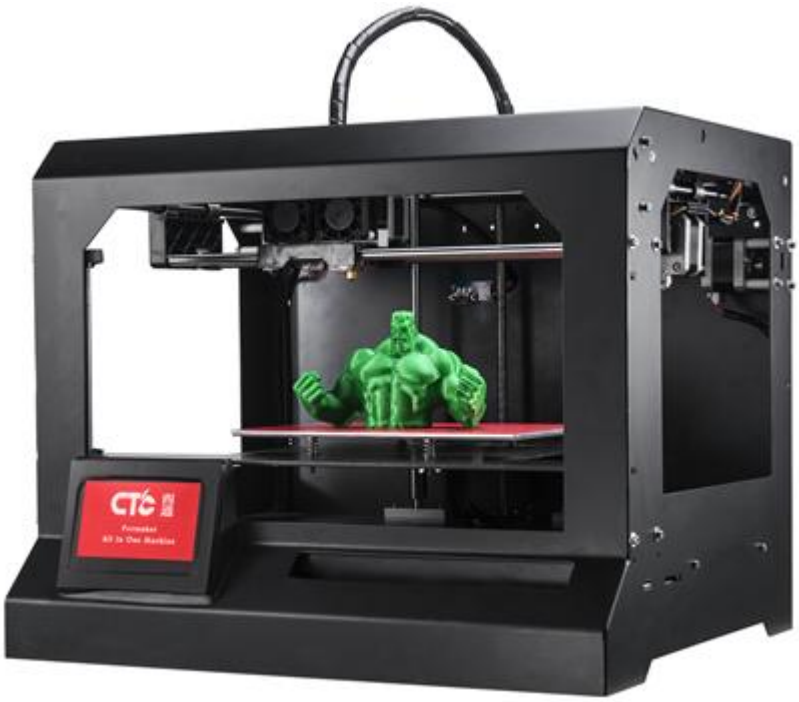
User Manual of CTC FORMAKER Printer



Company Name: Zhuhai CTC Electronic Co., Ltd.

Website: www.ctcprinter.com or www.ctcprint.com

Catalogue

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1. Specification

1.1 Introduction of specification

This user manual mainly consists of product overview, operation instructions, maintenance and fault elimination, etc. Please read it carefully and use this 3D printer according to the specification.

1.2 Notes

Due to the difference in place of each customer and the voltage in each area, please check the voltage in your place before using the printer (generally 110v and 230v).

After using the product for a period of time, the user needs to maintain the printer. The service life of the printer could be extended by maintaining it appropriately.

1.2.1 Safety matters

Our company does not advise you to use consumable items of other brands. To get optimal 3D printing effect, please use special consumable items manufactured by our company. The maintenance and repair caused by consumable items not manufactured by our company is not within the warranty scope of our company.

When the printer is printing or just finishes printing, the temperature of the model, nozzle, printing platform or the other parts inside the body is very high. Please don't touch it.

1.2.2 Contact

If you need 3D printer after-sale service, you can directly add our company's QQ group "259596564". For information about use and fault elimination of 3D printer, you can check it on the attached user manual and you also can add our company's QQ group "259596564" to get technical assistance online.

Besides, you also can focus on our company's MicroBlog "CTC 3D printing future" to know about our company's technical upgrading and dynamics

1.3 List of product accessories

Material list of FORMAKER printer:

Serial No.	Material Name	Quantity	Unit	Remarks
1	3D printer	1	Set	
2	Power line	1	Piece	
3	USB data line	1	Piece	
4	Kit	1	Suit	
5	SD card	1	1	
6	Printing supplies	1	Piece	
7	Hanging column	1	Piece	
8	Laser	1	1	
9	Engraving motor	1	1	
10	Motor power	1	1	
11	CNC (PCB) holder block	1	Suit	

2. Product Category

2.1 Product overview

CTC FORMAKER printer is a powerful 3D printer integrating FDM 3D printing, laser printing, CNC printing and PCB printing. You can realize multiple printing modes by replacing few parts and components at a printer, thus solving the printing simplicity fundamentally. It could print online by connecting with the computer through USB data line, or offline through SD card. As offline printing will be further stable. We advise you to print offline.

2.2 Product appearance

2.3 Product Specifications

2.3.1 Product parameters

1. 3D printer parameters

Total volume: 320*467*381mm

Packing size: 565*430*535mm

Weight: 15KG

Dimension: 225*145*125mm

Input voltage: 220V/110V

Power: 360W

Extrusion flux of the nozzle: about 24cc/hour

Operating system: Windows XP, Windows7/8 (32/64-bit)

Software: ReplicatorG or CTC Chinesization version (compatible with MakerWare software)

Printing raw material: ABS and PLA

Property of raw material: special 3D printing ABS and PLA (exclusive unique formula)

Layer precision: 0.1mm-0.5mm

Positioning accuracy: XY axis -0.011mm

Filament diameter: Z axis 0.0025mm

Nozzle diameter: 0.4mm

Speed of motion axis: 30mm/s-100mm/s

Motion speed of recommended nozzle: 35-40 mm/s

Input file type: stl , gcode

2. Parameters of laser printer

Power of laser head: 3W

Voltage of laser head: 12V

Facula of laser: 0.1MM

3. Parameters of CNC printer

Motor revolutions: maximum 30000r/min

Motor voltage: 0~48V (related to the revolutions, the higher the voltage the larger the revolutions)

Cooling mode: air cooled

4. PCB printing parameters

Line spacing: 0.3MM

Line width: 0.4MM

2.3.2 Suggested environment

Operating environment: installed in ventilated non-dust area. Temperature: 15℃ to 35℃; humidity: 20% to 80% (non-condensation)

Storage environment: temperature: 0℃ to 40℃; humidity: 100%-80% (non-condensation). No etchant corrosive gas and clean field.

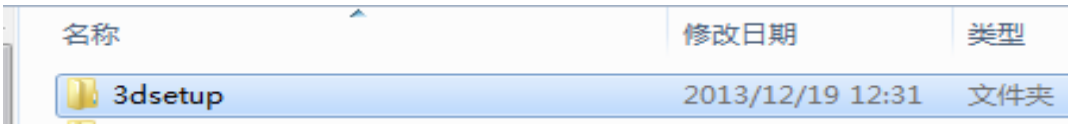
3. Operation Instruction

Operation instruction is mainly for FORMAKER 3D printing. For the operating instruction of other functions, please refer to the attachment. With STL format 3D file, you can complete the printing of various complicated 3D entity model through software ReplicatorG or Makerware. For the printing file generated through other functional software should be converted to .X3G files through ReplicatorG, it's advised to install ReplicatorG.

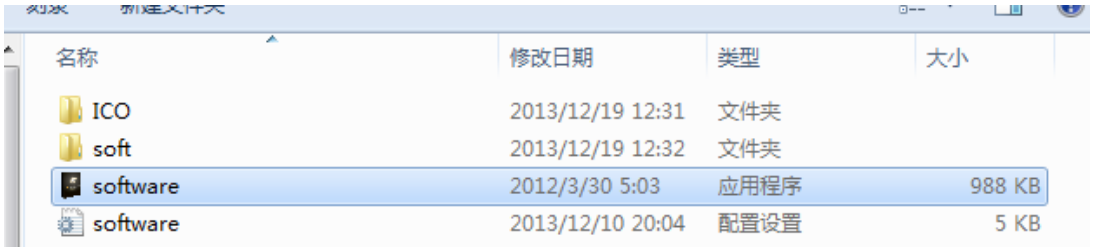
3.1 Preparation work of computer

3.1.1 Install ReplicatorG drive software

(1) Take out SD card and read the printer driver inside it, then search 3dsetup folder,



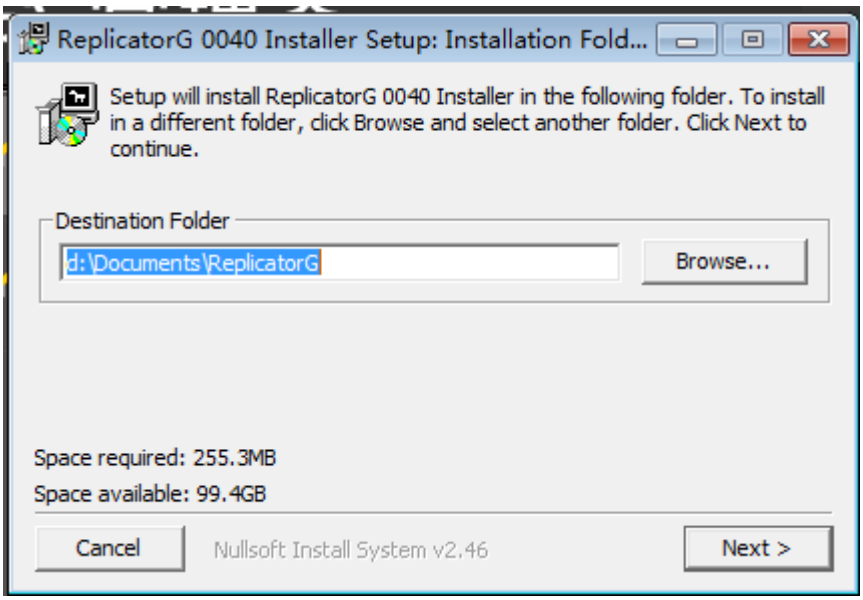
(2) Open 3dsetup folder and then search software file,



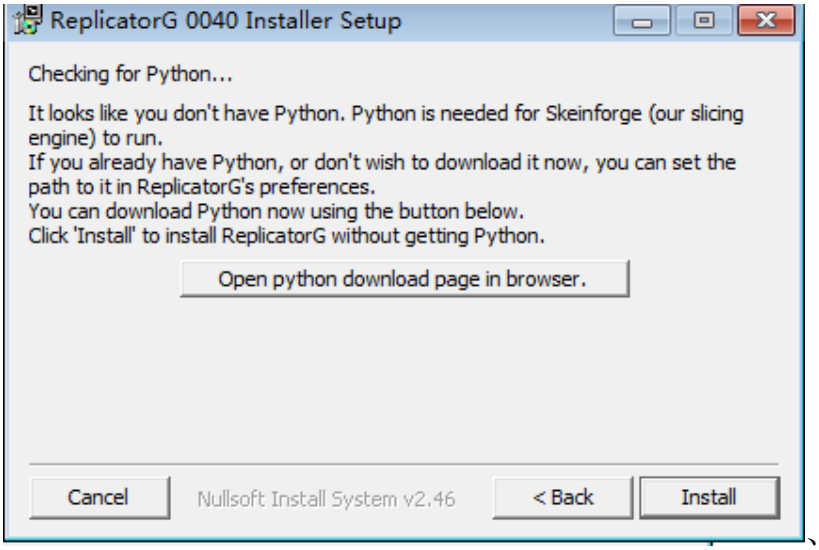
(3) Right click and open the software file to enter software installation manager,

(4) Click Replicatorg software installation (English or Chinese)

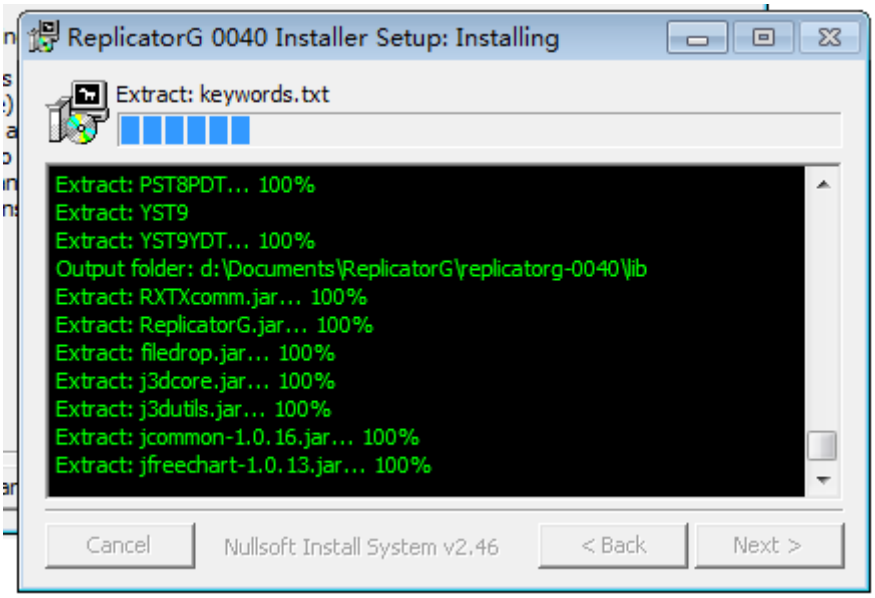
(5) Click automatic installation in Replicatorg software, the icon will show up, and then click “Next”.



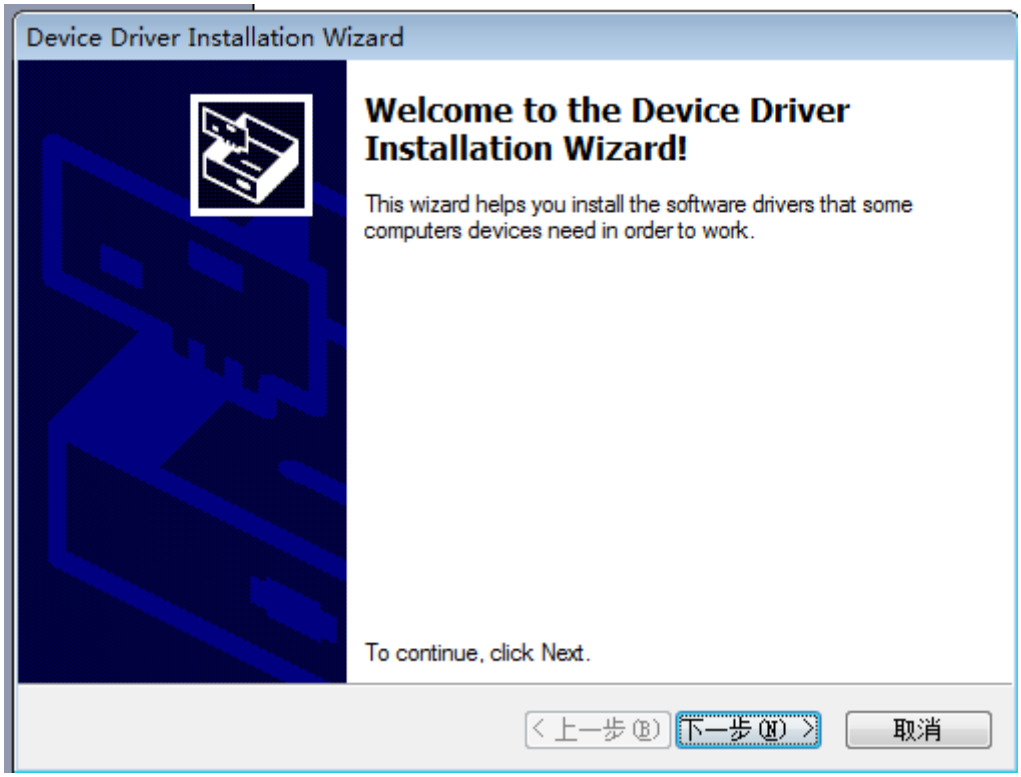
(6) After clicking “Next”, the icon will show up, and then click “Install” button.



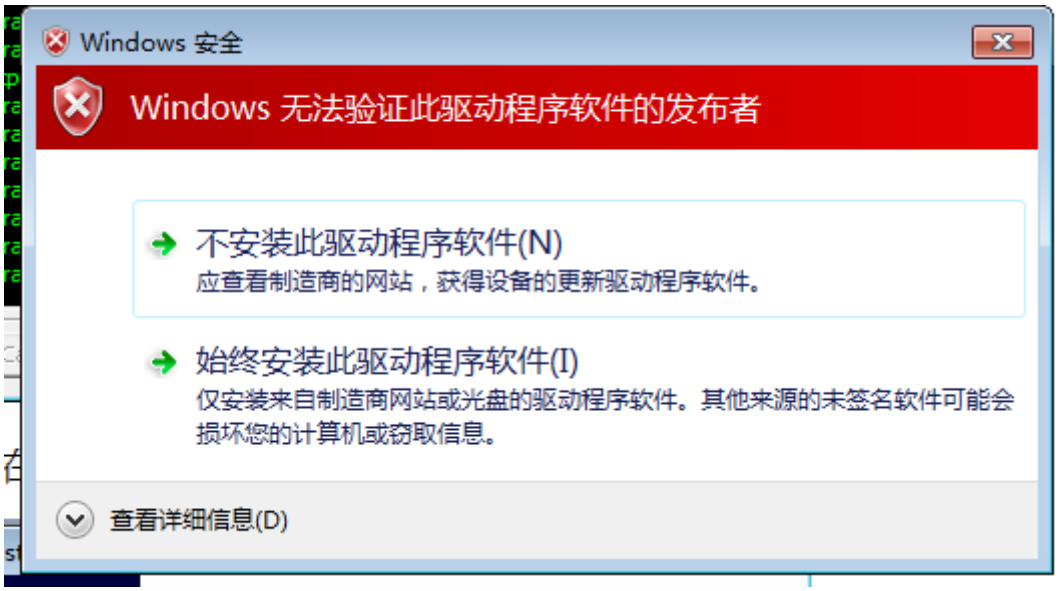
(7) Click “Install” button, the window will show up, please wait for a while.



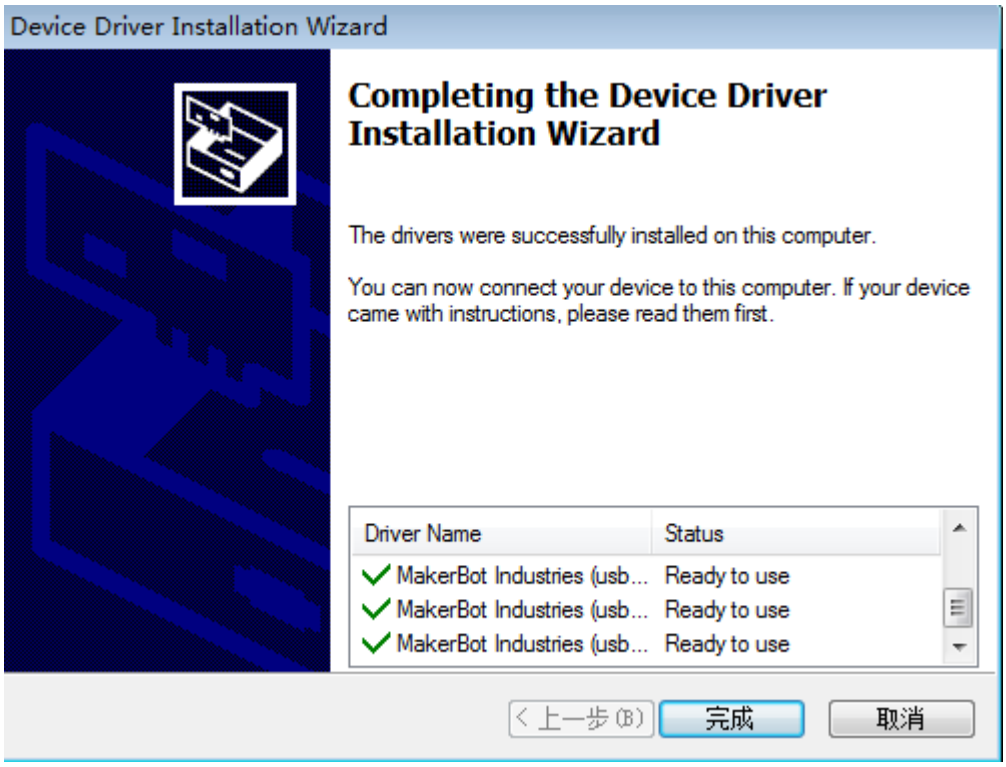
(8) After clicking “Install” button, please wait for a while, the dialogue will pop out, and then click “Next”.



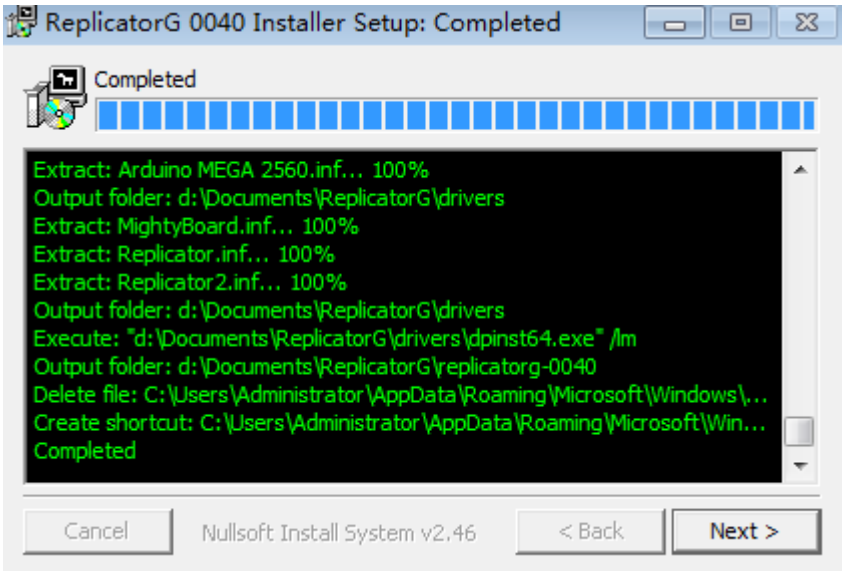
(9) After clicking “Next”, the next prompt will show up for consecutive 5 times, please click “Always install this drive program software”.



(10) Click “Always install this drive program software” for five times to complete installation. The dialogue will pop out at the same time. Please check whether all programs are installed (query method: check “Driver Name” in the pop-out dialogue. If indicating all marks “√”, it means the software is installed successfully. However, in case of item with “×”, it means the software is not installed successfully.)

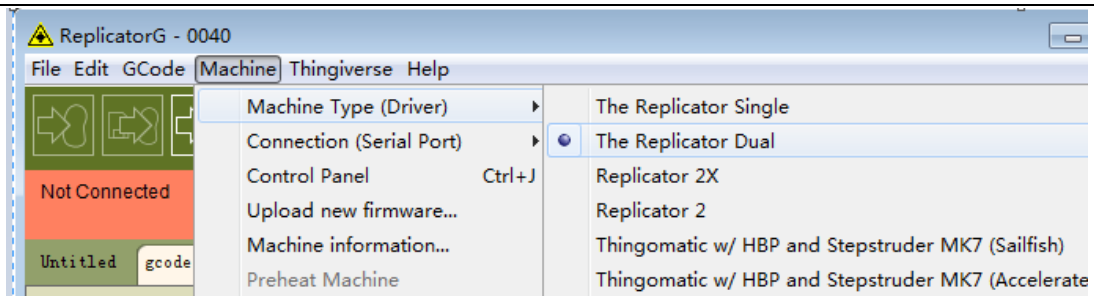


(11) Click "Next" button at homepage, the software Replicatorg printing software will be installed successfully.

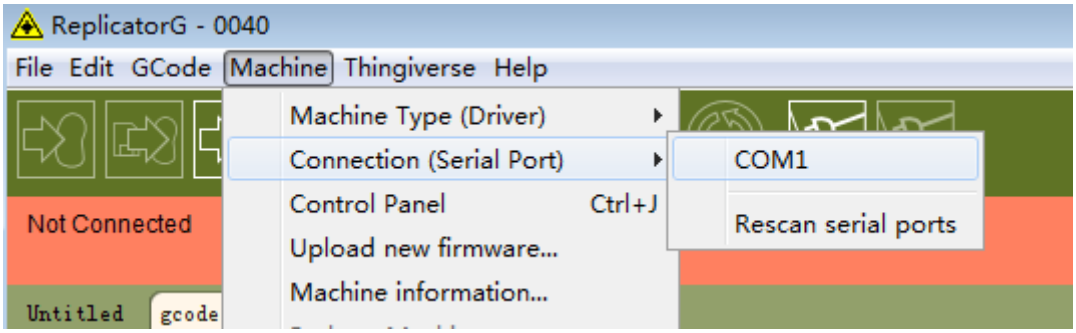


3.1.2 Description of software functions

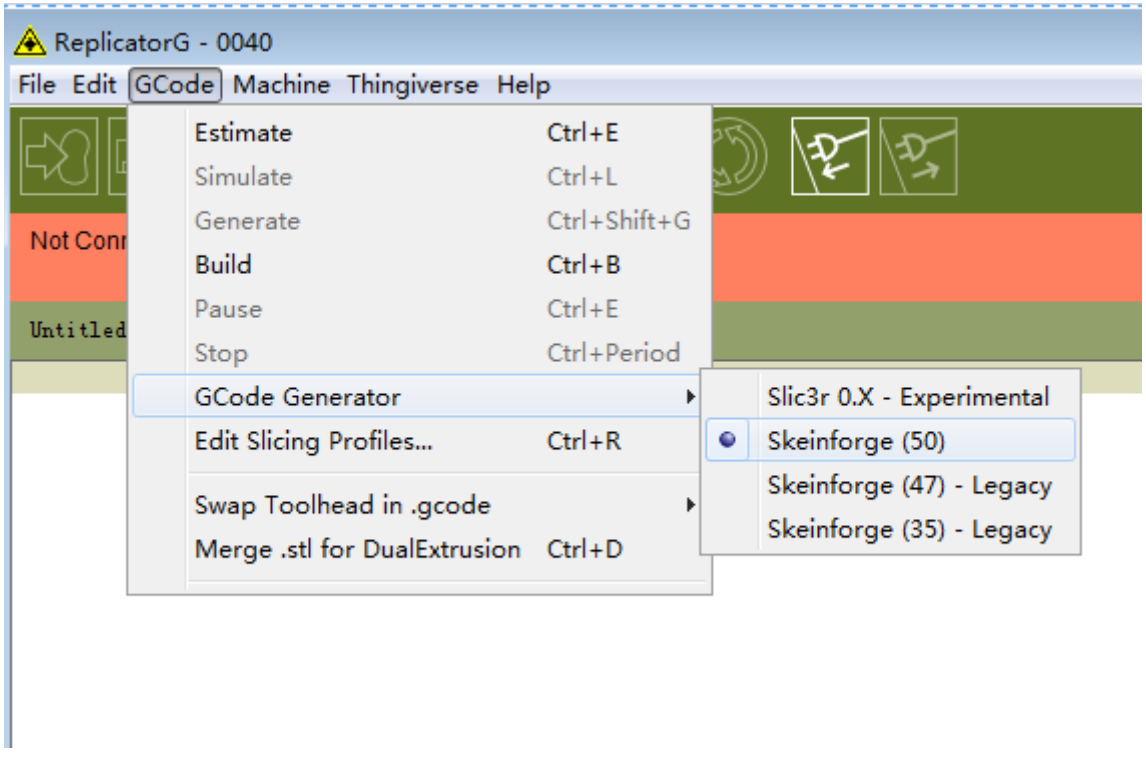
(1) Power on computer, connect USB and open Replicator (For the first time, choose "The Replicator Dual" machine for double nozzle and "The Replicator Single" for single nozzle);



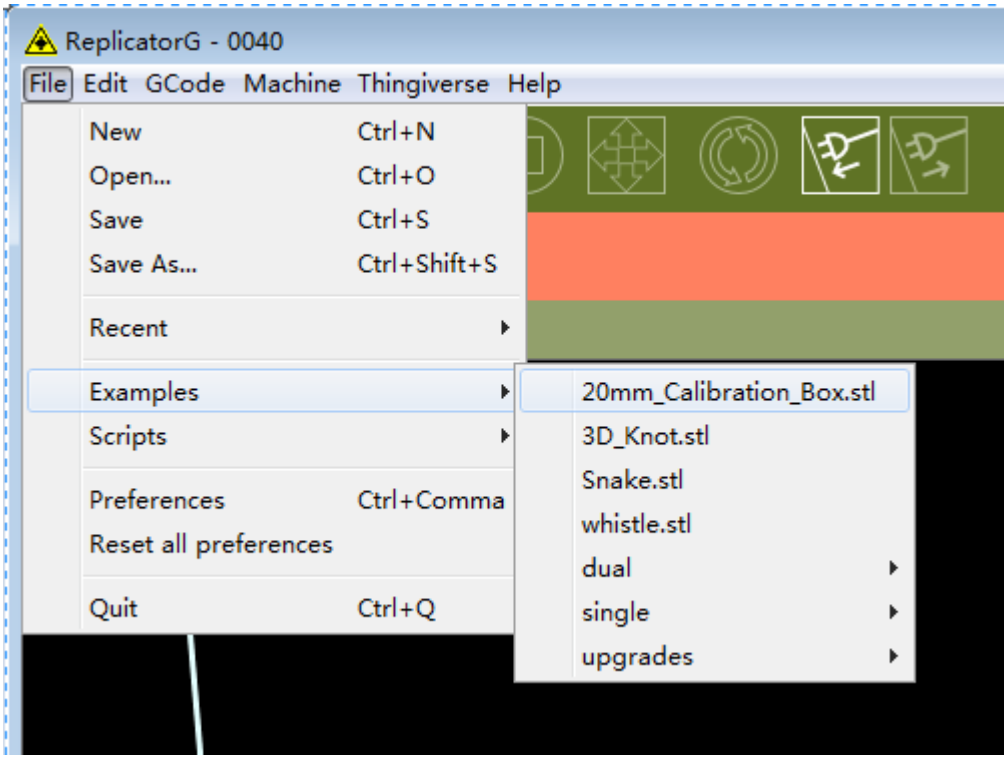
(2) Next, choose correct serial port (Notes: the serial port of the machine is usually not COML);



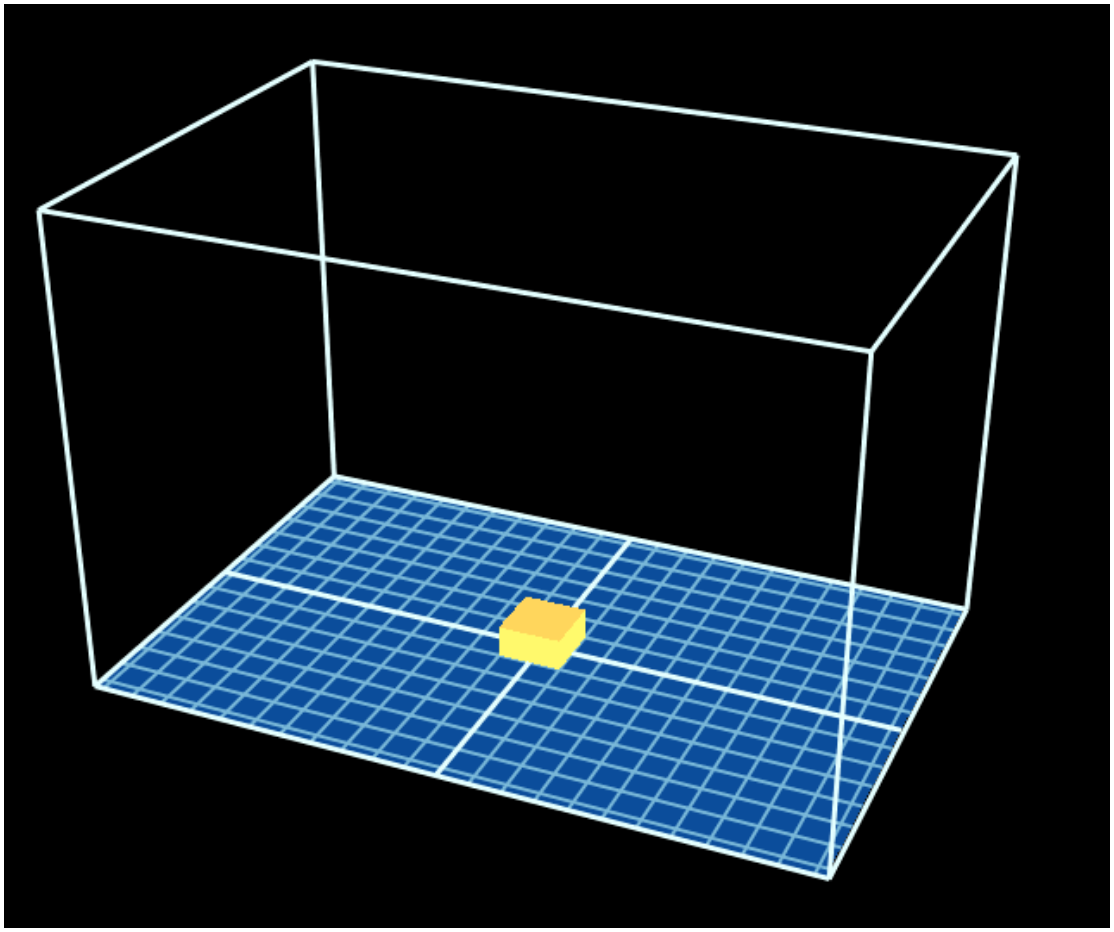
(3) Click online.



