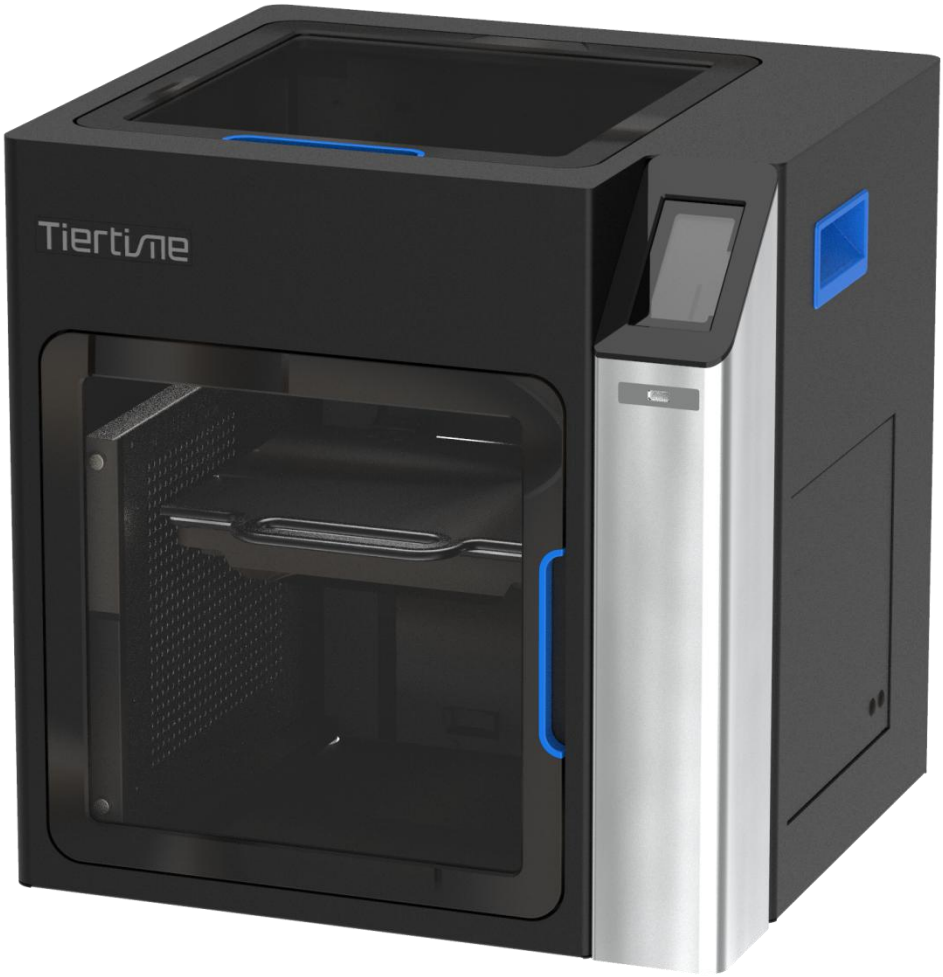
Tiertime UP300D

User Manual



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☼ Marked topics are essential contents that highly recommended for **first time users**.

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1. Safety and Printing Environment

1.1 Safety Precautions

1. The UP300D 3D printer requires the power adapter provided by the original manufacturer, otherwise the machine could be damaged or even cause fire. Keep the power adapter away from water and out of high temperature environments.

2.During printing, the temperature of the nozzle of the printer could reach 300°C and the temperature of the print platform could be over 100°C. Do not touch these parts with your bare hands when the printer is in the operation mode, not even with the heat resistant gloves included in the accessories, as the temperature could damage the gloves and injure your hands.

3. During printing, the print head and other mechanical parts move at high speed. Touching these parts while they are moving could cause injuries.

4. Wear goggles when removing the supporting material from models or detaching models from the build plates.

5. When printing with plastic filaments, the process could generate slight and, for some people, annoying odor. It is recommended to run the printer in a well ventilated environment. We also suggest to keep the printer in an environment with a stable temperature as unwanted cooling could cause adverse effects to the print quality.

6. When using the “Extrude” function, make sure there is enough space between the print head nozzle and the build platform. 50mm is recommended, otherwise the nozzle could be blocked.

7. Fasten moving parts. Tie back loose hair, secure loose clothing and keep all printer doors closed during operation.

8. Do not leave the printer unattended during operation. Watch to make sure the first a few layers adhere correctly.

9. Adult Supervision: Adult supervision is required in the presence of children. Small printed parts are a choking hazard, and always keep sharp tools away from children.

1.2 Printing Environment

As the slight odor could be generated during printing, keep the printer in a well ventilated environment. The UP300D's ideal working temperature is between 15°C and 30°C with a relative humidity between 20–50%. Printing at temperatures out of this range could cause adverse effects to the printing process and print quality.

1.3 One Year Warranty

Tiertime and its authorized resellers warrant to the original purchaser that this product is free from defects in material and workmanship. Tiertime or its resellers 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 Tiertime or a reseller. Print heads, Nozzles and Print Boards are warranted for ninety (90) days.

• Tiertime reserves the right to determine the validity of all warranty claims.
• Warranty is voided if the product serial number has been altered or removed.
• Warranty is voided 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.
For the detailed Warranty and Service Level Agreement, please visit our website https://www.tiertime.com.

1.4 Compliance

FCC

RoHS

CE

2. Unboxing

2.1 Unboxing the UP300D

1. Cut open the tape on the top of the cardboard box, and open the box from the top.

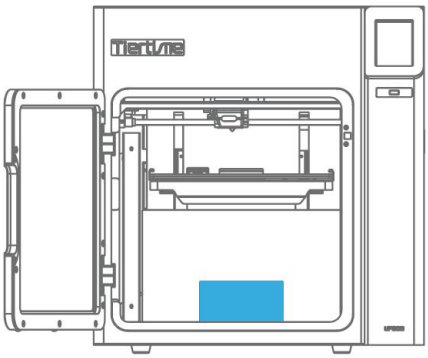
2. Take out the two boards on the top foam, and remove the top foam.

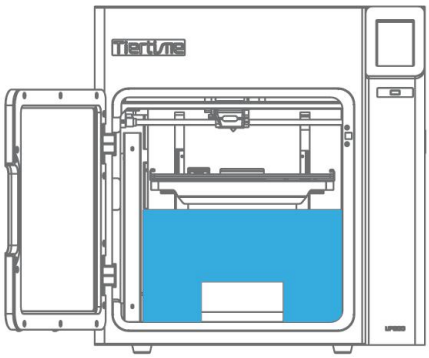
3. Remove the plastic cover and the square shaped foam wrapping around the machine.

4. Lift the printer out of the cardboard box using two handles on both sides of the printer, and place it on a flat surface.

5. Open the Top Lid and remove all the tights and foams inside the printer. There are six tights in the machine.

6. Open the Front Door, and take out the two foams and two extruders beneath the build platform. As figures show below:





7. Take out the roll of filament, the accessory box and the power cord at the bottom of the cardboard box.

8. Put all the foams back to the box, and keep the box for the future use.

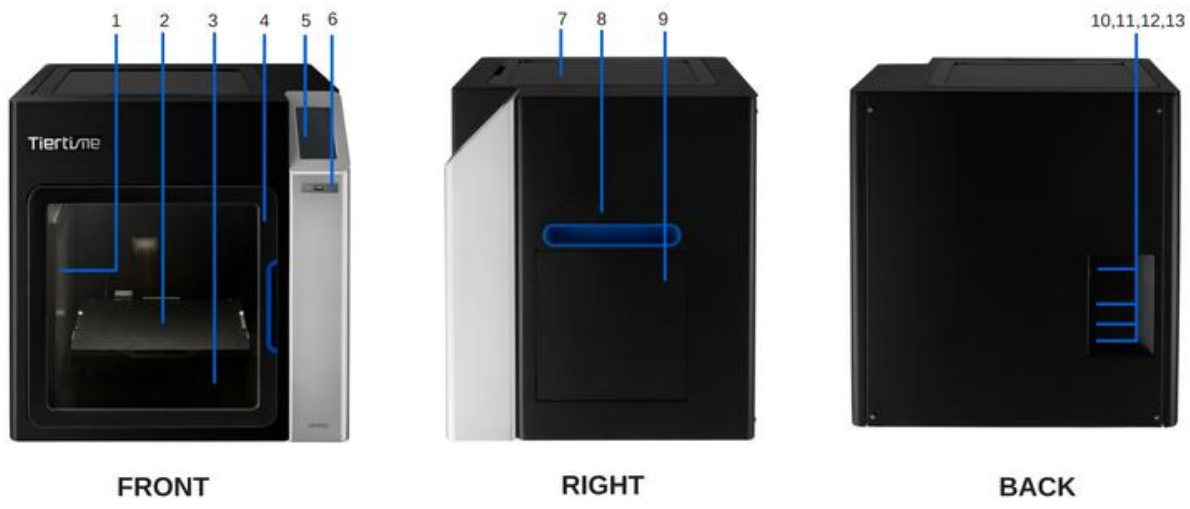
2.2 What's in the box

The Convergence dual extruder is installed on the UP300D.
1. Accessory box
One ABS Type single extruder
One USB Cable
One Pliers
One Scarper
One Nozzle Wrench: 8mm
One Nozzle Wrench: 10mm
One Pair of Gloves
One SD Card Reader
One SD Card
One Calibration Card
One Nozzle Height Detector
Two PTFE Tube: Shorter one for PLA Extruder; Longer one for TPU Extruder
Three Allen Keys: 2mm, 2.5mm, 3mm
Three Nozzles: 0.2mm, 0.4mm, 0.6mm

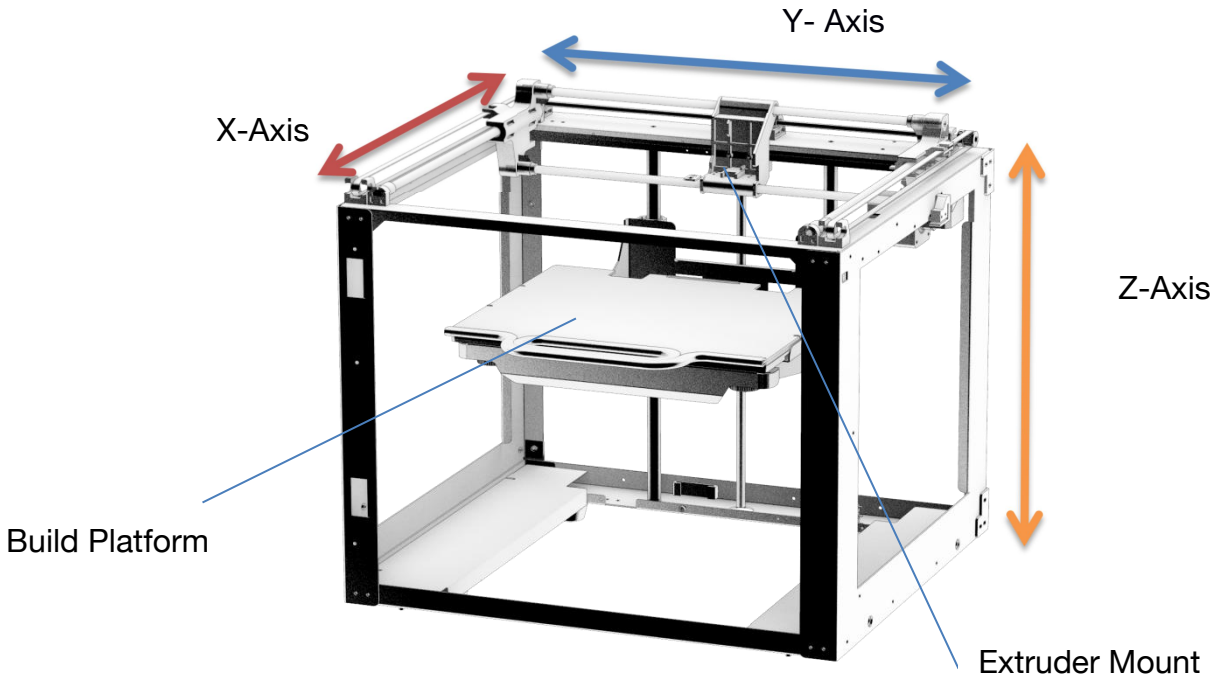
2. In the UP300DD box
One roll of 500g PLA Filament
One roll of 500g Water Soluble Support Filament
One Flex Glass Board
One Perf Glass Board
One Power Adapter
One Power Cord

Notice: All accessories may subject to change without prior notice. If anything is missing, please contact your local distributor, or Tiertime's global technical support center, which can be reached via support@tiertime.com.Introduction

3.1 Main Parts of UP300D



1. Dual Filter 2. Build Platform 3. Waste Tray 4. Front Door 5. Touchscreen 6. Front USB Port	7. Top Lid 8. Right Side Handle 9. Filament Bay 10. Power Switch 11. Ethernet Socket 12. USB Port 13. Power Socket



4. Printer Installation

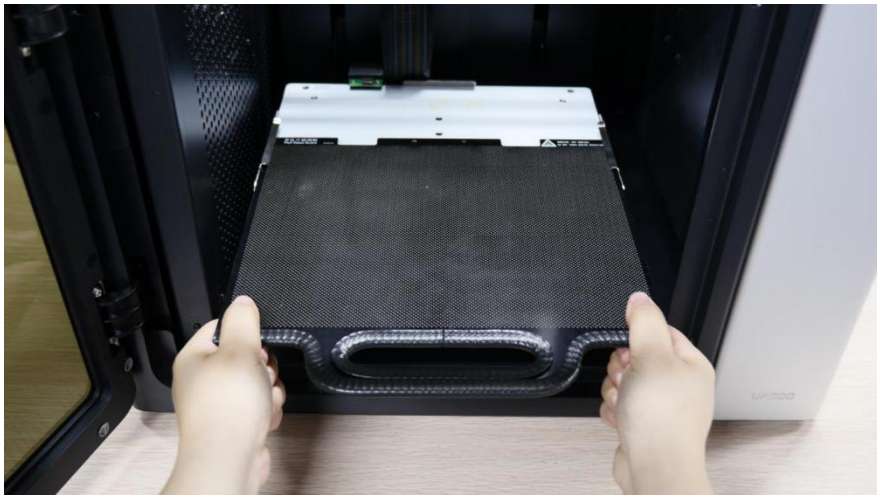
4.1 Install the Print Board

1. Find the “perforated print board”.

2. Open the front door.

3. Slide the board onto the build platform and make sure to push the board all the way to the back.

4. Close the front door.



4.4 Connect the Power Cable
1. Plug in the power on the back of the UP300D
2. Plug the other end of the cable into a wall outlet.

