

MiiCRAFT 3D Printer

Utility User Manual

Version 1.0



REVISION HISTORY

Date	Revision	Changes and Additions	Page	By
05/15/2023	1.0	First Draft ver 6.4.4	All	All

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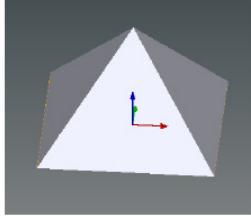
1. System Requirements for Using Utility

These are the basic requirements for using Utility on a PC. If your device does not meet these requirements, you can still install Utility, but may not have the greatest experience with Utility.

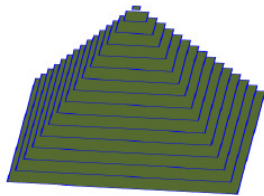
Operating system	Windows 10
CPU	Intel Core i7 or above
RAM	8 GB or above
Hard Drive Space	250 GB SSD or above
Graphic Cards	Dedicated Graphics 2GB or above ; Support Open GL 3.3 or above
Browser	Use Google Chrome only
Wifi Dongle (Optional)	<ul style="list-style-type: none"> ● Advance Series/ Profession Series / Prime Series / Hyper Series suggest to use with D-Link DWA-127 Wireless Networking Adapter. ● Ultra Series suggest to use with EW-7811Un ● Other brand and model of wireless network adapter may not compatible to our printer

2. Printing Work Flow

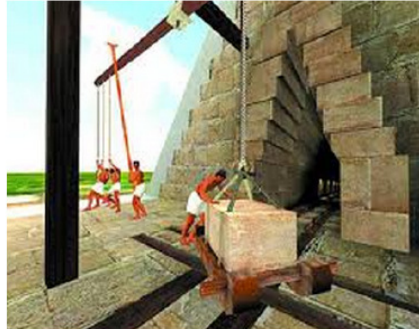
This manual focus on the work flow of 3D file preparation and Printing setting.



1. Get 3D file (*.stl) from
 - a. CAD
 - b. 3D scanner



2. 3D file preparation
 - a. Repair 3D file
 - b. Build supports
 - c. Slice (Layer thickness)

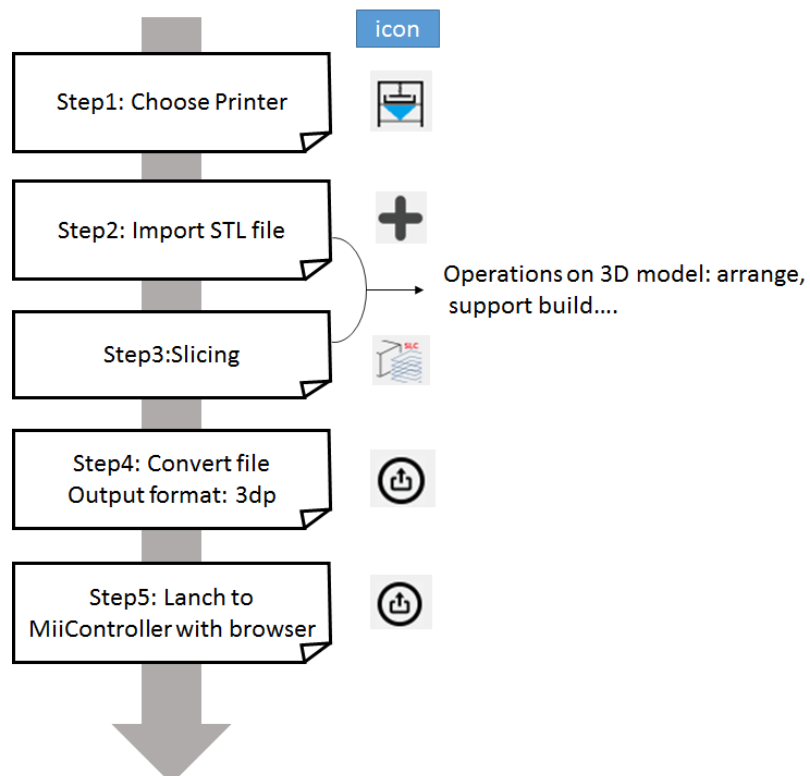


3. Printing setting
 - a. Material selection
 - b. Tilt speed
 - c. Printing optimization

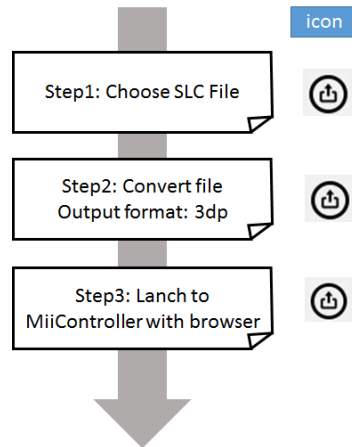


4. After printing
 - a. Post curing
 - b. Remove supports
 - c. Grinding (optional)

● Flow Chart: From STL file to print job file



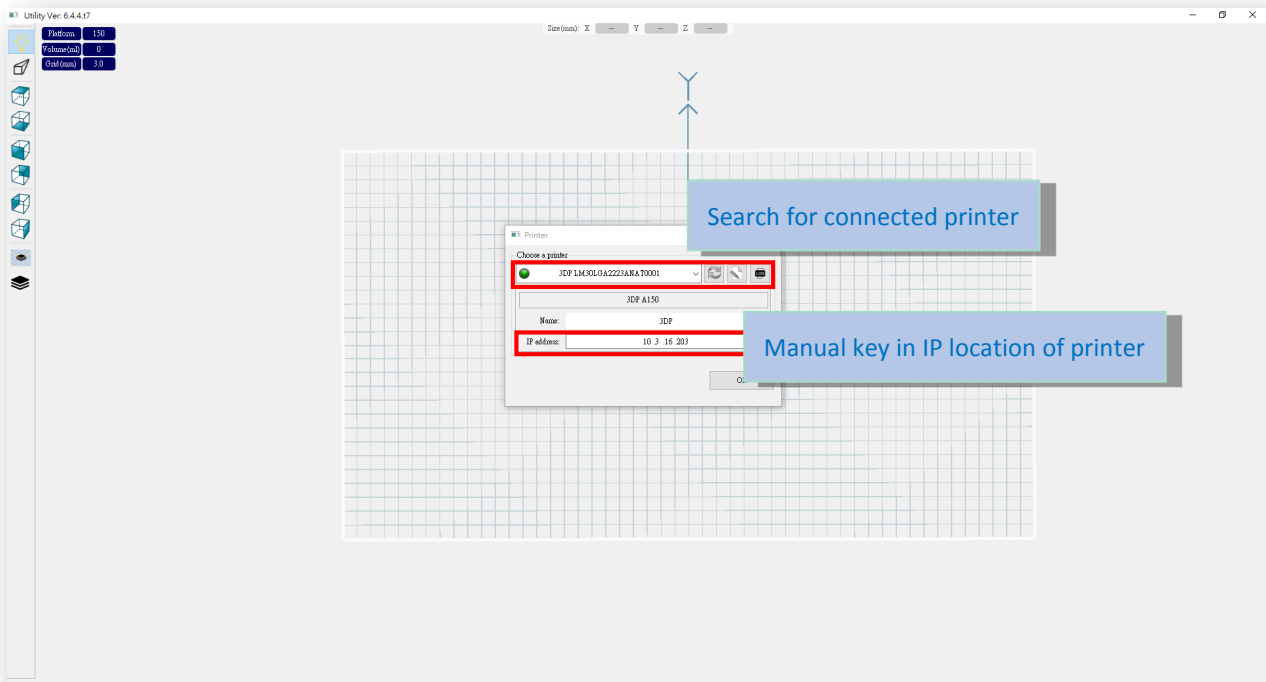
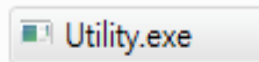
- Input: SLC file



2.1 Utility Operation Steps

2.1.1 Open Utility and Connect to printer

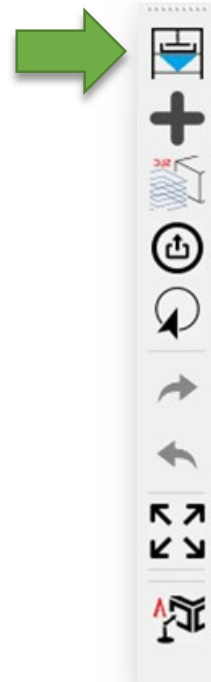
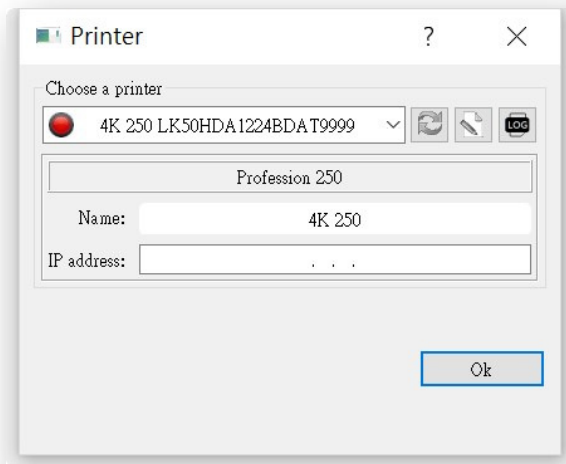
- Unzip the installation file, and click Utility.exe
- Need to connect to printer first, otherwise cannot use Utility



- Connect your printer with laptop
 - **Basic** : Connect printer and laptop by RJ-45 cable [Initiating time 1 minute]
 - **LAN** : Connect both printer and laptop to local area network [Initiating time a few seconds]
 - **IP sharer** : Connect both printer and laptop to IP sharer [Initiating time a few seconds]
 - **WIFI dongle** : Insert WIFI dongle into printer USB port => Panel: Engineering mode => Wifi => Connected --
 - **WIFI dongle** => Key in IP(Wifi) location shown on printer on Utility [Initiating time a few seconds]

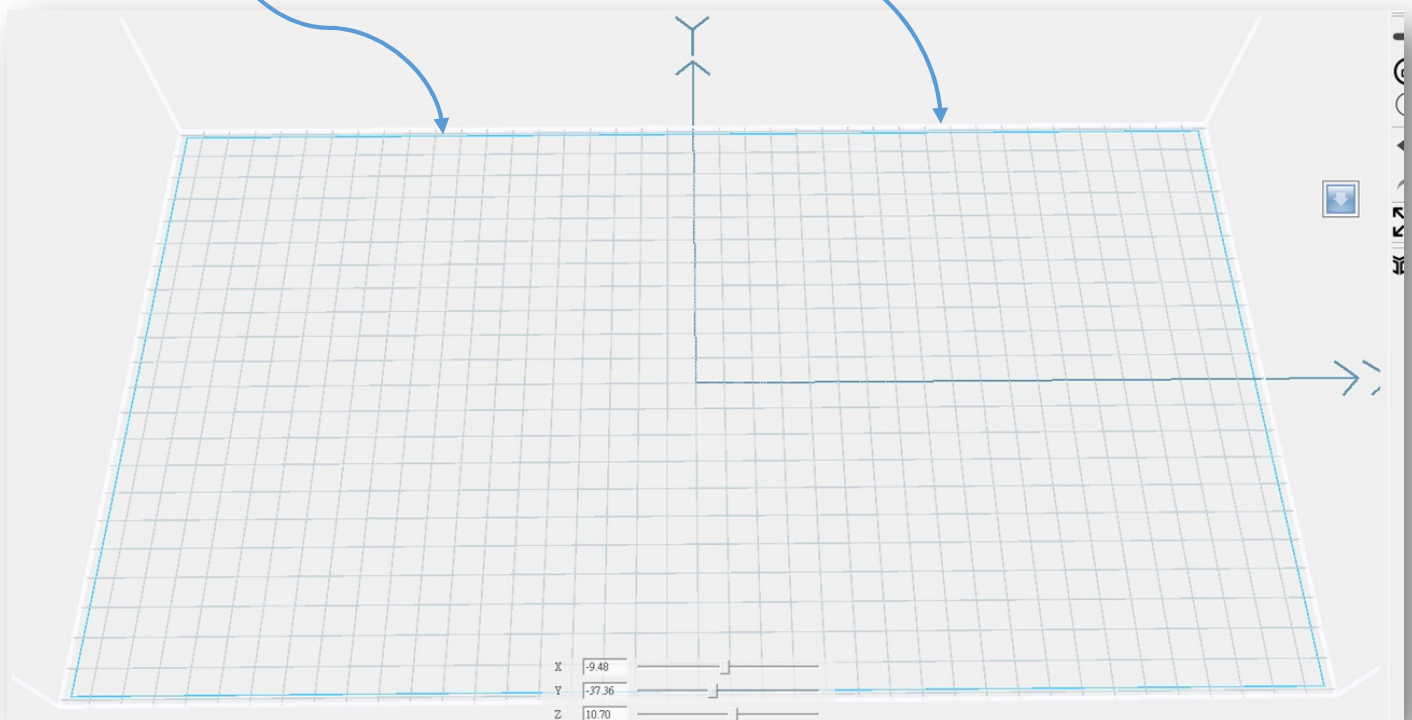
2.1.2 Choose a Printer

- Select printer, also select building platform size.
- Set printer information whenever using this panel



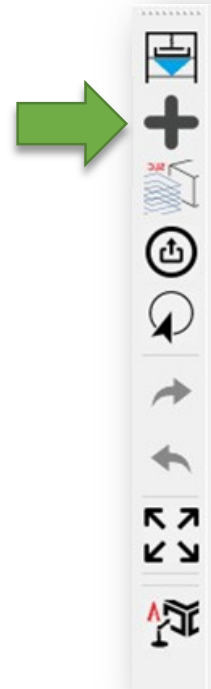
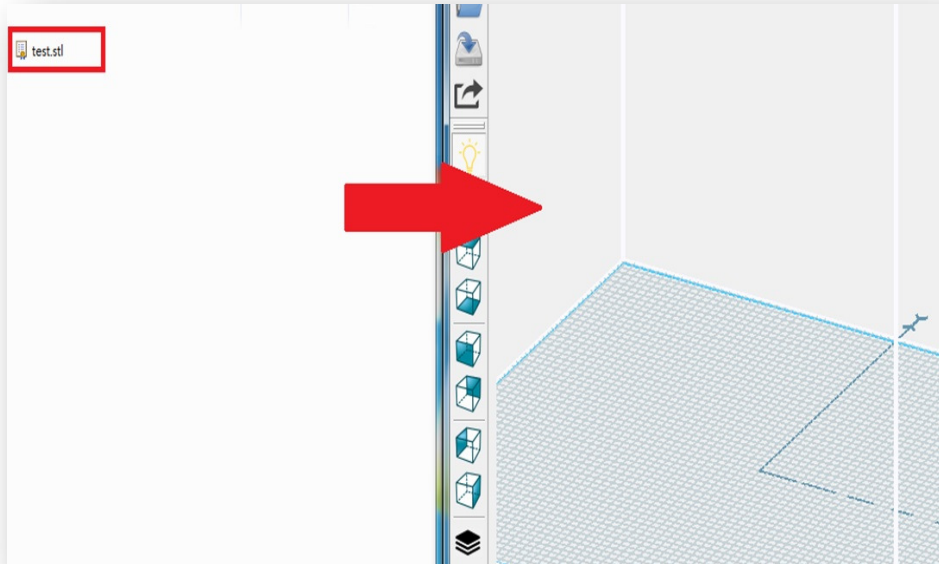
2.1.3 Open Utility and Connect to printer

- White frame is the largest printing boundary
- Blue frame is suggest printing boundary

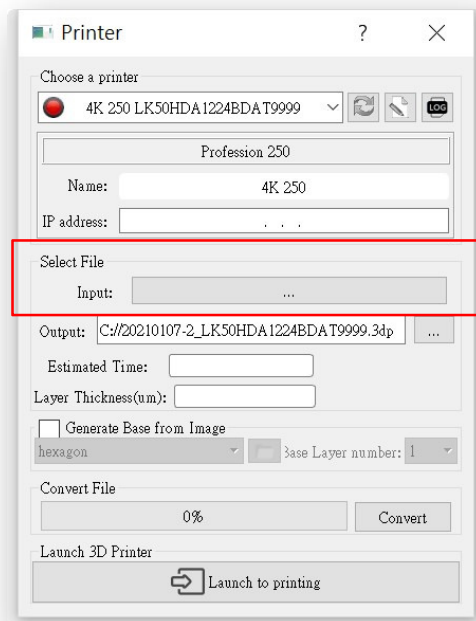


2.1.4 Import file



- Two way to import .stl file
- Tool bar, icon as picture on the right
 - Drag the .stl file from folder into Utiltiy

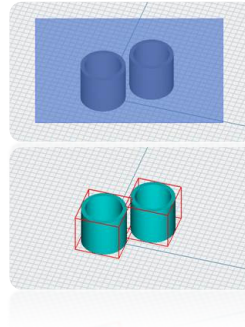


- How to import .slc file (sliced file)
 - Tool bar, icon as picture on the right



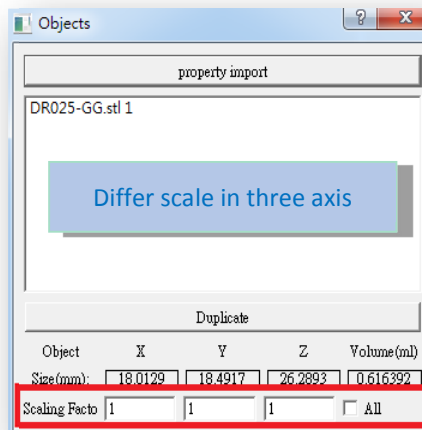
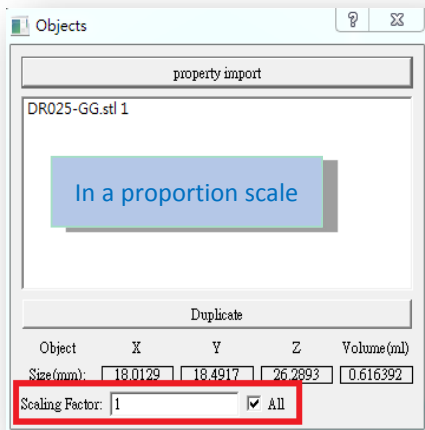
2.1.5 Hot key

- Right Mouse Button –Rotate platform
- Middle Mouse Scroll -Zooms in and out making the view of the build area larger or smaller
- Middle Mouse Button -Move platform
- Alt+E = Move model 
- Alt+R = Rotate model 
- Ctrl + D = Duplicate object
- Ctrl + mouse click = Multi select the object
- Ctrl + mouse click + drag = Move multiple object
- Mouse click + drag area = Box selection

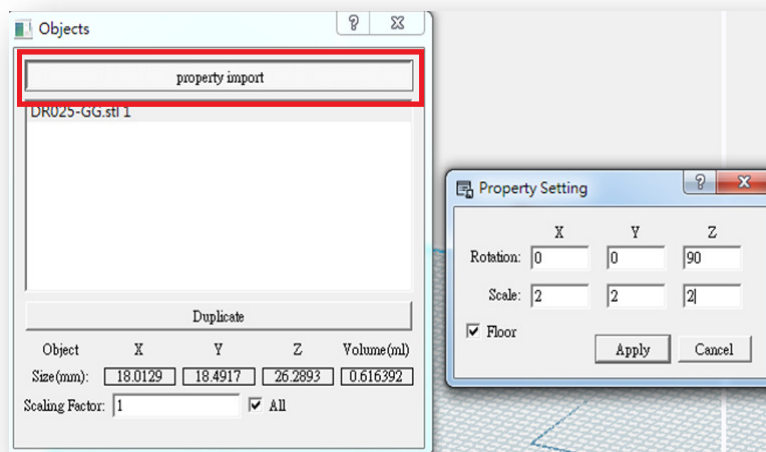


2.1.6 Duplicate and Resize Model

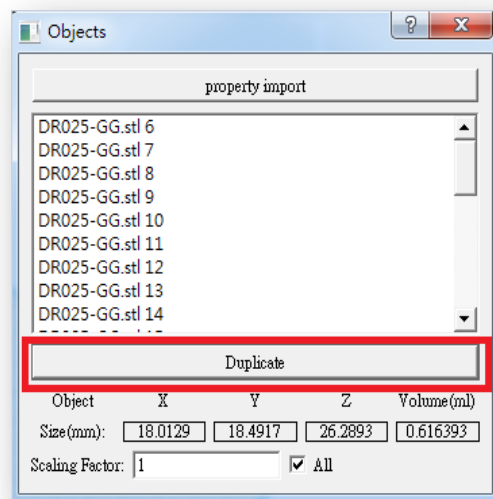
- Tool bar, icon as picture on the right
 - Note: When the file name is high light, means the model been selected, now instruction is active.
 - Select “all” to do amplify or minify in a proportion scale



- Property import, the setting will apply to every model import later, EX: Property import setting Z axis rotate 90 degree, X,Y,Z amplify 2 times, so the model import later will all follow this setting