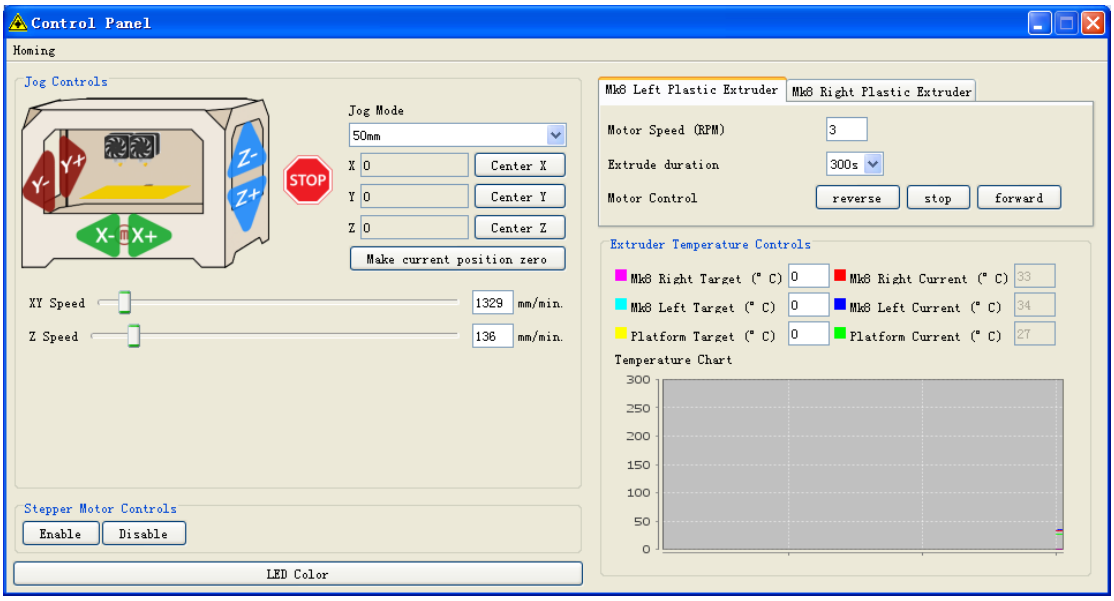
(4) Then, choose the file to print:



Then, the pattern of the file will show up:



(5) Open control panel



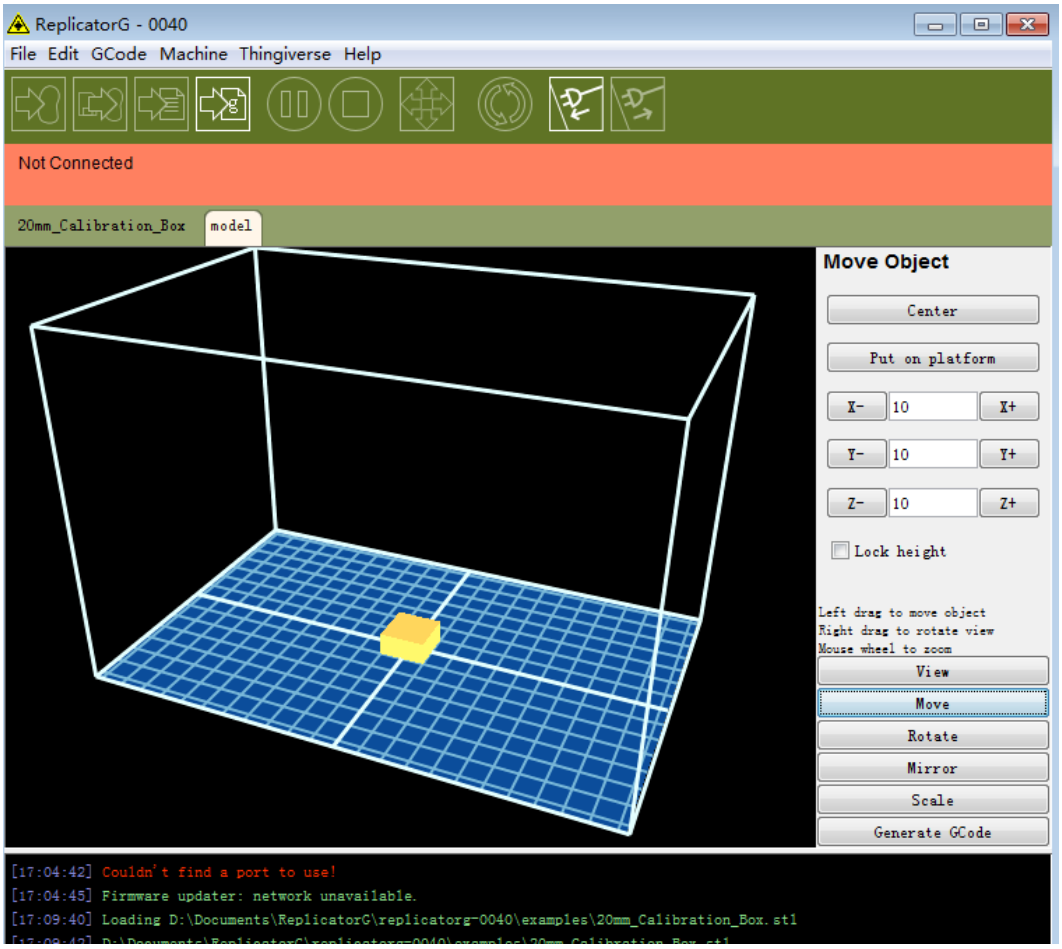
Set the temperature of nozzle: After setting target temperature frame, then click “Enter” button.

Due to the difference in temperature conduction for different machines, there is large temperature value difference. It’ had better start from 2150 to try filament exflagellation. At this temperature, it rises fast to 190, which indicates there is large margin for temperature. If is slow, there is small margin. If filament comes out, it indicates the temperature is low. If the exflagellation with the sound of bubble, it indicates the temperature is high. The appropriate temperature should be set according to the actual situation. If “reverse” is clicked, the motor of extruder head will rotate reversely and the material (to be used up) will be delivered out. Then, flatten the fresh material and put it inside through the hole, and click “stop” and then click “forward”. At this time, the extruder motor will rotate forward. Insert it tightly until the material is gripped, and then put into the nozzle until it spins.

Notes: the machine will continue reaching to the bottom when the temperature reaches the preset value.

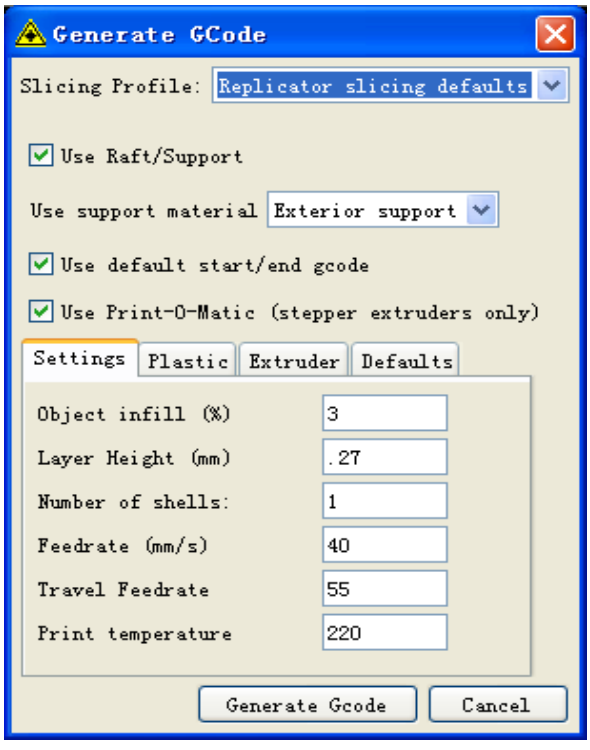
How to start printing:

Move the image to the appropriate position, then click the below button,



Select:

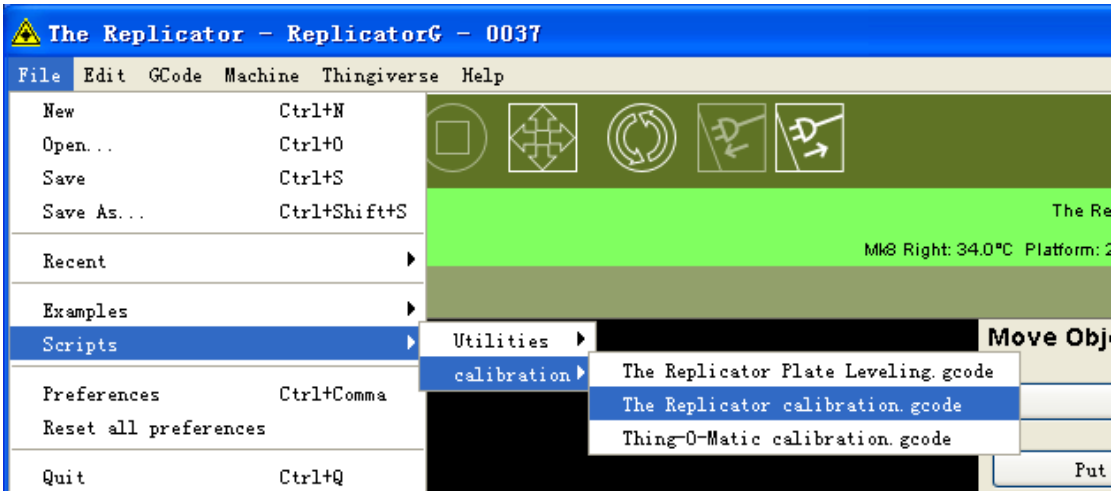
Please pay heeds to the above option, click “Generate Gcode” to generate Gcode, and then move the printing head to the central position.



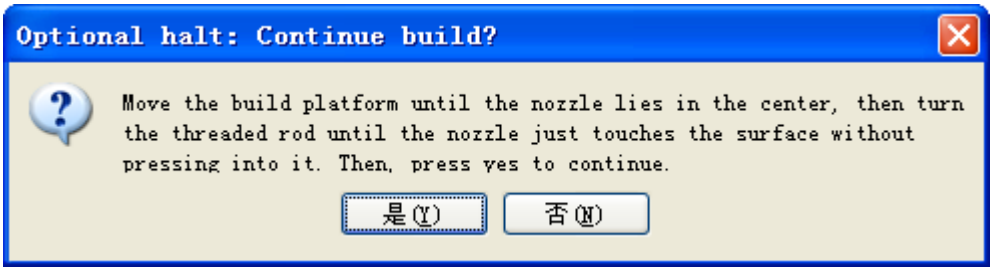
Can revise Feedrate (mm/s) into 20. Tralvel Feedrate 20 brings about printing effect with higher precision.

How to calibrate (not necessary to calibrate under normal condition):

Move the nozzle to the platform that just approaches through control panel .



After it runs, there will be hint:



Click “OK”, then the machine will start automatic calibration program:

Click “OK”, and then disconnect , and reconnect to finish calibration.

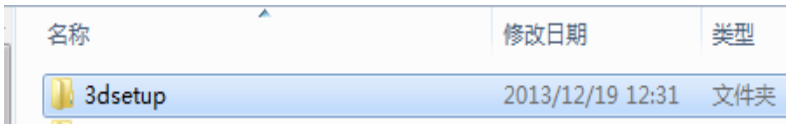
Generate Gcode to print:

Click , the machine will start printing.

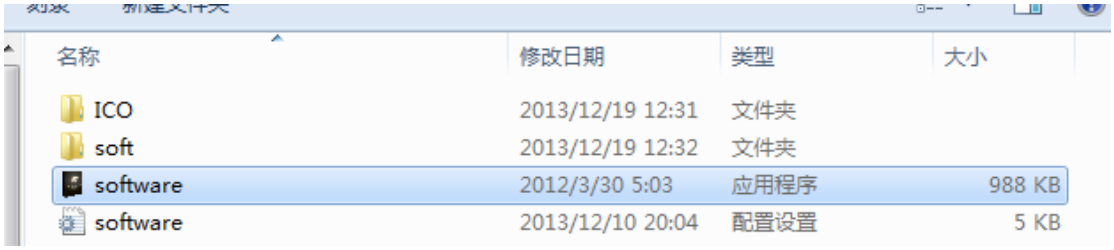
Notes: The printer will continue reaching the bottom at 10mm after the temperature reaches the preset value.

3.1.3 Install MakerWare drive software

(1) Take out SD card and read the printer driver in it, search 3dsetup folder;



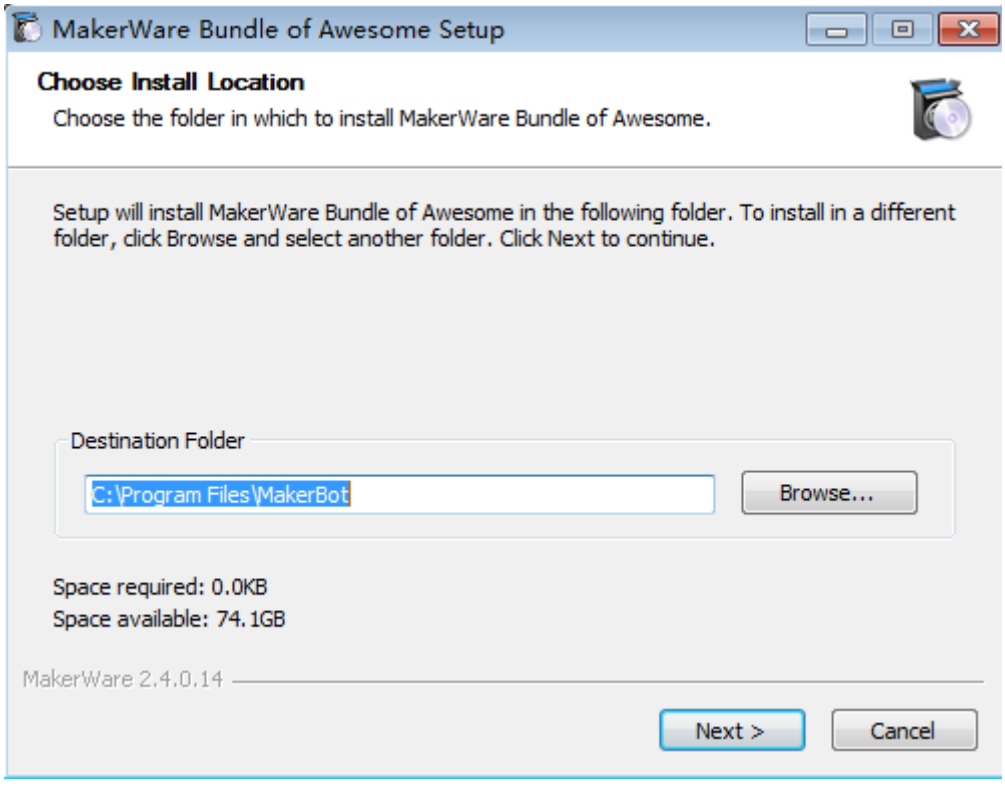
(2) Open 3dsetup folder, then search software file



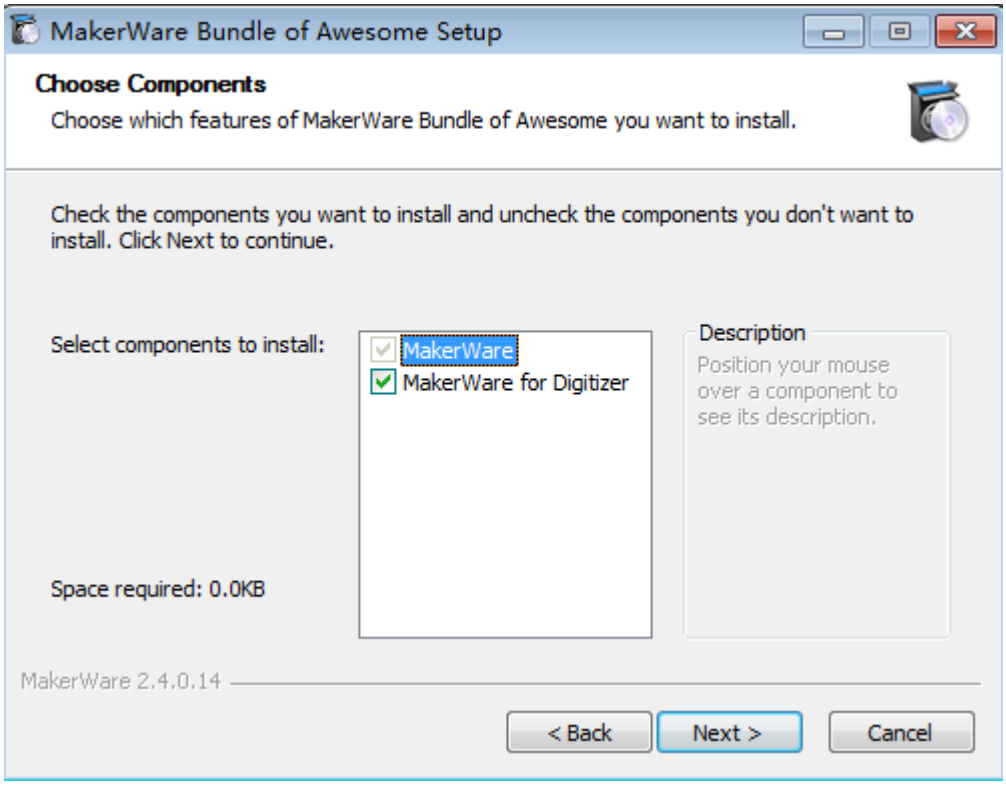
(3) Right click to open software file, and then enter software installation manager;

(4) Click MakerWare, the software drivers for different computer operating systems will show up; then search appropriate printer driver according to your computer operating system, and then click automatic installation;

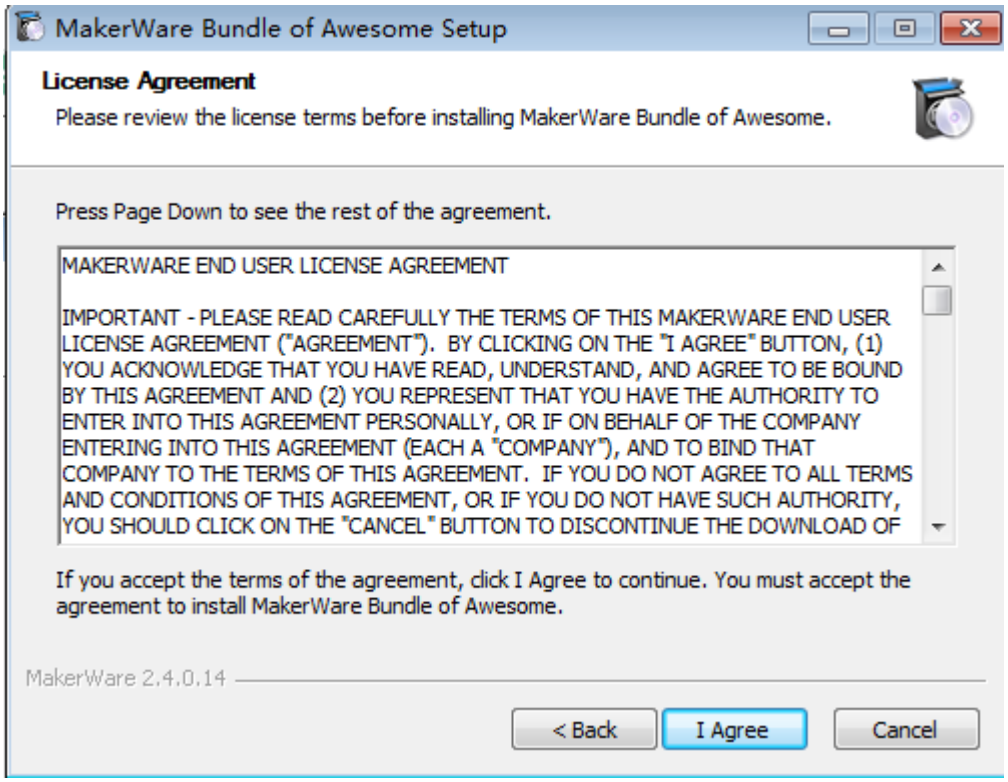
(5) Click “automatic installation” in MakerWare software, the below icon will show up, and then click “Next” button;



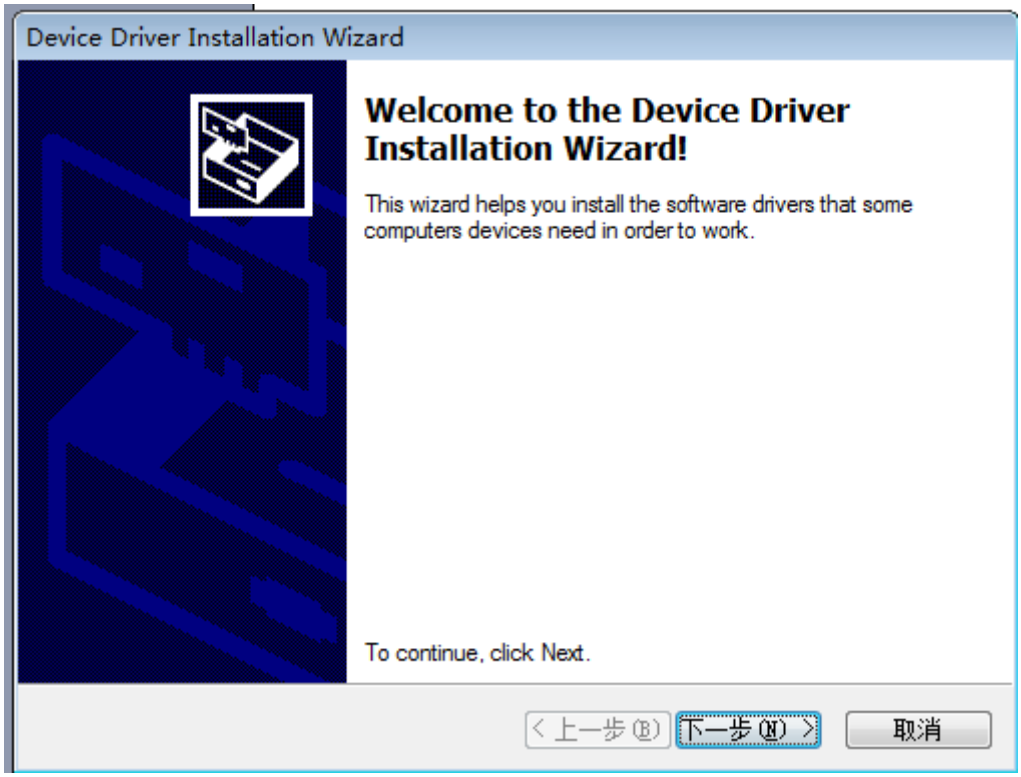
(6) Then, click “Next” button.



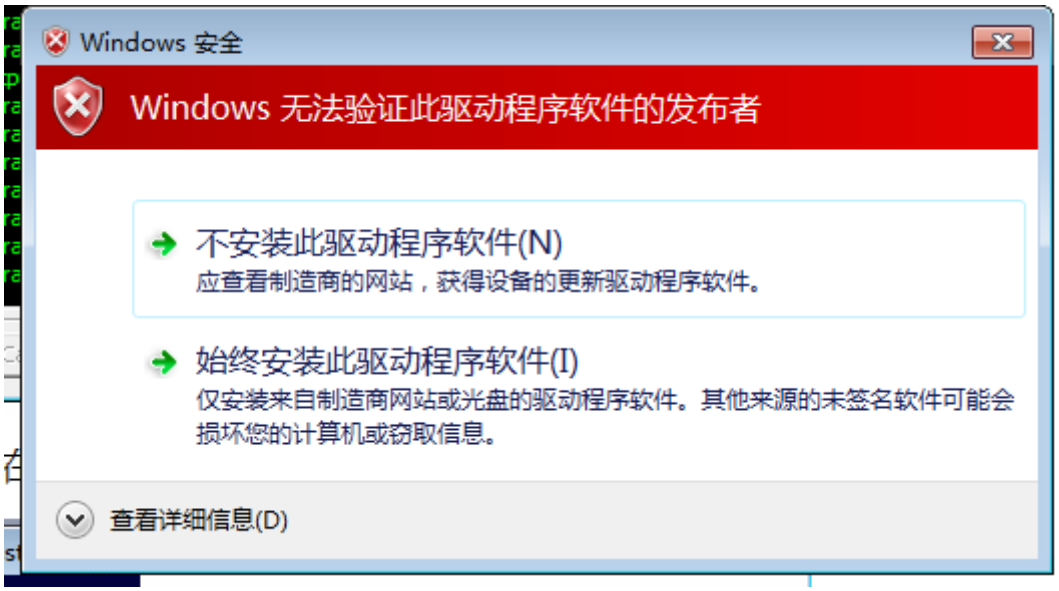
(7) Then, click “I Agree” button



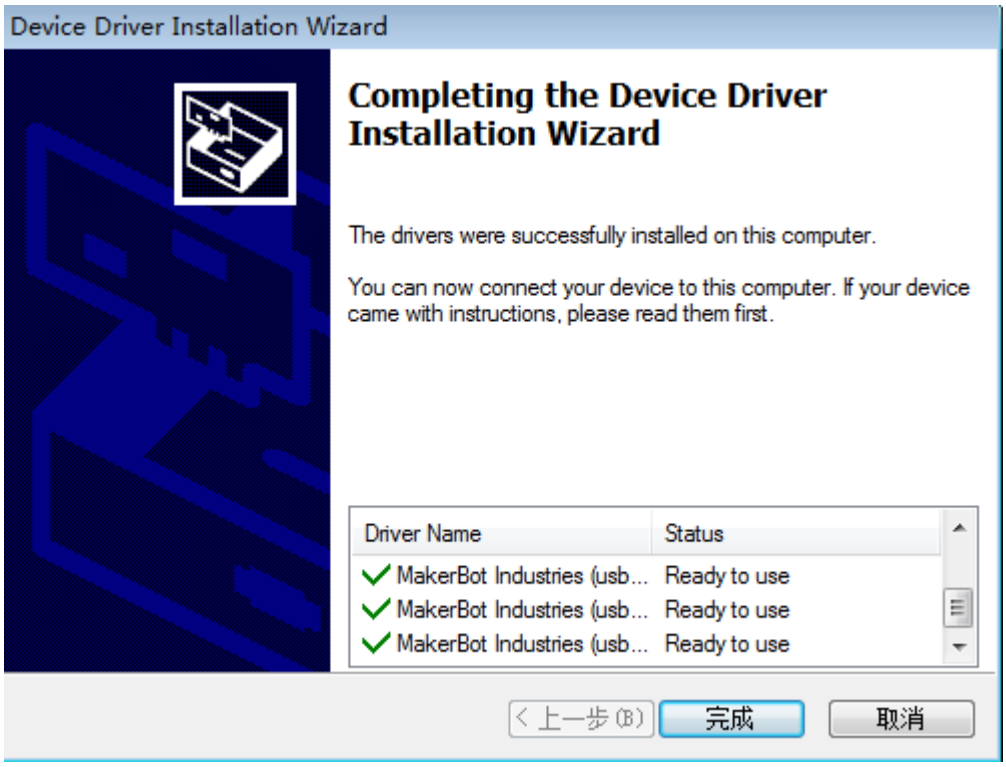
(8) After clicking “I Agree” button, wait for a while, the next dialog box will pop out, please click “Next”;



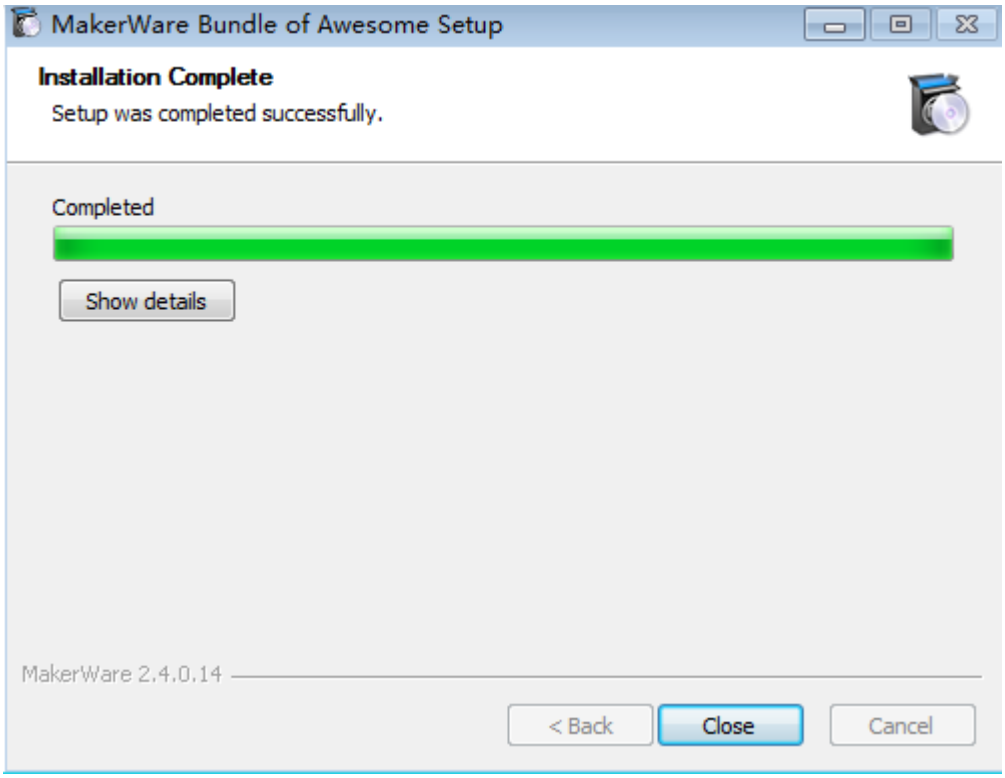
(9) After clicking “Next”, the next prompt will show up for consecutive 5 times, click “Always install this drive program software”;



(10) Click “Always install this drive program software” for five times to complete installation. The dialogue will pop out at the same time. Please check whether all programs are installed (query method: check “Driver Name” in the pop-out dialogue. If indicating all marks “√”, it means the software is installed successfully. However, in case of item with “×”, it means the software is not installed successfully.)

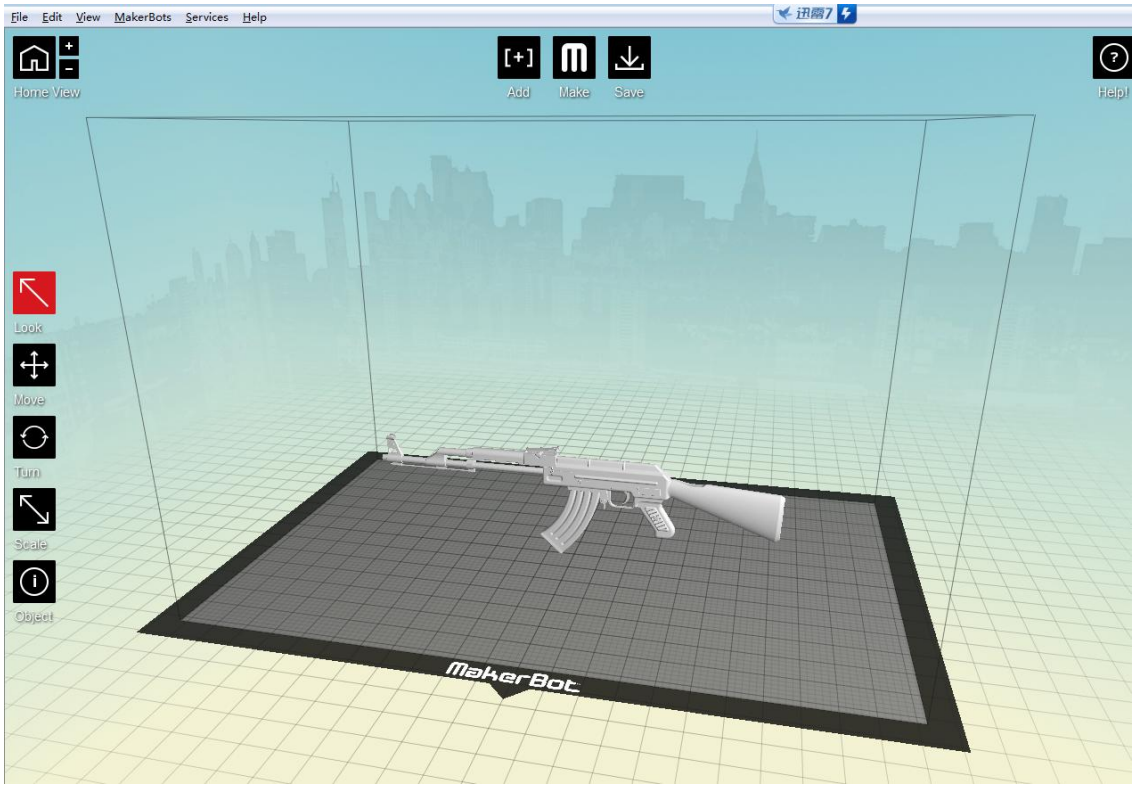


(11) Click “Close” button at homepage, the software “MakerWare” printing software will be installed successfully.

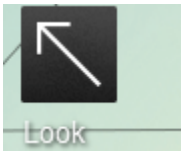


3.1.4 Software functions

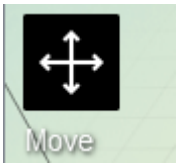
(1) Function interface of MakerWare software



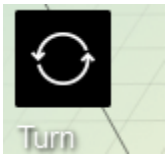
(2) Introduction of function buttons



File view tool



File location move tool



File turning tool

File scale adjuster tool

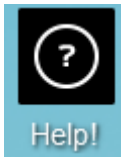
Left-right head option

Addition file tool

File section generation tool

File save tool

View zooming tool



Software function introduction

(**Notes:** left click the file to have the color of its frame changed before using the tools, shown by below:)

Fig. 1 (Open the picture but not click “selecting”)

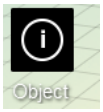
Fig.2 (Open the picture and click “selecting”)

(3) For section generation parameters, open STL file through

and move it to the horizontal panel with

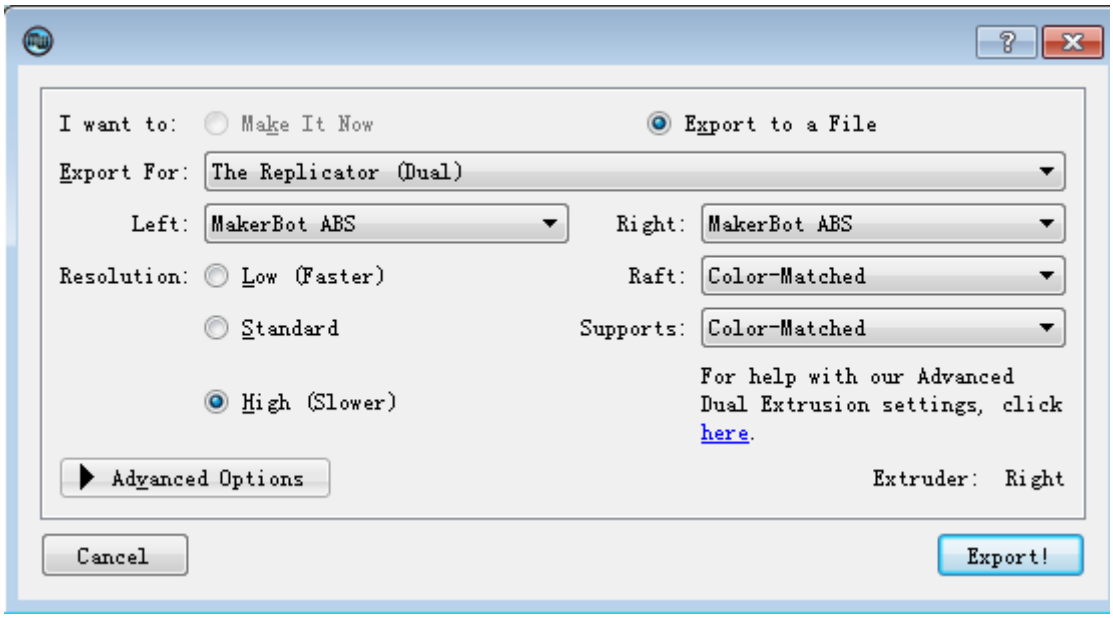
, and adjust the optimal printing angle with

; zoom in or out the file that could not be moved for exceeding maximum printing size with

; after completing above operations, choose the printing head with 

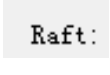
to print; next, click

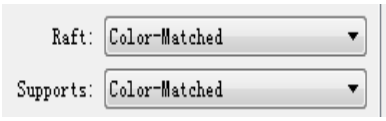
to set detailed parameters. Please refer to the picture:



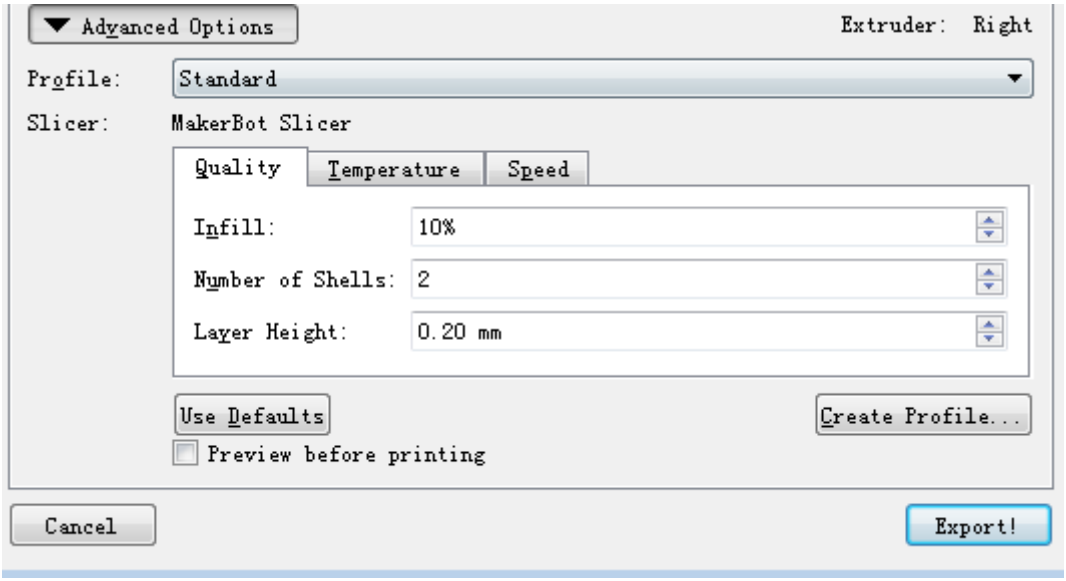
At option item of “Export For”, “The Replicator (Dual)” printer type should be selected.

