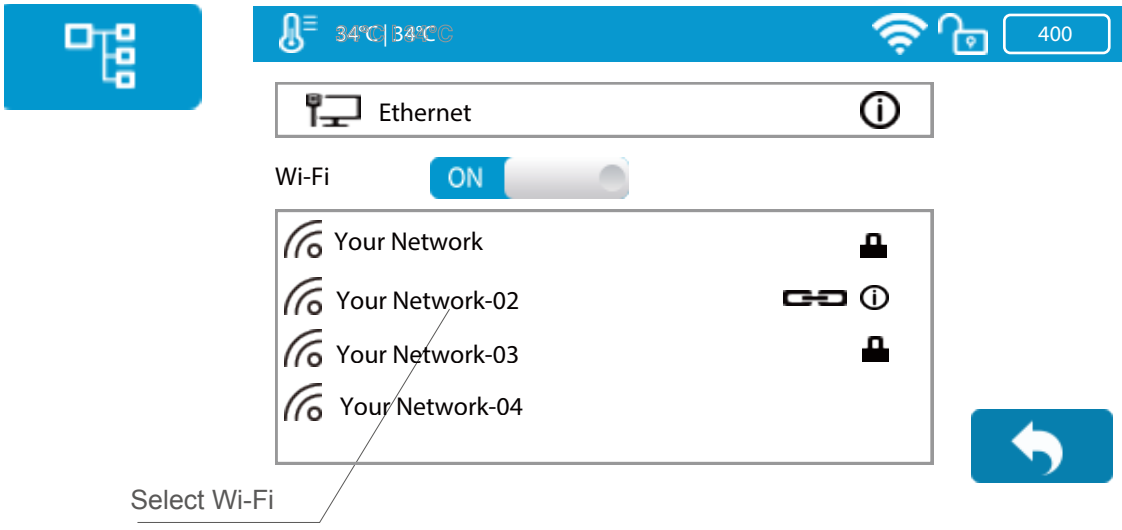
Wi-Fi Setup through Touchscreen 3-2

Connecting to the Afinia H400+ through Wi-Fi requires a Wireless Local Area Net - work (WLAN). Computer and printers must connect to the same WIFI network (same SSID) to communicate.

In order to achieve stable Wi-Fi connection, users are recommended to connect under a capacious WIFI environment. A crowded network or an area with a large number different networks are known to cause interruption during data trasnfer.

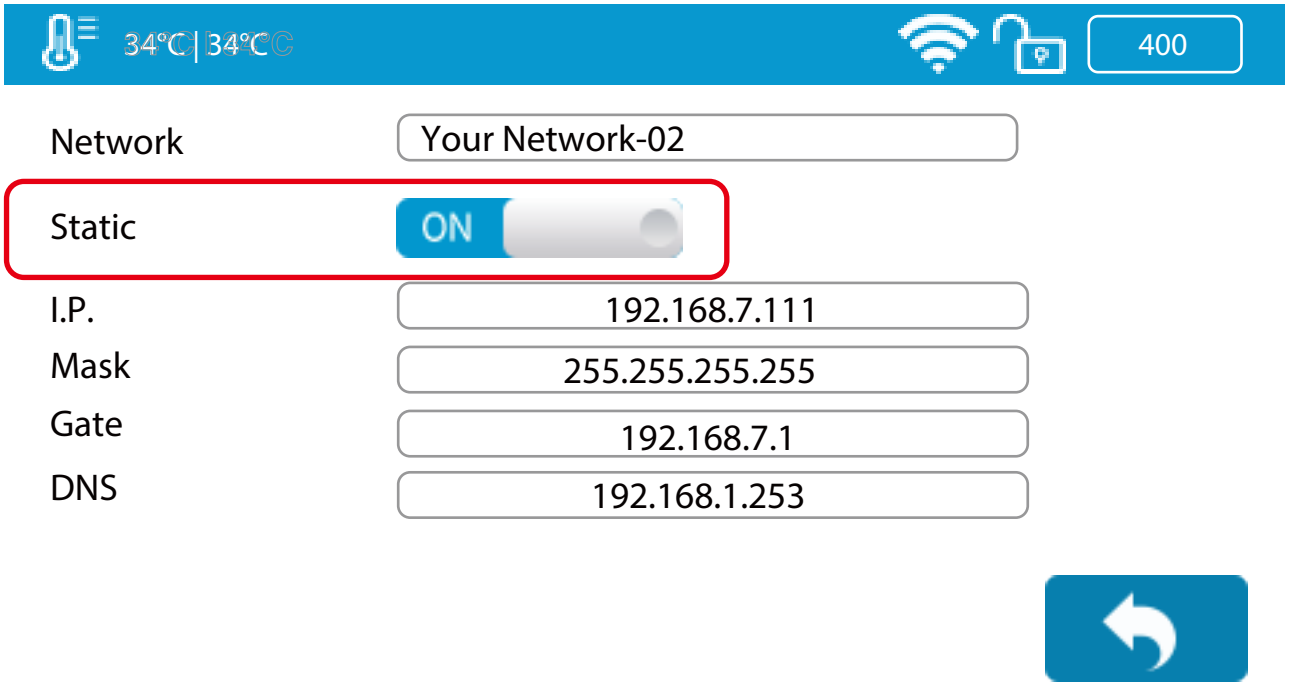


Private setting, which add pass- word for WIFI connection.



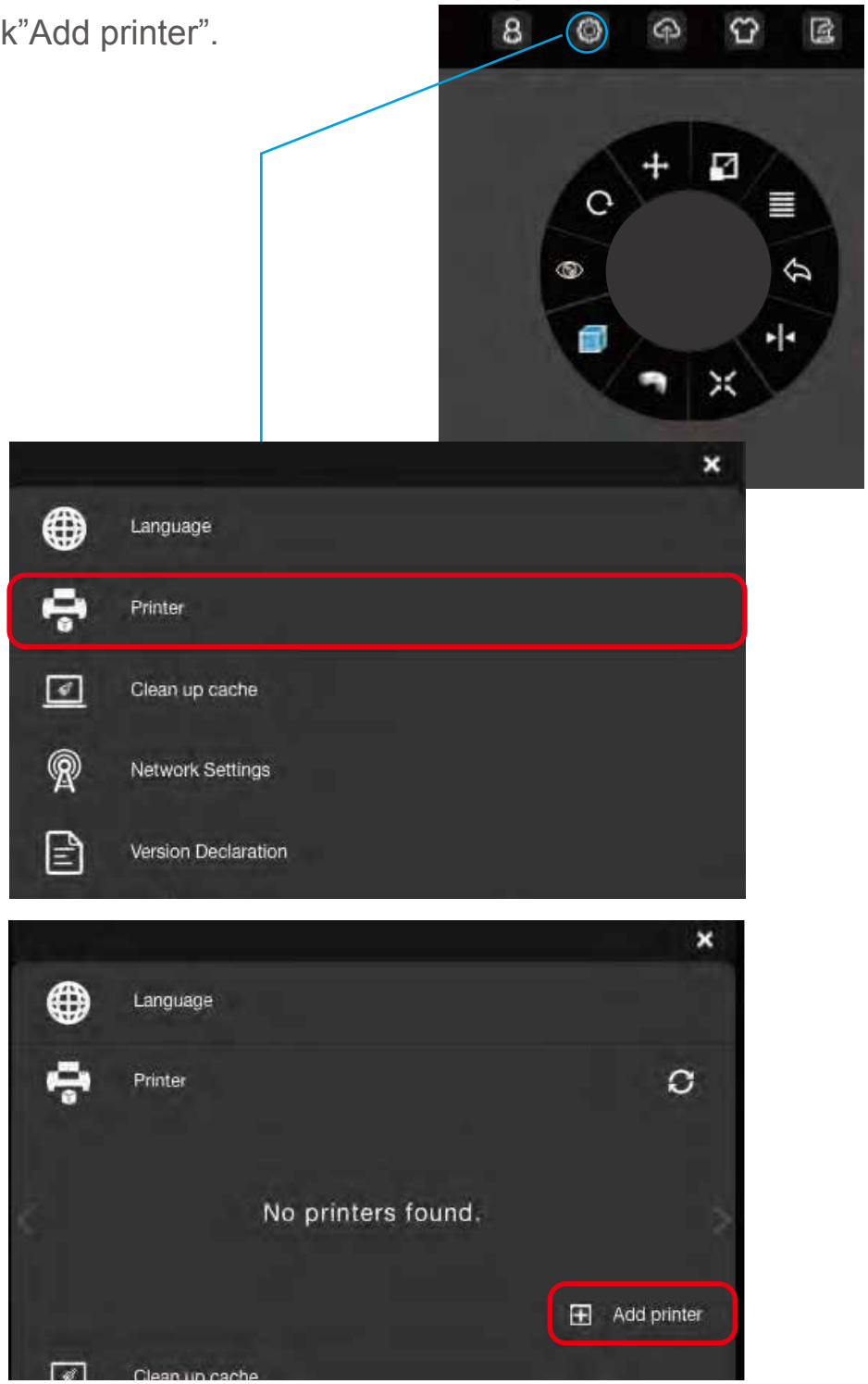
Select Wi-Fi

To edit network settings of Wi-Fi networks, click connnected network's "Information" button, then toggle on the Static button. The same steps also apply to ethernet connection.

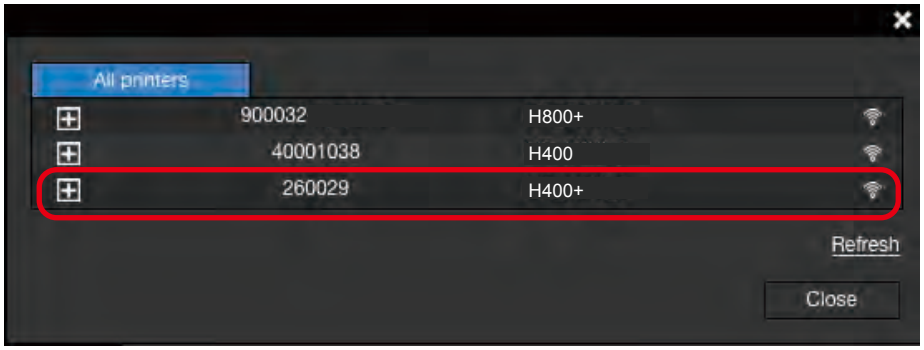


If the user switches on the private function in Wi-Fi setting, a password fieldl will appear to allow passowrd setup. This password will be required for Wi-Fi connection to the printer to prevent unathorized usage through Wi-Fi Please note this is weak protection and that anyone who can access the printer through USB or touch screen could change the private password.

