

Makeblock Constructor I 3D Printer Kit

4. 3D Printer Software

Operation Guide V2.0

2014/7/16 by C

Catalog

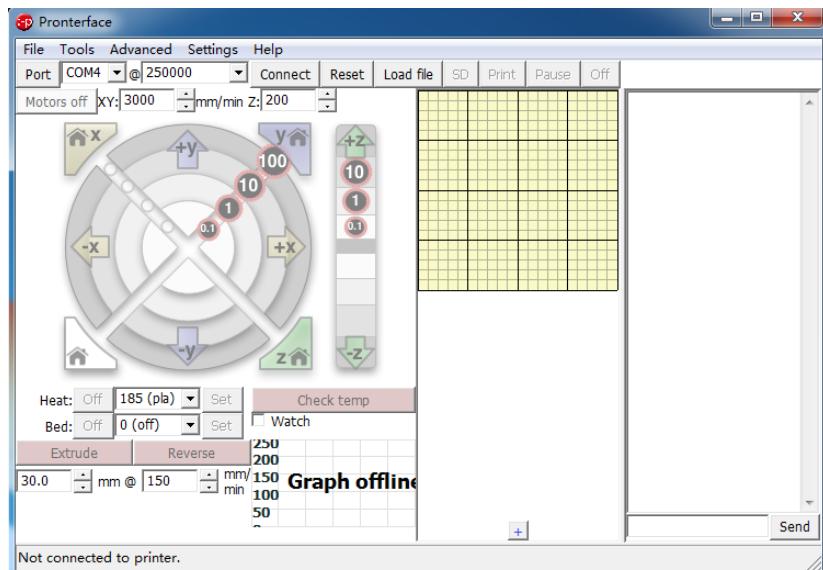
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4.1 Software Overview

We're going to introduce you two kinds of 3D printer software, Printron and Cura. You can choose either of them to use after familiar how to use these software. Printron and Cura both are open-source software, and widely used in 3D printer fields.

How does 3D printing process work? Connect the 3D printer and import the 3d model into the software. The software slice the 3D model into layers then converted them into G-code. Software sends the G-code via serial port transfer to controller, and controller converts G-code as motor and extruder motion to lay down material in layers while printing process. (FDM deposition modeling) The main function of 3D printer software including turn layers into G-code and send G-code to controller board.

Printron

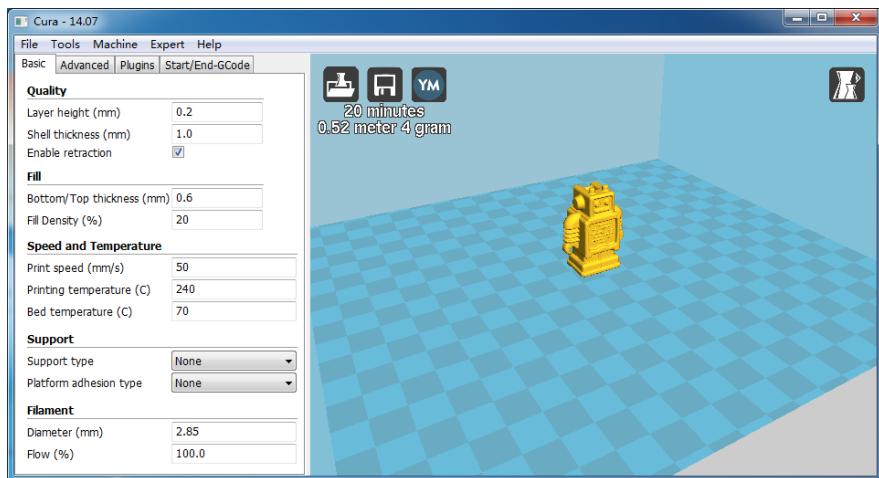


Printron (also called pronterface, and pronterface built-in Slic3r, the fact is the different software. Slic3r is the tool to cut the model into horizontal slices, generates toolpaths to fill them and calculates the amount of material to be extruded.

Printron is a set of G-code sending application; it consists of printcore, pronsole, pronterface and a small collection of helpful scripts. Together with Slic3r form a powerful printing toolchain. Slic3r is the tool you need to convert a digital 3D model into printing instructions for your 3D printer. We need to import the 3D model (STL file format) into G-code, and open the G-code file to print in pronterface.

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Cura

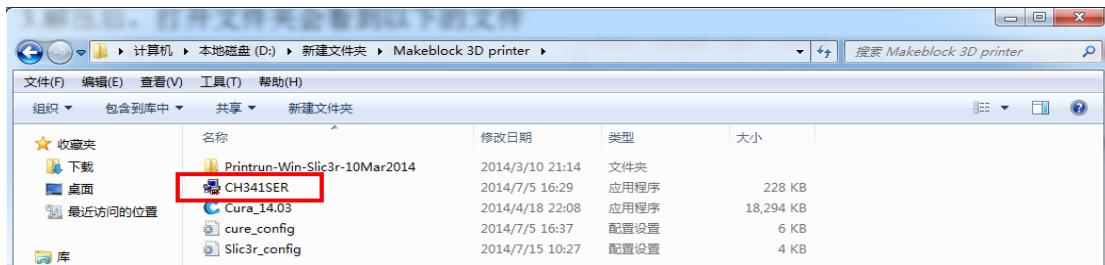


Cura is developed by Ultimaker to make 3D printing as easy and streamlined as possible. The interface of Cura is beautiful and easy to use, it slices a 3D model in layers and print to layers.

4.2 Arduino drivers installation

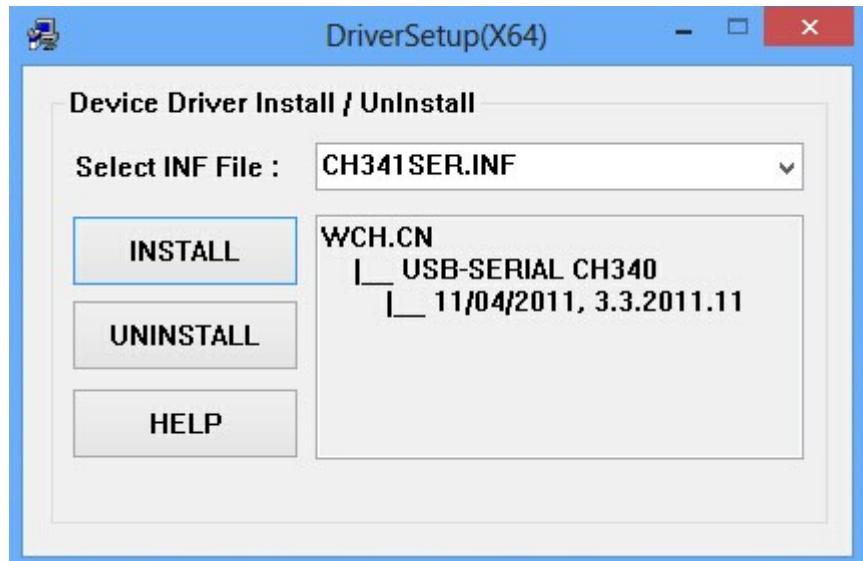
If you already install the mainboard driver before, please ignore this installation process.

You can find Window driver CH341SER in resource folder Makeblock 3D Printer you download.

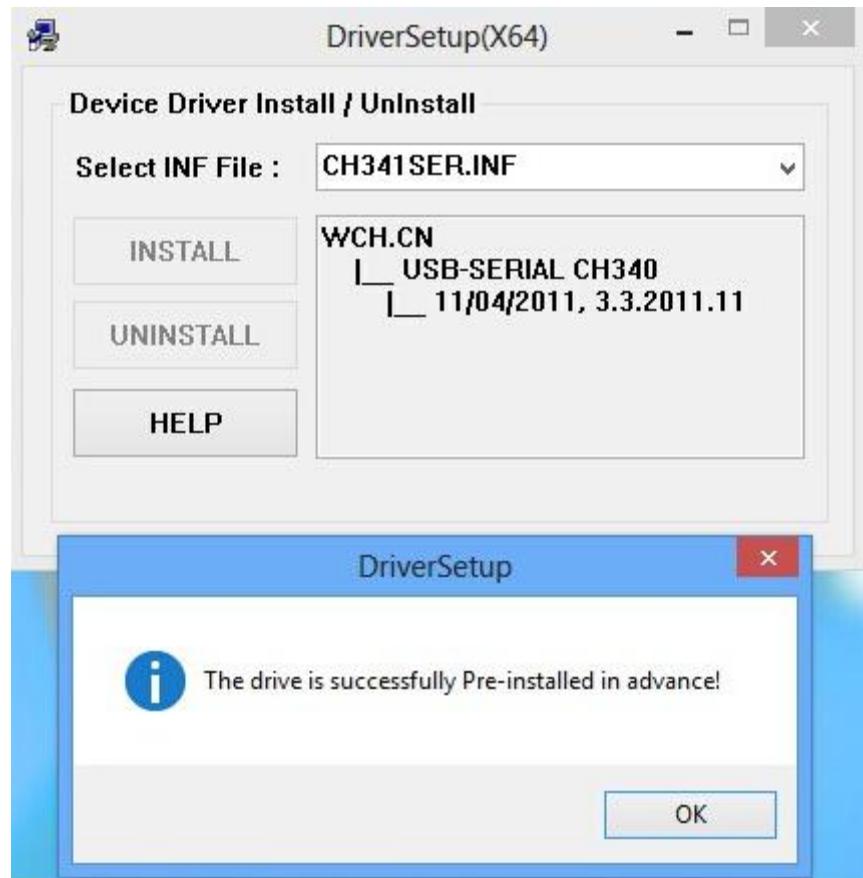


double click the file "CH341SER" and click "Install" button as the below picture

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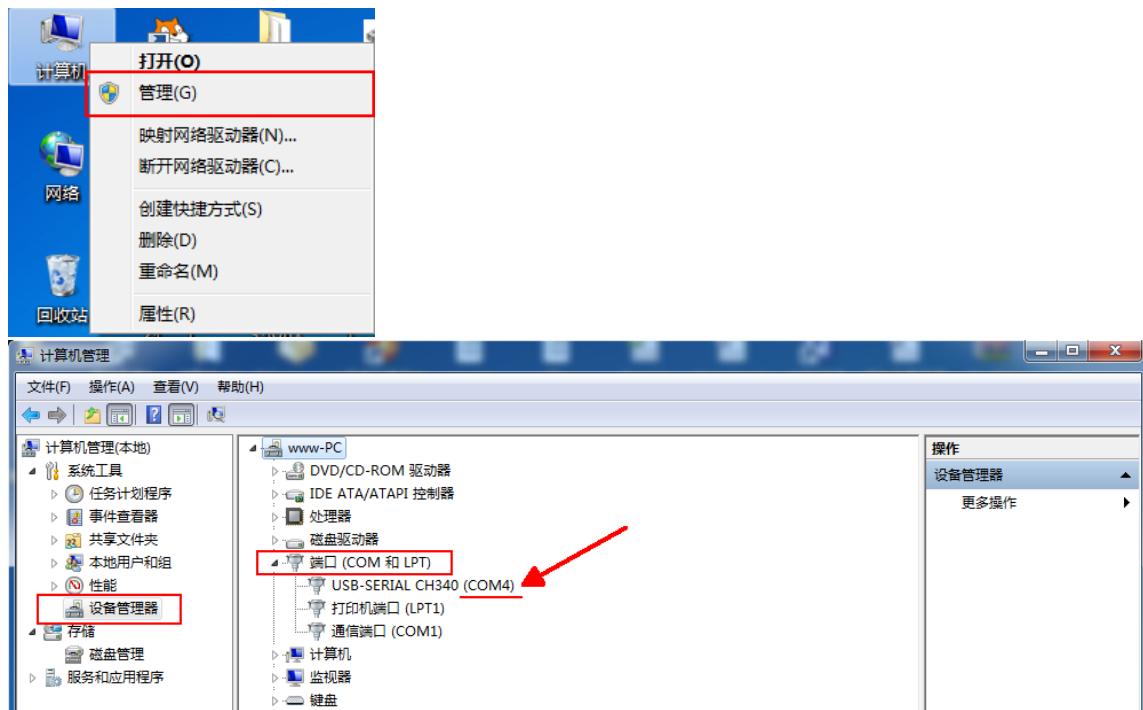


After seconds, the following window will popup the successful installation message, then click the “Confirm” button.



Connect the computer and controller by USB cable, plug in the 3D printer power, right click “Computer”, and select “Manage”.

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Enter Device Manager—Port, you can see the system-assigned the port to Arduino is COM X (X could be 2 to 6) Please remember the port number, you will need this while software setting.

Note: The COM won't display if you don't plug in the Arduino board.

4.3 Pronterface installation and operation



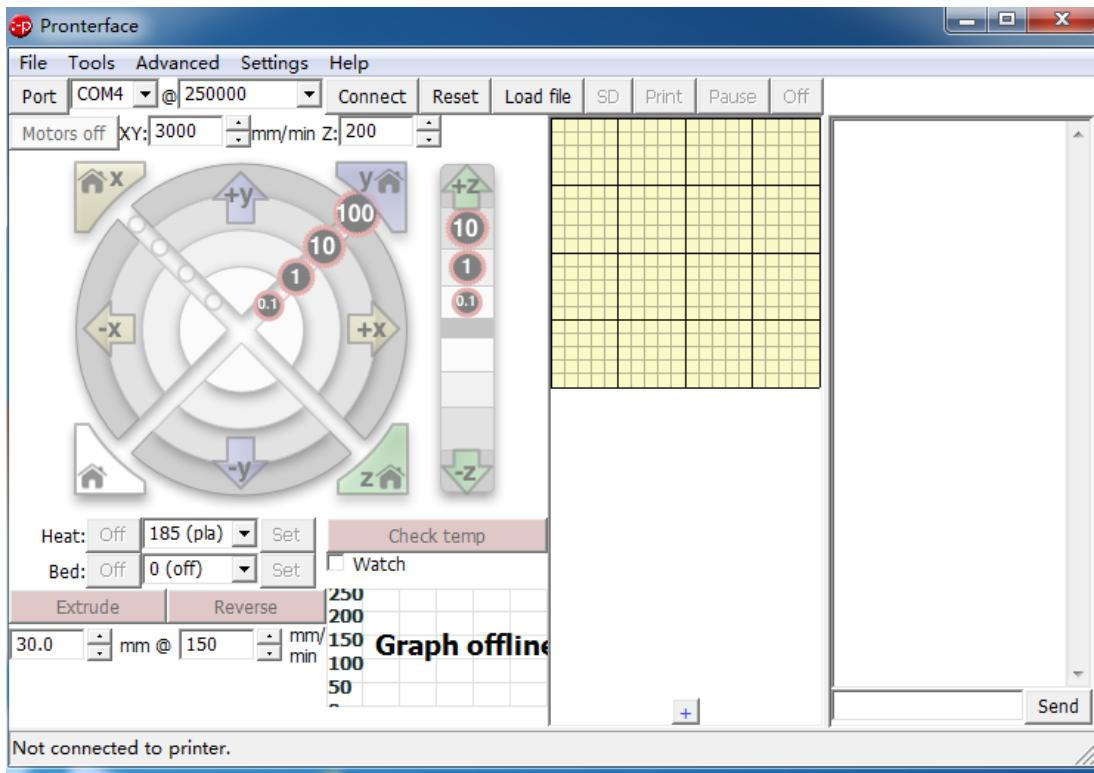
Note: please follow the instructions step by step, or the 3D printer may not work properly.

1. Return to the unzip files, double check the red icon “Pronterface” to open the 3D printer controller software.

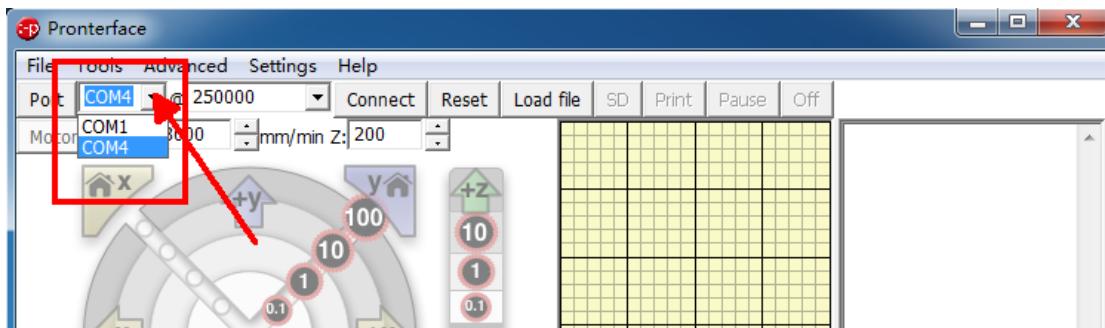


2. Check the 3D printer controller Pronterface interface below:

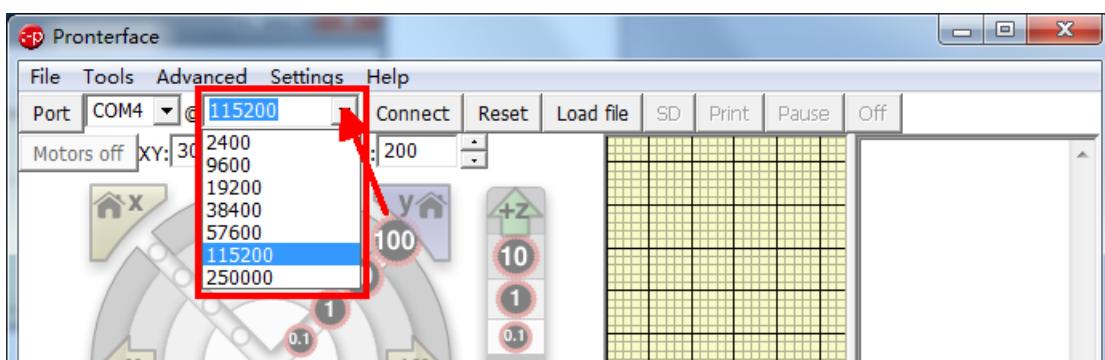
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3. Please set the software to make it interface with controller. Select the corrodig port, if you forget which port, please return back return *My Computer—Manage—Manage Device—Port* to confirm.

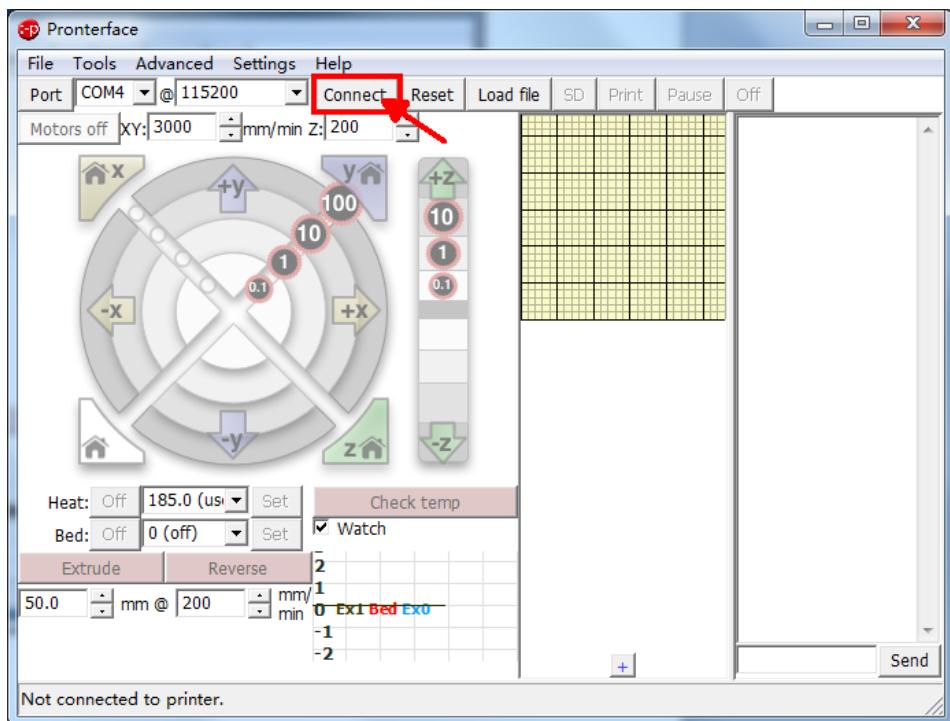


4. Click drop-down and select the baud rate option as 115200



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5. Click Connect button to connect the main control board.

