UP mini

user manual

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Precautions

1. UP mini 3D printer requires power adapter provided by original manufacturer. Otherwise it could casue damage to machine or even fire hardzard. Please also keep the power adapter away from water and high temperature.

2. During printing, the nozzle of the printer will reach 260°C and the print platform could reach 60°C. Please do not touch these parts with bare hand while they are hot, not even with the heat resistant gloves included with machine as the temperature could damage the glove and your hand.

Warning label on printer:
High Temperature, do not touch!

4. During Printing, the nozzle and print platform will move at high speed, do not touch these parts while they are moving.
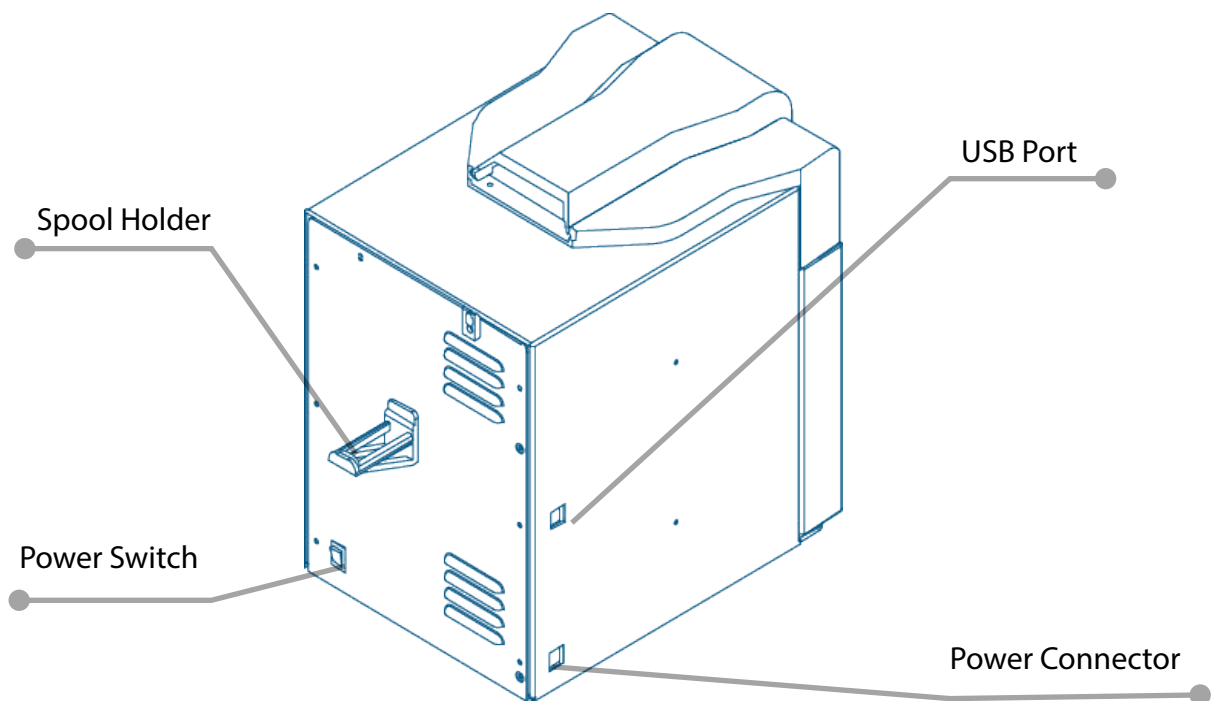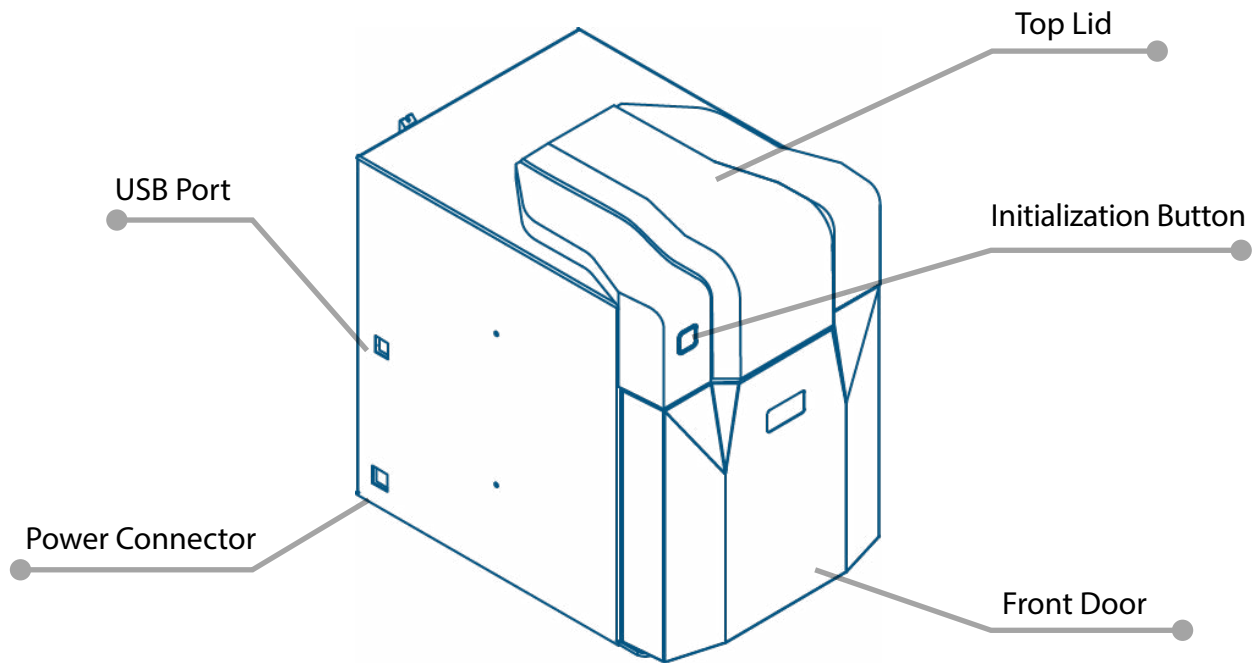

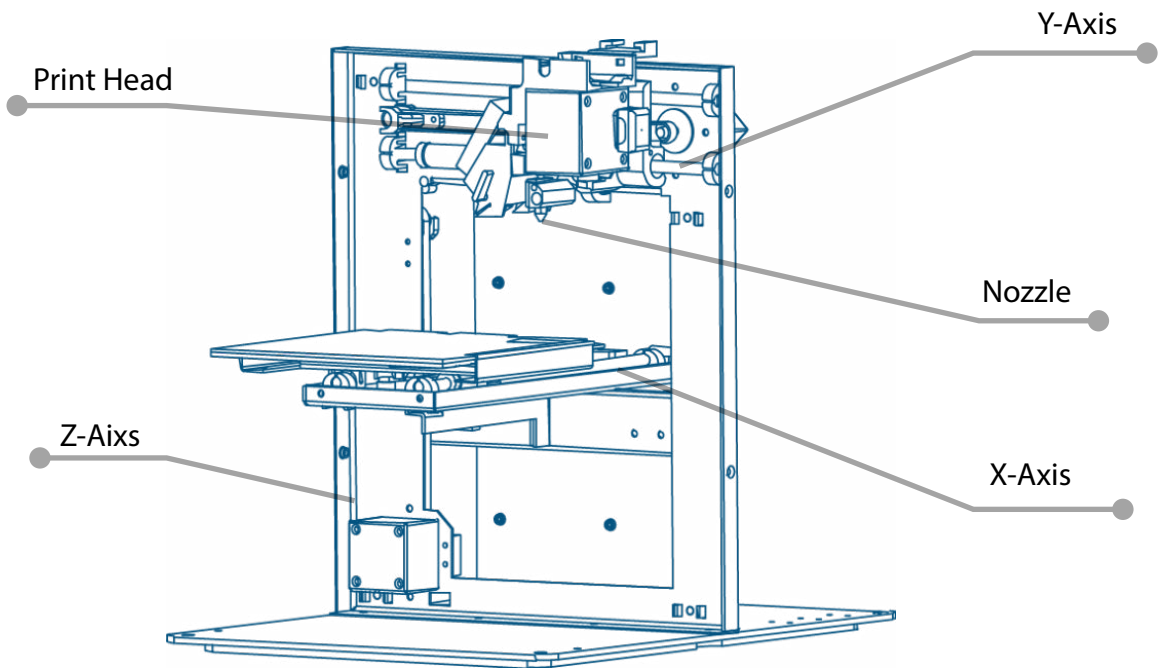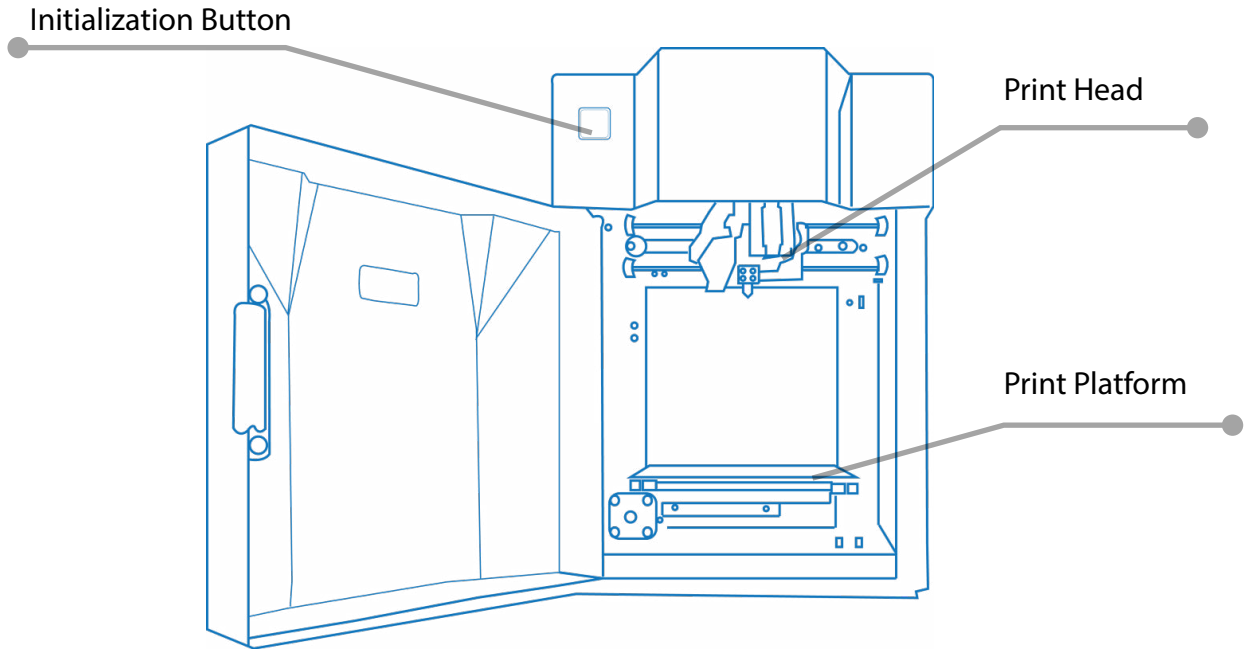*Warning label on printer:*
Moving parts, do not touch!