4.2. Install Software UP Studio 3.0

To operate the UP300D, you need to install the UP Studio 3.0 software on your computer. Although UP Studio 2.X can also work with UP300D, it does not support dual extrusion function and is obsoleted.
You can download the installation files of UP studio software from the following url: https://www.tiertime.com/downloads/software

System Requirements:

Supported Operating Systems:

Windows 7 (SP1) or higher (64 bit only)
Mac OS 10.10 or higher

Hardware requirements:
Open GL 2.0
At least 4GB of RAM

Installation

Make sure you download the correct version of software based on your computer's configuration.

4.3 Update the Touchscreen Firmware

We regularly update the Tiertime 3D printer's touchscreen program. It is important to make sure your UP300D's touchscreen system is up-to-date before the first use and pay attention to the upgrade announcement for touchscreen system in the future.

1. Download the UP300D Touchscreen Upgrade Program from https://www.tiertime.com/touchscreen-upgrade-program/

2. Save the file to the root directory of the USB drive which comes with the UP300D, and make sure the file is named as "UP300D_x.x.x_update.tt" (Case sensitive), x.x.x being the version number.

3. Insert the USB drive to the USB socket under the touch screen, and turn on the printer. Wait until the printer is fully ready, go to Information Page, and press the "Upgrade" button. Follow the instructions on the touchscreen afterwards.

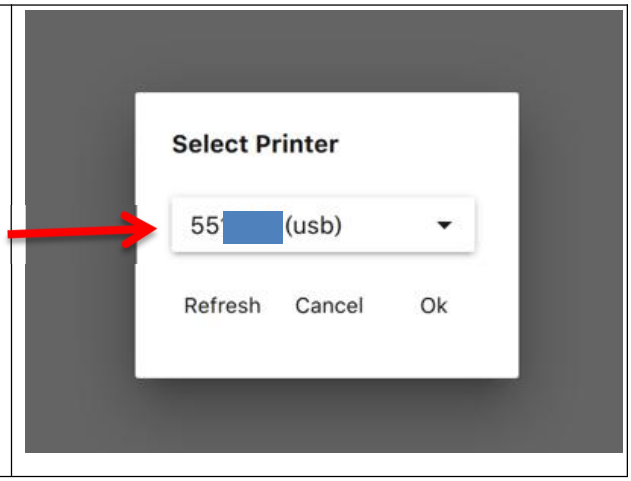
4. Keep the USB drive handy for the future use.

5. Prepare UP300D for Printing

UP300D supports USB and other networking communications. For Wi-Fi, and Ethernet connection please refer to page xxxxx.

5.1 USB Connection

Find a USB cable, and connect one end to the computer and the other end to the UP300D back USB port (type-B). Open the UP Studio on the computer, you will find the connected UP300D listed in the available printer list of Wand.



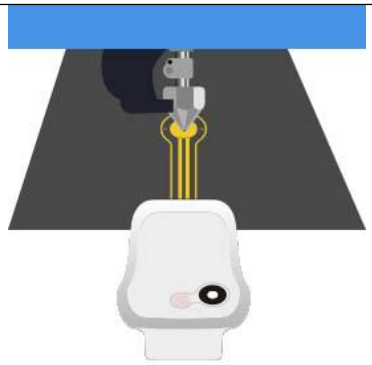
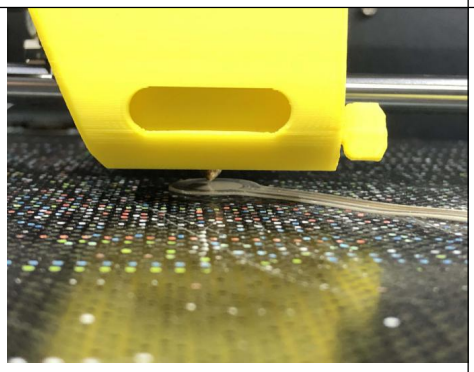
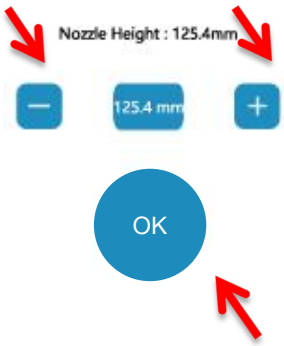
5.2 Auto Calibration

Auto Calibration can be triggered from the touchscreen, or from Wand software when connected to a computer (refer to page xxx). It consist of leveling of the build plate and measurement of nozzle height. For more info please refer to page xxx.

Auto Calibration from Touchscreen

1. When the machine is switched on, user need to first run initialization in order to operate the printer. Go to touchscreen press initialize button.
2. Click Calibration.
3. AUTO. The printer will start the process of calibration.

1. Initialize Printer	2. Press “Calibrate”	3. Press “Auto”

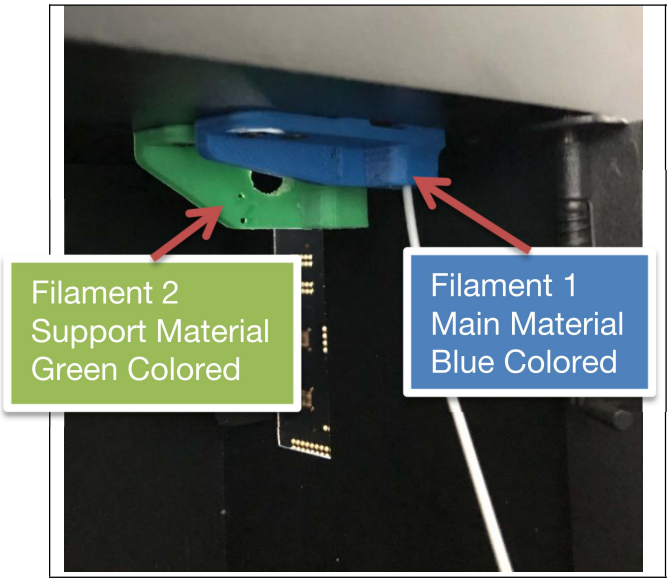
4.When Leveling procedure finishes, the touchscreen will ask the user to confirm nozzle height value.	5. Put the nozzle height detector under the nozzle.Adjust the + and - button to make the nozzle just touching the sensor pad	6. When the nozzle touch the sensor it will emit a buzz sound, press OK button to save the value
		

Make sure the nozzle is clean, plastic debris will add error to Nozzle Height.

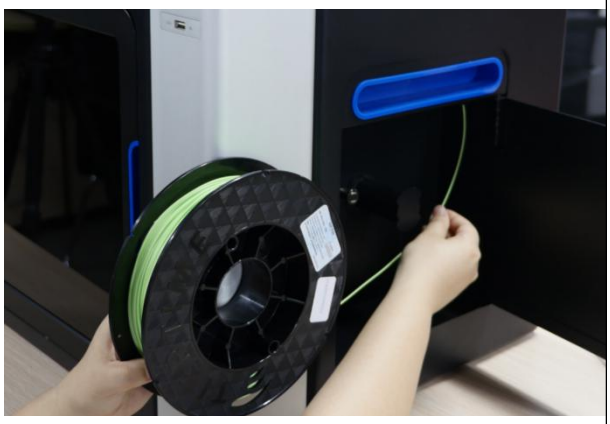
5.3 Load Filament

You will find two spools of filaments in the package.
1. 500g Tiertime PLA
2. 500g Tiertime PVA
In order to archive good consistency and print quality, we recommend use Tiertime filaments. The default print settings of UP Studio are optimized using Tiertime materials, so you can start printing confidently without adjusting any parameters.

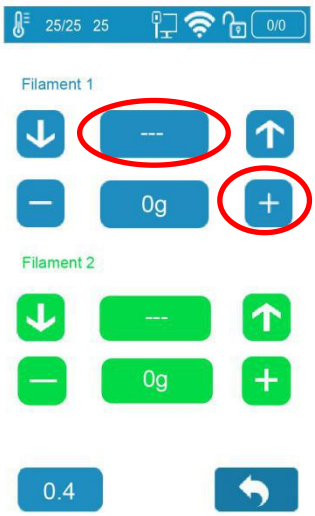
Load Main Material (1)
To install the filament, please following the instruction below:
1. Remove the vacuumed bag.
2. Find the end of the filament, and use pliers to make a clean cut of the end.
3. Open the door of the filament bay, feed it into the guiding tube, you should able to feel the filament triggered mechanical switch (filament sensor) at the opening.
4. Keep feeding the filament until the end of the filament sticks out from the other end of the guiding tube (You can open the top lid, and make sure the filament sticks out).

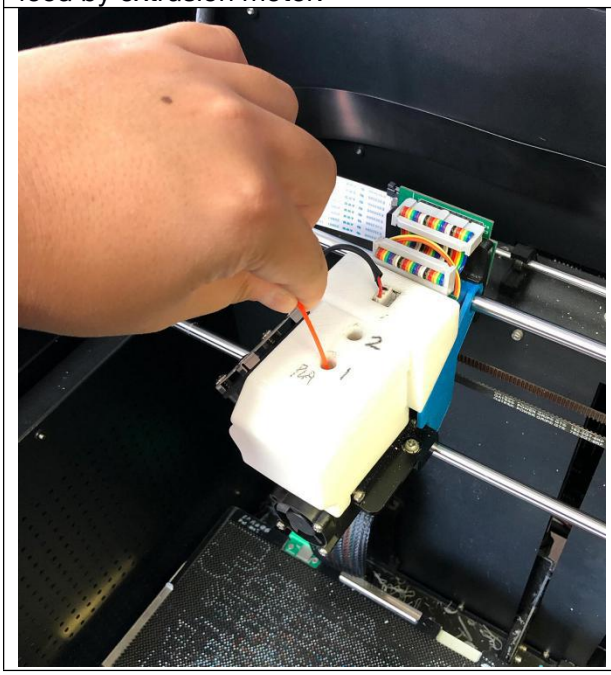
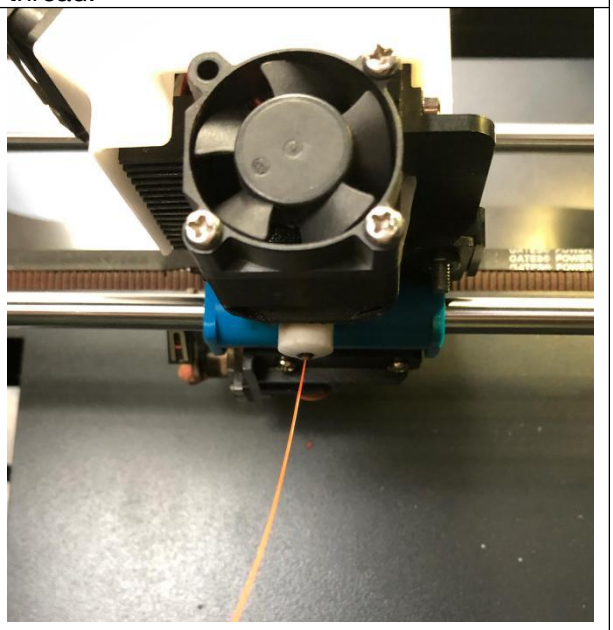


Insert filament into guiding tube, must go through the filament sensor.