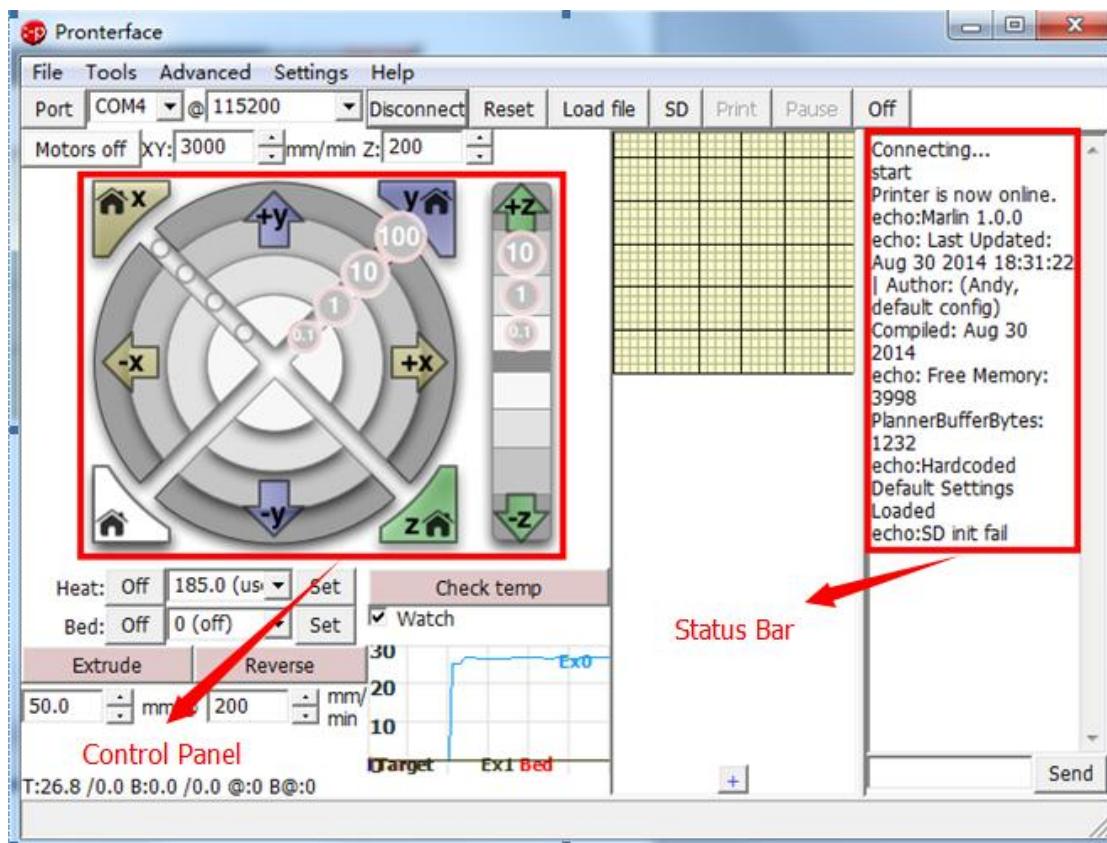


6. If the connection is correct, the interface as shown below and control panel will turn brighten.



If the status is disconnect, please check if you connect the mainboard to computer with USB or if the correct port setup is correct. If you can't find the COM port, that means the mainboard is disconnected or CH341 drivers is install incorrect. Please double check and restart your computer and try it again.

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4.3.1 Check the running status

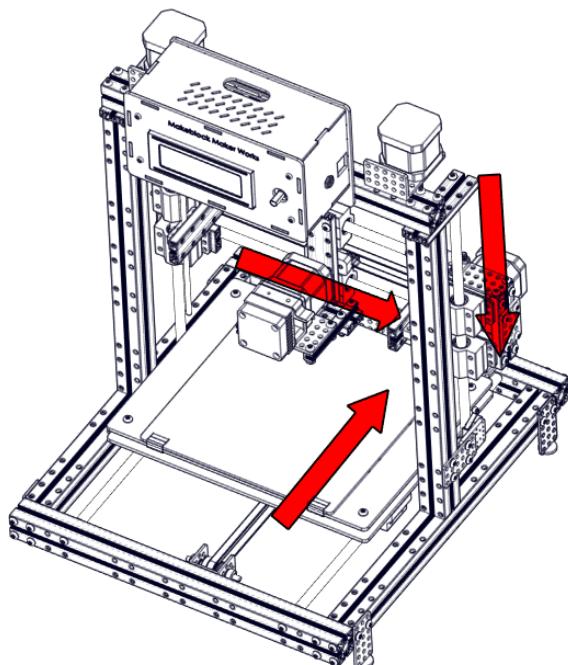
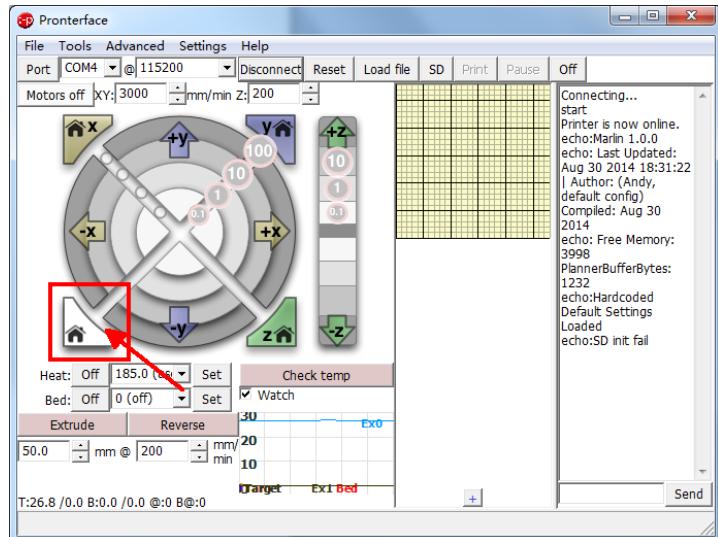
⚠ Before the first running, please MAKE SURE the end stop and stepper motors are installed in the corrodig position and the wiring is correct. Or the 3D printer will crash while X/Y/Z axis is running or motors will run reverse direction. Please MAKE SURE you can disconnect the power anytime once the running status is incorrect. If the error happened, please correct the wrong wiring and installation and try again.

⚠ Please make sure you can cut off the power supply before turn on 3D printer.



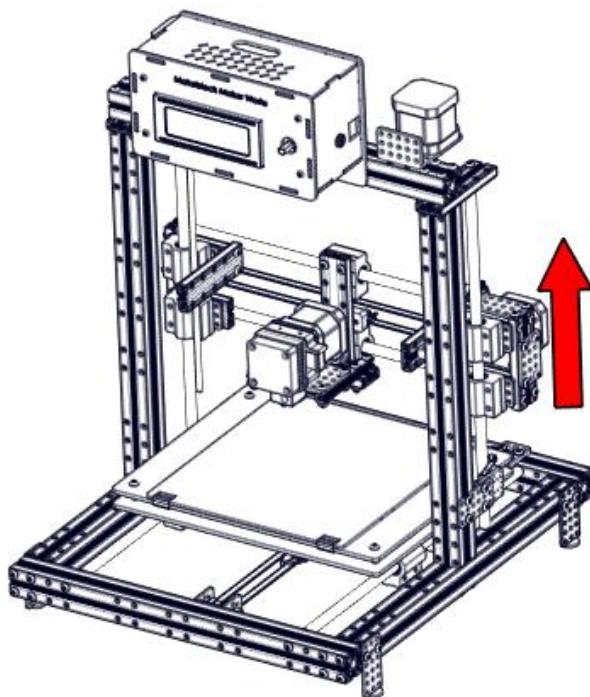
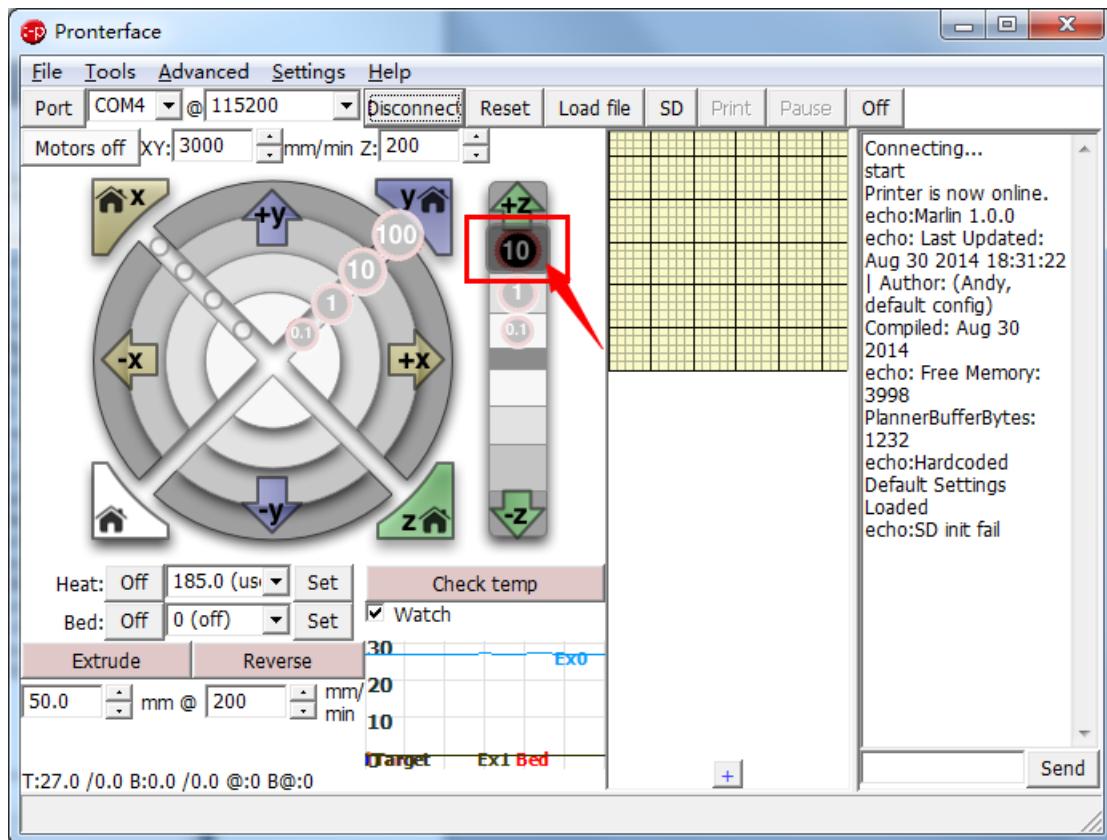
1. Click the button can reset the 3D printer to zero.
(Normally Z axis will turn down, X axis will turn right, Y axis will move back. If there's no movement or the direction is opposite please turn off the power immediately and correct the wrong wiring and installation and try again.)

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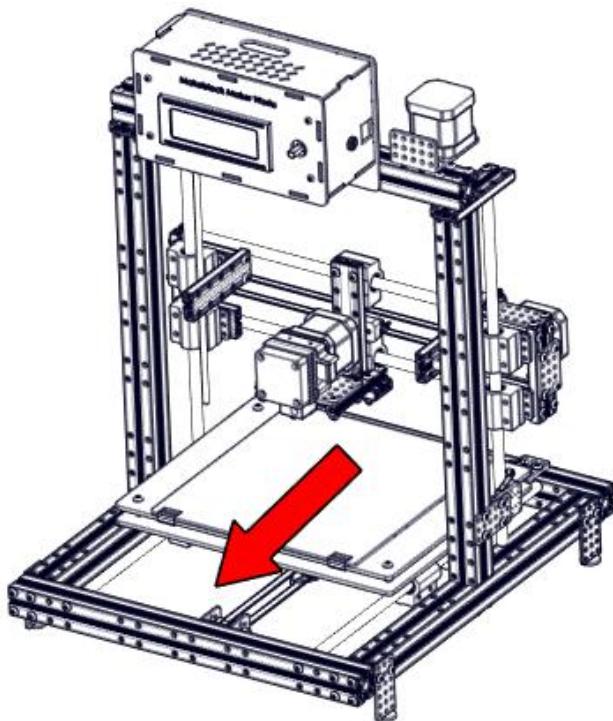
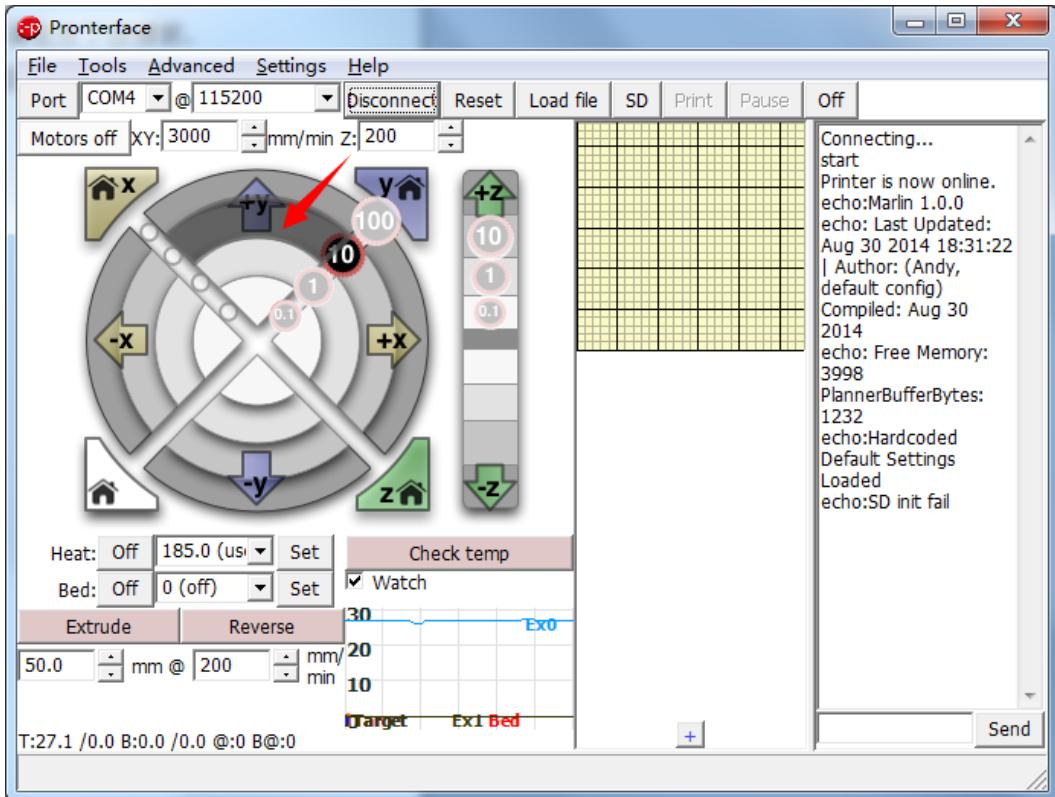
- 2、 Click “+Z 10” button, and check if Z axis is up 10mm.(Please focus on Z axis movement, because the movement time is short, you might ignore this.) If there's no response or direction is opposite please turn off the power immediately and correct the wrong wiring and installation and try again.

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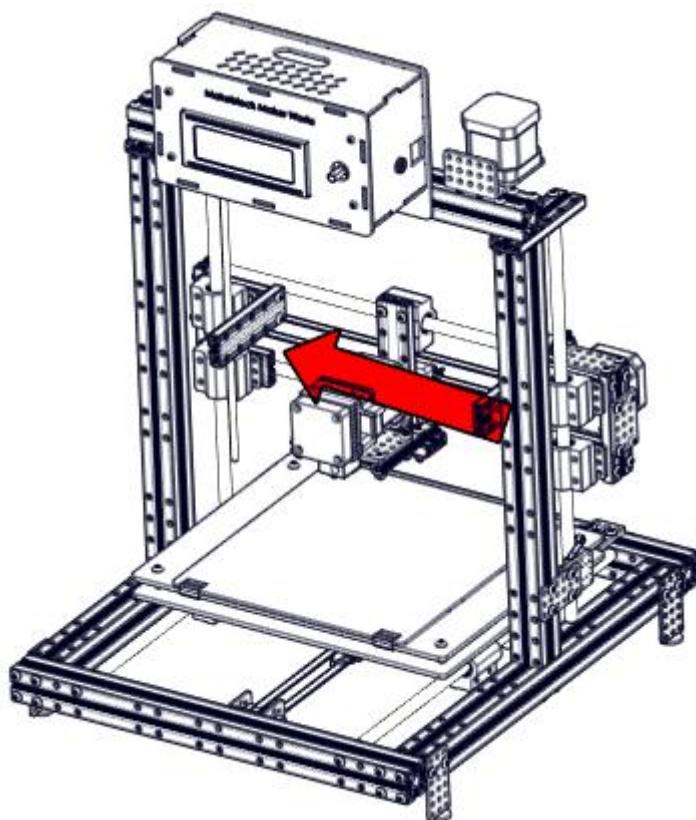
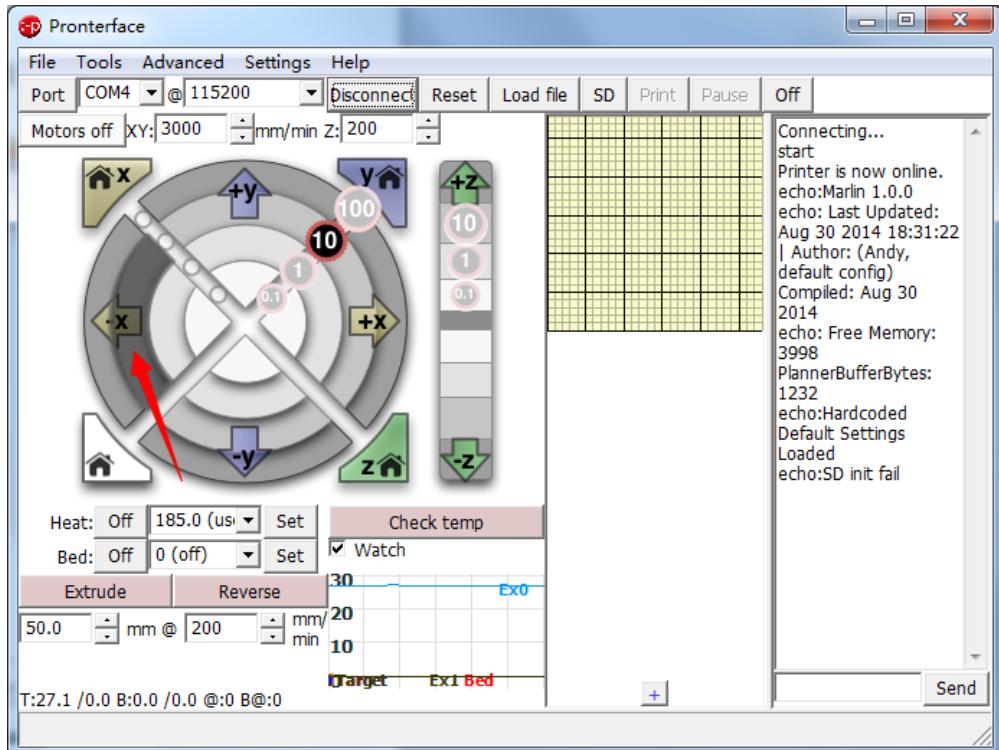
- 3、Click “+y 10” button, and check if Y axis move direction at you. If there’s no response or direction is opposite please turn off the power immediately and correct the wrong wiring and installation and try again.

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- 4、Click  “+x 10” button, and check if the extruder move to left side. If there’s no response or direction is opposite please turn off the power immediately and correct the wrong wiring and installation and try again.

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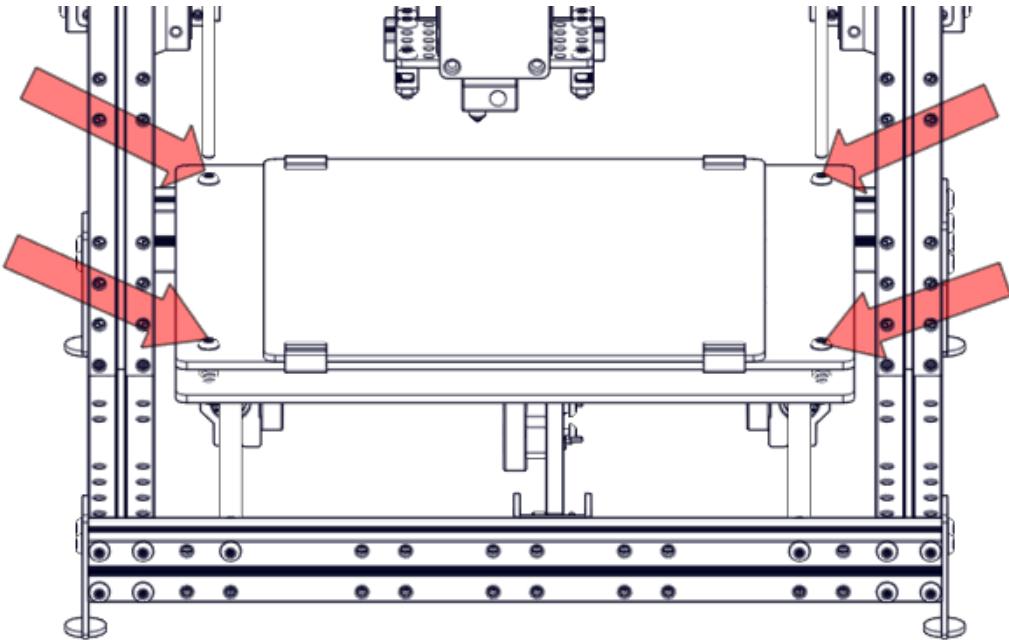
4.3.2 Level your print platform



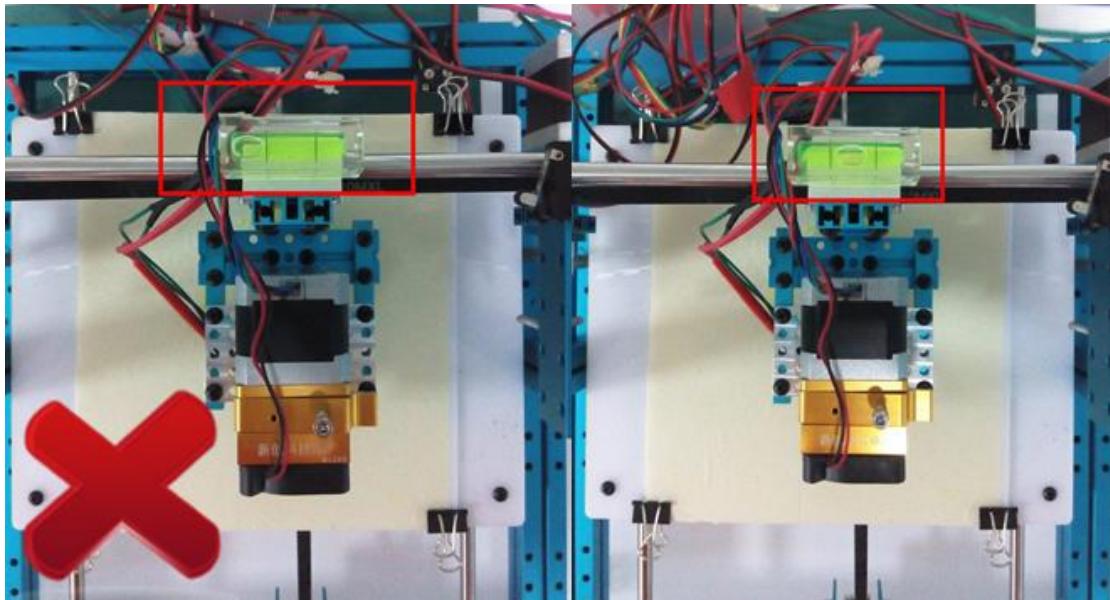
video available on

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When the first we assembly the 3D printer, the printer nozzle is not 100% perpendicular to the print platform (If so, it might cause the filament can't stick to platform or it can't extrude.) We need to adjust the four corners screws of the platform by tighten the screw to clutch the springs or loosen the screw to relax the springs.