5. Please wear goggles when removing the supporting material from model and detaching model from perf board.

6. When printing ABS and PLA, slight smell will be produced, please run the printer in a well ventilated environment. We also suggest you to put the printer in an enviroment with stable temperature, as unwanted cooling could has adverse effect on print quality.

7. When UP softwre is sending data to printer, where the status bar on the left bottom corner is showing "sending layers", do not unplug USB cable, as this will interrup data transfer and results in printing failure. USB cable can be unpluged after data printing started.

8. UP mini's working temperature is between15°C and 30°C relative humidity 20%-50%. It is recommended to discharge static charge from user's body before touching the machine to prevent interruption of printing and damaging the printer.

UP mini Specification

Printing		
	Technology	MEM (Melted Extrusion Manufacturing)
	Build Volume	120x120x120mm
	Print Head	Single, Modular for easy replacement.
	Z-resoution	0.2/0.25/0.3/0.35mm
	Supporting Structure	Automactically generated, easy to remove, adjustable
	Platform Leveling	Manual
	Print Surface	Heated bed with perf board
	Unterthered Printing	Yes

Software		
	Bundled Software	UP Software
	Compatible File Formats	STL, UP3, UPP
	Connectivity	USB
	Operating System	WinXP/Vista/7/8, Mac OS

Power Supply		
	Poweradapter	110-240VAC, 50-60Hz, 220W

Mechanical		
	Printer Body	Metal Chassis, enlosed.
	Printer Weight	6KG / 13 LB
	Printer Demiension	240(W) x 355 (H) x 240 (D)mm
	Weight with Packaging	11.2KG / 25LB

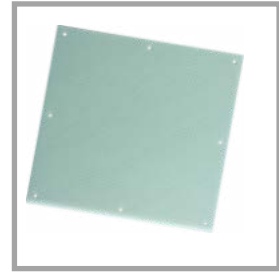# Printer Body illustration

Top Lid

USB Port

Initialization Button

Power Connector

Front Door

Spool Holder

USB Port

Power Switch

Power Connector

Initialization Button

Print Head

Print Platform

Print Head

Y-Axis

Nozzle

Z-Aixs

X-Axis

Accessories

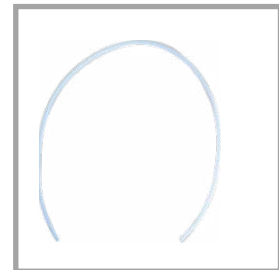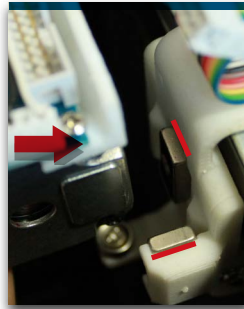|		
USB Cable	Power Adapter	Perf Board
Spool Holder	ABS Filament	Print Head
Hex Key	Plier	Filament guiding tube
Nozzle Wrench	Gloves	Shovel
	Blots and Nuts	
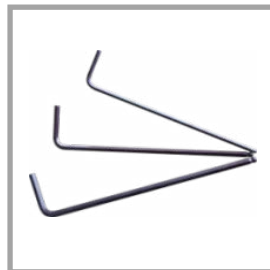
If anything is missing please contact your local distributor or support@pp3dp.com

Installing the Print Head
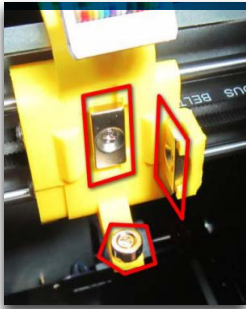
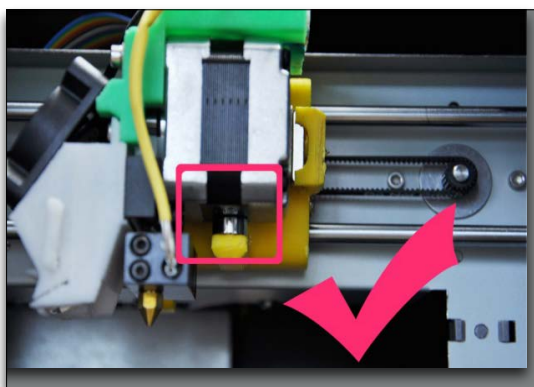**1** There are 3 magnets for holding the print head in place.

2 During installation make sure the magnets are aligned to the metal plates on the print head's stepper motor.

3 After fitting the print head, plug in the cable to connector residing on the print head.

Correct installation.

Incorrect installation, note the magnet under the print head is not in contact with the motor.
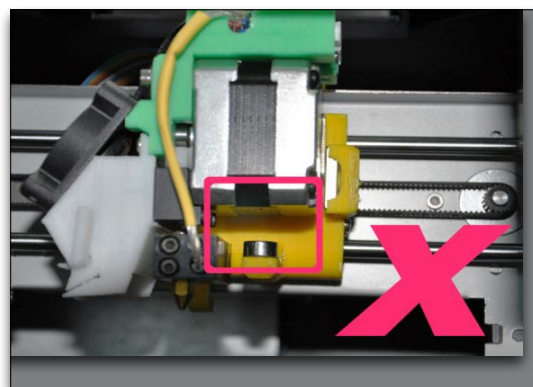
Install the Perf Board
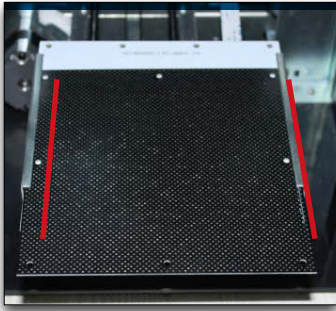
1 Slide the perf board into the slots on the 2 sides of the platform.
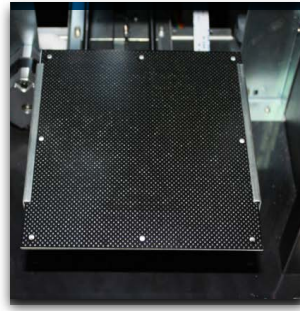
2 Finsihed.

Install the Spool Holder
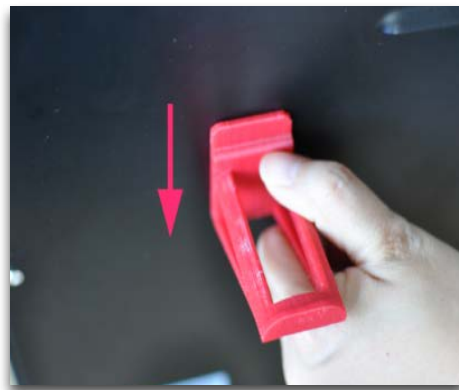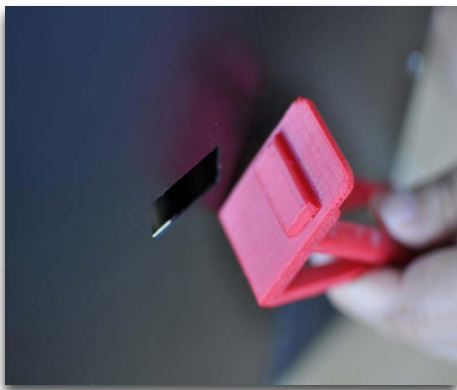
Hook the spool holder on the back of the printer.