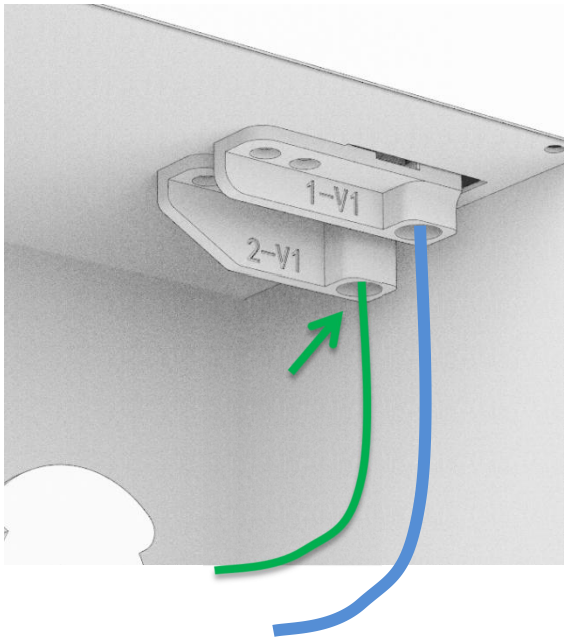


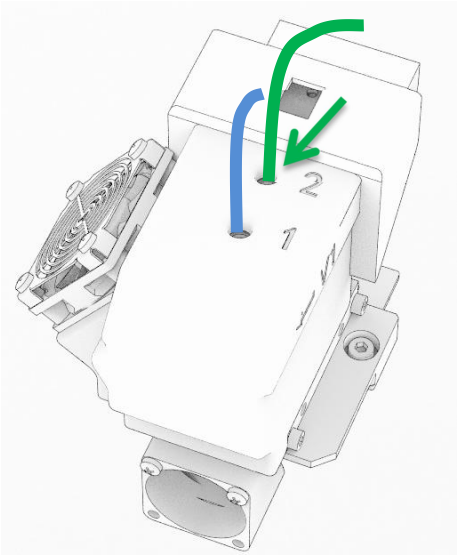
5. Go to touchscreen

1. Press Material	2. Press “Filament 1”Material Button until it shows “PLA”, then press “+” button to increase material weight to 500g.	3. Press “ ” to extrude material. The machine will heat up and buzz when start to extrude. It will stop automatically
		

4. When the extruder start to extrude, push the filament into entry 1 on extruder until it can be feed by extrusion motor.	5. The filament should able to be extruded from nozzle and form a clean straight thin thread.
	

Load Support Material (2)
Loading of support material is same the main material but use the Filament 2 entry from the filament bay and extruder head. On touchscreen user should choose the correct support material that match the main material. For PLA, the matching support could be Tiertime PVA or breakaway. For more info refer to page xxx.





---Important!!!---

For Convergence Dual Extruder, both main and support materials must be loaded into the extruder. Leaving one side of the hotend empty will inevitably results in hotend clogging.

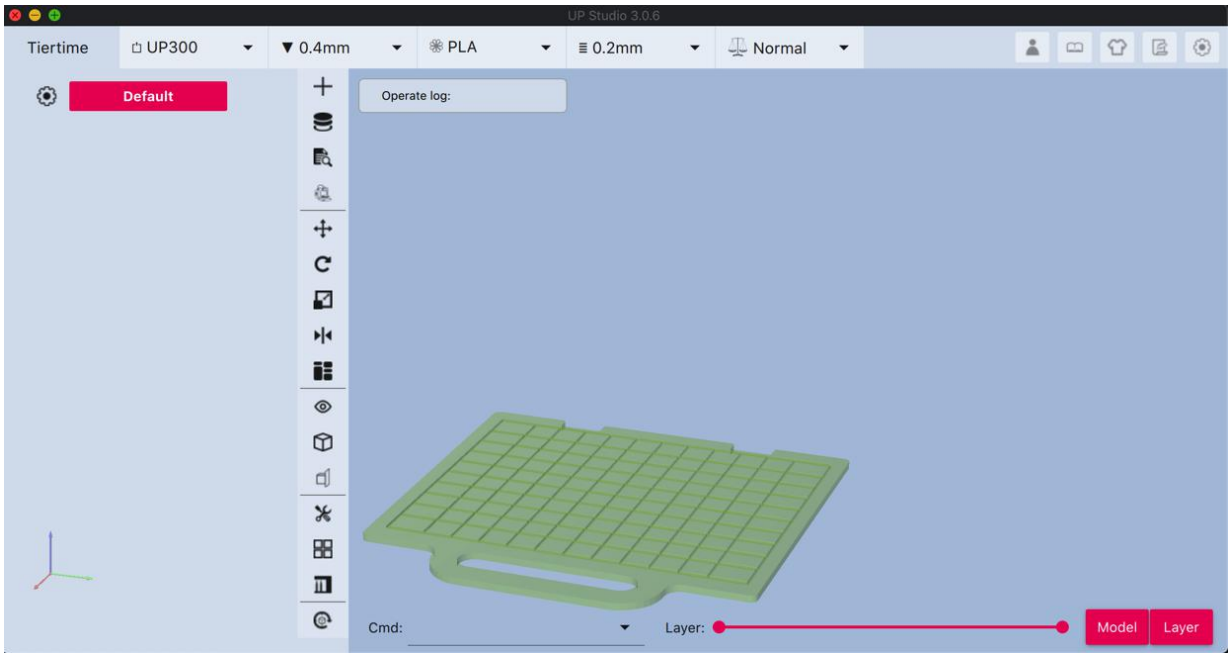
6. First Print

This chapter intends to guide new users to print a object with the Covergence Dual extruder. Therefore as mentioned in the previous chapter the printer should be loaded with PLA and Tiertime PVA support for dual material printing.

-For more info on the convergence dual please refer to page xxx
-UP300D can also use LT/HT Single Extruder for single material printing, for more info on printing with single material, please refer to page xxx.

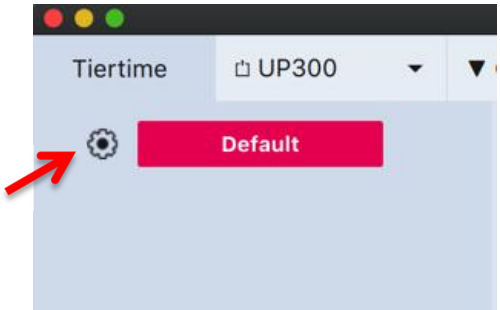
6.1. Slicing

1. Open UP Studio 3.

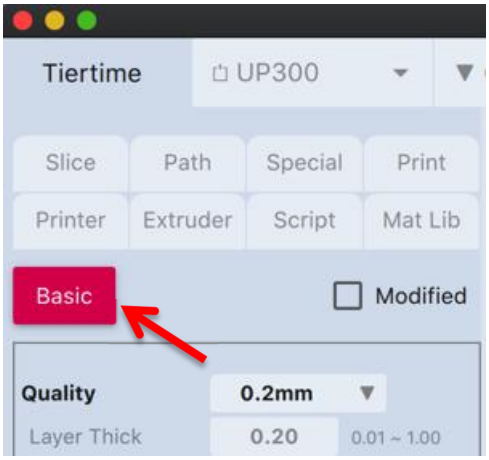


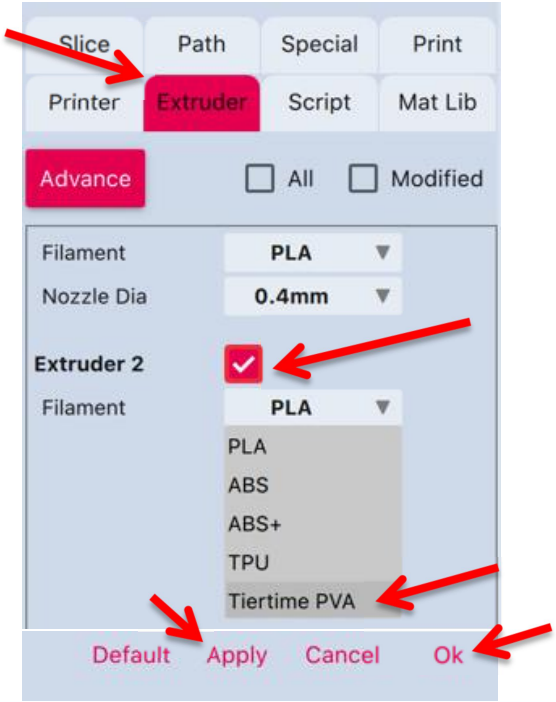
2. Turn on Extruder 2.

1. At Left column click the “gear” icon to open the print setting menu.



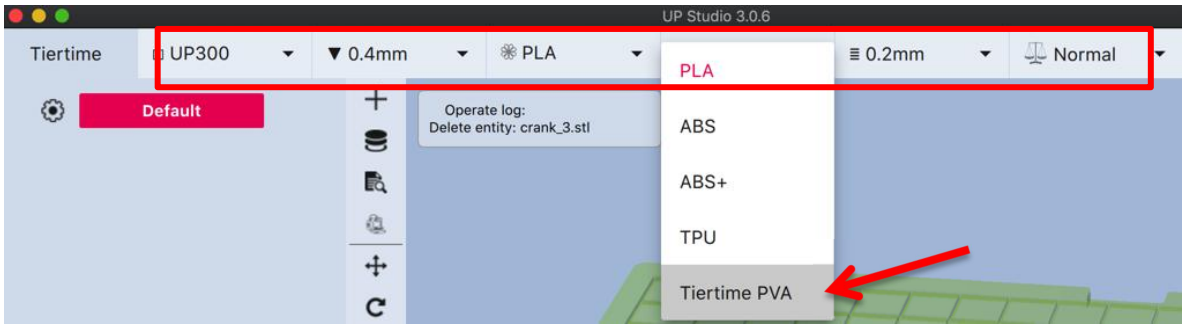
2. Then click “Basic” button to switch to “Advanced” mode.



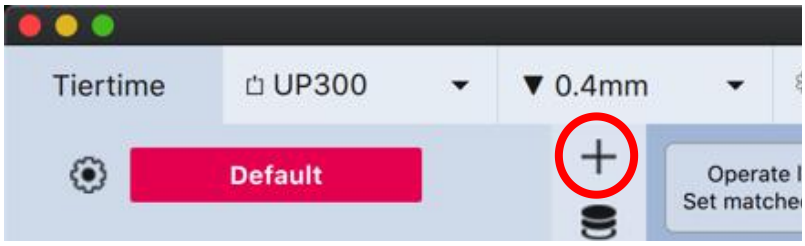


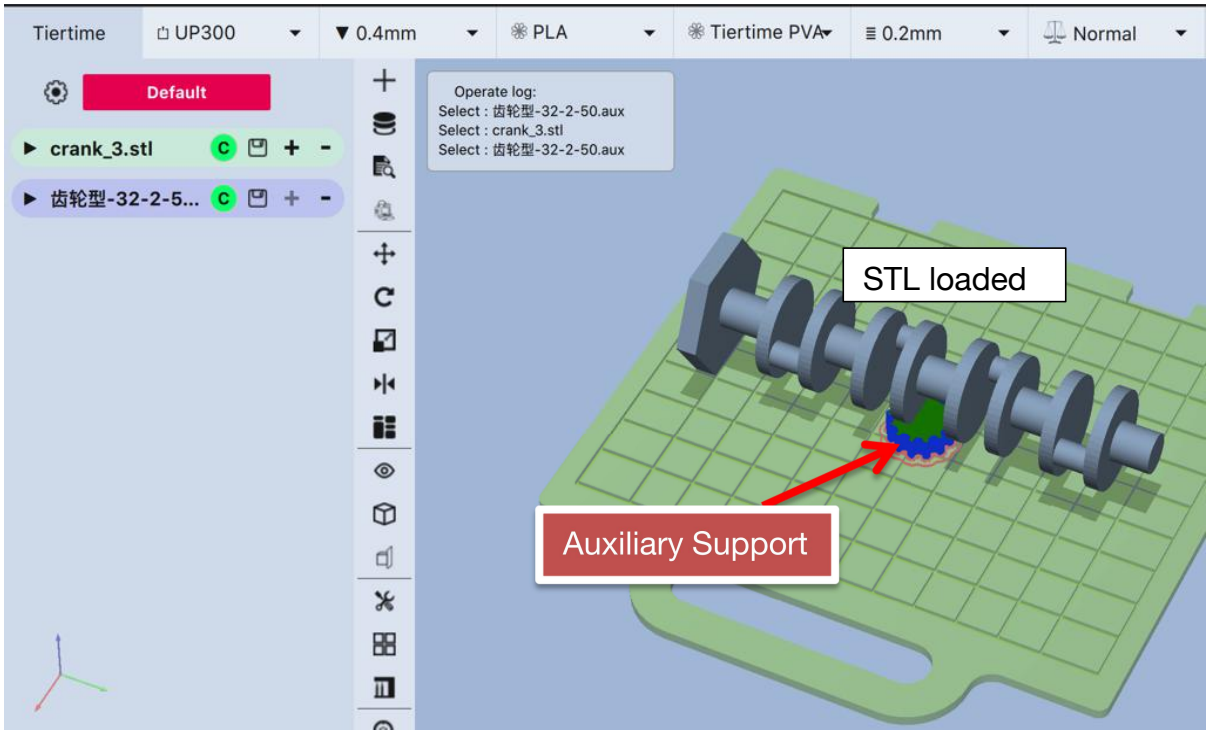
3. Select “Extruder” Tab, Check the “Extruder 2” Option, then select filament “Tiertime PVA” for its filament option. Then click “Apply” => “OK”

4. Go to top menu print settings, select the correct machine type and print settings, eg Layer thick and nozzle diameter, the filament type for both extruders. The left side material is filament 1(main material) select PLA, the right side material (support) select Tiertime PVA.



3. Load a STL file by click the “+” button on the vertical menu.





Please note an Auxiliary support pillar is auto loaded with the file. This is due to the activation of second extruder. On the left object list, two new entries appear, one is the STL model loaded and the other is the Auxiliary support.