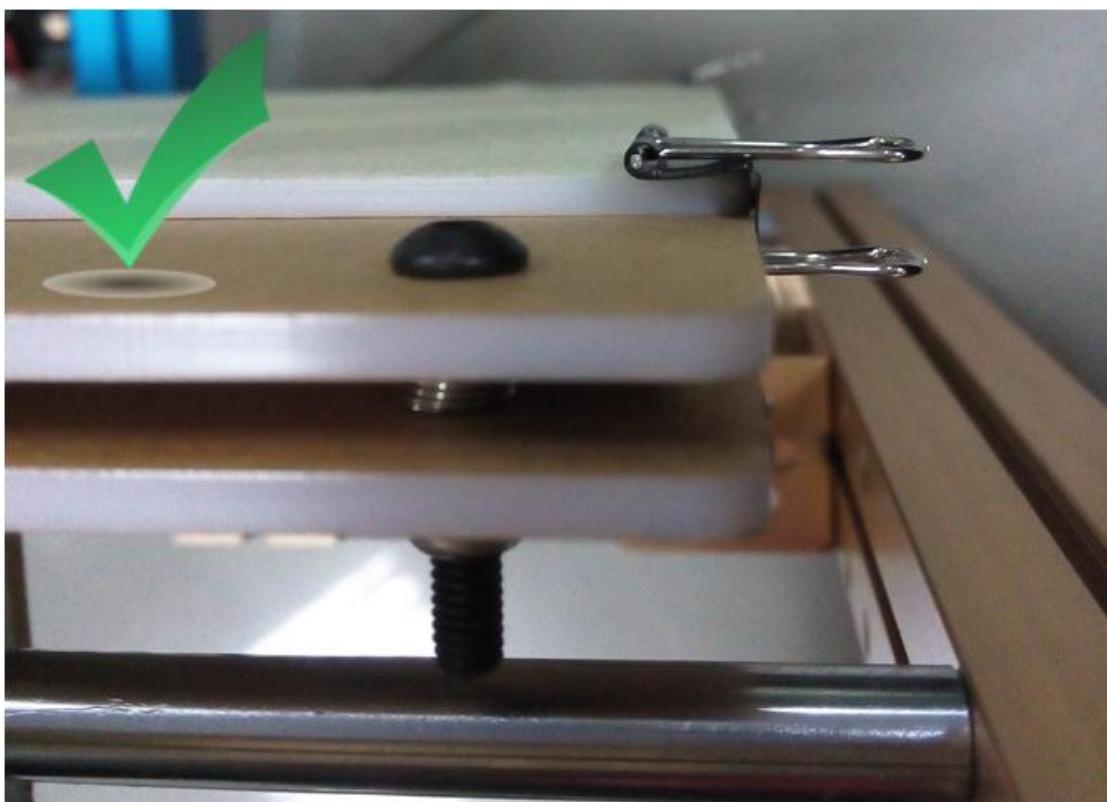
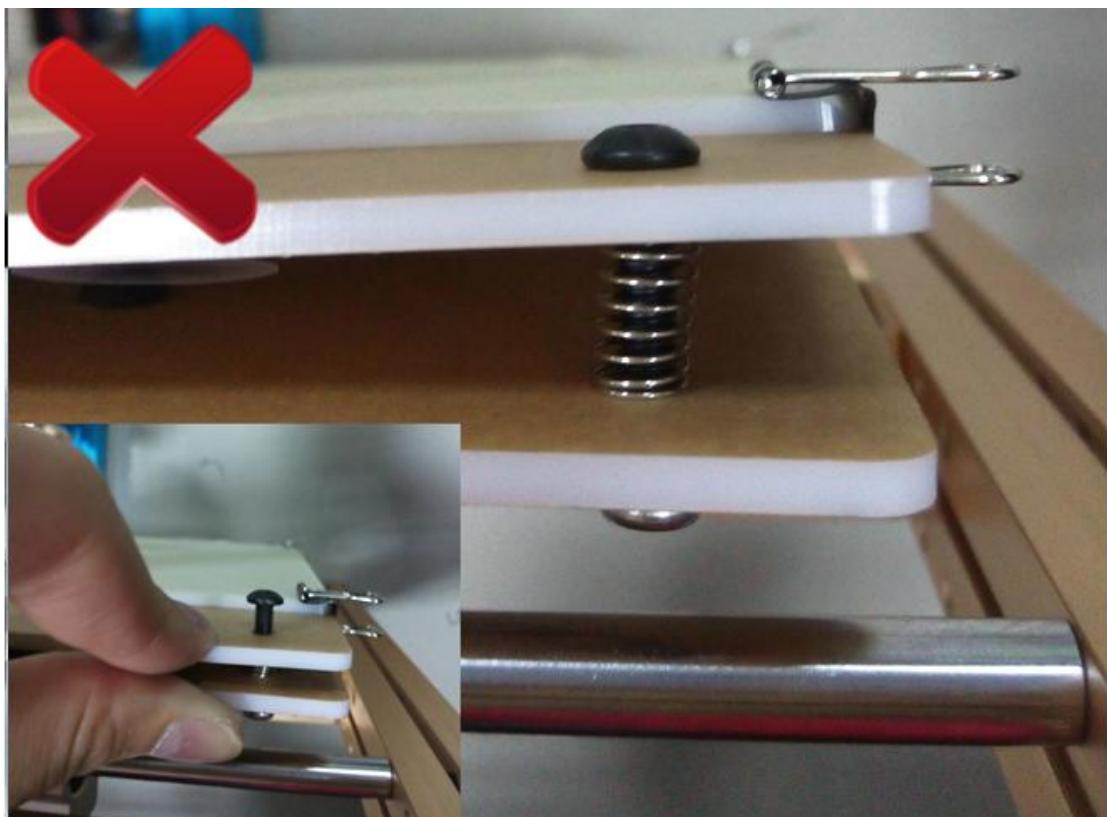


- 1、Before level the print platform please MAKE SURE the nozzle already done level Set. If not, for reference please watch the tutorial video.



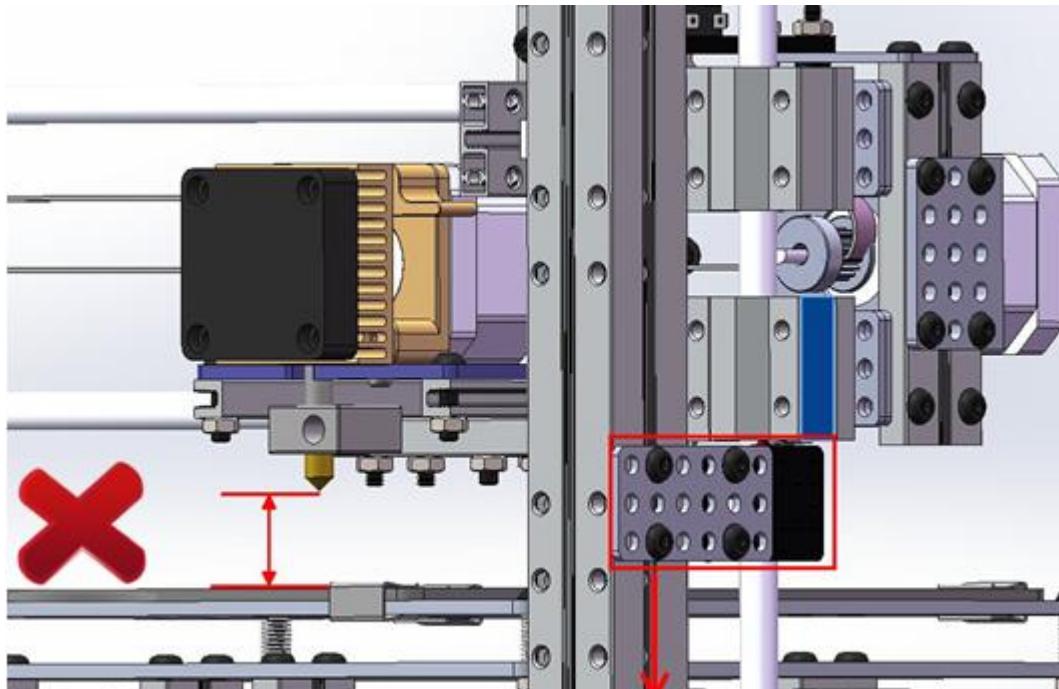
- 2、Before leveling the print platform, please MAKE SURE the four springs are tighten. (It can't be too loose as shown below, or too tighten to shape the board.) Try to adjust the four springs compression at similar levels.

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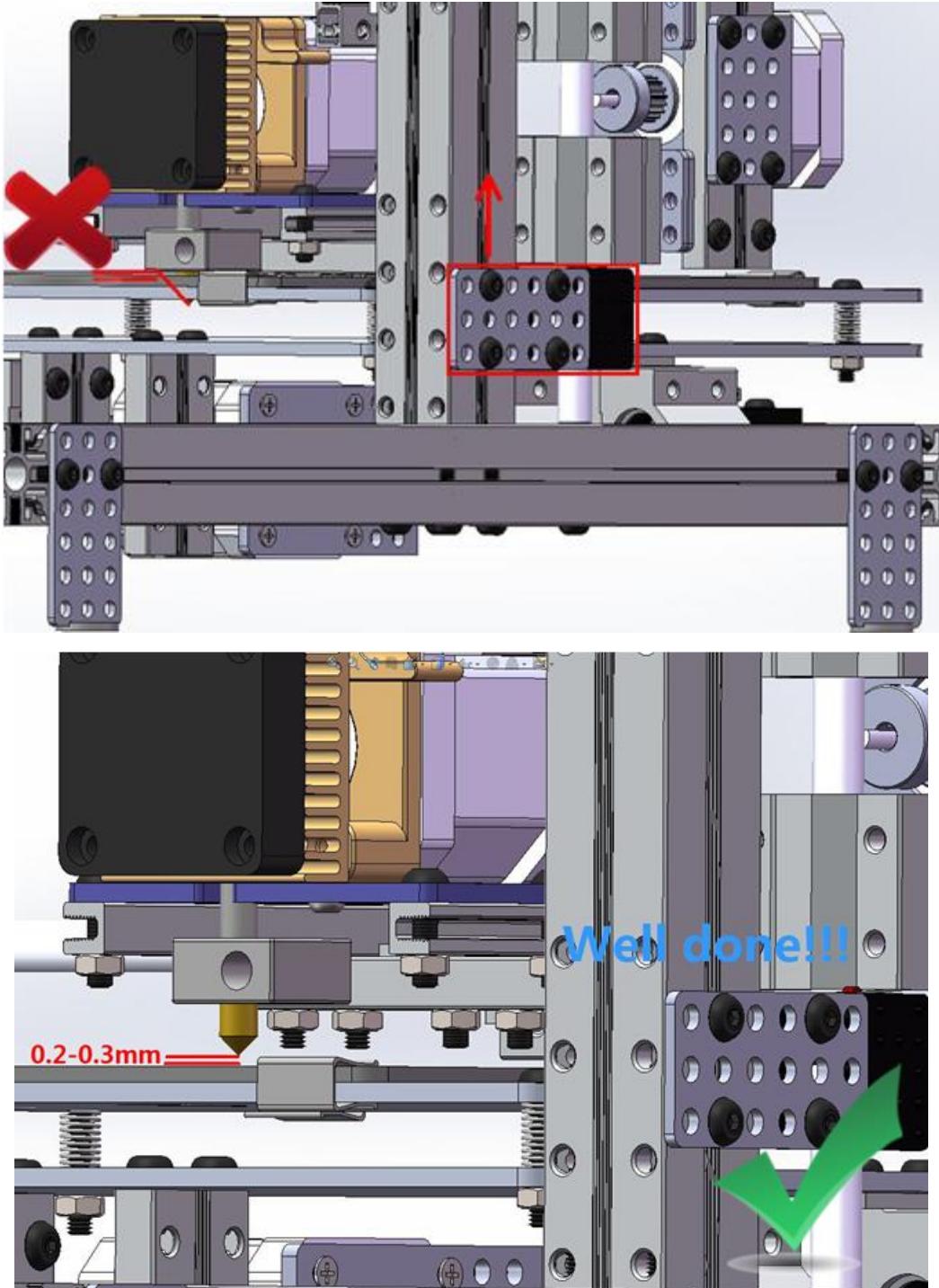
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3、Click  Home button, wait until the machine return back to zero and check the distance between nozzle to platform. If the nozzle is far away from platform, please click  Home button to turn down the Z-axis end stop.



If the nozzle is close to the platform, please click  +Z 10 button to raise the nozzle.

Then raise the Z-axis end stop, click the  Home button again.

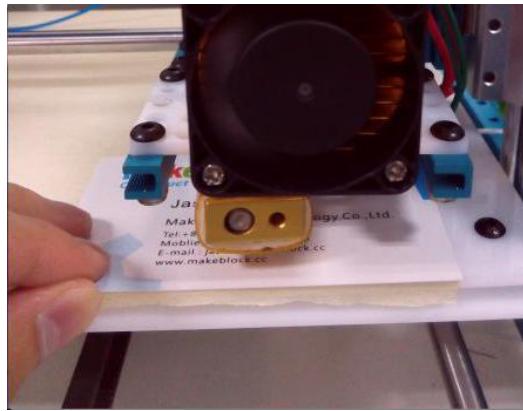


Repeat the adjustment until the distance of nozzle and platform between 0.2-0.3mm.

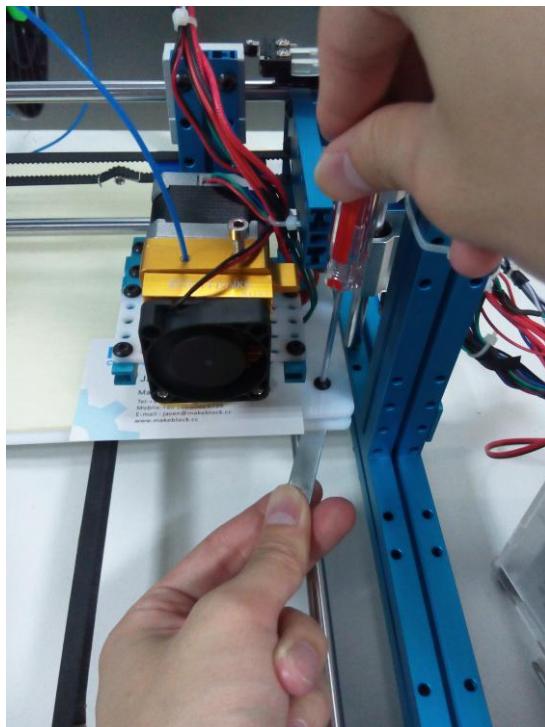
(Note: Why leave a certain distance? The machine prints the first layer, it can pull up smoothly. If too tight, the nozzle will press on the platform surface and can't extrude. If too loose, the filament can't stick to the platform.)

1. You can check the level of the distance between nozzle and platform by using a piece of name card to check the gap under the nozzle.

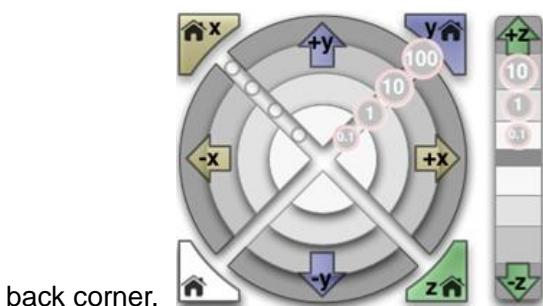
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Tighten or loosen the screw while moving the card between nozzle and platform. Please stopped once you feel the resistance from the gap, it means the distance might close to 0.2-0.3mm.



2. Click the corresponding button on the control panel to move the nozzle on the right back corner.



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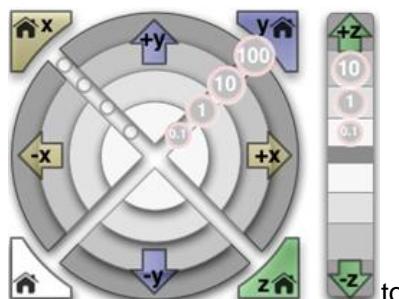
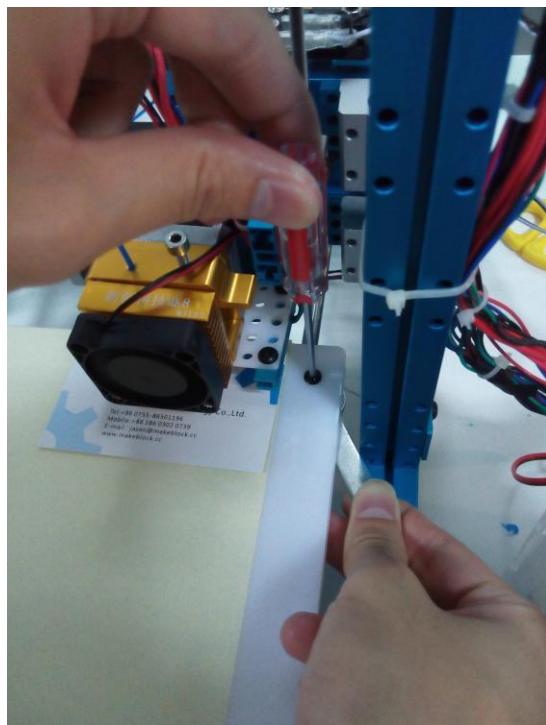
⚠ Please three-click  before this step. (Please raise the nozzle 3mm to avoid scratch the platform)

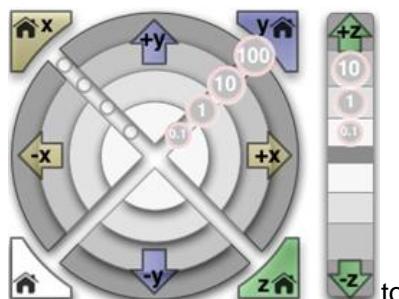
Once you the move the nozzle on the right back corner.

a) Double-click the +y 100  button;

b) Click  Z Home button;

c) Leveling the print platform (Put name card between nozzle and platform, tighten or loosen the screw to make sure the movement of card meet proper resistance.)



3. Click the corresponding button on the control panel  to move the nozzle on the left back corner.





Please three-click **1** before this step. (Please raise the nozzle 3mm to avoid scratch the platform)

Once you the move the nozzle on the left back corner.

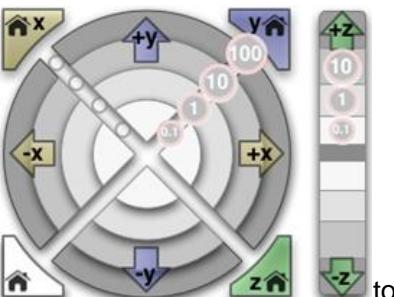
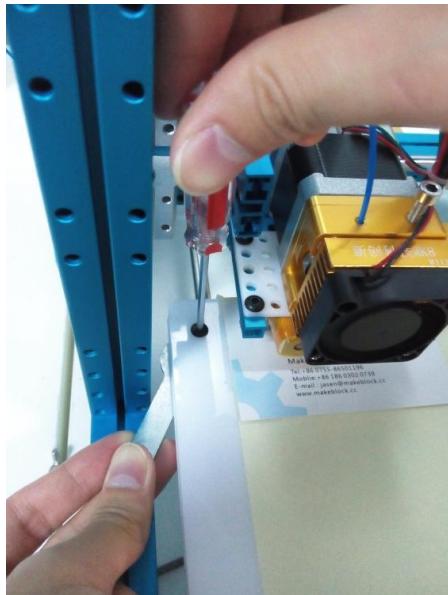


a) Double-click the **-x 100** button;



b) Click **Z Home** button;

c) Leveling the print platform (Put name card between nozzle and platform, tighten or loosen the screw to make sure the movement of card meet proper resistance.)