At the following option items “Left” and “Right”, choose different options according to the material.

Raft tool is to bottom on the printer material bearing platform before the printer works. 

Supports tool is to automatically add supporting material through software for the impending graph to ensure the printing could be smoothly completed. 

There are three items under the option of Resolution (Resolution:). Different printing precision could be chosen according to personal requirements, like: Low (Faster) , Standard , High (Slower) . However, it is officially advised to choose standard. Click "Advanced Options" to set printing parameters.



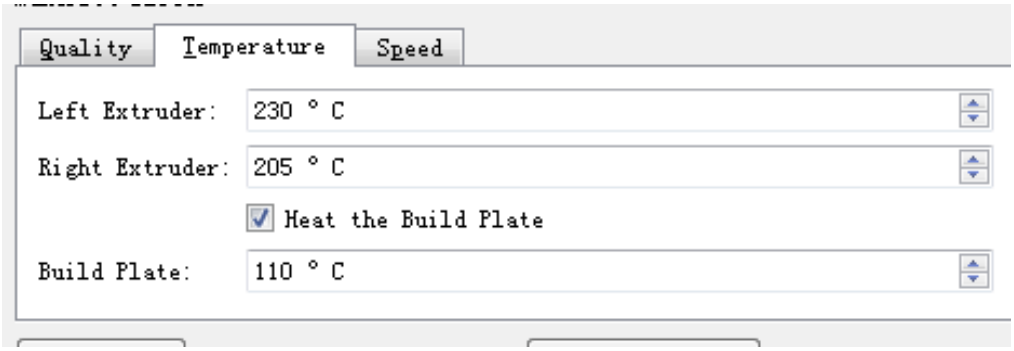
For the tool Profile: , there are also three options behind it, low, standard and high. The user can choose it according to the personal requirements. However, it is officially advised to choose standard.

There are also three options under Slicer: , namely Quality , Temperature , and Speed .

Quality (Quality) indicates the detailed precision parameter; Infill: indicates filling rate.

Number of Shells: : wall thickness; Layer Height: : precision. The data of each option could be adjusted according to personal requirements. The parameters suggested officially are as shown by the Fig.:

Temperature (Temperature): temperature,

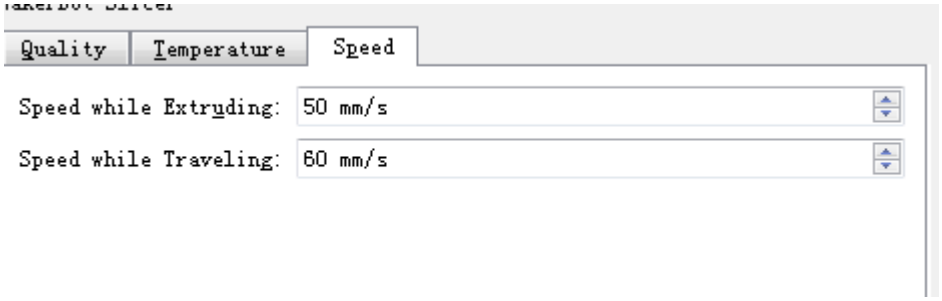


Left Extruder: : left extruder; Right Extruder: right extruder; Build Plate: : heating plate. different temperature could be selected according to the material.

Official suggestion: ABS material, extruder: 220-230°; plate: 110°.

PLA material; extruder: 205-210°; plate: 40-60°.

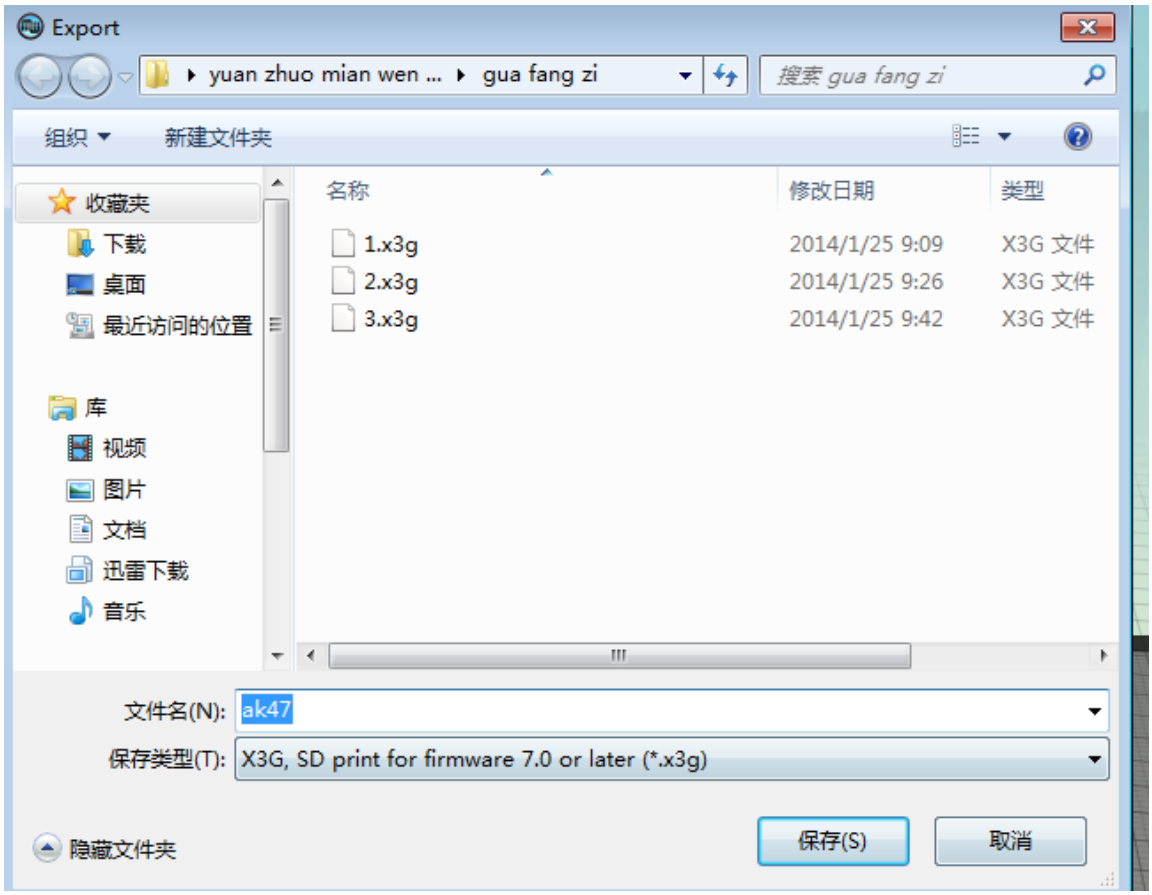
Speed (Speed): not exceeding 80mm/s

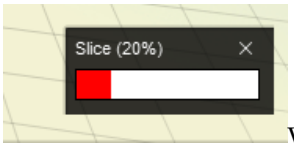


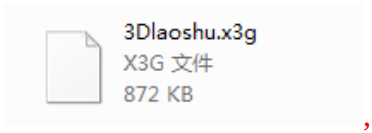
Official suggested speed: ABS speed: upper 30-35mm/s; lower: 40-45mm/s

Speed for PLA material: upper: 50-55mm/s; lower-55-60mm/s

After completing the above settings, click “Export” button, then the path choice dialogue will pop out, and please select a file address to save the file.



After pressing the "save" button, the progress bar 

will show at righter lower corner; certainly rename it by adding 3D before the file name. like 

, copy the generated X3G format file with SD card and insert the card into the printer for printing.

3.2 Description of LED touch screen functions

3.2.1 Description of functions of menu items

LED touch screen is resistance touch screen; you can directly press and touch it.

The menu items are simply explained below:

Menu Items	Functions	Explanations
Build from SD	SD card printing	Select .s3g or .x3g file from the SD card to print
Preheat	Preheat	Start preheating

Utilities		Tools	Enter into auxiliary tool menu
	Monitor Mode	Monitoring	Enter into monitoring interface and monitor the temperature of nozzle and baseplate
	Change Filament	Filament change	Change filament according to the screen tips
	Lever Build Plate	Level printing plate	Level printing plate according to the screen tips
	Home Axes	return to the original	Extruder running to X, Y and Z axial original location
	Jog mode	Job mode	Pointing control of X, Y and Z axial motors
	Run Startup Script	Run startup script	Running guidance program for startup for the first time
	Enable Steppers	Enable steppers	Enable/turn off all motors
	Blink LEDs	LED switch	LED switch (not used)
	Exit menu	Back to main menu	Back to main menu
Info and Settings		Parameters & setting	Enter into parameter setting menu
	Bot Statistics	Device information	Check running time statistics of the device
	General Settings	General parameter setting	General parameter setting
	Preheat Settings	Preheating parameter setting	Preheating parameter setting
	Version Number	Version No.	Check version No.

	Restore Default	Restore default setting	Restore default parameter setting
	Exit menu	Back to main menu	Back to main menu

3.2.2 Main menu

After the machine is electrified, the main menu interface will show up, as shown by the Fig. 1.

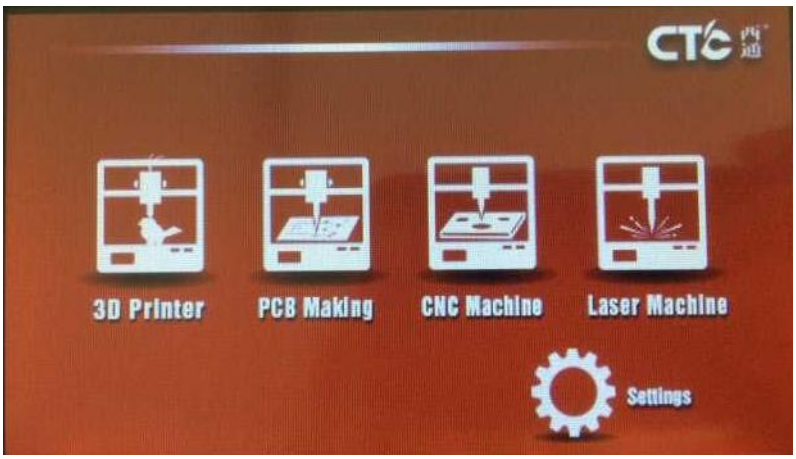


Fig.1 Main Menu

1. SD card printing

Select corresponding functions to SD card and browse files (as shown by the Fig. 2), directly select the file and print.

Fig. 2 SD Card File Option

2. Setting

Select “Settings” and enter into setting interface (as shown by the Fig. 3).

Fig. 3 Setting Interface

3.2.3 Preheat

Select “Preheat” and enter into preheating operation interface (as shown by the Fig. 4), and directly press “ON/OFF” button to select left and right extruders and heating platform. Then, touch “Preheat”, the machine will begin preheating.

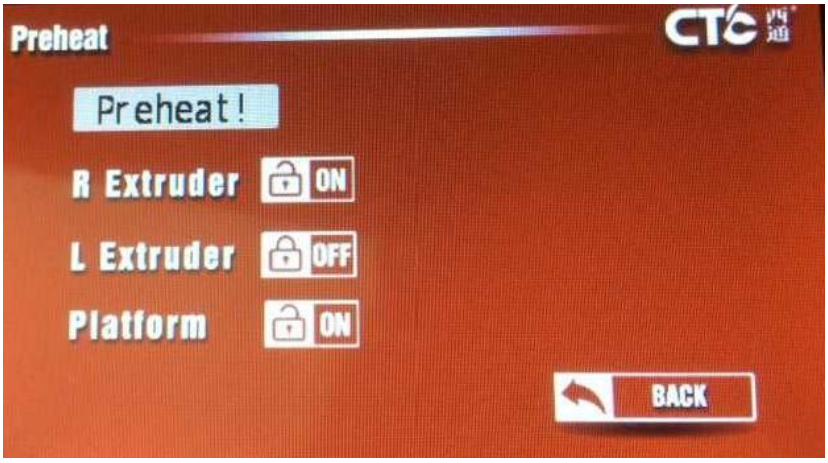


Fig. 4 Preheat

3.2.4 Auxiliary too submenu

Select “Utilities” and enter into auxiliary tool submenu (as shown by the Fig. 5)

Fig. 5 Auxiliary Tool Submenu

1. Monitor Mode

Select “Monitor Mode” and enter into the monitoring interface to monitor the temperature of the extruder and platform. This function is mainly for FDM 3D printing function.

2. Change Filament

Select “Change Filament” to change filament. Firstly take out the filament on the extruder and put into the new one according to the screen tips. This function is mainly for FDM 3D printing function.

3. Printing platform adjustment

Select “Level Build Plate” to level printing platform according to the screen tips. When, the printing platform is imbalanced, it is necessary to enter into this interface to adjust it. Under normal condition, it is only necessary to adjust it at the first time.

4. Back to origin

Select “Home Axes” control extruder to return to the original coordinate position of the machine.

5. Jog Mode

Select “Job Mode” and enter into pointing control interface (as shown by the Fig. 6), select and move corresponding X, Y and Z axes through “-” and “+”.

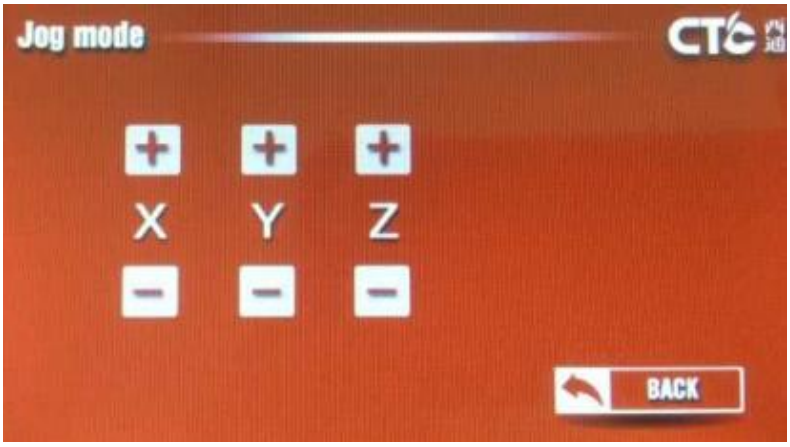


Fig. 6 Pointing Control Interface

6. Running Guidance Program

Select “Run Startup Script”, then the printer will automatically run the use guidance program when running for the first time. There is not exit button after entering into “Run Startup Script”, it’s necessary to finish all process to exit. If mandatorily exiting, the printer should be restarted.

7. Enable Motor

Select “Disable Steppers” o enable the 3-axial motor.

3.2.5 Parameter and setting submenu

Select “Info and Settings” and enter into parameter and setting submenu (as shown by the Fig. 7)

Fig. 7 Parameter & Submenu Setting

1. General Settings

Select “General Settings” and enter into the general settings (as shown by the Fig. 8), and select parameters by touching the button.

Fig. 8 General Settings

Select “LED Color” and enter into LED color option. However, this function is not used, so the LED color cannot be changed by revising the parameters.

2. Preheat Settings

Select “Preheat Settings” and inter into preheating parameter setting interface (as shown by the Fig. 9). Touch while square area and input parameters via keyboard. This function is mainly for FDM 3D printing function.

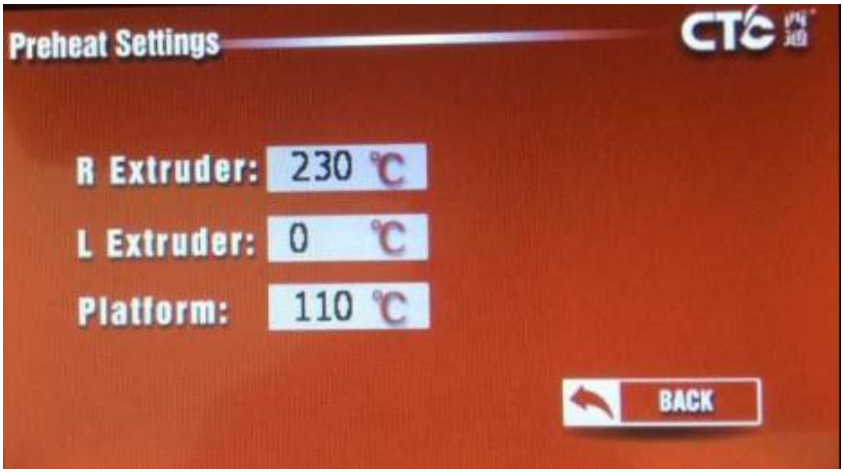


Fig. 9 Preheating Parameter Setting Interface

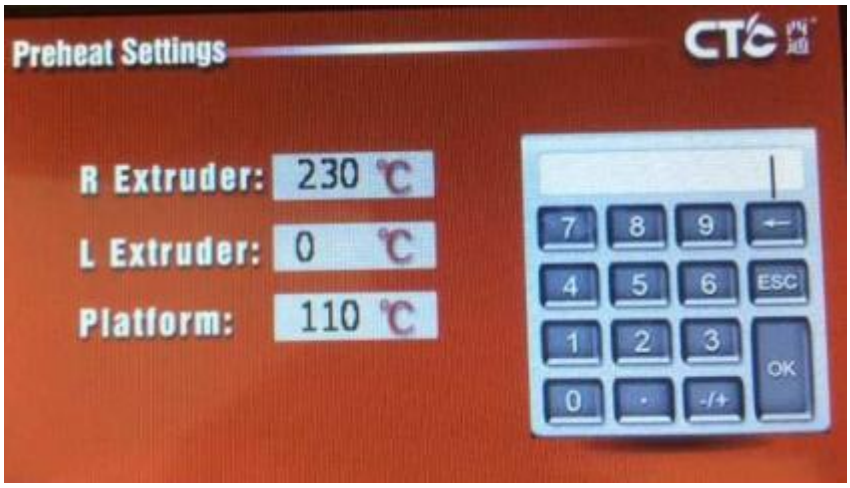


Fig. 10 Preheating Parameter Setting Keyboard Interface

3. Restore Defaults

Select “Restore Defaults” and restore default parameters.

4. Device Information

Select “Bot Statistics” and enter into device information interface (as shown by the Fig. 11), check the total printing time and the last one of the printer.

Fig. 11 Device Information Interface

5. Version Number

Select “Version Number”, and check the version number of the software.

3.3 Replacement and Use of Printer

For replacing printer, before the printer is not installed and fixed, don’t power on. Do make sure to power off during replacing the printer.

3.3.1 Replacement of Laser Printer

1. Dismantle two the set screws at the two sides of the bottom of the printer to dismantle printer.

2. Fix laser head, assemble the laser head and clamp, fix with the screw, then install the clamp on the printer head and fix the two screws on the bottom.

3. Start up, and enter into laser function to select laser printing file.

4. After entering into printing interface and select adjustment height. In case that the function used last time is this one and the laser and platform height is the same, the user cannot adjust the height and directly print the file after initializing. (YES: manual adjustment; NO: the same as the last printing height).

When adjusting the height, place a piece of paper on the object to print and adjust the axis Z to the appropriate location (adjustment: rough adjustment; Minitrim: fine adjustment) so that the printing head is at a distance of a piece of paper from the object to print.

Click “Next” and start printing

After finishing printing, the printer will prompt

3.3.2 Notes for Laser

1. When replacing the printing head, power off the laser to avoid accidental injury.

2. When the printer works, please don’t directly see laser source, especially the children to avoid damages to the vision due to the laser source.

3. After the printer finishes printing. It’s advised to power off to extend the service life of the laser head.

4. Material: paper (low reflect light coefficient), wood and acrylic plate (pay heeds to the color).

5. The working platform should be leveled.

3.3.3 CNC (PCB) Printer Replacement

1. Dismantle the two fixed screws at the two sides of the bottom of the printer head and then dismantle the printing head.

2. Replace the printing head, dismantle the tool fixing screw of the motor and install it on the clamp, then install it on the printing head and fix the two fixing screws from the bottom. Firstly fix the motor. As for the tool, it can be fixed before the machine starts printing to avoid accidental injury.

3. Manually move the printing head to the original point and place CNC (PCB) printing material on the printing platform. If CNC printing material is used to print, it is necessary to dismantle the heating baseboard and tighten the four screws below the heating baseboard.

4. Start up, and enter into CNC (PCB) function and select CNC (PCB) file to print.

5. After entering into the printing interface, put into the printing material and adjust the height so as not to touch the printing material. (If this function is used last time, the height cannot be adjusted and it is just necessary to print after initializing), select printing and adjust the location of printing material and then check the location of the printing file size.

6. To power off, fix the adjusted printing material with the clamp after initializing of the printer.

7. Install the tool on the printer head with wrench.

8. To start up, choose the printing file; click the touch screen to adjust the height of printing platform. Adjustment: rough adjustment; Mintrim: fine adjustment. After the height arrives at the knife edge of a paper on the material, pull out the paper until there is resistance.

9. Click “Next” and start printing.

3.3.4 CNC (PCB) Notes

1. It’s advised to wear gloves when operating the machine.

2. The tool should not be exposed for too long, 13mm is advised.

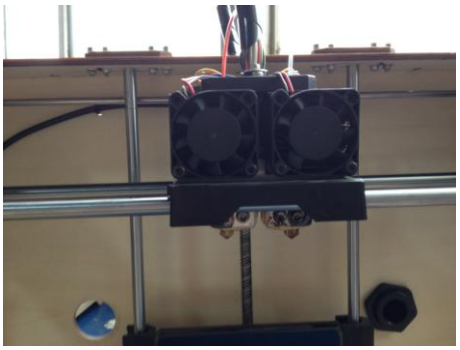
3. When the PCB printing material is used to print, the printing platform should be leveled.

4. Firstly fix the wood material, and then turn on the machine. To avoid scratching, it’s advised to move the motor away when fixing the wood material.

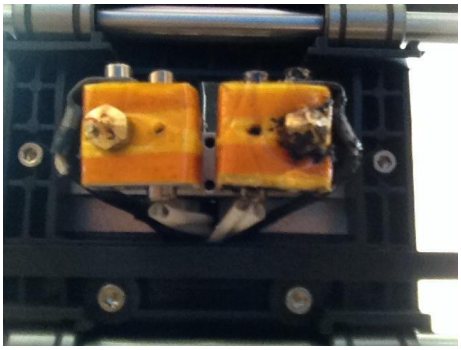
4. Maintenance

4.1 Cleaning printing head

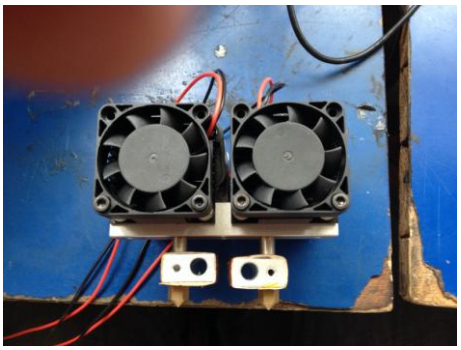
It’s necessary to the clean the printing head after the printer is used for a period of time. For the appearance of the printing head, please refer to the Fig.1. Two white screws could be found at two sides on the bottom of the printing head, as shown by the Fig. 2; then take out the printing head after removing the two screws, as shown by the Fig. 3. Before dismantling the printing head, it’s necessary to remove the two black hexagonal 2.5 screws below the fan to remove the fan and cooling fin, as shown by the Fig. 4. A piece of aluminum rod could be found after the fan and cooling fin and motor are removed, as shown by the Fig. 5. The, after the stepping motor is removed, the glue gear of the printing head could be found, as shown by the Fig. 6. Then, after cleaning the glue in the gear, the printer could be installed for use.



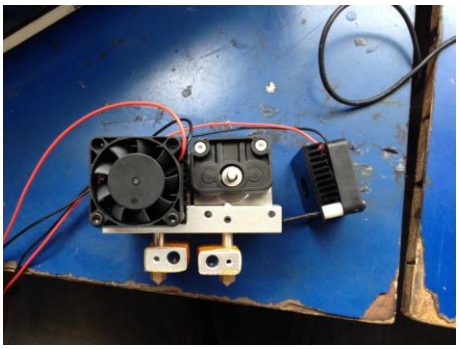
(Fig. 1)



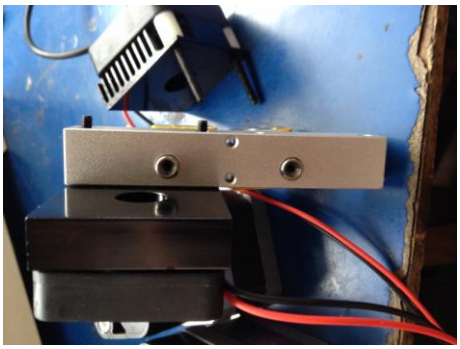
(Fig. 2)



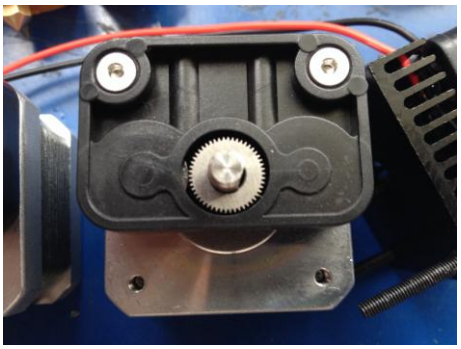
(Fig. 3)



(Fig. 4)



(Fig. 5)



(Fig. 6)

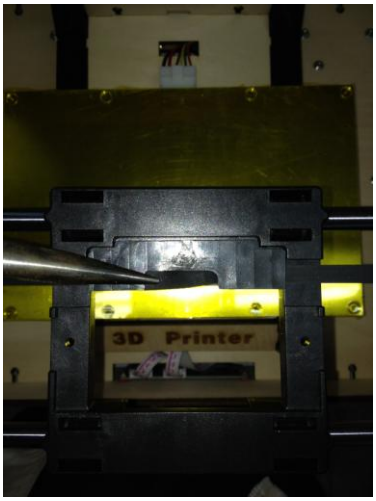
4.2 Tighten belt

Notes: 1. The tight belt should make the filament gap of the belt touch the belt pulley;

2. The force at left and right of axis Y belt pulley should be the same.

3. Between the axes X and Y should be the right angle.

(Belt at Right Side of Axis Y)



(Belt of Axis Y)

(Belt at Left Side of Axis Y)

4.3 Maintenance of Optical Axis and Screw Rod

It is necessary to use quality lubricating agent. Apply appropriate quantity of lubricating agent to the bearing steels at axes X, Y and Z, as shown by the Fig. 2, 3, 4 and 5.

(Fig. 1)

(Fig. 2)

(Fig. 3)

(Fig. 4)

(Fig. 5)

5. Troubleshooting

5.1 In case of printing deflection after fixing of screws, please check whether the belt pulley of printer is at horizontal line.

5.2 The temperature is not normally displayed, please check thermocouple. If normal, it is necessary to replace the thermocouple.

5.3 If the temperature display is NA, please check thermocouple. If normal, it is necessary to replace the

thermocouple.

5.4 If the axis X is abnormal with shaking phenomenon, there is something wrong with the motor line of the axis X, then it is necessary to replace the motor line of the axis X.

5.5 In case of LCD blue screen, sudden restart-up after starting up, and non-stopping after the touch of limit switch of the motor, it is necessary to check the connecting wire of sensor. If the connecting wire of sensor is normal, there might be something wrong with the wire of sensor.

5.6 In case that the fan doesn't rotate, please firstly assure the temperature is above 50^{o} and rotate it with hands. If still not rotating, you can check the connector with the screwdriver or test the battery. After making sure that there is something, it's necessary to replace the fan.

5.8 If the motor doesn't rotate, it is necessary to replace the driver board of motor.

6. Common problems and solutions

6.1 Filament---rough---dismantle extruder

6.2 slipping---too fine---reduce the filament

6.3 Blocked extruder—heating pipe blocked---dismantle heating components, and heat to 220o and take the filament with tweezers

6.4 Abnormal temperature---damaged thermocouple---replace thermocouple

6.5 Printing dislocation---loosened screws—check and tighten the screws

6.6 Edge warping of printed sample--- high height of baseboard---adjust the height of baseboard

6.7 Fail in conversion into G code-machine type and number of extruders not selected and incorrect storage path—select and change

6.8 Filament adhered to the extruder---the supporting material pull down by the extruder---reset the parameters

6.9 No filament---something wrong with the model—repair the model and reconvert the code and set parameters

6.10 Drive or software not installed---something with the system configuration—reinstall the system

6.11 Printing the sample cannot stick the platform—large distance between extruder and platform---readjust the platform

6.12 If the motor of printer cannot rotate through pointing control mode after electrified, then preplace the new printing identifier.

6.13 Blue adhesive tape not removed---platform heating. it can be completely removed under 20^{o} or 30^{o}.

7. Warranty & license agreement

Quality assurance:

The commitments are available behind each item. We ensure each product is of qualification and high quality based on strict accessory processing standards and assembling testing process.

After-sale guarantee:

1. As for the problem due to the product quality within 7 days as of the date of receiving the product, we will be responsible for undertaking the freight fees to freely replace or repair the product for you.

2. As for the problem due to the product quality within 7-30 days as of the date of receiving the product, we will freely replace or repair the product for you, but you shall be responsible for undertaking the freight fees.

3. As for the problem due to the product quality within 30-90 days as of the date of receiving the product, we will freely replace or repair the product for you, but you shall be responsible for undertaking the freight fees.

4. As for the problem due to the product quality after 90 days as of the date of receiving the product, you can consult it freely. In case of replacing the accessories, you need to be responsible for undertaking the cost for the accessories and the freight fees.

Notes for change & refunding:

1. Basic conditions for change & refunding: ensure the packing and accessories of the product and user

manual are intact without damages and influencing the secondary sales. So only as lack of one item, the change and refunding is not accepted. To change the product, you should retain the attached gifts. In case of refunding, please send the product back to our company with the attached gifts.

2. In case of change and refunding due to the problem of quality, please check the intactness of the product on the date of receiving. In case of problem about the product, please contact us within 5 days and take photos.

3. Notes: in case of following situations, we will not provide change and refunding services: (1) The product to change or refund doesn't live to the requirements of the received one. The change and refunding services cannot be provided in case of lack of packing, accessories and user manual. (2) The change and refunding services cannot be provided in case that the purchased product is obviously dirtied or as assumed. (3) The attached gifts don't belong to the after-sale service scope. (4) The blocked extruder of the product due to non-CTC consumable items or PLA. (5) The product with the invoice issued should not be refunded, but can be changed due to the problem about quality.

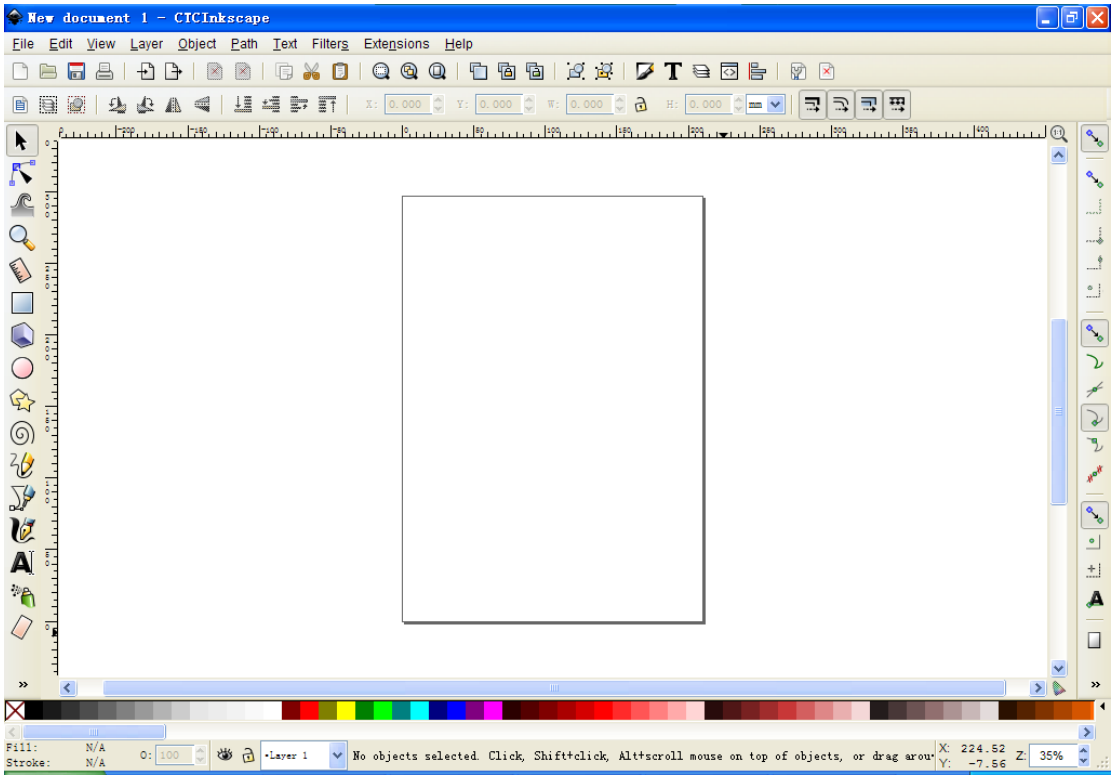
4. About maintenance of product: (1) after the printing is finished, it's necessary to remove the remaining printing consumable items inside the extruder to avoid blocking, which is also the basic maintenance of 3D printer. Notes: If the extruder is blocked due to the consumable items manufactured by other companies, the warranty will be invalid. (2) The lubricating agent and can be added to the guide rail once every month. (3) During printing, please do cut off the power of the printer or directly terminate the guide rail component of the printer with metal object.