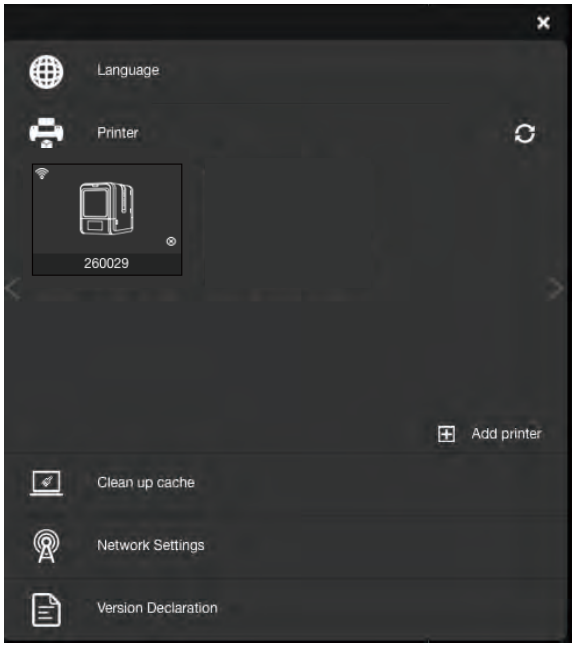
Open Studio on your computer, make sure it connect to the same Wi-Fi network as the printer. Click “Settings”, find the “Printer” section, then click”Add printer”.

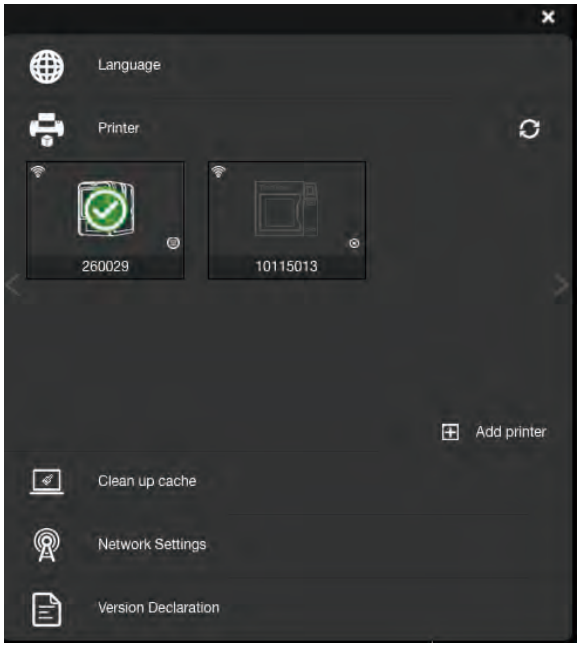


Find the printer in the All printers lists, then click “+” to add the printer. If the printer not shows up, click “Refresh” to reload the list.



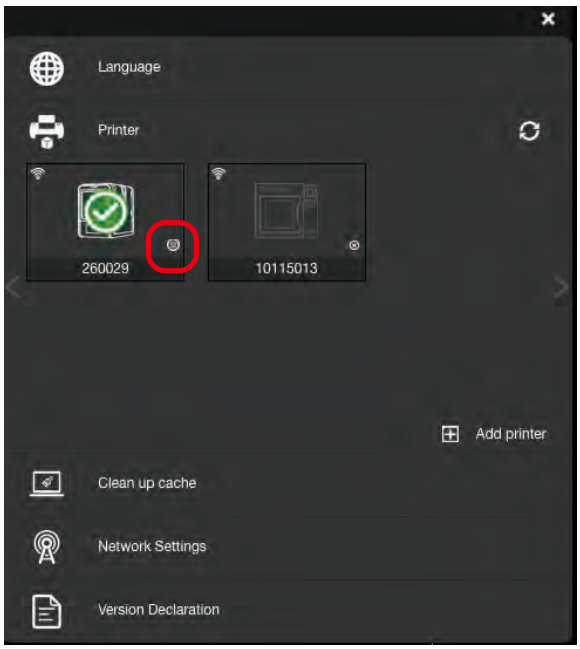
The icon of the printer will show up in Printer. Click the printer icon to connect. A green tick means the printer is connected to the software successfully.

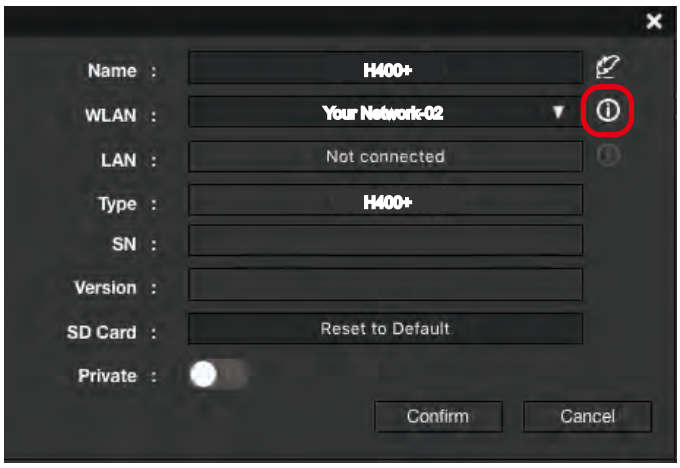




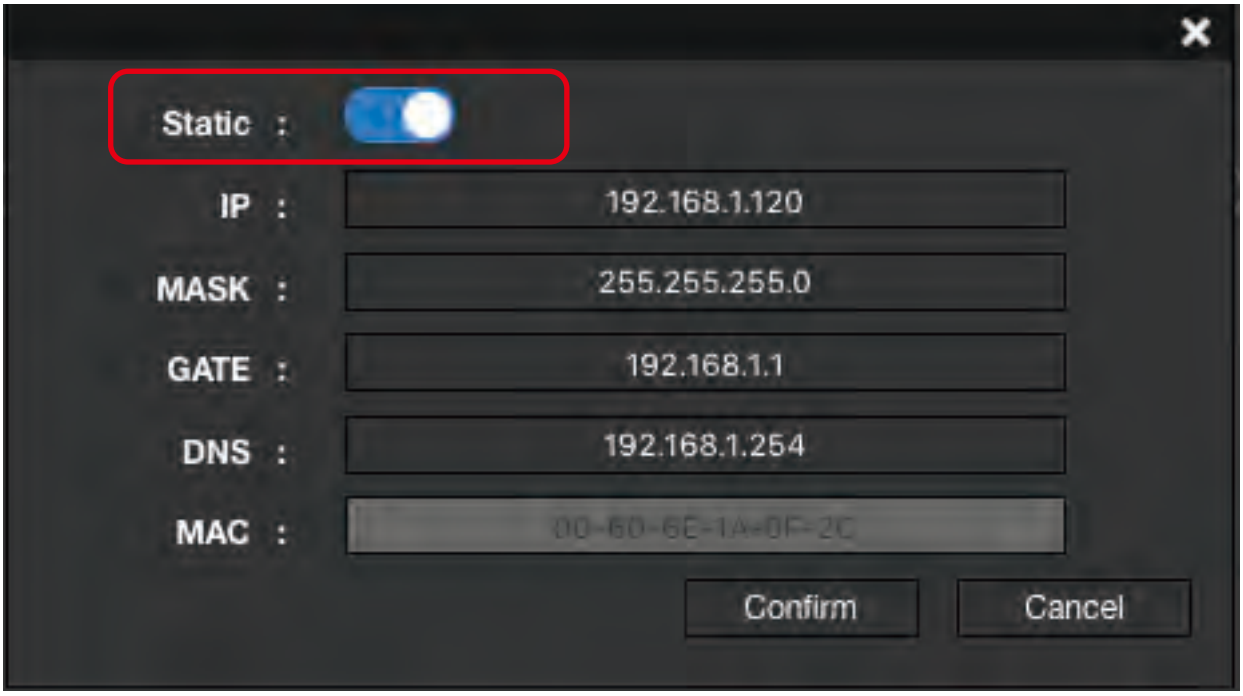
Wi-Fi Setup (Afinia Studio) 3-6

You can change the Wi-Fi Network settings in Afinia Studio.