4. Click the corresponding button on the control panel to move the nozzle on the left corner.

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⚠ Please three-click before this step. (Please raise the nozzle 3mm to avoid scratch the platform)

Once you the move the nozzle on the left corner.

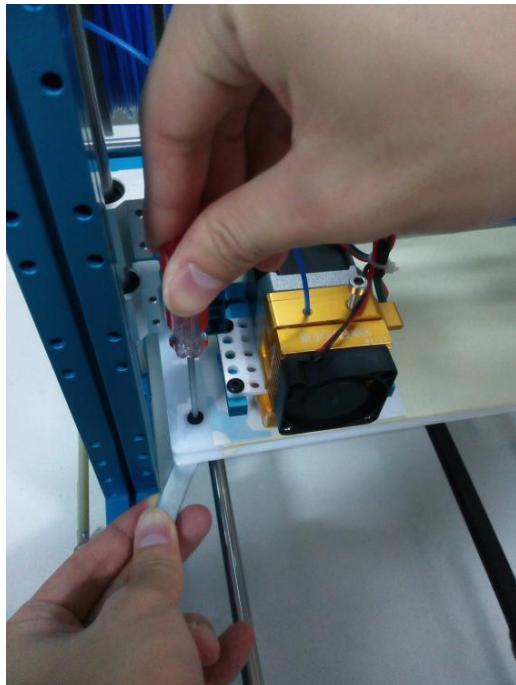


a) Click **Y Home button**



b) Click **Z Home button;**

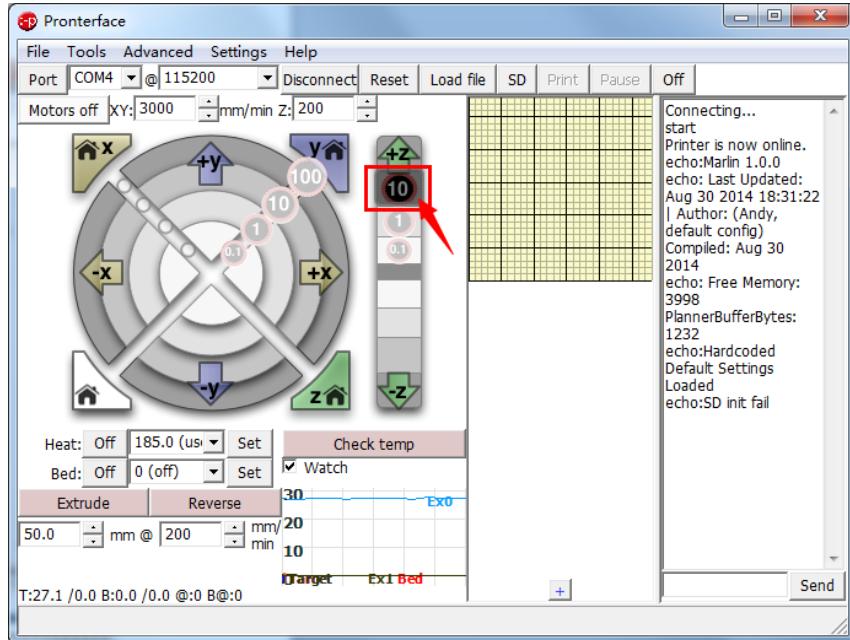
c) Leveling the print platform (Put name card between nozzle and platform, tighten or loosen the screw to make sure the movement of card meet proper resistance.)



Congratulations , as now, you have leveled the print platform.

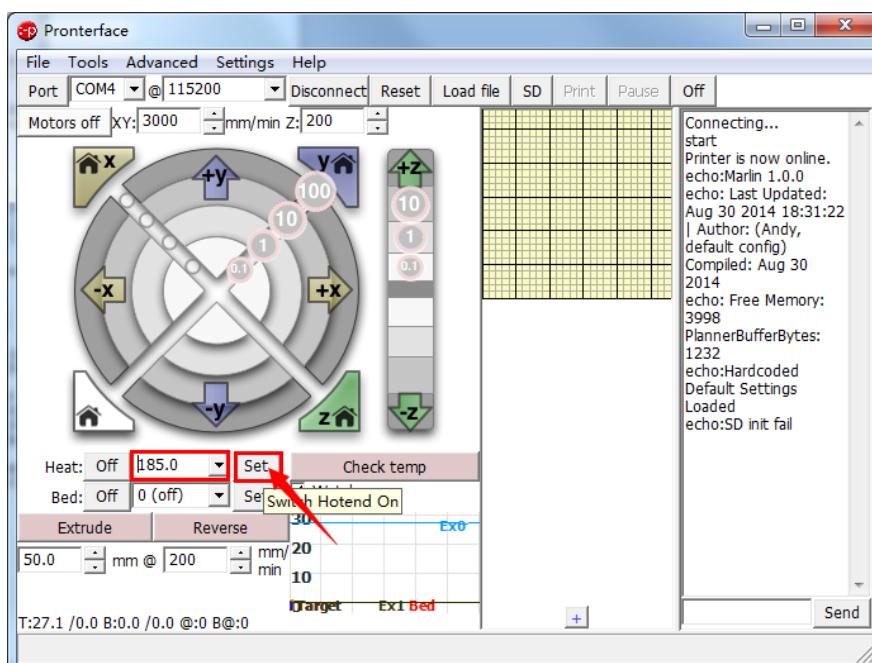
4.3.3 Testing the extruder with filament

1、Click +z 10 button  to raise the nozzle 10mm to avoid scratch the platform.



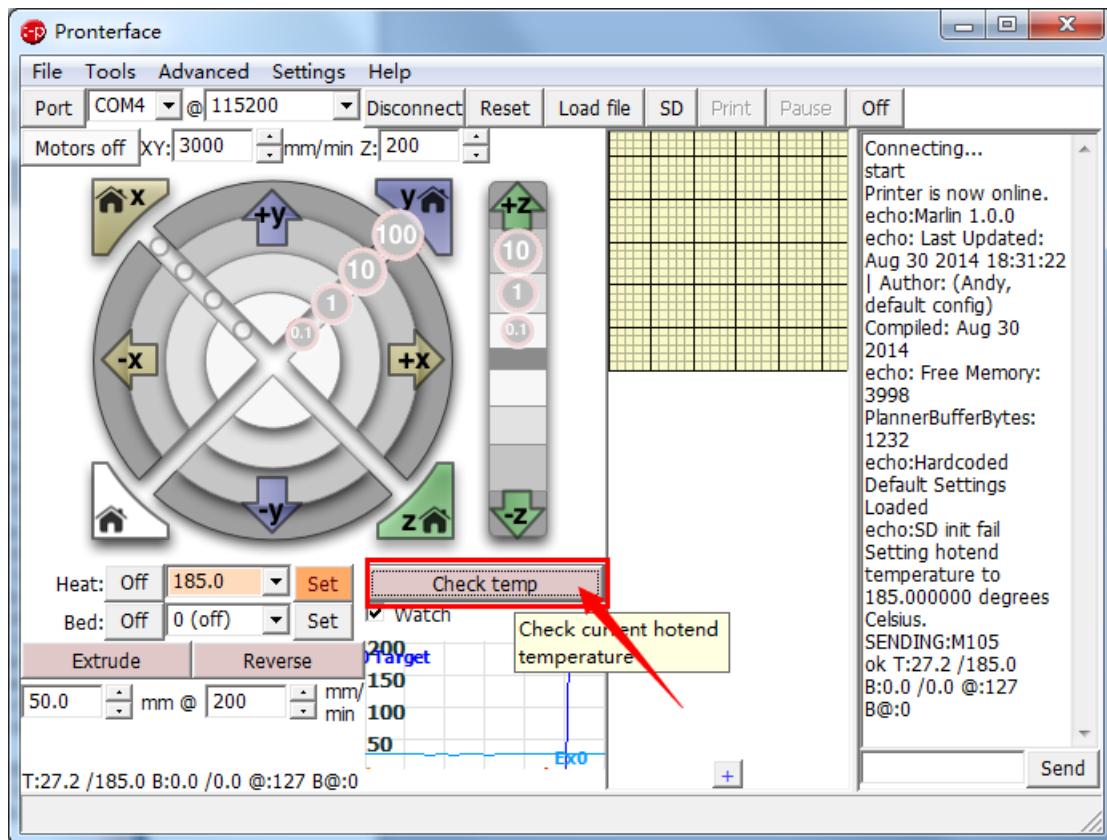
2. Click the drop-down box on the right of Heat option.

- a) Select the temperature you need
- b) Click Set button

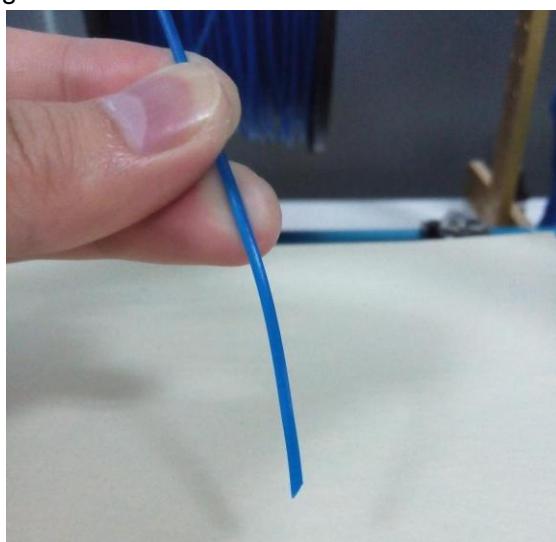


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- Click “Check temp” button to inquire the temperature of nozzle. The current nozzle temperature will display on the lower left area. If the temperature is not rising, please check if the nozzle and thermocouples wirings are correct.

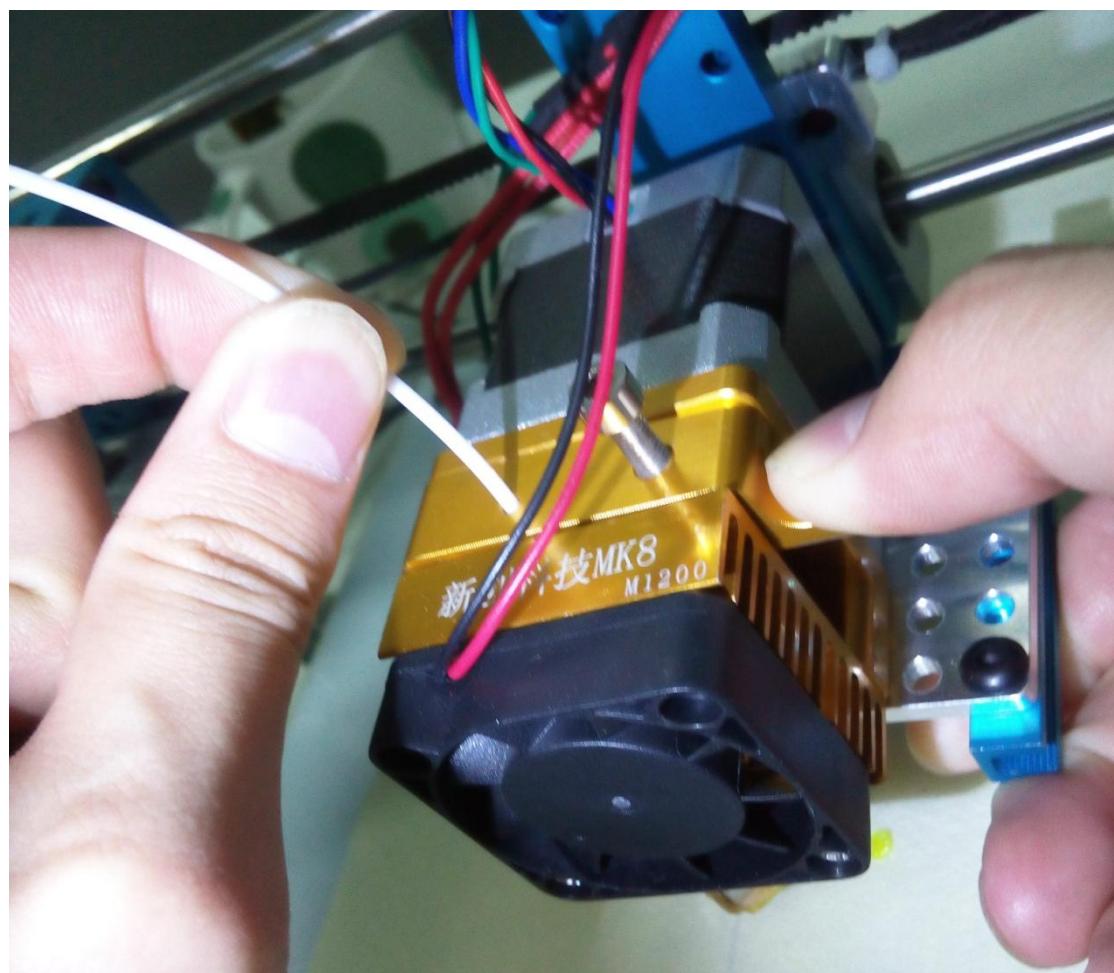
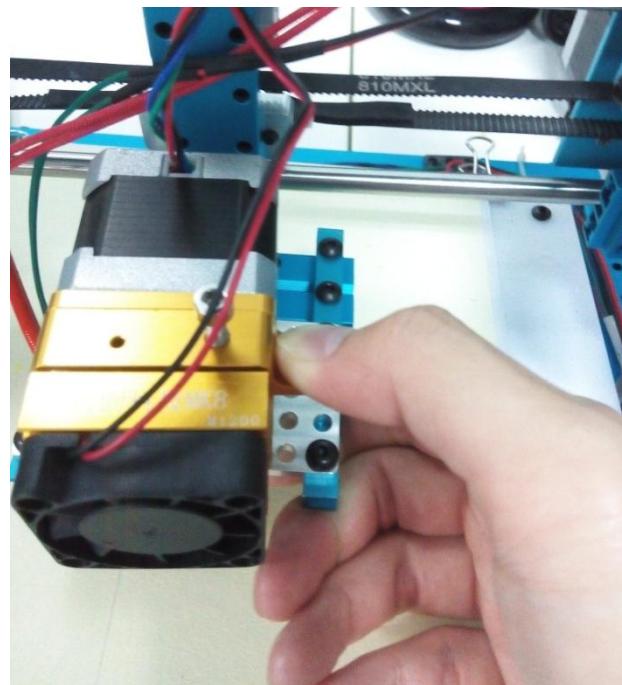


- Suppose the objective temperature is 185 degree, when the temperature approach to 185 degree, then fills the filament into the nozzle. Cut the filament at an angle of 45 degrees, and straighten the filament.



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5. Press the gold clip of nozzle by the right hand; insert the filament into the extruder by left hand. Press down the filament slowly to watch if the extruder can fill up the PLA stick and release your right hand.

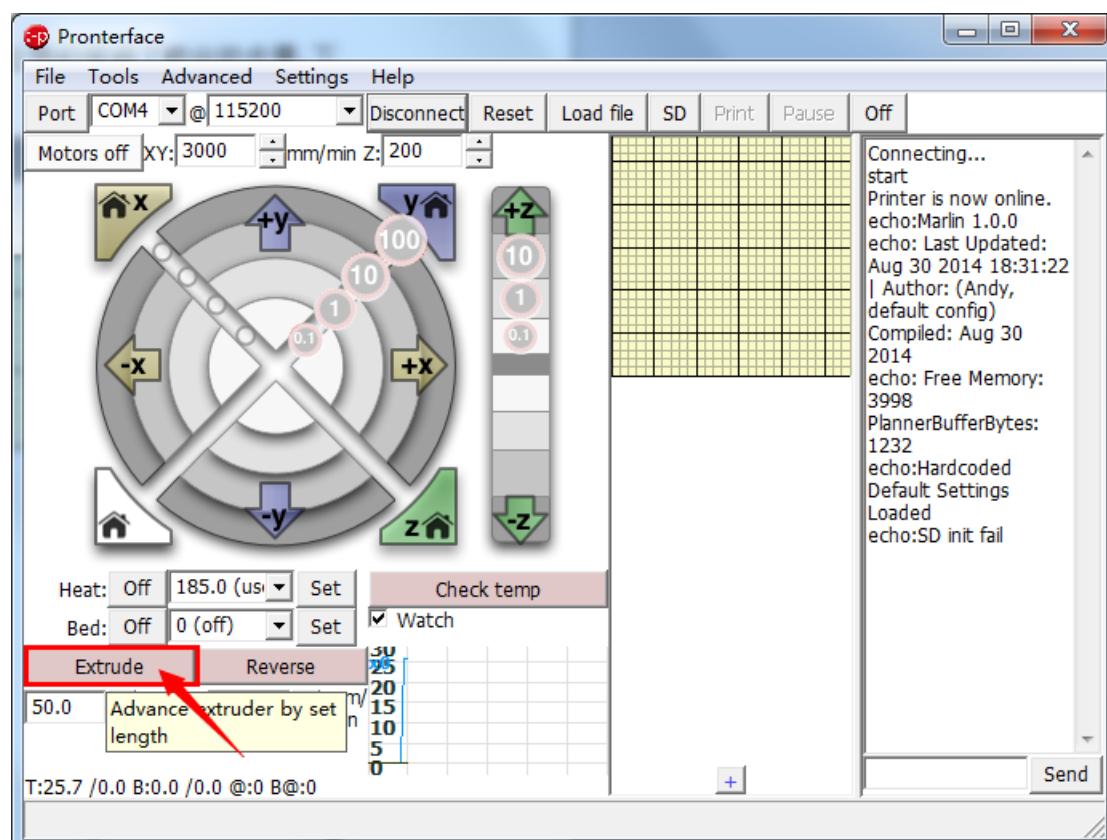


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6. Click *Extrude* button to check if the stick can pull out by motor. If the filament moves to the opposite direction, please check if the motor wiring is correct.

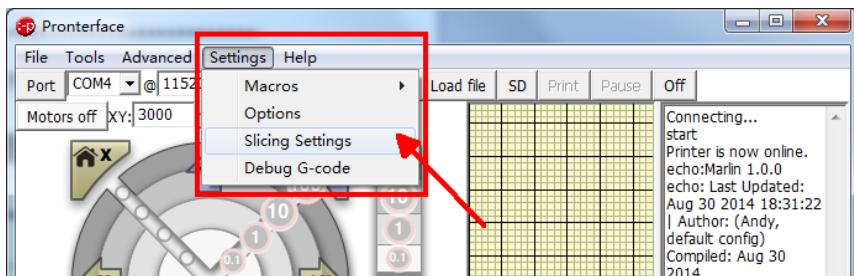
Reverse button is used for extrude out the filament, normally we will use this button when we need to replace the filament.

Be careful to avoid be burned by nozzle. Use the tweezers to clear up the extruded filament. Now we complete the fill up the nozzle step.