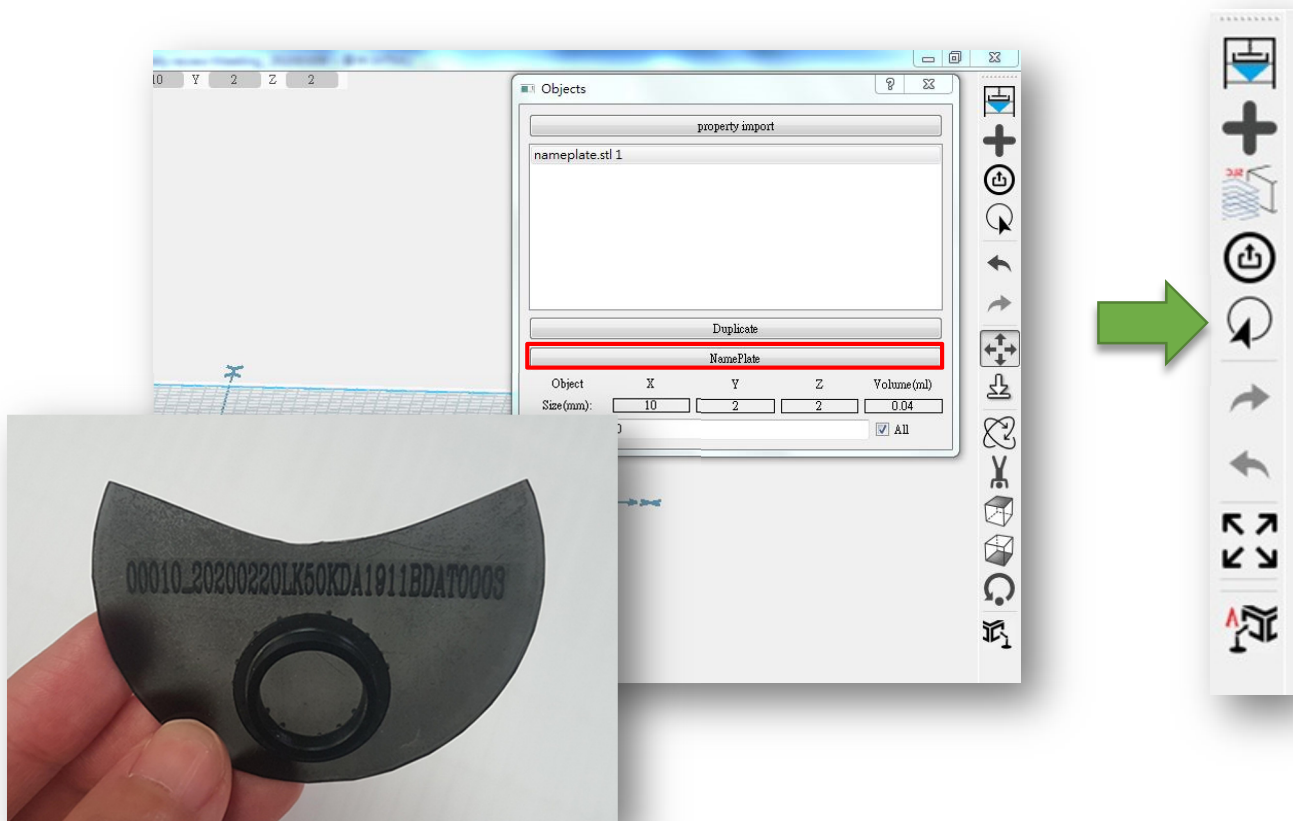


- Duplicate selected model



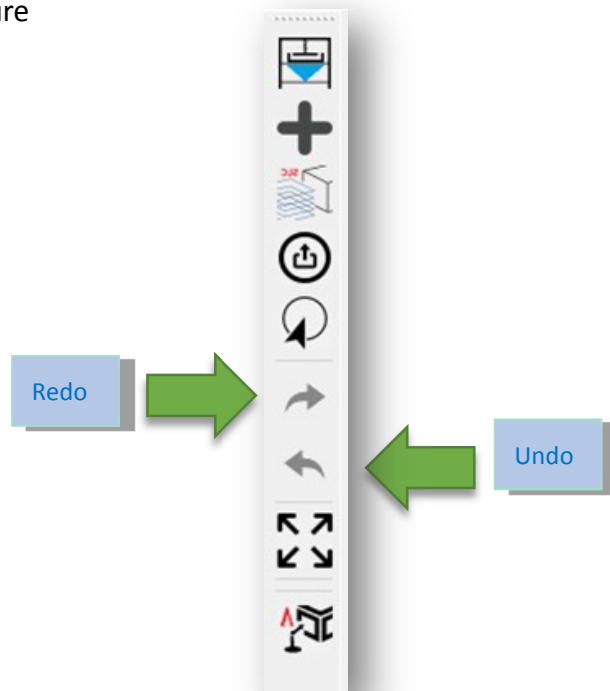
2.1.7 Generate Nameplate on print model

Nameplate is a serial number combines date, machine serial number and printing job number.



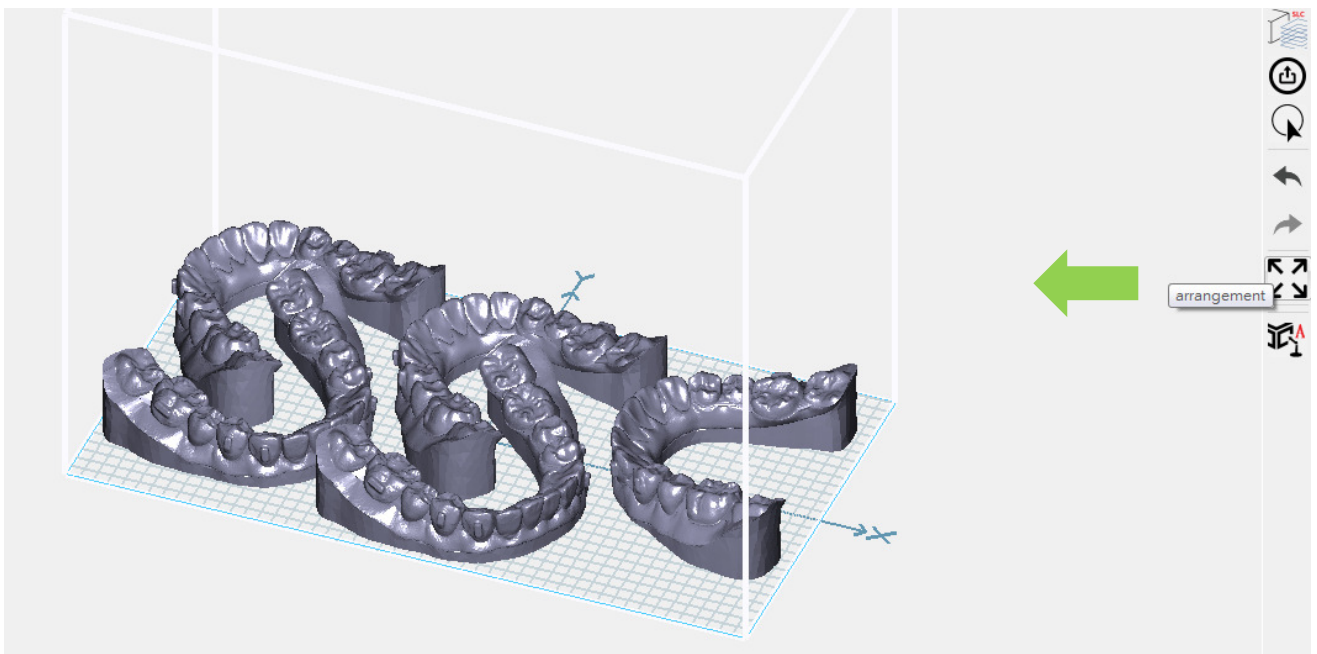
2.1.8 Undo and Redo

Tool bar, icon as picture



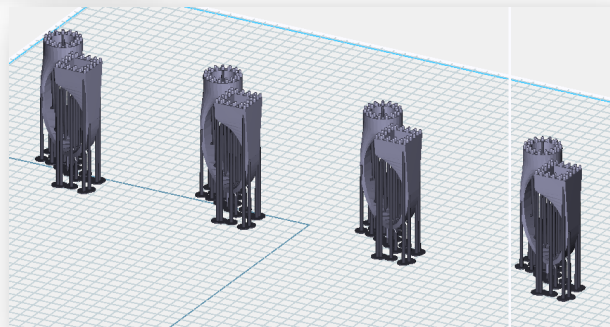
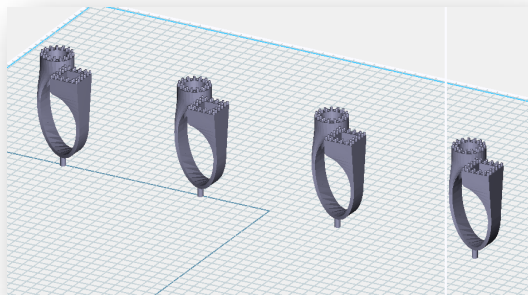
2.1.9 Auto arrangement

Tool bar, icon as picture on the right side, clicking icon will arrange models automatically.



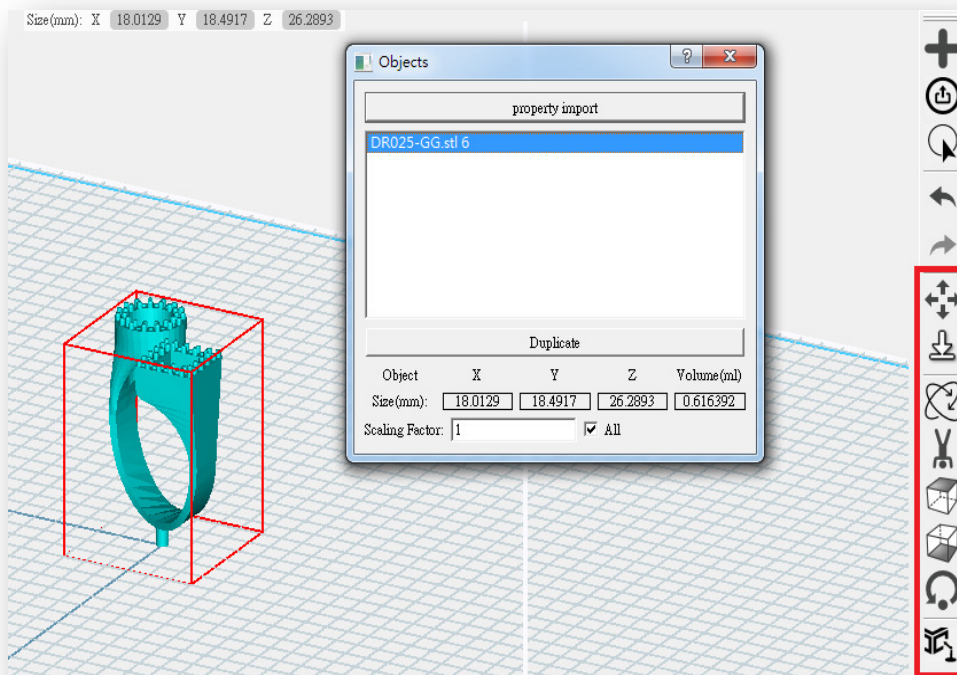
2.1.10 Auto support

Tool bar, as picture on the right, build auto support for every model

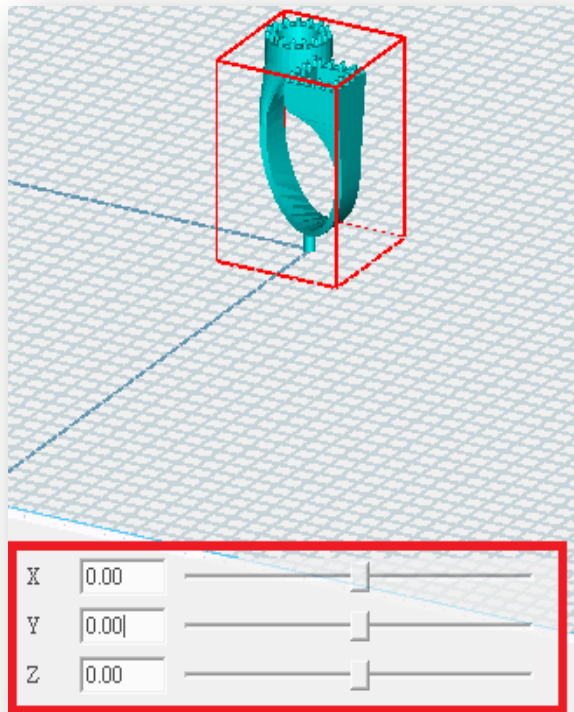


2.1.11 Model arrangement

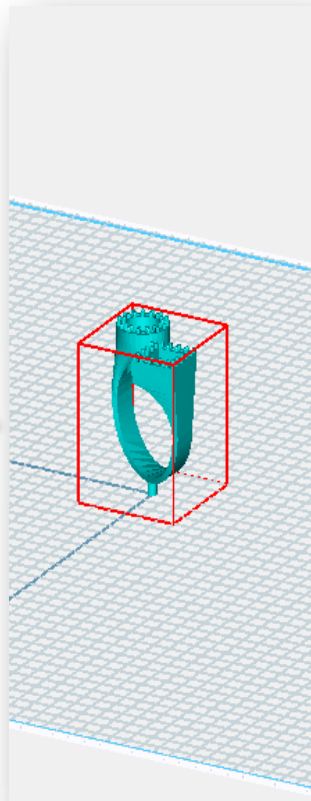
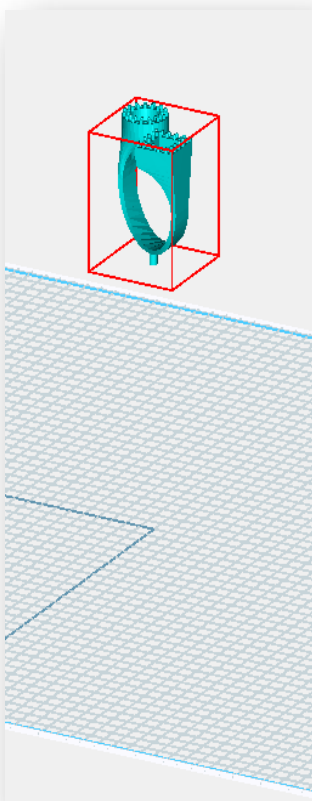
- Select one model (been high light), more setting shows up in tool bar (as below red box), here you can do customize model arrange, and build customize support.



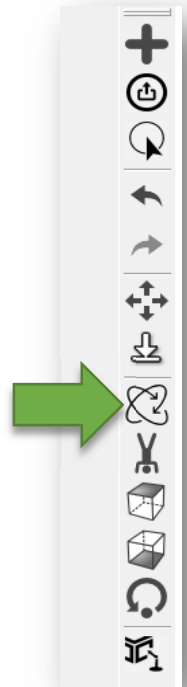
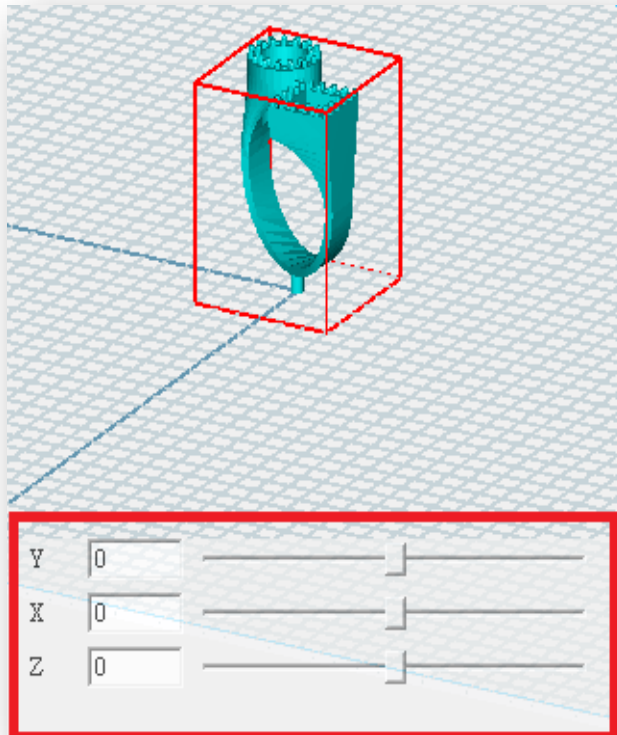
- Select model, and click on tool bar
 - Drag and move the model
 - Or set X, Y, Z coordinate



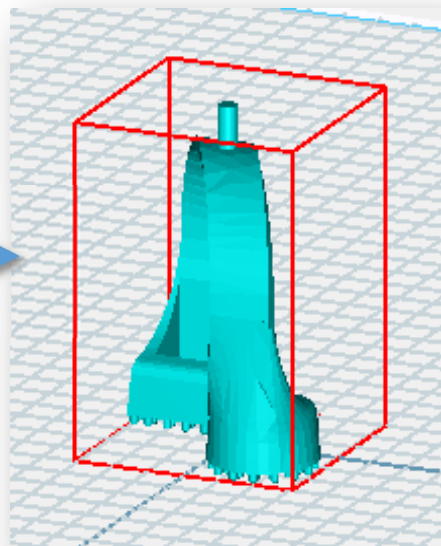
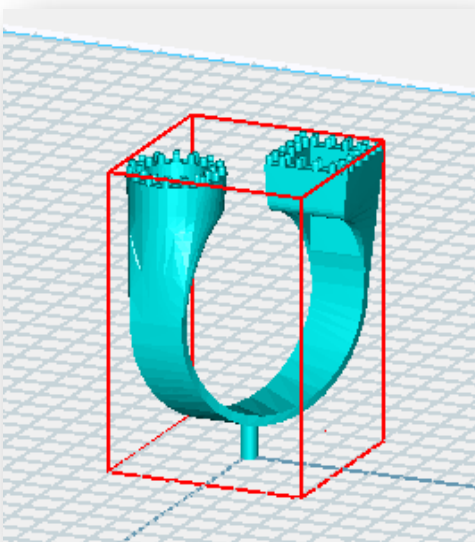
- Select model, and click on tool bar, put model down to floor.



- Select model, and click on tool bar
 - Set X, Y, Z axis rotation degree
 - Or use horizontal scroll bar

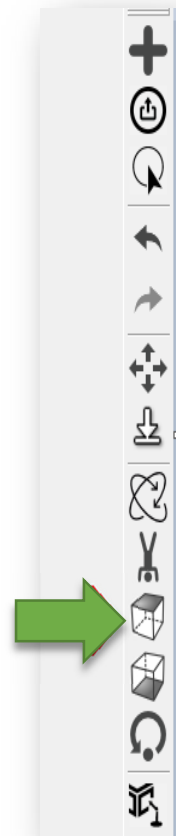
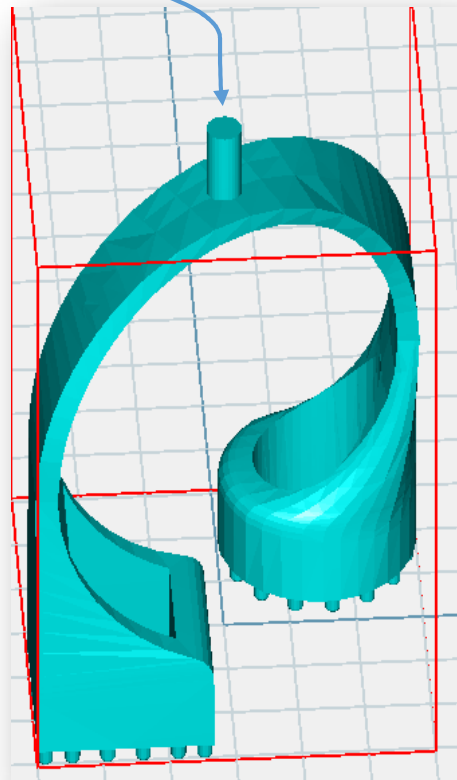


- Select model, and click on tool bar, put model upside down



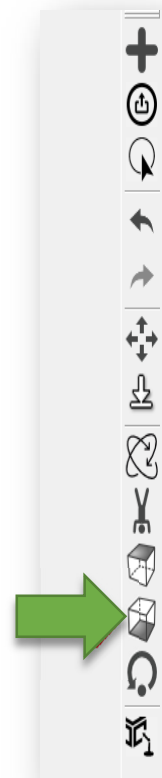
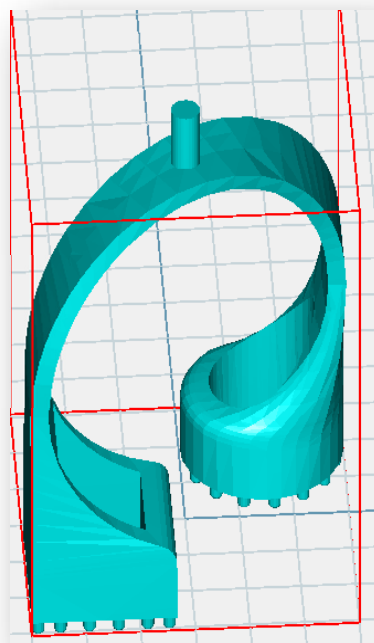
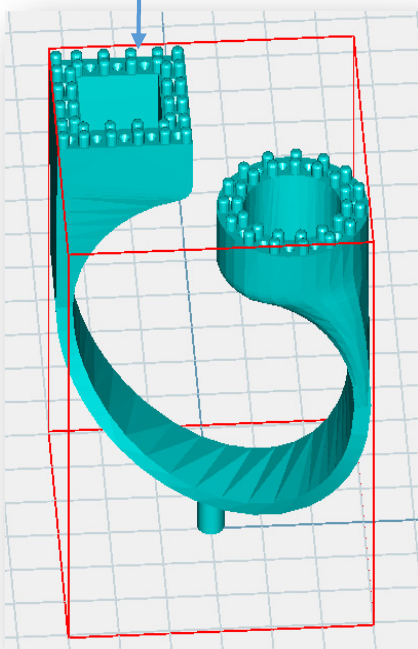
- Select model, and click on tool bar, click on one side, face up