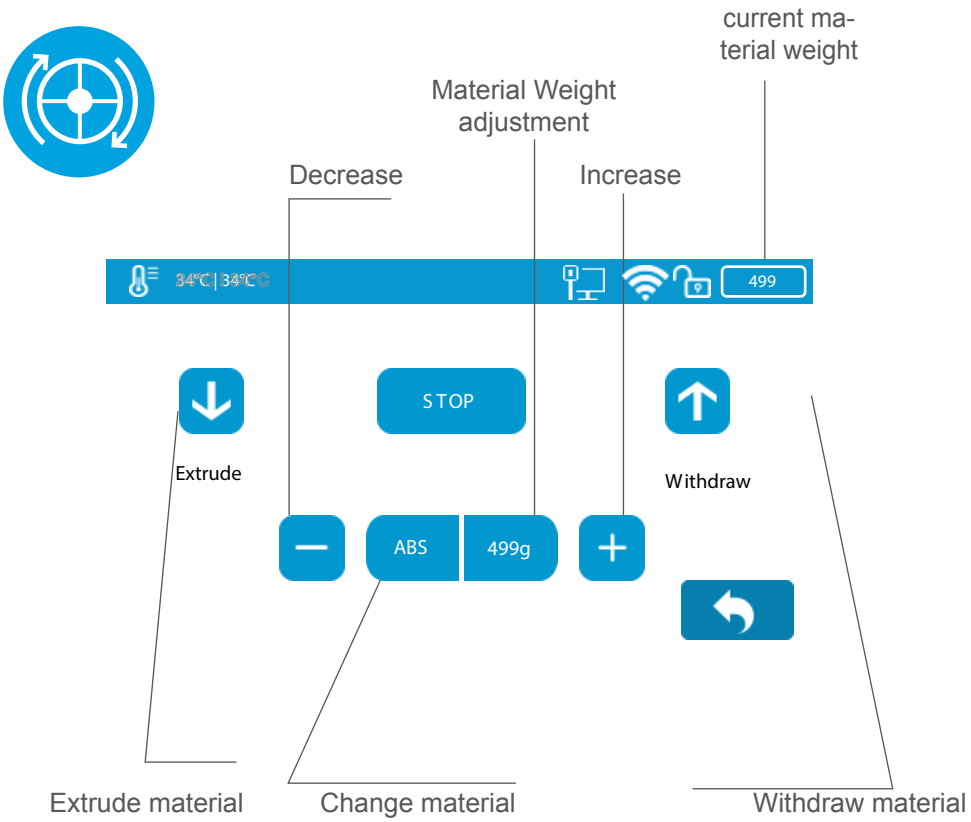




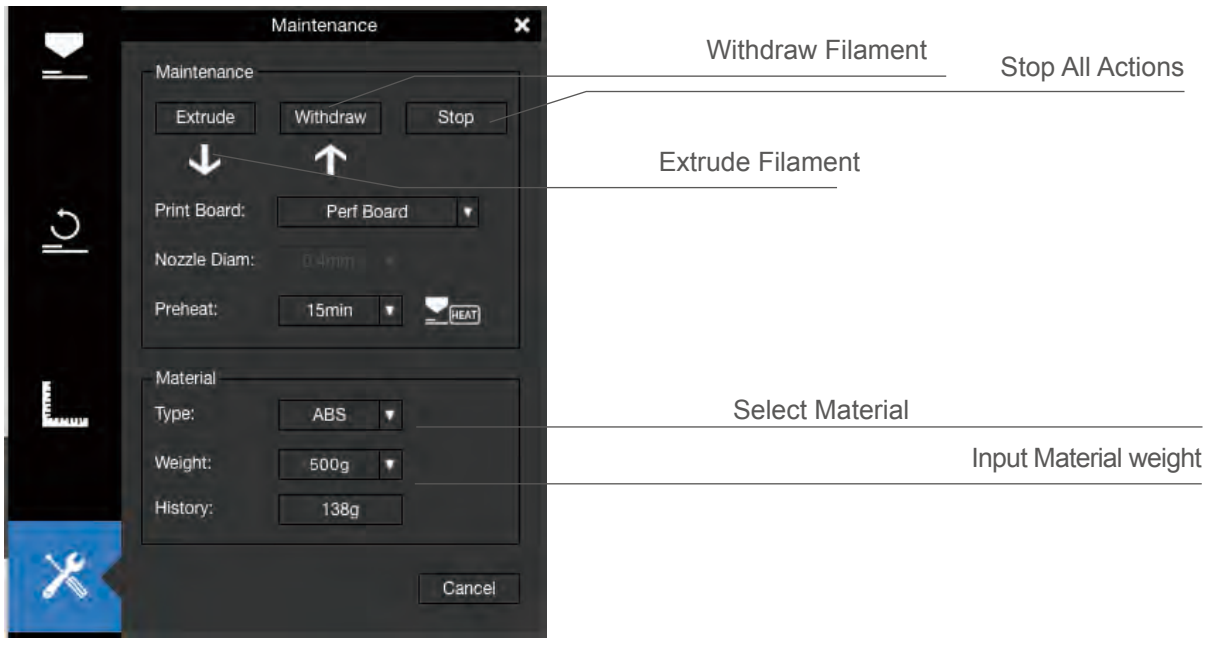
Toggle on “Static”, then to change the IP, Mask, Gate, DNS address. “Confirm” to save and finish.



Set Materials (Touch Screen) 3-6



Set Materials (Afinia Studio)



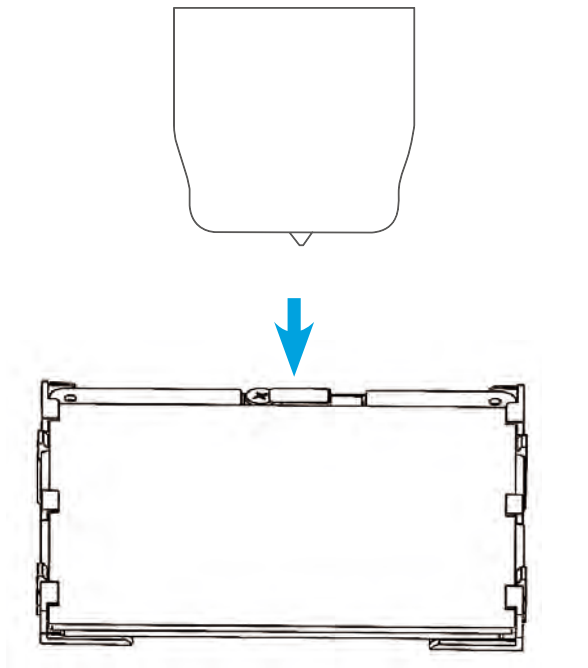
Set Nozzle Height (Afinia Studio) 3-7

For setting nozzle height with touch screen please refer to page 15.

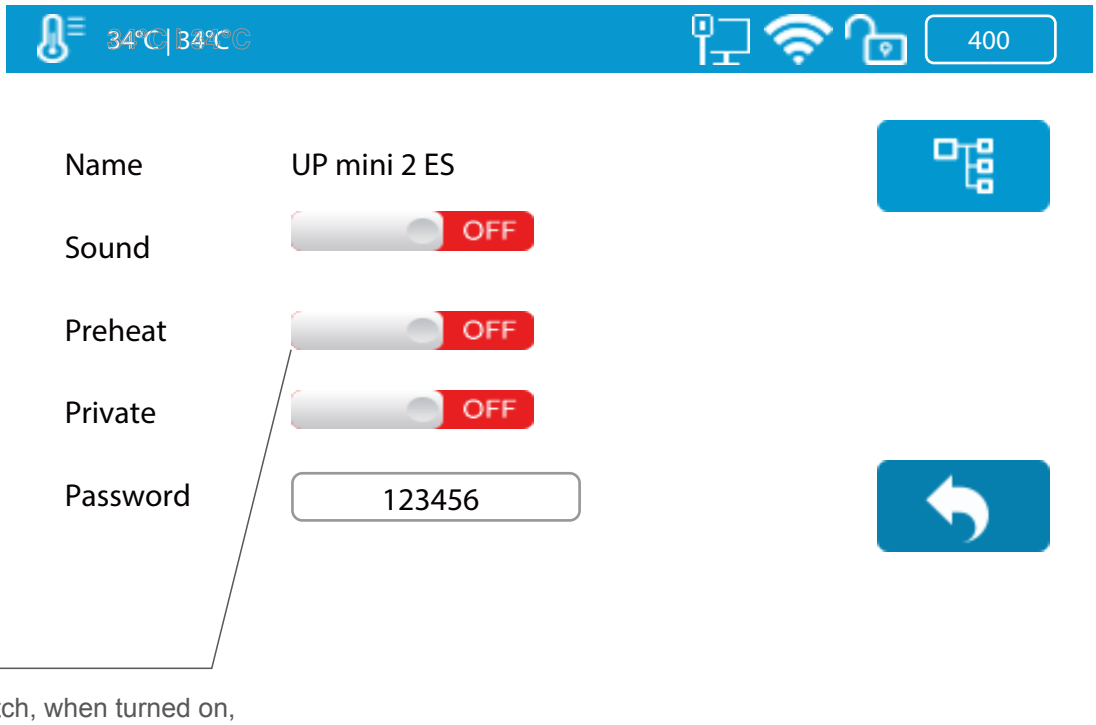
Open the Calibration panel

At the Nozzle Height section, click “Auto” will initiate the automatic nozzle height de- tection process.

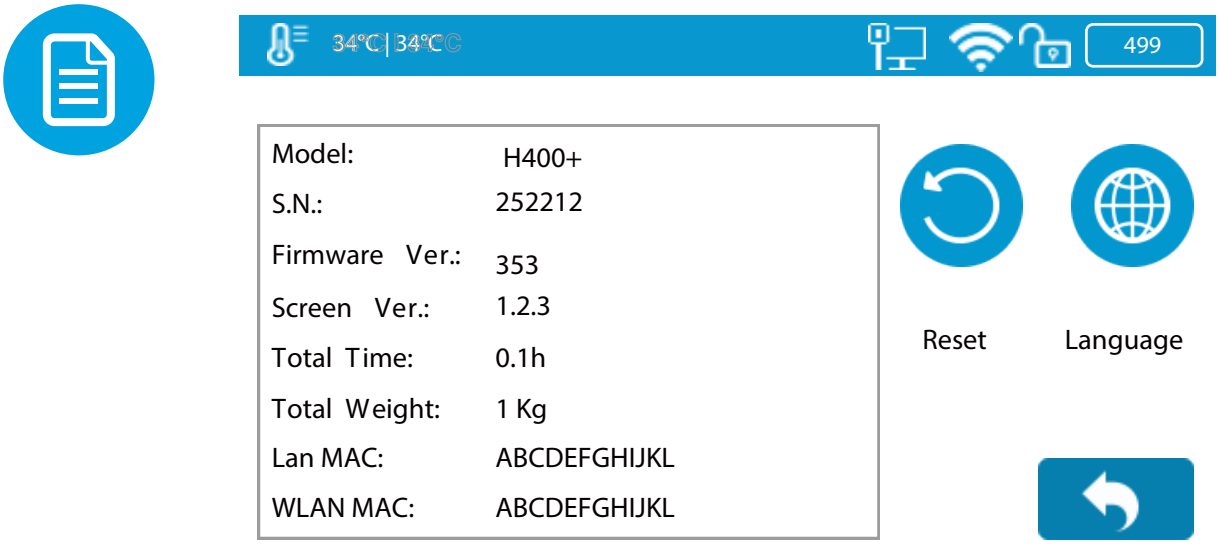
Clicking +/- button will move the platform up and down, or user could input a specific value at the text field and click “To” button the move the platform to a specific height. Clicking “Save” will replace nozzle height value with current platform height.



During nozzle height detec- tion, the print head nozzle will touch the thin metal sheet on the detector to make measurement.



Peheat switch, when turned on, for every print job, the printer will first preheat 15min before proceed to printing.



Model: current machine model.

S.N.: machine serial number.

Firmware Ver.: shows current firmware version.

Screen Ver.: shows current screen version of the printer.

Total Time: total printing time count

Total Weight: total print weight count

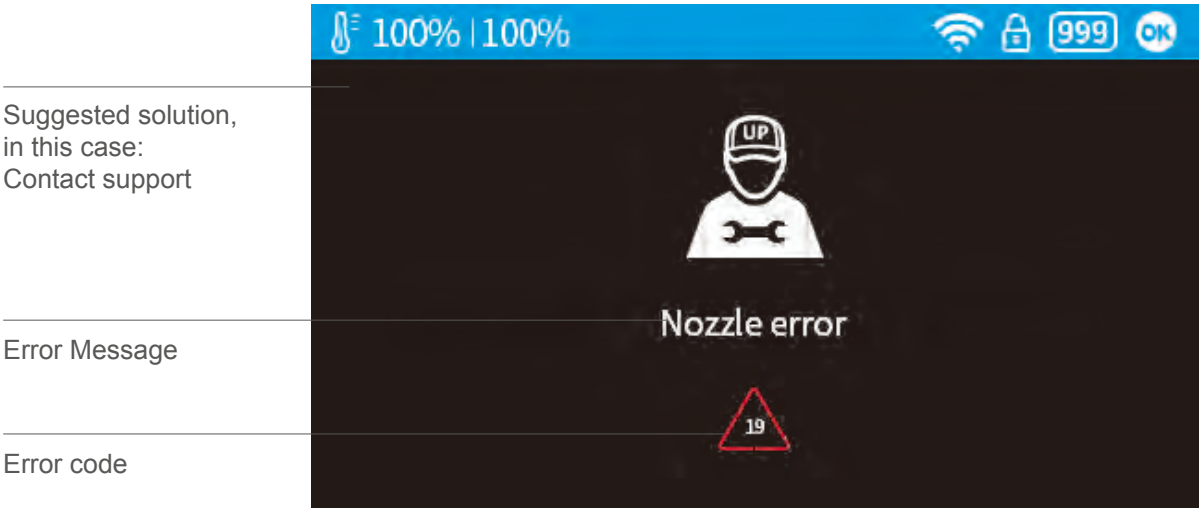
Lan MAC: printer's LAN address

WLAN MAC: printer's WLAN MAC address.