Attachment 1 INKSCAPE Specifications

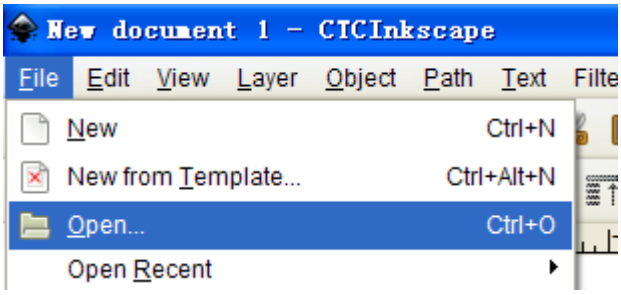
Inkscape software could identify the outline of the pattern to finish describing the pattern. However, the software lacks strong capacity to identify the multiple colors. It is advised to convert the color of file pattern into another one to make sure to better test the outline. This function is mainly to identify picture information and then have it converted into the final printing file, namely drawing picture along the outline. This function is mainly used for paper cutting, etc.

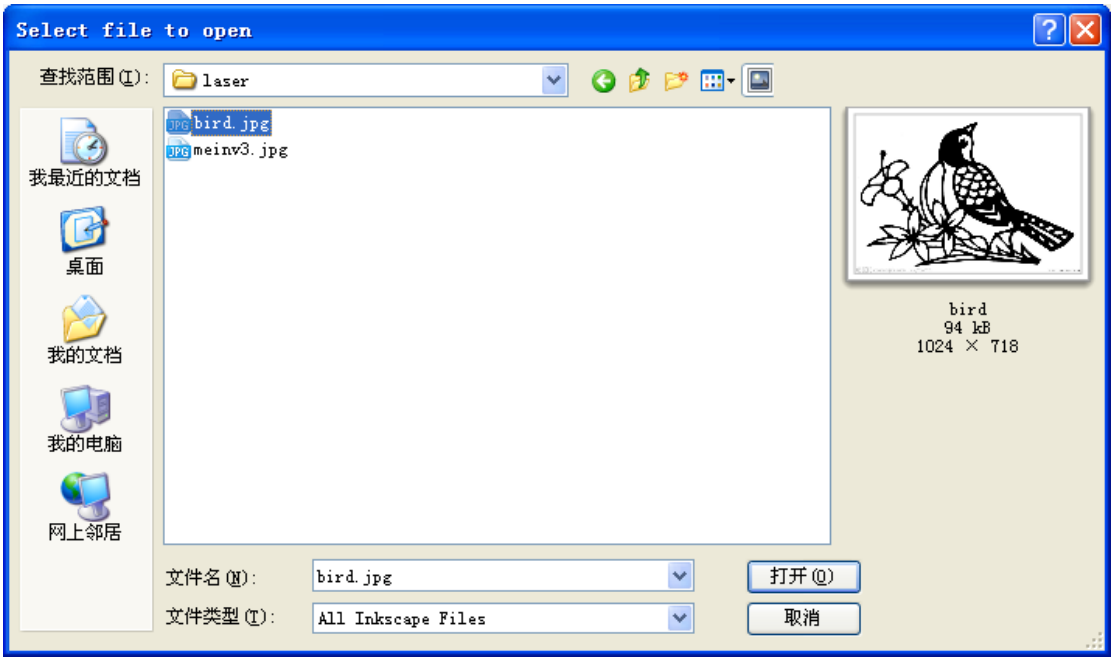
1. Inks cape generates NC file

1. Select inkscape to install according to the default setting, then open it, the interface is as below:



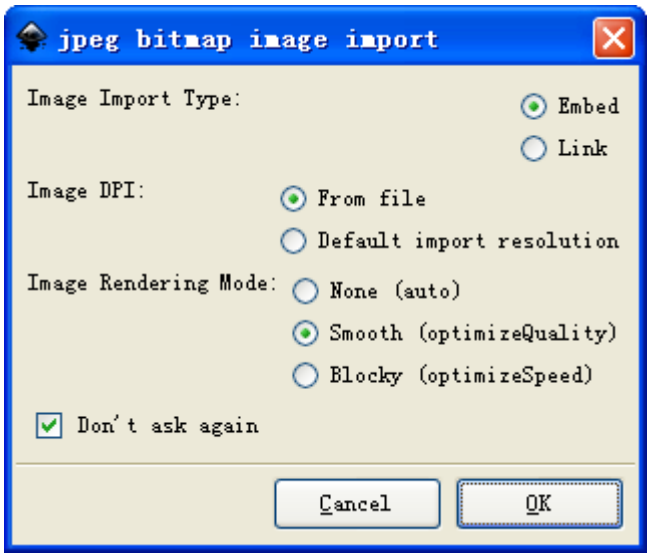
2. Open the folder and import the file to print through File-open



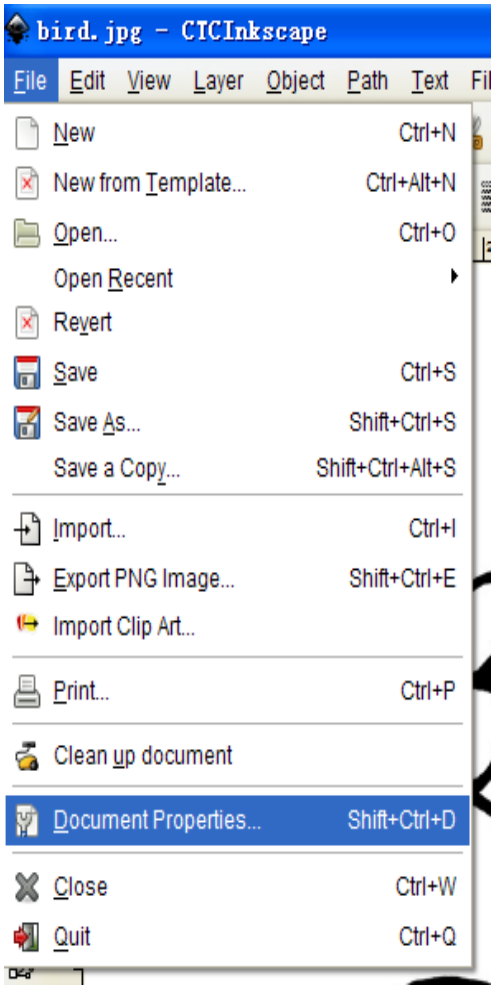


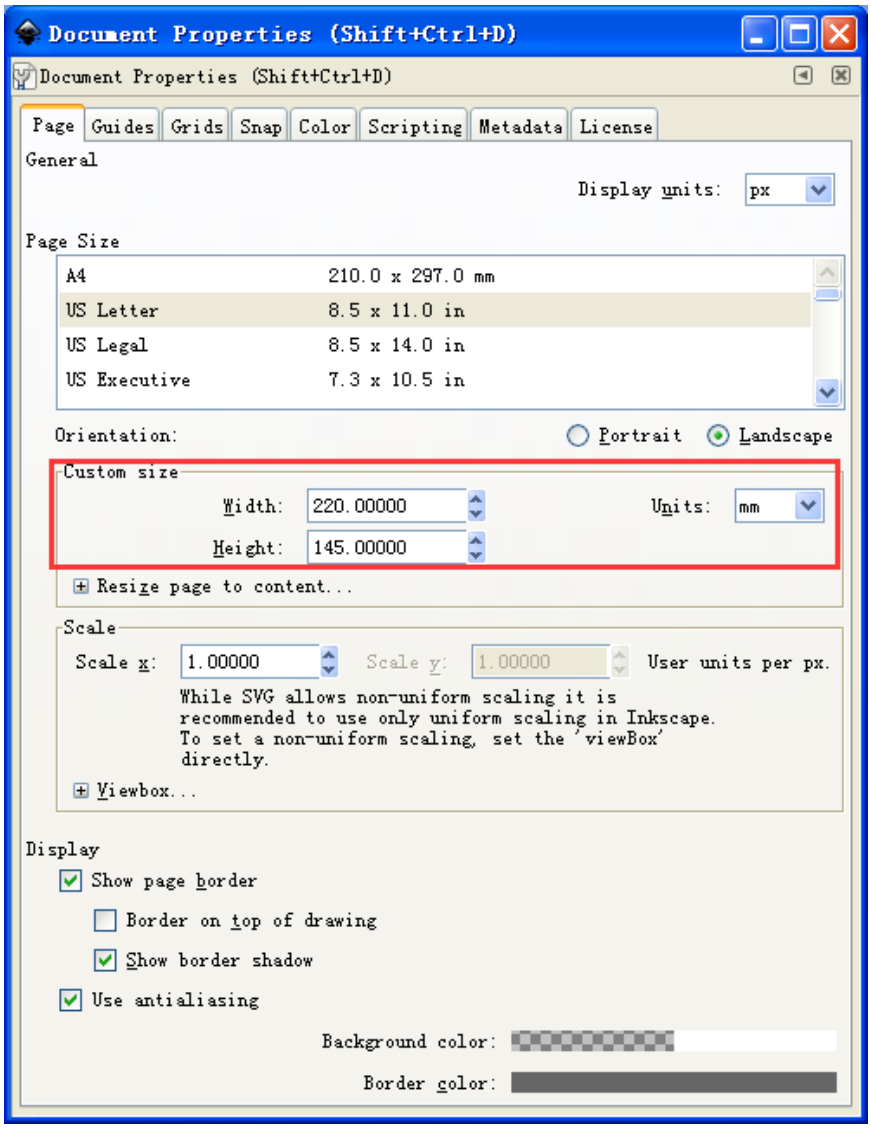
3. You will find there is setting information popping out after opening the picture for the first time. You can

choose default setting and select “Don’t ask again”, this window will no longer pop out.

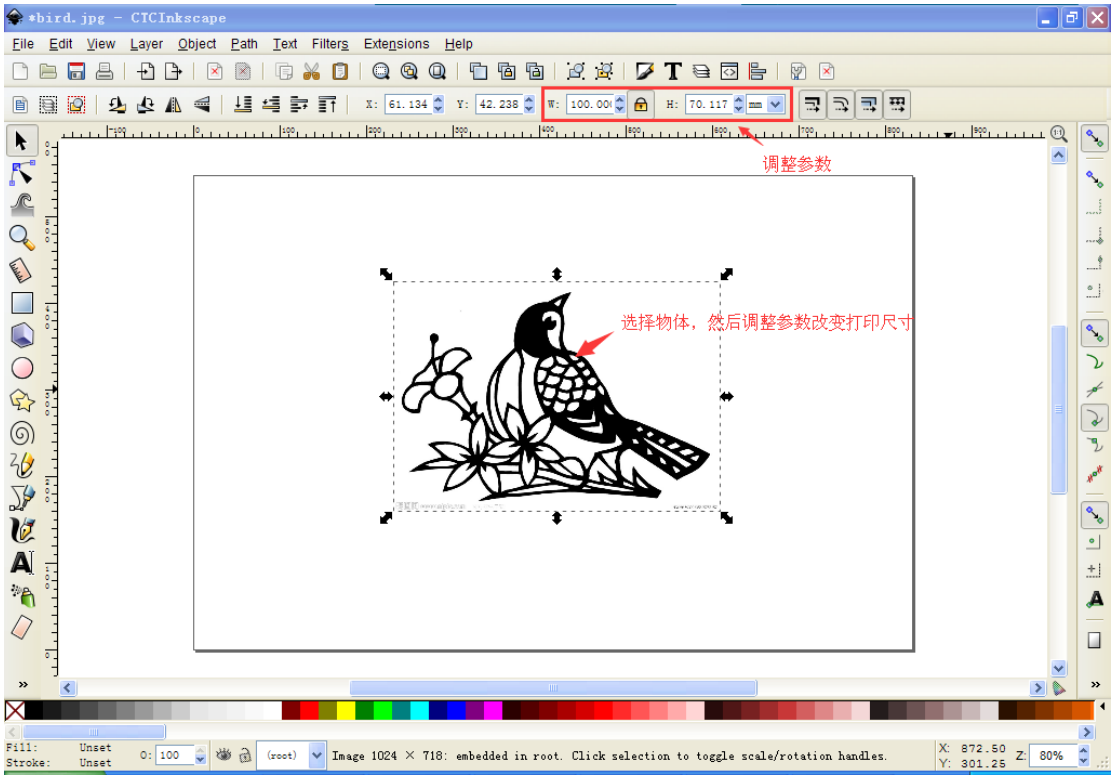


4. After opening the folder, set the size of printing platform according to the File-Document properties, the size of printing platform is 220mm*145mm

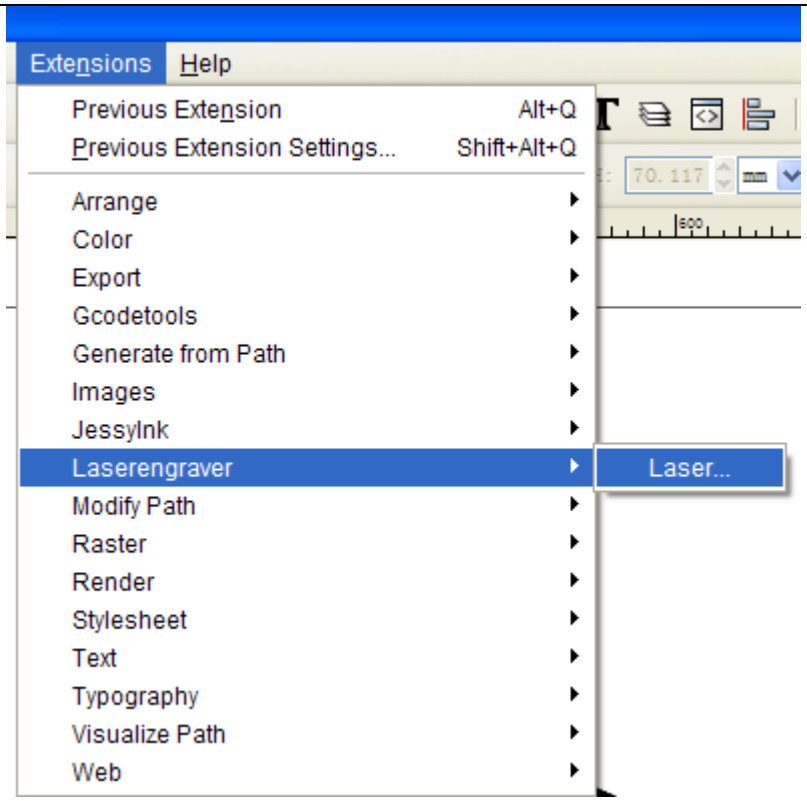




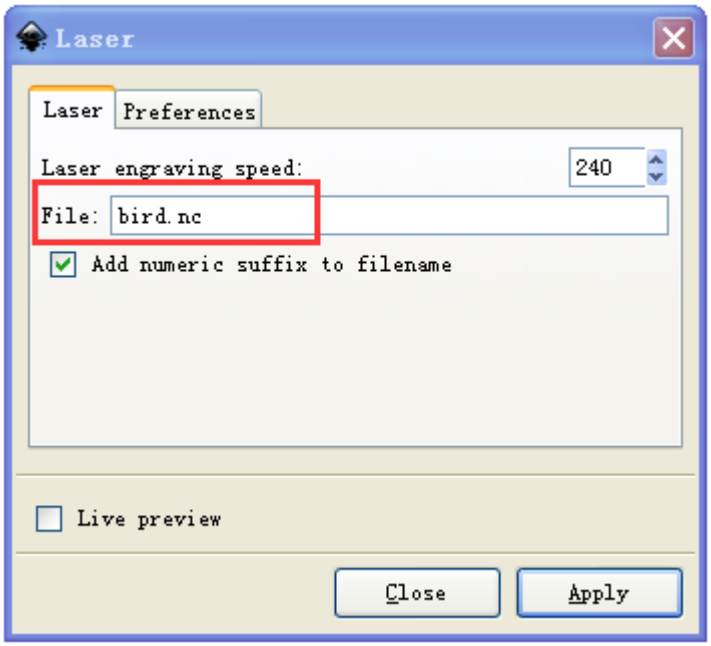
5. Select the object to print, change the size of the object by adjusting the parameters and moving the arrow. You will notice the location of the object to print at the printing platform. The printing location can be changed by moving the object. For the software might be not compatible with the computer system, generated file might be damaged and the parameters cannot be set. In this case, it's advised to close inkscape and then restart it again until it is editable.



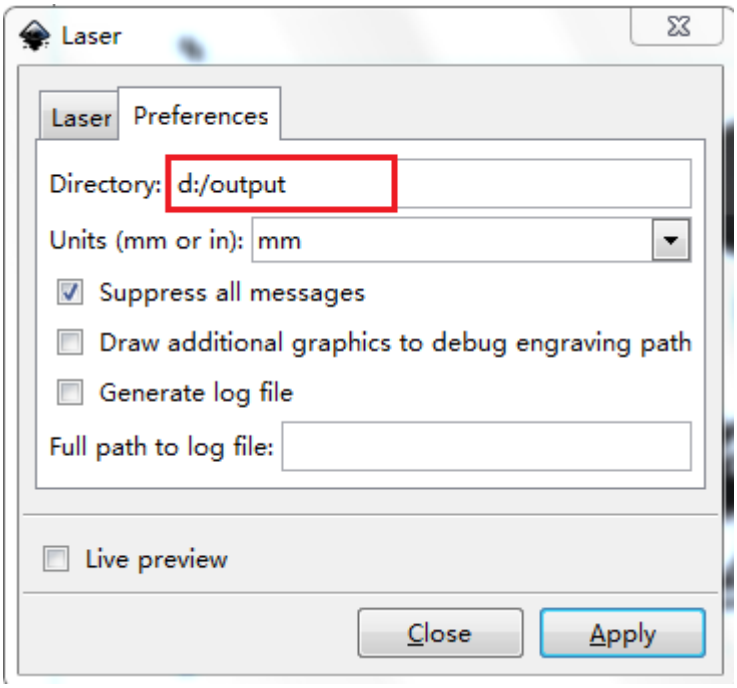
6. Select Extensions-Laserengraver-Laser to generate the original location of printing coordinate.

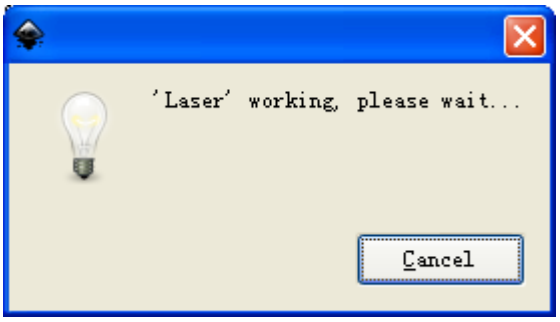


The file name can be set in the pop-out window. However, the printing speed of laser printing head cannot be adjusted but can be done when converted later.

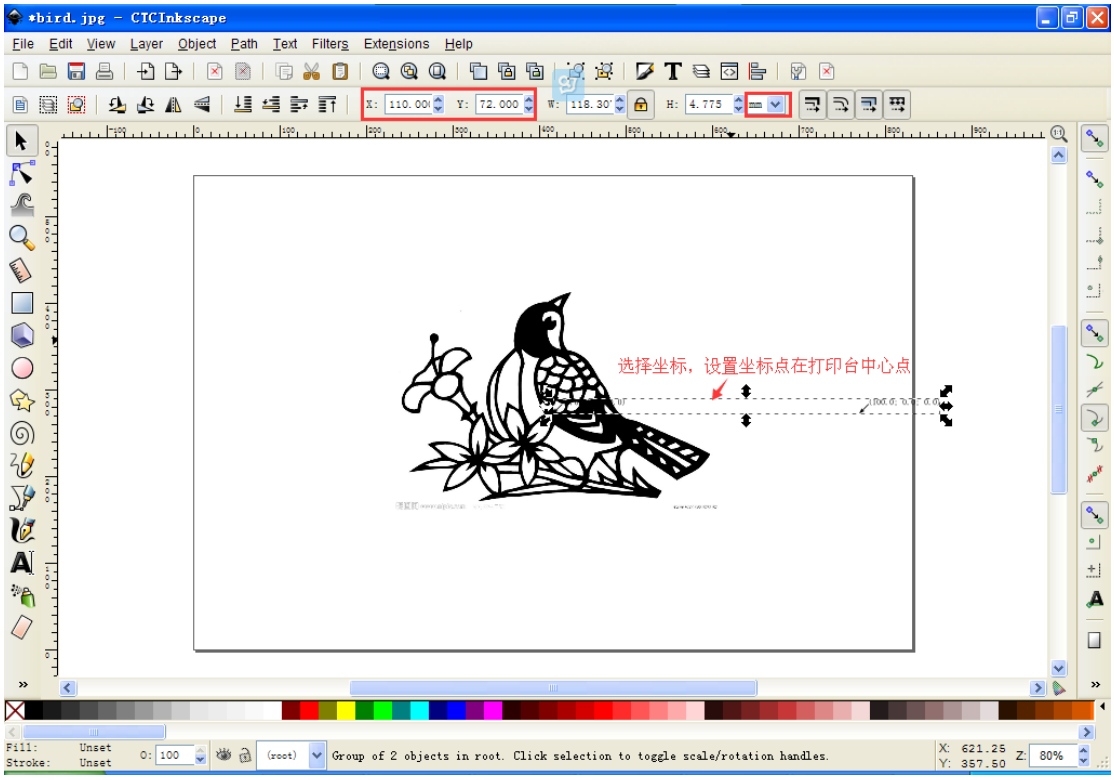


Save path: Directory, the path disk to save should have corresponding folder. As shown by the following diagram, there should be output folder in D disk.

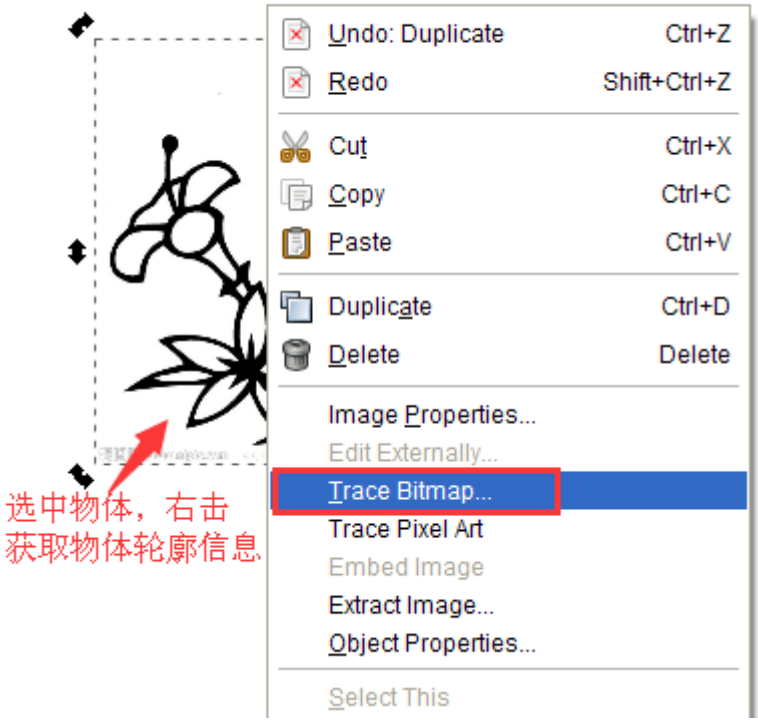




After generation of the file, there will emerge a coordinate, then select it and set parameters of axes X and Y and set it to the center point of the printing platform.

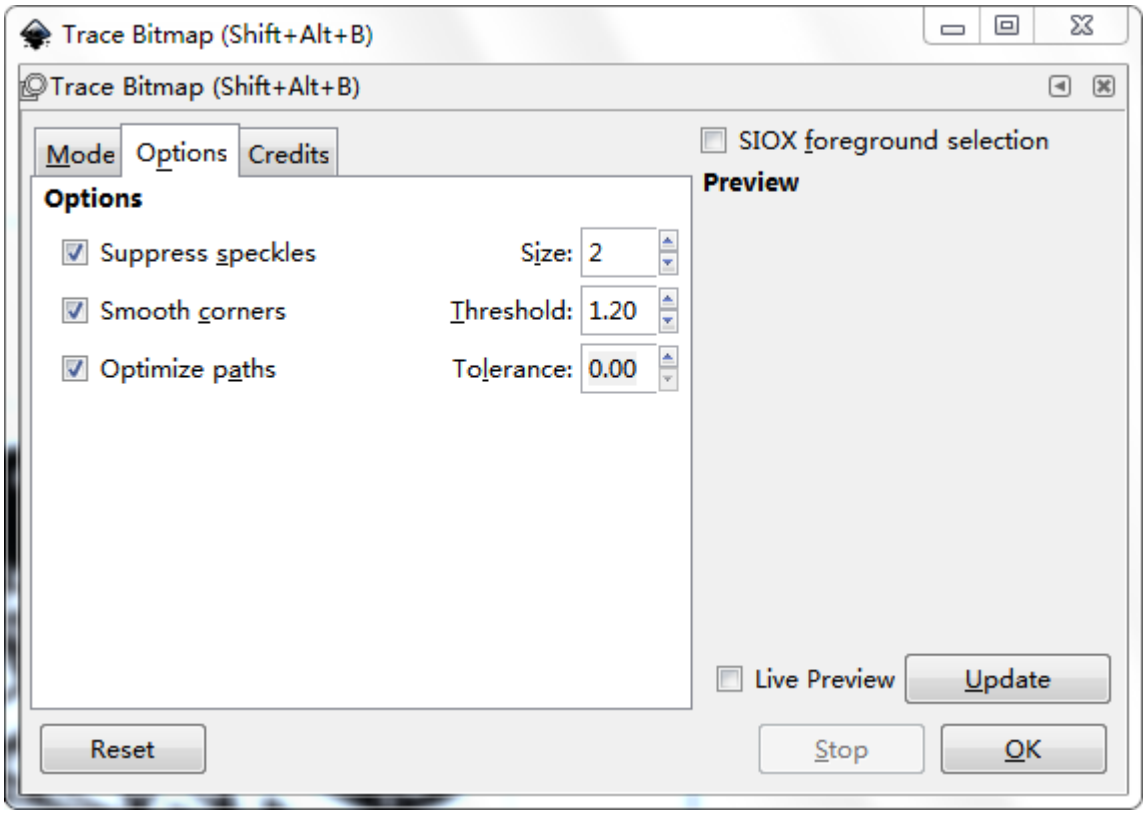


7. Select the object, right click and select Trace Bitmap to obtain the outline information of the object. the obtained outline information is the laser motion track of the printing.

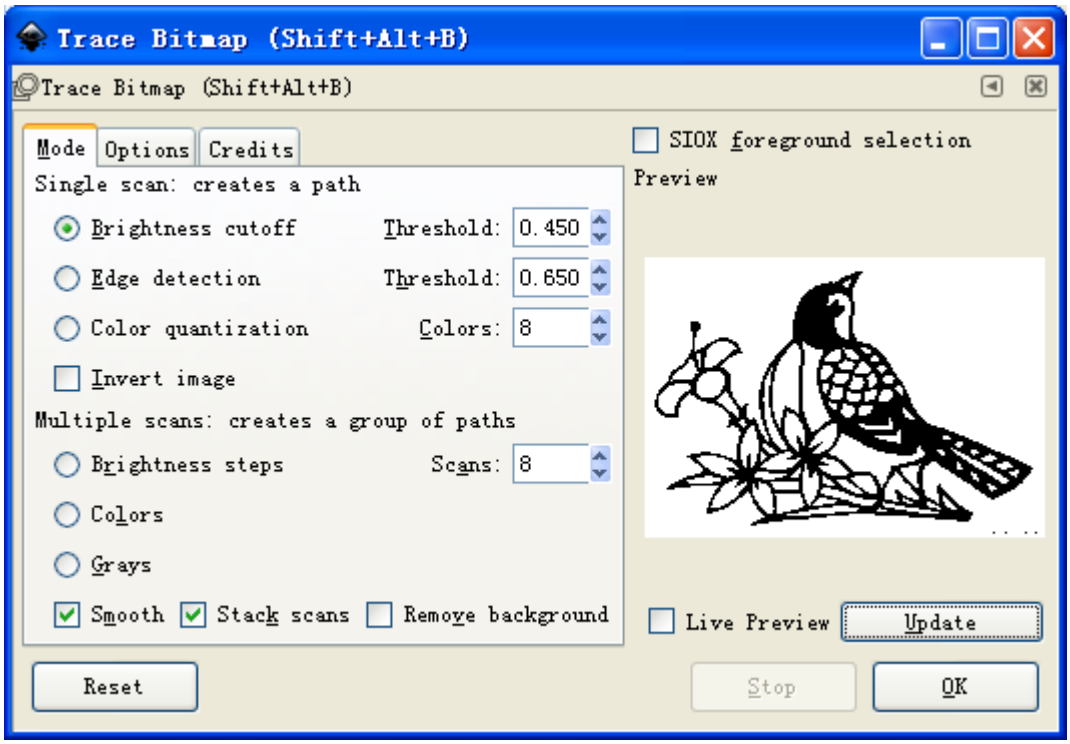


Set and select satisfied parameters. Generally speaking, default setting can be selected. The options---adjust the parameter threshold of smooth corners; adjust the arc end of graphic cutting. The default highest value is

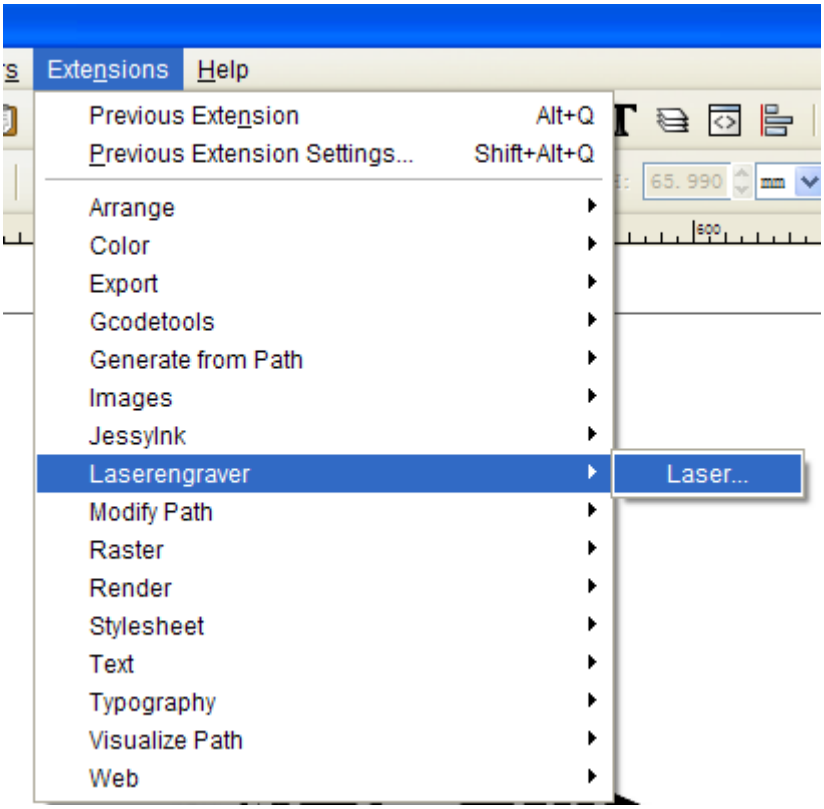
generally set inside the software. The large numerical value can be input. Check the highest value.

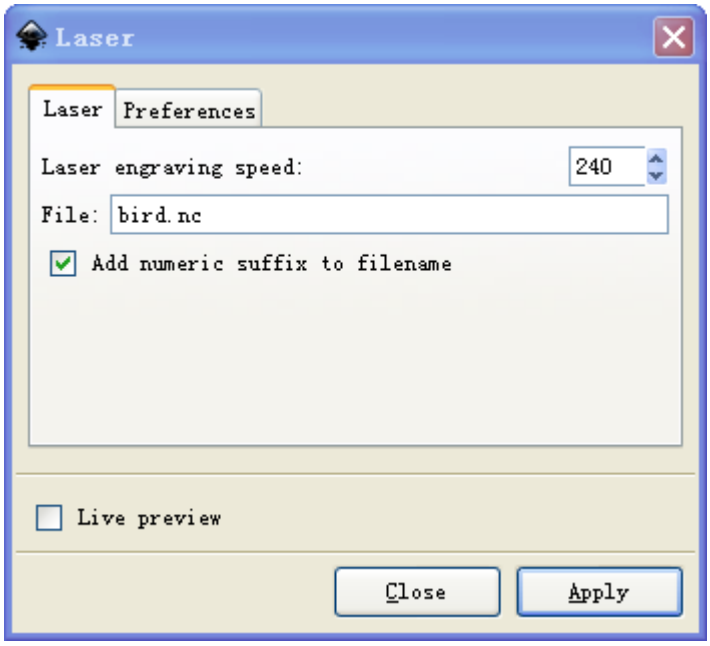


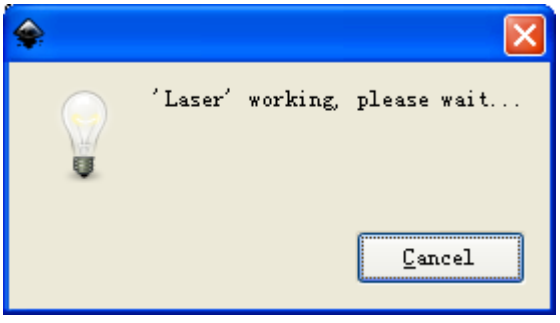
Update can be previewed. Obtain information by click ‘OK”. Notes: press the button only once to update. For pressing many times, information of many outlines might be generated. And the repeated printing might occur in the end.