EX: Select this side

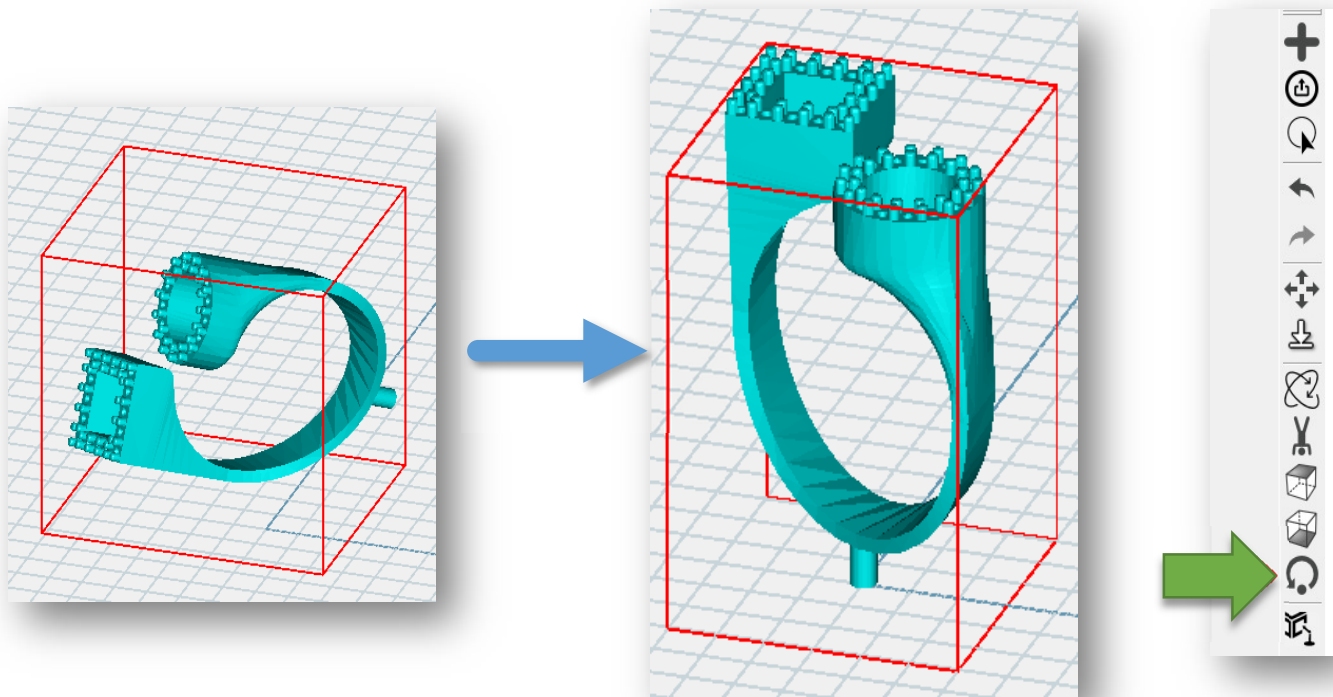


- Select model, and click on tool bar, click on one side, face down

EX: Select this side

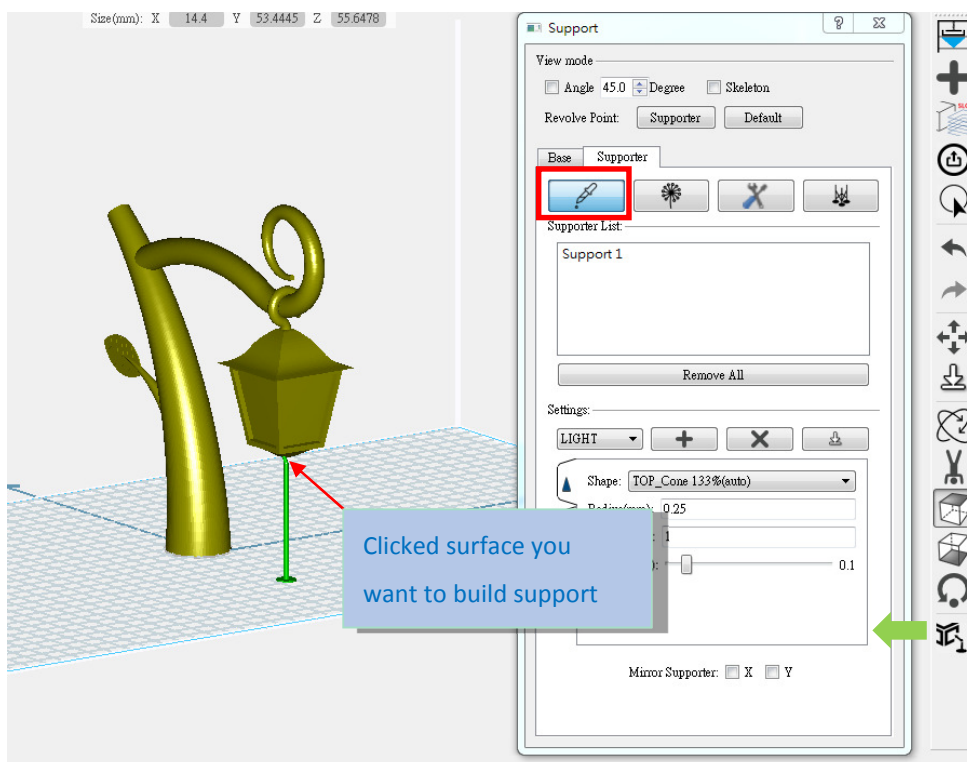


- Select model, and click on tool bar, back to the default rotation.

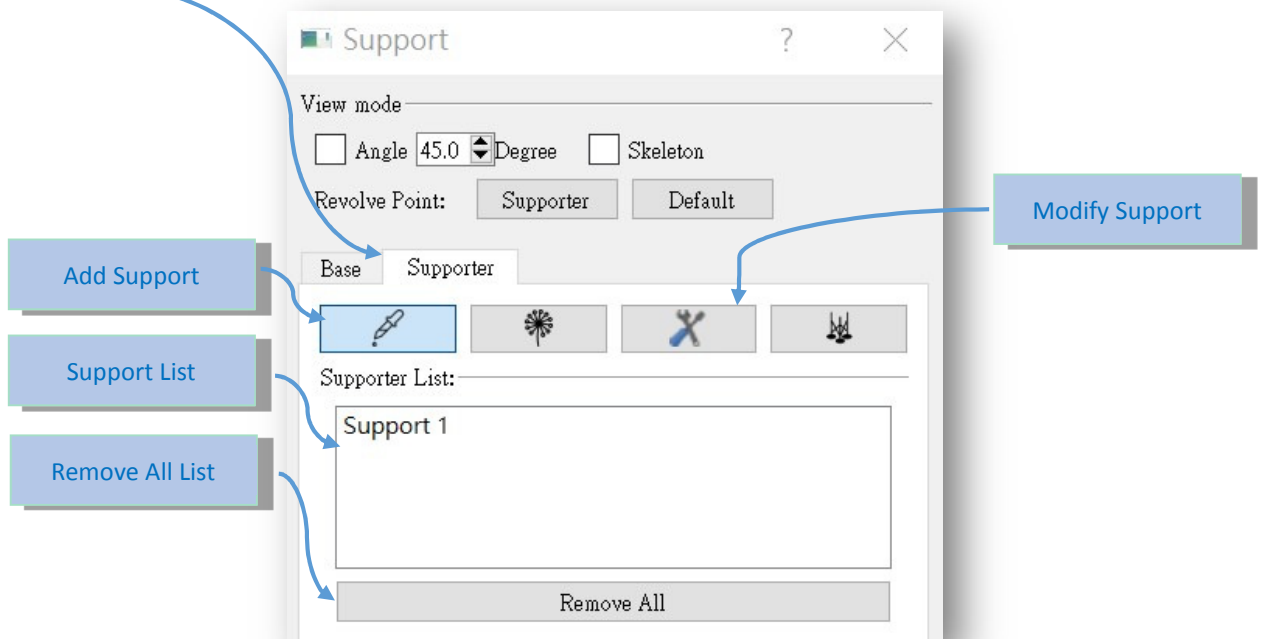


2.1.12 Build supports

- Select one model (been high light), click the icon (green arrow) on the tool bar and support edit window will show.
 - Add support, click where you'd like to add support

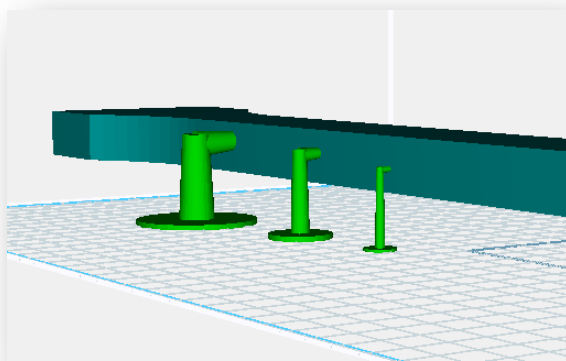


Add Support to Existing Support

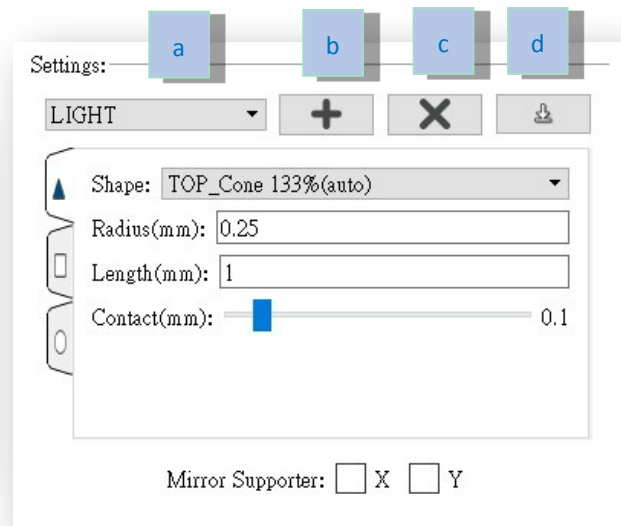


● Support setting

- (a) 3 kinds of basic support setting can be selected by user preference
 - LIGHT
 - MEDIUM
 - HEAVY



Support for customizing and saving settings



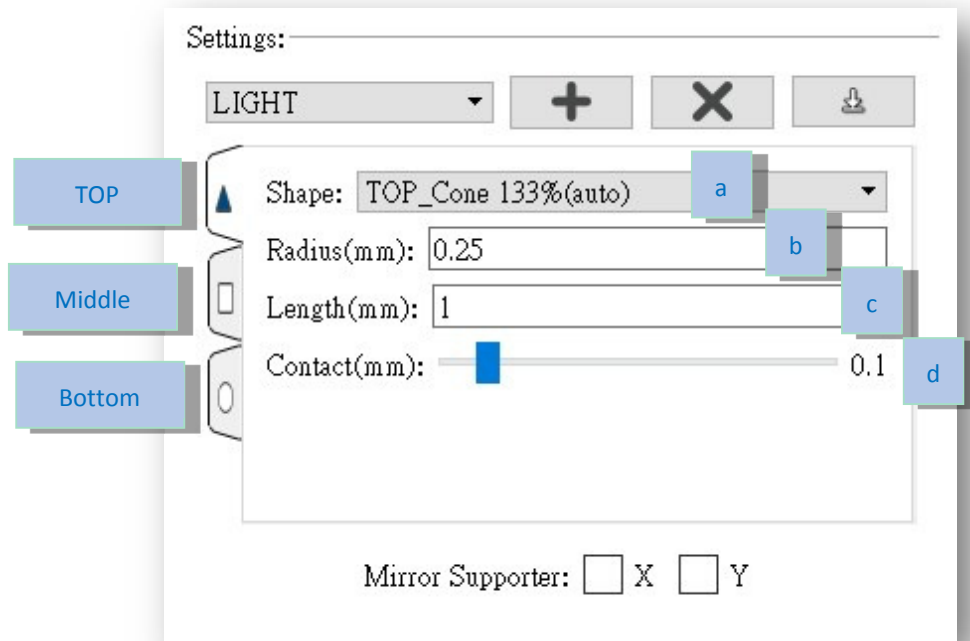
● EDIT

- (b) Add support setting
- (c) Delete support setting
- (d) Save support setting

- Customize support setting: One support can be separate into top, middle and bottom.

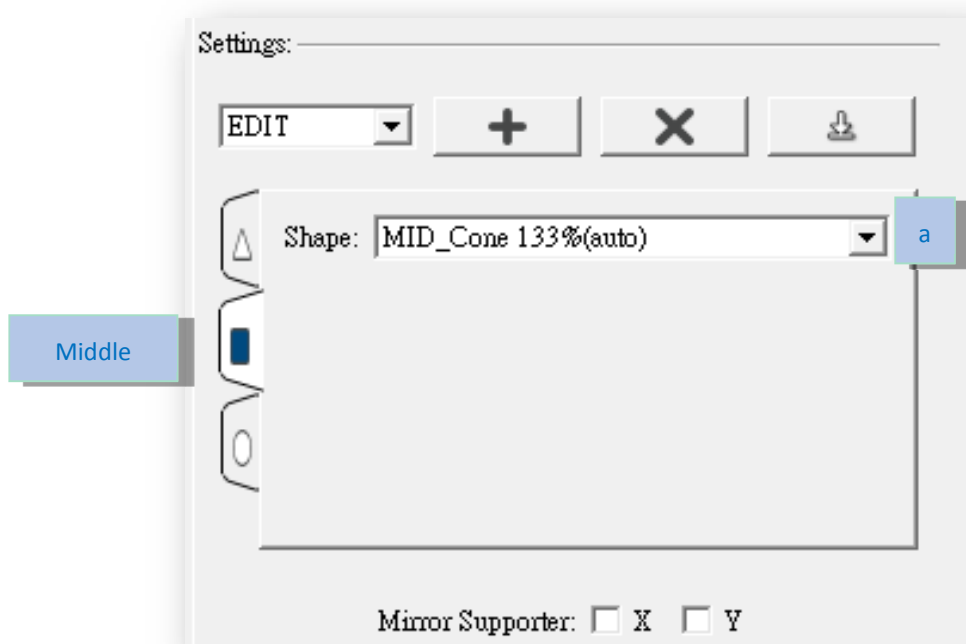
■ Top support setting

- (a) Top support shape
- (b) Top support radius
- (c) Top support length
- (d) Top support and model contact

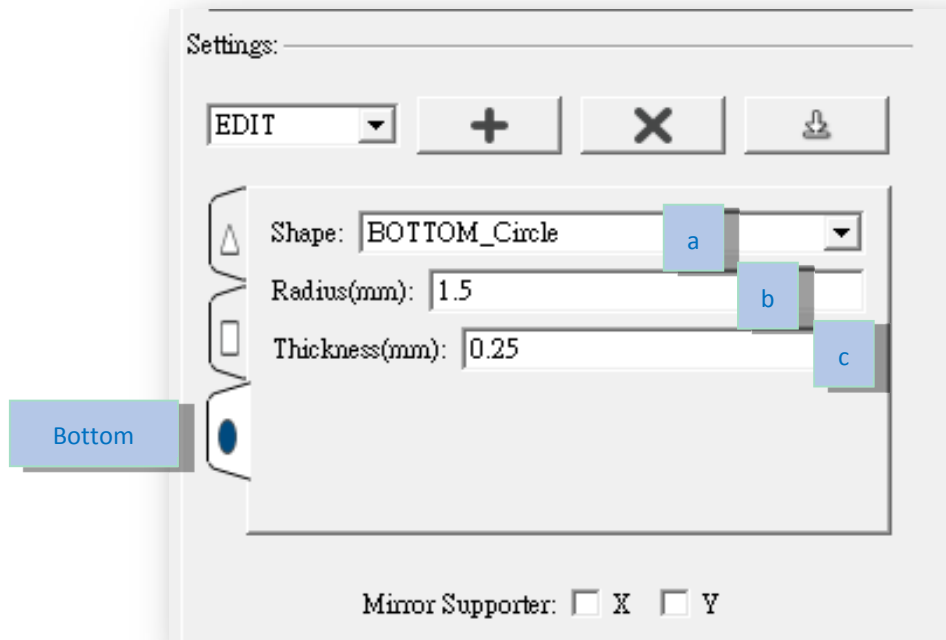


■ Middle support setting

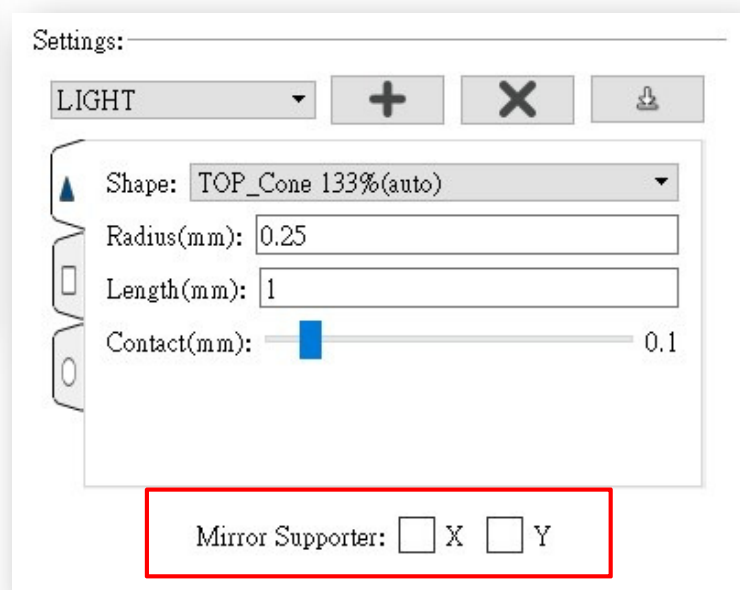
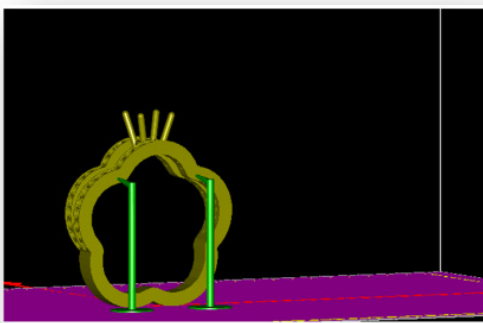
- (a) Middle support shape



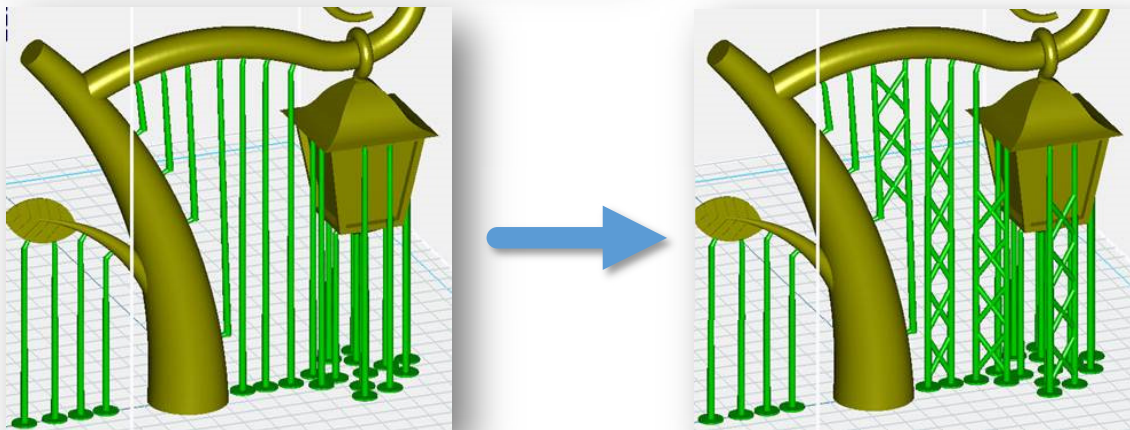
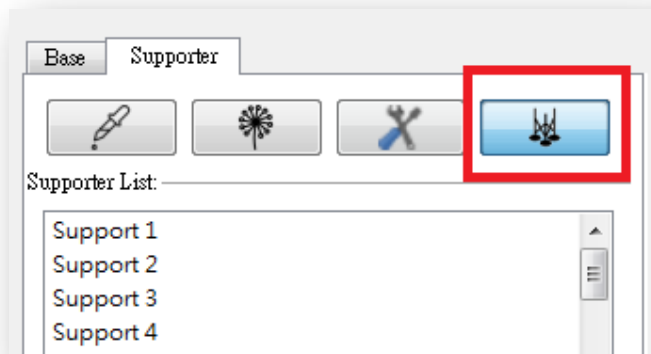
- Bottom support setting
 - (a) Top support shape
 - (b) Top support radius
 - (c) Top support thickness



- Mirror supporter: Build symmetrical supports according to X axis or Y axis.