6.2 Auxiliary Support (A.S.)

It is a special preset object for material switching during a print. The A.S. is printed as a column and material will be switched within the path of A.S region of the current layer. User should able to observe a gradient of material change in A.S.. It is important to have A.S. for printing dual material, as all the mixture of the two materials during shifting main(1) and support (2) material will be dumped into the A.S. and the support and main objects will retain high purity of its own corresponding material. This is important as mixing the two material not only affect the color of print, but also affect the strength of the main object and the solubility of the support.

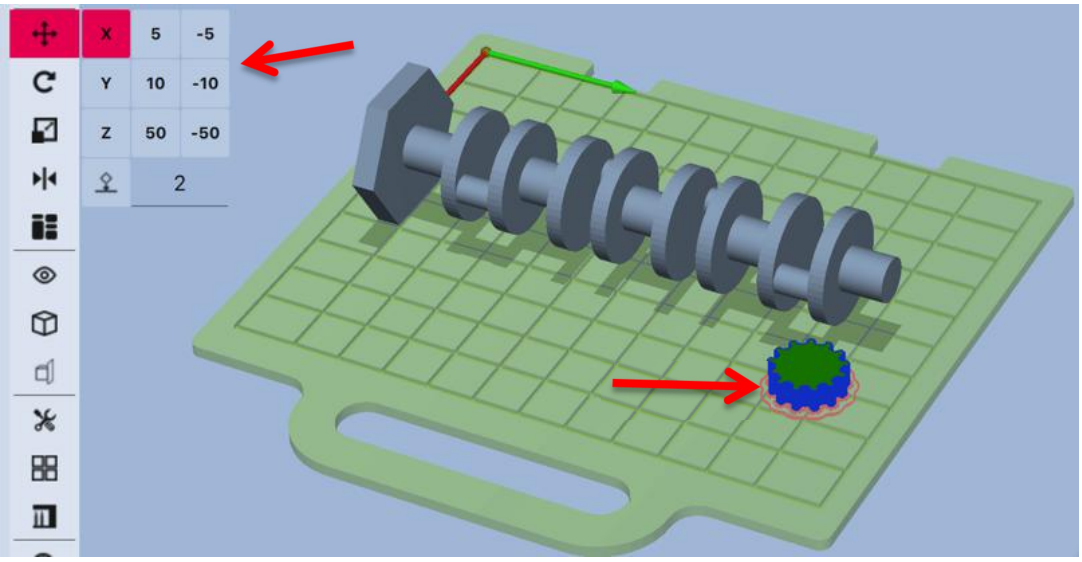
Auxiliary Support print setting is partially depend on the print parameter of the current print job but its shape and path are not adjustable by users.

Due to the structure of Covergence Dual Extruder, prolonged stagnent material flow in the hotend will casue degradation and backflow material which eventually result in clogging of hotend.
1. Even user is printing an object that does not need any support, the Auxiliary support(A.S) is still required for periodic material purge to prevent clogging.

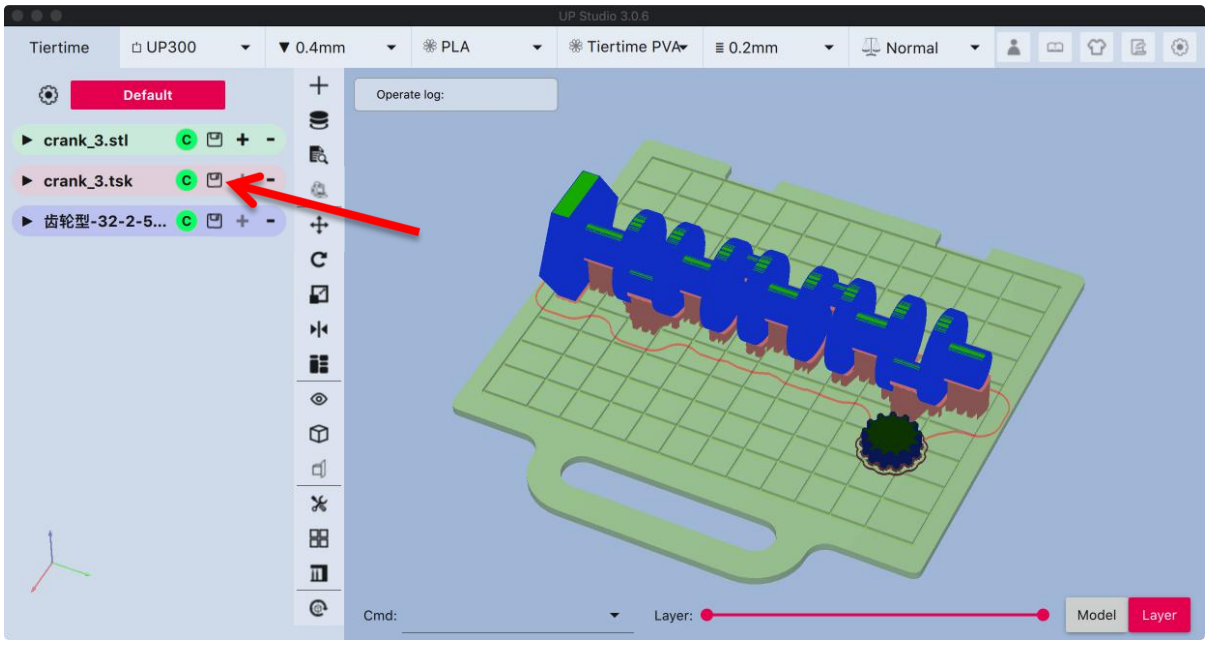
2. When using the same material for both main (1) and support (2), the A.S. is still required.

4. Move the Auxiliary support pillar to a suitable location.

1. First left click on the Auxiliary support to select it, then click the “ ” move button.
2. Right-click-drag the Axuiliary support to an area not overlapping with the STL model.
3. Alternatively user can adjust the location by using the key pad. For more info on model layout please go page xxxx.



5. Print preview. After adjustment of the model layout, click the “ ” preview button to slice the model for preview (not saved).



Click “ ” (save) button of the task file to save it to hard drive or USB drive.

6.2 Connect and Send Print Job to Printer

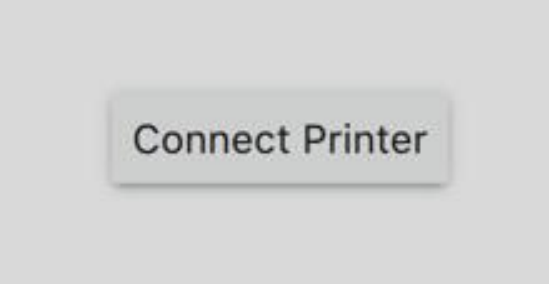
U300D supports USB, Wi-Fi, and Ethernet connection. For Connecting with WiFi or Ethernet, please refer to page xxx.

USB Connection

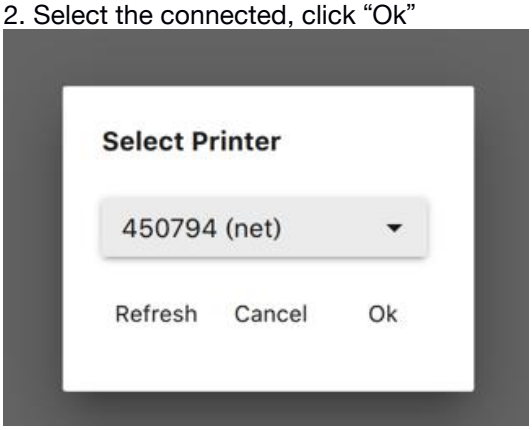
Use the USB cable included, connect to one of your computers USB port and UP300D's back side USB port (Type-B).

Open UP Studio 3 on the computer, click the " " button (Print) to bring up the "Wand" printer hosting module.

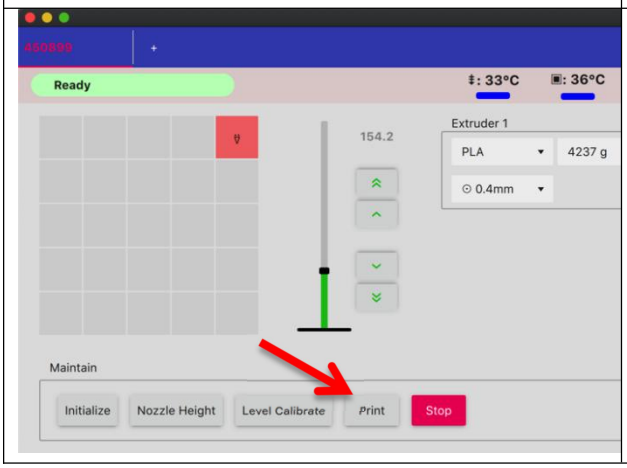
1. Click connect printer



2. Select the connected, click "Ok"



3. Click "Print" to bring up task list.



4. Click "Print Task" to load the .TSK file that just saved.

Once selected, the task file will be transferred to the printer. When data transfer is finished, it will start to heat up and start printing after reaching adequate temperature. As long as the data transfer is finished, user can disconnect the printer from computer and printer will able to carry out the print job on its own.

6.3 Remove the Printed model

To remove the printed model from the print board of the UP300D, it is recommended to wear gloves for protection. Take out the print board with its front handle, using the scraper that comes with the machine, scraping the model off the print board from one corner of the model.
Clean the print board from plastic residues, put back into the build chamber for the next print.

7. Printer Calibration

Printer calibration in Tiertime system involve of followings:

1. Nozzle Height Measurement

2. Platform Matrix Leveling (9-Point Compensation)

3. Vertical Calibration

4. Dimensional Calibration

All the above calibration are made in terms of **SOFTWARE**. For Nozzle Height and Leveling Compensation are routine procedures that are done by users.

For Dimensional calibration and Vertical calibration were done through hardware in factory and only need to be re-calibrated in software when user found the corresponding measurements are not satisfactory.

Since all the calibration data are stored in the on-board SD card of the touchscreen mainboard. If user replaced/formatted SD card or replaced touchscreen entirely, the calibration data previously made will be lost and the calibration may need to be redone.

7.1 Nozzle Height Measurement

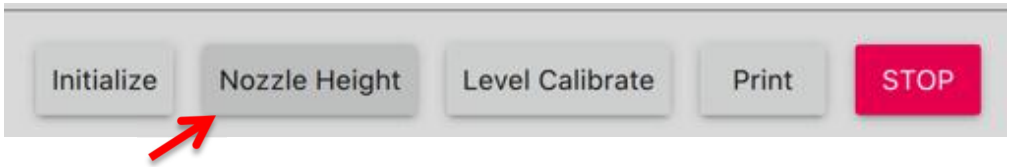
Nozzle Height Value is the most important measurement of the printer as it determines how close the nozzle to the build platform when printing starts. The optimal distance between nozzle and build surface depends on depends on different situation.

If use raft, the optimal distance is about 0.2mm.
If print without raft the distance should be less than 1x layer height, eg 0.2mm layer the distance should be about 0.1-0.15mm.
The reason for this is, in order to achieve good first layer adhesion, the first layer should be pressed against the build surface, become slightly overspread to obtain a adequate contact with the print surface.

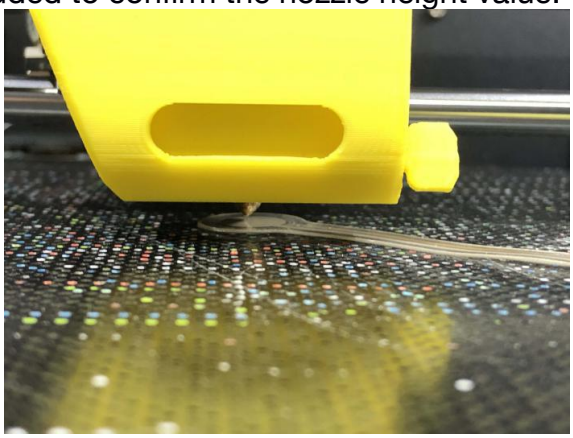
7.1 Set Nozzle Height through Touchscreen, please refer to page xxx.

7.2 Setup Nozzle Height Value through Wand (computer hosted)

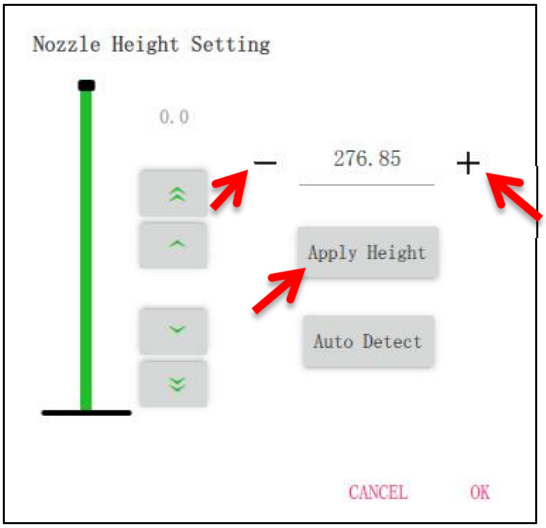
7.2.1 Connect printer to computer, open UP Studio 3.0 and click the “Print” button to open “Wand”.
7.2.2 Click “Nozzle Height” button, the print head will move the position that is near the platform.