Install Filament Spool

As shown in the diagram, put the filament spool on the spool holder and put the filament through the filament guide tube, then insert the tube into the printer through the hole under the lid.
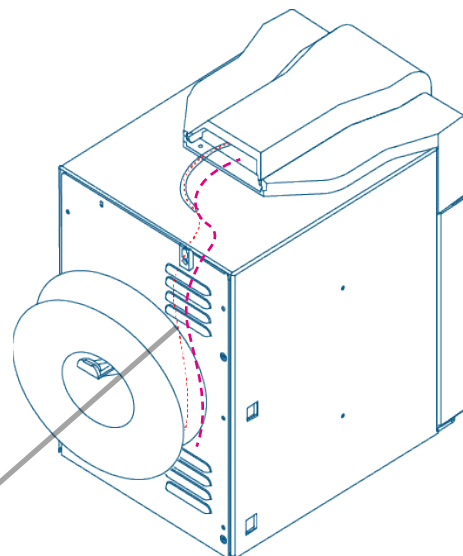
Install UP software
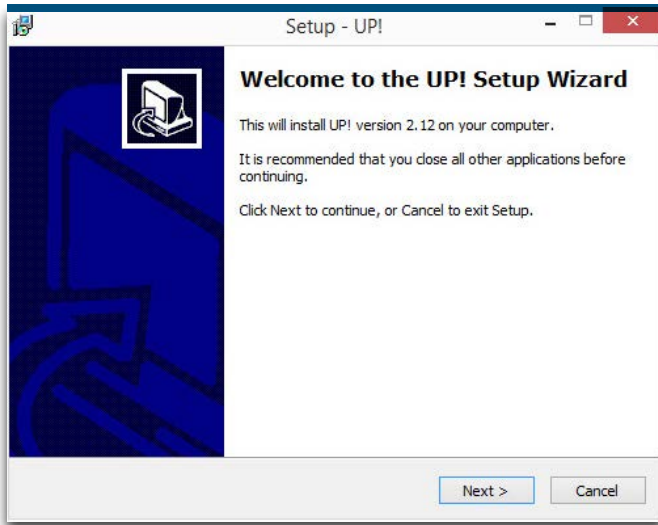
1. Go to *www.pp3dp.com* to download the latest version of UP Software.
2. Double click UP! Setup.exe to install the software(default installation directory *C:\Program files\UP* a pop up window will appear, select"install" and following the instruction to finish. The printer's driver is now installed into the system.
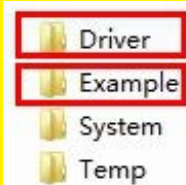

After installation,in the UP folder:
Driver folder contains the printer drivers.
Example the example folder contains STL files for the printed parts of UP printers and example files.

Testing of printer driver installation

First make sure computer and printer is connected to computer via USB cable and the printer is switched on. The initialization button should be light up in red color.
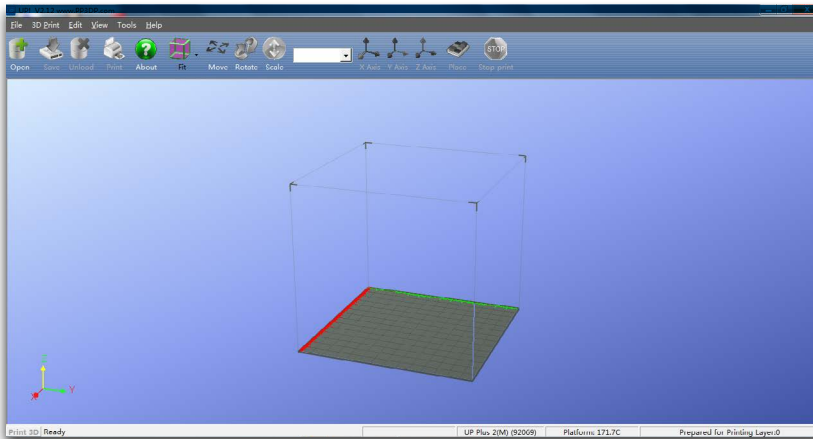
After driver installation, double click the desktop icon of UP software to open it.
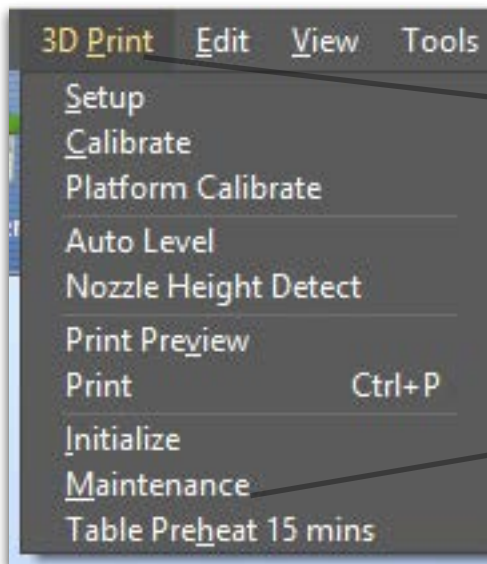
Click"3D Print".

"Initialize" and "Maintenance" options will light up and avaliable for selection.This indicate the successful installation of printer driver.

Initialization of printer

Initialization is required for everytime the machine is switched on. During initialization the XYZ aixs will move slowly and hit the endstops. This is essential as the printer need to find the endpoints of each axis.

Two ways of initialization:
1. UP mini can be initialized by clicking initialization option in the menu which is shown above.
2. The printer has initialization button on front of the machine shown in the picture below. When the printer is idle, press this button will trigger initialization

After initialization, the other software options will light up and become available for use. These options can only be chosen after initialization.
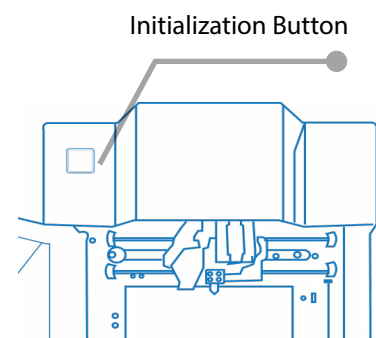
Initialization Button

Platform Calibration

Plarform calibrate is the most important step for successfull printing, as it ensures the first layer adhesion.The actaual calibration is done by measuring the distance between the nozzle and platform.Ideally, the distance between nozzle and platform is constant, but in reality the distance varies at different position due to many reasons (eg. slightly tilted platform.) To calibrate the platform, we just need to tell the machine, on 9 calibration points, the height of plaform that is touching the nozzle.The printer will able to compensate for distal errors base on our measurements.The calibration procedure contains 2 parts:
1. Setting nozzle height.
2. Setting compensation values.

Platform calibration interface:

Open: Menu - 3D Print - Platform calibrate

Interface annotation:
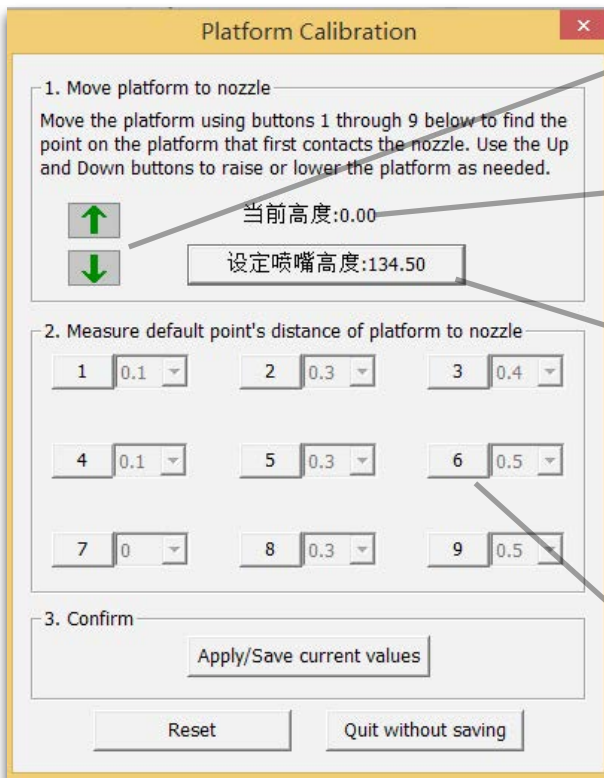
A. Moving Platform UP/DOWN: click/hold the button, platform will move accordingly.

B. Display the current platform height.

C. Setting nozzle height: click this will set the current platform height as the nozzle height.

D. 9 calibration point buttons, represent 9 positions on platform, after clicking the nozzle will move to the corresponding positions. The drop down menu beside the button is for setting leveling compensation values.

Platform Calibration

1. Move platform to nozzle

Move the platform using buttons 1 through 9 below to find the point on the platform that first contacts the nozzle. Use the Up and Down buttons to raise or lower the platform as needed.

当前高度:0.00

设定喷嘴高度:134.50

2. Measure default point's distance of platform to nozzle

1	0.1	2	0.3	3	0.4
4	0.1	5	0.3	6	0.5
7	0	8	0.3	9	0.5

3. Confirm

Apply/Save current values

Reset   Quit without saving

Platform Calibrate: 1.Setting Nozzle Height

Setting nozzle height, actually, is not setting the nozzle itself as UP mini's print head does not move in the Z-axis. Here the nozzle height we are refering to is a platform height value, at this height, the platform will be just touching the nozzle (thus "nozzle height"). After setting the value, the platform will be restricted to move over "nozzle height" as the it will start crashing onto the nozzle if going beyond it. The nozzle height value is important for protecting the printer from damages as well as being the basis for calculating leveling compensations.