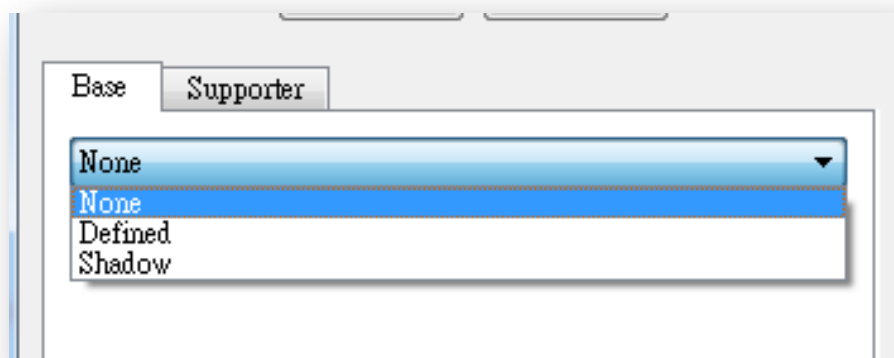


- X type supporter:
 - First build at least two supports.
 - Click cross structure function
 - Click two supports which you like to have cross structure between
 - Click two supports again can cancel the cross structure

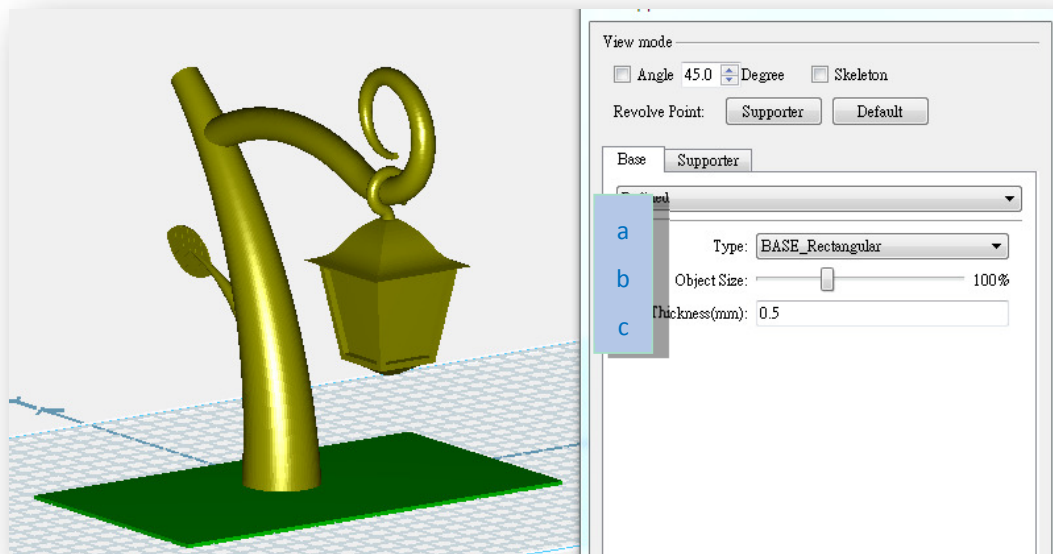


2.1.13 Build Base

- None: no base
- Defined: built-in base
- Shadow: shadow base

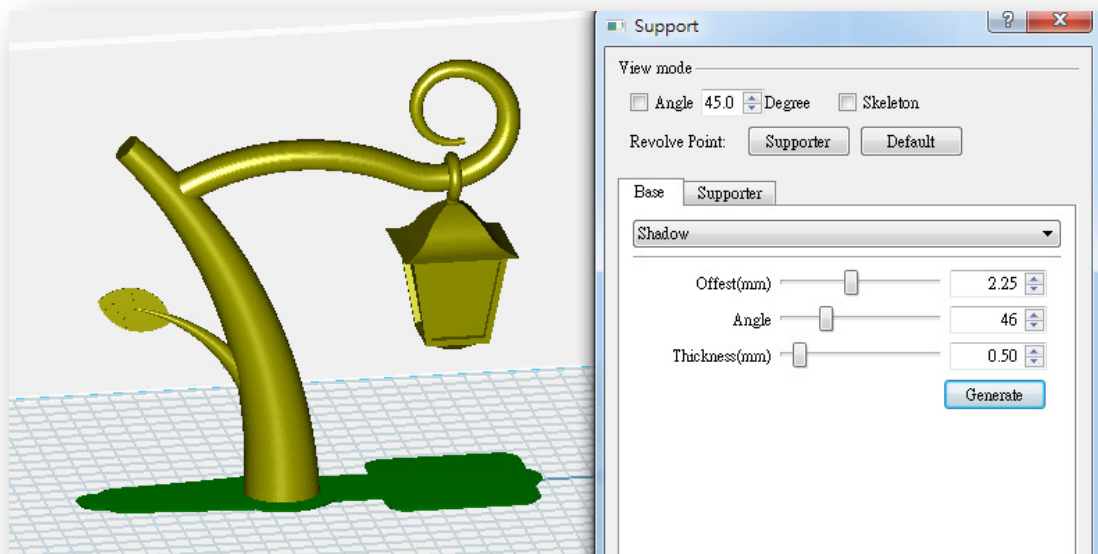


● Defined Base:

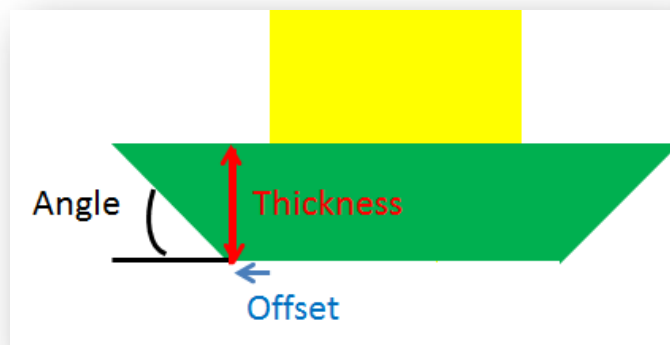


- (a) Base Type
- (b) Base Size
- (c) Base Thickness

● Shadow Base

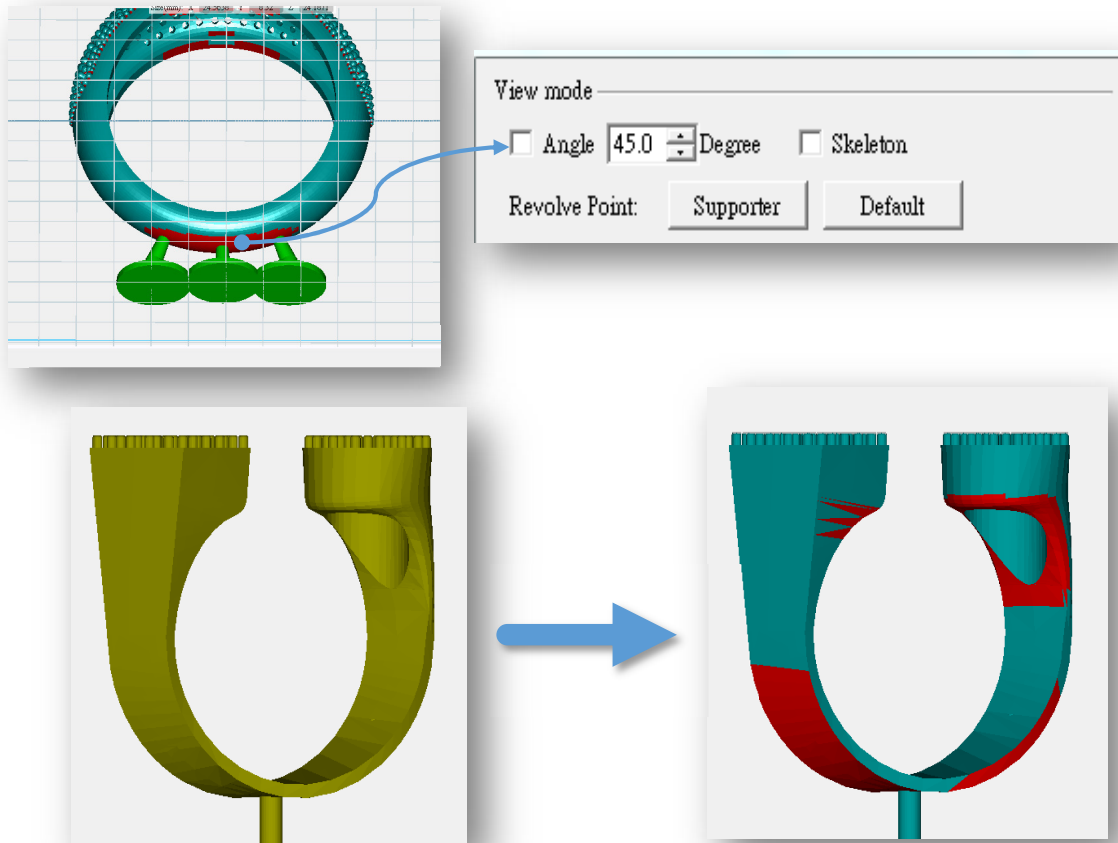


- parameters

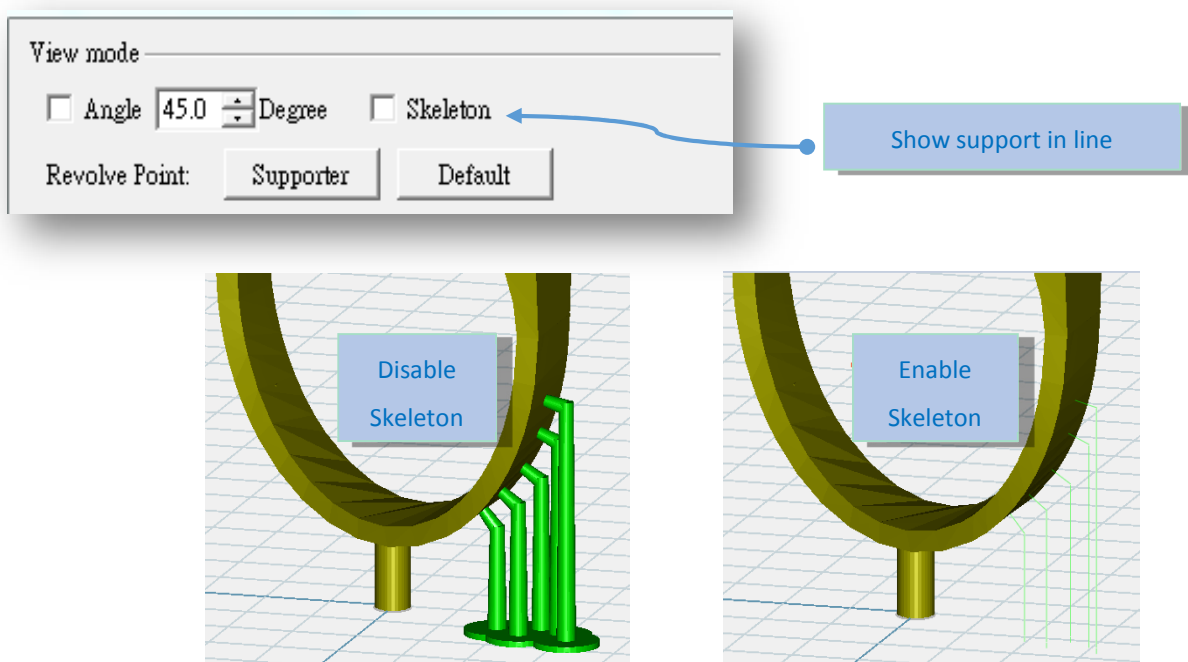


2.1.14 Build support – View mode

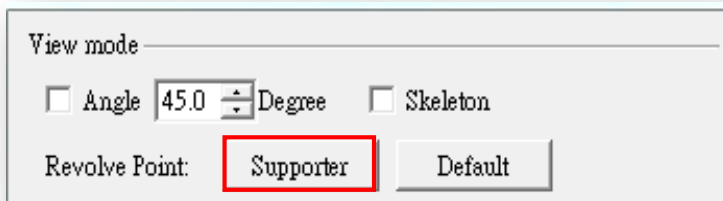
- Angle Indicator will help identify the bevel angle of object surface
 - Below a certain angle will become red in preview
 - These red area indicates area more flat and possibly hang in air, where need to build supports



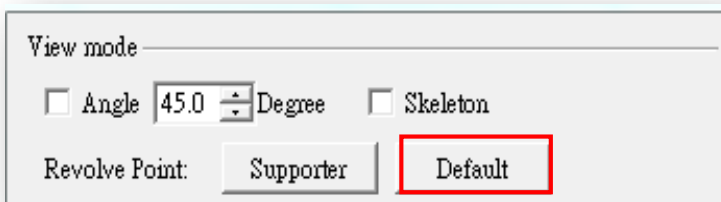
- Skeleton



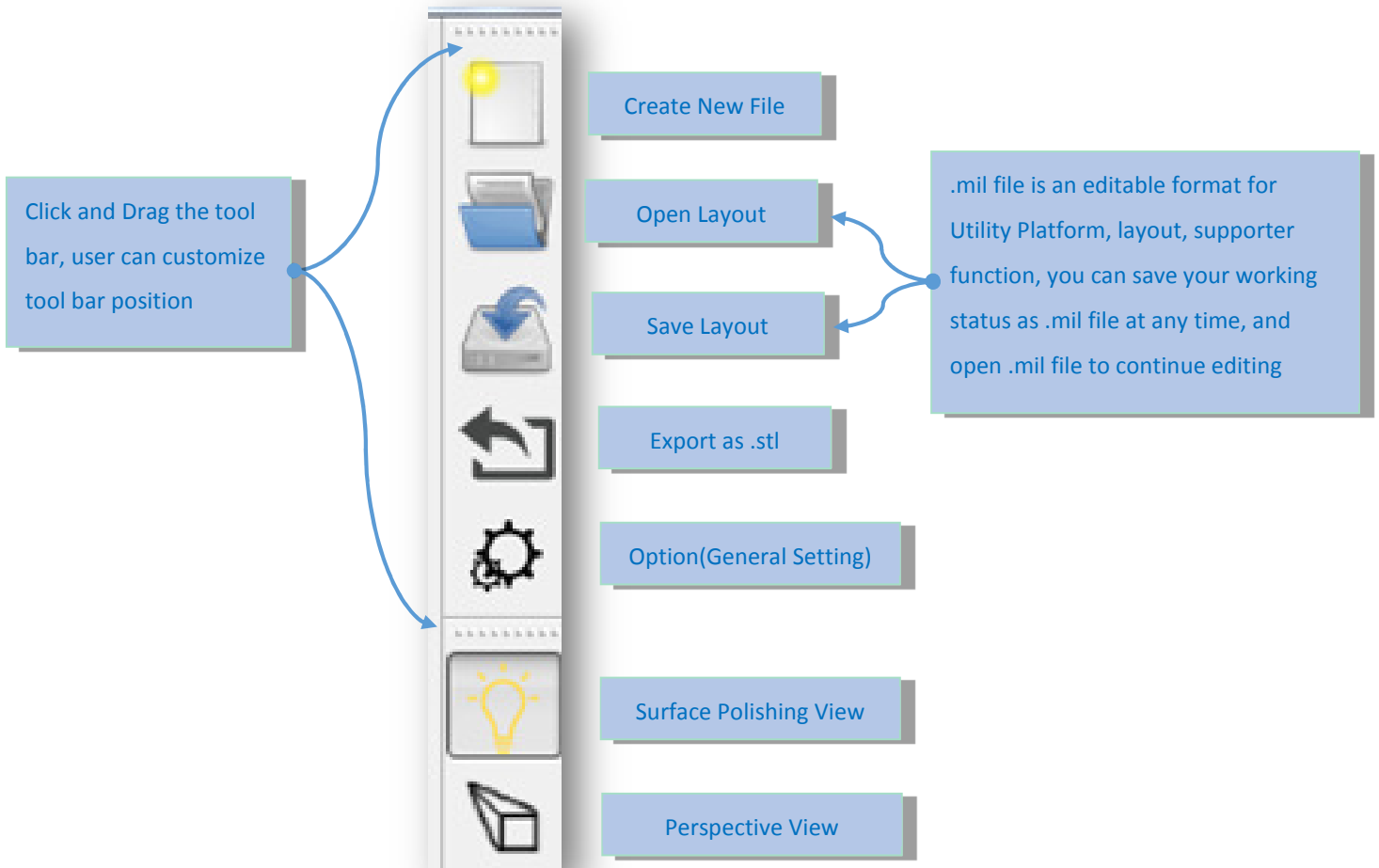
- Revolve Point : Supporter
 - Select one support
 - Click Revolve point: supporter
 - Use fix support as view rotation center
 - See the 360 degree position of support

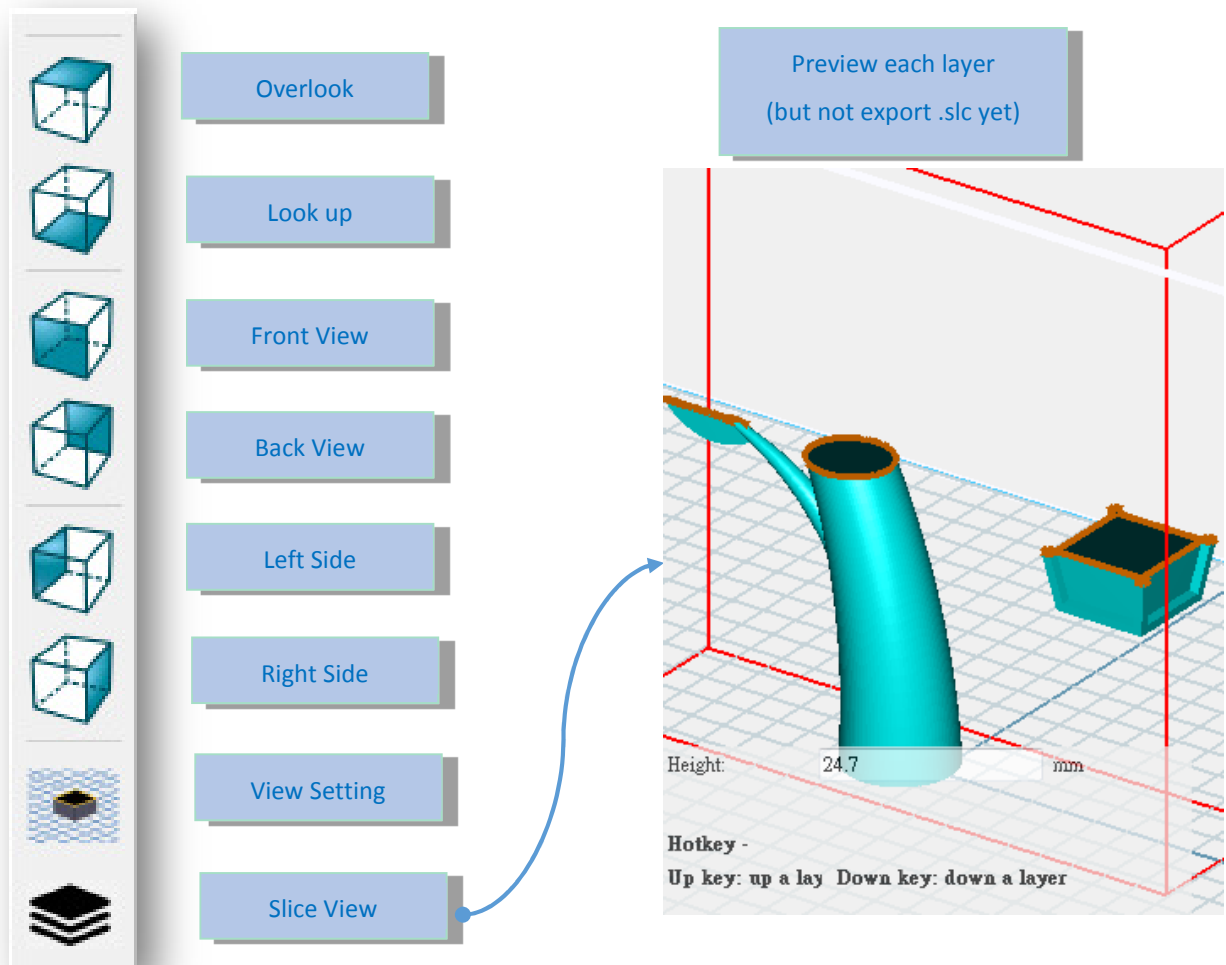


- Revolve Point: Default (Use platform as view rotation center)



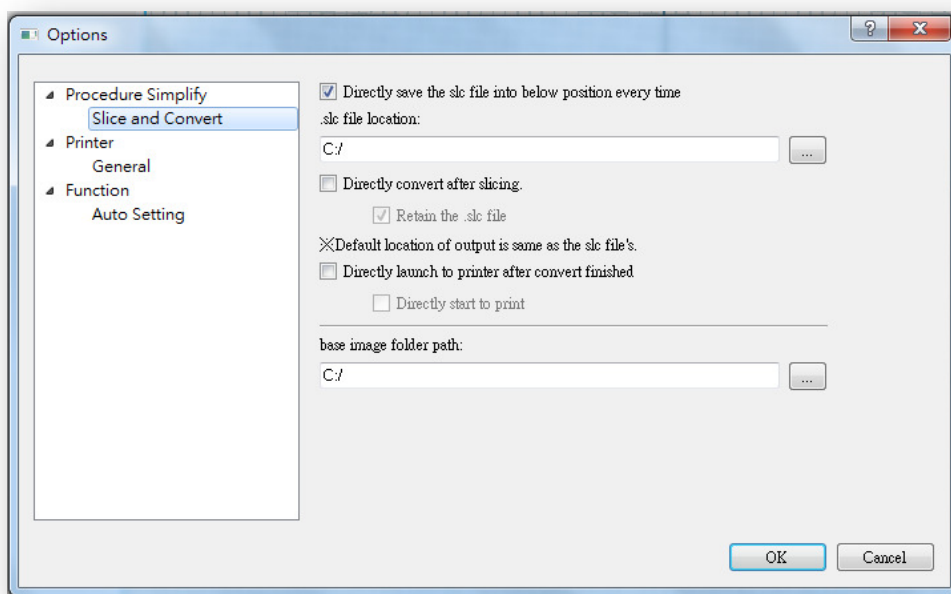
2.1.15 Tool bar (default in left side)