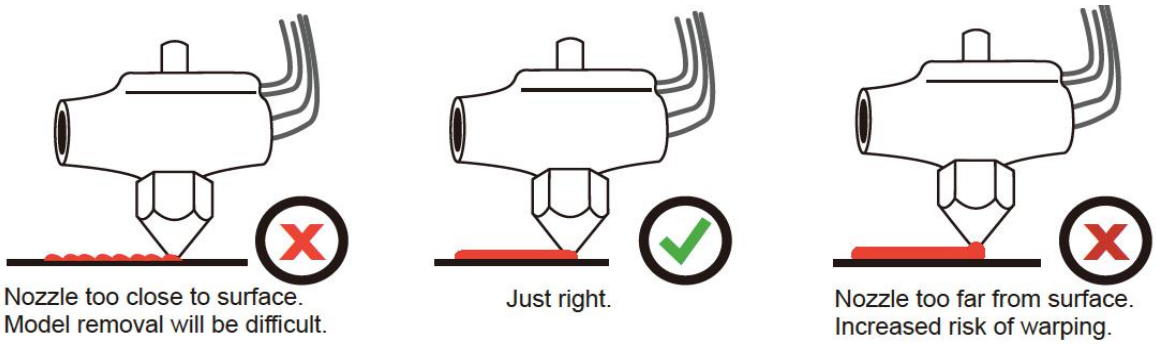
7.2.3 Use the height detector included to confirm the nozzle height value.



User need to put the sensor pad of the detector under the nozzle and then use + / - buttons to adjust the nozzle to touch the sensor until the sensor give a buzz sound. When the nozzle height is determined by the sensor, click “Apply Height” to update the nozzle height value.



It is recommend to print a small test object after the measurement, check the following for recommended first layer adhesion.

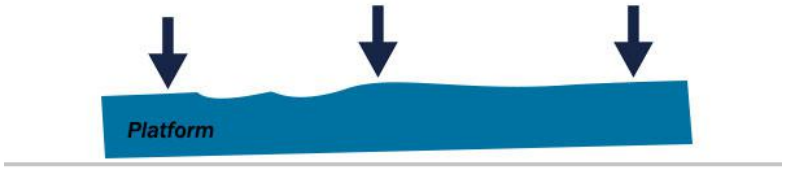


7.3 Matrix Leveling (9-Point Compensation)

Tiertime Matrix Leveling can effectively reduce the adverse effects of tilt and uneven surface of build platform. The leveling will not affect the print's dimensional accuracy in contrary to other leveling methods. Its leveling mechanism is to first measure the platform heights at 9 different points and then use the values to generate a compensating raft that provides a flat and leveled build surface. Then the object is print onto the raft for best print quality and platform adhesion.

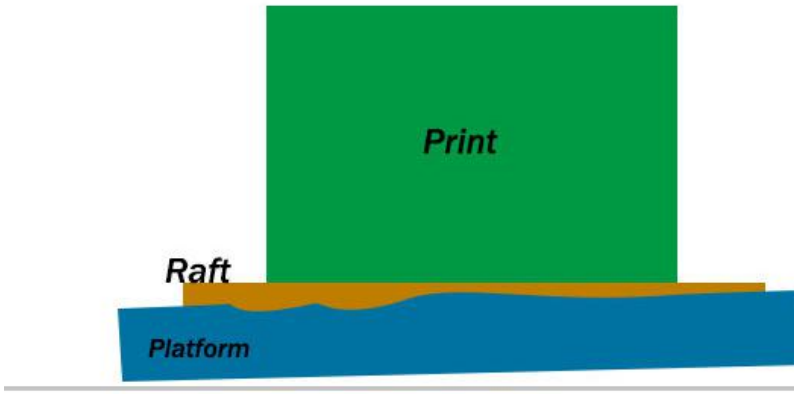
The Leveling process could done automatically or manually on UP300D.

1. Platform may be tilted and print surface may be uneven (may not be visible in real situation). Platform height at 9 different points are measured (arrows) by automatic probe or manually with paper.



2. A compensating raft is laid onto the platform to build a flat and leveled surface. The amount of compensation depends on the result of the previous measurement.

3. Object is printed on the raft. Note object's bottom is flat and horizontal in contrary to the platform's tilted and uneven surface.

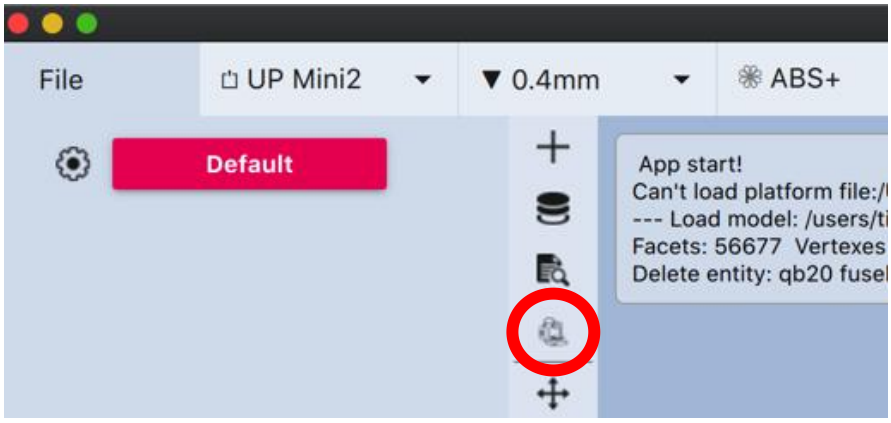


7.3.1 Auto Matrix Leveling through touchscreen, refer to page xxxx.

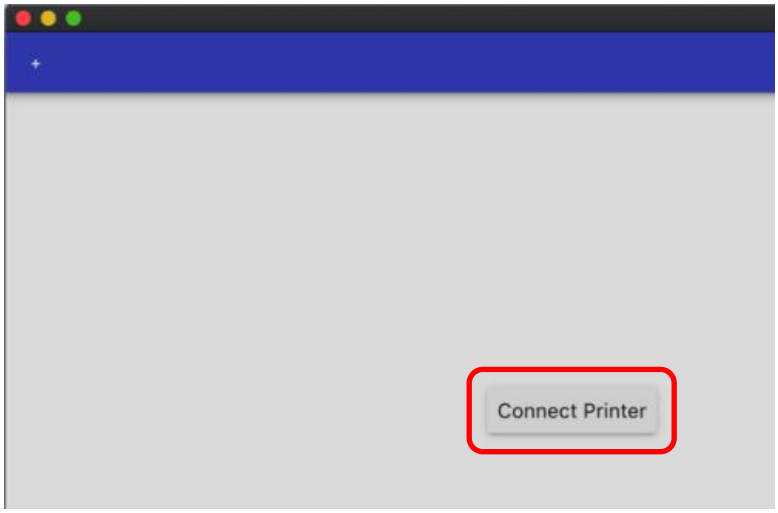
7.3.2 Auto Matrix Leveling through Wand (computer hosted).

1. Connect printer to computer using USB/Wi-Fi cable.

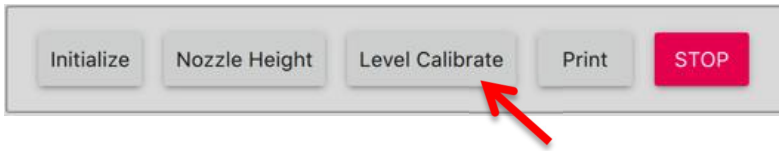
2. In UP Studio click “Print” button to open “Wand”.



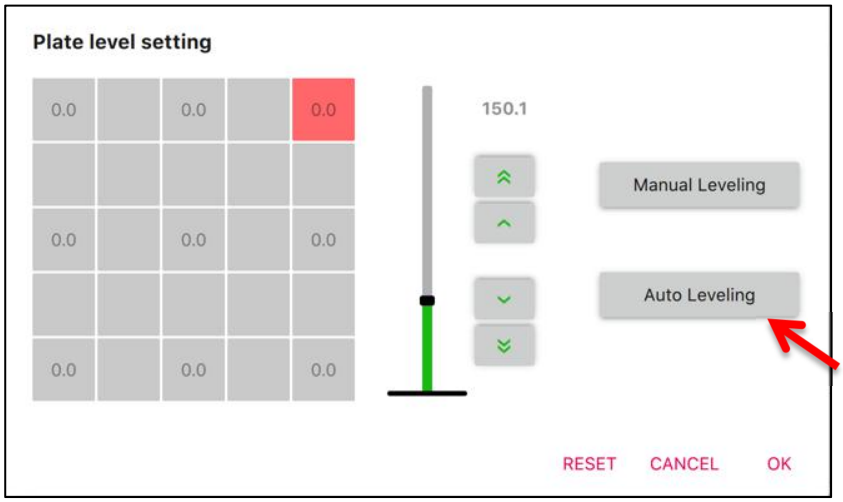
3. Click “Connect Printer”, the USB connected printer should in the available printer list, click it to connect.



3. Click **Initialize**, and wait for the initialization process finishes
4. Click Level Calibrate.



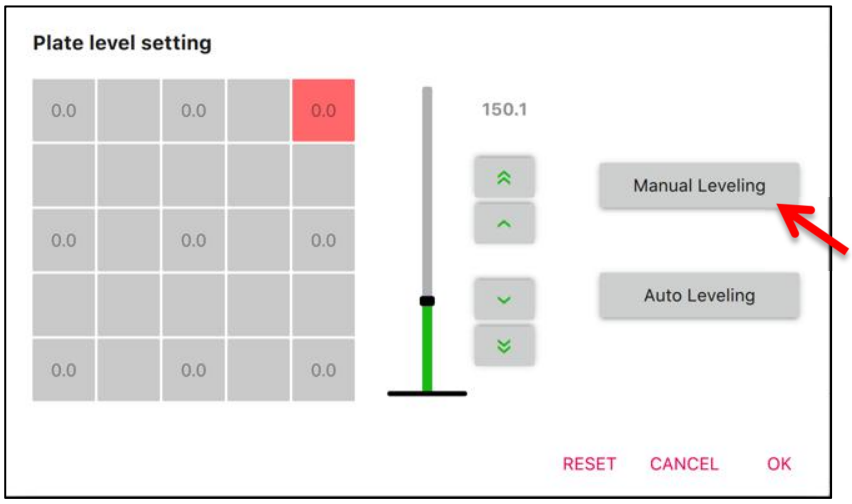
5. Click Auto Leveling, the print head will then probe the platform in 9 positions. The leveling probe will be lowered and start to probe nine positions on the platform. After probing the platform, the leveling data will be updated and stored in the machine. The leveling probe retracts automatically when the process is done.



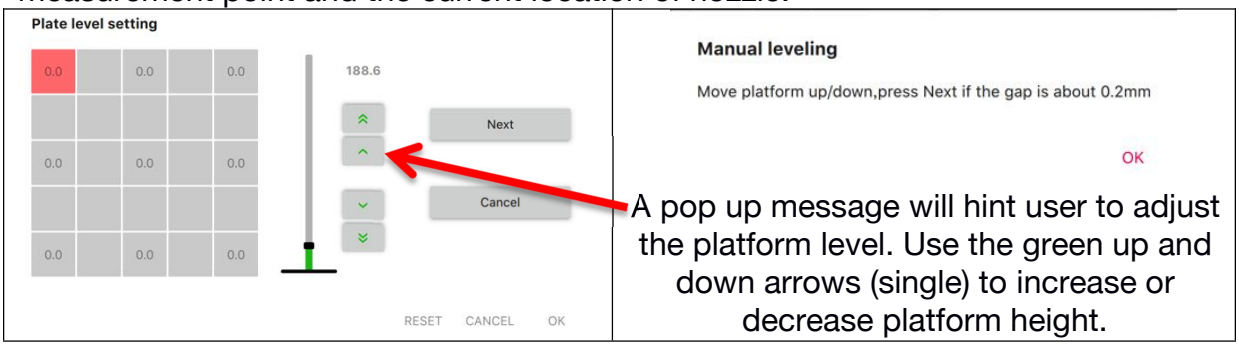
7.4 Manual calibration

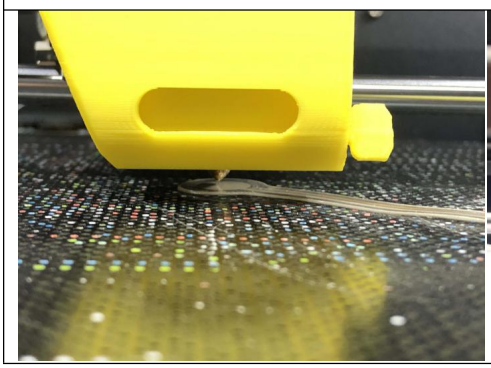
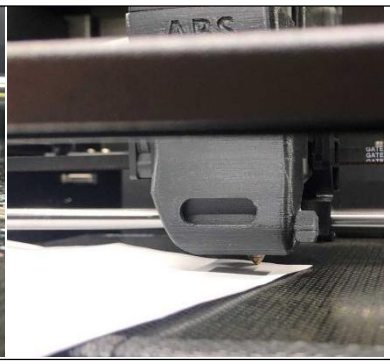
Although the Auto Calibration is always the easiest way to calibrate the UP300D, some advanced users may prefer to level manually to have full control of result.

1. At plate leveling interface, click the Manual Leveling button



2. Red square now move the box on upper left corner representing the measurement point and the current location of nozzle.