During the calibration we are measuring distance shorter than 1mm, so we recommend using a print paper as a guide for measurement.

Protocol for setting nozzle height:

1. Initialize printer

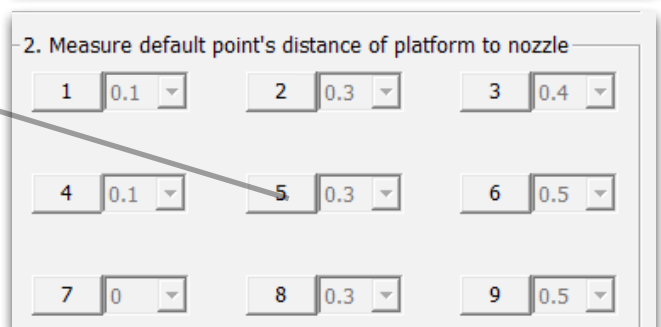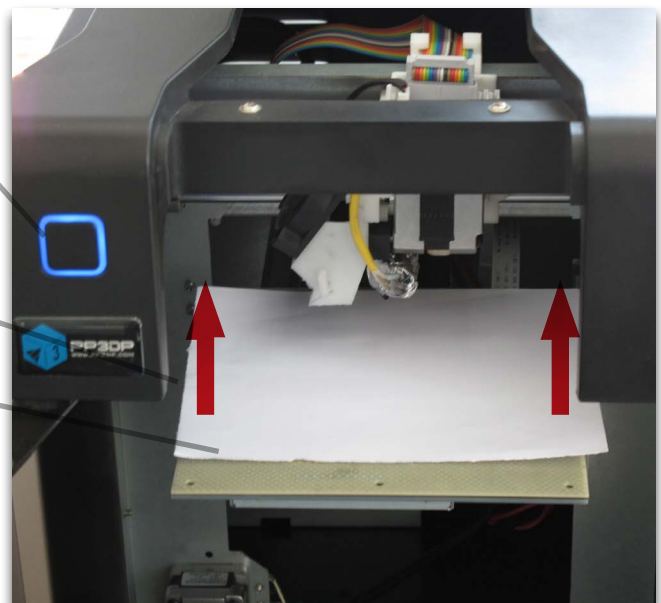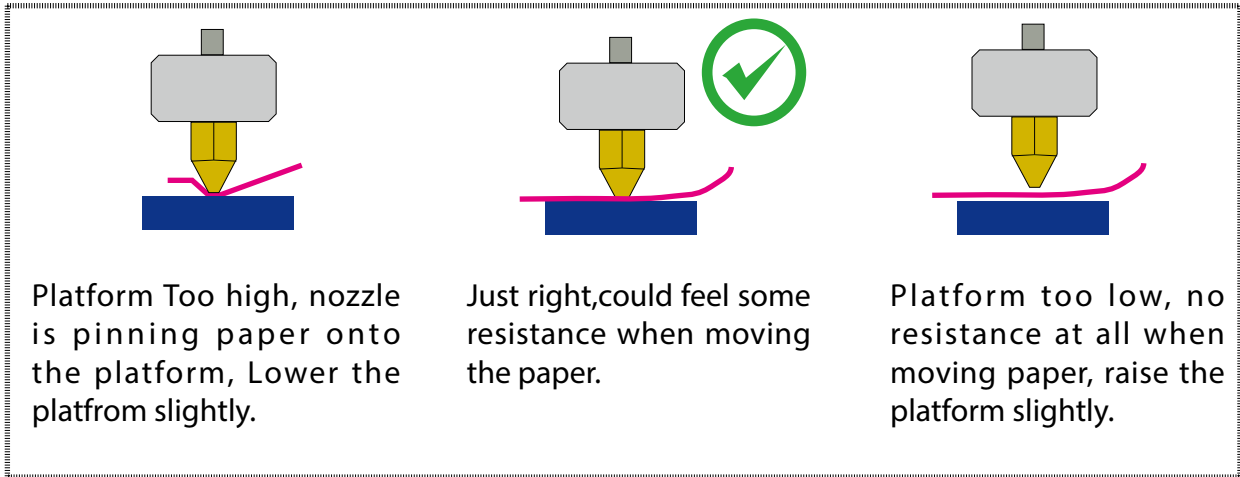2. Open the calibration interface and press the UP key, note the current height value, stop the platform at about 115.

3. Put print paper on platform.

4. Hit the "5" button.Nozzle will go to the center of the platform.

5. Raise the platform until it is just touching the nozzle. We can move the paper between the nozzle and platform and see if there is any resistance. Like to diagram below.

Platform Too high, nozzle is pinning paper onto the platform, Lower the platfrom slightly.

Just right,could feel some resistance when moving the paper.

Platform too low, no resistance at all when moving paper, raise the platform slightly.
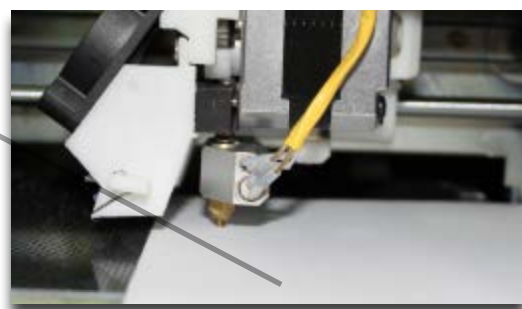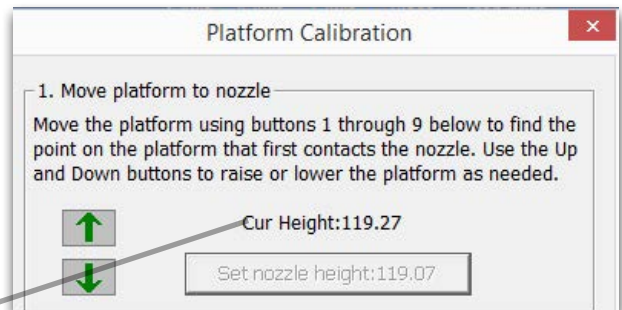
6 When obtained the right platform height, write down the value of "current height".

We will refer this as the "platform height".

Repeat step 1- 6 for all other 8 positions and obtain their platform height value when touching the nozzle.

Platform Calibration ✕

1. Move platform to nozzle

Move the platform using buttons 1 through 9 below to find the point on the platform that first contacts the nozzle. Use the Up and Down buttons to raise or lower the platform as needed.

Cur Height:119.27

Set nozzle height:119.07

7 When obtained the platform value of all 9 positions.Find out the smallest value among the 9 calibration points.

As you can see in this case, the calibration point 1 has the smallest platform height value, it is actully the highest point on the platform. (therefore the platform does not need to rise as high as the other points to reach the nozzle

Platform Values at 9 calibration points (hypothetical):

1: 119	2:119.5	3: 120
4: 119.5	5: 119.9	6: 119.1
7: 119.2	8: 119.4	9: 119.8

8 We set this height as "Nozzle Height" since it is where the nozzle first start to touch the platform. Now go to calibration point 1 and rise platform to 119.

Click the button" Set Nozzle Height" to finish.

Platform Calibration ✕

1. Move platform to nozzle

Move the platform using buttons 1 through 9 below to find the point on the platform that first contacts the nozzle. Use the Up and Down buttons to raise or lower the platform as needed.

Cur Height:119.27

Set nozzle height:119.07
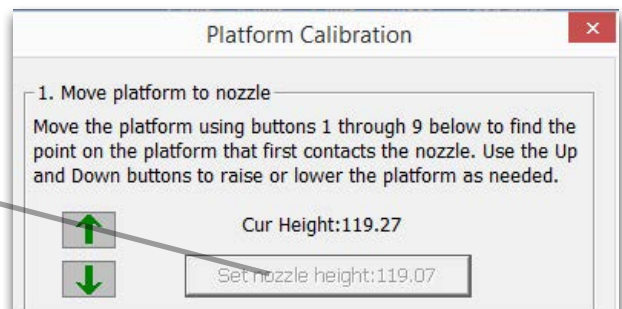
Platform Calibration: 2.Setting Compensation Values

As shown in the left, when platform is at the "nozzle height", only part of the platform is touching the nozzle. Therefore we need to set compensation values for all other calibration points to inform the printer about the distance between nozzle and print surface thorughout the XY plane.

Afte setting the nozzle height, the drop down menu next to the buttons will be available. A compensation value between 0.1 - 1.0 mm will be available for setting.