8. Select Extensions--Laserengraver—Laser again to generate the two-dimensional coordinate of this object.

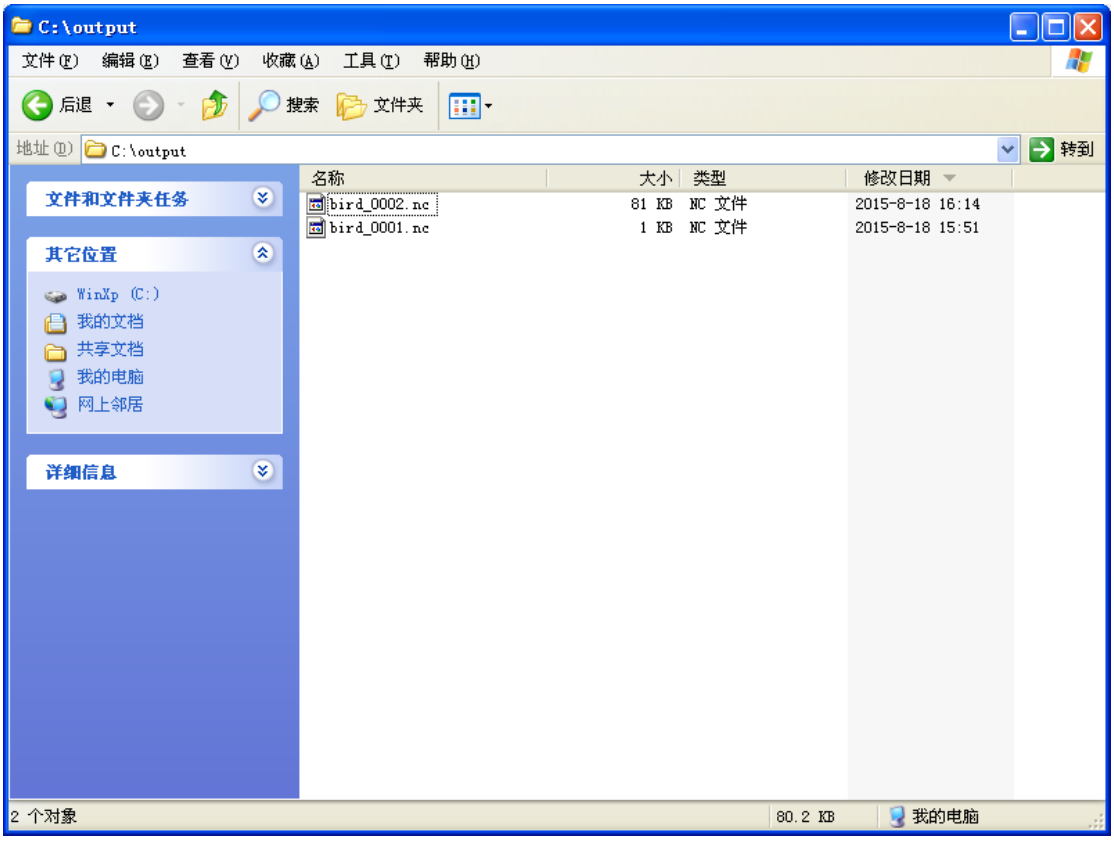






9. Generate .NC printing file, as shown by the following Fig. bird_0001.nc indicates the original point

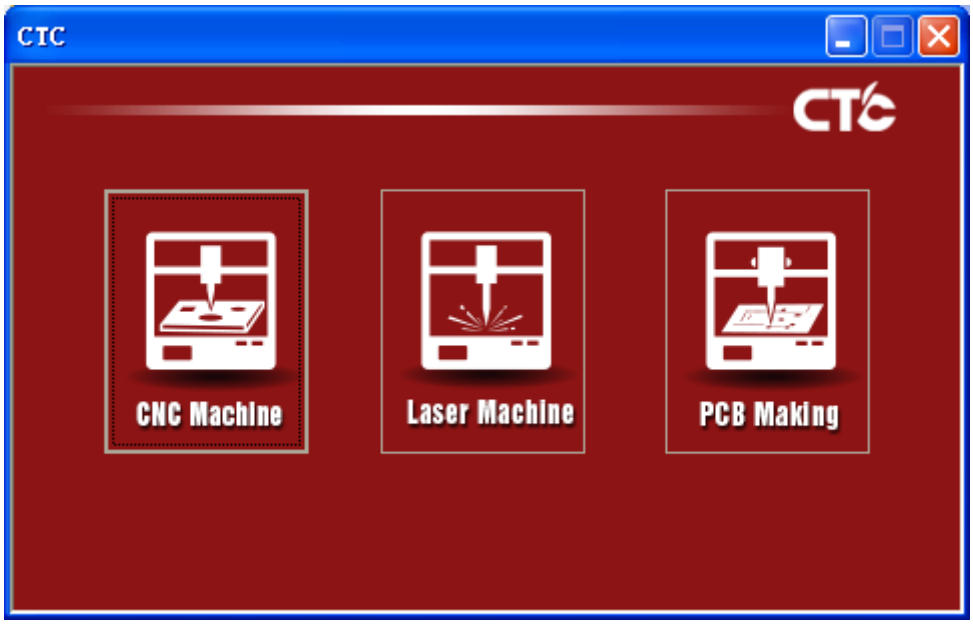
coordinate file and bird_0002.n indicates the file to print.



2、NC file converted into .X3G file

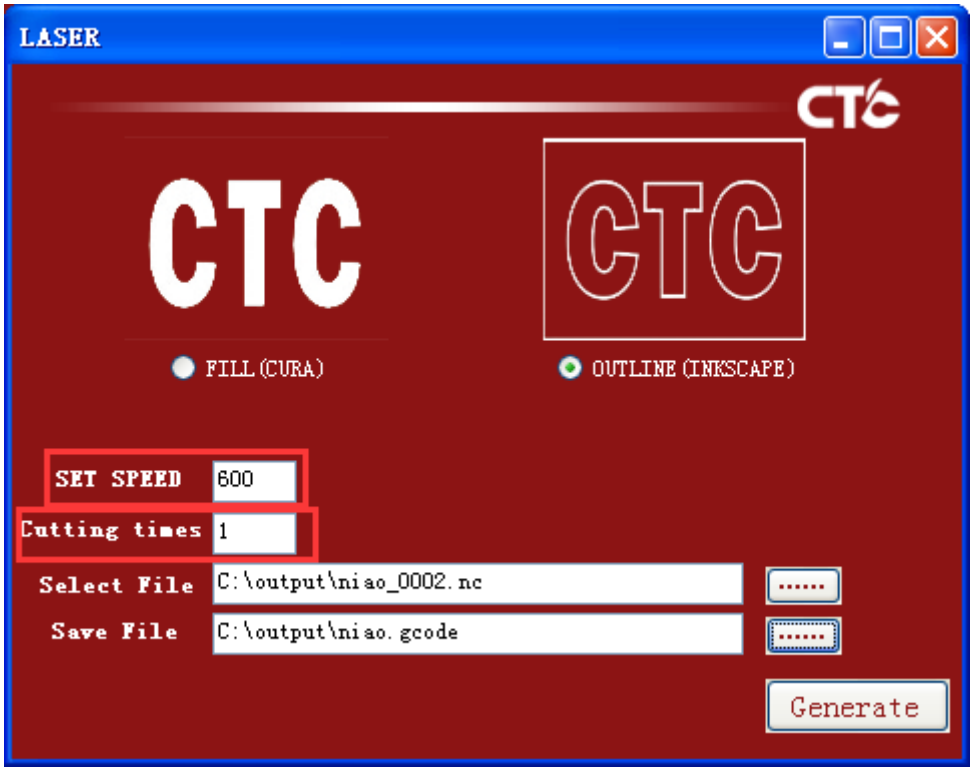
Convert .NC file into .X3G one through conversion tool.

1. Open CTC_TG.exe and select Laser Machine—OUTLINE (INKSCAPE)

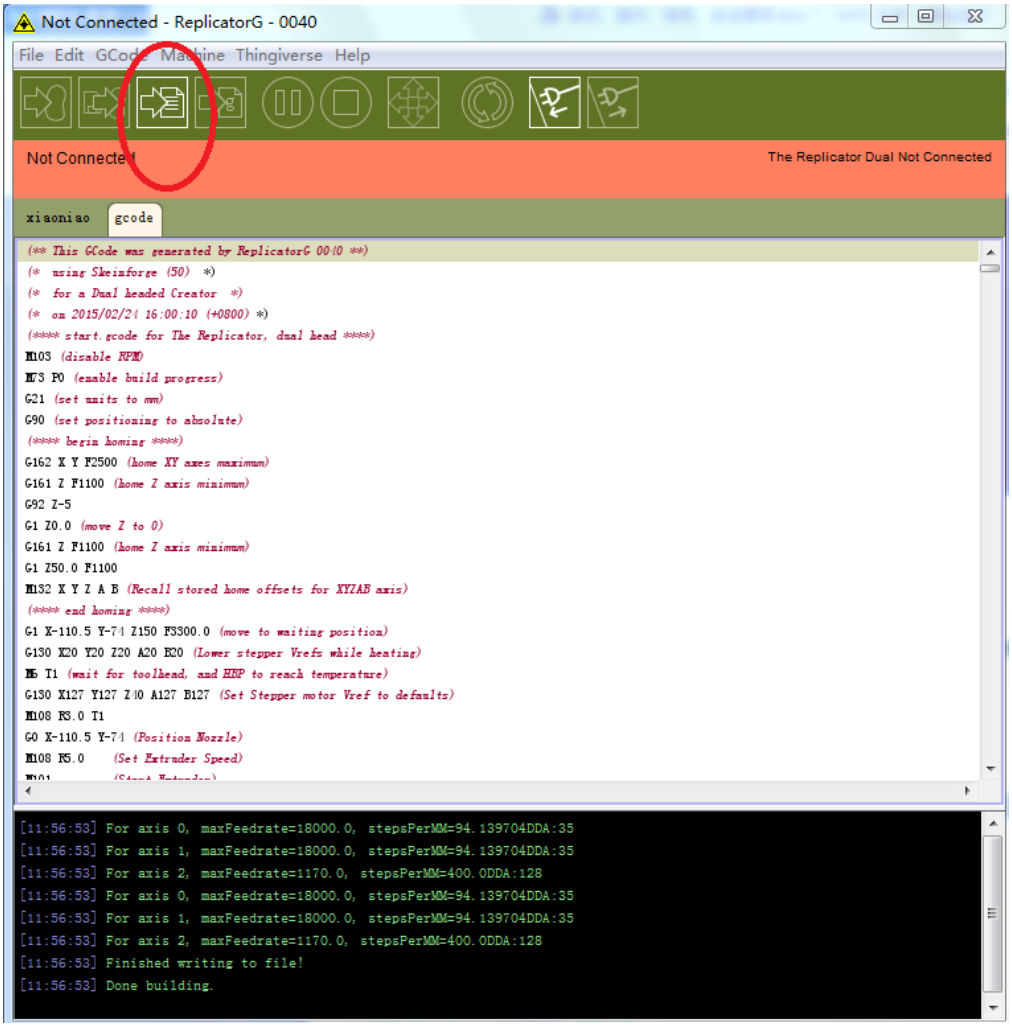


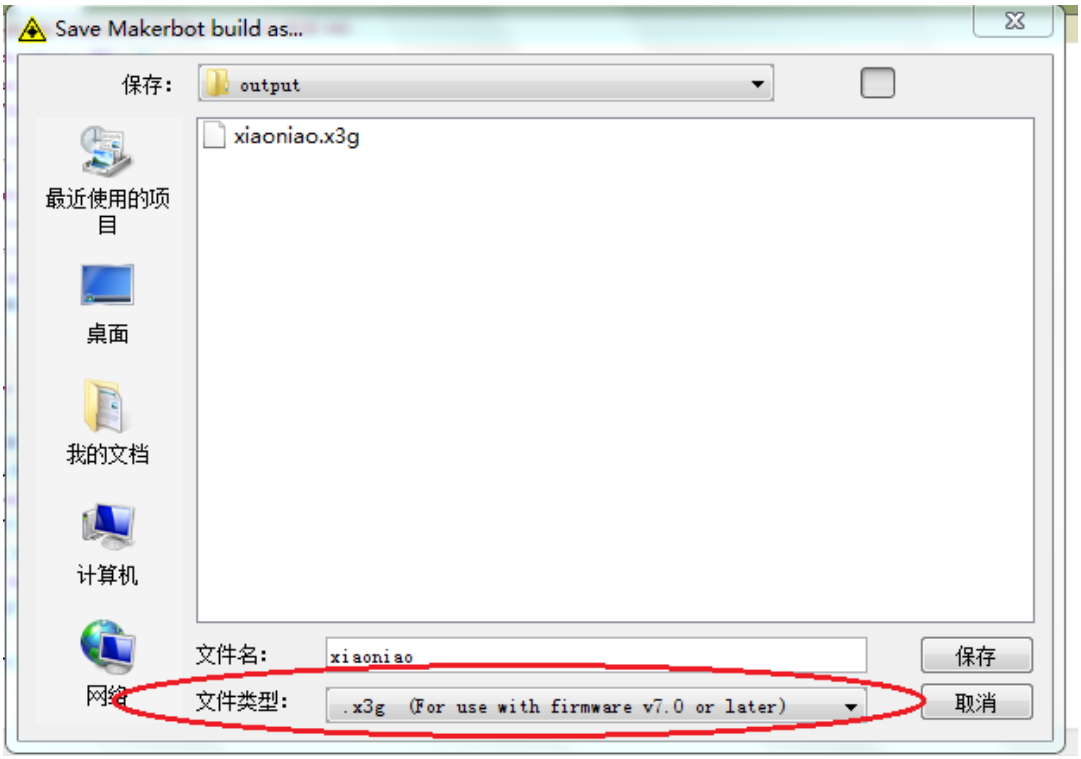
Click “Select File” and select the file to convert. “Save File” indicates the storage location of the

converted file. Generate converts and generates .GCODE file. The prefixing will be automatically added before the file name. By taking laser_XXX.gcode for example, before conversion, the printing speed, object printing times and printing materials to refer can be set.



3. Open .gcode file with ReplicatorG software.





Save, and then generate .x3g file, which can be normally printed.

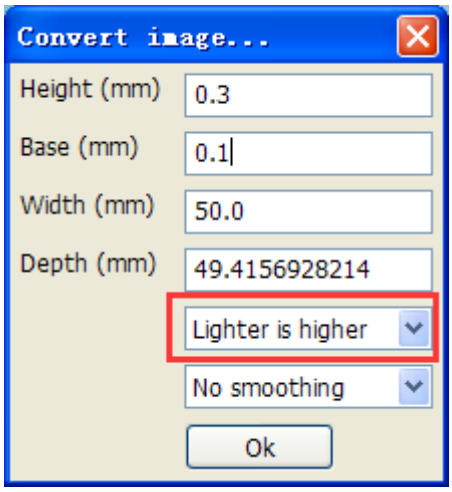
Attachment 2 Cura Specifications

Use Cura software to generate laser printing file, and engrave the graph or pattern on the wood board or paper through laser ablation. The picture or graph can be previewed in Cura after imported. Besides, the final pattern can be imagined through preview.

The graph imported through laser ablation should be black or white for the capacity of Cura to identify color is very low. In case of necessity to print color pictures, firstly convert it into the sketch through Photoshop and then convert it to print.

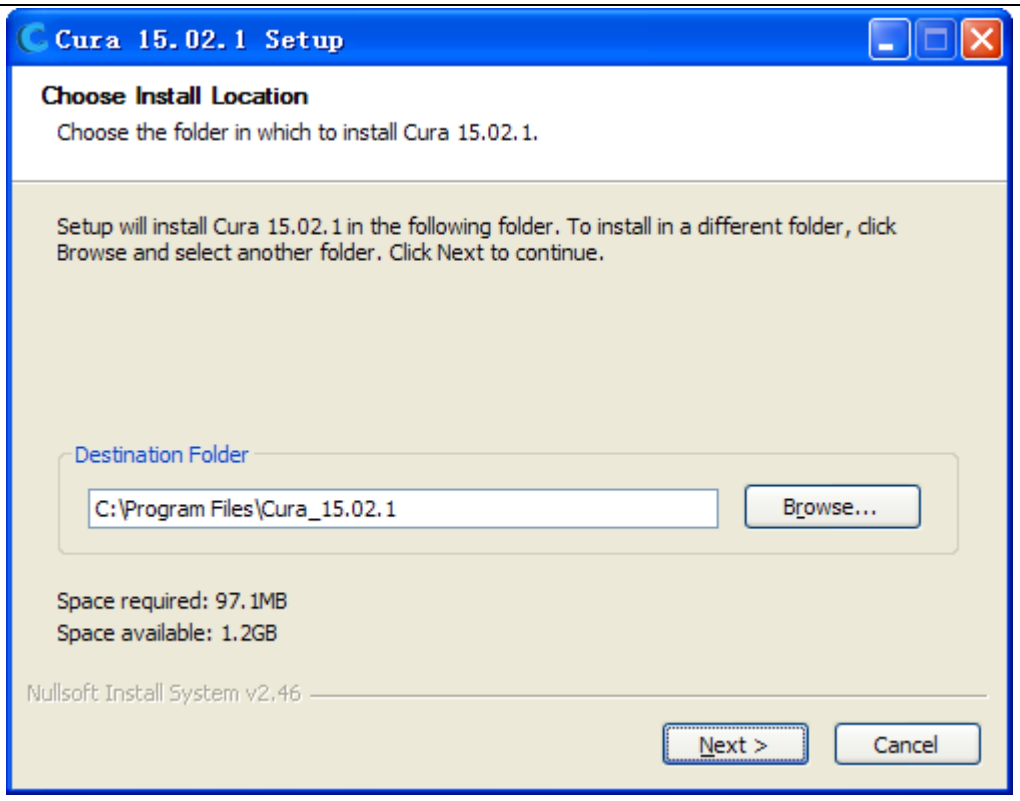
Cura software also can generate CNC embossment printing file, by converting the grey-scale map and picture into 3D embossment printing file. After the grey-scale map is imported into Cura, the line of the generated stereogram is smooth with better CNC embossment effect. In case the picture or other supportable files are imported, the generated stereogram might have many abrupt information and undesirable CNC embossment effect. Of course, CNC embossment effect is closely related to the fineness of the picture and accuracy of the file to generate and print.

Cura generates CNC embossment printing file. Please note: the concavity displayed in Cura will become the convex after printed. if it is necessary to reimport the printing file to check the final printing effect, select "Lighter is higher".

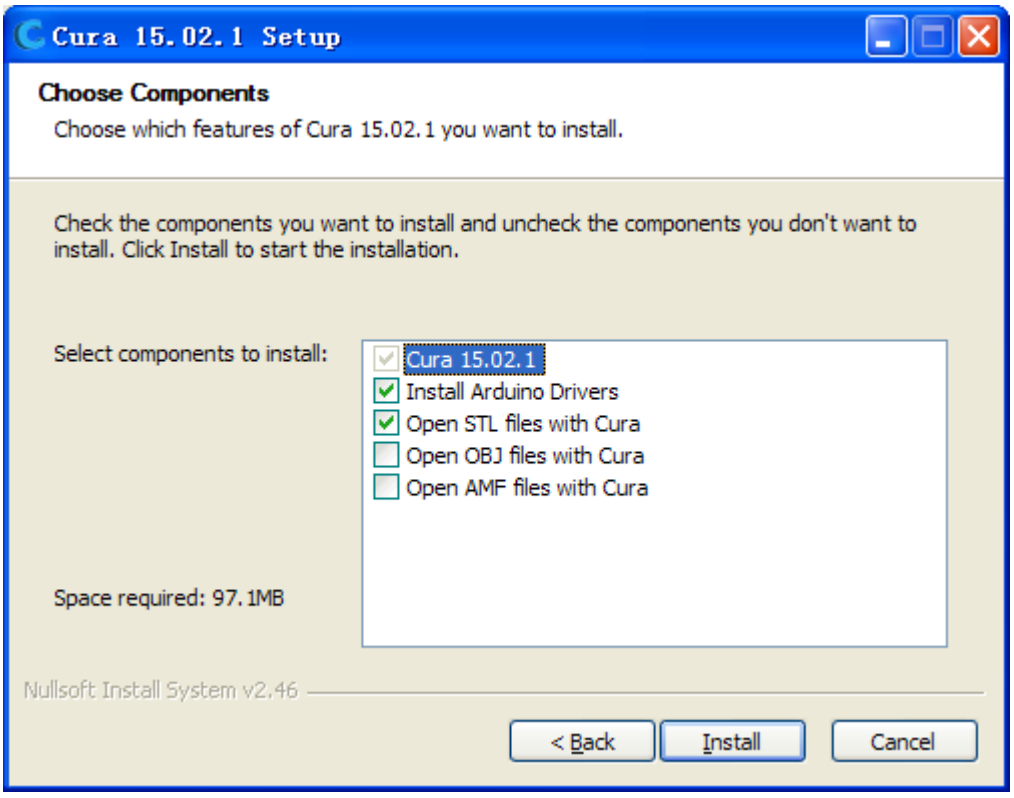


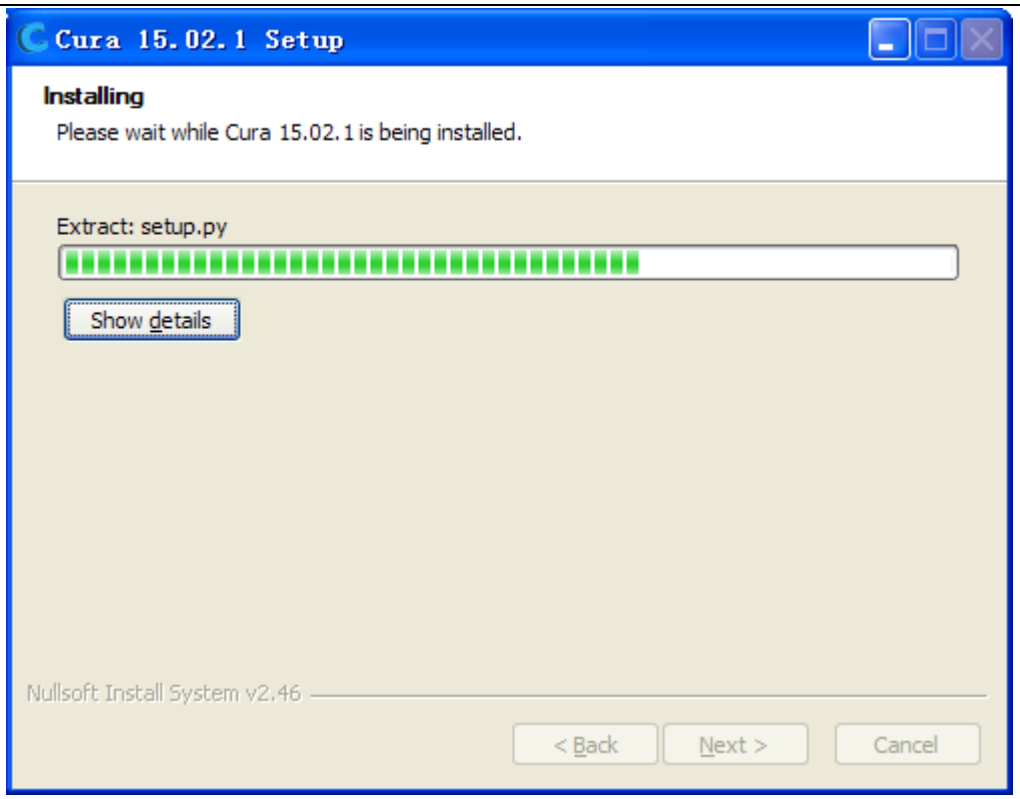
1. Install Cura 15.02

1. Click Cura_15.02.1.exe, then the following window will pop out and then set installation path.

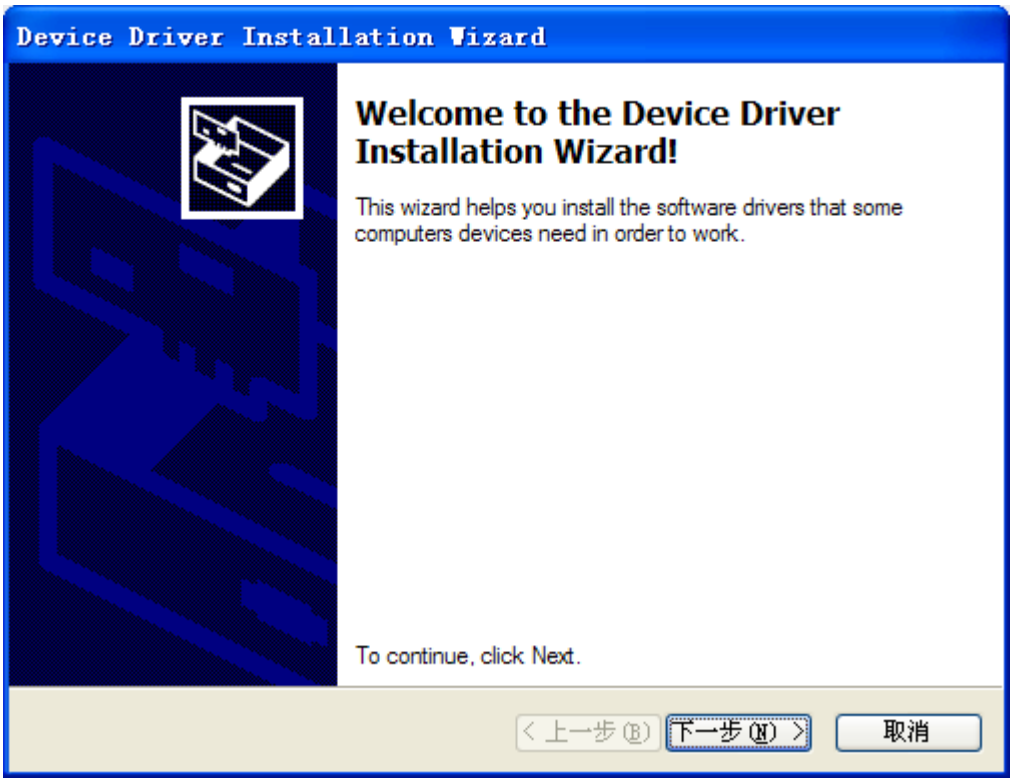


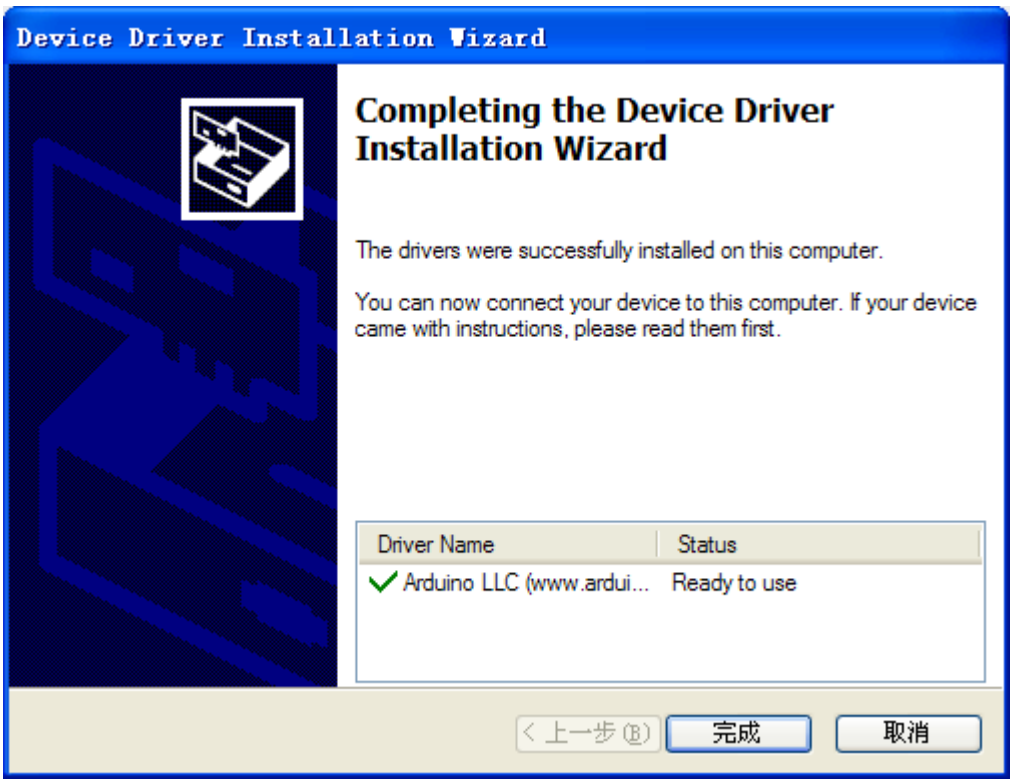
2. Click “Install” to begin installing.



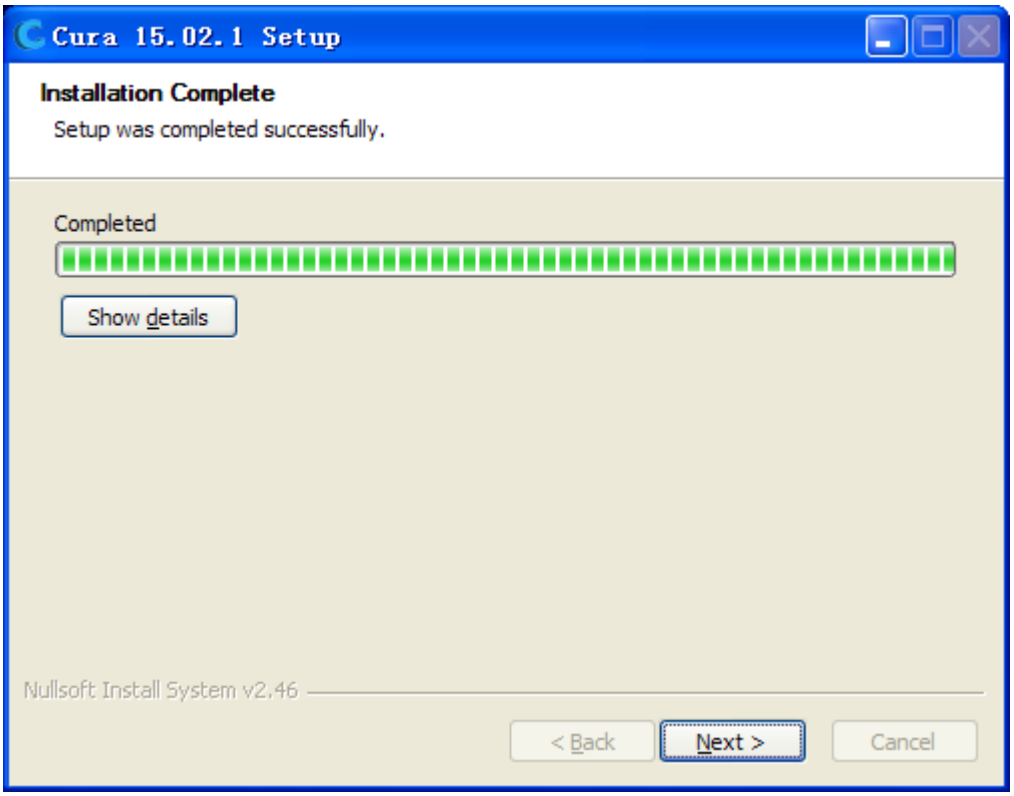


3. The device drive installation dialogue will pop out during the installation.



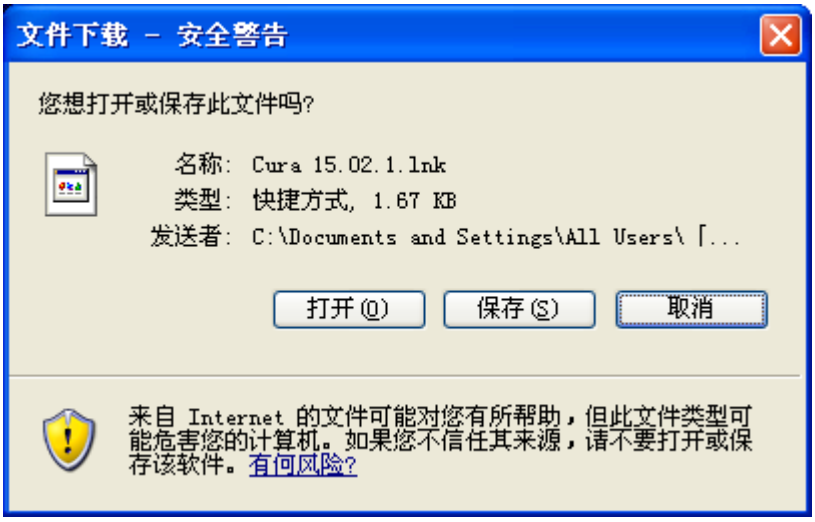


4. After device drive installation is completed. Click “Finish” and return to the installation interface of Cura, then click ‘Next”.



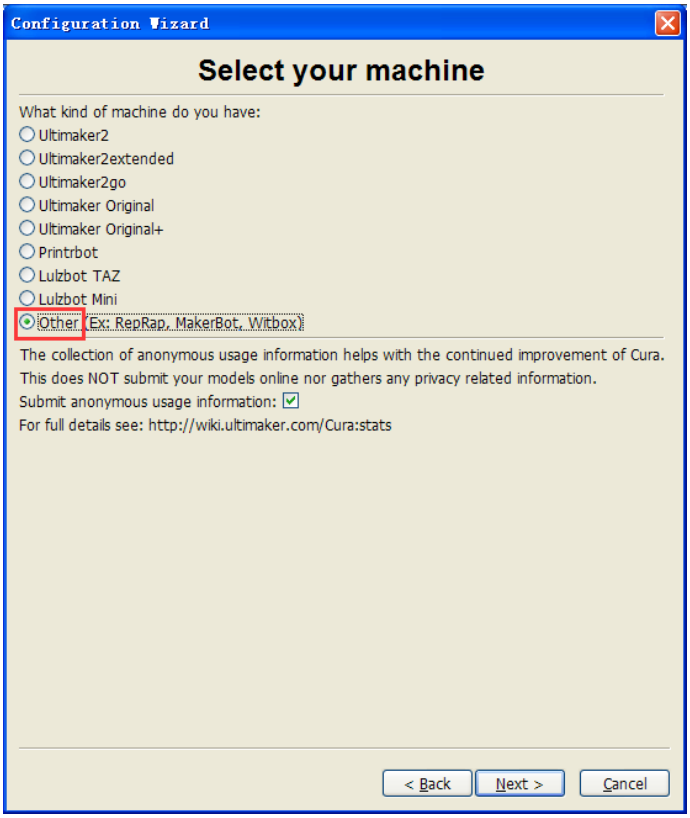
5. Click “Finish” to complete Cura installation.

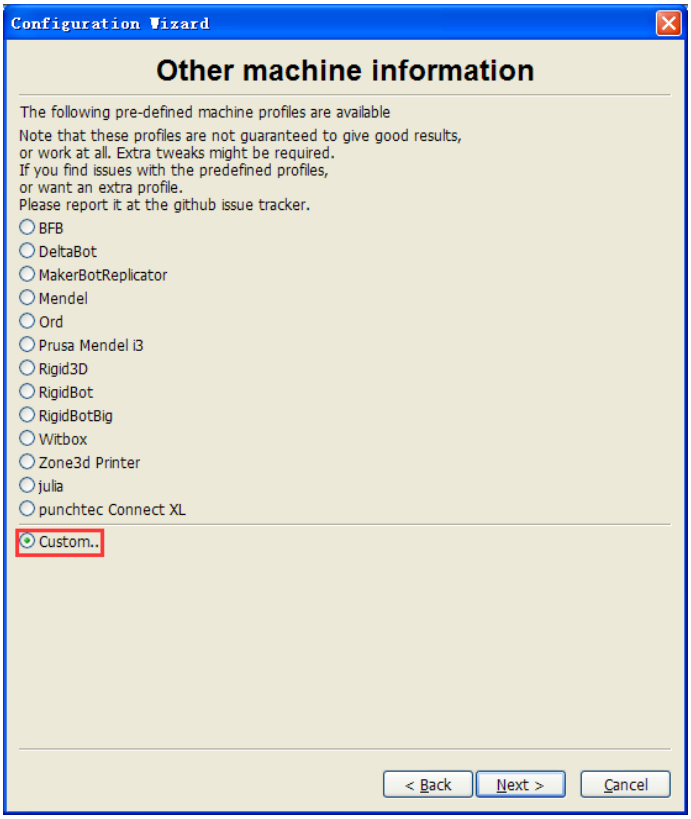
6. After the installation is completed, the following prompt might show up, click “Open” to normally use Cura software.