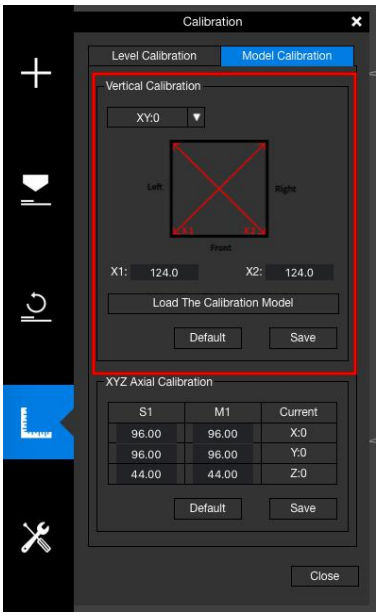


Use the nozzle height detector (or a piece paper as feel gauge) to determine the platform height at the measurement point.	Click “Next” button to save the current height reading and move to the next measurement point.
 	

Repeat the measurement for all 9 points then the software will calculate the compensation values for all the 9 points as well as the ~~nozzle height value?~~

7.5 Vertical Calibration

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

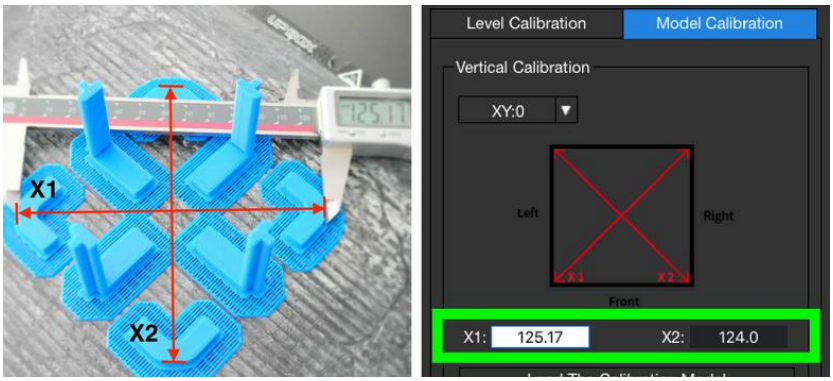


1. Find the VC.stl in the installation directory of UP Studio. Load it in UP Studio software, and follow the normal process to print it.

2. After the model printing is done, take out the build surface with the printed model on it. Don't remove the object from the surface. The printed model includes 4 corners, and 4 L-shapes.

3. In the UP Studio Software, find Model Calibration. Click **Default** before entering any new values into the edit fields.

4. Perform X/Y measurements. Use a thin ruler or a Vernier scale to measure the diagonal length of the printed model from one corner to the opposite corner, as shown in the figure below for X1. Then, do the same for X2. Enter the values for X1 and X2 into the software.



5. Click the Confirm button to complete the X/Y axis calibration. The software will round those values to the nearest tenth.

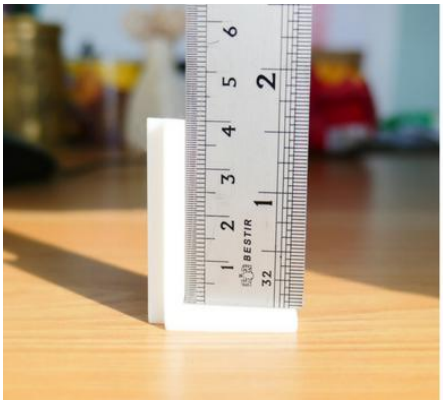
6. Click the dropdown menu in the upper left to shift to X/Z mode. X/Z calibration requires measurement of the L-shapes.

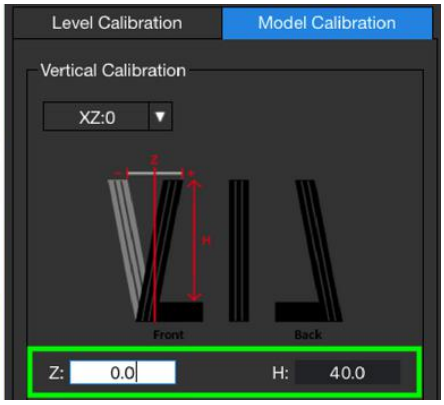
Only one L-shape is needed to do the measurement, but all the L-shapes are needed to check in order to find the right one.

First, remove all the L-shapes from the build plate and peel them off the raft. Rememer the position of each L-shape on the build plate when peel them off the build plate.

Place them in a position on a table that matches their original position on the print surface – right for right, front for front, etc.

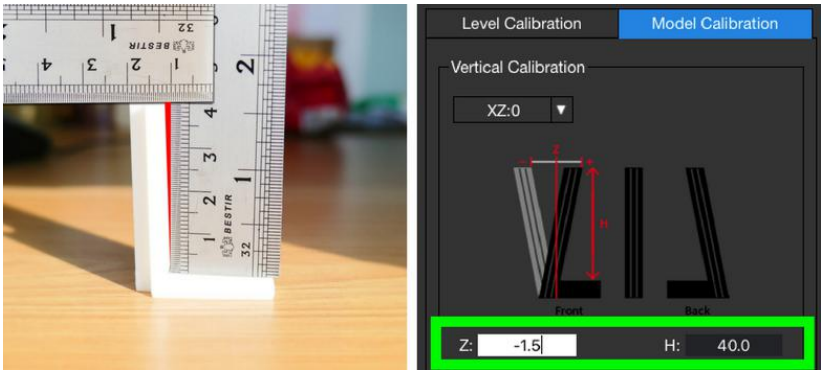
Use a right angle ruler as shown in the following Figure and push the ruler against the corner of each one of the L-shapes. If the angle of the corner of the L-shape is 90 degrees, move to the next L-shape. Continue this process with each L-Shape. If all the L-shapes are 90 degrees as shown in figures 3 and 4, enter '0.0' for the Z value and X/Z calibration is done.



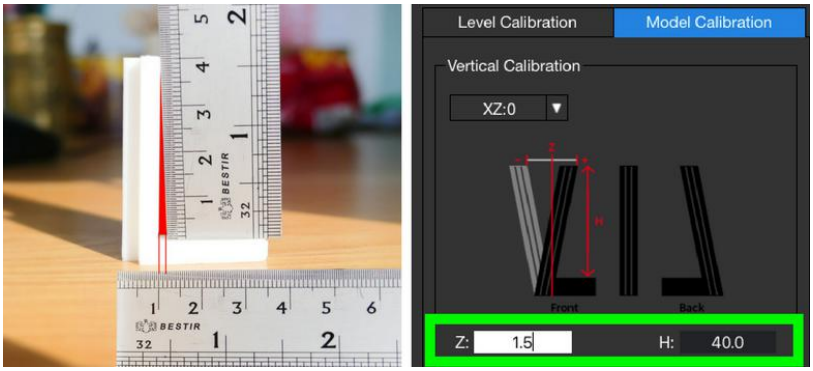


If you find one L-shape that is not 90 degrees, it means the X and Z axis are not perpencular, and it needs to be adjusted. To clarify, you need to look for a gap between the ruler and the L-shaped object. If you find a gap, you have found the L-shape that will provide your Z value and so you need to measure the gap.

The gap will either be at the top of the L-Shape (an obtuse angle) or at the bottom corner(an acute angle), between the ruler and L-Shape. Use another ruler to measure the gap, as shown below. Enter the Z value as a negative number if the angle is obtuse. Enter the Z value as a positive number if the angle is acute.



Obtuse Angle, Z value will be negative.



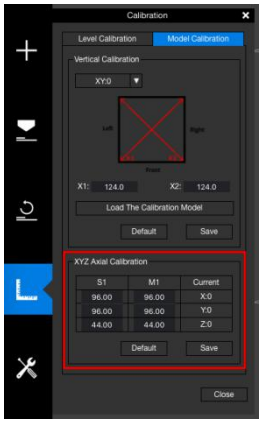
Acute Angle, Z value will be positive.

In our case, for figure 4, the value of Z entered is -1.5 mm. For figure 5, it is 1.5 mm. The H value is the measurement of the L-shape's height between the bottom of the ruler sitting on the L-shape's base and top of the L-shape. Thoeratically, it is 40.0 mm, and the deviation on the height makes the value otherwise. Enter the height measurement into the H value field.

In the end, do not forget to click the Confirm button to finish the process.

7.6 Dimensional Calibration

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.



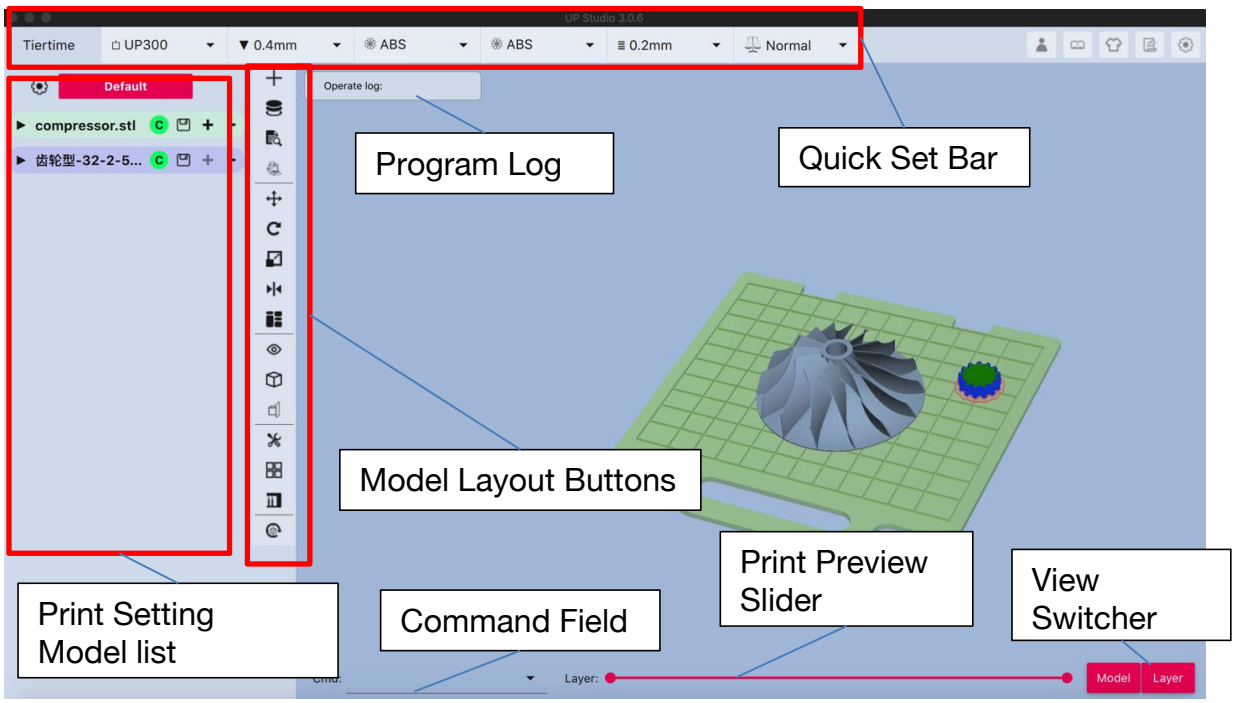
To correct the dimensional error, go to Calibrate -> Model Calibration. Fill in the M1 column with the printed object's actual values and enter the model's correct values into the S1 column.

Click Confirm. The software will save the values and adjust printing parameters to correct for deviation.

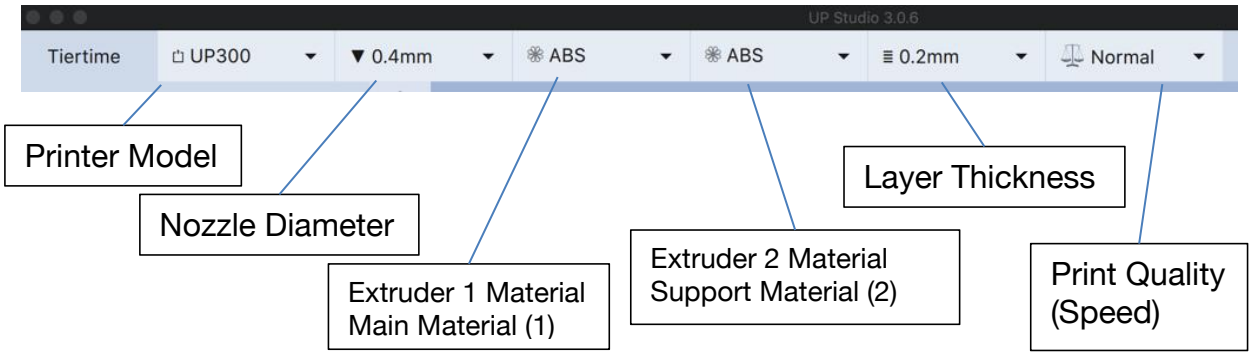
Keep in mind, a calibration is only valid for the model used during the calibration process. You may need to redo XYZ axial calibration for a different model in order to achieve maximum dimensional accuracy.

8. Introduction to UP Studio 3

8.1 Interface



8.2 Quick Setting Bar



Quick Setting Bar provides a quick way to change essential print settings, also give overview of current print settings.