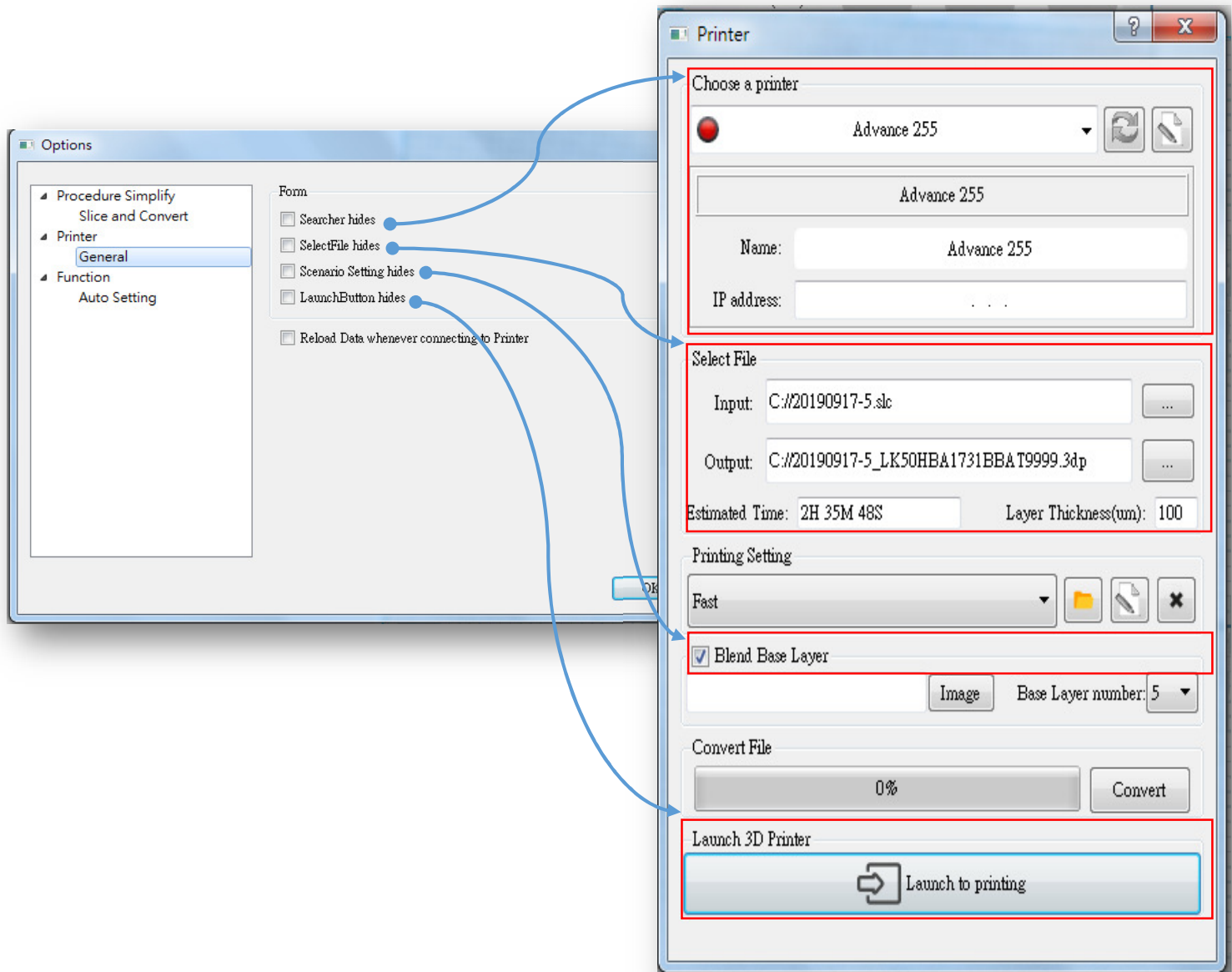


2.1.16 Tool bar – Options setting

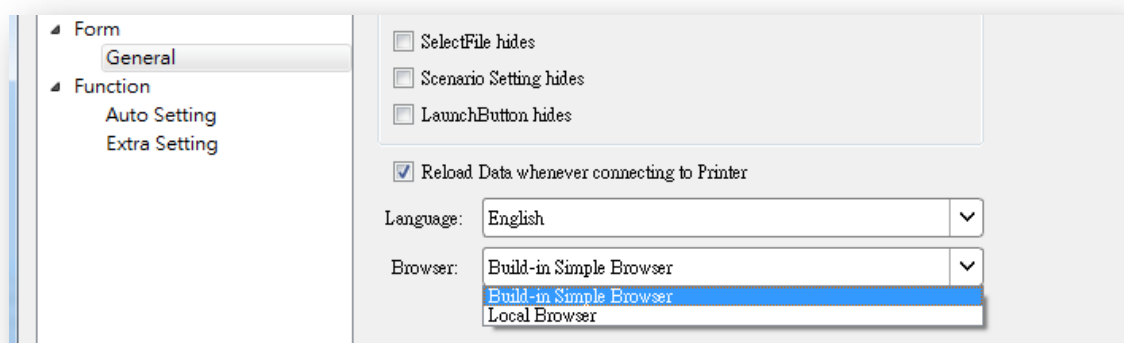
- Procedure Simplify : Settings for skip some procedure enquiry alert every time.



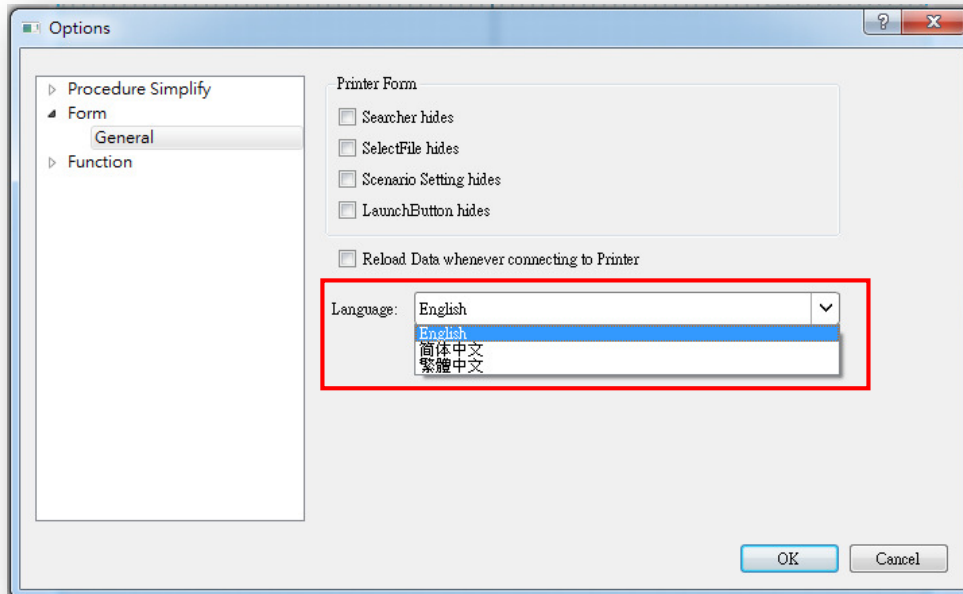
- Printer => General setting
 - Printer panel setting : Settings for hide some function panel.
 - Reload Data(Printer calibration data) whenever connecting to printer.



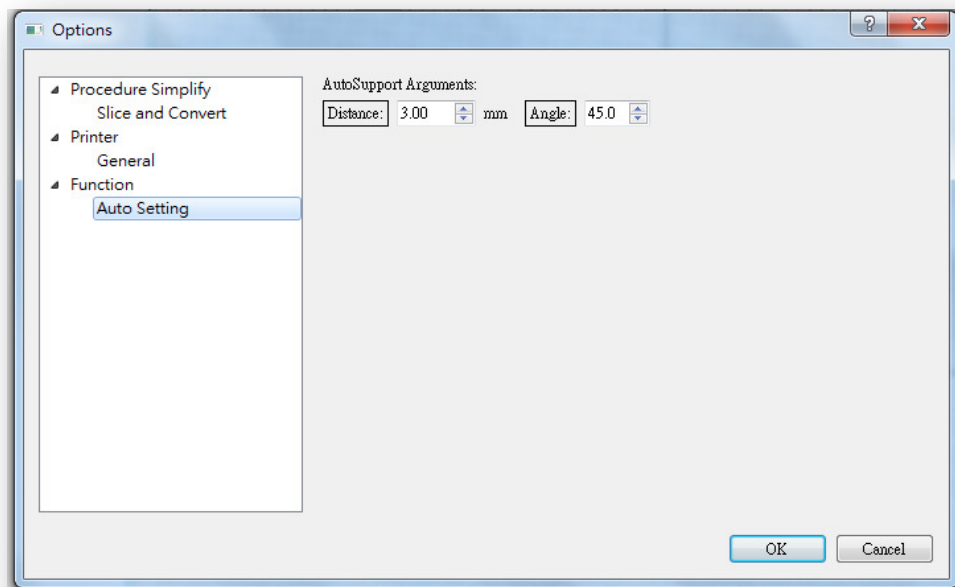
- Browser used: Built-in or Local Browser



- User interface language: English, Traditional Chinese, Simplified Chinese



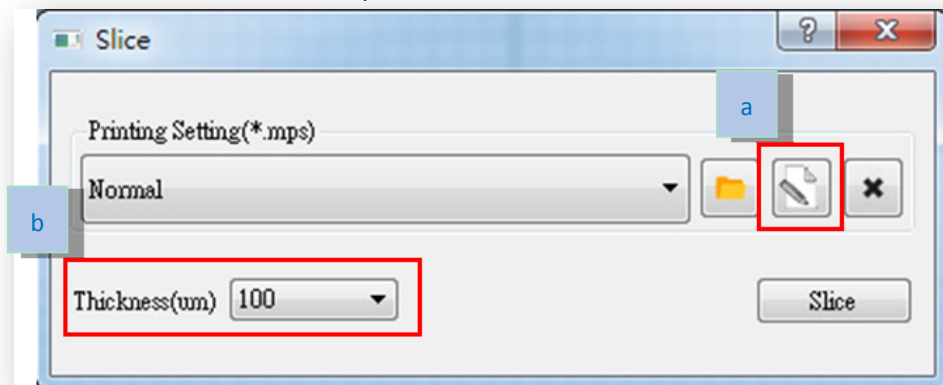
- Function => Auto setting:
 - Distance: The distance of supports and supports. The density of supports.
 - Angle: The model surface below a certain angle, will automatically build supports.



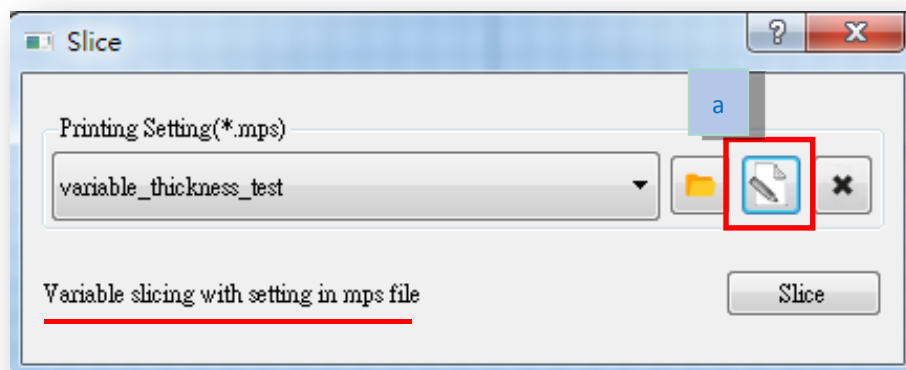


2.1.17 Slicing

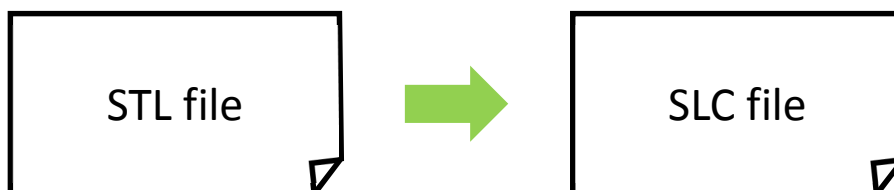
- Click slicing icon, slice dialog will show.
- Choose printing setting(*.mps) you want.
- Type and thickness of slicing are based on values saved in mps file.
- Type 1 - Uniform thickness:
 - (a) Open edit page of mps(see section of printing setting) and choose thickness
 - (b) Or choose thickness directly



- Type 2 - Variable thickness:
 - (a) You must change multiple thickness in edit page. (see section of printing setting)

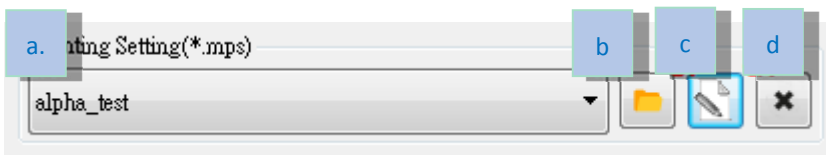
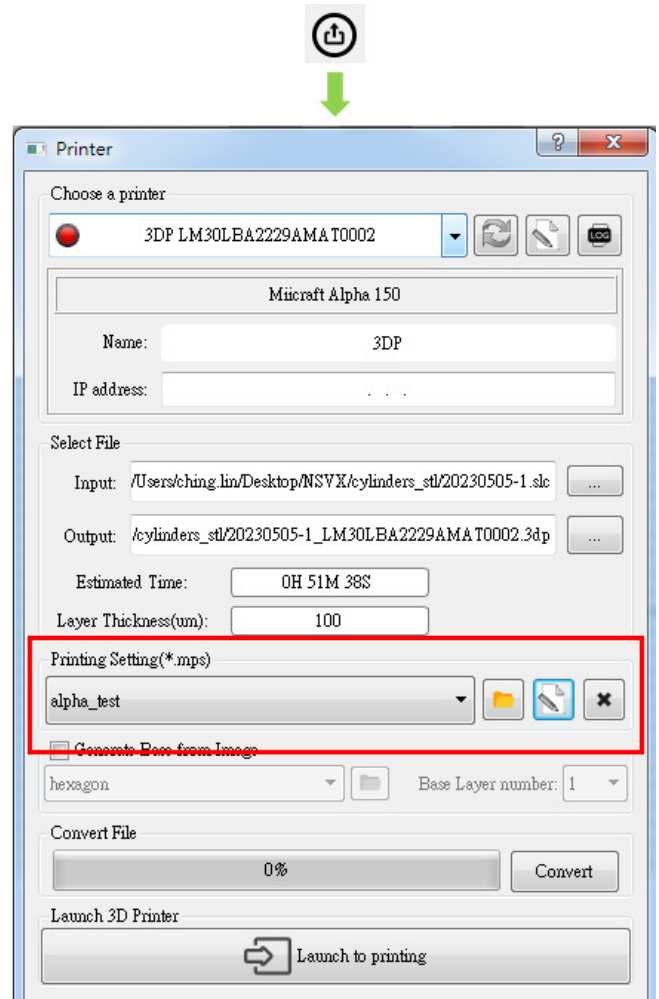
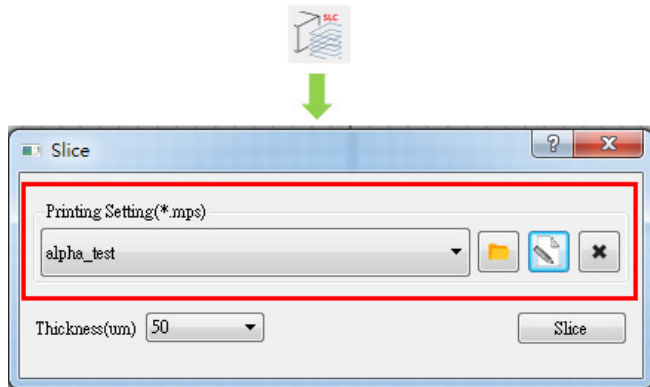


Click slice button, and choose the file path you want to save.



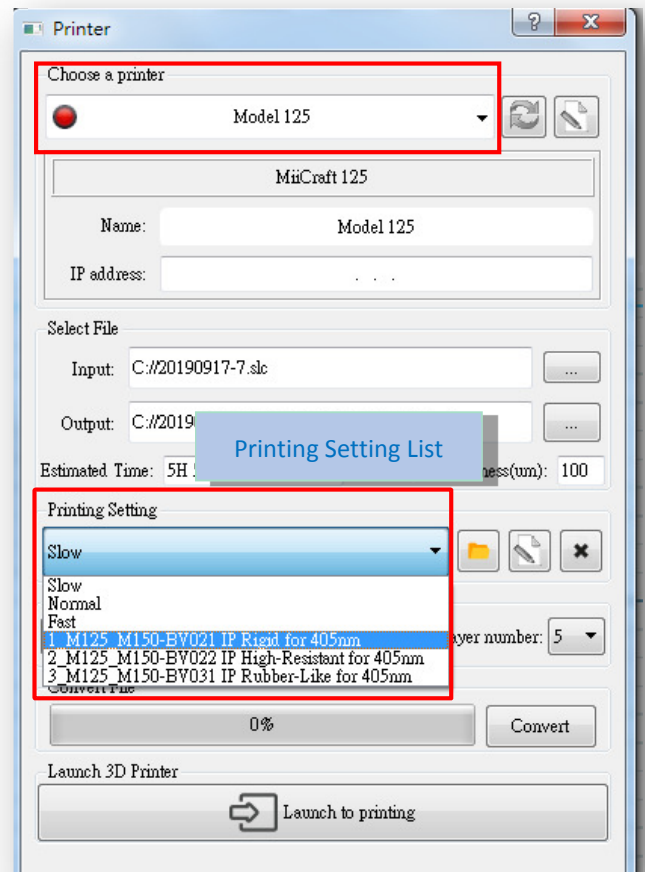
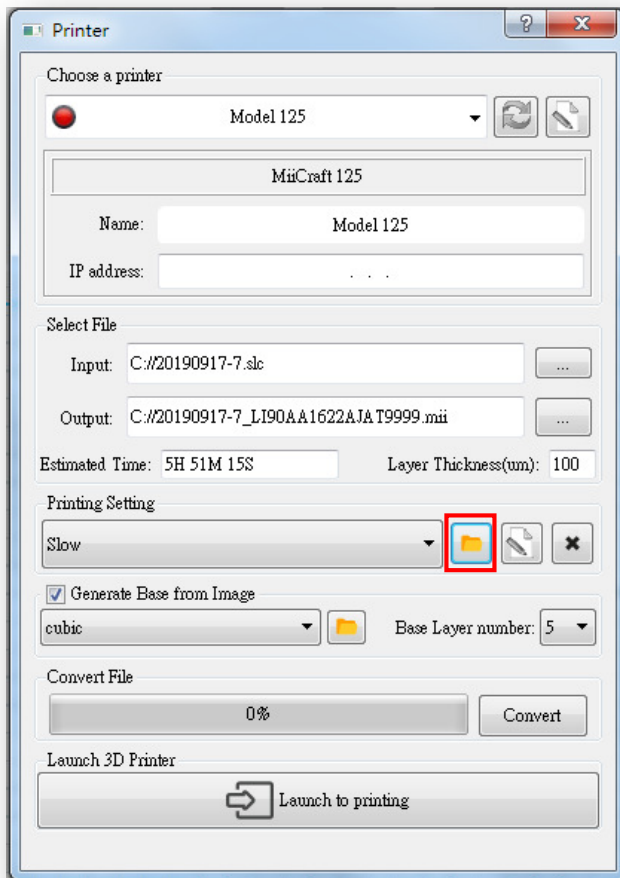
2.1.18 Printer setting

- In slicing stage  and convert stage , you can choose and edit printing setting(*.mps).

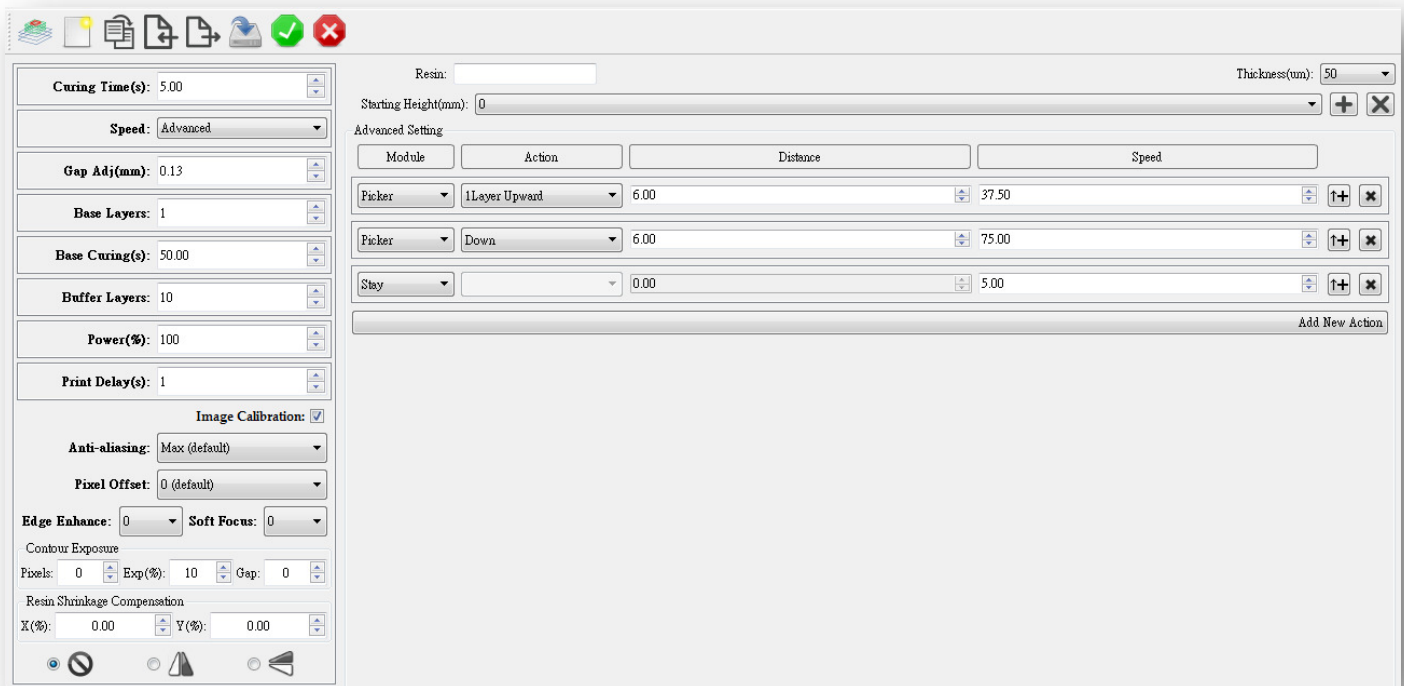


- (a) mps list
- (b) Choose a folder you want to put mps files, software will add names of mps files to list(a). See more in next page.
- (c) Into edit page
- (d) Delete current mps file

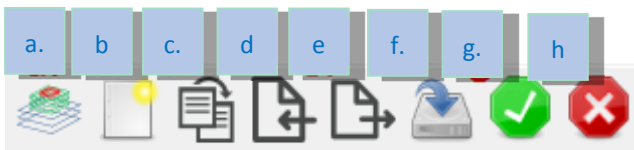
- mps file management
 - Assign mps user management file: The printer you choose will affect the mps you can see.
ex: Choose MiiCraft Profession Printer, can only select mps file for MiiCraft Profession Printer
 - Put mps files into user assigned folder path, the mps list will show up in the printing setting list as below picture.