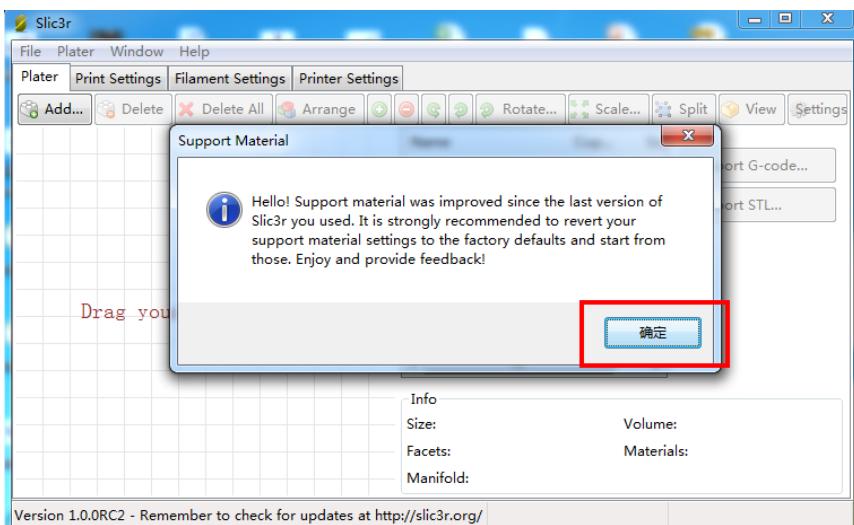


4.3.4 Software slice convert into GCODE

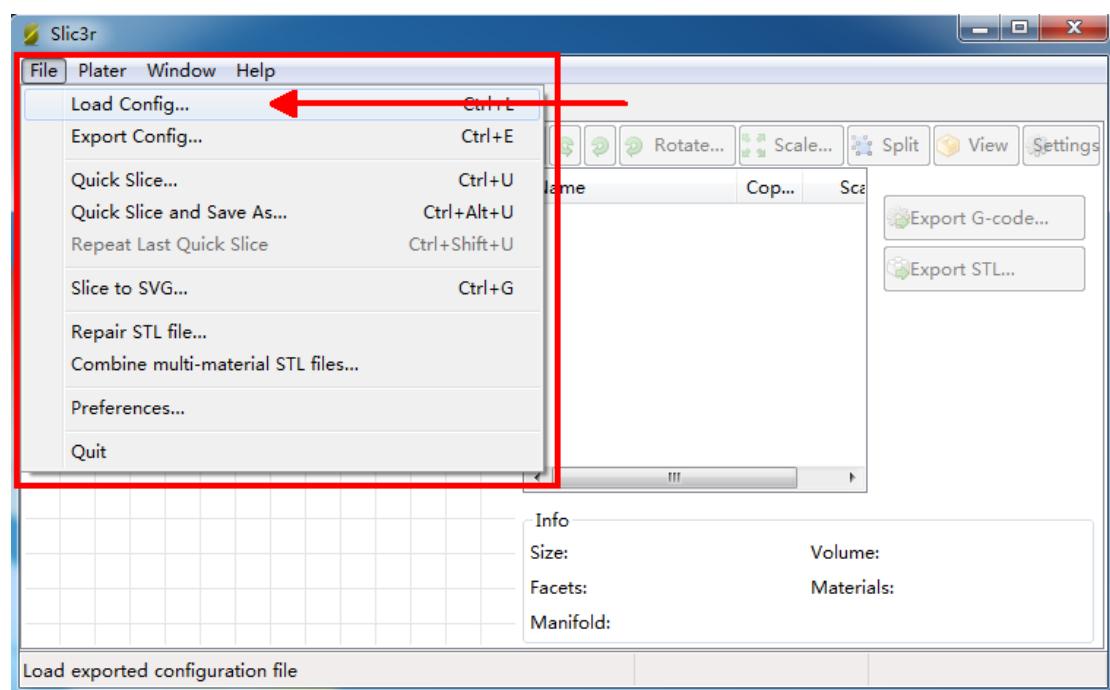
1、Open the software Slic3r. Click "setting" - "Slicing Settings"



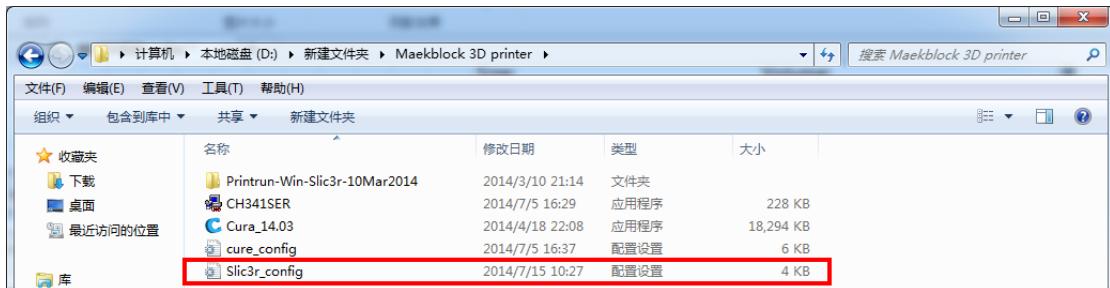
2、Click OK on the popup window



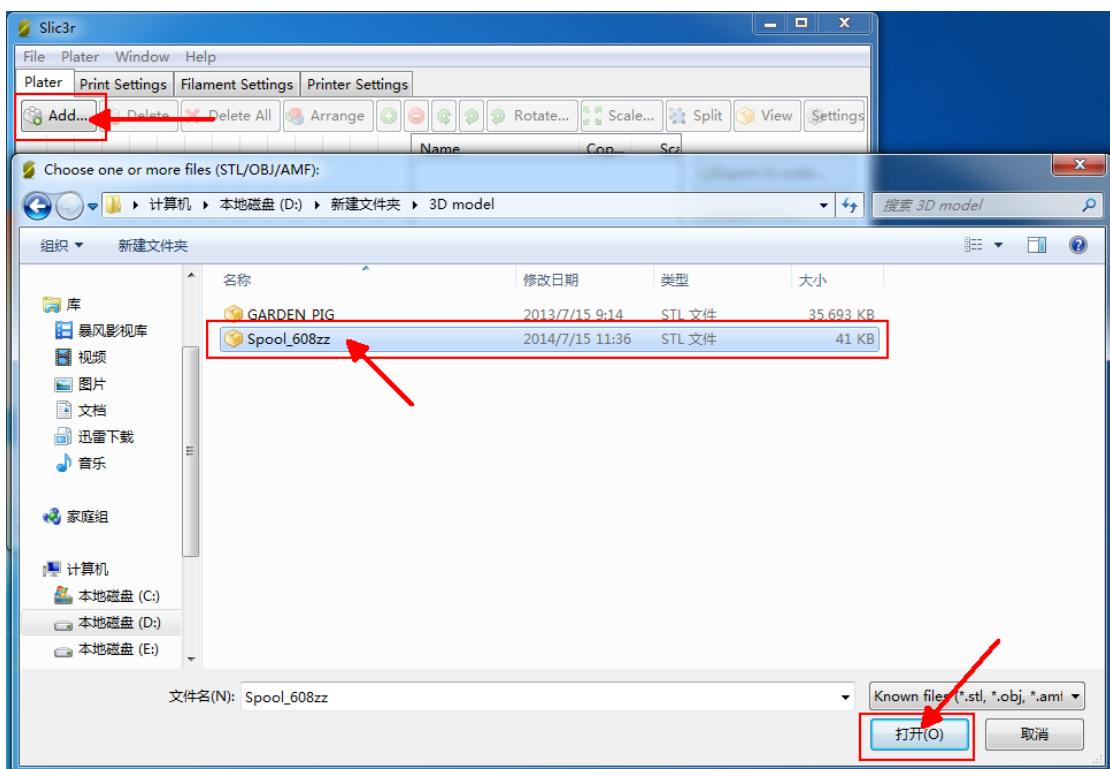
3、Click "File"-> "Load Config" to load the file "slic3r_config" included in the resource package.



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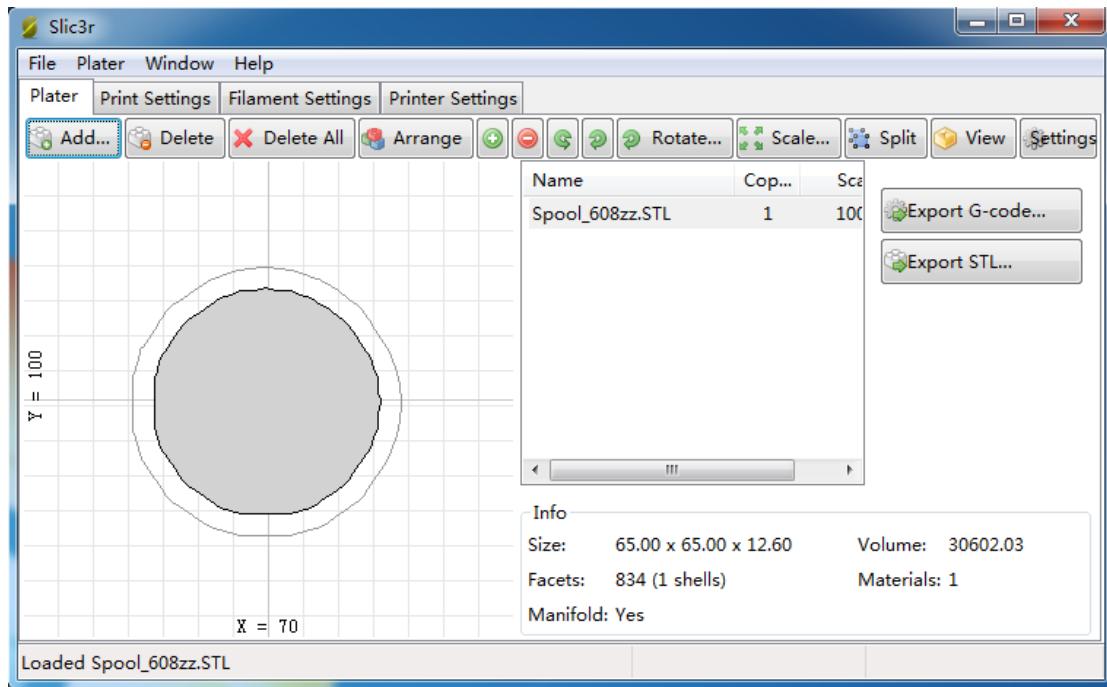


4. Click *Add* button and select the 3D model (The format requires STL) and click *Open* button.

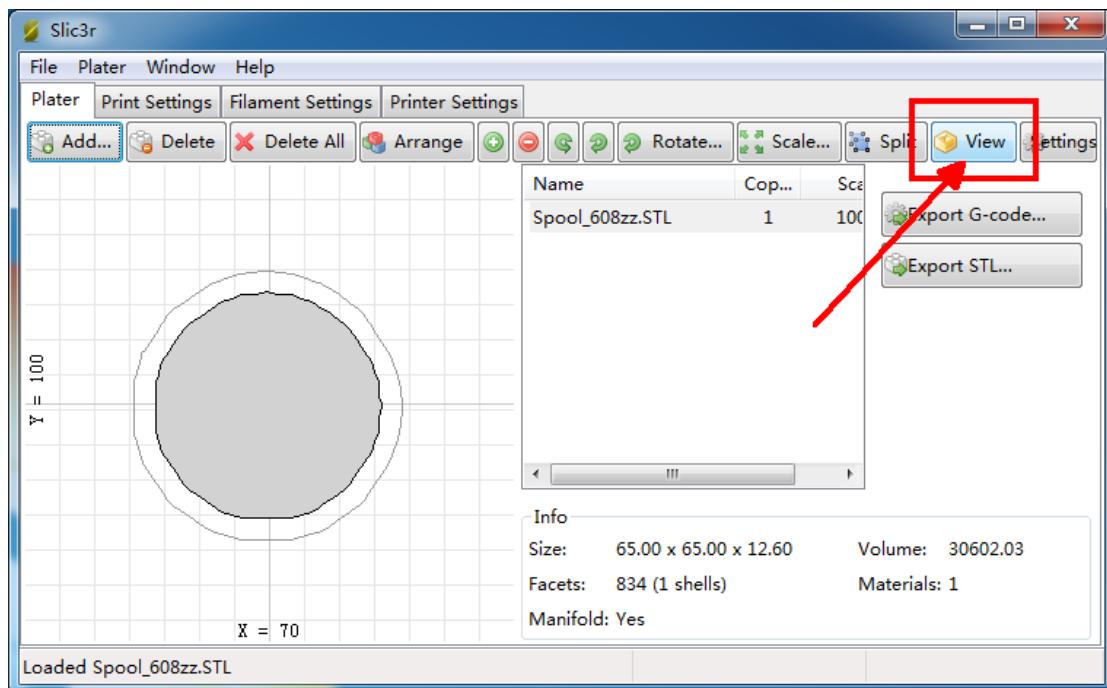


5、Then you will see the 3D model from the top view

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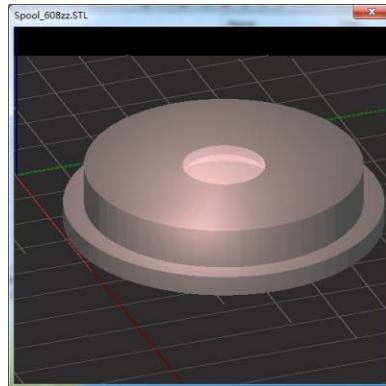


6、Click "View" button to check the 3D model file.

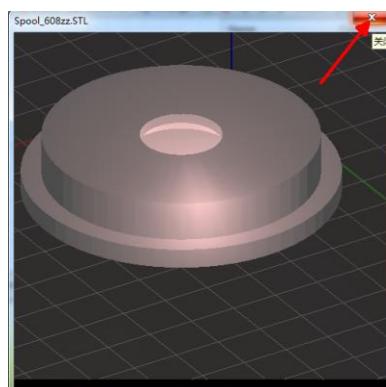


7、Then you can use your mouse to drag the 3D model to see it from different view.

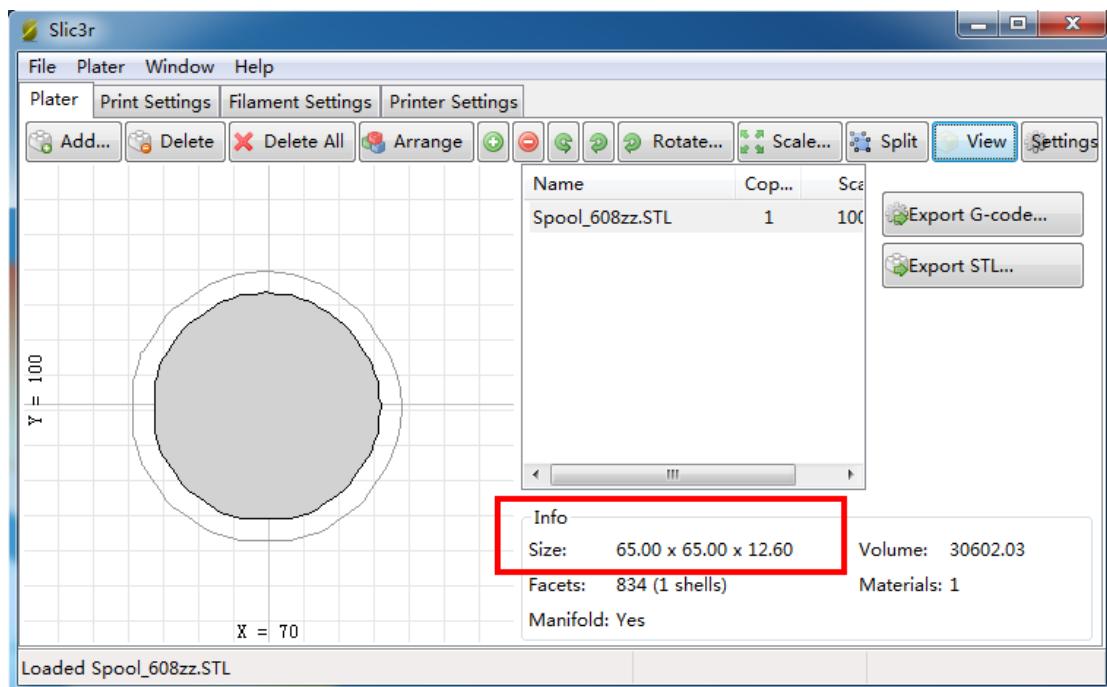
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Close the popup window.

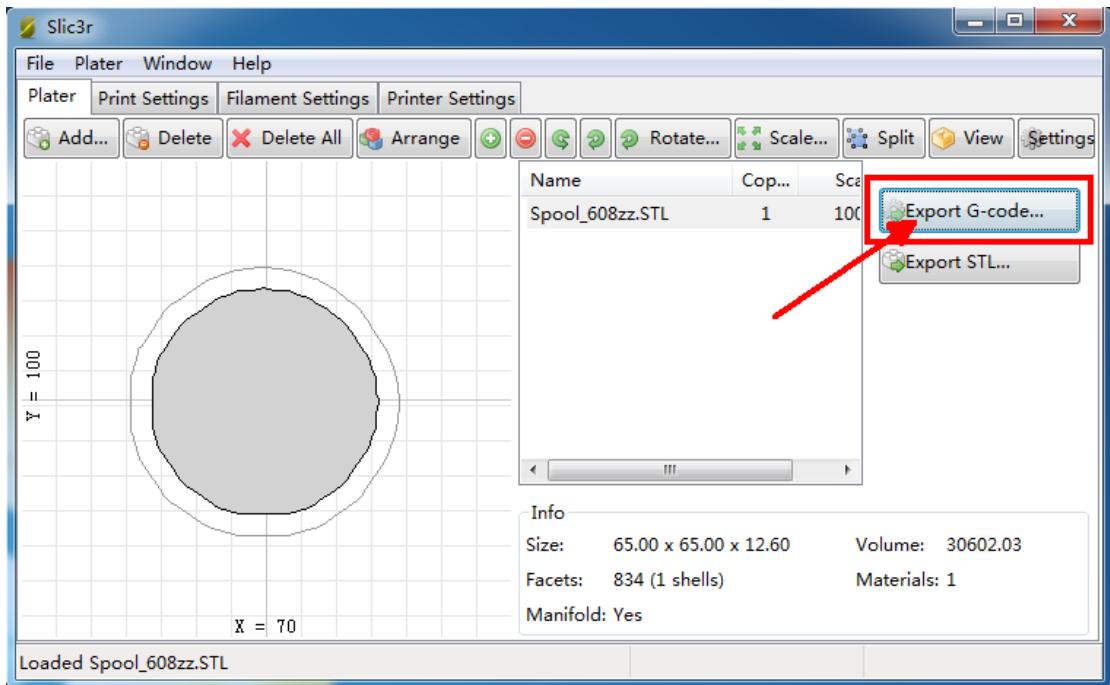


8、The info panel has shown more details about the model. The printing area of 3D printer is limited 125mm x 165mm x 120mm (WxDxH).

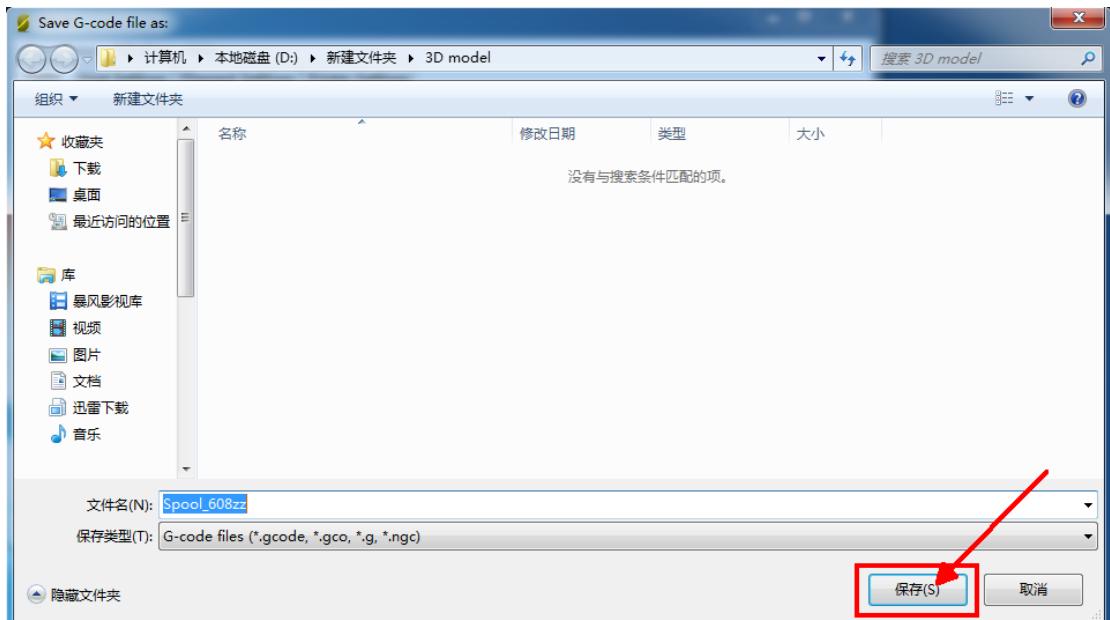


9、Click the button " Export G-code " to generate the G-code of the model.

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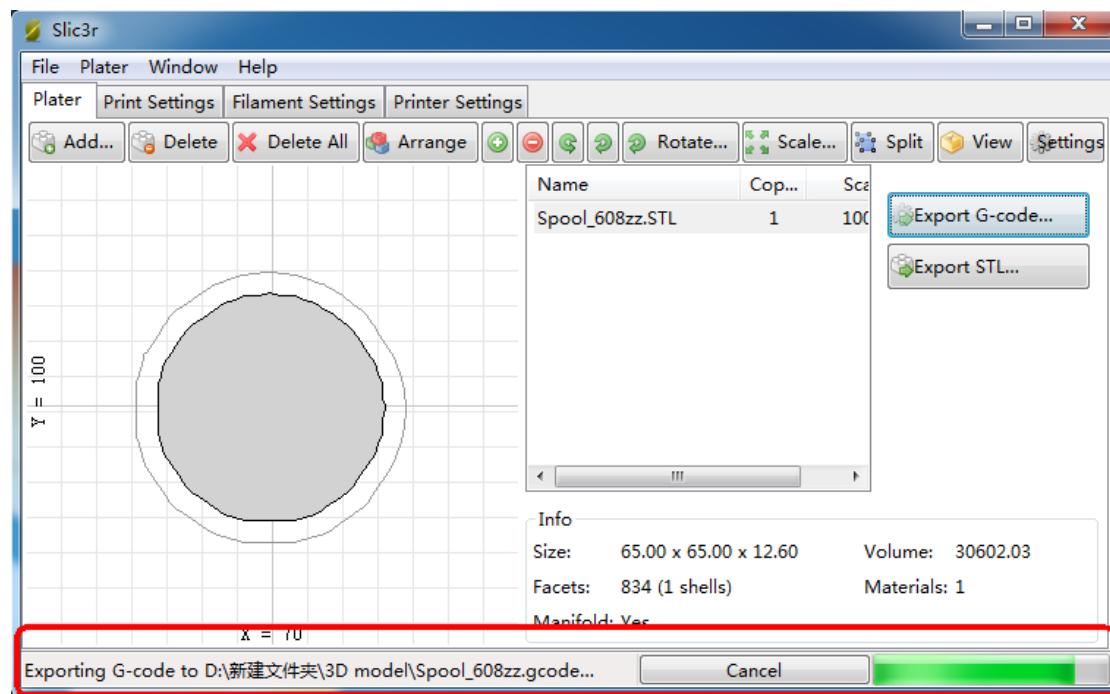


save, please remember the path, you will need to load the G-code file from this path.