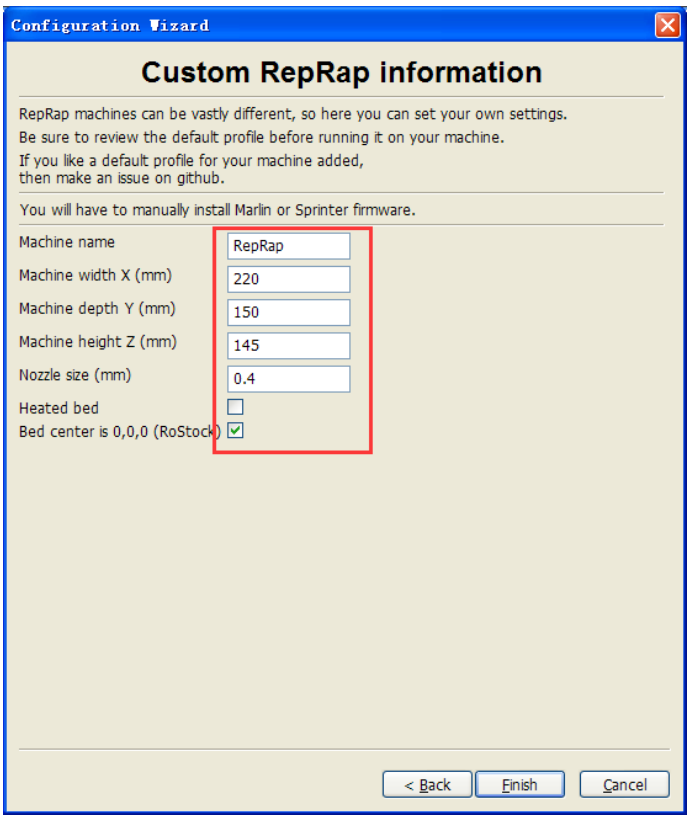


7. After the software is installed, it is necessary to set the information of printer. In case of no setting interface, it can be set through Machine--Add New Machine, as shown by the following Fig.

Configuration Wizard
Add new machine wizard
This wizard will help you in setting up Cura for your machine.
< Back
Next >
Cancel


Configuration Wizard
Select your machine
What kind of machine do you have:
Ultimaker2
Ultimaker2extended
Ultimaker2go
Ultimaker Original
Ultimaker Original+
Printrbot
Lulzbot TAZ
Lulzbot Mini
Other (Ex: RepRap, MakerBot, Witbox)
The collection of anonymous usage information helps with the continued improvement of Cura.
This does NOT submit your models online nor gathers any privacy related information.
Submit anonymous usage information:
For full details see: http://wiki.ultimaker.com/Cura:stats
< Back
Next >
Cancel

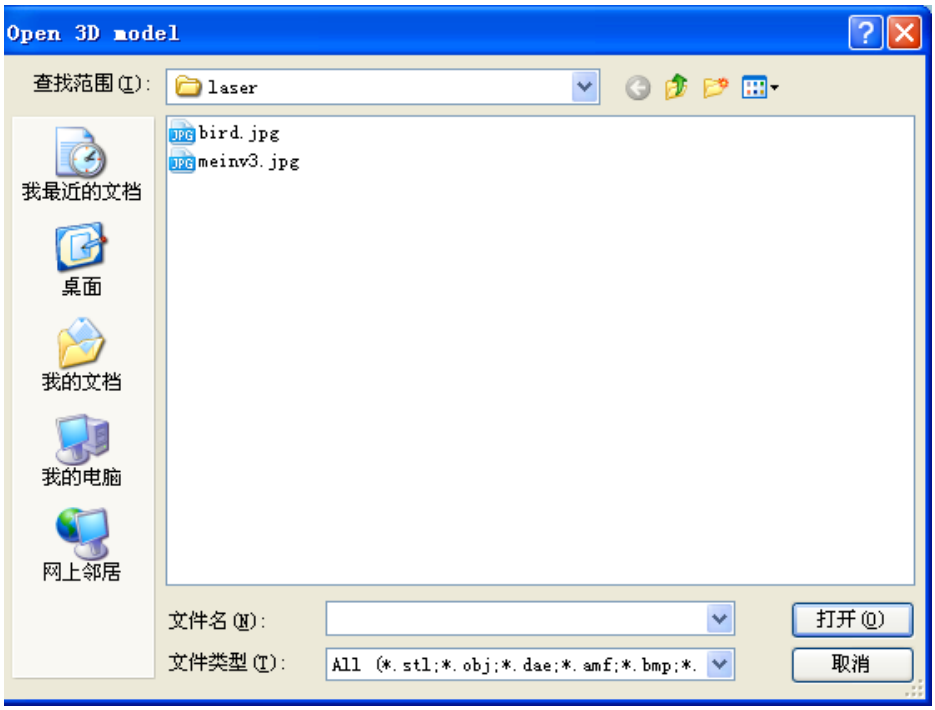

Configuration Wizard
Other machine information
The following pre-defined machine profiles are available
Note that these profiles are not guaranteed to give good results,
or work at all. Extra tweaks might be required.
If you find issues with the predefined profiles,
or want an extra profile.
Please report it at the github issue tracker.
BFB
DeltaBot
MakerBotReplicator
Mendel
Ord
Prusa Mendel i3
Rigid3D
RigidBot
RigidBotBig
Witbox
Zone3d Printer
julia
punchtec Connect XL
Custom..
< Back
Next >
Cancel


Configuration Wizard
Custom RepRap information
RepRap machines can be vastly different, so here you can set your own settings.
Be sure to review the default profile before running it on your machine.
If you like a default profile for your machine added,
then make an issue on github.
You will have to manually install Marlin or Sprinter firmware.
Machine name
RepRap
Machine width X (mm)
220
Machine depth Y (mm)
150
Machine height Z (mm)
145
Nozzle size (mm)
0.4
Heated bed
Bed center is 0,0,0 (RoStock)
< Back
Finish
Cancel

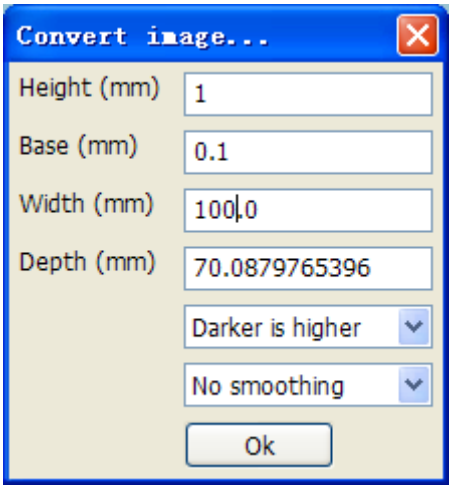
2. Generate .GCODE file

1. Open Cura software, File--Load model file or directly click the icon

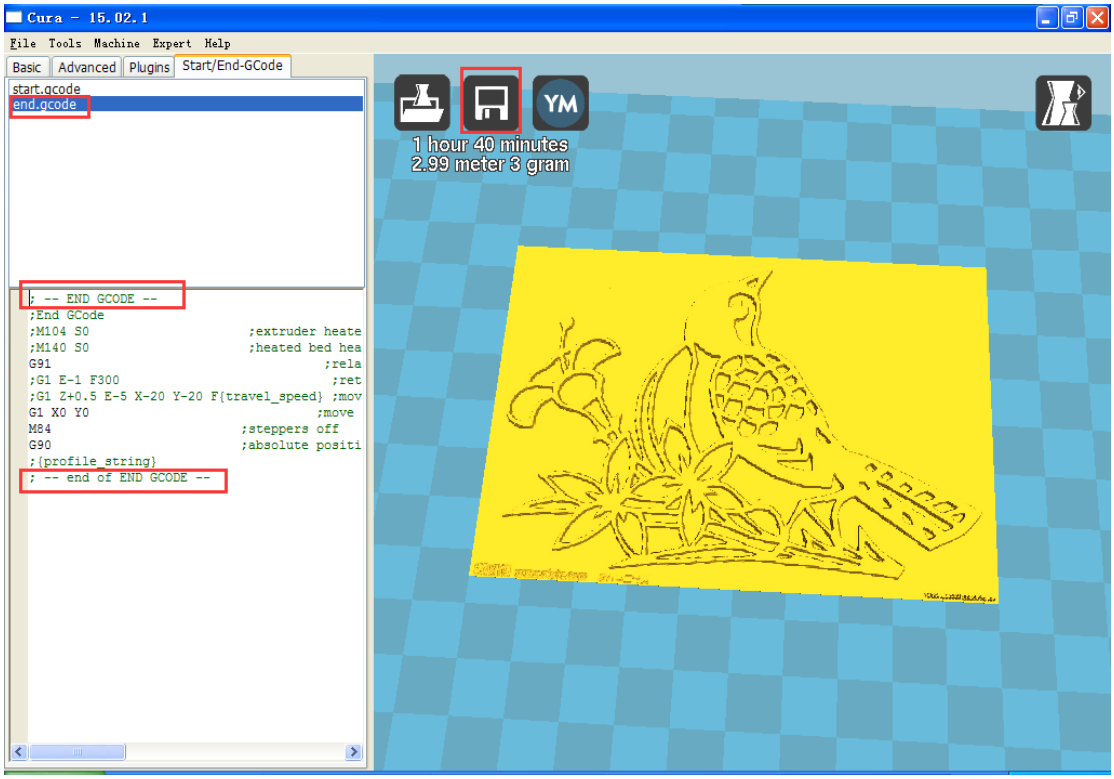
to open the file to print.

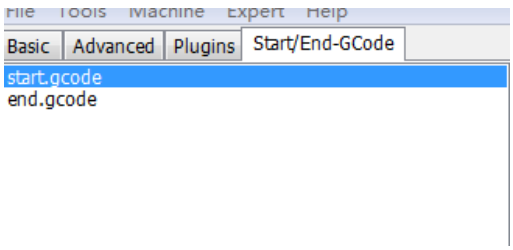


2. Printing file setting window pops out, then set parameters according to the requirements.



3. After setting parameters (size of nozzle and its thickness), Cura will generate Gcode file and click the icon to save Gcode file.





If the file cannot be successfully converted, open to test and change:

Click Start.gcode, copy the following programing to substitute the old one.

; -- START GCODE --

; -- end of START GCODE --

Click end.gcode, copy the following programming to substitute the old one.

; -- END GCODE --

; -- end of END GCODE --

3. Some icon buttons of Cura

1. The parameters of the printer have already been set when the printer is set, so it is not necessary to reset it. Therefore, after the printing file is imported, Cura will automatically generate the section file .gcode.

1) Slicking

2) Sectioning is finished.

After the sectioning of the icon at left upper part of the interface is finished, it can be saved into the computer with the icon in the middle. Besides, the printing file can be opened with .

2. Cura software can support some printers to print online. If it is connected online successfully, the icon will become

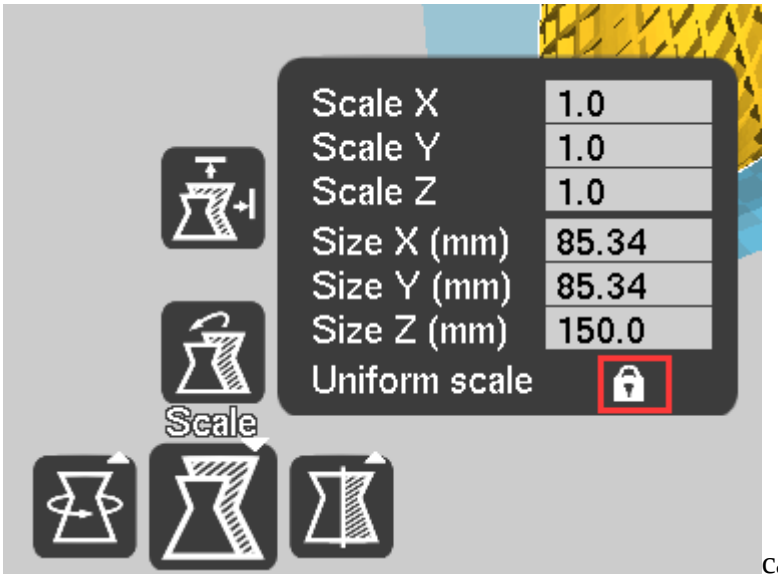
, then click the online icon to print online. However, this type of printer doesn't support. Besides, for the printing object is special, it is necessary to convert the gcode file generated by Cura. Therefore, it cannot be printed online.

3. Other icons

1) The following three icons at left lower corner can show up when the it is necessary to select the object to print.

(1) By rotating

, the printing location and direction of the object to print can be selected.

(2) The scale 

can set the size of the object to print. It can be zoomed by scale or unidirectionally.

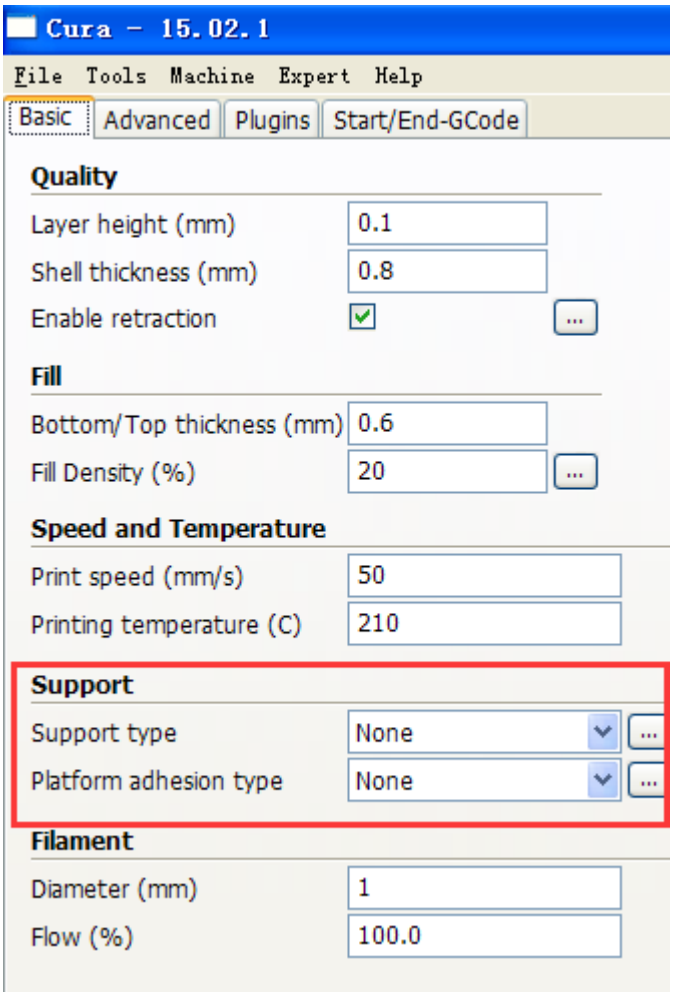
(3) Mirror

, turn the direction of the axes X, Y and Z

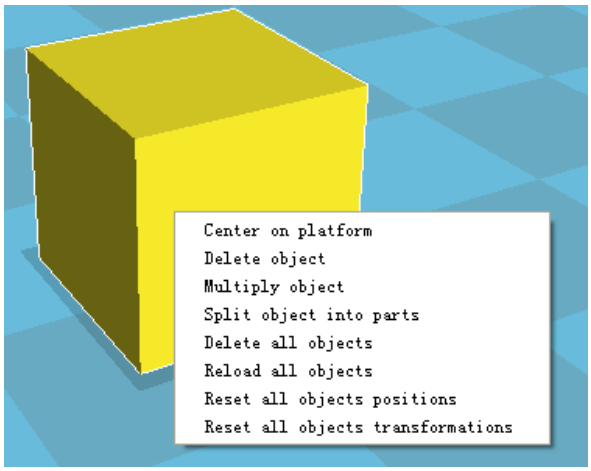
2) The icons at right upper corner

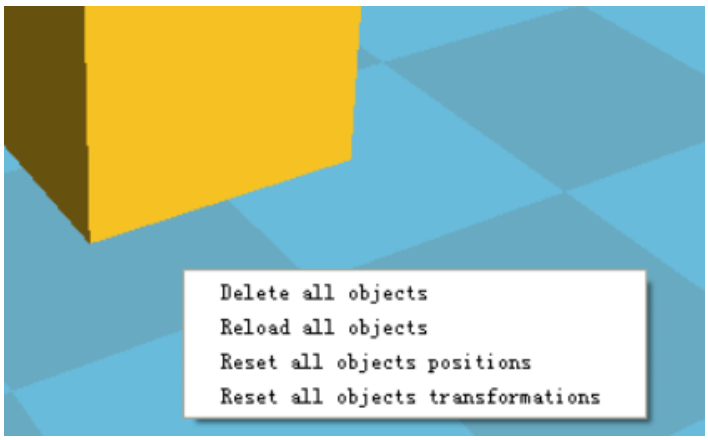
Preview mode

3) Add support



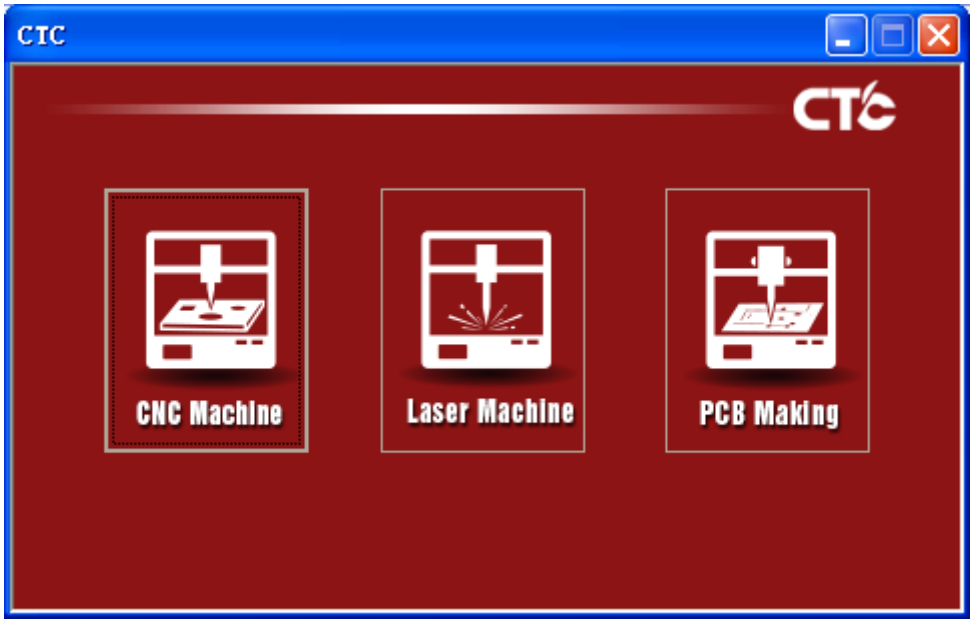
4) Right click some shortcut operations



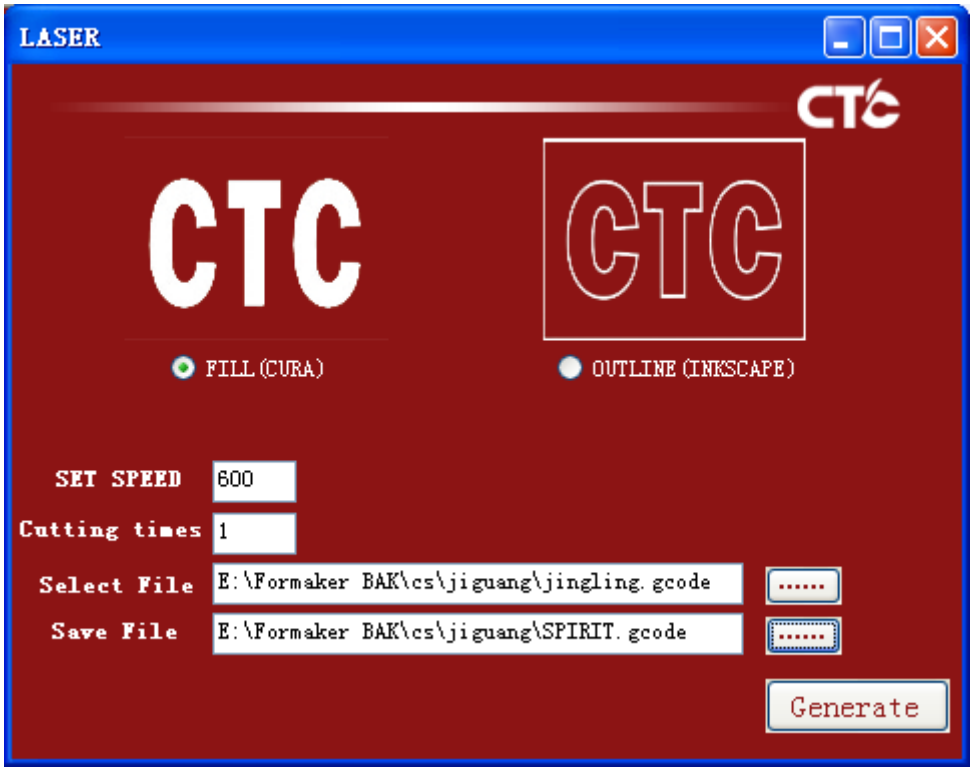


4. GCODE file converted into .X3G file

1. Open “CTC_TG.exe”

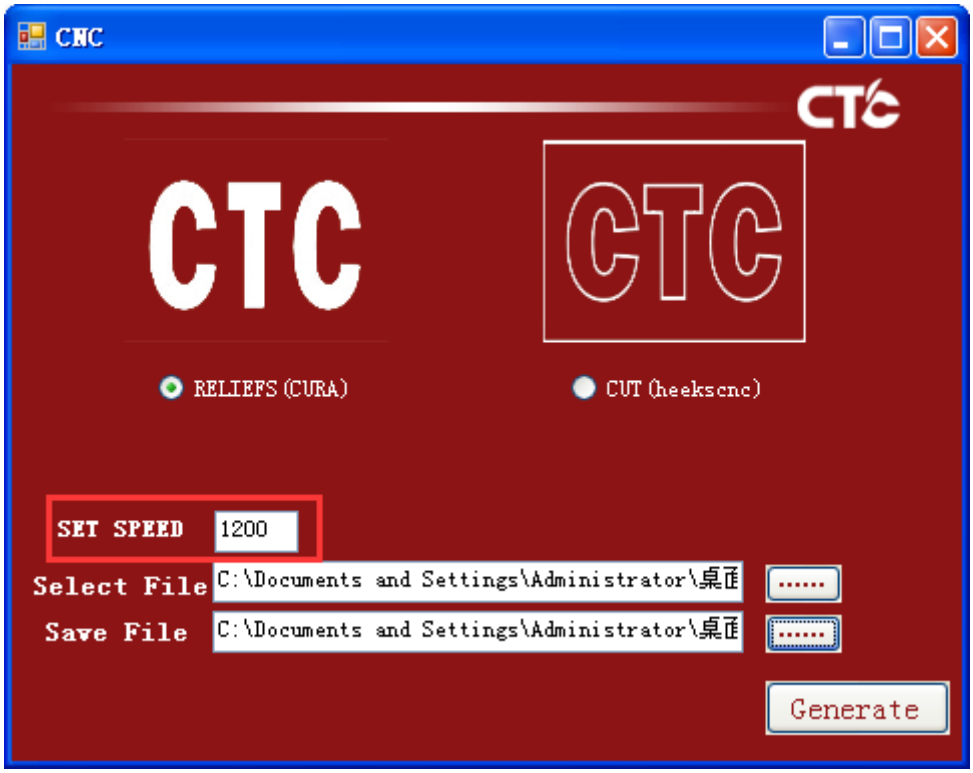


(1) Select Laser Machine—FILL (CURA). The converted file should follow up the format of laser printing file. Click “Select File” to select the file to convert. “Save File” indicates the storage location of the converted file. “Generate” converts and generate ReplicatorG software that could identify the converted .GCODE file.



(2) Select “CNC Machine—RELIEFS (CURA)”. The converted file shall conform to the format of CNC printing file. Click “Select File” to select the file to convert. Save File” indicates the storage location of the converted file. “Generate” converts and generate ReplicatorG software that could identify the

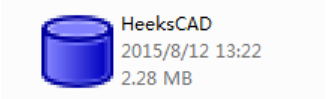
converted .GCODE file.



2. Use ReplicatorG software to open .gcode file converted with CTC_TG.exe, then generate .x3g file, which can be normally printed.

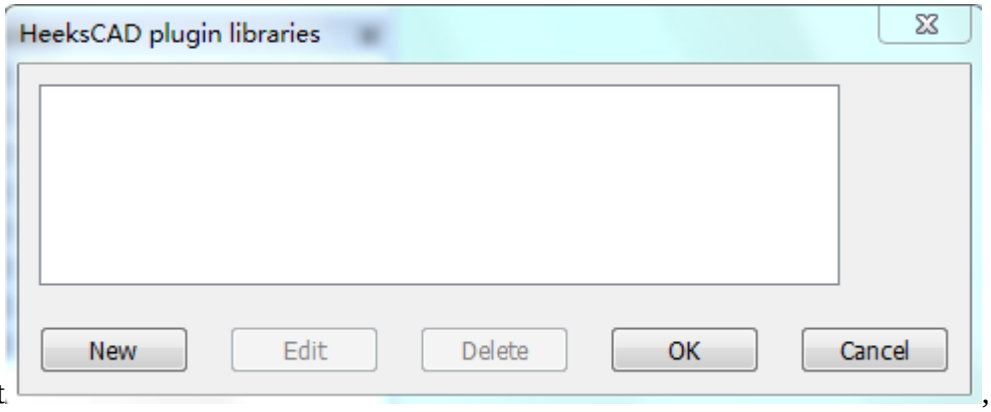
Attachment 3 CTC-Heekscnc Specifications

Use CTC-Heekscnc software to generate PCB sample plate to make and cut printing file, and import the file named DXF file. To make PCB sample plate, output DXF file from some PCB paint software and then import it into CTC-Heekscnc (the tutorial for importing DXF with PCB software can be searched online). The conversion of a PCB file form can be used as an example. Firstly open the folder

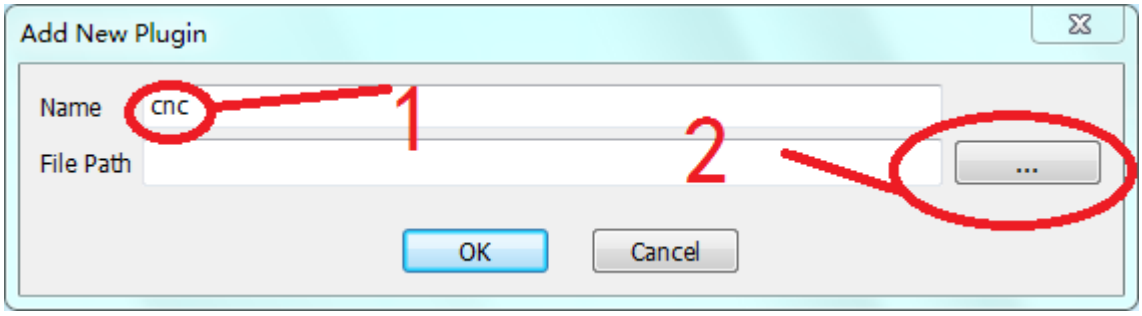
, and then click 

to run software.

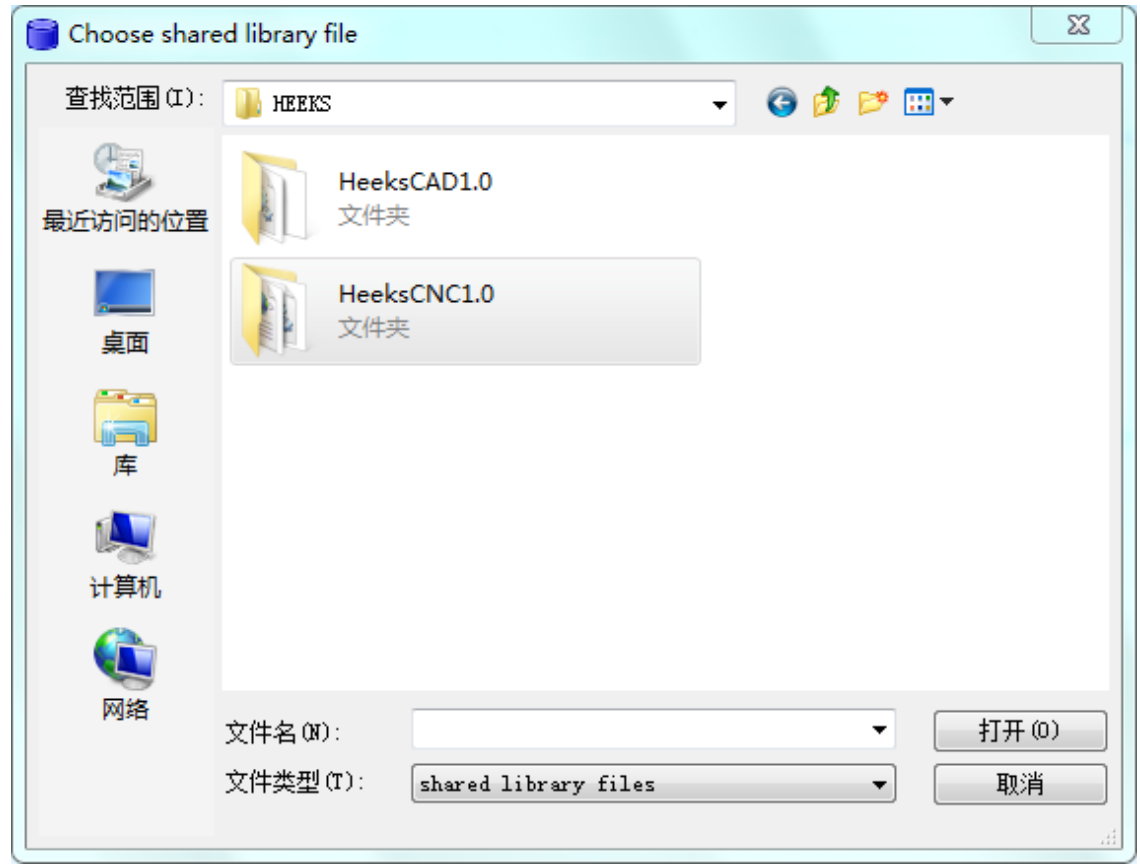
1. Import DXF file

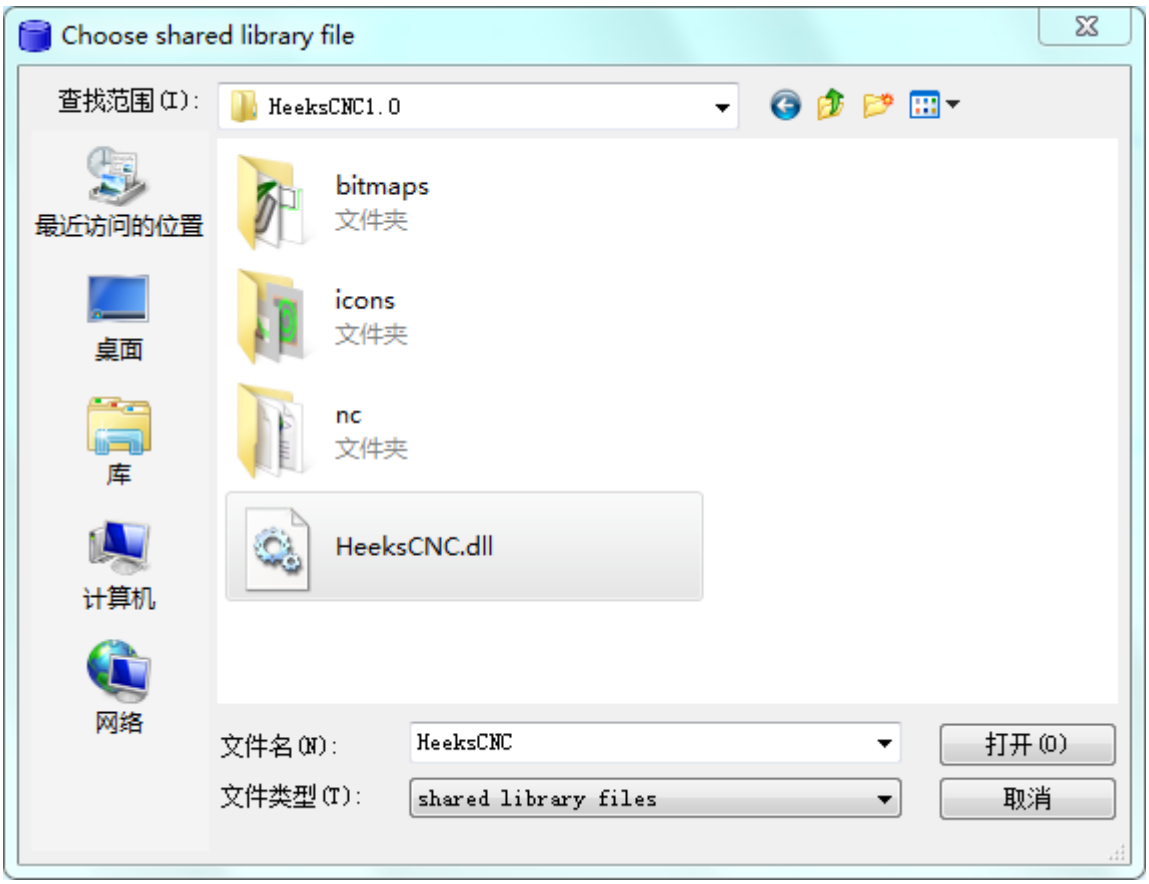
Check the tool bar. If there is no machining, it is necessary to add Machining tool. Open File--+Plugins, the window below will pop out 

, click "New", and input "CNC" at "Name"

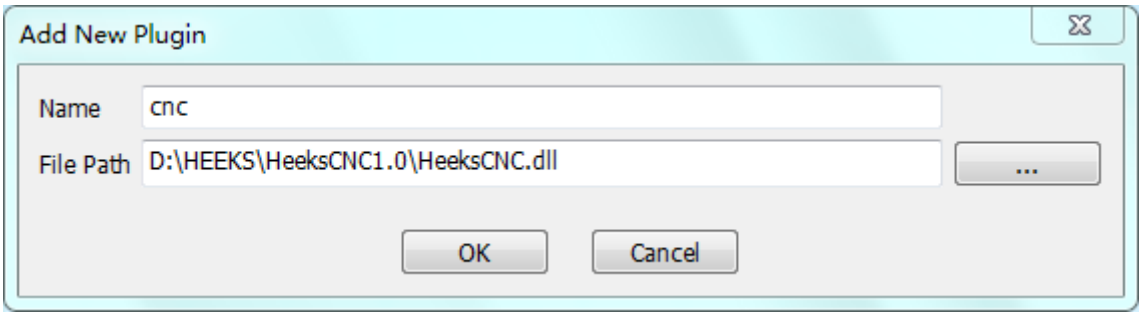


Find out HeeksCNC1.0 folder, open and find out HeeksCNC.dll file, and then open it.