● Edit Page



■ Icon list on the top



- (a) Switch to uniform/variable thickness.
This icon is missing means this mps is default mps file or this printer didn't support variable slicing. See more in page 36
- (b) New mps file
- (c) Duplicate mps file
- (d) Import mps file
- (e) Export mps file
- (f) Save current mps file
- (g) Save and exit edit page
- (h) Exit edit page

- Parameters on the left side

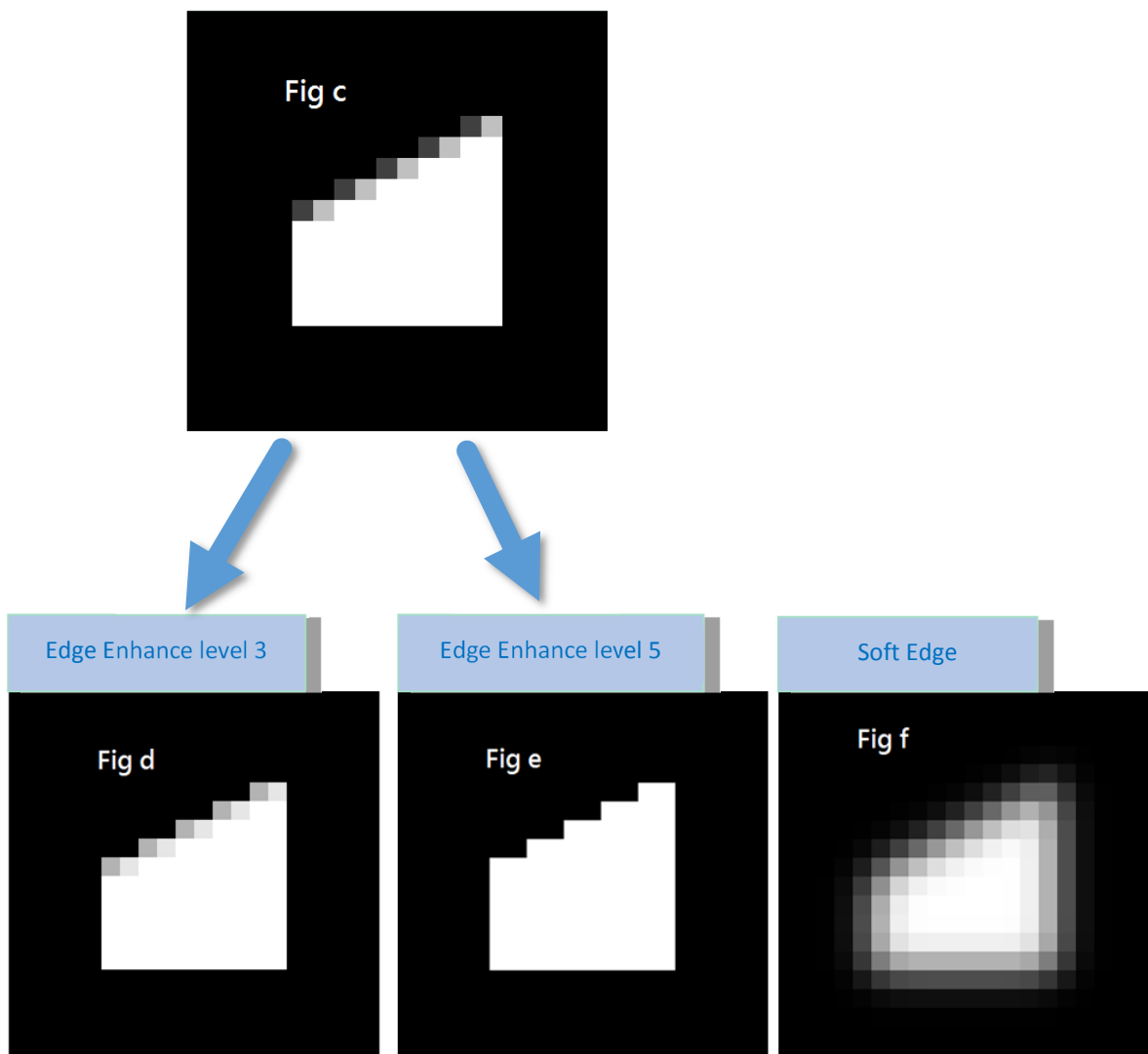
The screenshot shows the MII CRAFT 3D Production System parameter interface. The interface is a vertical stack of control panels. Each panel has a label on the left and a control on the right. The controls include text boxes, dropdown menus, checkboxes, and buttons. The parameters are: Curing Time(s) (5.00), Speed (Normal), Gap Adj(mm) (0.10), Base Layers (1), Base Curing(s) (50.00), Buffer Layers (10), Power(%) (100), Print Delay(s) (10), Image Calibration (checked), Anti-aliasing (Max (default)), Pixel Offset (0 (default)), Edge Enhance (0), Soft Focus (0), Contour Exposure (Pixels: 0, Exp(%): 100, Gap: 0), and Resin Shrinkage Compensation (X(%): 0.00, Y(%): 0.00). At the bottom, there are four circular buttons with different icons.

- (a) Curing Time (s): The amount of time for UV curing(seconds) per layer.
- (b) Speed: Slow, Normal and Fast, means different peeling speed. Also user can select "advanced" to set user defined peeling mode.
- (c) Gap Adj (mm): Adjust thickness of the first layer.
- (d) Base Layers: Define number of base layers.
- (e) Base Curing (s): Curing time for base layers.
- (f) Buffer Layers: Set the Number of buffer layers.
- (g) Power (%): At 100% is the existing brightness of light engine. User can adjust the power in response to different resin character.
- (h) Print Delay (s): For first layer, picker stay for at least 1 sec. then cure.
- (i) Image Calibration: Make image calibration for this printer.

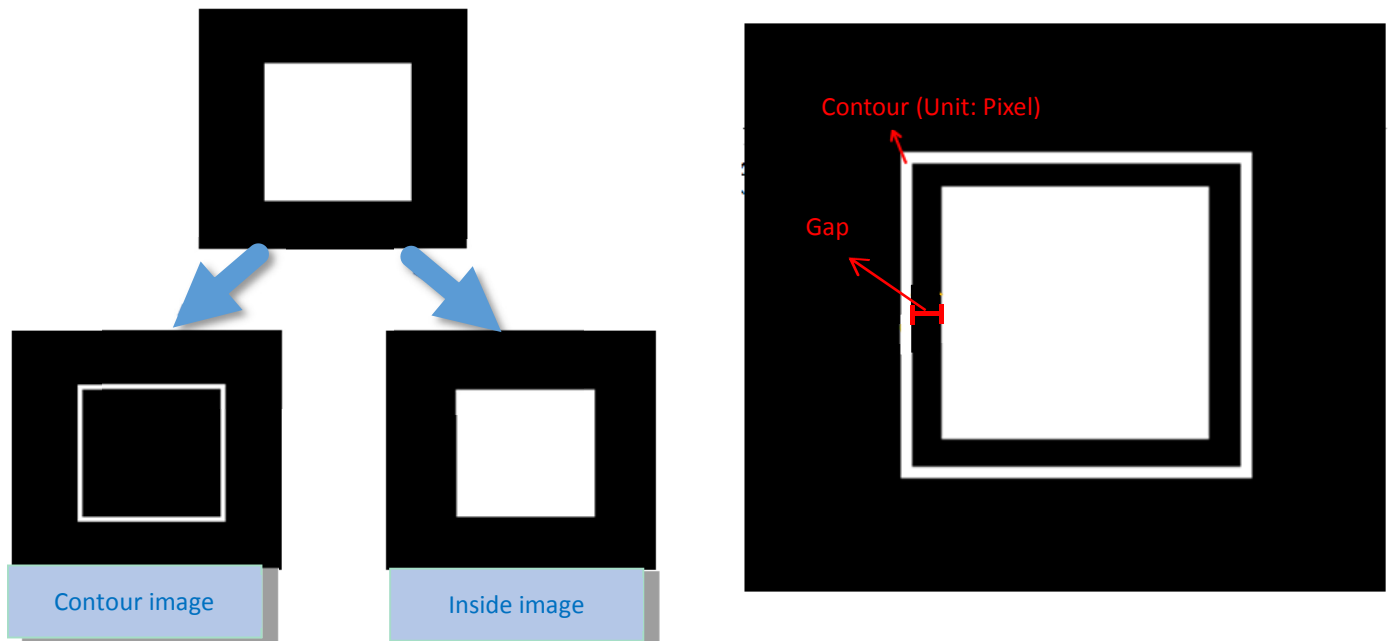
■ (j) Anti-aliasing:



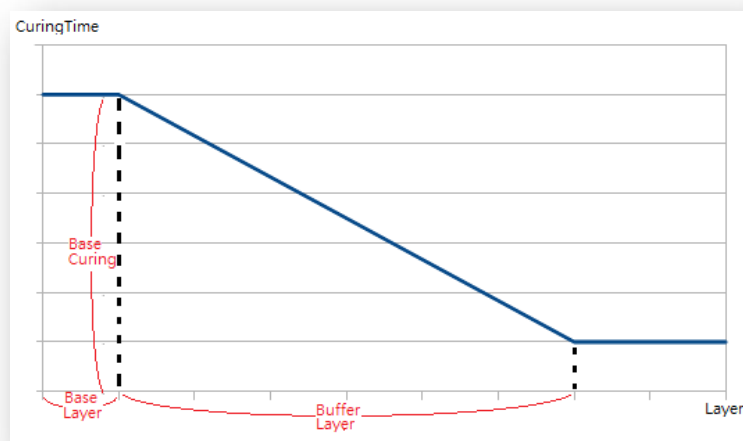
- (k) Pixel Offset: Can slightly adjust edge pixel (0.5 pixel = 1)
 - For example:
 - Select -2, erode 1 pixel on the edge
 - Select 2, add 1 pixel on the edge
- (l) Edge Enhance and Soft Edge:



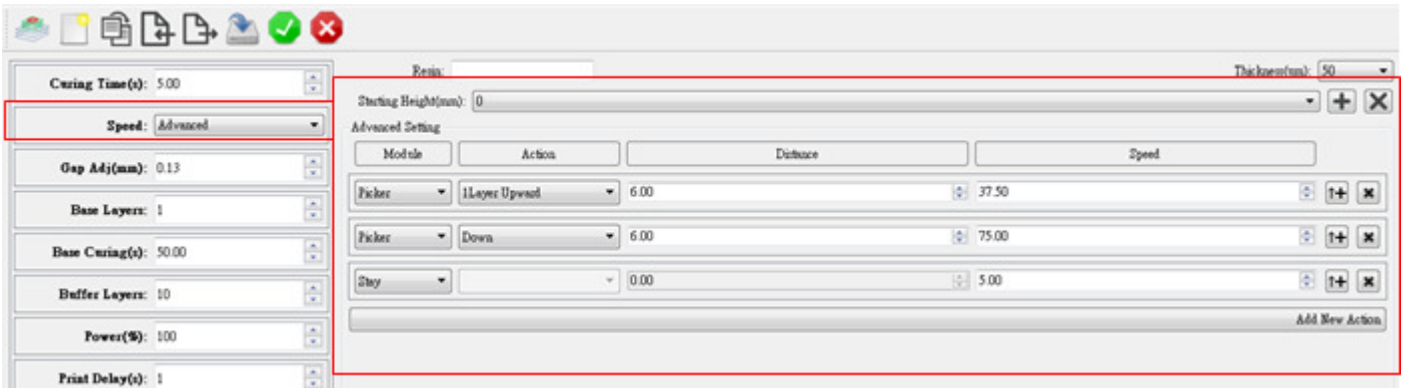
- (m) Contour Exposure: User set this function to exposure contour image first, then exposure inside image. Can prevent contour deform.
 - Pixels : Contour pixel
 - Exp (%) : Contour exposure time . The percentage is compare to curing time (Inside image exposure time is same as curing time)
 - For example: Square object
 - If user set contour pixel, one image will become 2 image, contour and inside.



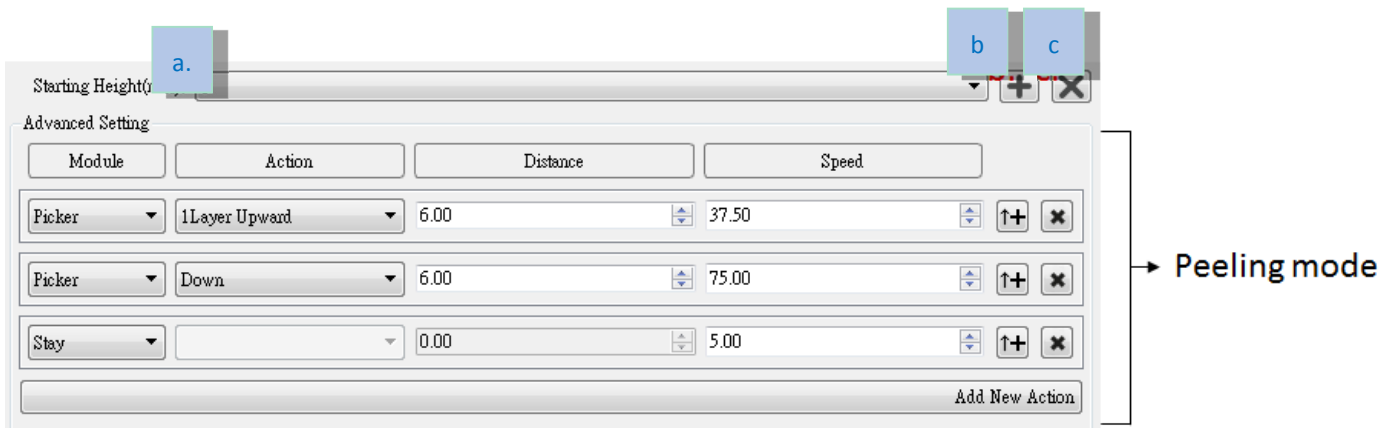
- (n) Resin Shrinkage Compensation:
 - +0% to 9.9% → Enlarge an image
 - -0% to -9.9% → Shrink an image
- (o) Flip image by X axis or Y axis
- What is Buffer layer?
 - Within buffer layer, the curing time is gradually change from base layer setting to layer setting.



- Advance Setting: Customize peeling mode
Choosing Advanced in speed field, red box on the right will show.

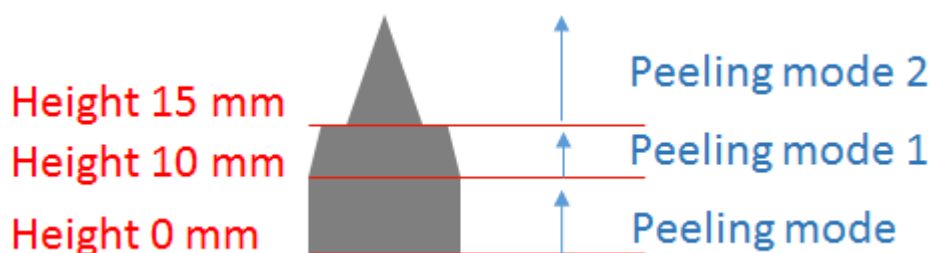


- Advanced Setting Region



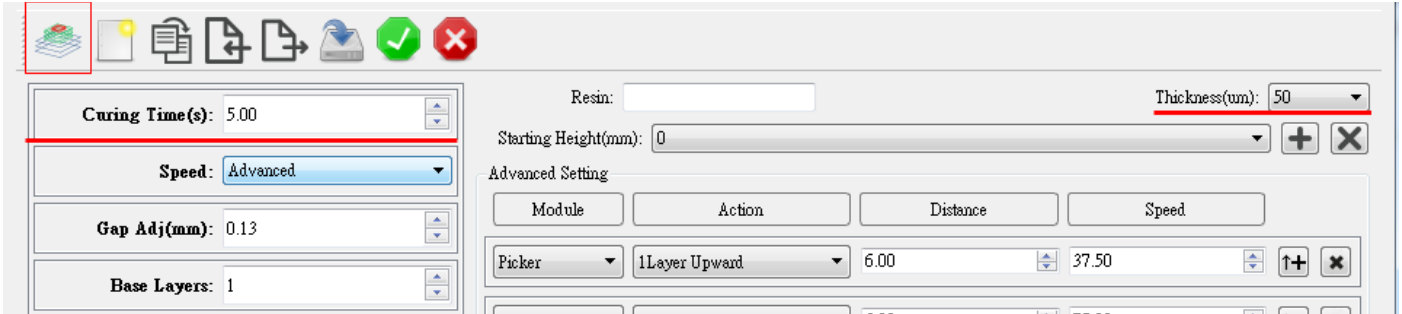
- (a) Height list, the height peeling mode is applied from.
Peeling mode will change as starting height changed.
- (b) Add a height
- (c) Delete current height

For Example, there are three heights (0, 10, 15 mm) in the list.

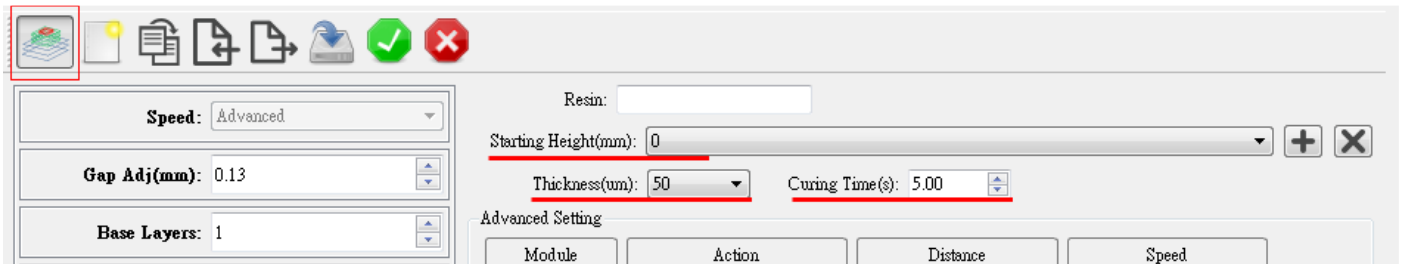


- Range from 0 mm to 10 mm, platform moves based on peeling mode.
- Range from 10 mm to 15mm, platform moves based on peeling mode1.

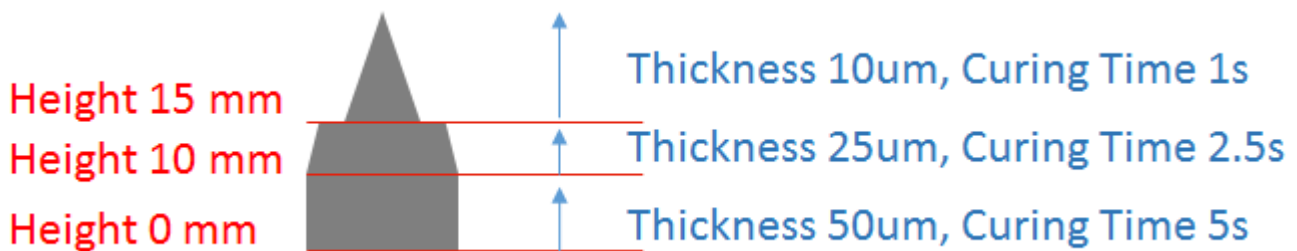
- 15 mm above , platform moves base on peeling mode 2
 - Correlation between slicing and printing setting(mps file)
 - Uniform slicing:
- ↓this icon is off, sole value is enough for curing time and thickness(red line).



- Variable Slicing
- ↓this icon is on



Thickness and Curing Time parameters moved to advance setting region, so speed always equals to Advanced. You need to set thickness and curing time in every height interval as peeling mode. For examples, you want to divide slicing into 3 height interval, 0mm, 10mm and 15mm respectively.




Set different Thickness and Curing Time parameters in three interval. Variable Slicing will be executed when you choose this mps file. You still can set same value in thickness and curing time, this situation just like uniform slicing do.