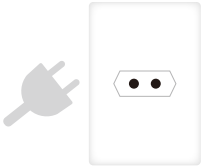
Reset: The printer's name, nozzle height, material type to ABS, and material weight will be 500g.

Defult Settings:
Printer's Name: S.N.
Nozzle Height: 0mm
Material Type: ABS
Material Weight: 500

Language: There are two set of languages to choose from Chinese Simplified and English.



Other possible error prompt:



Unplug printer and restart

reinitialize the printer

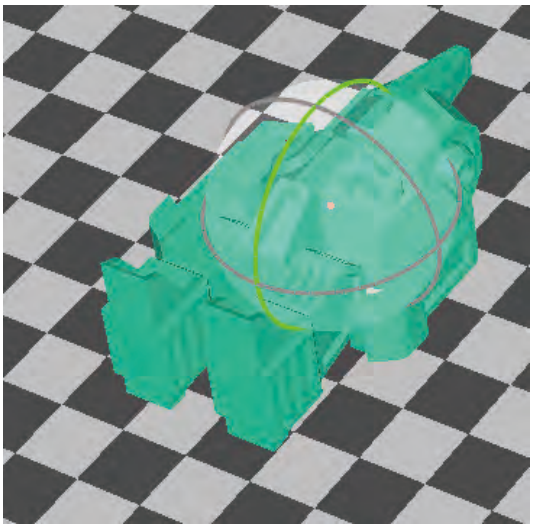
Rotating Models (Afinia Studio) 4-1

Choose the model and click the rotate button.

Choose the rotation axis

User could input a specific value
or choose a preset value for rotation.

Alternatively, user could use the rotation guide to rotate model in real time by holding and dragging with the mouse.

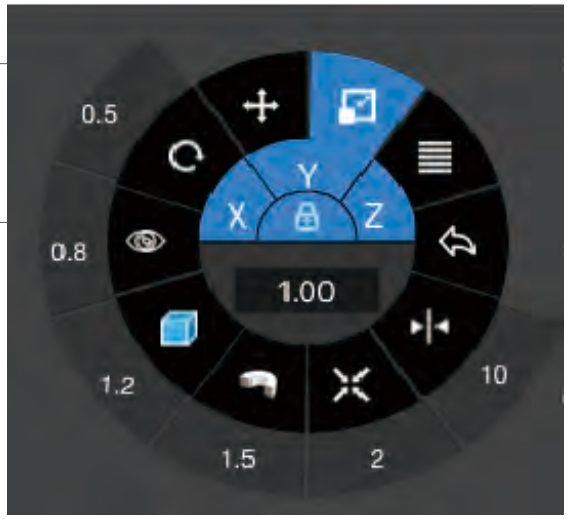


Choose the model and click the Scale button.

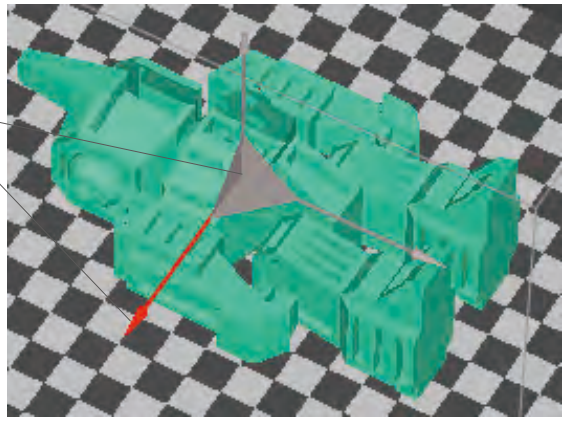
By default the scaling is in all axes.
User could also choose a specific axis for scaling.

User could input a specific scaling factor or choose a preset value

Click MM or INCH to convert models to sizes of corresponding units.



Alternatively, user could use the scaling guide on the model. User could scale in a specific axis or scale in all directions by holding and dragging with the mouse.

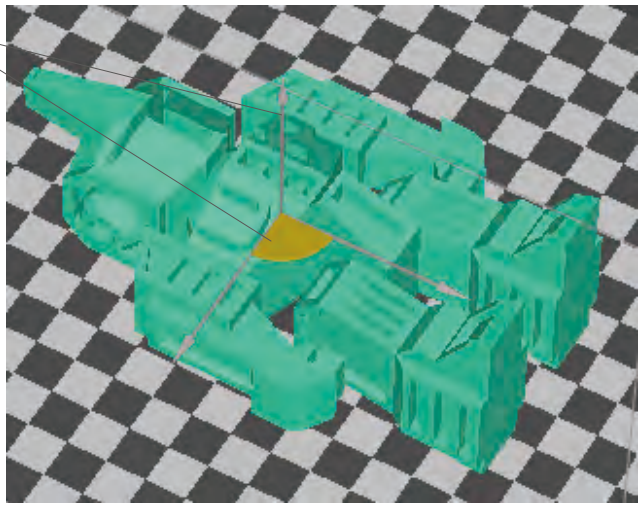


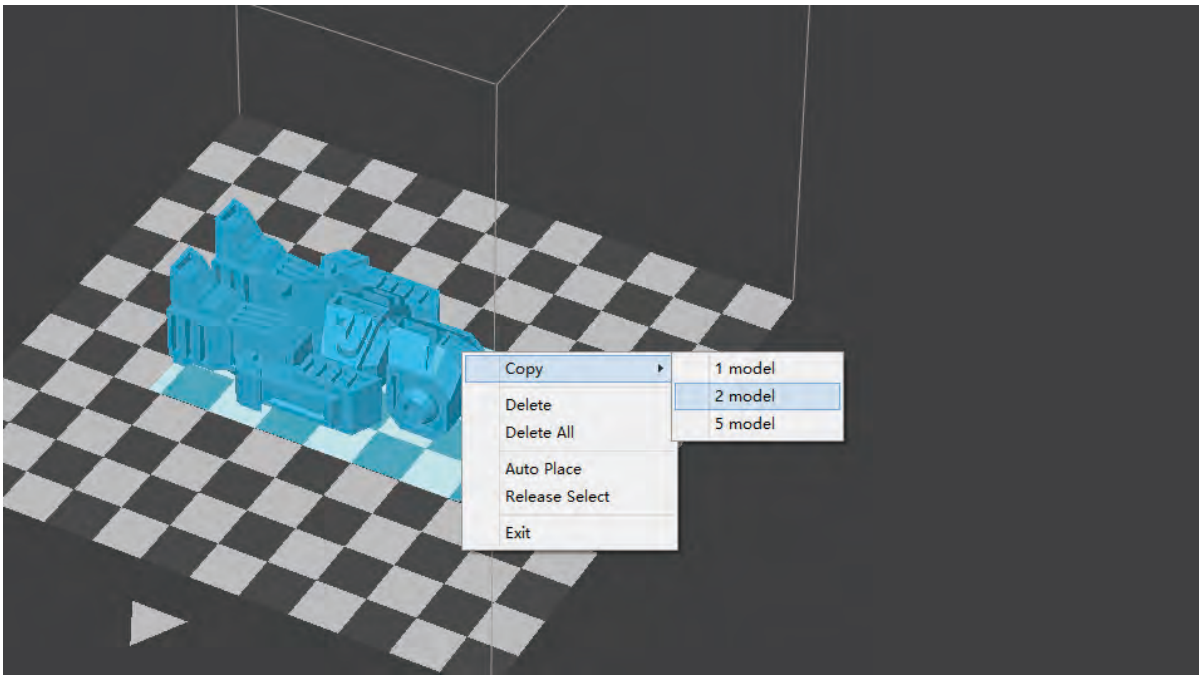
Choose the model and click the Move button.

Choose the direction of movement

User could input a specific value or choose a preset value for distance of movement.

Alternatively, user could use the translational guide on the model to move on the X-Y plane or a single direction by holding and dragging the mouse.

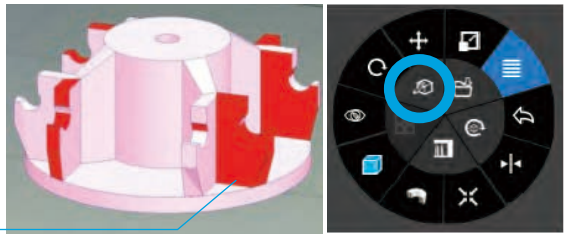




Choose the model by clicking it (hight lighted),the right-click to bring up the menu and select copy number.

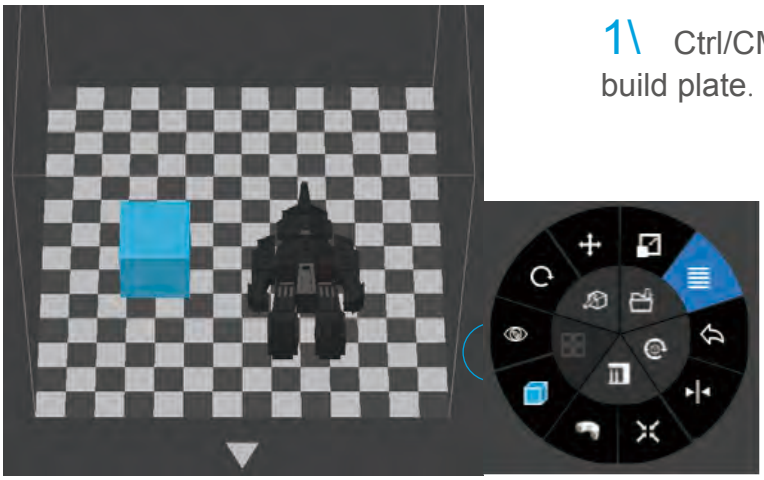
Repair A Model

1\ If the model contains defective surfaces, the software will highlight the surfaces in red.Click the "more" button to reach second level menu

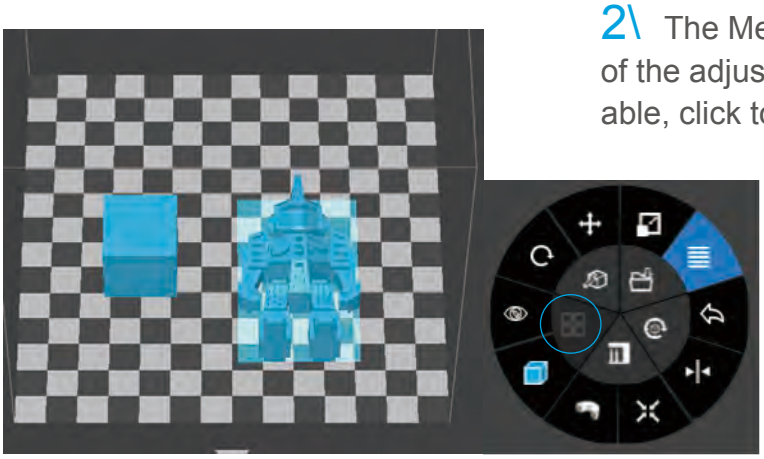


2\ Click the x button the repair the model.The red defective surfaces will resume a normal color when repaired.