To calculate compensation value:

Platform height - nozzle height = compensation value
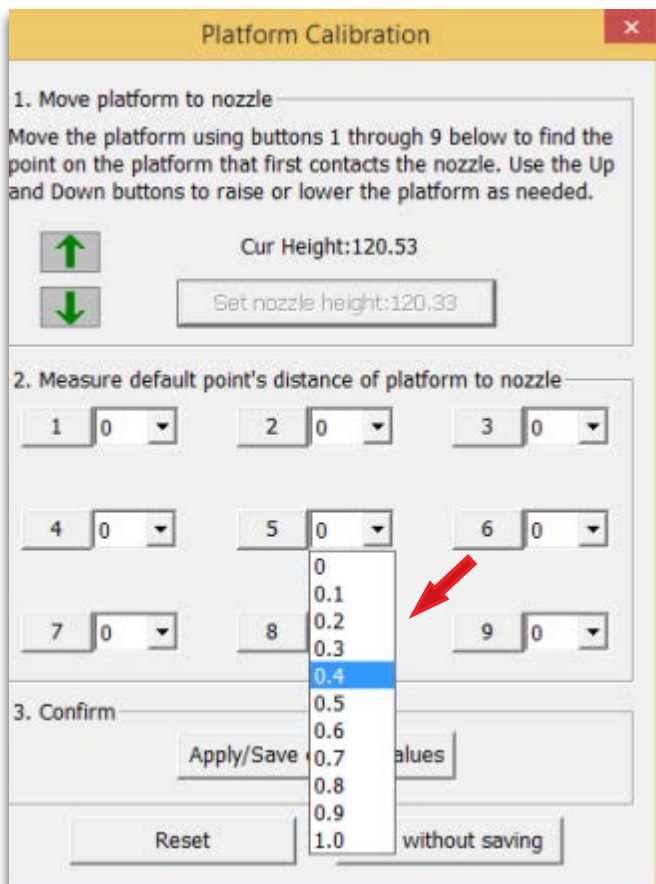
For example, setting the compensation value for calibration point No.3. Assume the "platform height" is 120 and the "nozzle height" is 119, the compensation value should be set to 1.0.

After setting 1.0 in the drop down menu, the nozzle will move to point No.3 and the platform will rise 1 mm. Now we can use the paper again to verify the compensation value.

After setting all calibration points click "Appy/Save Current Values " to finish the calibration.

Platform Calibration

1. Move platform to nozzle

Move the platform using buttons 1 through 9 below to find the point on the platform that first contacts the nozzle. Use the Up and Down buttons to raise or lower the platform as needed.

Cur Height:120.53

Set nozzle height:120.33

2. Measure default point's distance of platform to nozzle

1	0	2	0	3	0
4	0	5	0	6	0
7	0	8		9	0

0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

3. Confirm

Apply/Save Current Values

Reset   without saving

Prepare for Printing

Make sure printer switched on and connected to computer. Select Main Menu - 3D Print - Maintainance.

①
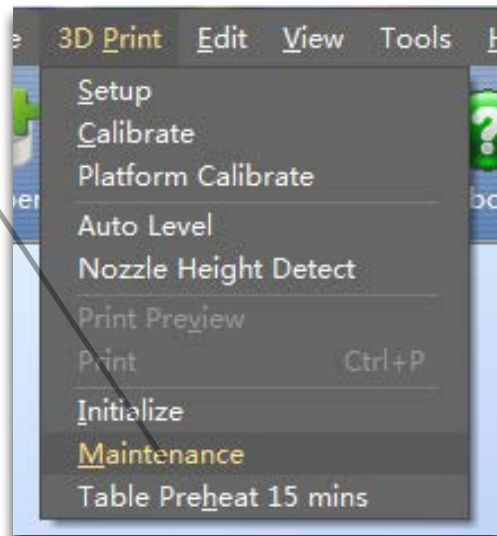
Hit "Extrude" button,the print head will start to heat up, within 5 minutes its temperature will reach 260°C,then printer will buzz and the print head startts to extrude.

②
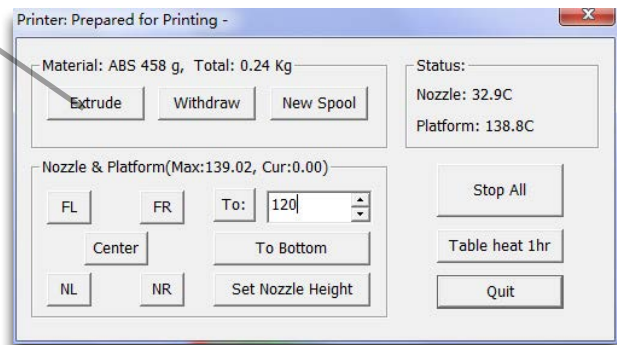
Gently insert the fliament into the small hole on the print head. The filament will be feed into the print head automatically when it reach the extruder gear inside the print head.
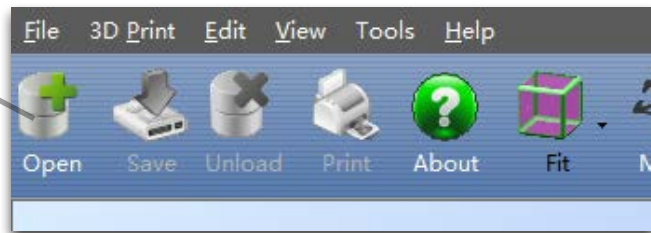
③

Check the nozzle for plastic extrusion. If plastic is coming out from the nozzle that means the print head is ready. The extrusion will stop automatically.
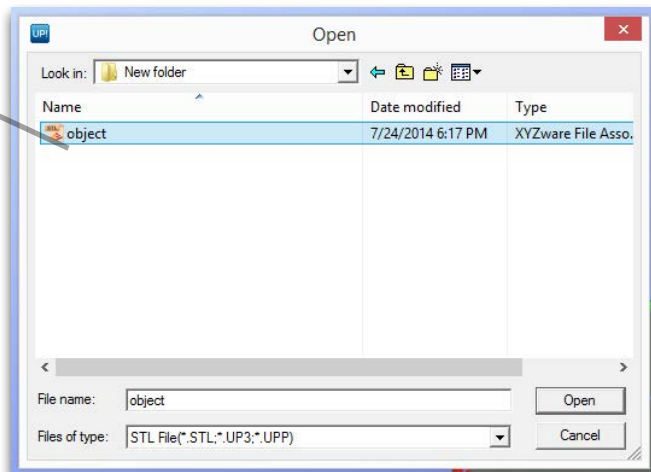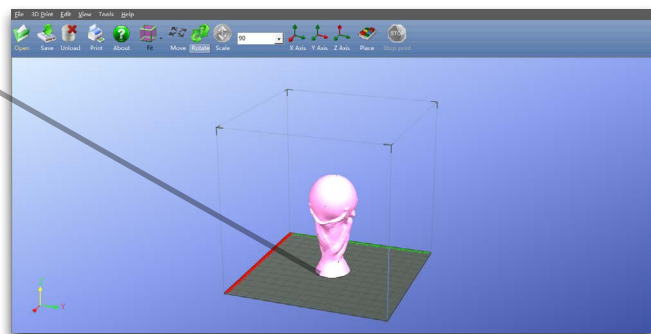
④
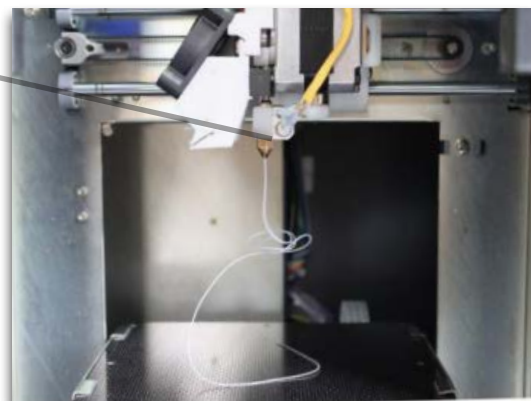
Loading a model

1 Click Load

2 Choose your model.
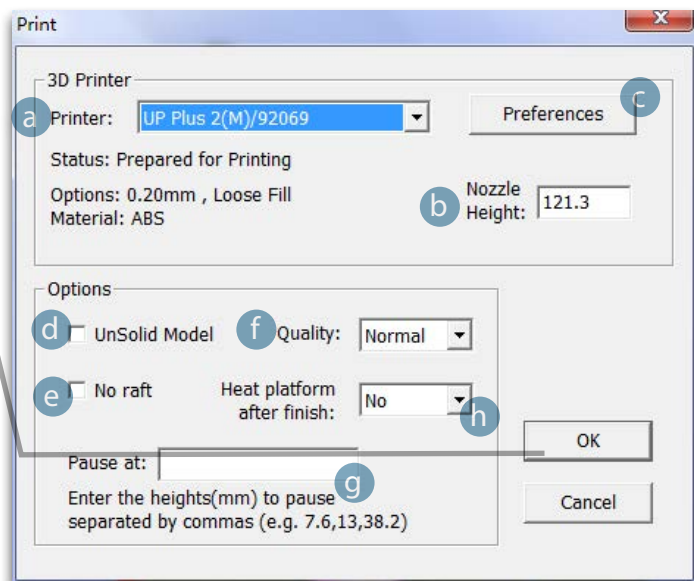

**3** Loaded model on the print plate.

4 Click print to open the print preview window.

5 Click "OK" to start printing. The program will first slice the model into Gcode and then transfer the data to the printer.