8.3 Print Layout Tools

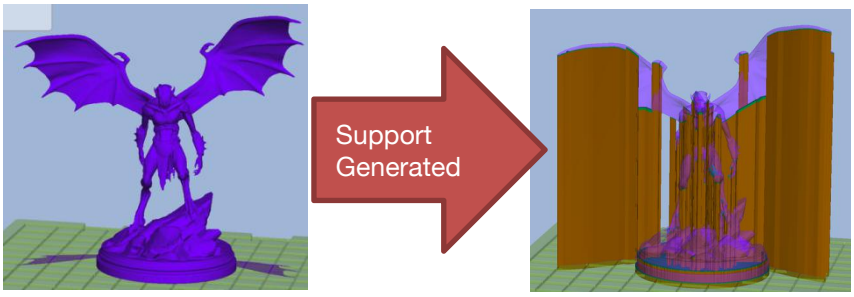
Button	Description
	Add 3D file to build space.
	Slice model and save the data (.tsk) to the directory of the original 3D file.

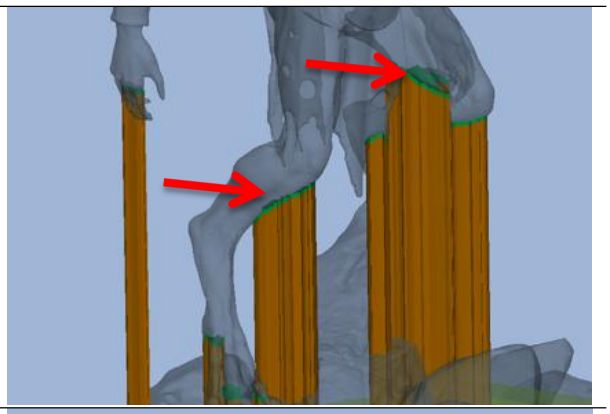
	Preview Slice Result. The 3D file will be sliced but not saved, the sliced result will appear on file list of right column.
	The “Print” button. clicking this button will call out the “Wand” hosting module. This button does not initiate printing.
	Move. Select a 3D model and then click this button. Mouse Right-Click-drag the model to move it along X-Y Plane. Alternatively use the keypad to move move model along selected axis.
	Select a 3D model and the click this button to rotate. Select the axis and rotation degree on the keypad. Select surface to be bottom. Click the bottom and select target surface, it will rotate to become the object bottom.
	Scale object. Use keypad to select preset ratio or input a target scale ratio. Link all axis when scale, this keep all 3 axis to keep the original proportion of the model.
	Mirror object along selected axis.
	Autoplace。 Click this button all the objects in print space will be automatically arranged to become evenly distributed and “onto” the build surface.
	Views. Quickly switch between preset view perspectives.
	Display modes. Choose to display Solid, Surface, Wire or make model transparent. Apply to all models in print space.
	Cross-section view. Choose to a section along specified axis for inspection only. This function cannot be used to cut/modify object.
	Fix Error. Choose a model and click this button to fix simple simple mesh defects. Cannot handle more severe issue.
	Merge. Merge selected models into a single model. The raft of the object will be merged as well.
	Support Editor. Select model and click this button to open support editor for detailed support editing.
	Reset Model. Remove all previous modification of the model and model return to the state it is just loaded into the software.

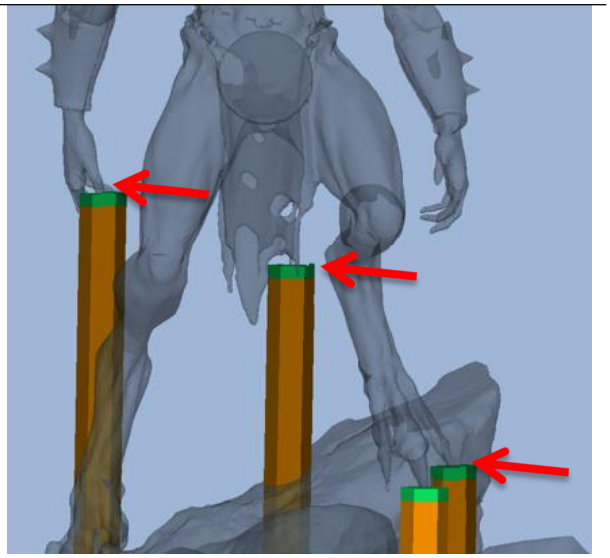
8.4 Support Editor

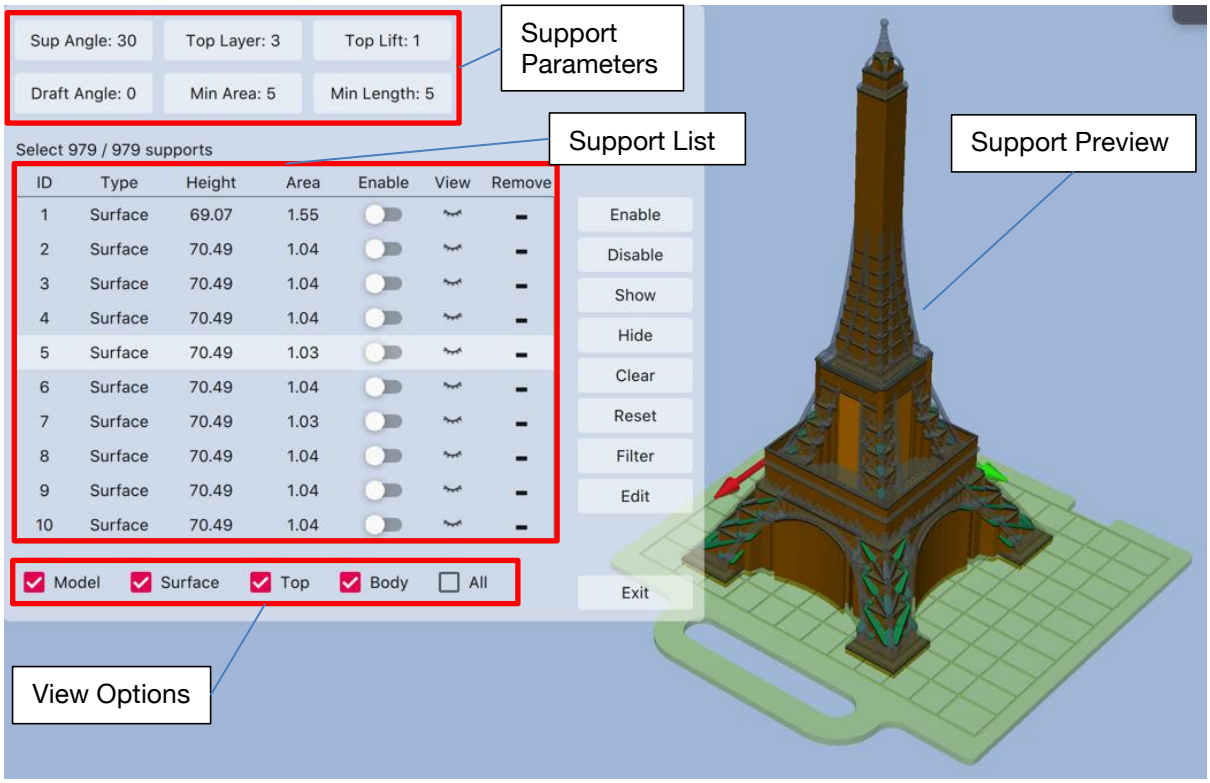
The support editor will first calculate all the possible support structure of the model. Then user could enable or disable specific supports base on their preference. The support editing result will be shown on the model at real time.

Support Types:
There are three types of supports in Tiertime's support generating algorithm. They treated differently and can be edited separately.

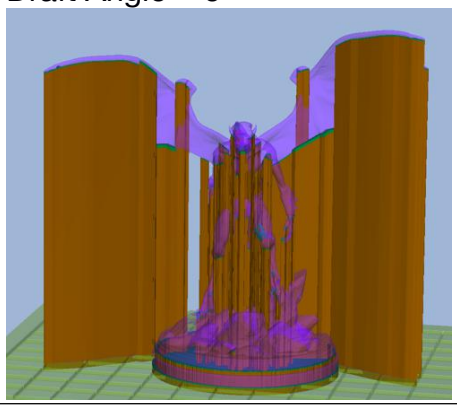
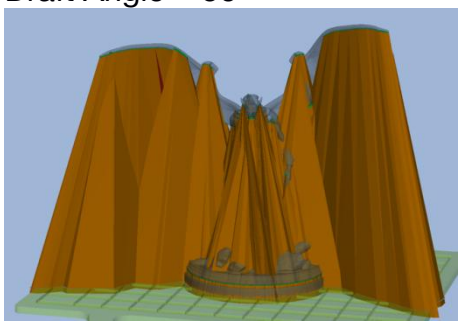


1. Surface Support	The most common support, support of the overhang surface.	
2. Edge support	Support the "Edge" of a shape	

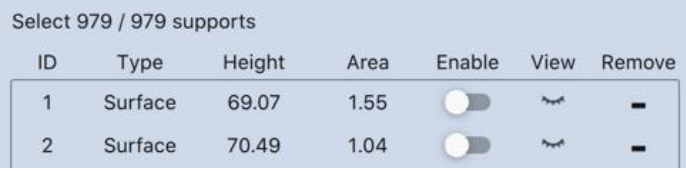
3. Point support	Support the “Tip” features	



Support Angle	The overhang angle threshold for support, overhangs less than this angle will not have support generated.
Top Layer	This determine number of interface layers between the support structure and the surface being supported. Increase the layer may make the support easier to remove but increase print time.
Top Lift	Determine how many layers the support will lift above the layer of the point feature. This setting cannot be 0 as the “point” cannot be supported if the supporting structure is within the same layer as the tip.

Draft Angle	Adding draft angle will make the base of the support to be wider than the top, this increase the stability of the support column.	
	Draft Angle = 0 	Draft Angle = 50 
Min. Area	Area threshold of the support structure, overhang surface with area less then the threshold will not be supported.	
Min. Length	Length threshold for the edge support. Edges shorter than the threshold will not be supported.	

Support List

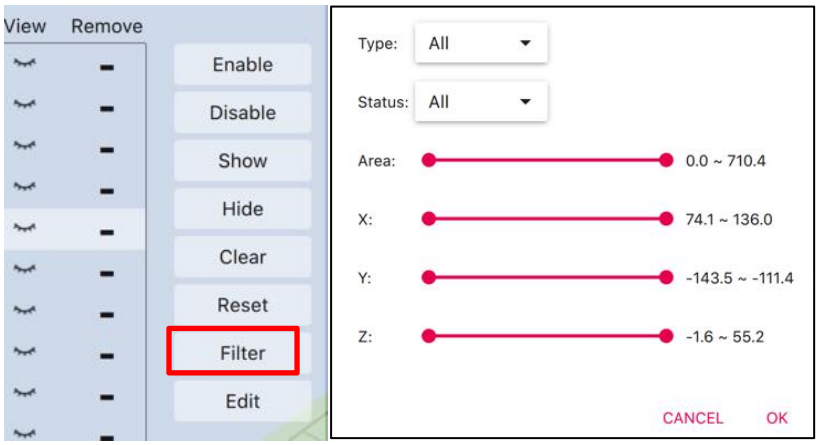


Enable：turn support on or off.

View: hide/show support, not affecting its status.

Remove: remove support from list, not affecting its status.

Support Filter



Filter allow user to setup conditions to only show a subset of supports in the support list. This conditions could be:

1. Support Type
2. Support Status
3. Supported Surface Area
4. Location on the XYZ plane.

The support filter is a quick way to find and selectively edit specific supports.

Print Settings

- Click Gear button to edit current print setting.

- Click the “Profile Name” Default to switch to profile management.
The default profile cannot be deleted. User can created new profiles by copying existing profiles and edit upon the copy.

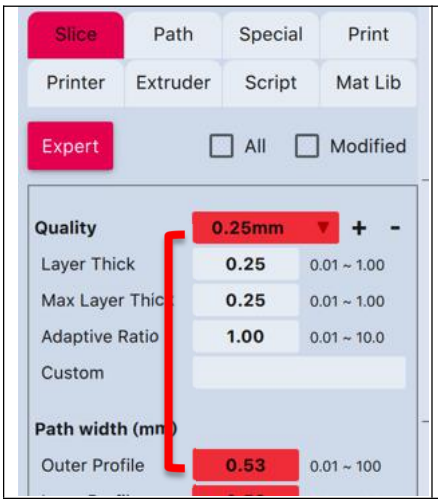
Print Settings

Print Setting Mode:
Click the button to switch between Basic, Advanced,Expert mode.

For Basic Mode, the print setting is similar to UP Studio 2. The basic mode although limited but the print settings are highly optimized, with quick selection of basic print parameters, users will able to get excellent print quality. If user is looking for a simple and easy printing experience Basic mode is the best choice.

For Advanced and Expert Mode, a lot more print setting are opened up, users have much more freedom on setting up print parameters but also has bigger risk of adding errors that result in print failure or defects.

After finish setting up the profile, click Apply to save and click “OK” to leave current interface.



Parameters that highlighted in red are modified, once click the apply button, the highlight will be removed.