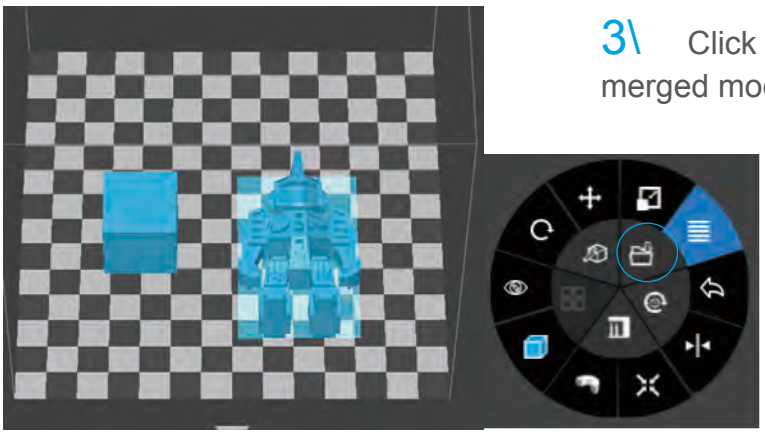
Merge and Save Models (Afinia Studio) 4-5



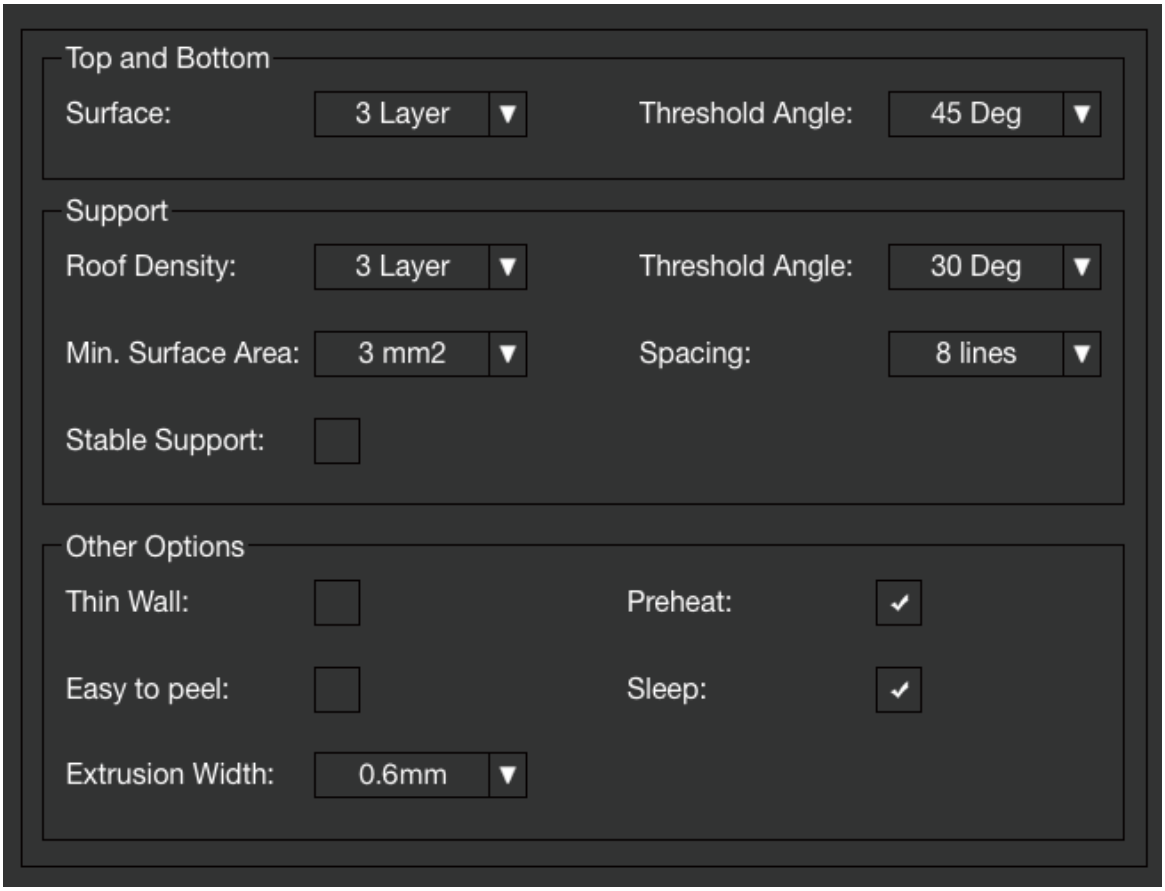
1\ Ctrl/CMD click all the models on the build plate.



2\ The Merge button on the second level of the adjustment wheel will become available, click to merge the models.



3\ Click the save button to save the merged models to comptuer.



Surface: the number layers sealing the top and the bottom of the printed object.

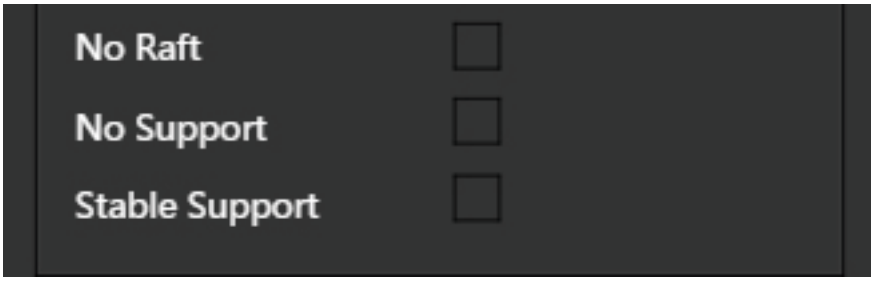
Threshold Angle: This determines at which angle the Surface layers will start to print.

Dense: Choose the number of dense layers between support and supported surfaces.

Angle: Determines the angle which support and dense layers are generated.

Area: Determines the minimal area of surface that will be supported, area less than this vaule will not be supported.

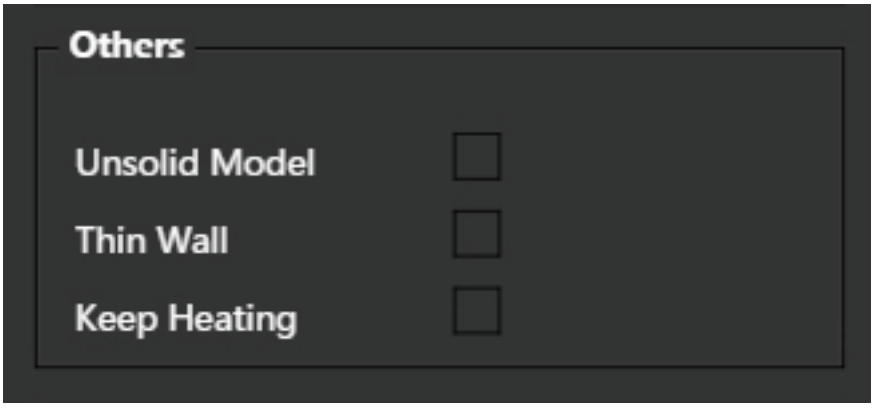
Space: Determines how dense the support will be, the larger the value the less dense the support.



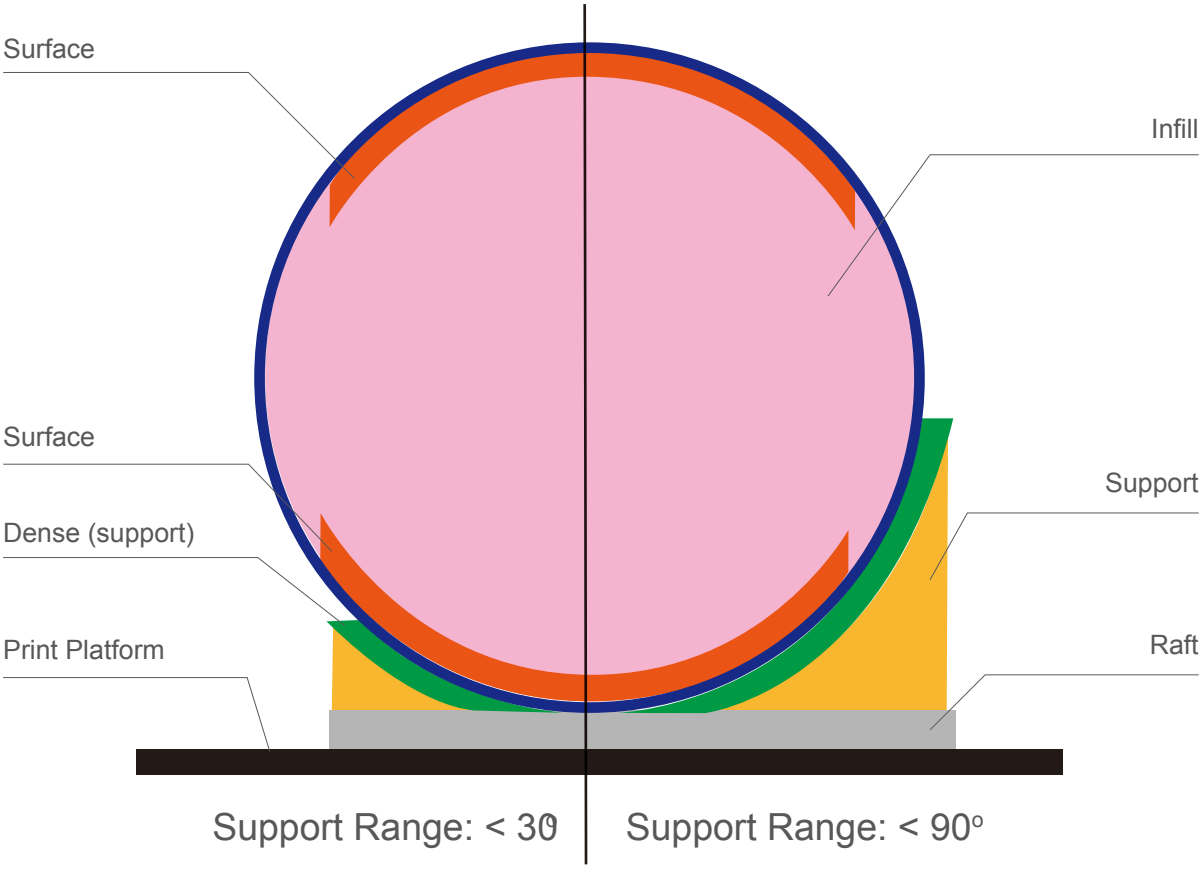
No Raft: print without raft

No Support: print without support

Stable Support: Support structure will be stronger but less easy to be removed.