Print

3D Printer

a Printer: UP Plus 2(M)/92069

Status: Prepared for Printing
Options: 0.20mm , Loose Fill
Material: ABS

c Preferences

b Nozzle Height: 121.3

Options

d ☐ UnSolid Model   f Quality: Normal

e ☐ No raft   Heat platform after finish: No   h

OK

Pause at:

g Enter the heights(mm) to pause separated by commas (e.g. 7.6,13,38.2)

Cancel

6 After sending the data, the program will suggest the amount of material and time needed for the model in a pop up window.
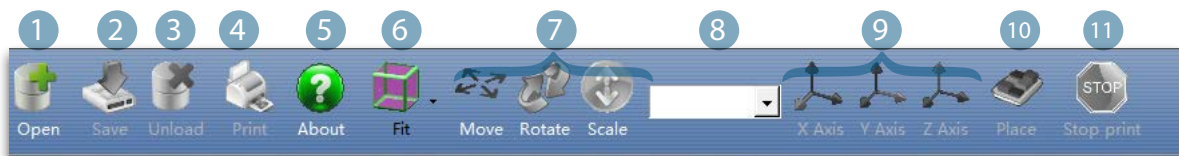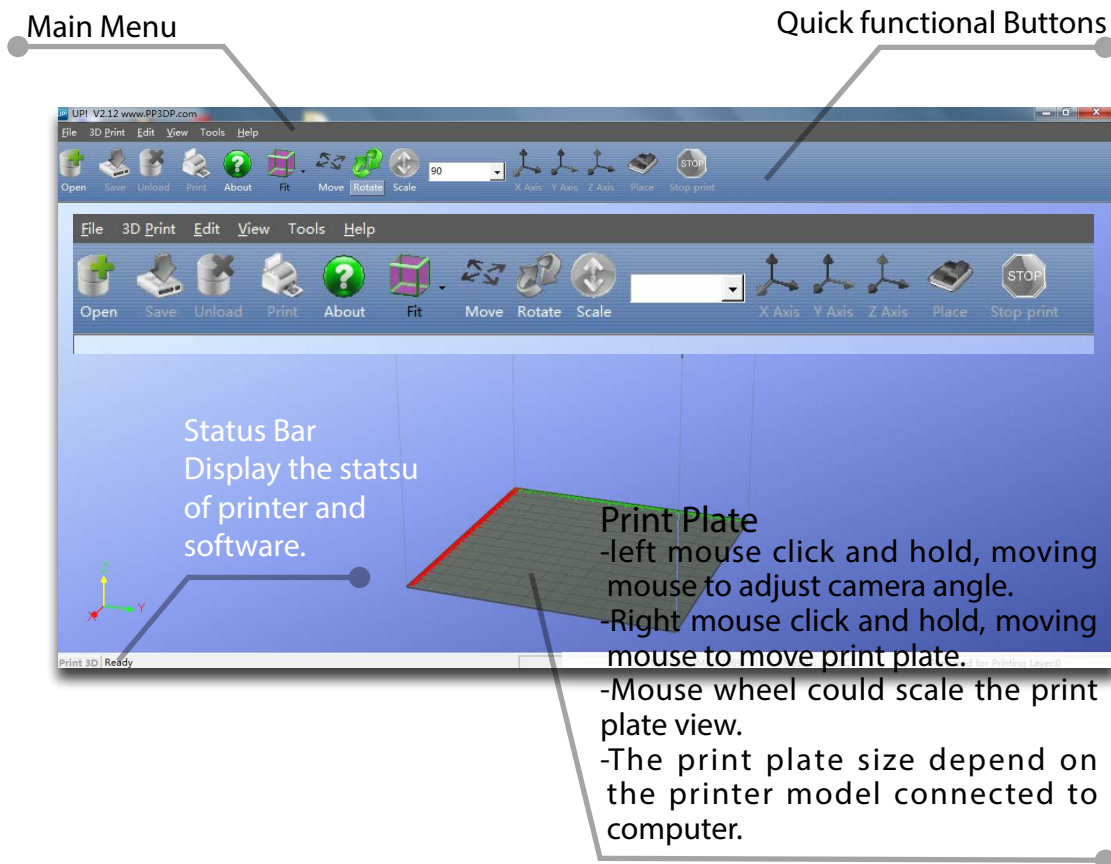At the same time, the nozzle will start to heat up. The print job will start automatically after clicking"OK"

UP!

⚠ Materials: 13.8 g
Print: 01Hour:13Minute
Finish: 06(Wednesday) 15:28

OK
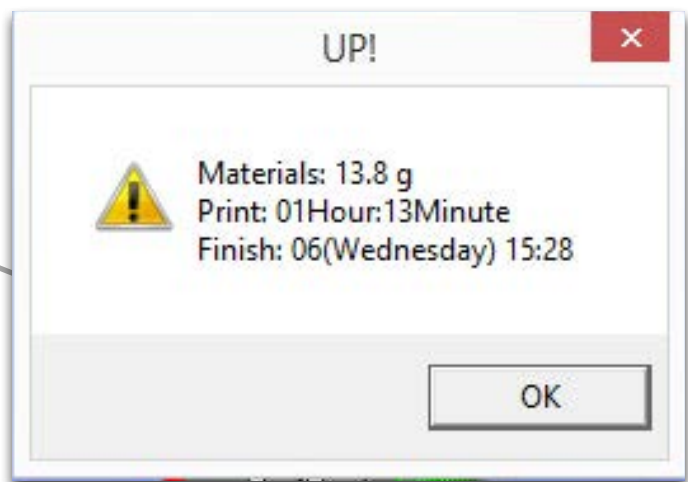
Annotation of Print Preview Interface:
a. Display the printer model.
b. Dispaly the noozle height.
c. Click to enter printer preference to set printing parameters.
d. If you model is not solid (defective), turn on this option.
e. No raft will be printed if this is turned on, print bed leveling will be disabled as well.
f. Print Quality: the better the print quality the slower the print speed.
g.Set the pause height, the printer will pause at indicated heightness for changing filaments.
h.Continuous heating of platform after printing, save heating time for consective printing and preventing breakage due to rapid cooling in cold weather.
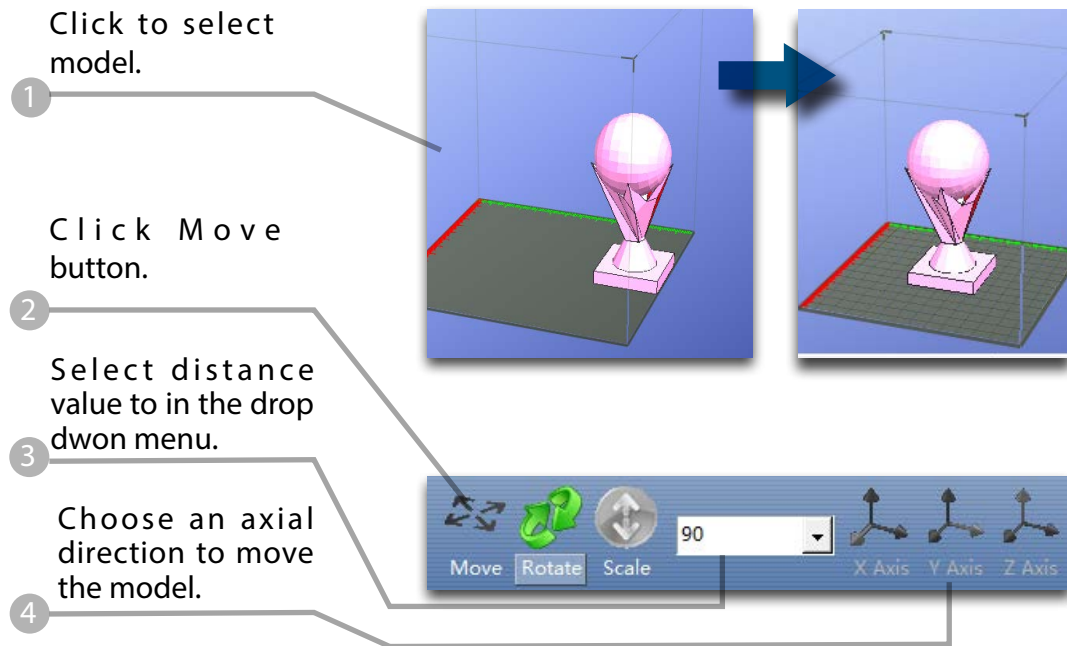
When printier finished receiving the print data, user could disconnect it from computer for untethered printing.

Software Interface

Main Menu

Quick functional Buttons

Status Bar
Display the statsu
of printer and
software.

Print Plate
-left mouse click and hold, moving
 mouse to adjust camera angle.
-Right mouse click and hold, moving
 mouse to move print plate.
-Mouse wheel could scale the print
plate view.
-The print plate size depend on
 the printer model connected to
 computer.