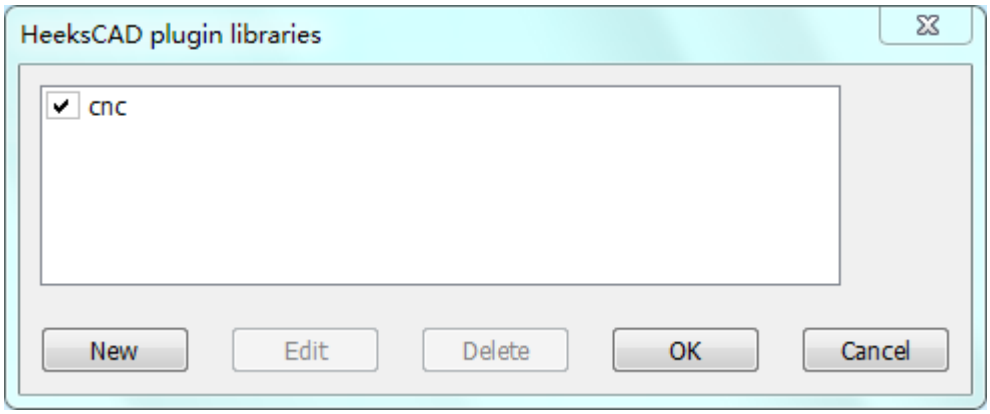




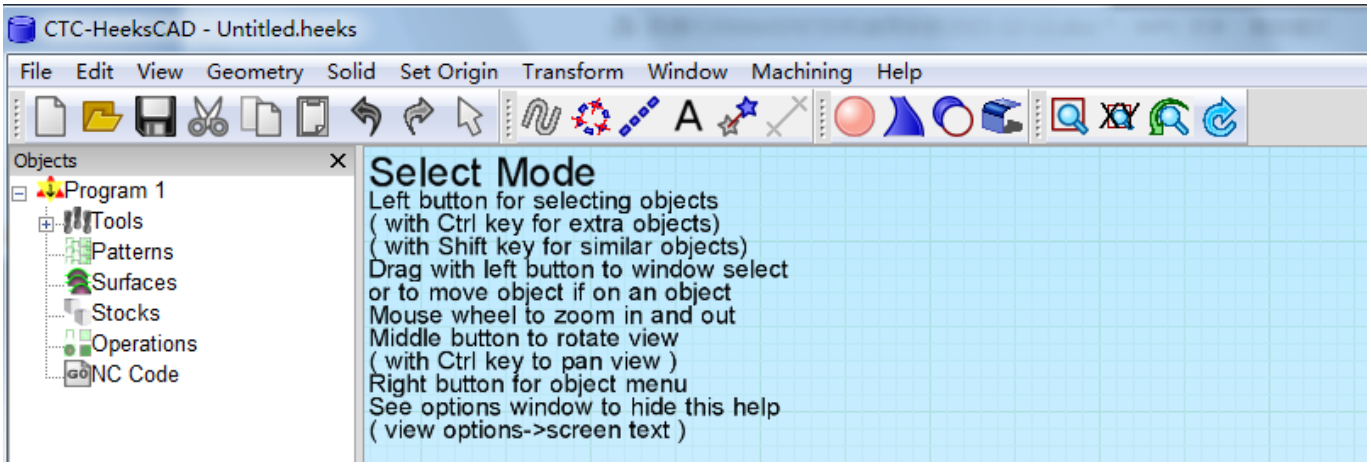
The following picture pops out, then click “OK”



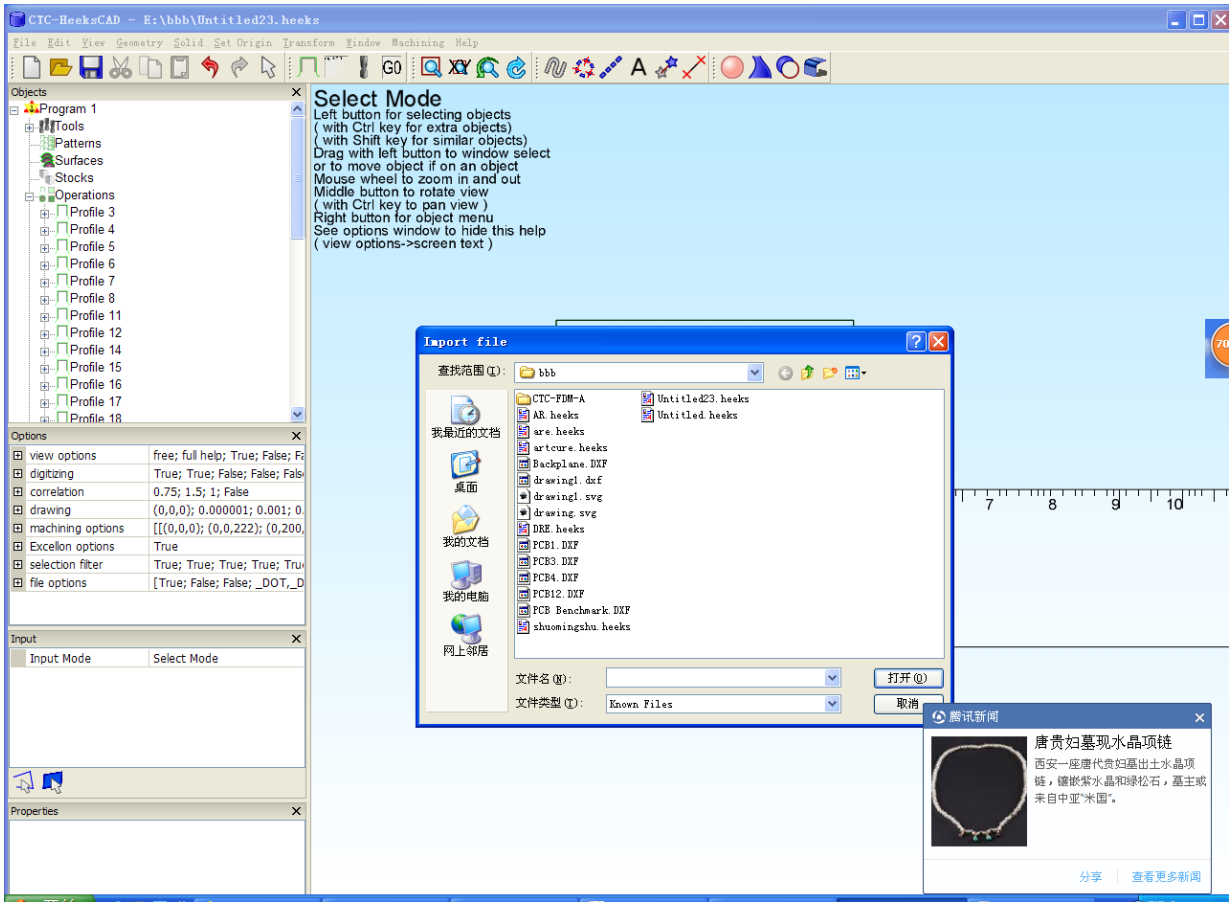
Click “OK”



Check interface, as shown by the below Fig. Then, the plug-in is installed.



Open software, File----->IMPORT.



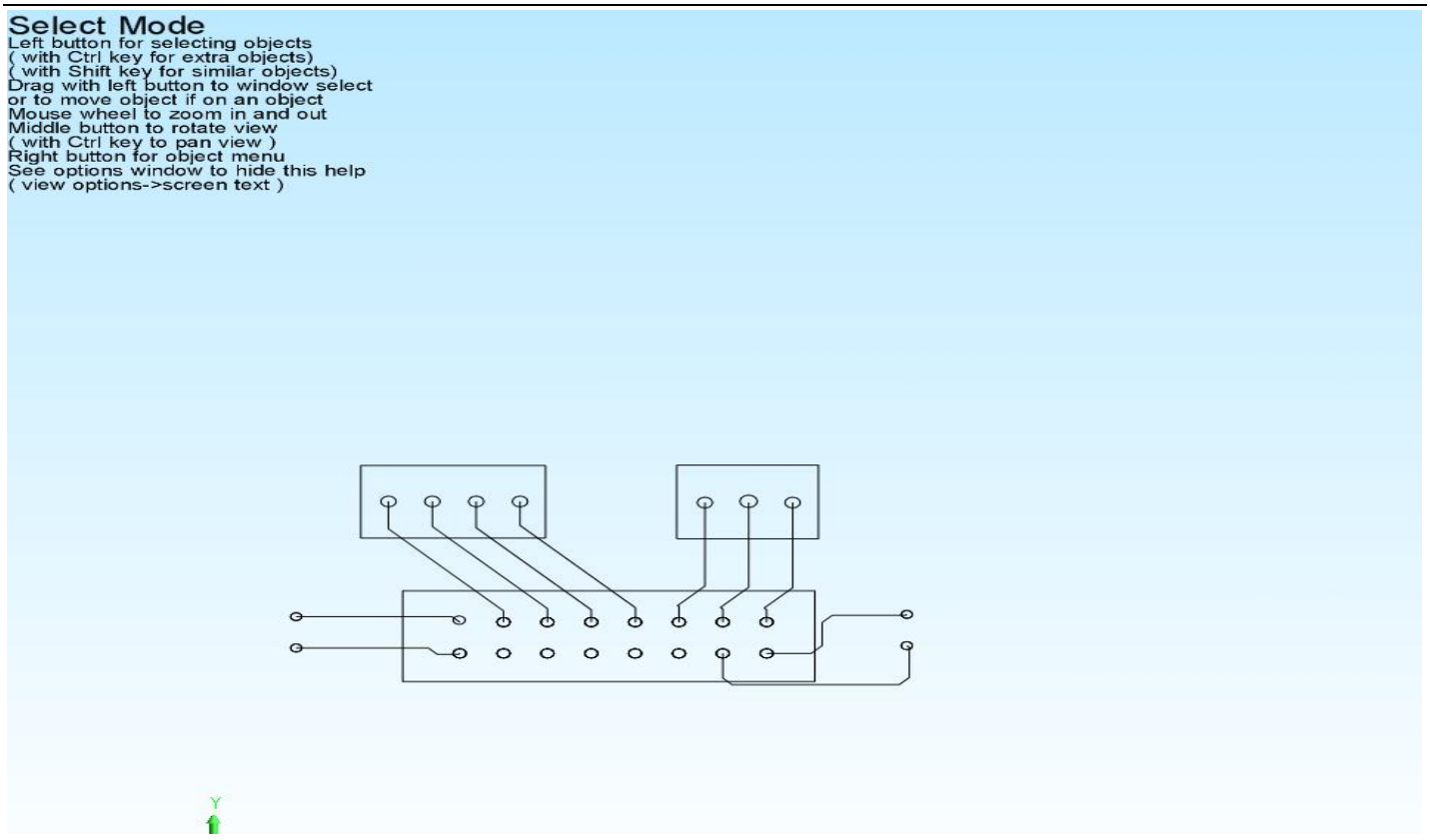
Import DXF file, Note: the file name and folder is at path, it's better not to include Chinese, or the unexpected question will emerge.

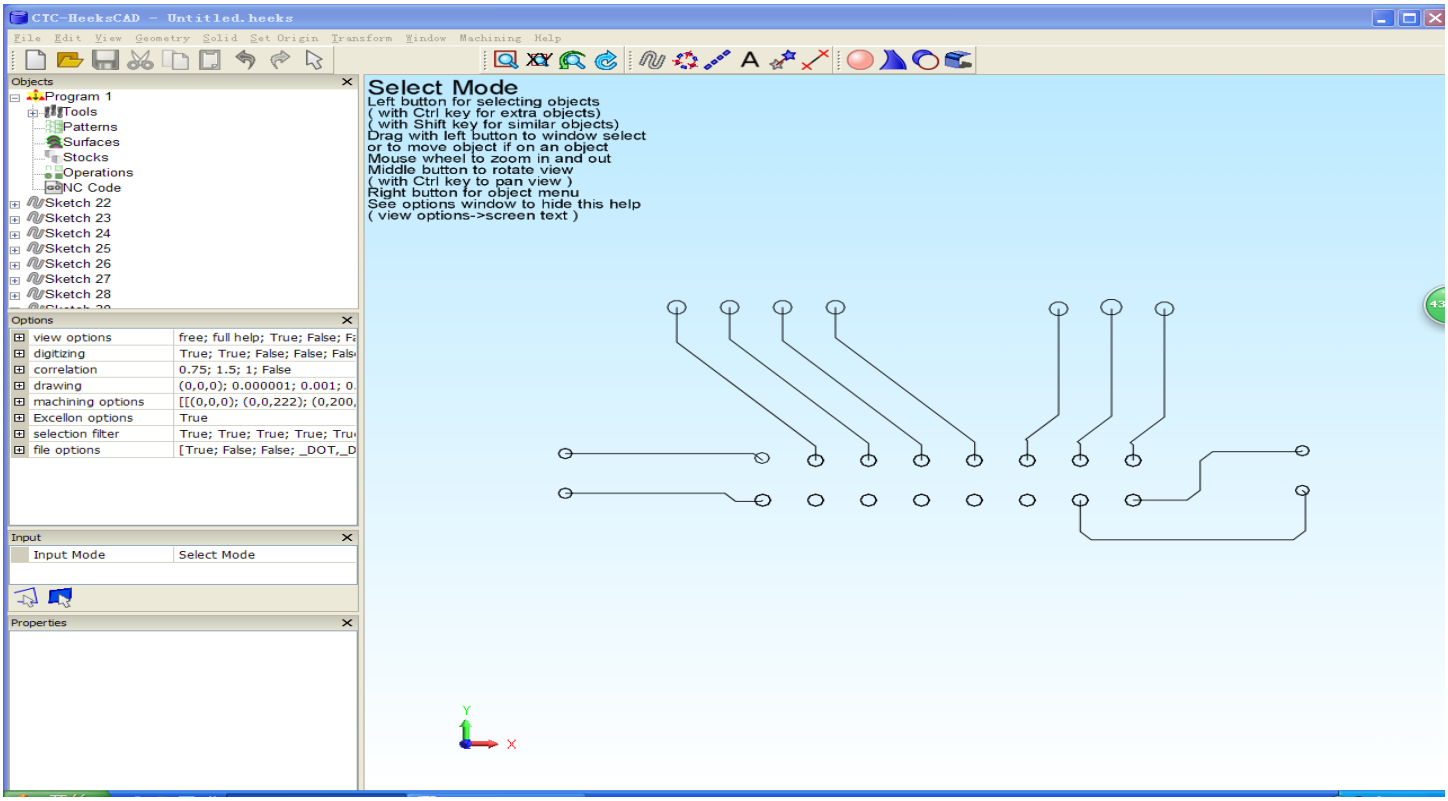
2. Select the path according to the requirement

During drawing, there are generally some marks, like length, width and height, which will also be displayed during importing to the software. The information of this part should be deleted to avoid unnecessary influences on generation of cutting path.

As for making of PCB sample plate, when PCB is generated, it is necessary to classify each layer. For example, in wiring layer in the top layer, it is just necessary to wire and not to put the element name on it. It can be classified into another layer. In this case, after the file is imported, the path could be easily selected.

If it is necessary to delete the unnecessary marks, it is just necessary to select it and then delete it with the right button.

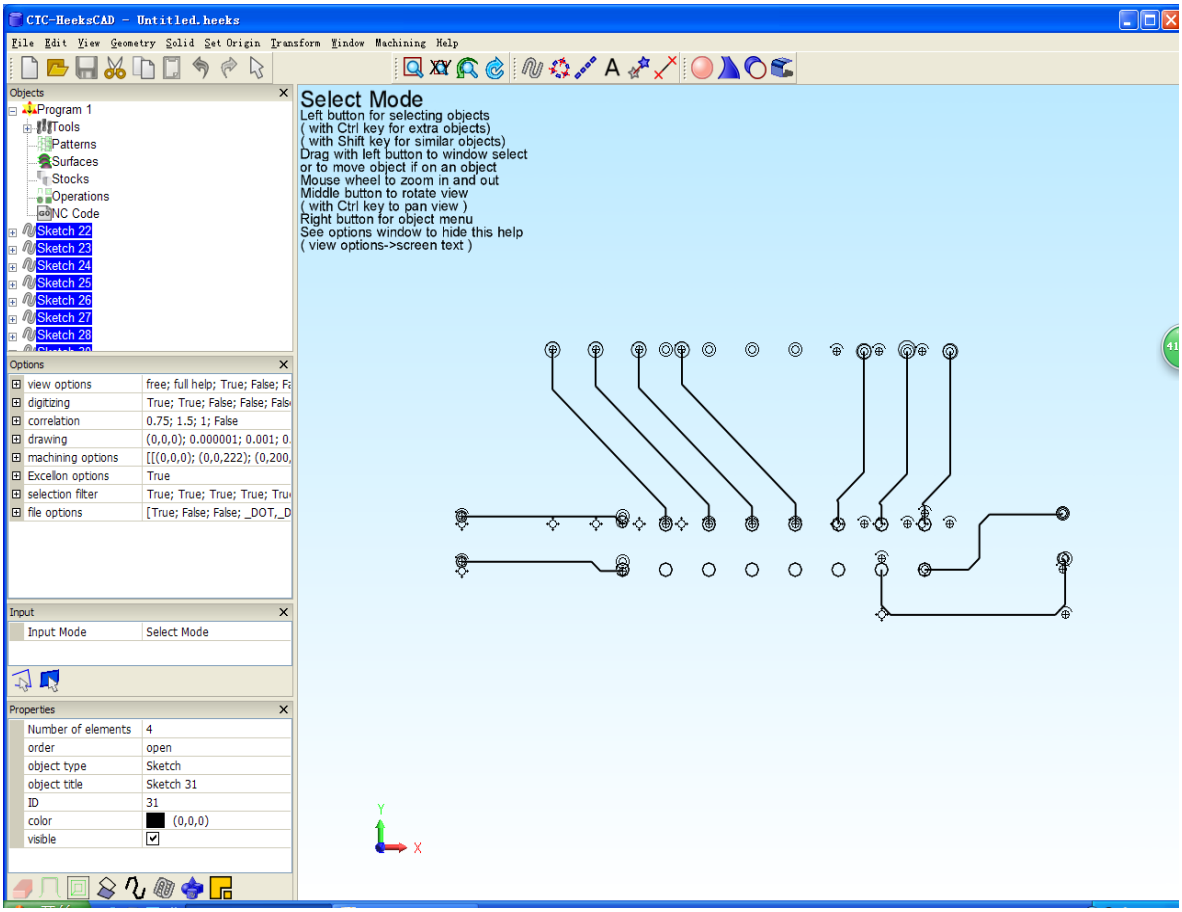




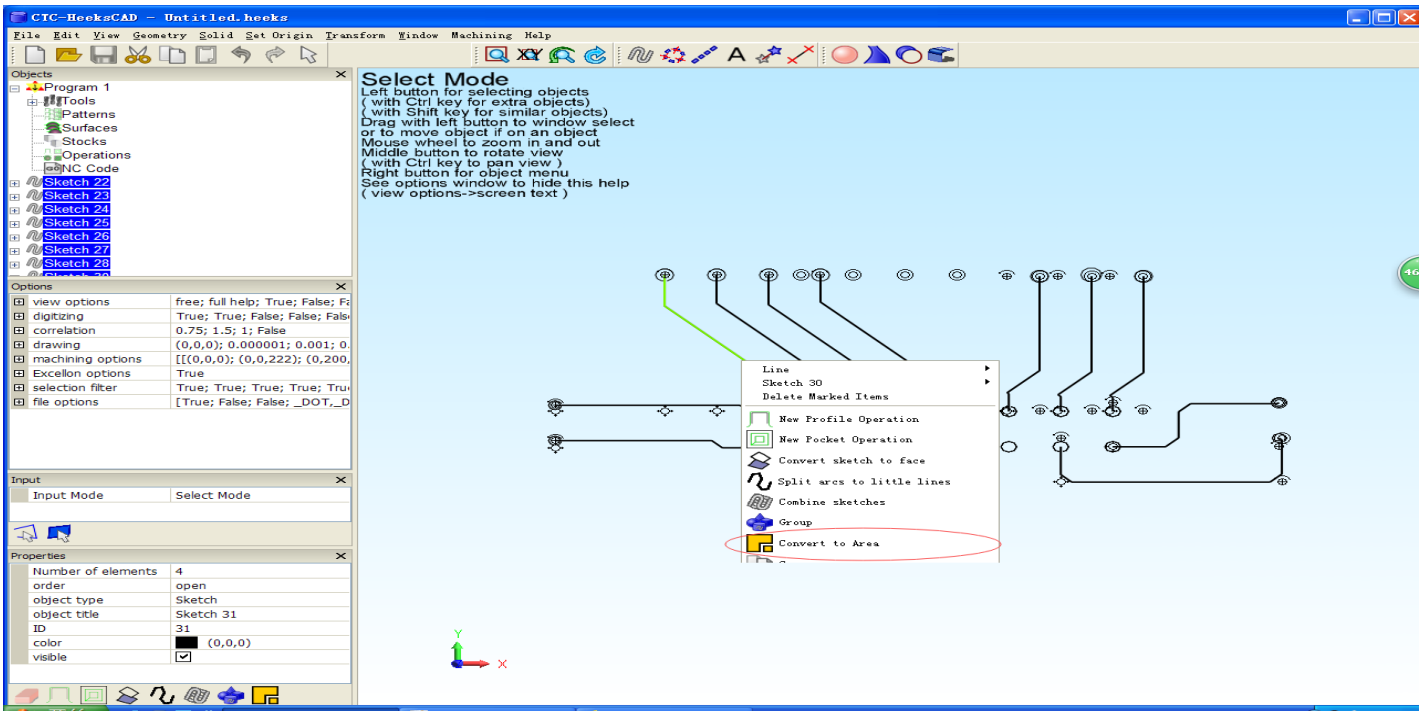
3. Line width setting

After DXF file is imported, the lines, no matter rough or fine, could be displayed into one fine line except

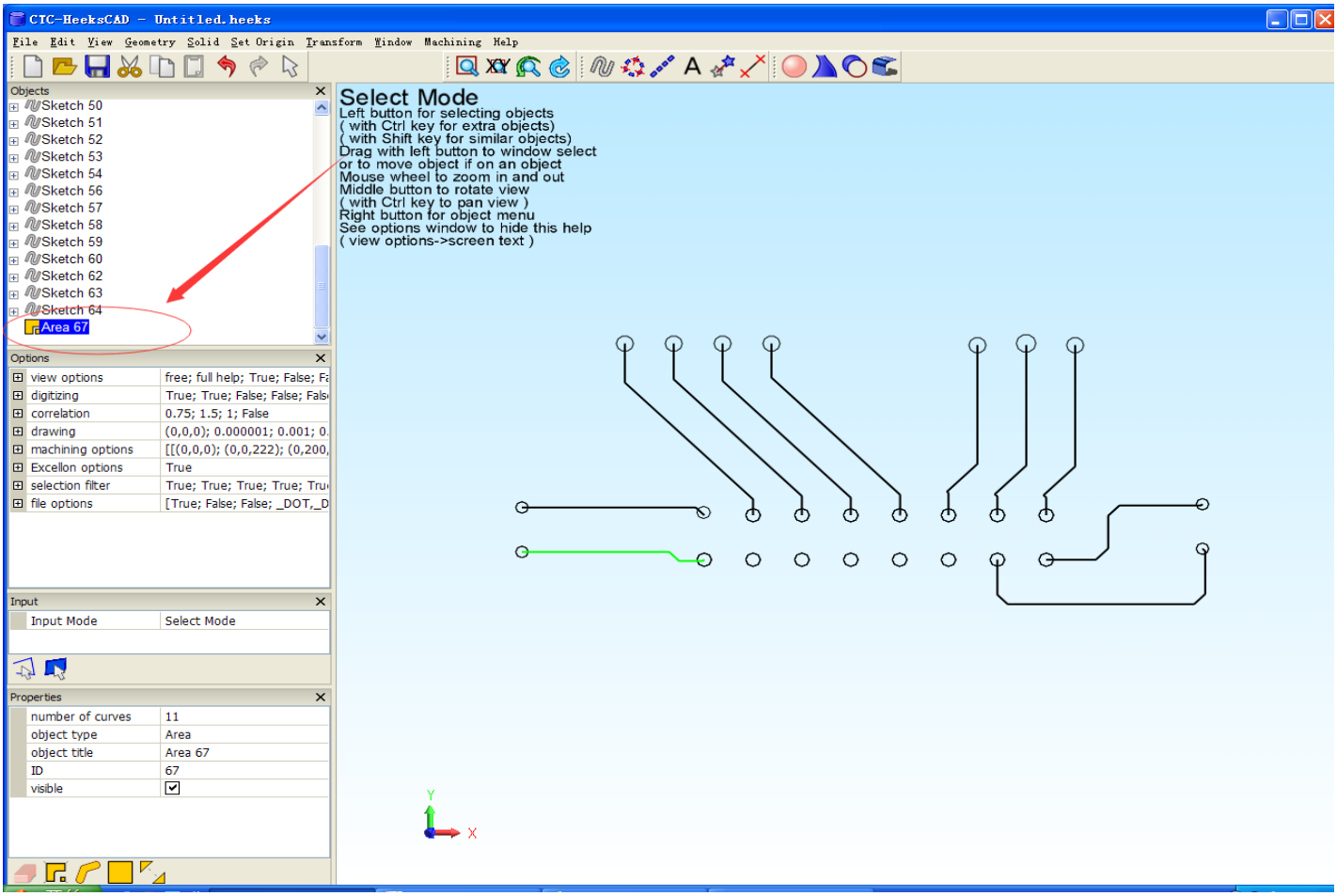
arc. When it is necessary to restore the original fine or rough line, it can be set according to this step (batch operation could be done).



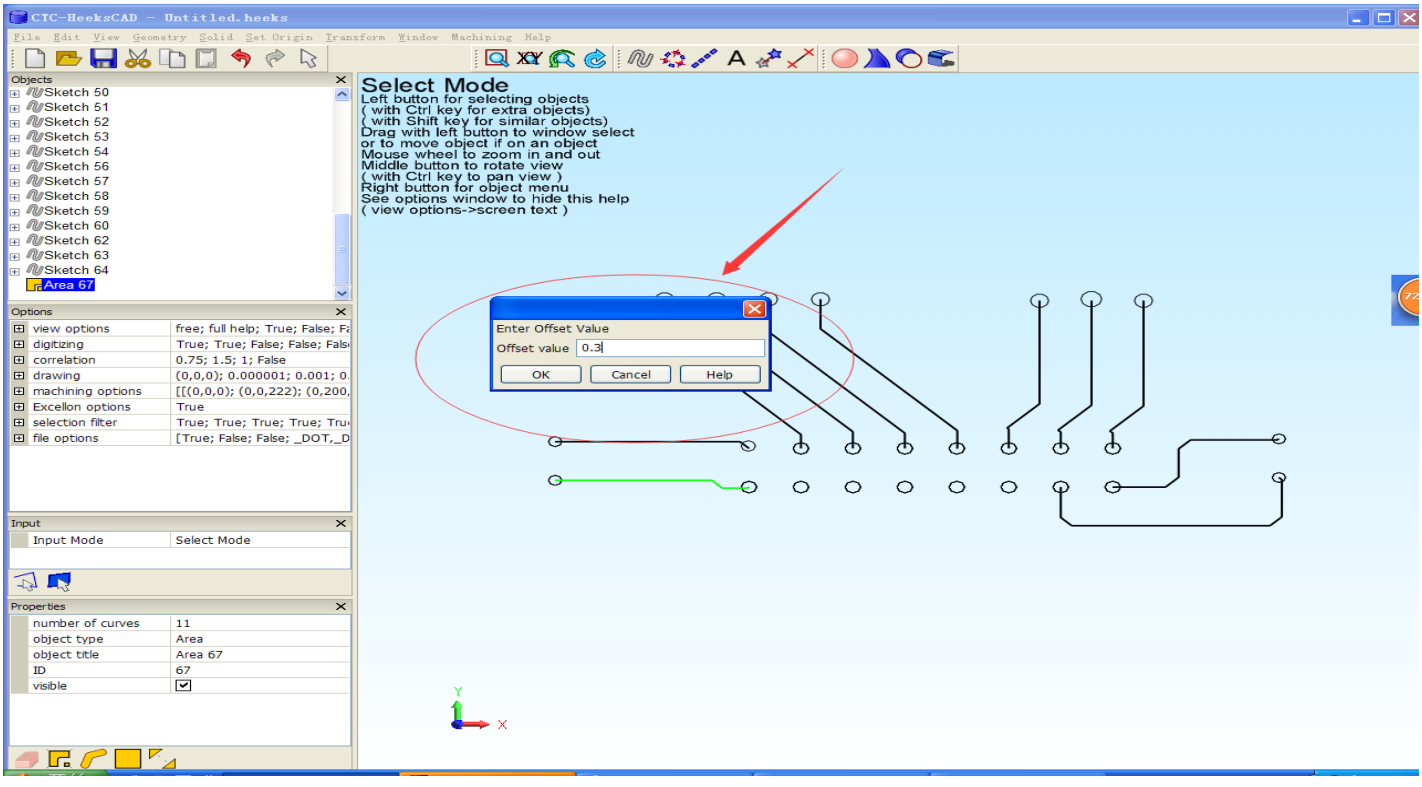
To select lines by batch, select convert to area with right button.



New icon will show up in the left title bar.

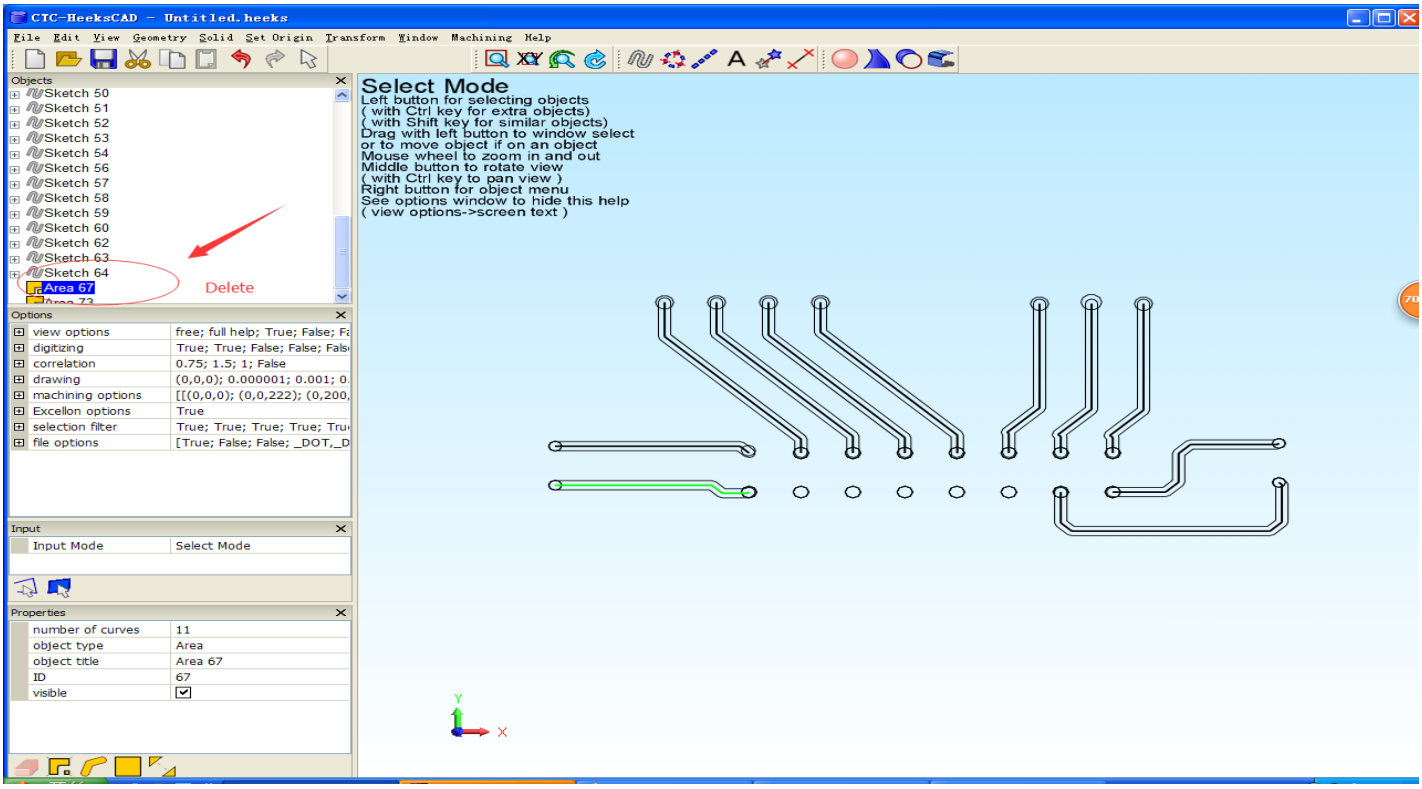


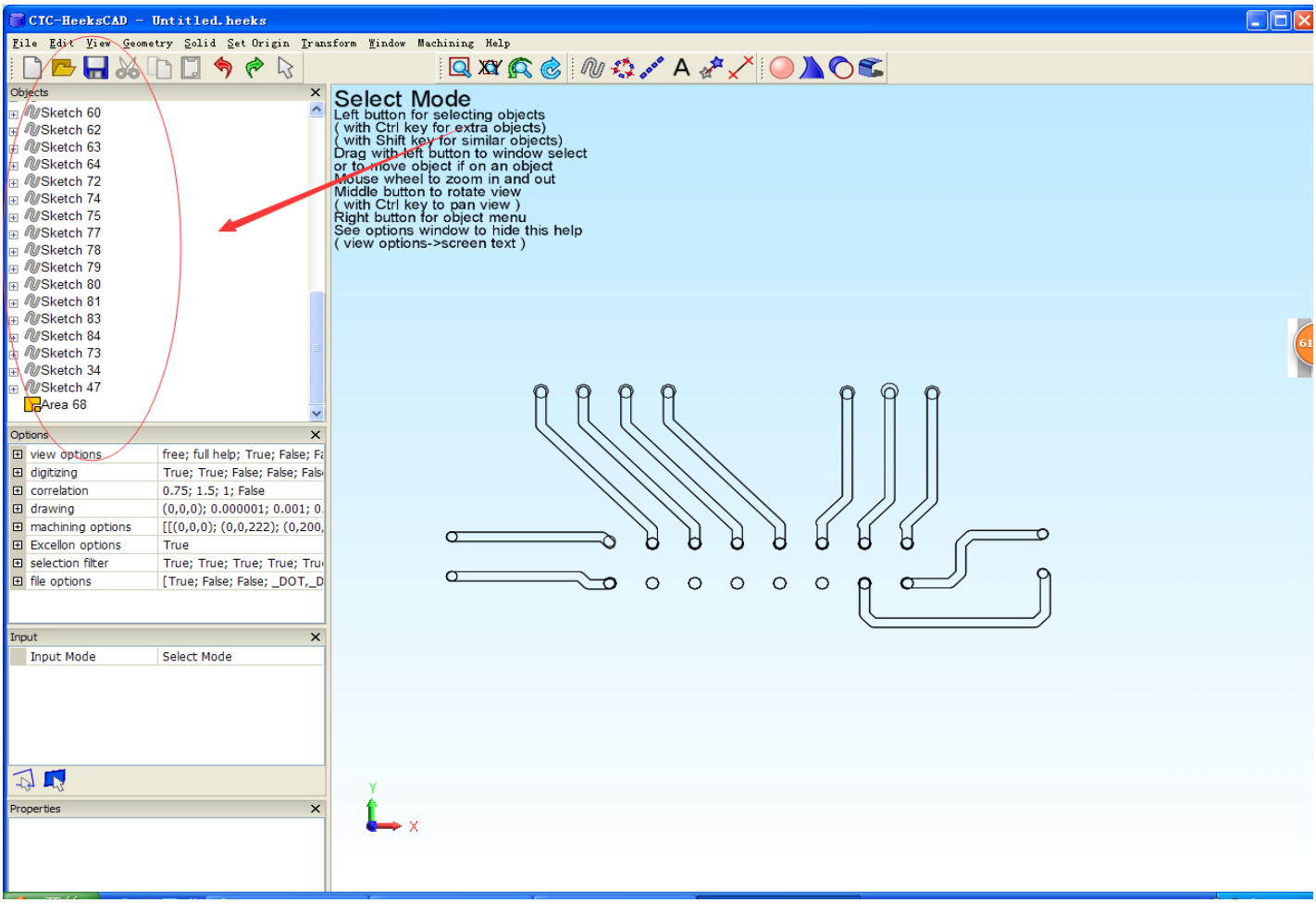
Select area67, and select “Thicken Area” with right button and input the set value, then click “OK”, unit: cm.