Unsolid Model: The software will autofix nonsolid models
Thin Wall: The Software will detect wall thickness that is too thin to print and expand the feature to a printable size.
Keep Heating: The platform will be heated after print job is completed.



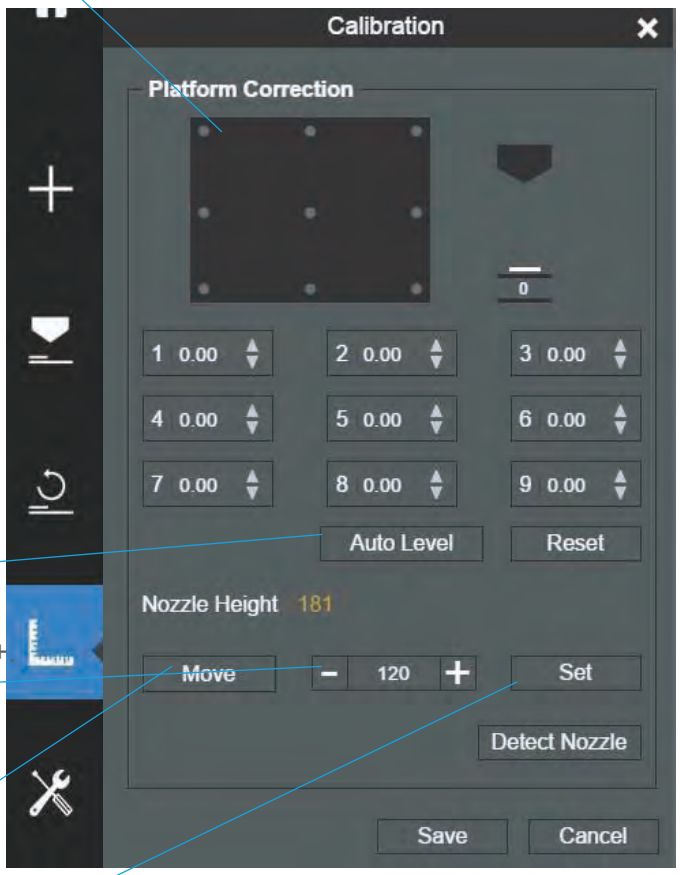
Dense: Solid support structure ensures that the surface being supported retains its shape and surface finish.

Infill: The inner structure of the printed object. The density of the infill can be adjusted.

Raft: The thick structure that assists with the adhesion of the object to the platform.

Surface: The top and bottom layers of the printed object.

The 9-button calibration screen shows the calibration points of the platform. Clicking on the value next to a number moves the nozzle to the corresponding position on the platform. The arrow buttons move the platform up or down for manual platform calibration. Before adjusting the platform calibration, click the “Reset” button to clear the previous values. Perform the Nozzle Height Procedure before setting the Platform Calibration.
Leave the platform at the Nozzle Height and click on the value in a numbered box. Use the up or down keys to move the platform until the nozzle is just touching the platform. Do this for each of the 9 positions then click Save.



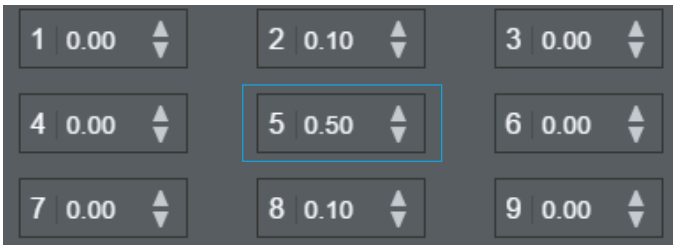
The auto buttons triggers automatic leveling and nozzle height detection. Auto Level is not available on the H400+

Moves the platform up/down: click the +/- buttons to move the platform up and down.

For sending the platform to a specif-ic height, input the value in the text eld between + and - and then click “Move” button.

Click "Set" button user want to save currently platform height as nozzle height.

After running the Platform Calibration, the 9 buttons will have values similar to those in the figure to the right. If your values are outside a total range of 2.00 mm, please attempt the Platform Calibration again.



NOTE: Having a level platform and correctly set nozzle height are essential for consistent, error-free printing. If the platform is unlevel or the nozzle height is not set correctly, the following issues may happen:

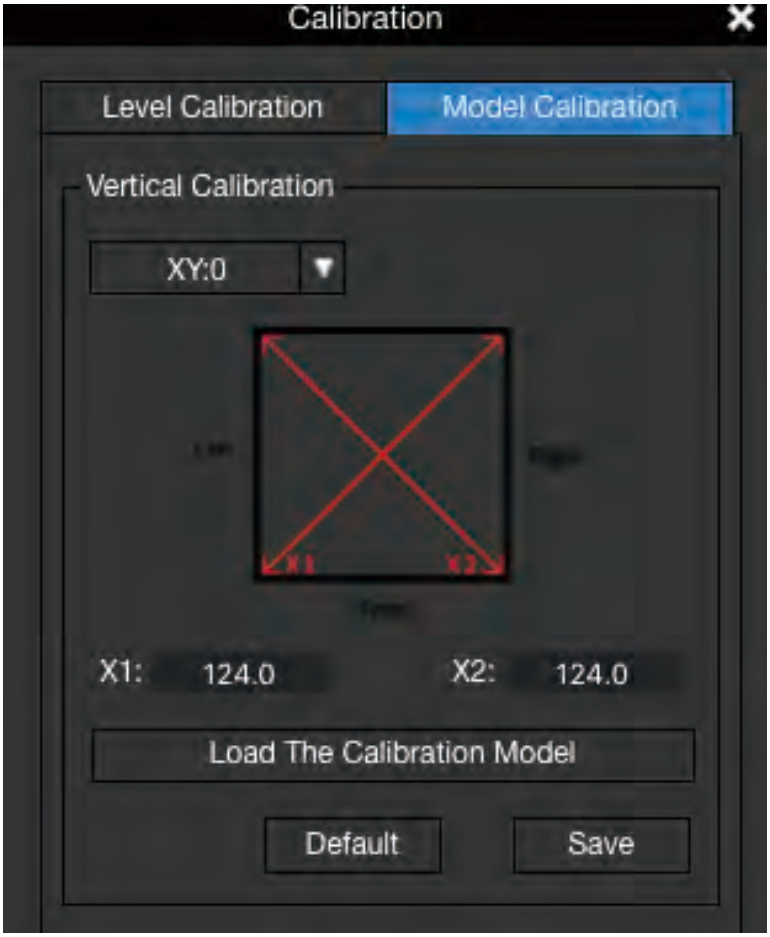
- **Nozzle jams**
- **Warping or lifting of prints from the platform**
- **Prints breaking free from the platform during printing**

1\ Initialize the printer

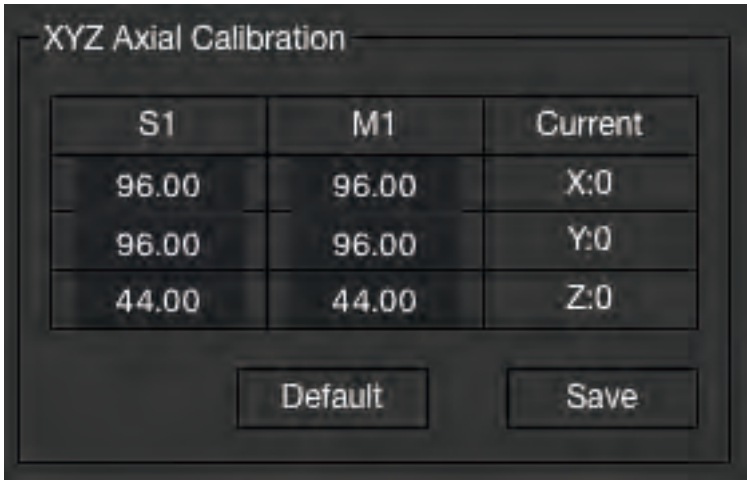
2\ Put the Calibration Card or folded piece of paper on the platform under the nozzle.

3\ Move the print head to the middle of the platform by clicking the 5 button.

4\ Raise the platform until it is just touching the nozzle. Move the paper between the nozzle and the platform to see if there is any resistance.



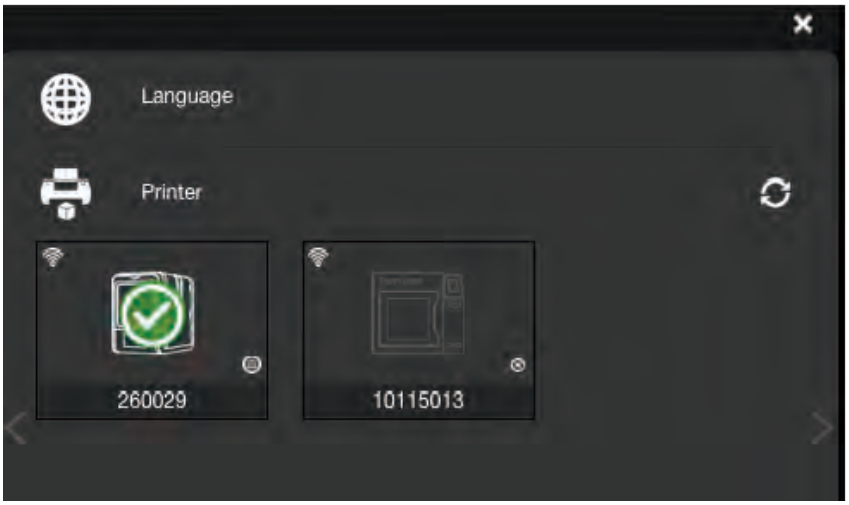
Vertical Calibration, its main purpose is to ensure all three axes are perpendicular to each other in order to guarantee consistent, high-quality prints.