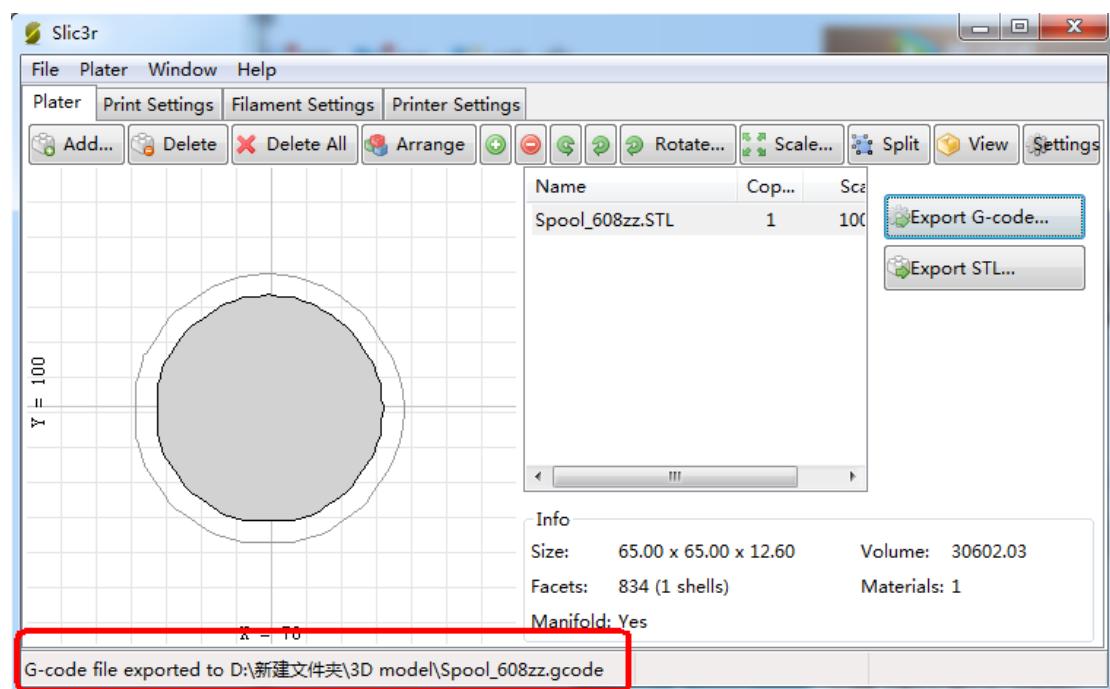


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In the processing

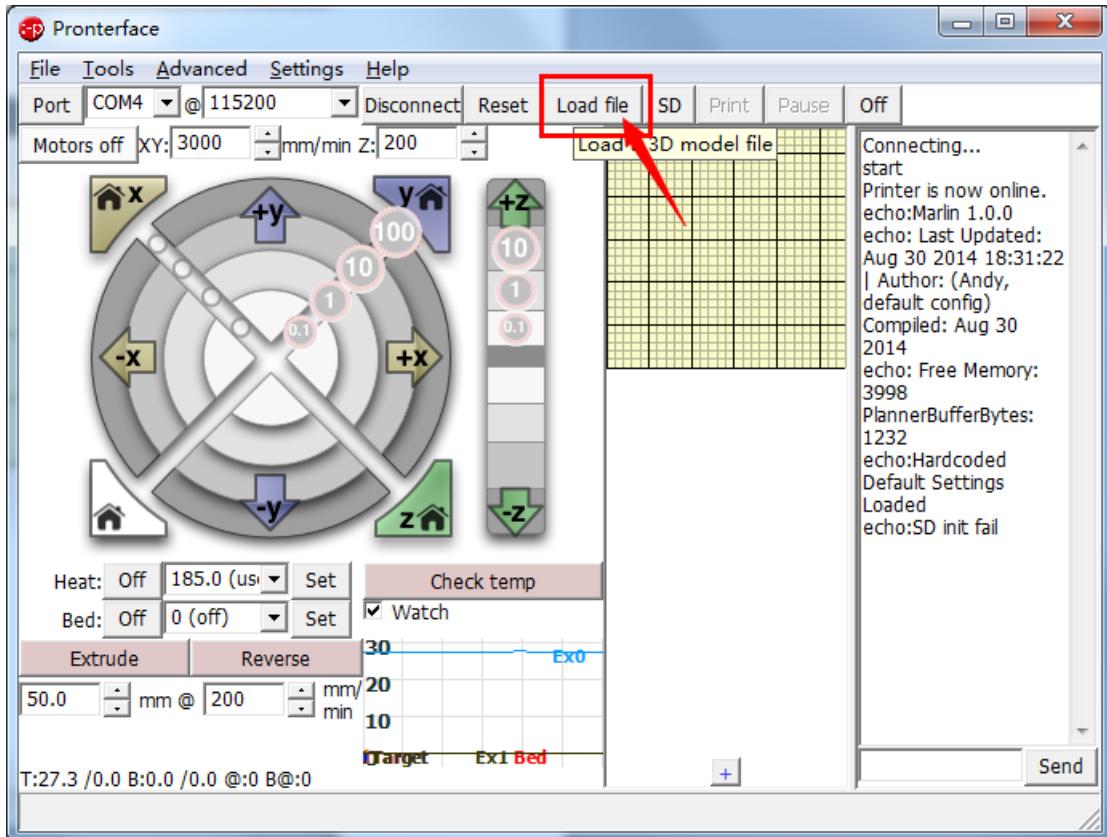


Done.

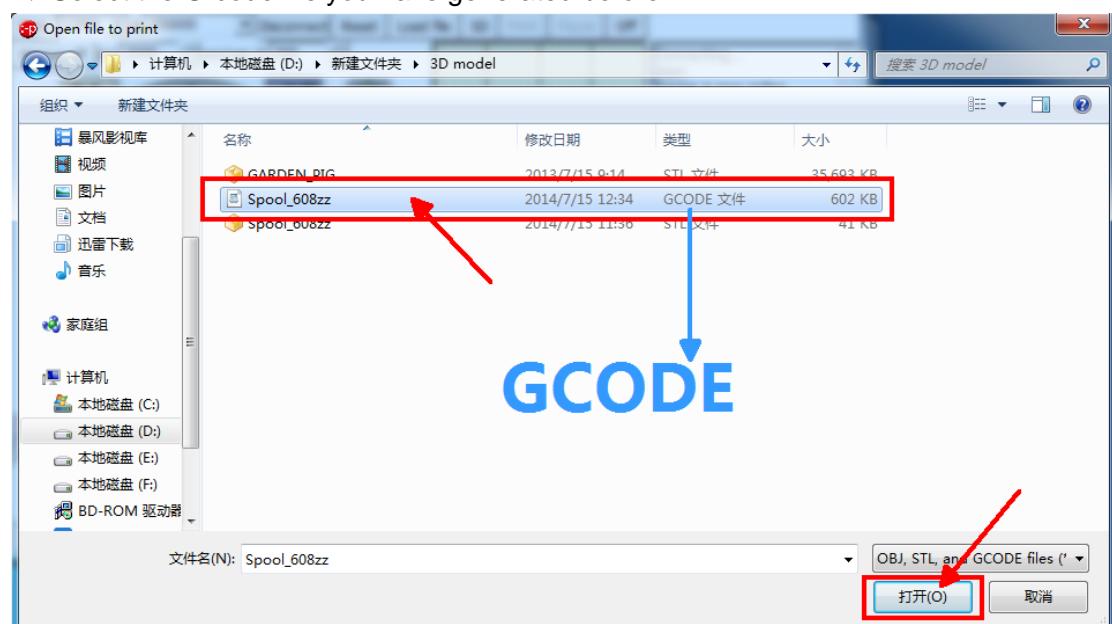


4.3.5 Load G-Code file to print

1、Click the button “Load file”

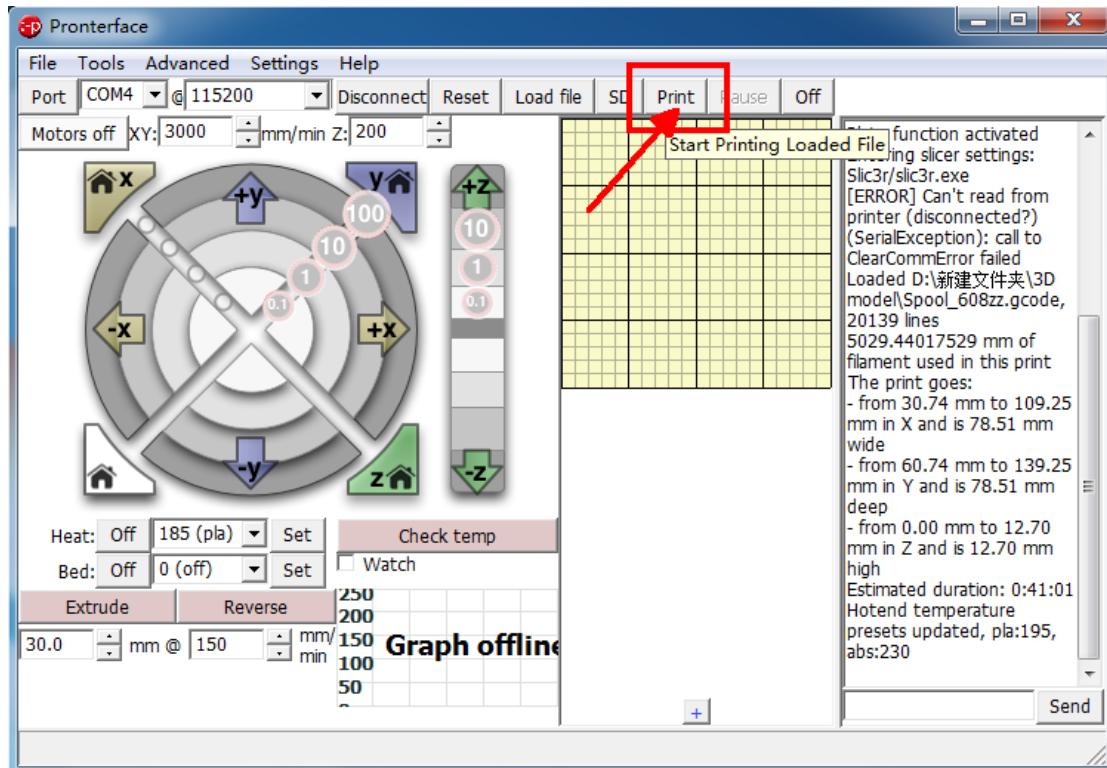


2、Select the G-code file you have generated before.



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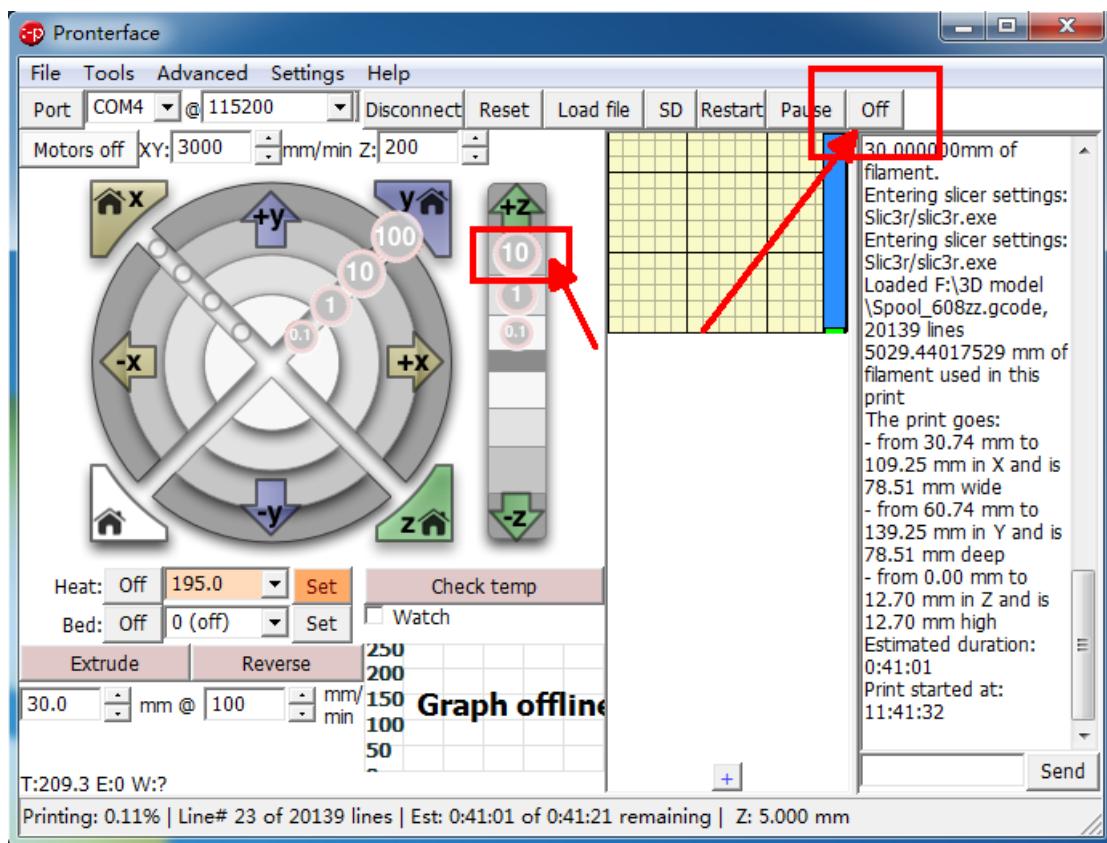
3. Click the button "Print" and wait for a few minutes to let the nozzle increase to the target temperature(185°C)



4. When printing, if you find the distance between the nozzle and bed is too far or too close to influence the printing results, you may need to redo the bed leveling process from your current.

Suggested: you should click the button "off" to stop the 3D printer for avoiding scald before you start to adjust.

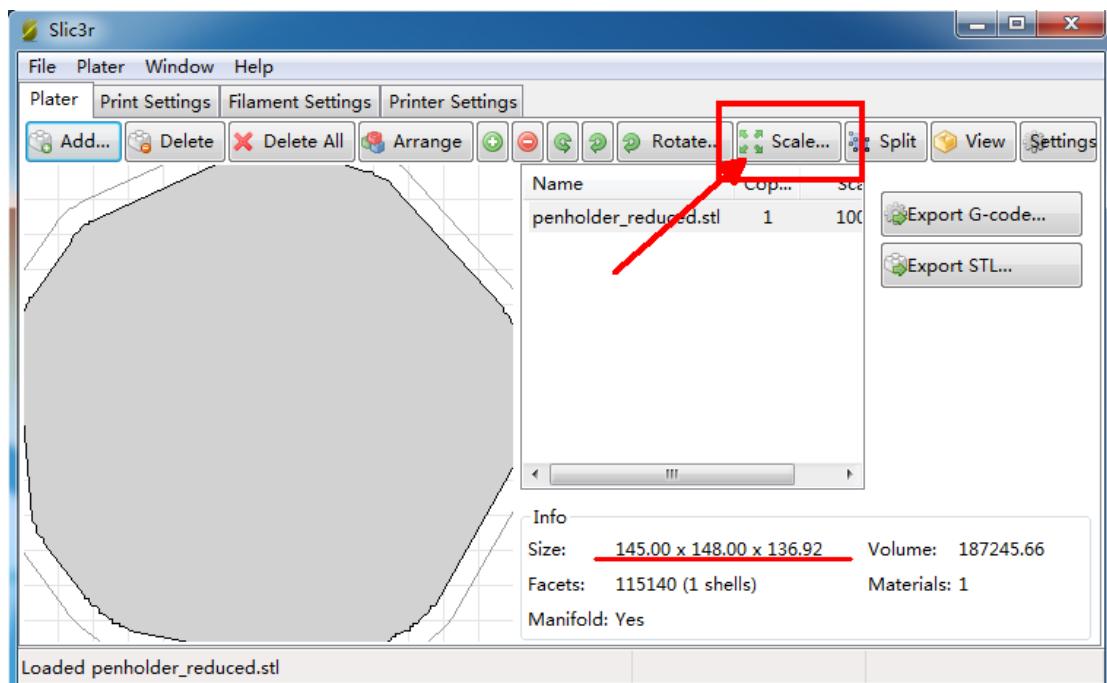
Makeblock Constructor I 3D Printer Kit



4.3.6 Additional suggestions

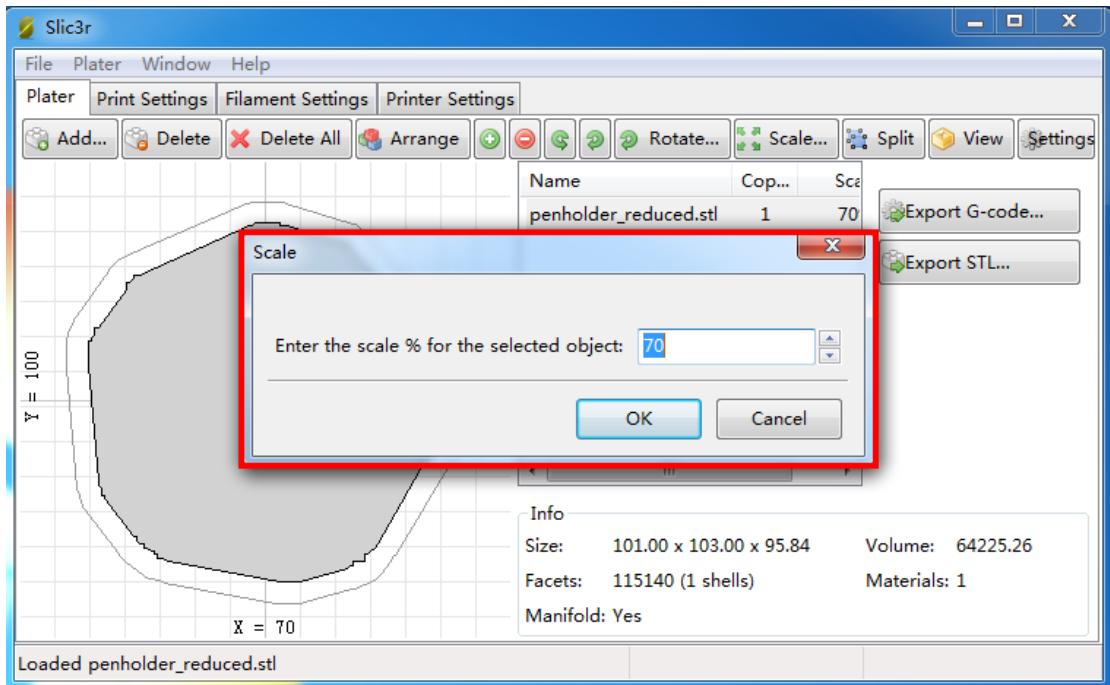
The build area of Construtor I 3D printer is 125mm x 165mm x 120mm(WxDxH). If you find the model you will print is out of range, you can scale the model.

(1) Click the button "Scale"

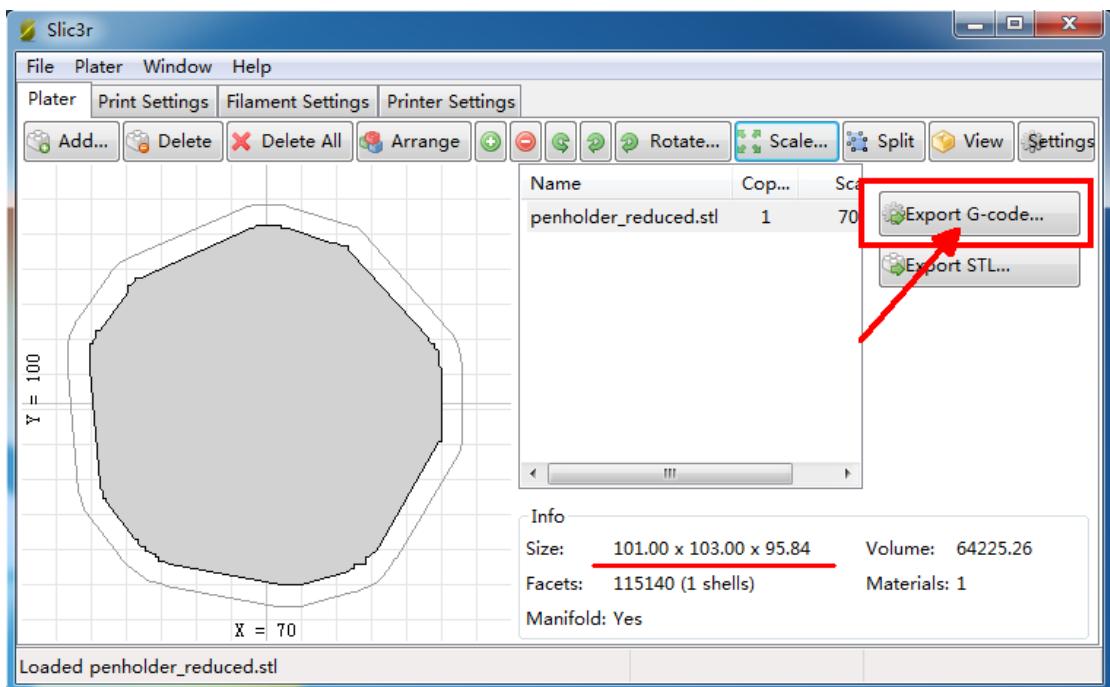


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(2) Enter the scale % for the selected object.