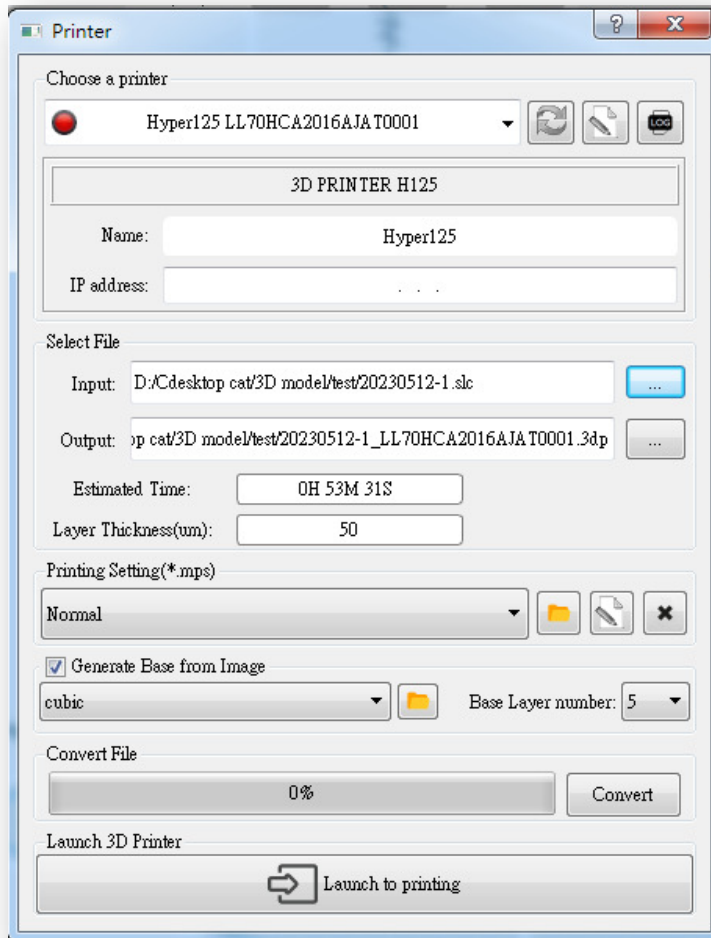
Note: The printing settings supported by each series of MiiCRAFT 3D Printer are as follows:

V : Active

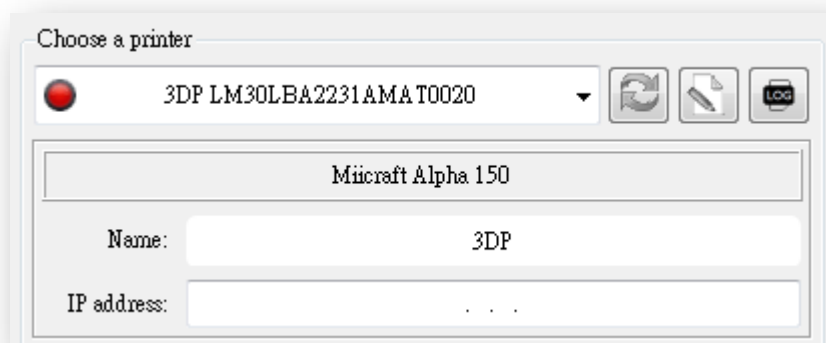
	Ultra	Advance	Profession	Hyper	Prime	Alpha
Image Calibration	V	V	V	V	V	V
Anti-aliasing	V	V	V	V	V	V
Pixel offset	V	V	V	V	V	V
Edge enhance	V	V	V	V	V	V
Overlap (%)		V				
Blur	V	V	V	V	V	V
Contour exposure		V	V	V	V	V
Resin Shrinkage compensation	V	V	V	V	V	V
Flip image	V	V	V	V	V	V

2.1.19 Convert to print job file (*.mii, *.3dp)

- Click the icon  , the window below will show.



■ Step1



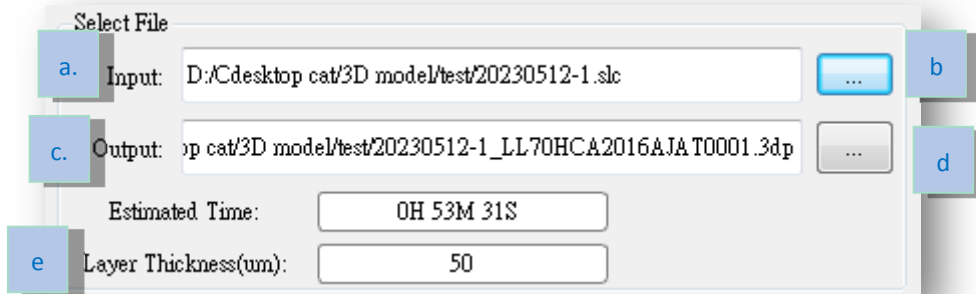
- In this stage, you still can change platform size from printer list.
- To print(only online printer), please check the light is green. See more in step 5.

 Online printer

 Offline printer

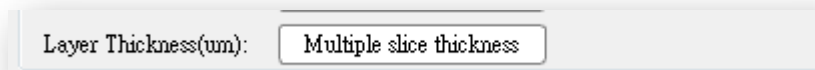
- To use printer calibrate information when converting files (Both online and offline printer)
- Trouble shooting: If unable to connect computer and printer, please check computer's proxy setting, it has to be closed.

■ Step2

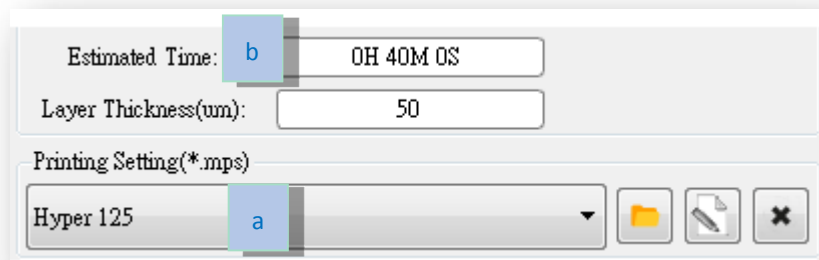


- (a) File path of slc file, default path is the latest slicing file.
- (b) Click this button and choose slc file path.
- (c) Output path of print job file
- (d) Click this button and change output path.
- (e) show thickness of slc file

↓ If thickness of slice is variable

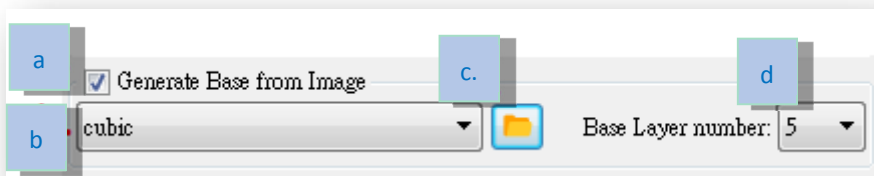


■ Step3

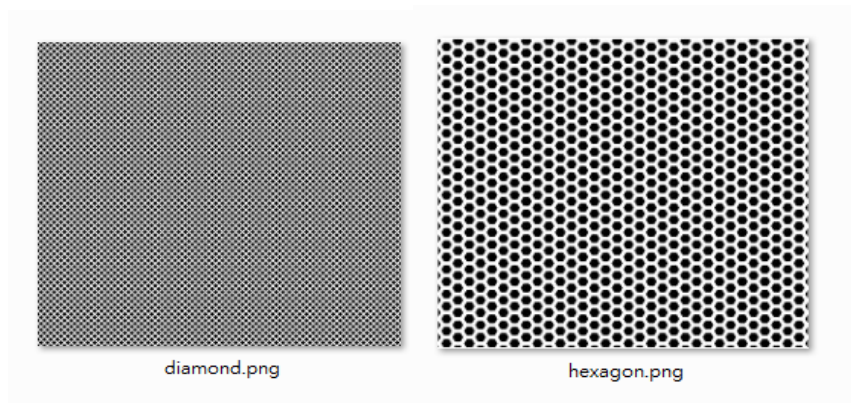
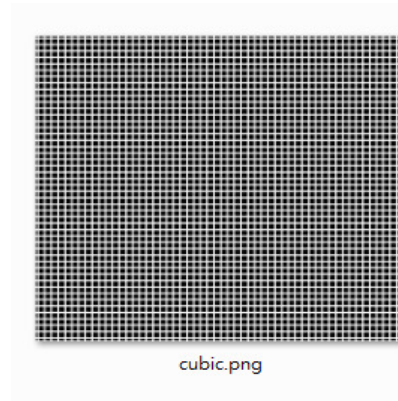


- (a) You still can change printing setting here. Output file will include these printing parameters.
- (b) If you change or edit mps file, estimated time of printing will change.

■ Step4



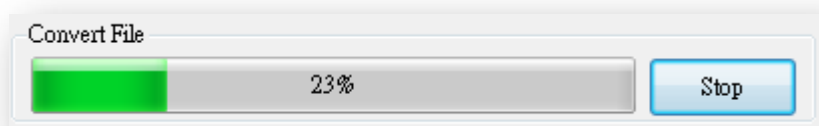
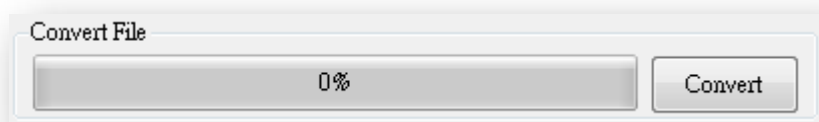
- (a) If blend base with image you choose
- (b) Image list
- (c) Folder path of base image
✂ You can put image but must check resolution of image.
- (d) Number of layer blending with base image. (from layer 0)



↑ Default base image, shape of hole are cubic, diamond and hexagon respectively

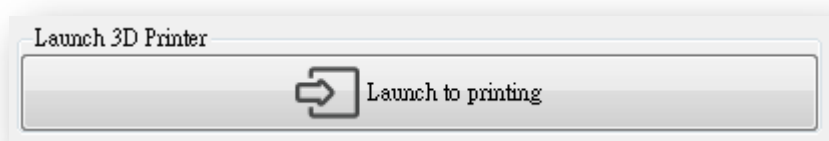
■ Step5

Click button to start converting,

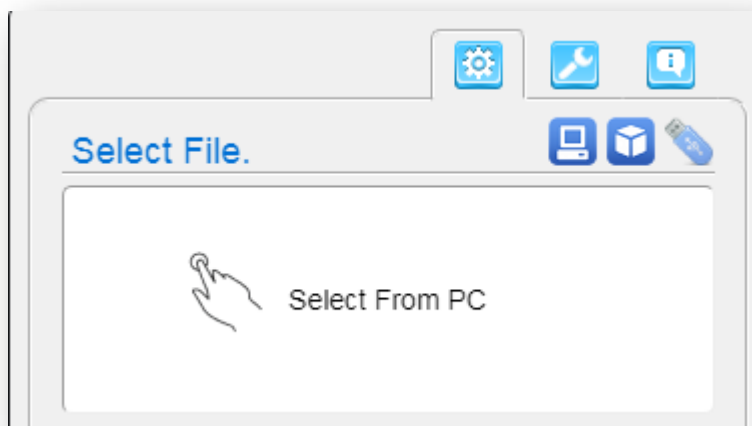


Click stop button if you want to cancel this converting process.

■ Step6

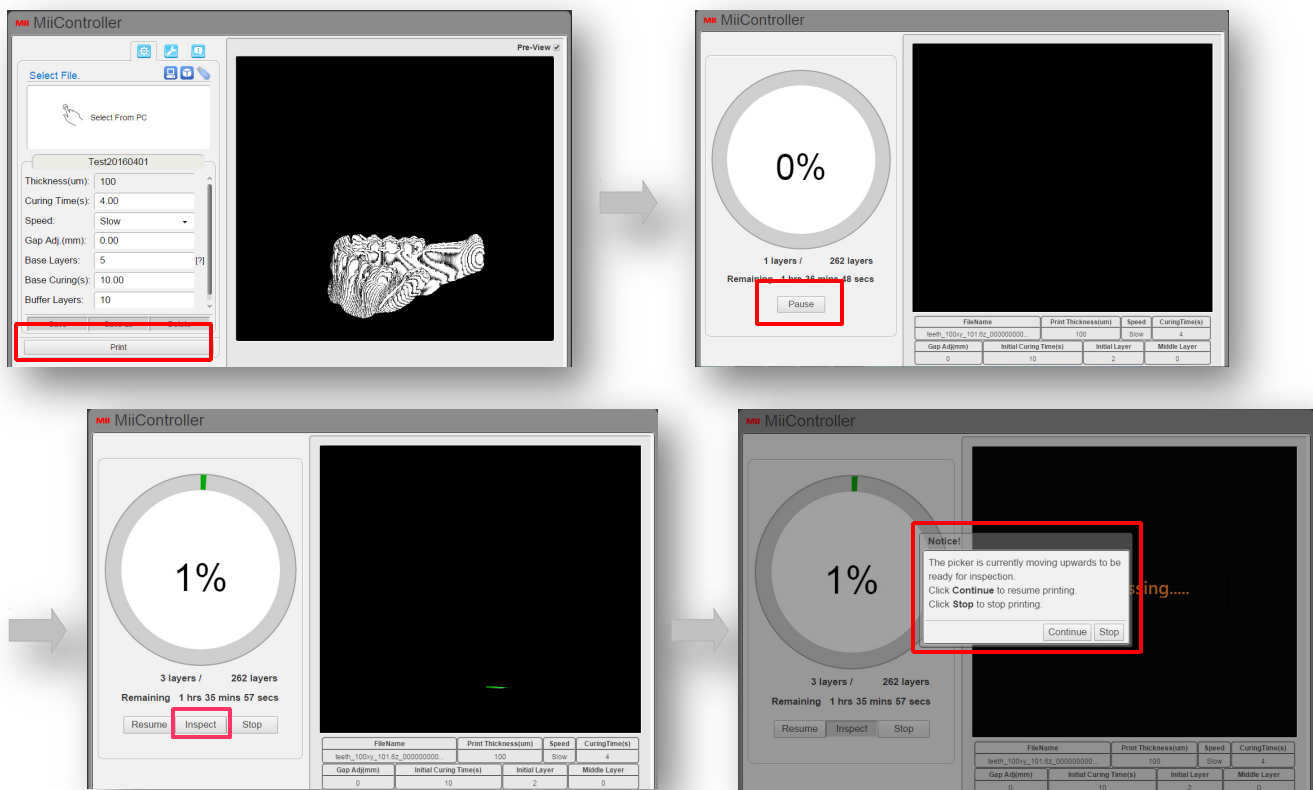


After converting finish, click launch button to invoke controller with browser.

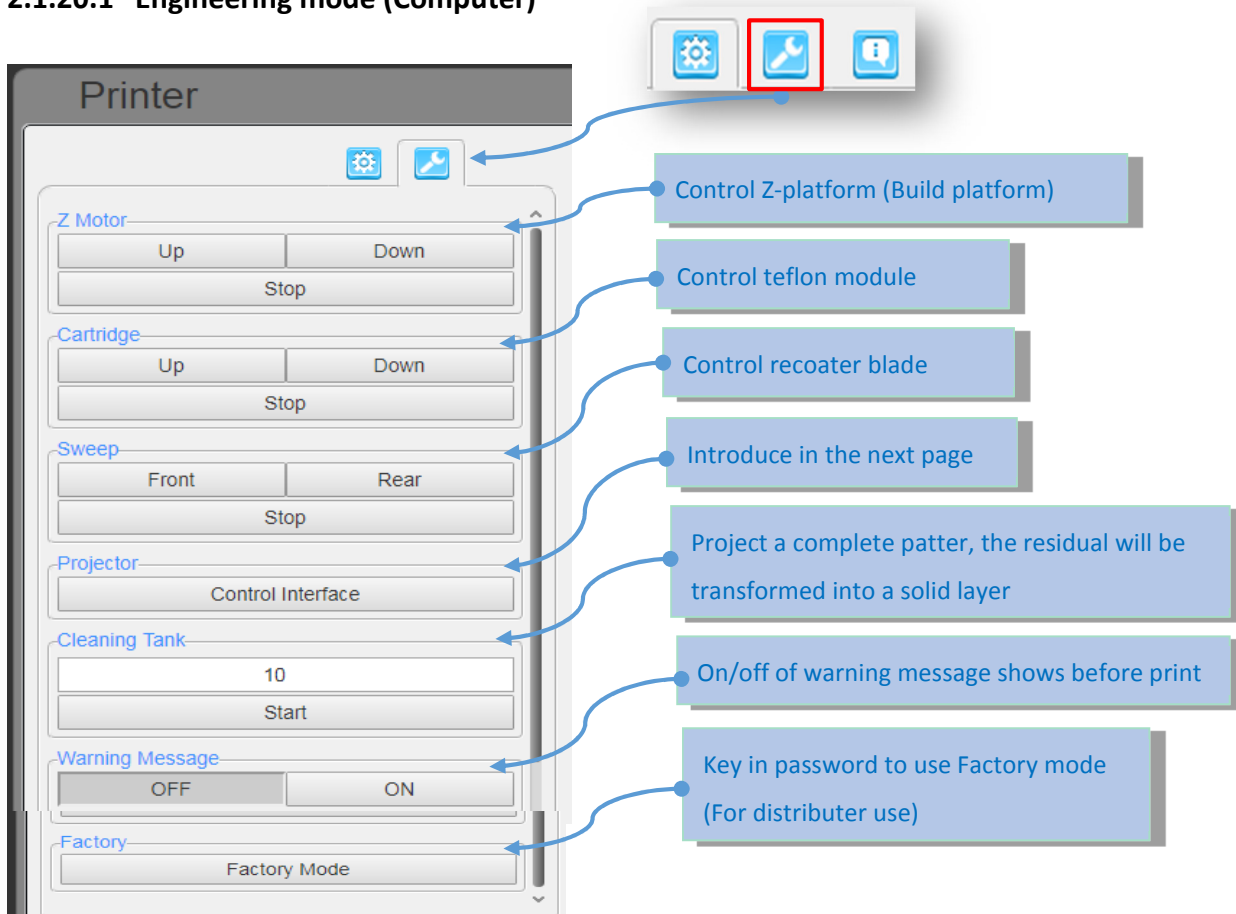


Upload printing job file (*.mii; *.3dp) to printer.

2.1.20 Print Via Computer



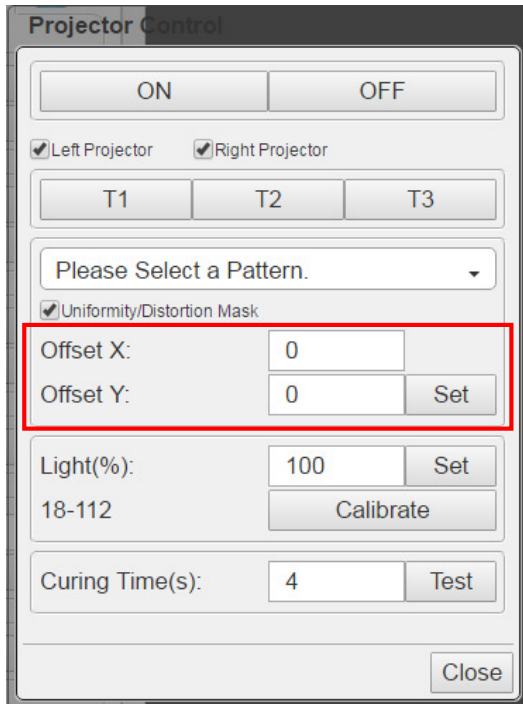
2.1.20.1 Engineering mode (Computer)



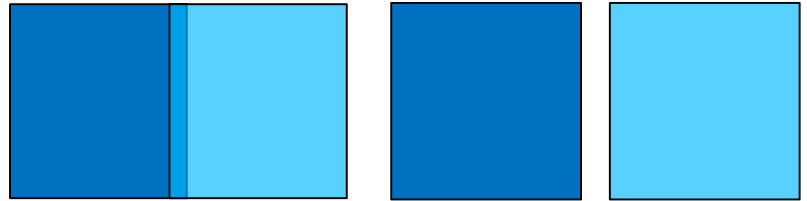
The screenshot shows the 'Projector Control' window with the following elements and callouts:

- Top Callout:** "If Machine is Advance series, you can choose left or right projector to control right projector to control" (points to the 'Right Projector' checkbox).
- Control Callout:** "Control the projector" (points to the 'ON' button).
- Pattern Callout:** "T1/T2/T3 : Use test pattern inside the projector, or select a pattern from menu" (points to the 'T1', 'T2', and 'T3' buttons).
- Calibration Callout:** "Tick this option to apply printer calibration function" (points to the 'Uniformity/Distortion Mask' checkbox).
- Offset Callout:** "Fix the left projector, and move right projector through X axis or Y axis" (points to the 'Offset X' and 'Offset Y' input fields).
- Light Callout:** "Light(%): At 100% is the existing brightness of light engine. The suggest range is base on the printer's condition, user can only set the % within the suggest range." (points to the 'Light(%)' input field and 'Calibrate' button).
- Curing Time Callout:** "Curing Time(s): Test print curing time." (points to the 'Curing Time(s)' input field).
- Calibrate Callout:** "Calibrate: Return to default setting of brightness" (points to the 'Calibrate' button).

The interface includes buttons for 'ON', 'OFF', 'Left Projector', 'Right Projector', 'T1', 'T2', 'T3', 'Set', 'Calibrate', 'Test', and 'Close'.



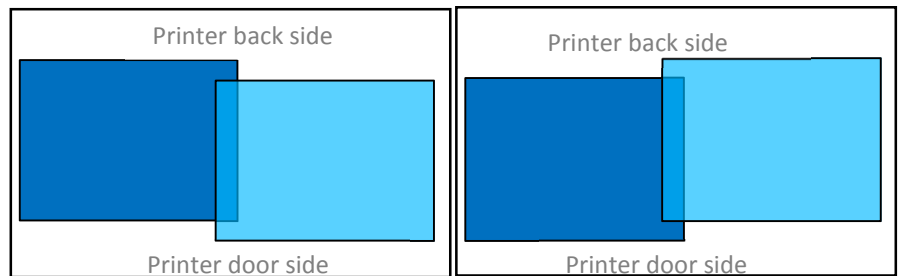
Fix the left projector image, and move right projector image through X axis.



Offset X : -9

Offset X : 9

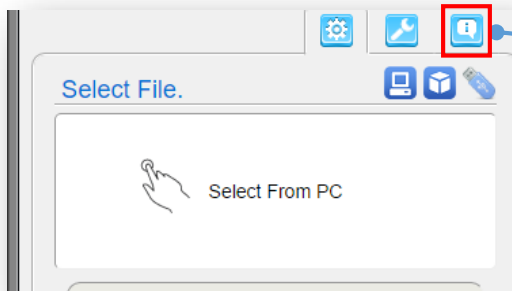
Fix the left projector image, and move right projector image through Y axis.