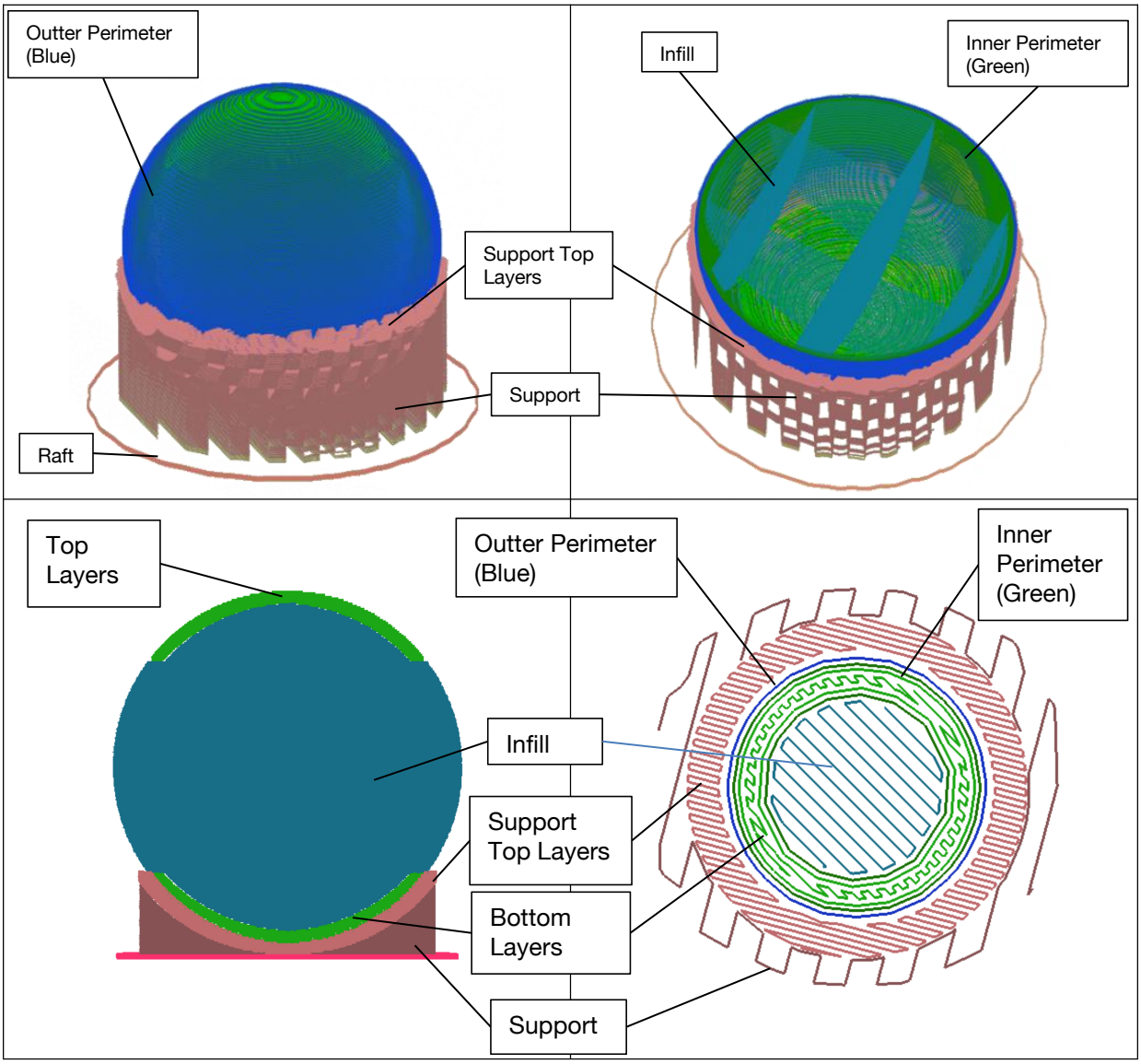
Some parameters such as “Quality”(layer thickness) are key settings that, when selected, will also pull values to other parameters, such as path width. The “pulled” parameters are recommend values, that give users a foundation for modification.

Introduction to print parameters:

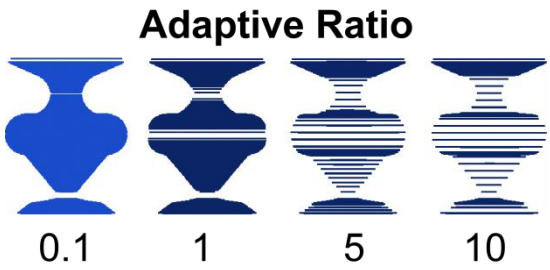
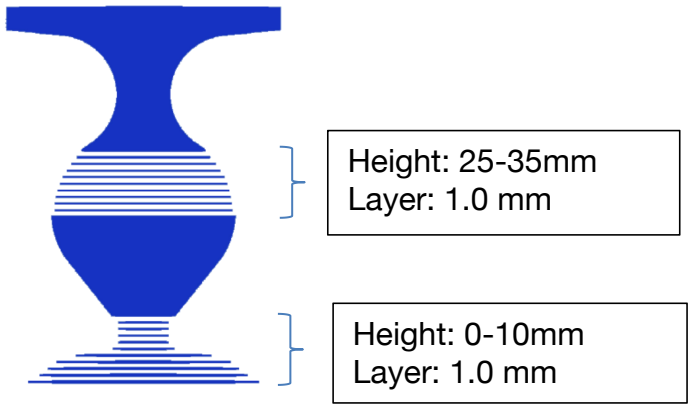
Entities of a Part: The model when sliced is divided into different regions or Entities, and each these entities' print setting can be adjusted individually.

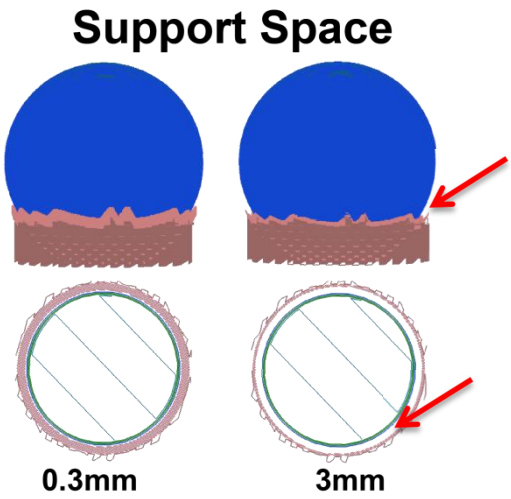
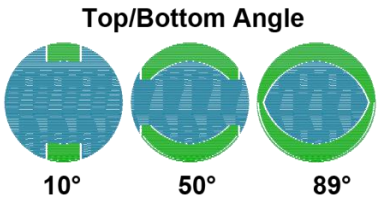
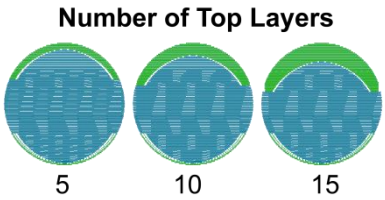
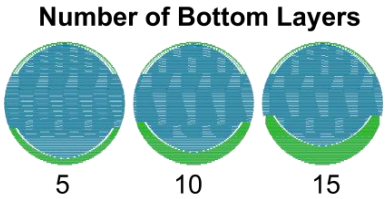
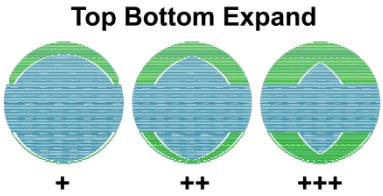
Perimeter: The wall/shell of the model. The outter most layer is the "Outter Perimeter", all the perimeter inside the Outter perimeter are "Inner Perimeters"
Infill: the region inside the perimeter, can be filled with certain patterns and density
Top/Bottom: The roof and bottom layers of the print
Support: Automatically generated structure that support the overhang structures
Raft: Thick layers that are under the print to improve adhesion and also compensate for unevenness of platform surface.

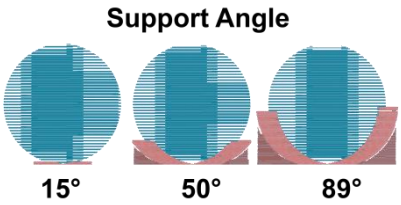
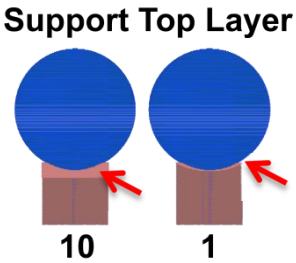
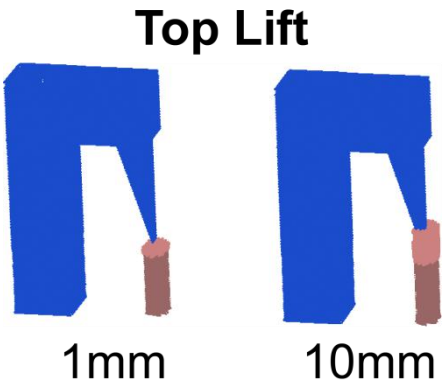
For most up-to-date details of print settings, please go to Tiertime knowledge base: https://support.tiertime.com/xxxxxxxxx

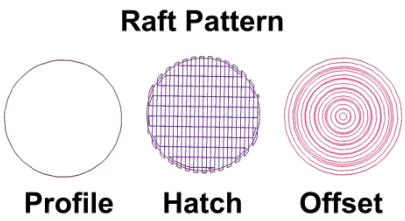


1.Slice

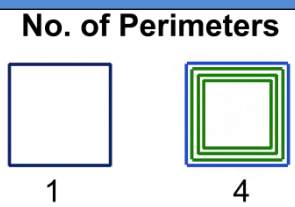
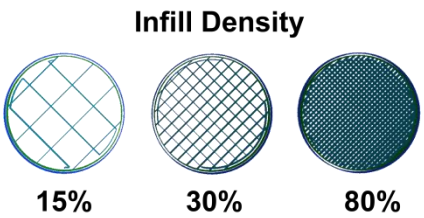
Term	Unit	Description
Quality		
Layer Thickness	mm	Layer thickness of print, the bigger the thickness the faster the print speed and lower the print quality.
Max. Layer Thickness	mm	Adaptive layers is to automatically adjust layer thickness base on the overhang angle. Set the largest layer thickness for adaptive layers.
Adaptive ratio	N/A	The bigger the adaptive ratio, the more discrete shift from thin to thick layers through overhangs. Overall the algorithm will more inclined to use thicker layers when the ratio increases.  Layer thick = Max (normal thick, min(thick, normal thick*tan(angle)))*ratio
Custom	N/A	Custom layer thickness. Allow user to define specific layer thickness for define height range: **Syntax: [start height, end height]layer thickness** **Eg. [0,10]1.0[25,35]1.0**  ❖ For regions that are not defined by custom layer thickness, default layer thickness setting will be used. ❖ Custom layer thickness will override the adaptive layer function.
Path Width		
Outer Profile	mm	Line width of the outter most Perimeter
Inner Profile	mm	Line width of the inner perimeter
Top	mm	Line width of top layers
Bottom	mm	Line width of bottom layers
Infill	mm	Line width of inner infills
Support	mm	Line width of supports

Support Space	mm	Horizontal distance between path of support and part. 
Top and Bottom		
Angle	°	Angle for determining top/bottom layers. 
Top Layers	Layer	Set the number of top layers 
Bottom Layers	Layer	Set the number of bottom layers 
Min. Area	mm^2	Threshold area for top and bottom
Expand	mm	Expand the area of top and bottom. 
Support		
Angle	°	Angle Threshold for support, the larger this angle the more support

		will be generated 
Layer	Layer	Number of interface layer (Support Top Layer) between object and support column. Support top layer also added between raft and part bottom surface, so this option will also increase apparent thickness of raft stucture. 
Min. Area	mm	Area Threshold of overhang surface, overhang area smaller than this will not be supported.
Min. Length	mm	Length Threshold of overhang edge. Overhang edge shorter than this will not be supported.
Stretch Angle	°	The angle to expand the base of support column. Refer to xxx page.
Suspend Lift Top Lift	mm	Only applied to point or edge features.Top lift represent the height which the support will “wrap” above the actual supporting point or edge. If the part contain pointy features that is facing down, it is recommend to increase top lift options. 
Raft		
Layer	Layer	How many layer the raft will consist
Thick	mm	Layer thickness of raft
Base Width	mm	Path width of the first 2 layers of raft
Expand	mm	How much to expand from the perimeter of the bottom layer for the raft layer
Mode	N/A	Raft infill mode, Profile is for Tiertime printer only, the raft is generated by printer. The pattern is not visible at this stage. The hatch and offset are for non-Tiertime printer, Tiertime machines cannot use these 2 types.

2. Path

Term	Unit	Description
Path Mode		
Profile/Perimeter	N/A	
Infill Density	%	Density of the infill pattern, 100%=solid infill, 0%=no infill 
Support Density	mm	
Full Fill Area	mm^2	Area threshold that override density to full/solid Infill. Area smaller than this value will be printed 100% infill.
Infill Path		
Top/Bottom Fill	N/A	Infill pattern for Top/Bottom Offset/Zigzag/Line
Inner Fill	N/A	Infill pattern for Inner Fill Offset/Zigzag/Line
Support Fill	N/A	Infill pattern for Support Fill Offset/Zigzag/Line
Infill Profile	N/A	Extra inner perimeter for infill None: no infill perimeter Always: Always print infill perimeter Alternate: print infill perimeter alternately, this option may increase the contact surface area between perimeter and infill thus increase the bond strength
Support Profile	N/A	Add a single perimeter to support column to increase stability of support but may make support more difficult to remove.