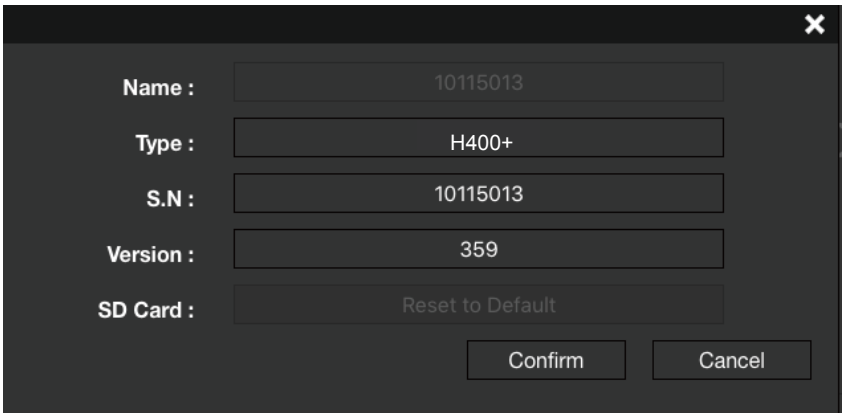


XYZ Axial Calibration is used to improve dimensional accuracy for a specific model. When a printed object is found to be deviating from its theoretical dimensions, we can use this method to correct it and achieve better precision.

Printer Info 5-4

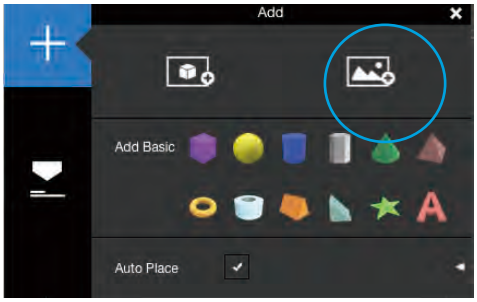
Printer info will be displayed by clicking the small button on the bottom right hand corner of the connected printer icon. Information including printer type, serial number and firmware version will be displayed. User could also set a custom name for the printer at the name field.

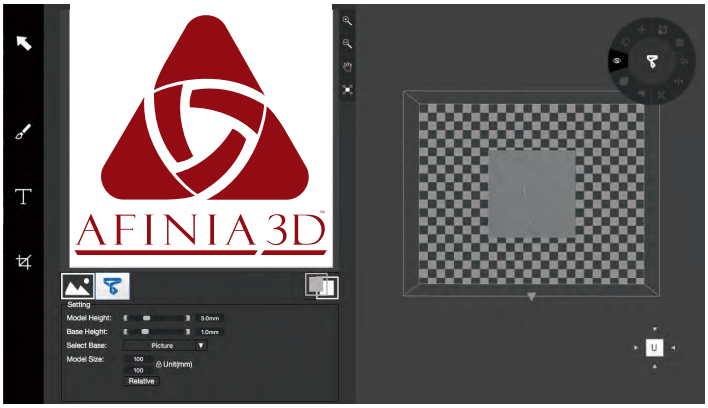




Check Auto Update to allow the software to inform user of the latest version.

Convert Picture Into 3D Model 6-1



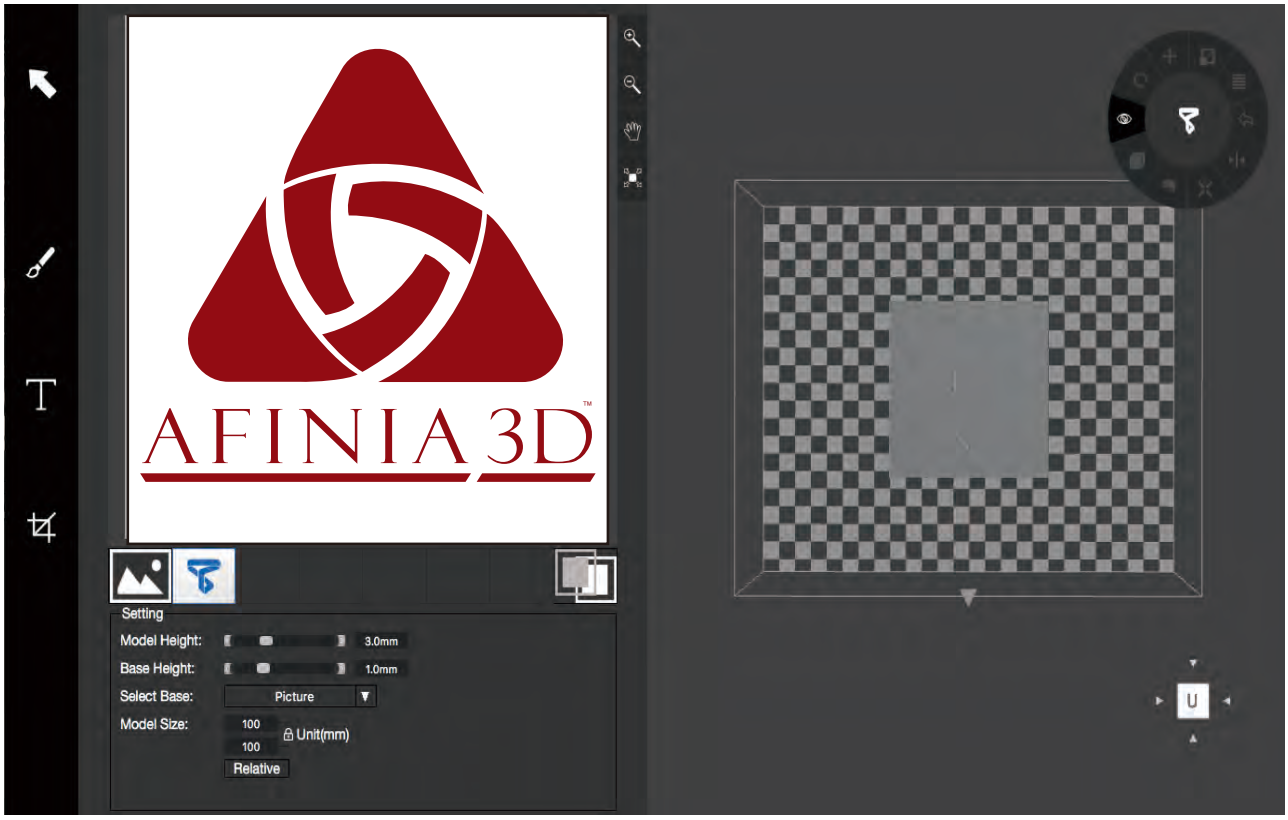


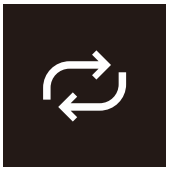
Click add picture button and select a picture.

The Base height determine the thickness of a flat layer that will hold the picture.

Model Height determine the contrast of the finally print.

The convert negative button will reverse the pixel intensity so that user could choose the picture to be protruding from or sunken into the base.



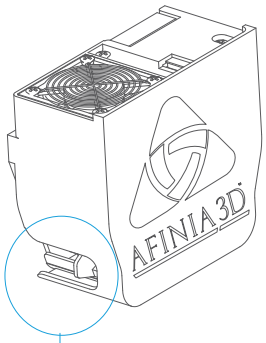


Update 3D model button. This button will convert the modified picture on the left to a 3D rendering on the right.

OK button sends the 3D rendering to the 3D printing interface for printing.

1. Ensure accurate nozzle height. If the nozzle height value is too low, it will cause warping; if it is too high, it will crash the nozzle into the platform,causing damage and clogging. You can manually fine-tune the nozzle height value in the"Calibation"panels.You can try to adjust the nozzle height value plus or minus 0.1–0.2mm from the base on previous results.

2. Calibrate the printing platform well. An unleveled platform usually causes warping. Allow enough time for sufficient preheating. Please use the 3DPrint–Preheat function. A well preheated platform is essential for printing large objects without warping.



Air Flow Adjustment knob

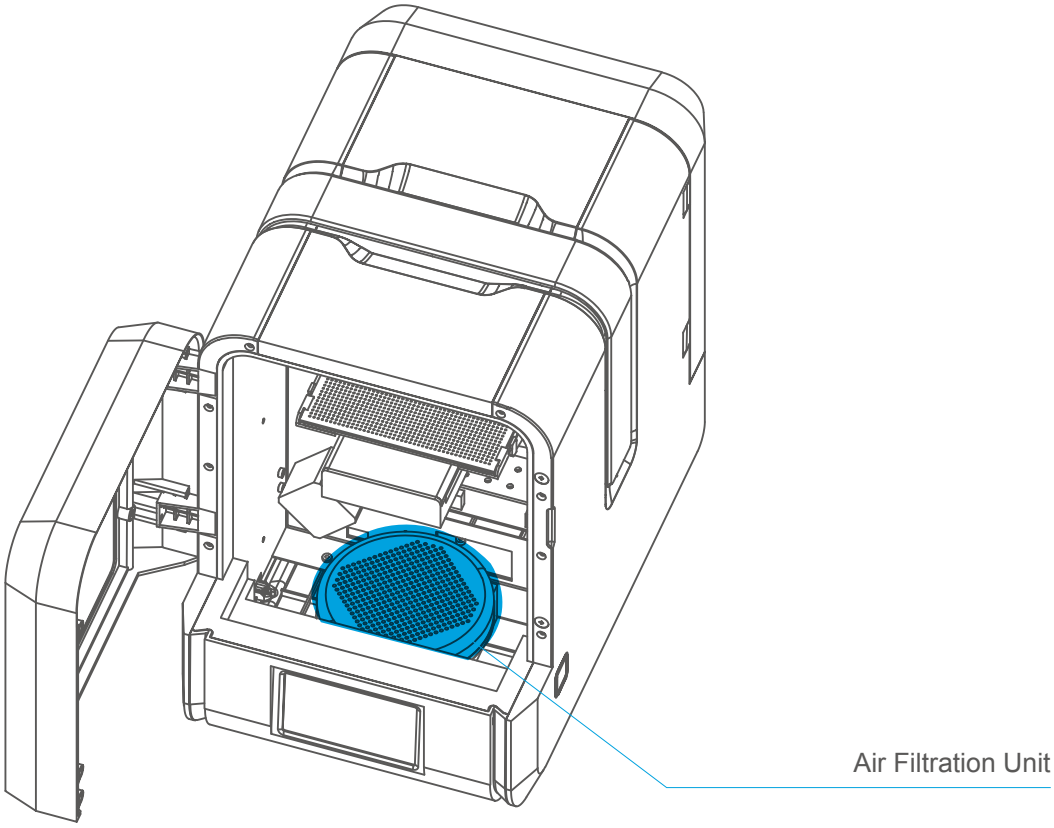
3. The airflow on print head is adjustable, slide the air flow adjustment knob to change the amount of cooling of printed object.Generally the more cooling provided, the better the print quality. Cooling also help separate from support and raft. However cooling also encourage warpping, especially for ABS.
To generalize, PLA can take strong cooling without problem,while ABS should avoid cooling or give little cooling.
For ABS+ medium cooling is recommended.