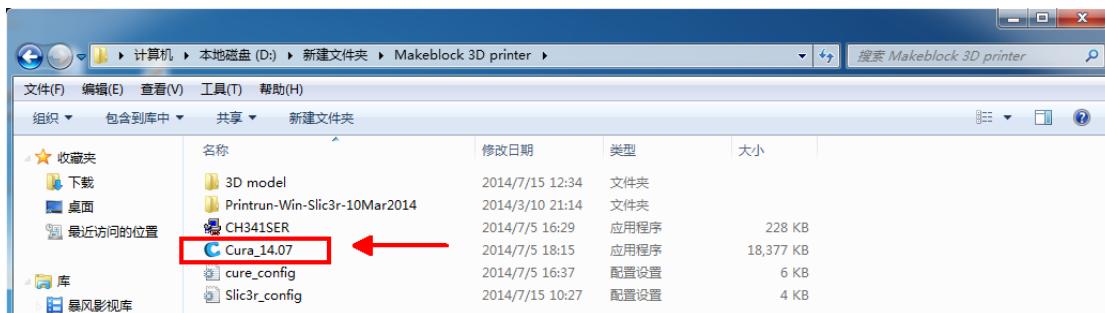
Make sure the size is in the range 125mm x 165mm x 120mm(WxDxH), then click the button "Export G-code" to generate the G-code of the model.



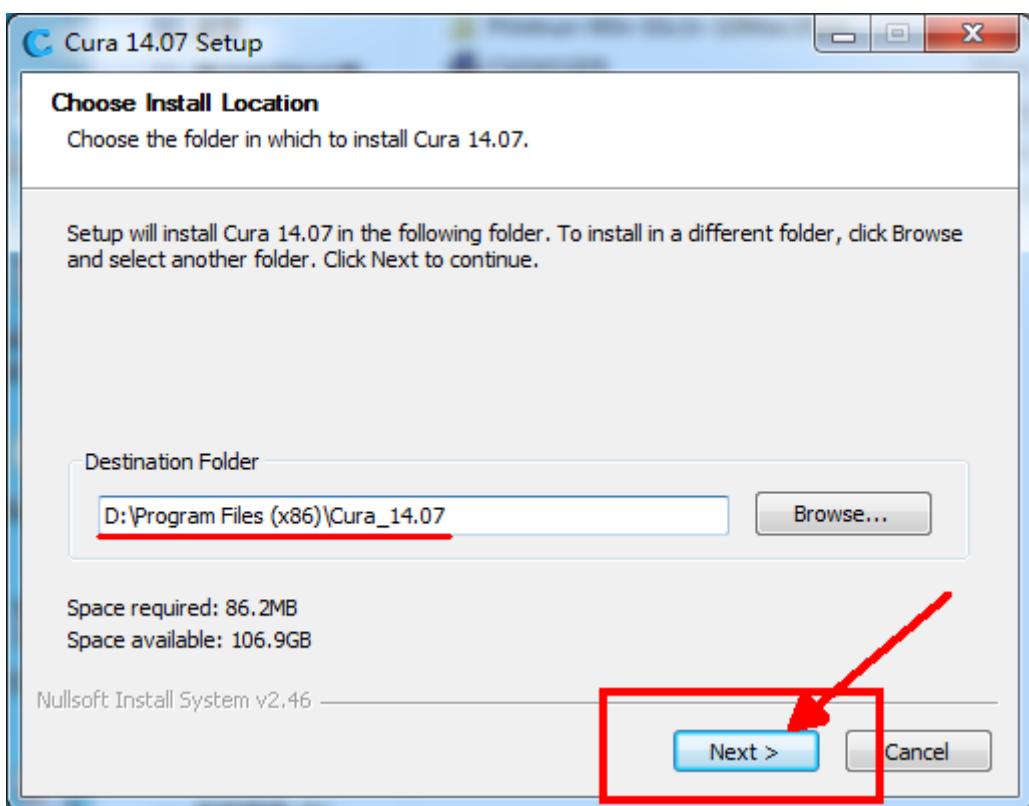
4.4 Cura software guide

4.4.1 Cura Installation

1.The software Cura has been included in the resource package you downloaded.

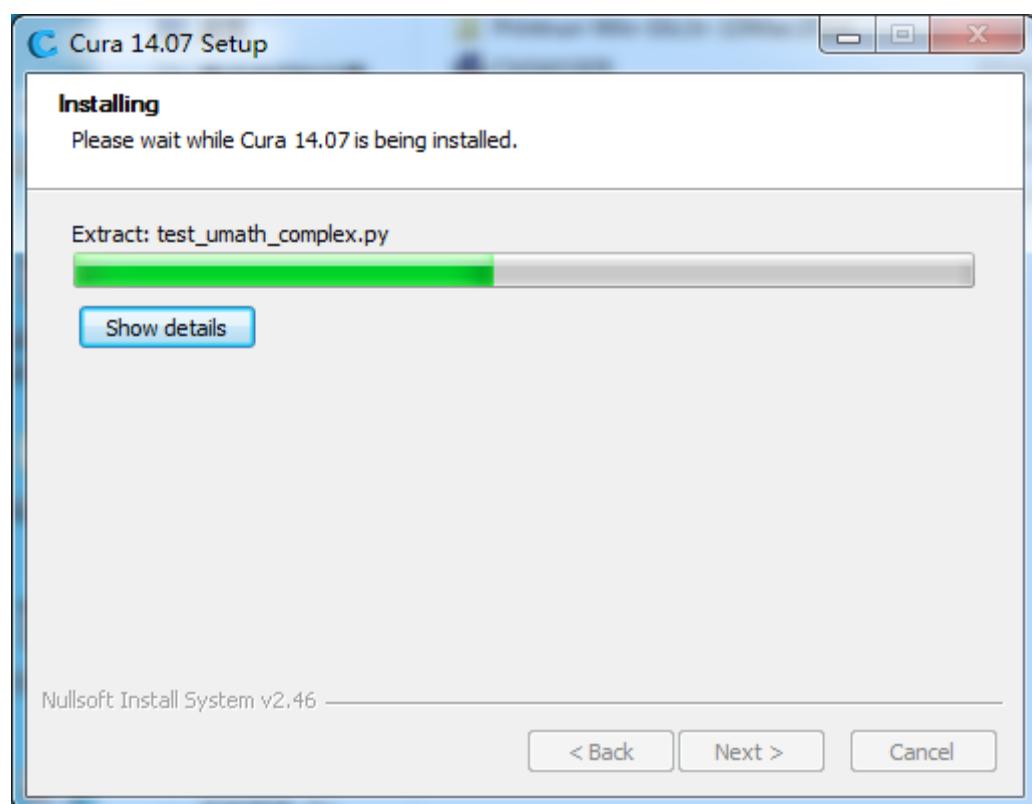
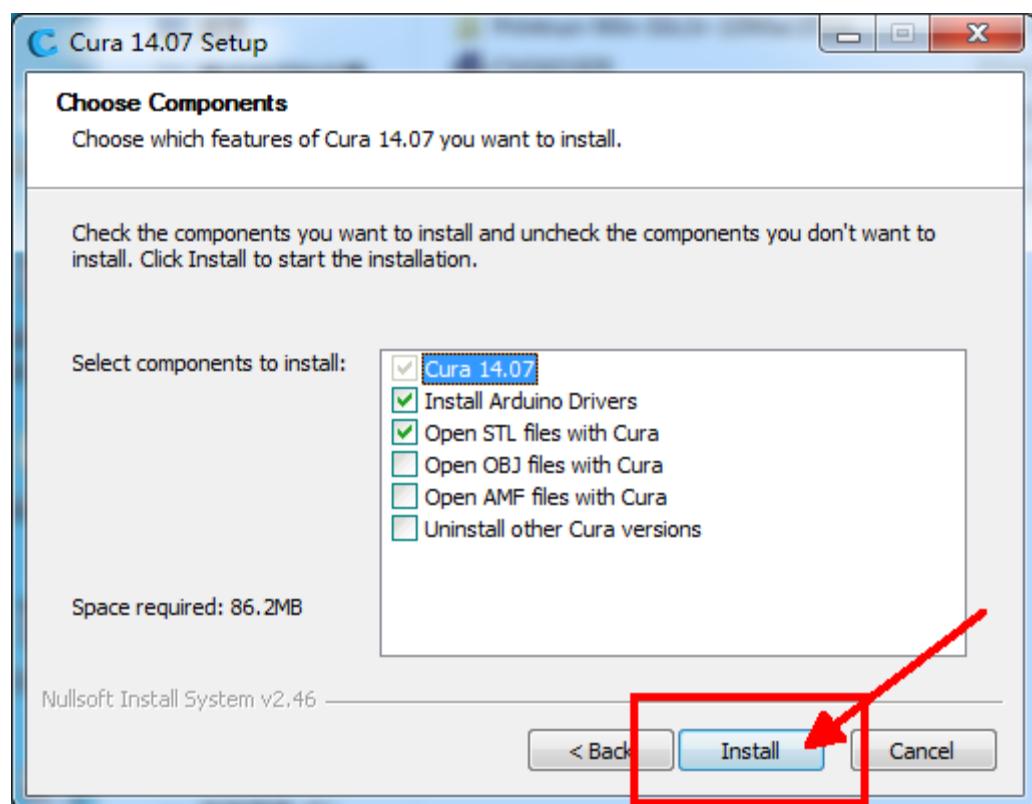


2.Click the button "Next".



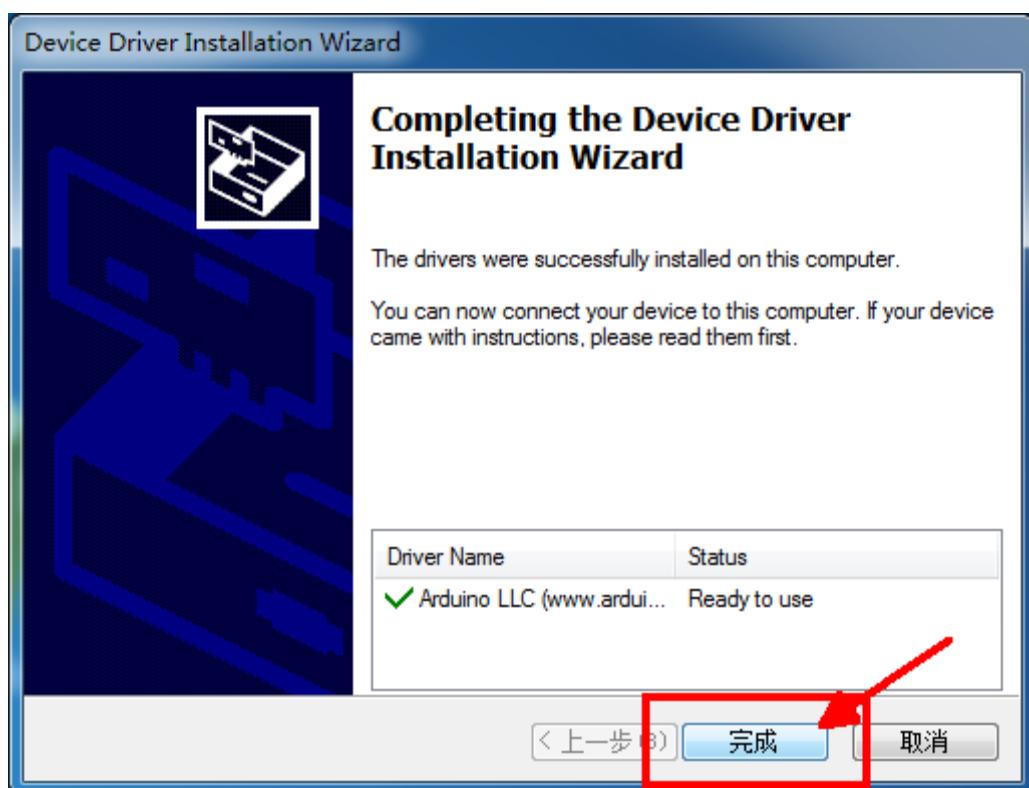
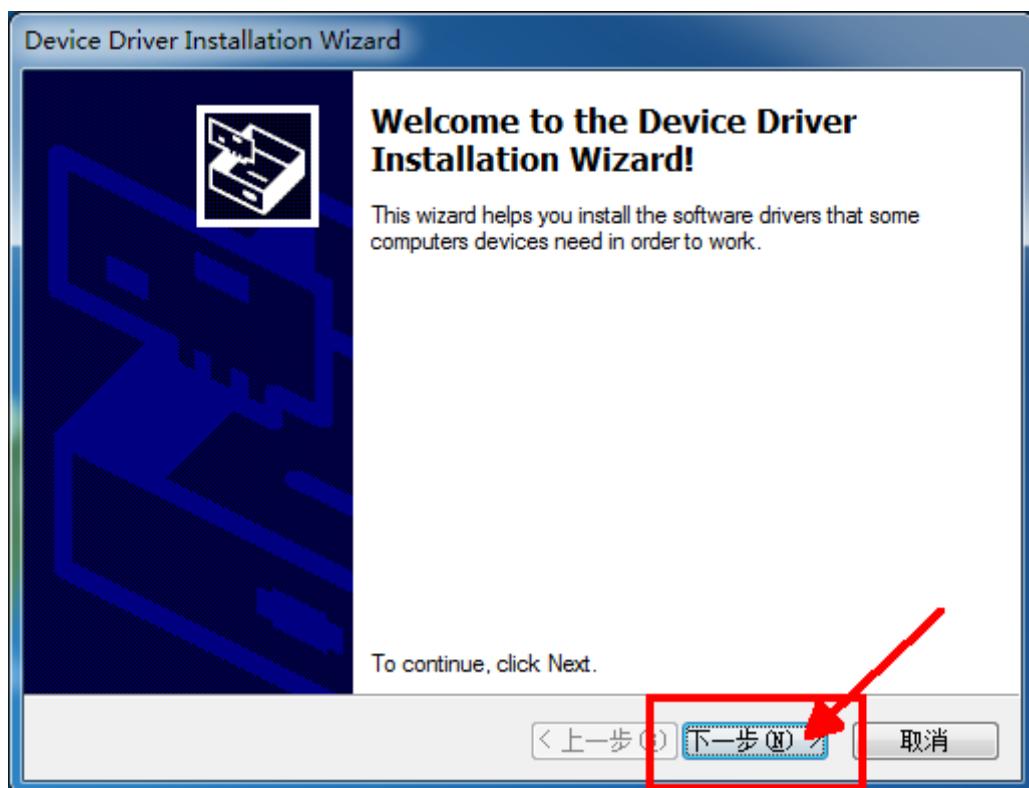
Makeblock Constructor I 3D Printer Kit

Click the button "Install"

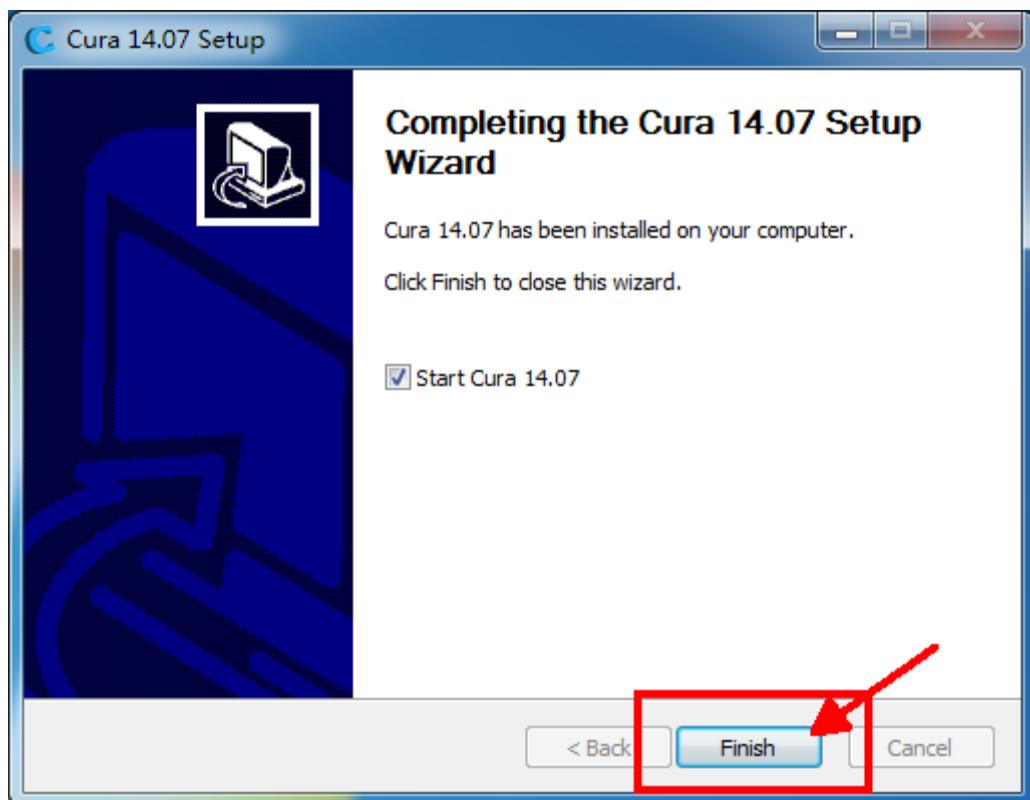
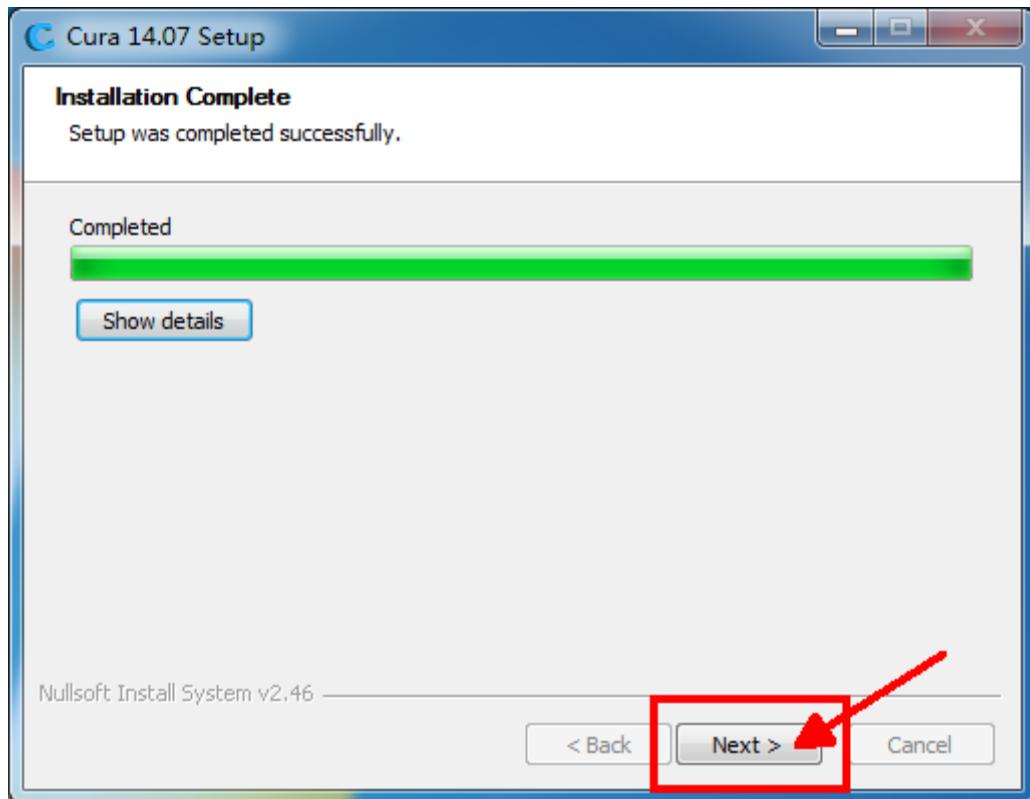


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3. Install the Arduino driver, then click the button "Next".