1. Load:Load a model.
2. Save : Save the model into .UP3, a propritory 3D model file for UP printers.
3. Unload:Unload the selected model.
4. Print : Print the current print plate.
5. About : Display software version, printer model, firmware version and etc.
6. View Perspective: A variety of pre-set of perspective.
7. Adjustments : Move, Rotate, Scale.
8. Set the value of adjustments.
9. Set the orientation of ajustments.
10. Place : Place the model to the center of the print plate. If more than one model
            exist software will optimize their positions and distance to each other.
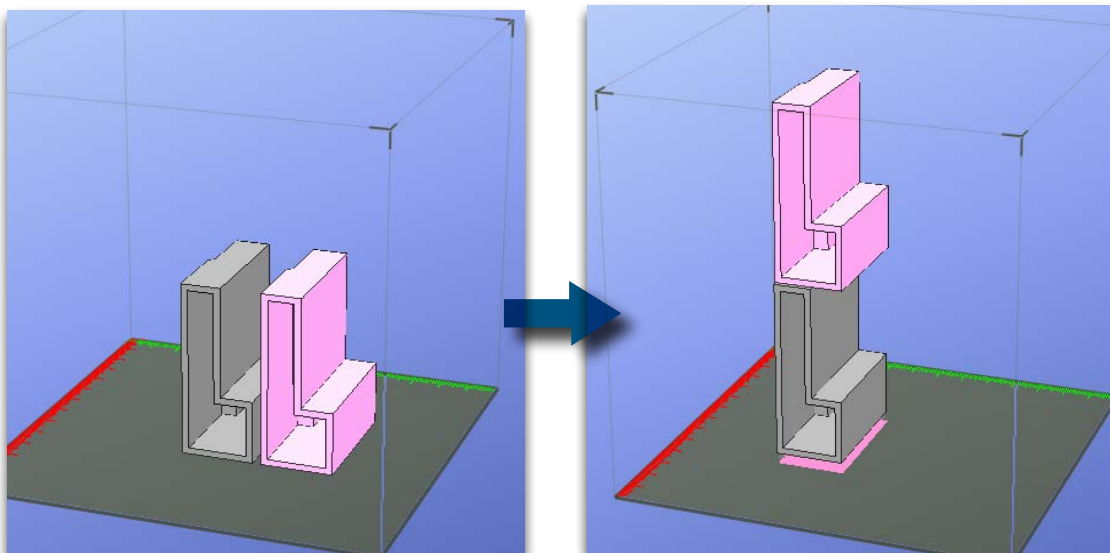11. Stop: If connected to printer, click this will stop the print.(cannot be resumed)

Moving Model

1 Click to select model.

2 Click Move button.

3 Select distance value to in the drop dwon menu.

4 Choose an axial direction to move the model.

Move | Rotate | Scale | 90 | X Axis | Y Axis | Z Axis

Drag model with mouse on XY-plane: Press and hold Ctrl Key, mouse left click and hold the target model, now the model could be dragged around on XY-plane.

Drag model with mouse on Z-axis: Press and hold Shift Key mouse left click and hold the target model, now the model could be dragged along the Z-axis.

Multiple models could be stacked by moving. They can also be fused into single model by "Merge" function in the "Edit" Menu.
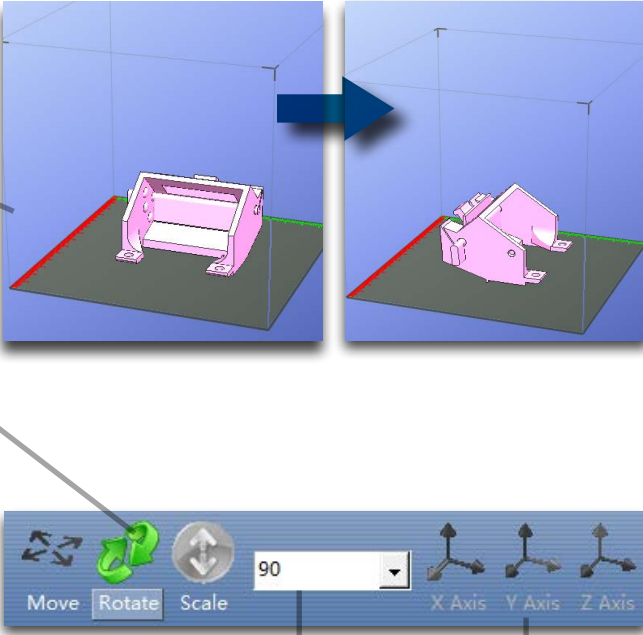
Rotate Model

Click to select model.
1

Click Rotate button.
2

Choose angle of rotation in the drop dwon menu.
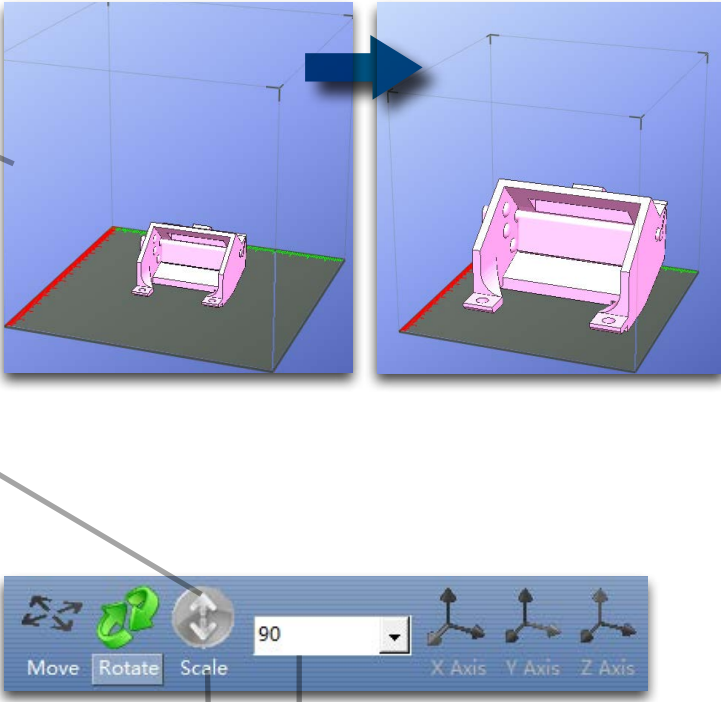3

Choose an axial direction to rotation the model.
4

Scale Model

Click to select model.
1

Click scale button.
2

Choose the scaling value in the drop down menu.
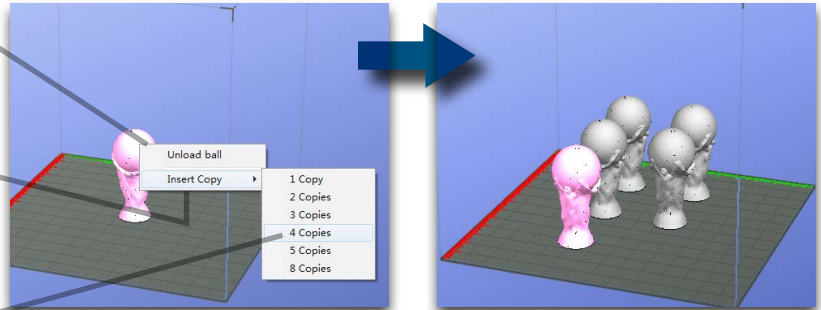3

Click the Scale button again to scale.
4

Duplicate Model

1 Click to select model.

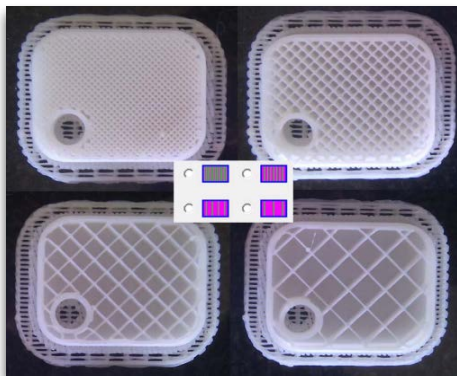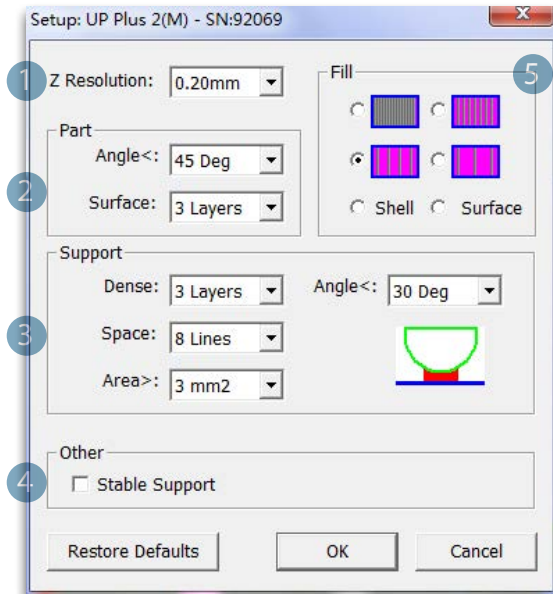**2** After selection, right click to open menu

3 In the insert copy menu, select the number of copy for duplication.

| Unload ball |
| Insert Copy ▶ |

| 1 Copy |
| 2 Copies |
| 3 Copies |
| 4 Copies |
| 5 Copies |
| 8 Copies |

Right click menu also contain unload function. Either choose a specific model to unload or unload all.

Printing Parameters
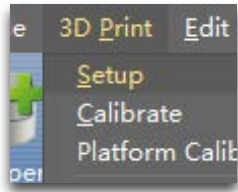
1. Z-resolution: Thickness of each printed layer, the lower the value, the more details will be generated.

2. Part:

Angle: Determine the range of dense support generation.

Surface: Choose the how many layers will be made for bottom of the model.

3. Supprot:

Dense: How many layers for dense support generations.

Space: Set the density of of support structure, the larger the value the less dense of the supporting structure.

Area: If the supporting area is less than this value, no support will be generated.(it is possible to turn off support by choosing only base.)

4. Stable Support: Generate more stable support but more difficult to remove.

5. Infill: The photo shows the effects of 4 different infill options.

Shell

No infill in shell mode.