4. Printing with no raft. It is highly recommended to use raft for normal printing as it improves adhesion and is required for leveling compensation. It is turned on by default, but you can turn it off in the "Print Preference" panel.

5. Printing with no support. It is possible to print with out supporting structures.You can turn off support by choosing "No Support" in the "print" setting panel.

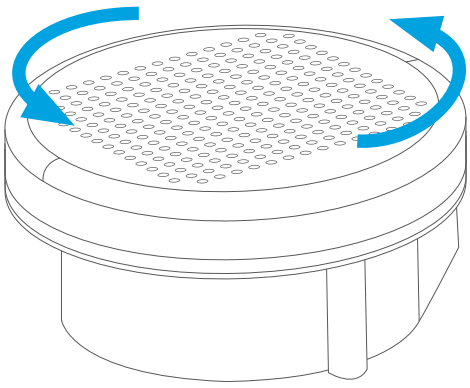
Printer Maintenance - Air Filter Replacement 6-4

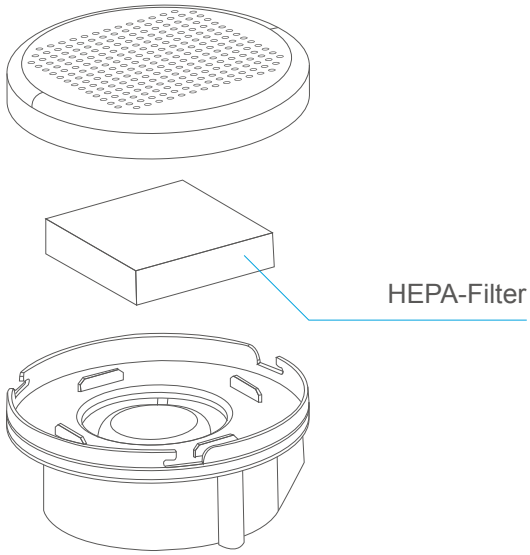
Change air filter for air filatraton unit. It is recommmended to change the filter for every 300 hours of usage or 6 months.

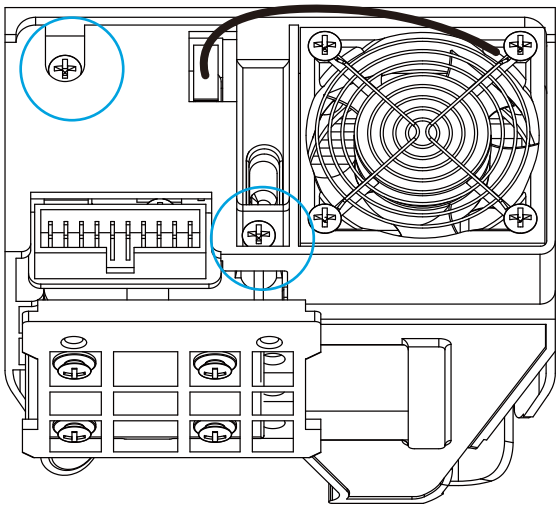


Front View

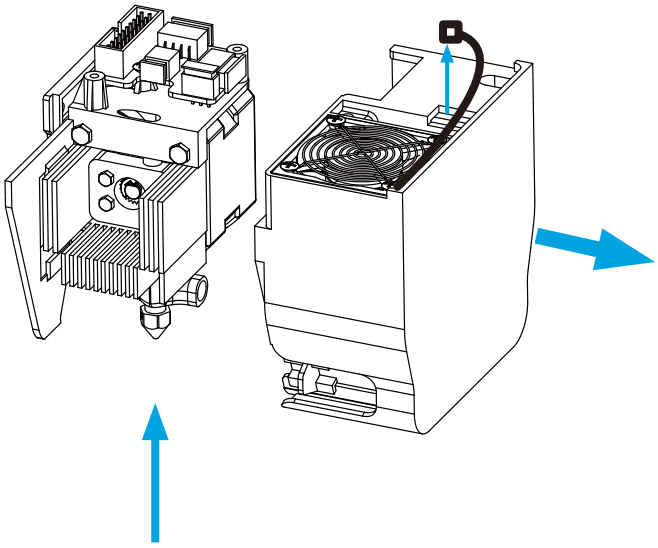
Turn counter-clockwise to open the cap.

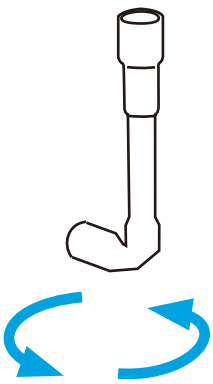






The printhead cover can be removed after removing two screws.

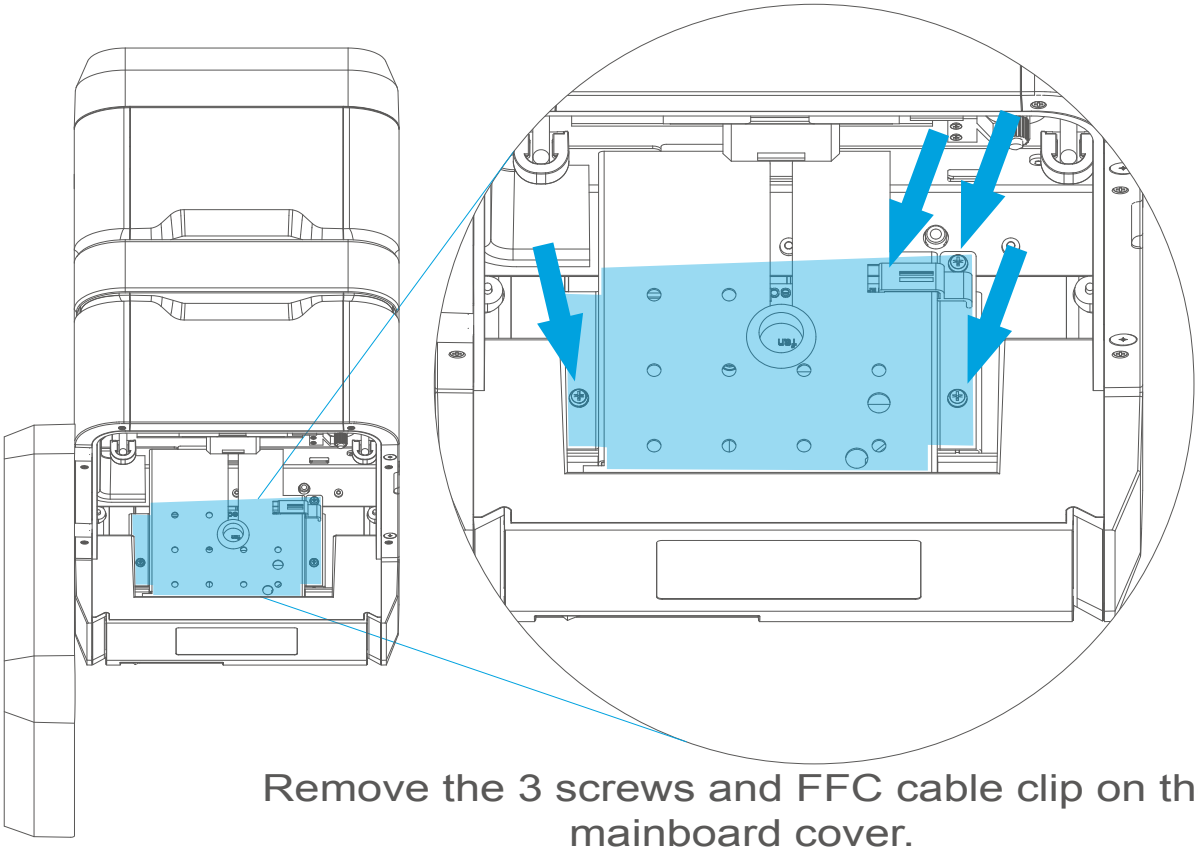




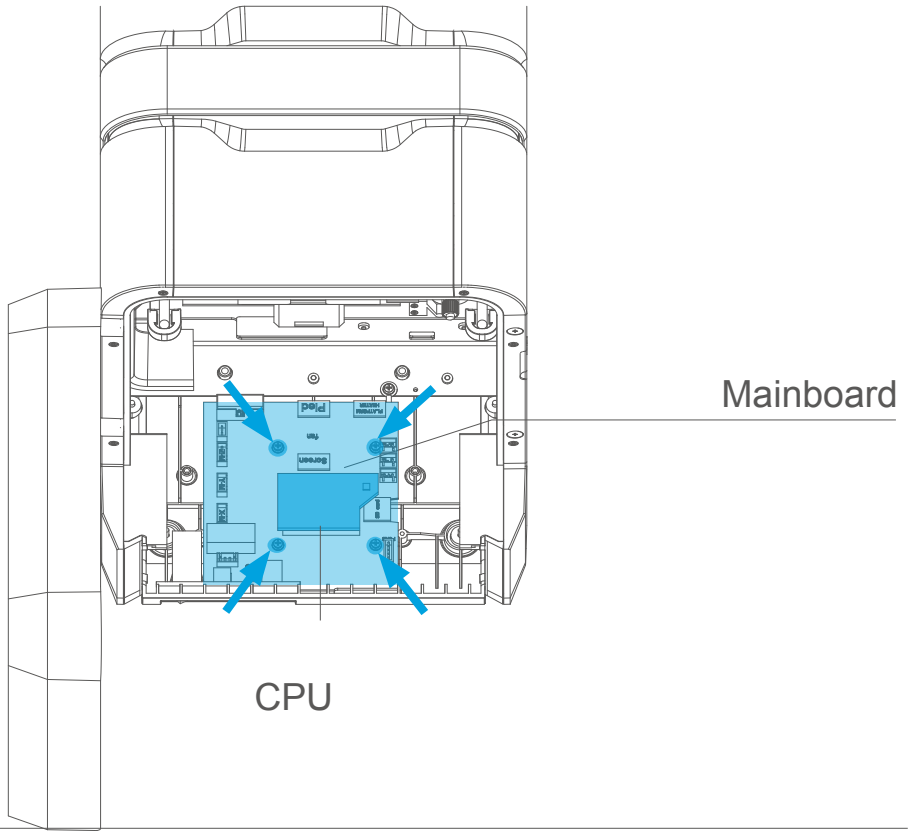
Heat up the nozzle to printing temperature by using the extrude function in the maintenace interface.

Nozzle can be removed by using the nozzle wrench provided. Make sure to stabilize the nozzle heater with a pair of pliers.

User does not need to remove printhead cover in order to remove the nozzle.



Remove the 3 screws and FFC cable clip on the mainboard cover.



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