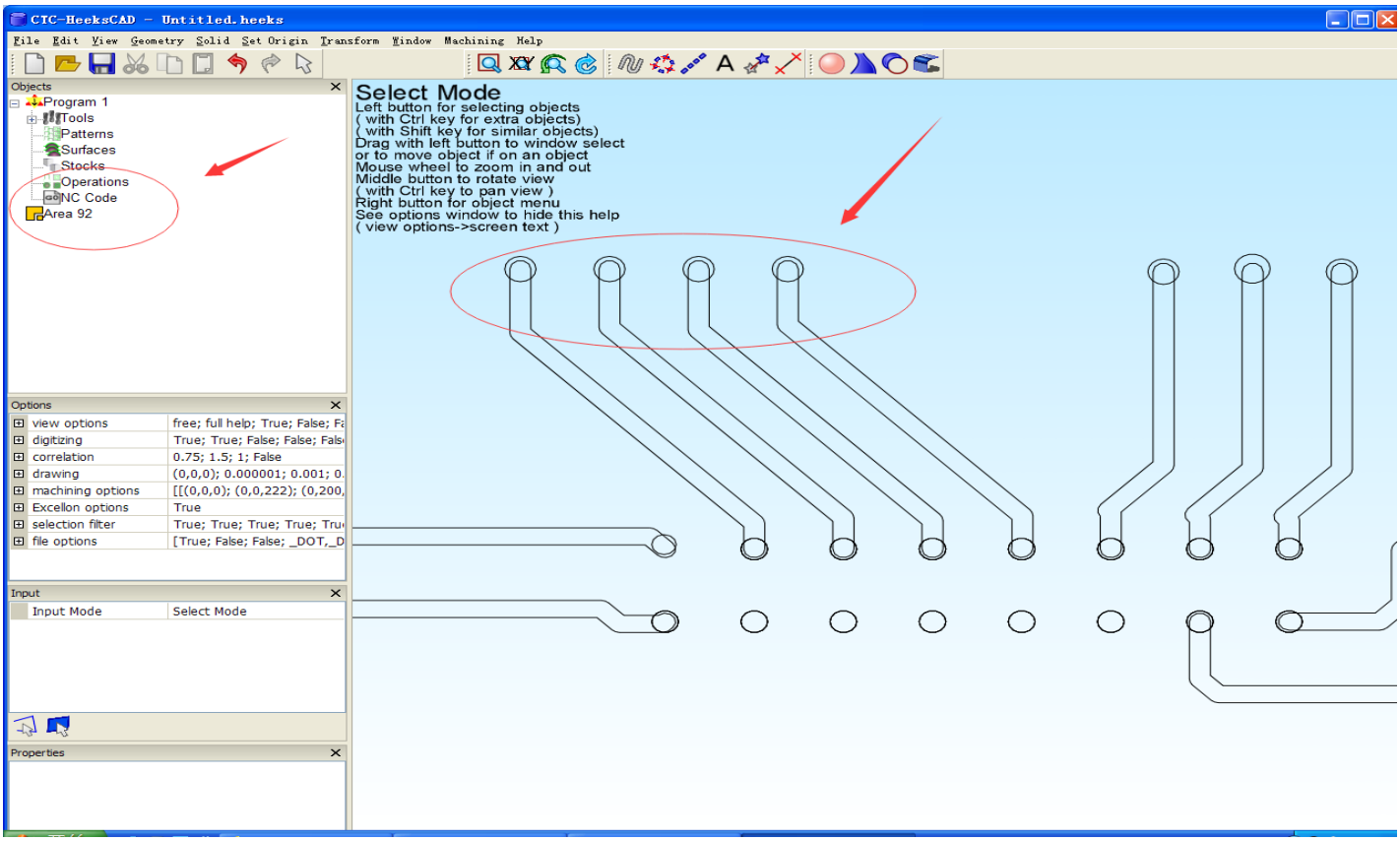
There will be one more Area icon emerging in information bar of the objects in the left. Area68 shows up here,

delete the original Area67.

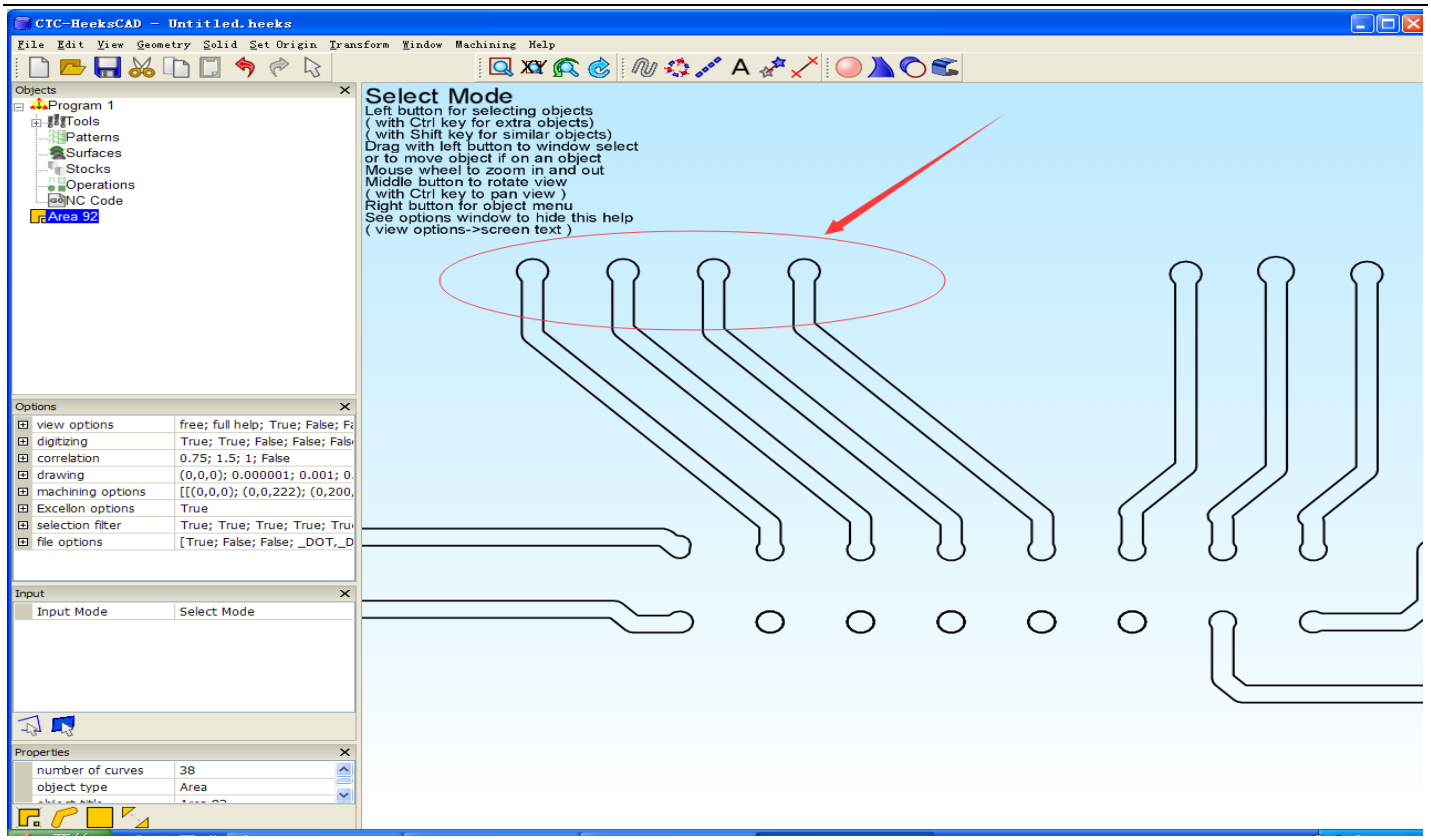




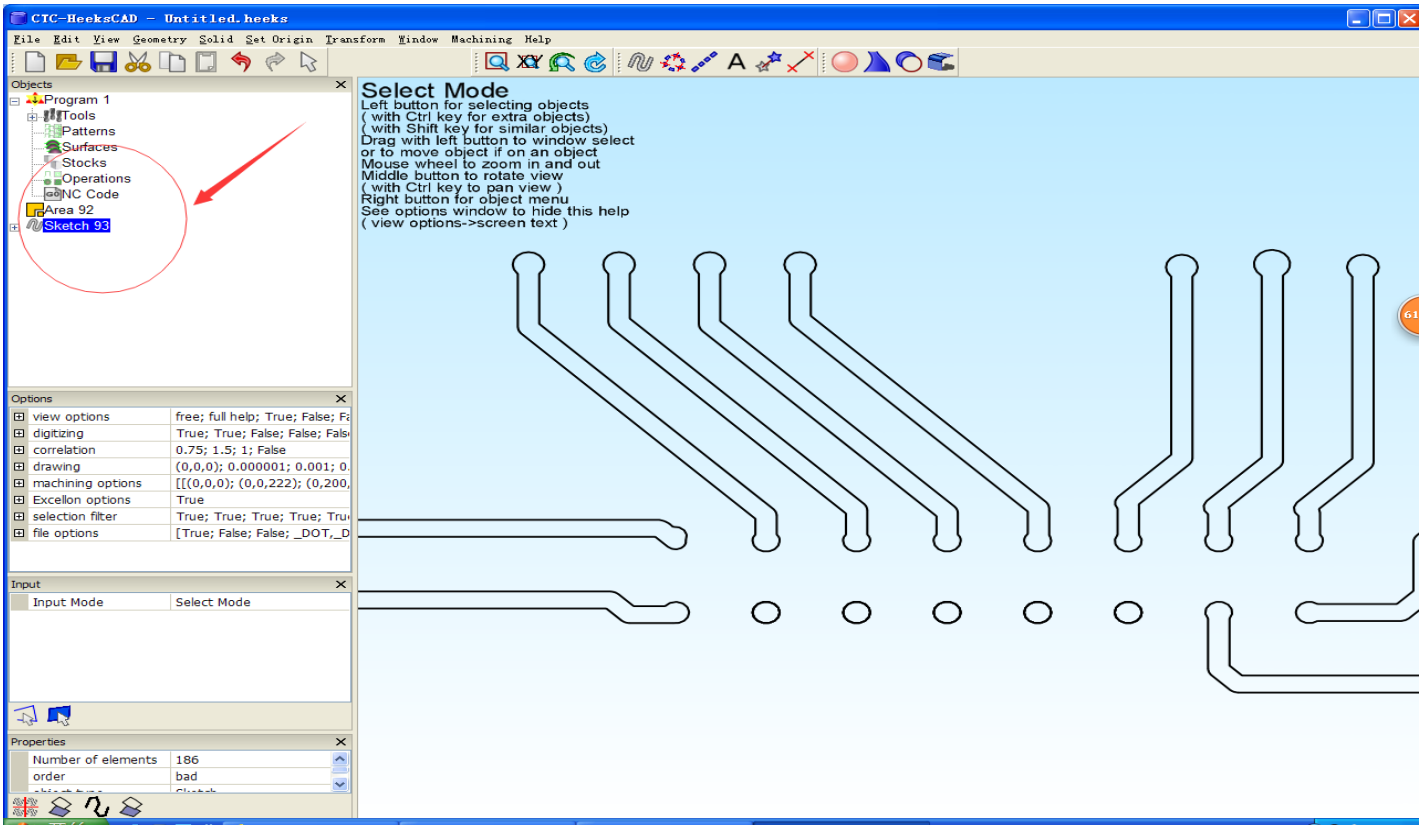
To select Area68, select “Make to Sketch” with right button, and then continue deleting Area68 (also cannot be deleted, but influences the vision), and then select all “Sketches” in the information bar of “objects”, and select “convert to area” with the right button.

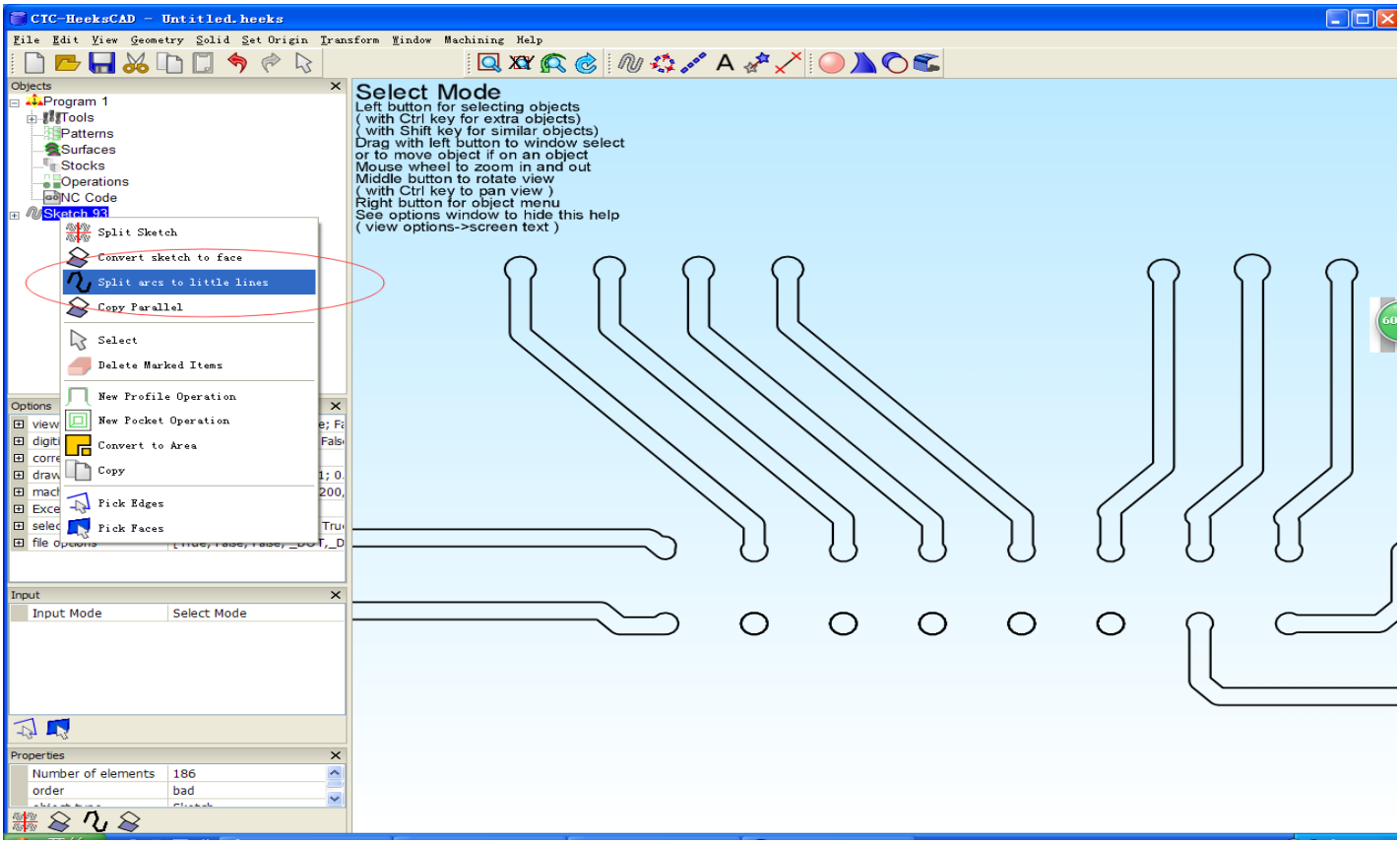


To select Area92, select “Record Area” with the right button.



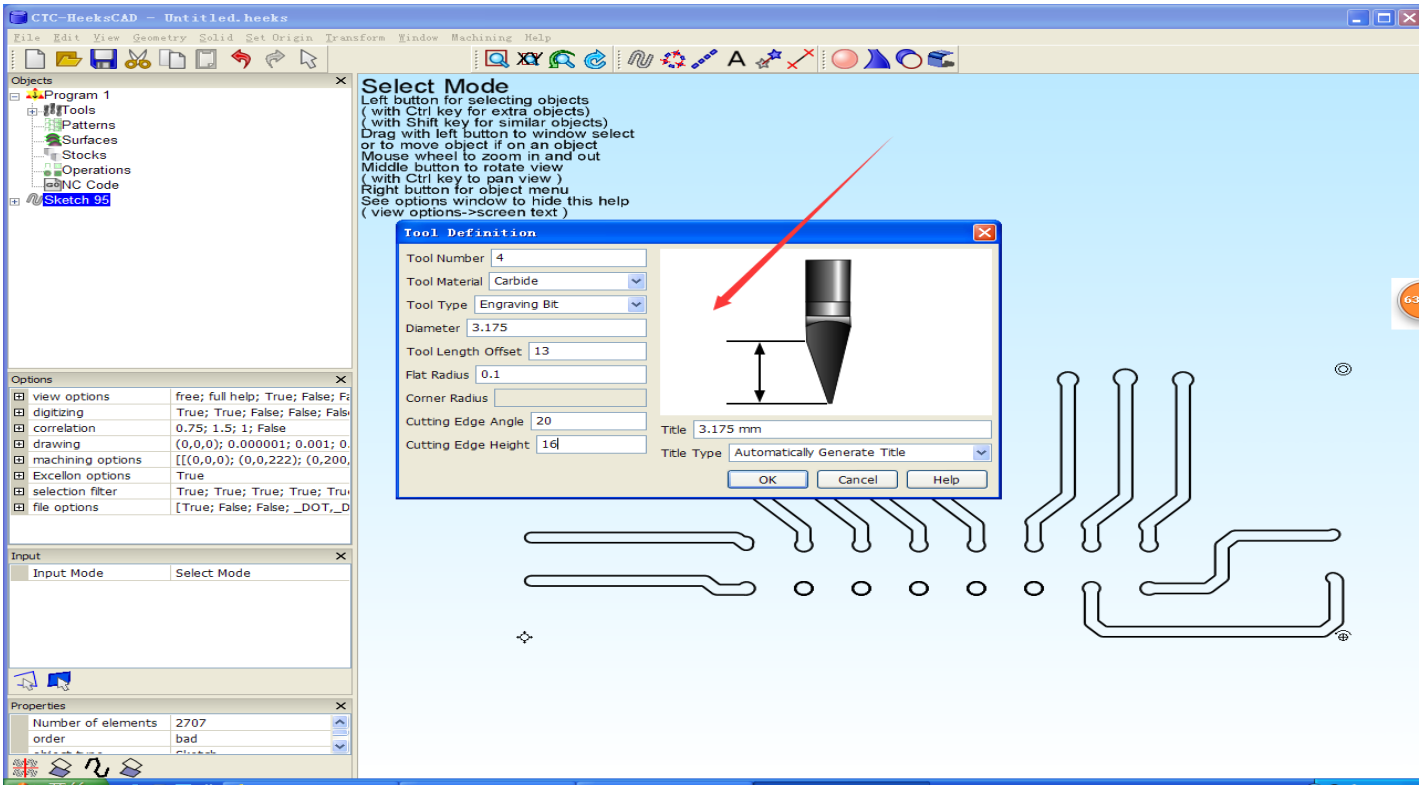
Similarly, to select Area92, select “Make to Sketch” with the right button.





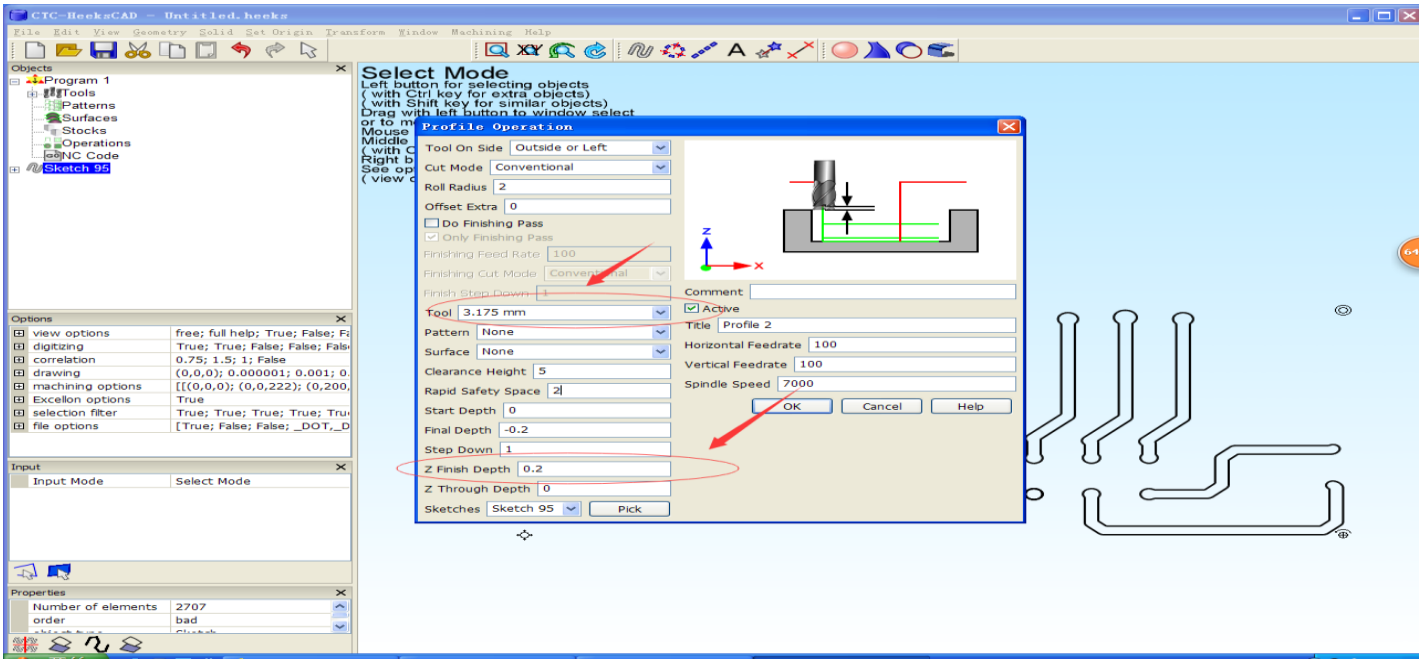
4. Add tools

Title bar Machining-------->Add new Toole-------> drill, select according to the below diagram, and the click “OK”



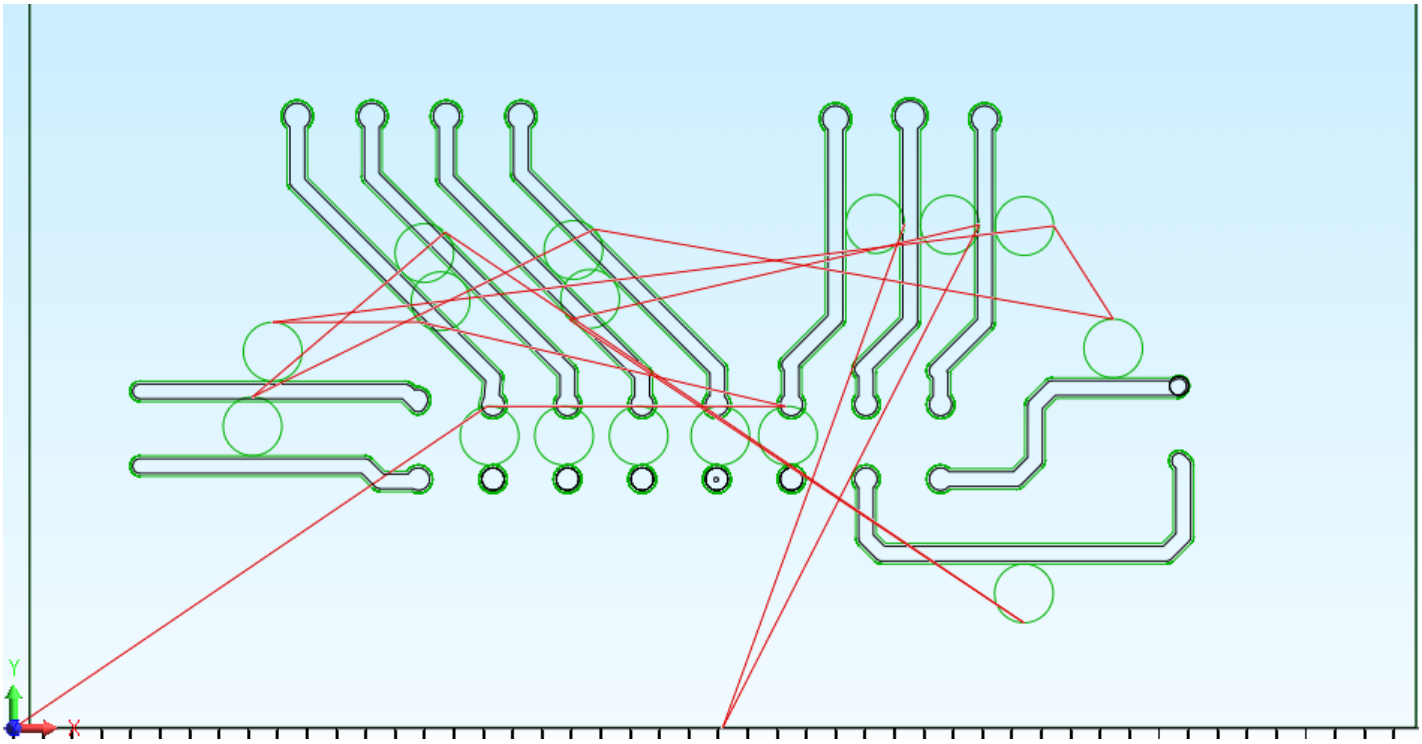
5. Generation tool path

To select “Sketch95” in information bar of “Objects”, select “New Profile Operation” with the right button. The recommended setting is below.

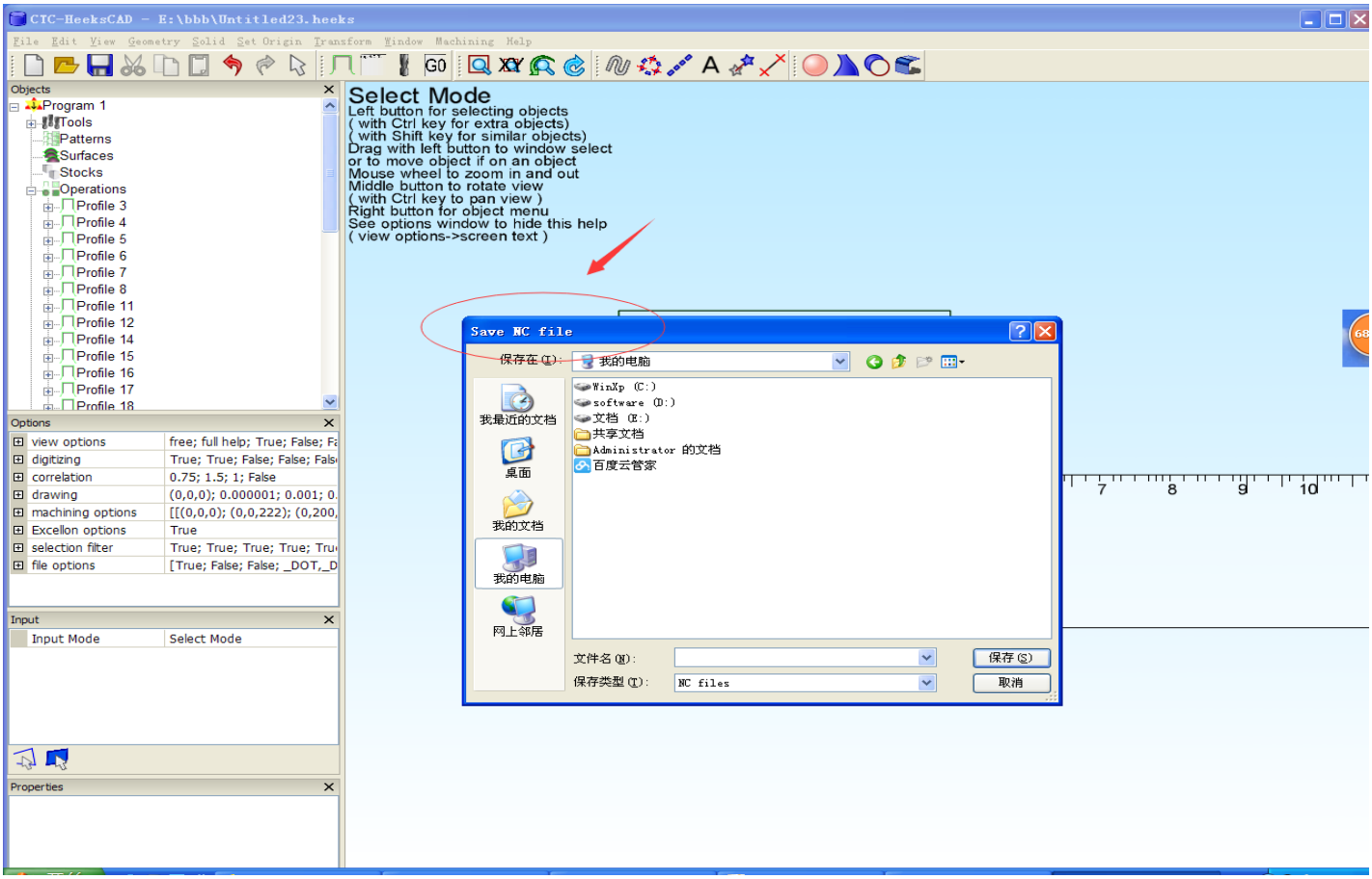


Tool bar, select the tool name added at the last step, and then click “OK”.

Tool bar Machining-------->Post-Process



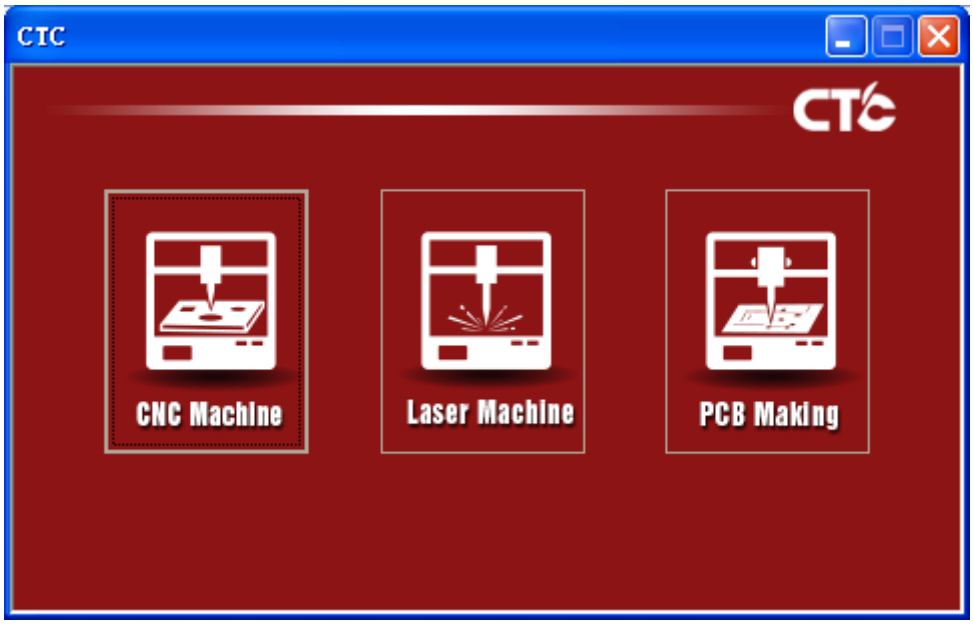
Tool bar Machining-------->Save NC file



Path generation is finished.

6. NC file converted into .X3G file

Open CTC_TG.exe



1. Select PCB Making; the converted file lives up to the format. Click “Select File” to select the file to convert. “Save File” indicates the storage location of the converted file. Generate converts and generate .GCODE file that can be identified and converted with ReplicatorG software, where the conversion will generate two files, of which one is marking file and the other is drill file (prefix: DIRLL).

2. Use ReplicatorG software to open .gcode file converted with CTC_TG.exe, and then generate .x3g file, which can be normally printed.