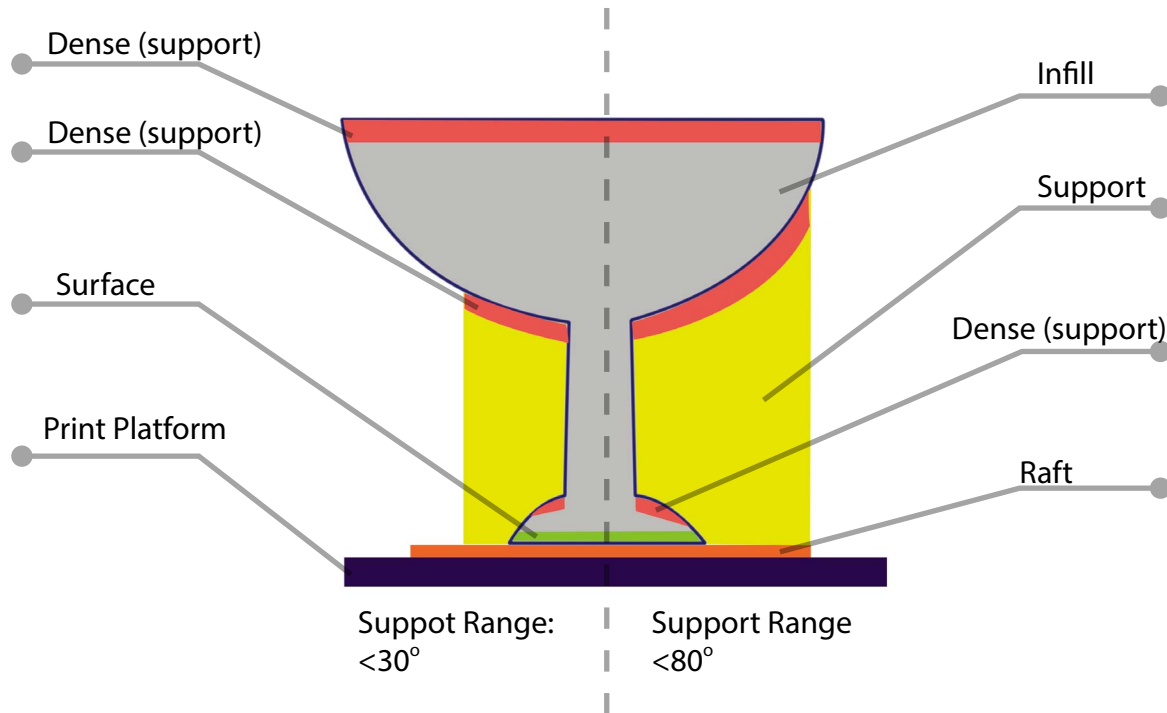## Surface

The object will be printed without bottom layers and top layes. Only a surface with single layer thickness will be made.

Annotation for printing parameters

Dense (support)

Dense (support)

Surface

Print Platform

Infill

Support

Dense (support)

Raft

Suppot Range:
<30°

Support Range
<80°

Dense: Solid support structure to ensure the surface being supported retain
its shape and surface finish.

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

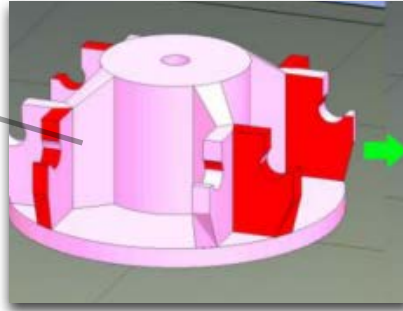Raft: The thick structure that asist the adhesion of object to the platform.
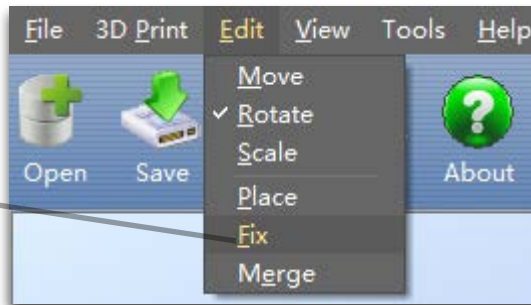
Surface: the buttom layers of the printed object.

Repair Model

UP software contains model repair function, can be used to fix simple defects.
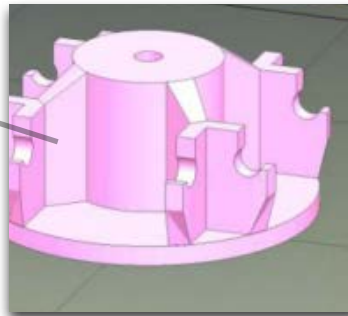
1. If the model contains defects, eg.have holes. The sofware will highlight the part with red.

2. After selecting the model, choose Edit - Fix to repair the model.

3. Repaired

If the model cannot be repaired, please use other 3D modeling or mesh modifying tools.
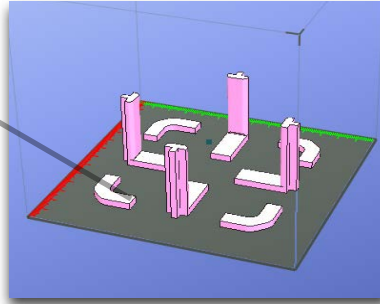
Calibration for the Correct Dimension

If prints are too big or too small or skewed, user could re-calibrate the printer to print in correct dimension. The method is to print a calibration model, measure its dimension and feedback to the software.

1 Load and print the calibration model:
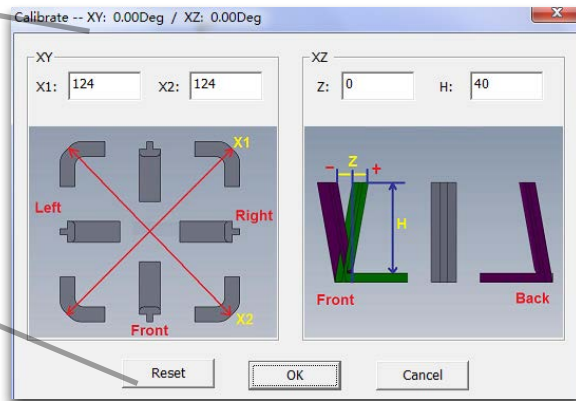*C:\ProgramFiles\UP\Example\Calibrate96.UP3*

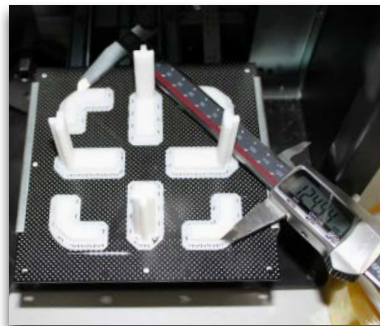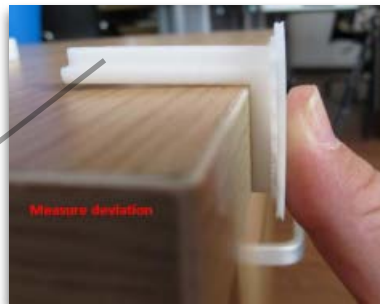**2** Open: 3D Print - Calibrate This will open the calibration panel.

3 Hit "Reset" button to revert the value back to default,make sure the upper panel dispaly: XY:0.00 Deg/ XZ:0.00 Deg

4 Measure the printed model accroding the calibration panel.
Input the measured values into the software and finish the calibration.

Printing Techniques

Precautions to ensure print quality:

1. Ensure accurate nozzle height. Nozzle too high will cause warping, nozzle too low will crash into platform causing damage and clogging. It is possible to manually fine tune nozzle height value at "maintenance" and "print preview" panels. User could try to adjust the nozzle height value plus or minus 0.1 - 0.2mm base on previous results.

2. Well calibrate the print platform. unleveled platform usually cause warping.

3. Give enough time for sufficient pre-heating. Please use the "3D Print" - "Preheat". A well preheated platform is essential for printing large objects without warping.

4. The air flow direction of the fan on the print head is adjustable. There is a small lever on the fan duct, when printing PLA turn the lever anti-clockwisely to direct air flow to nozzle, this will cool the PLA as soon as it is extruded and improve print quality. When printing large object using ABS, to minimize warping, turn the lever clockwisely to direct the air away from nozzle to slow down the cooling. For smaller ABS prints that warping is less likely to happen, user could direct the air to nozzle for better print quality.

5. No raft printing. It is highly recommended to use raft for normal printing as it improves adhesion and is required for leveling compensation, therefore it is turned on by default. User could turn it off in the "Print Preview" panel.

6. No support printing. It is possible to print without generating supporting structures, user can turn it off by choosing "Base Only" in Area drop down menu of printing preference panel.

Remove the nozzle

Afte a long time of printing, the nozzle could become very dirty or even clogged. We can replace it with a new one while the old one could be cleaned and reused.

1. Use extrude function in the maintenance panel, nozzle will heat up to printing temperature.

2. Wear heat resistance gloves provided.

3. Wipe the nozzle with tissue or cotton.

4. Unscrew the nozzle using the wrench provided.

5. Remove the clog: there are many method such as drill through the clog using a 0.4mm drill bit, try submerge in acetone or using a heat gun to melt and blow away the clog.

Troubleshooting

Problems	Solution
Printing or platform cannot reach target temp or over heat.	1.Initialize the printer.
	2.Heater catridge is broken, seek replacement.
	3. Cable is broken, replace the cable.
Cannot extrude plastic	1.Plastic clog the nozzle, replace new nozzle or remove the clog.
	2.The filament is too thick. Usually happens when using filament with poor quality.Please use UP filament.
	3.For some model, if PLA consistently cause problem, switch to ABS.
Cannot detect the printer	1.Install the printer driver correctly.
	2. Check for defective USB cable.
	3. Restart printer and Computer