Offset Y : -9

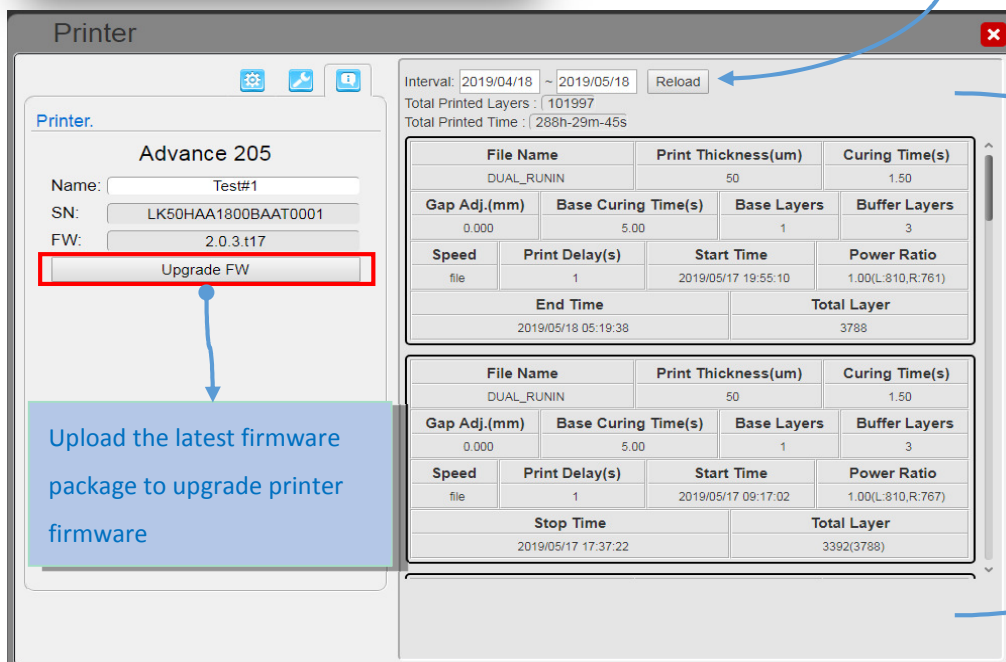
Offset Y : 9

2.1.20.2 Printing record and update firmware



Printing History

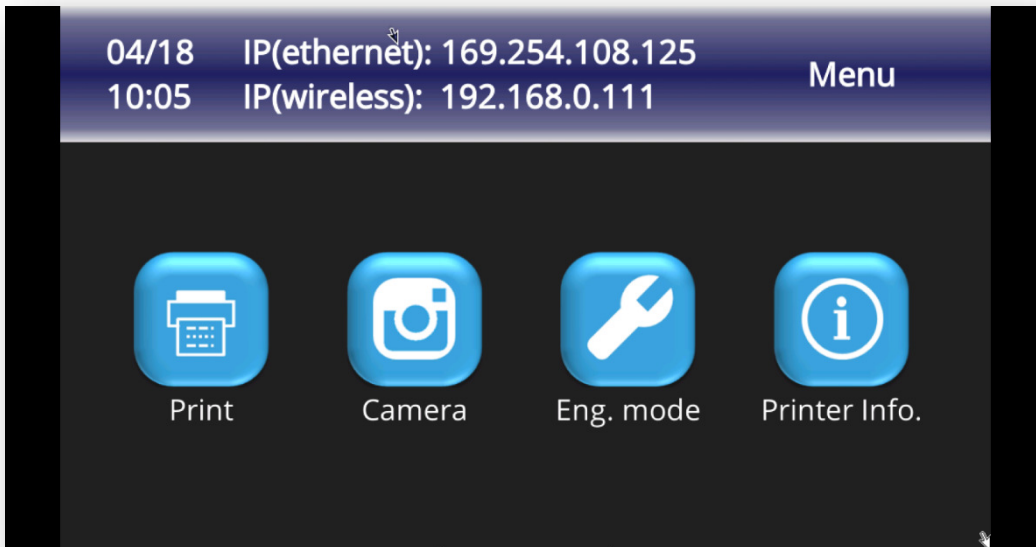
Search interval



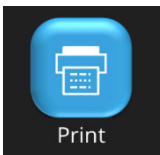
Upload the latest firmware package to upgrade printer firmware

Record

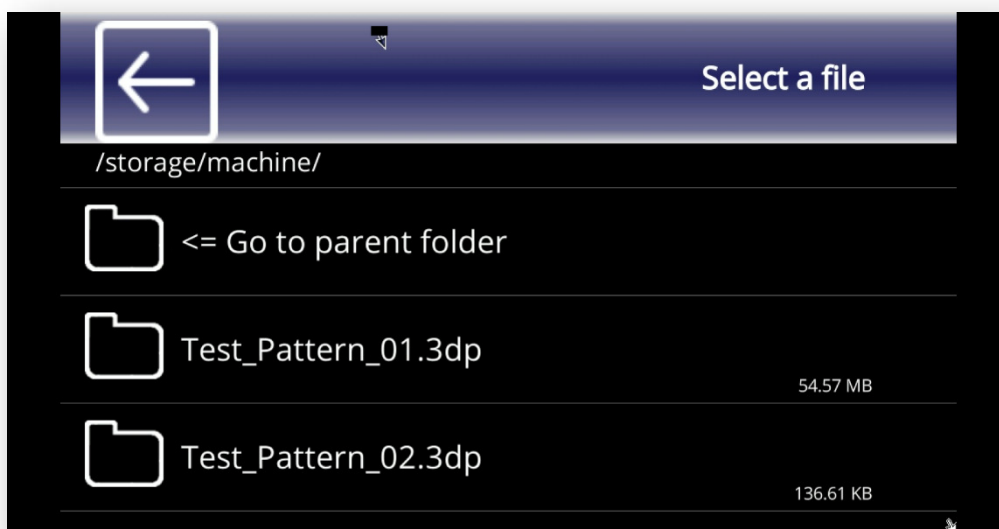
2.1.20.3 Print via touch screen panel



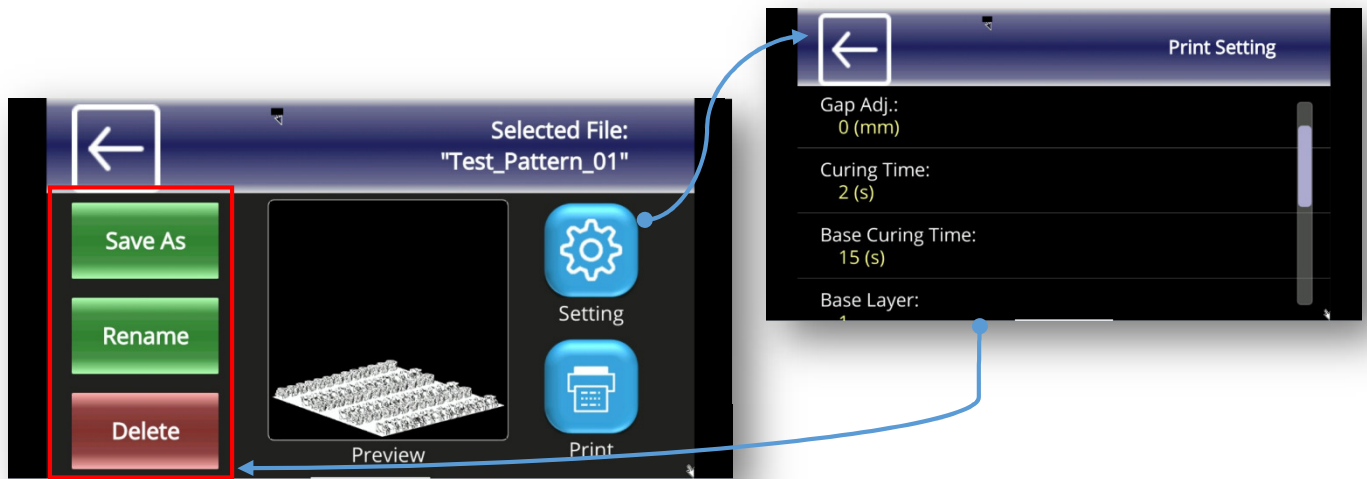
● To print:



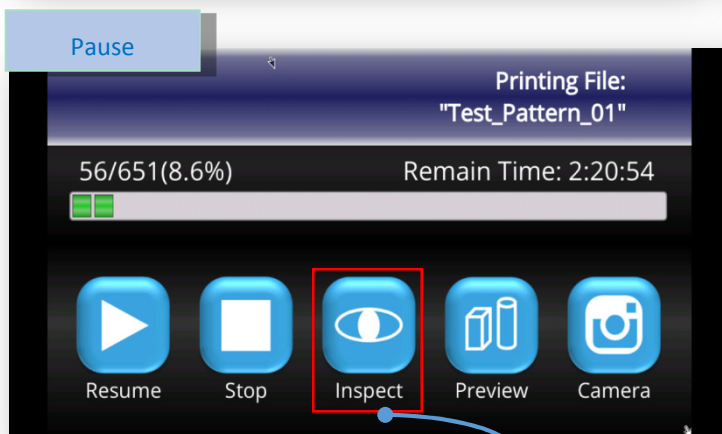
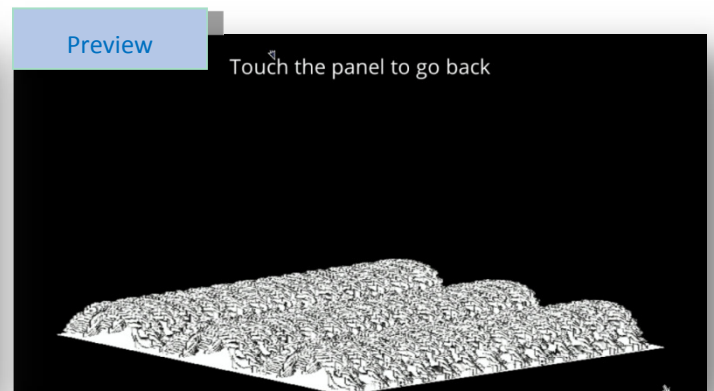
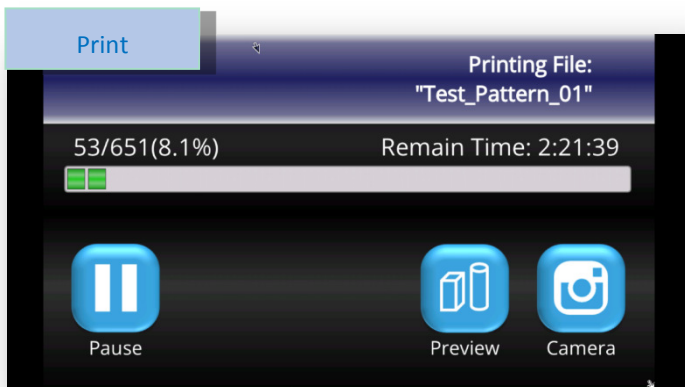
- Select .3DP file from
 - machine (file saved in printer) or
 - USB (insert into printer)
- File input size limitation:
 - Upload file from Computer, file limitation 500MB
 - Upload file from USB, file limitation 1G



- .3DP file
 - Save as : Save printing setting as another .3DP file
 - Rename : Rename .3DP file
 - Delete : Delete .3DP file



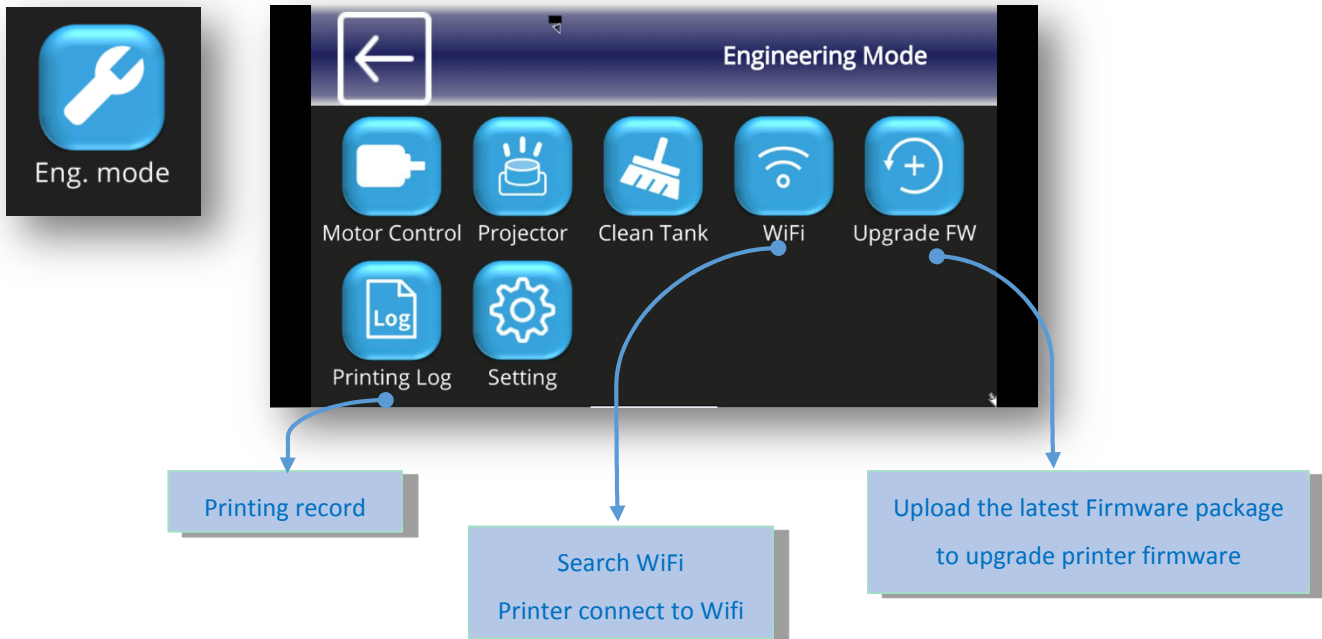
● Printing



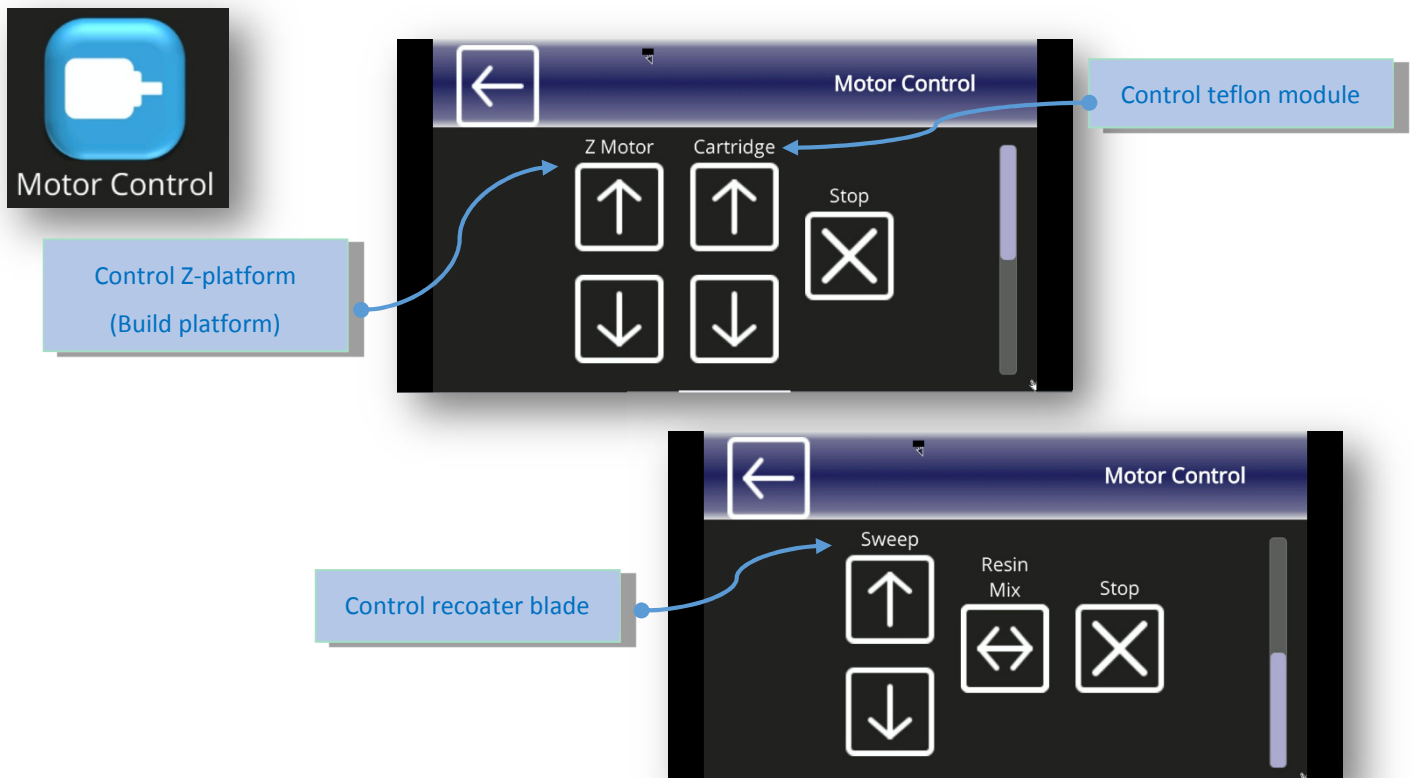
Let build platform moving upwards for inspect

2.1.20.4 Touch screen panel -Engineering mode

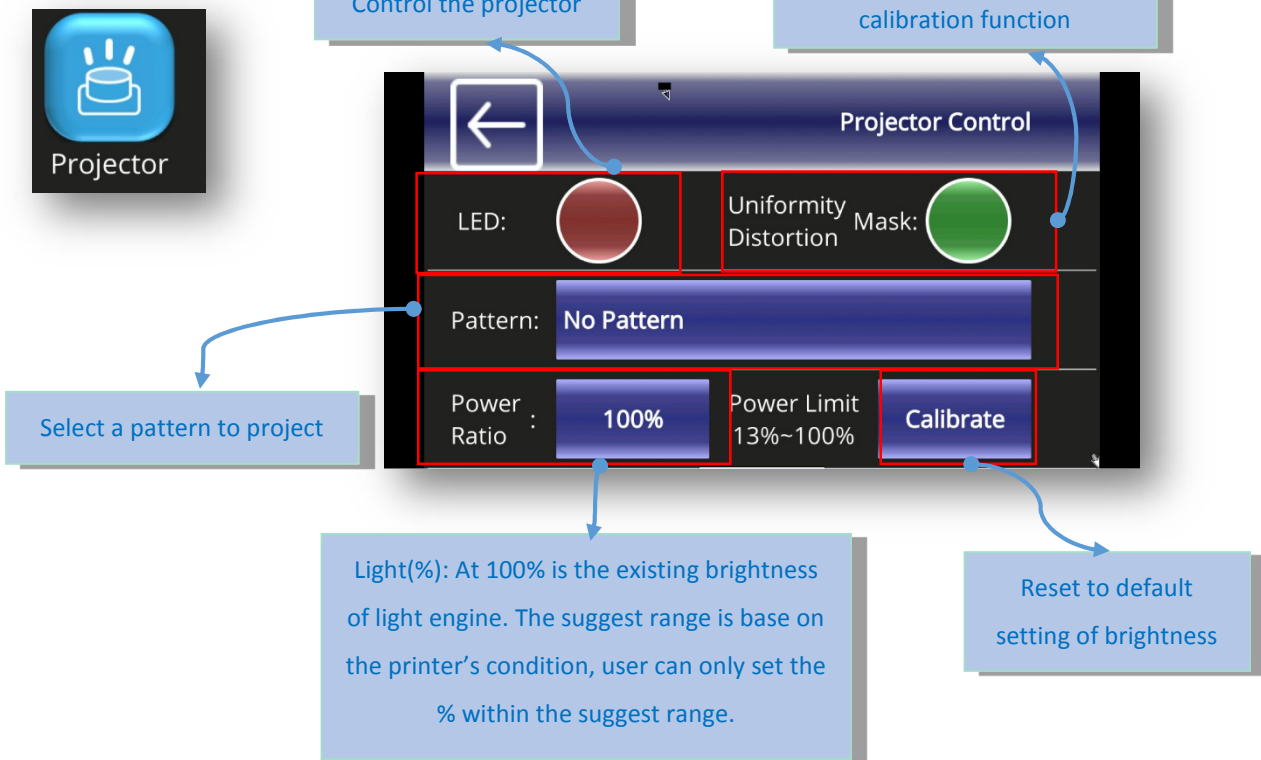
- Eng. Mode



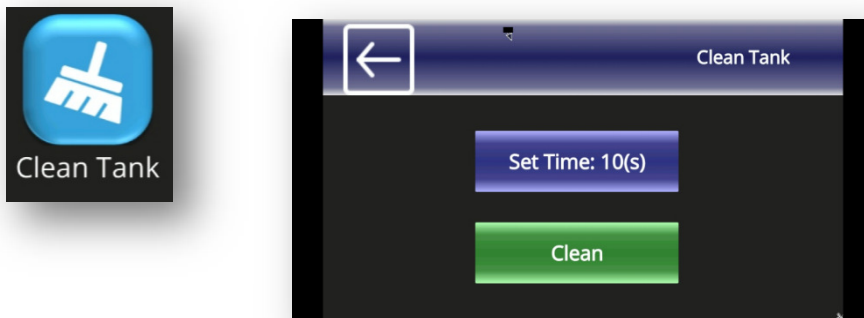
- Motor Control



● Projector



● Clean Tank



- When printing failure happen, there may have some printing residual left and stick on teflon module.
- Before to start another printing job, be sure to clean the printed residual out of teflon module.
 - Use "Clean tank" function via touch panel, it project a complete patter, the residual will be transformed into a solid layer.
 - Using the scrape, scoop up one side of the layer. Then carefully lift to remove solid layer from the teflon module.

● Setting