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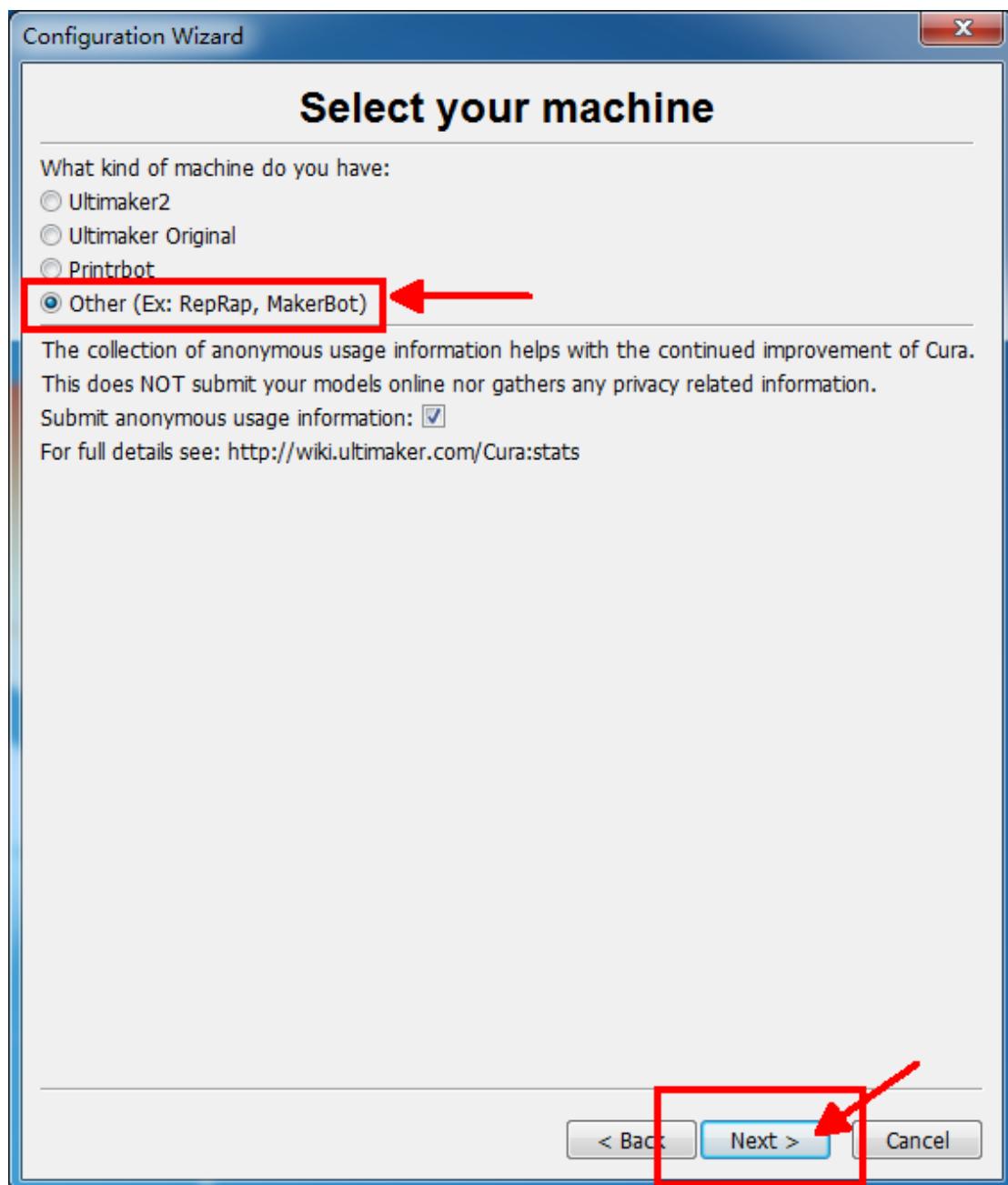
4.4.2 Start Cura

1. First time run wizard, please click *Next* button.



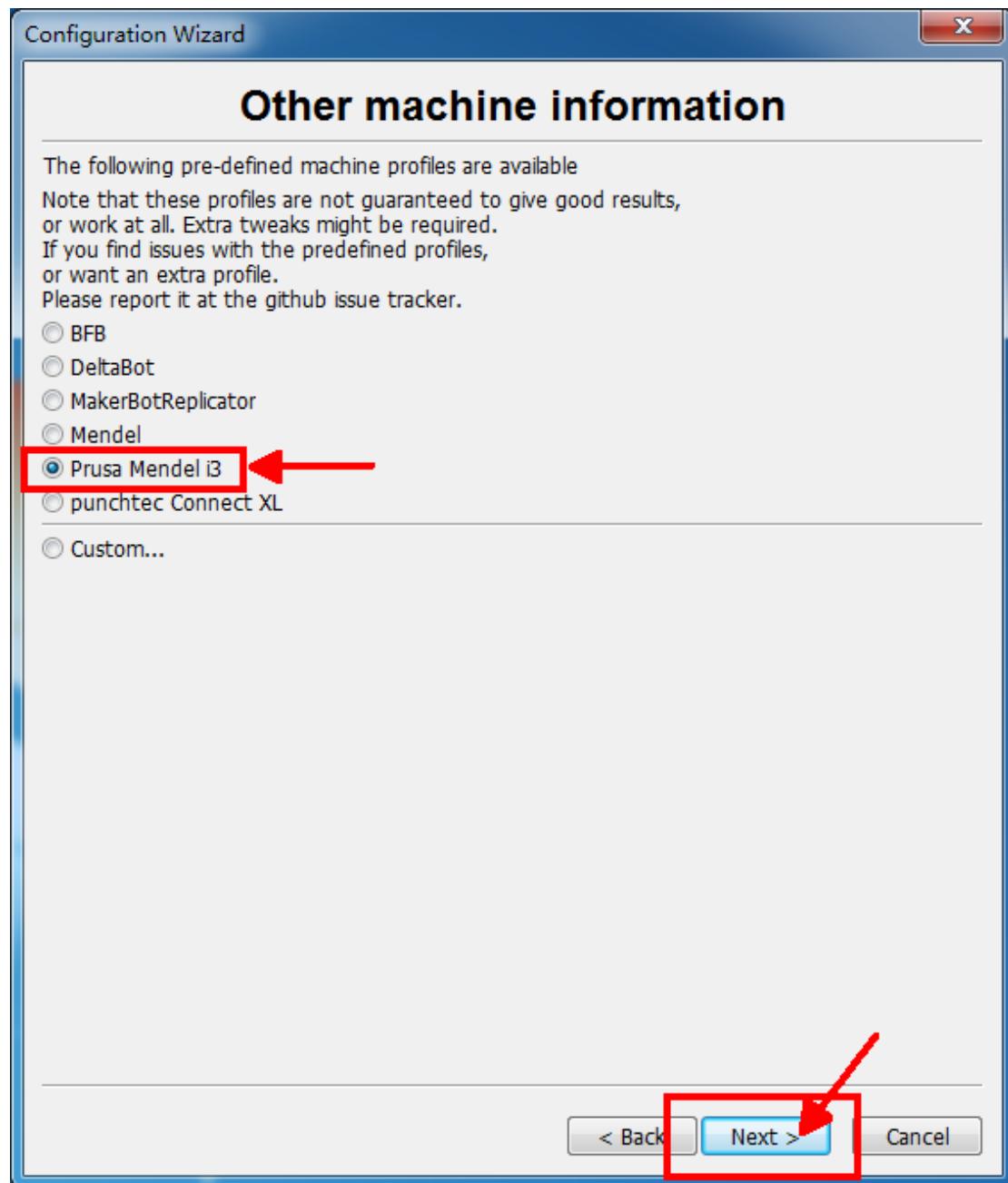
Makeblock Constructor I 3D Printer Kit

2. Select the basic type of machine, Makeblock Constructor I belongs to RepRap, please select *Other* option and click *Next* button.



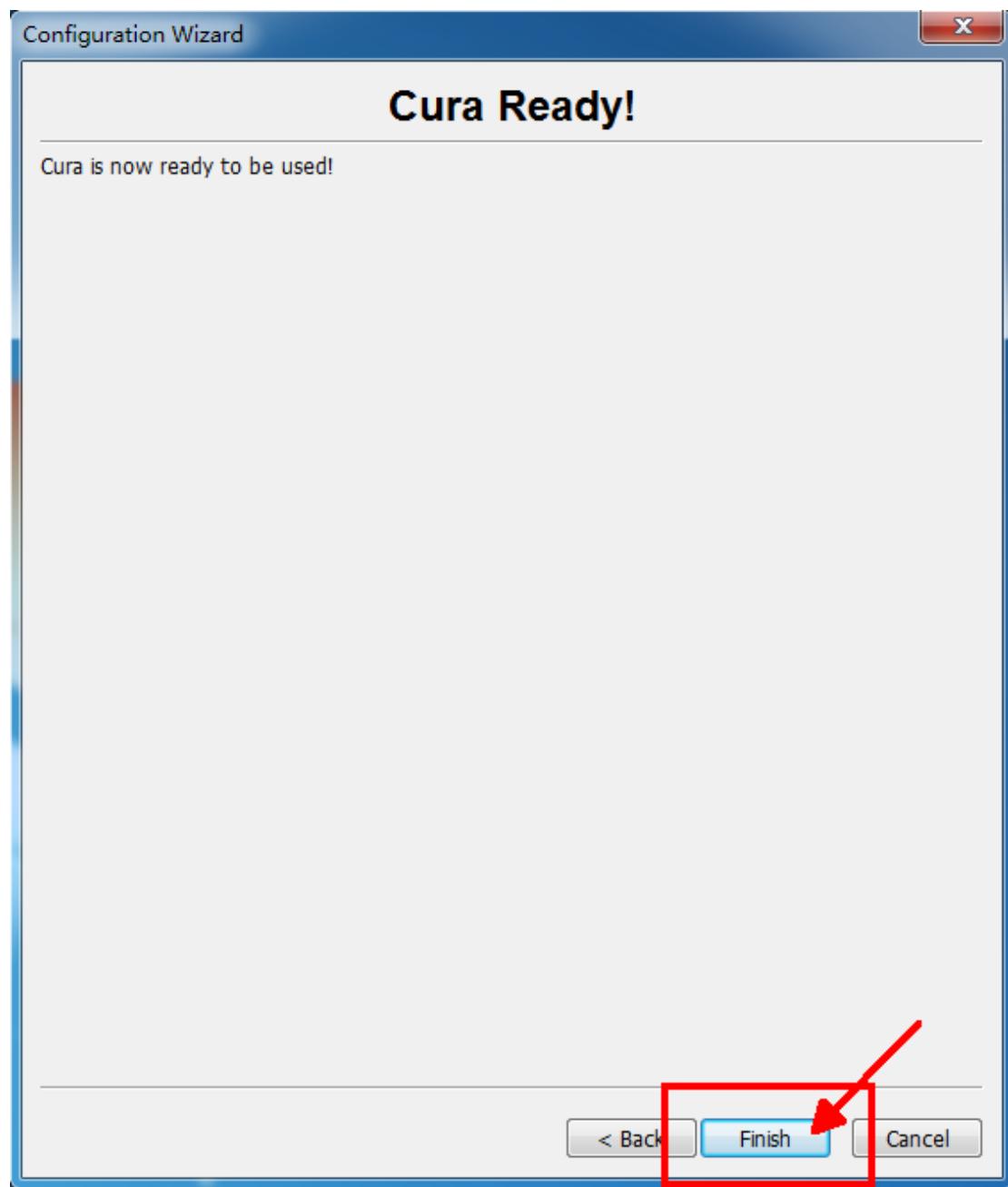
Makeblock Constructor I 3D Printer Kit

3. Select the type of 3D printer, Makeblock Constructor I belongs to Mode :i3. Please select *Prusa Mendel i3* and click *Next* button.



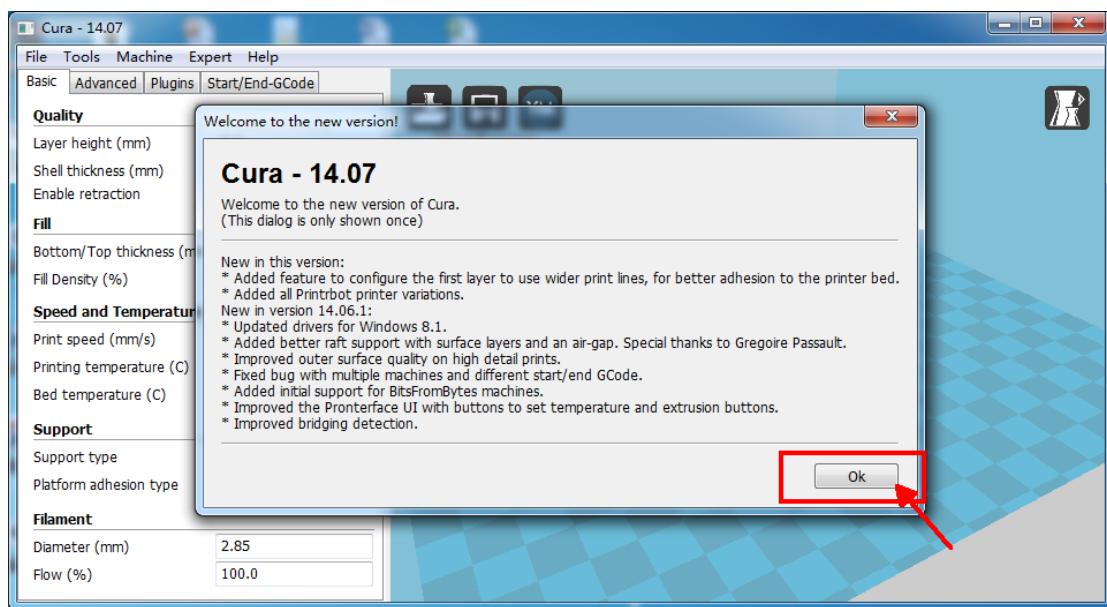
Makeblock Constructor I 3D Printer Kit

4. When the setup is complete, it will display Cura Ready, please click *Finish* button.

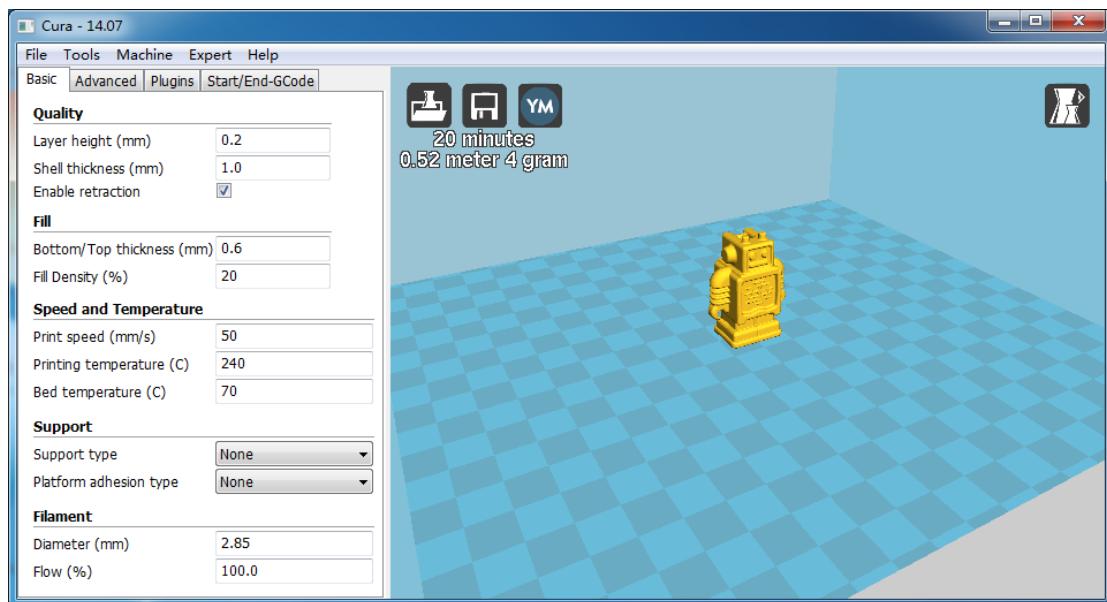


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5. Click the button OK.

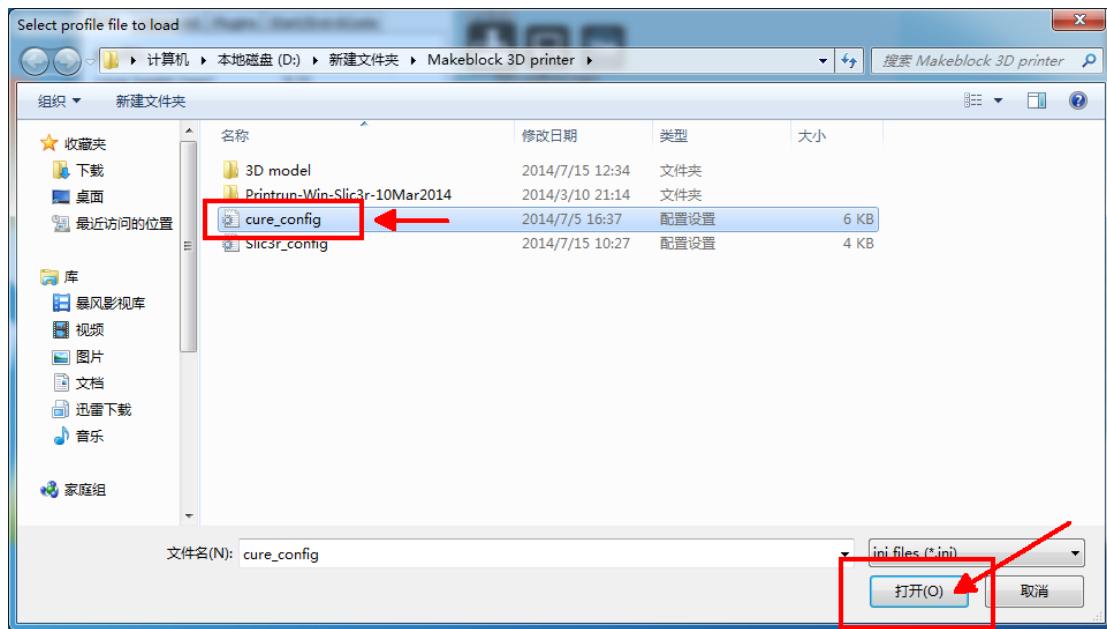
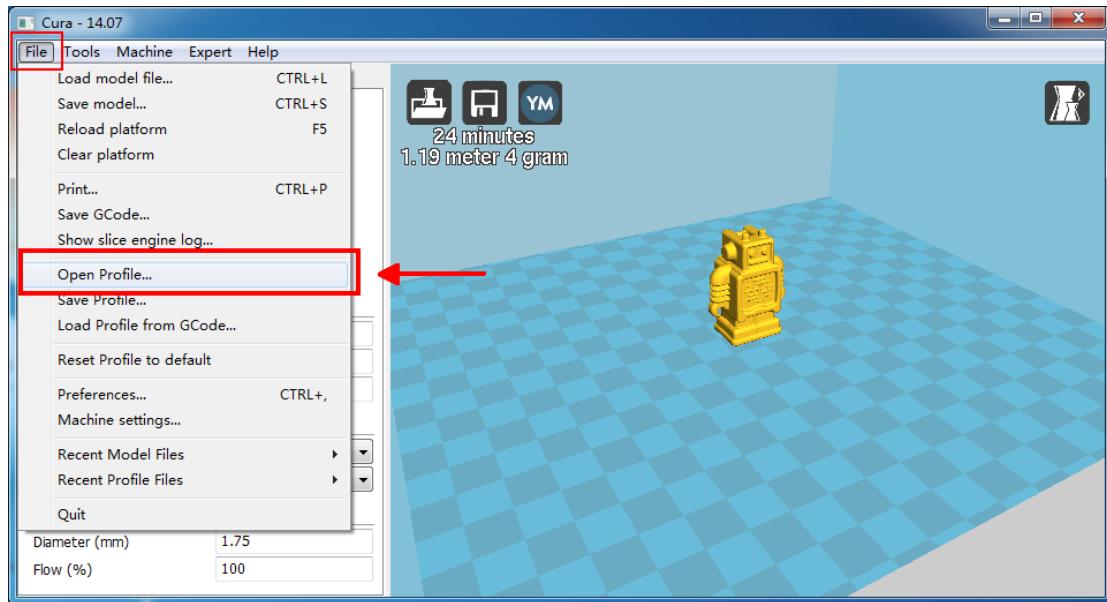


6. Cura software interface overview.



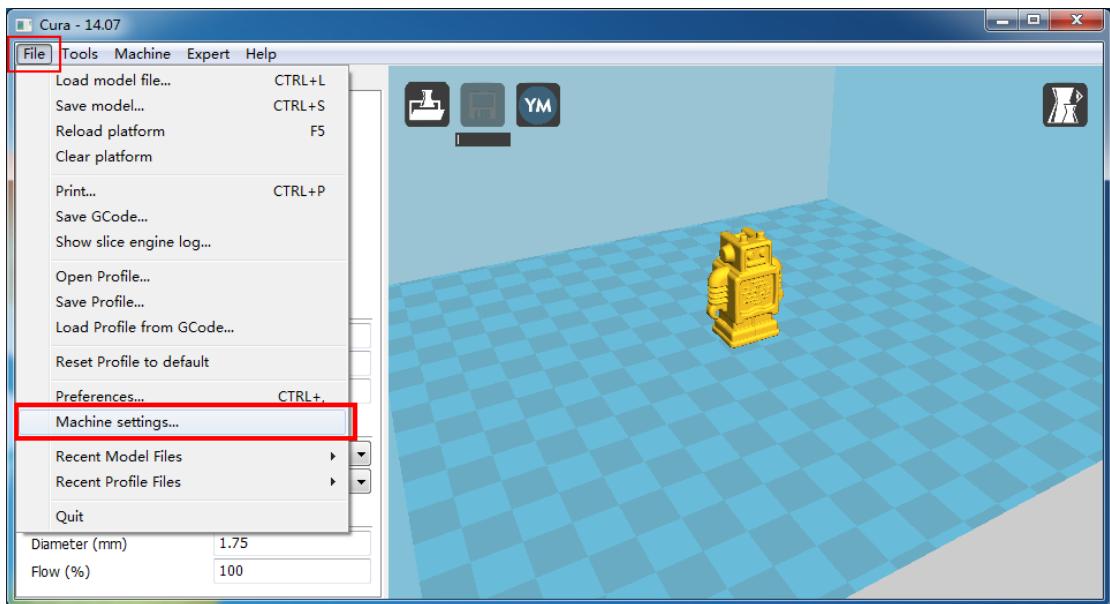
4.4.3 Configuration

1. Load our config file "cura_config"

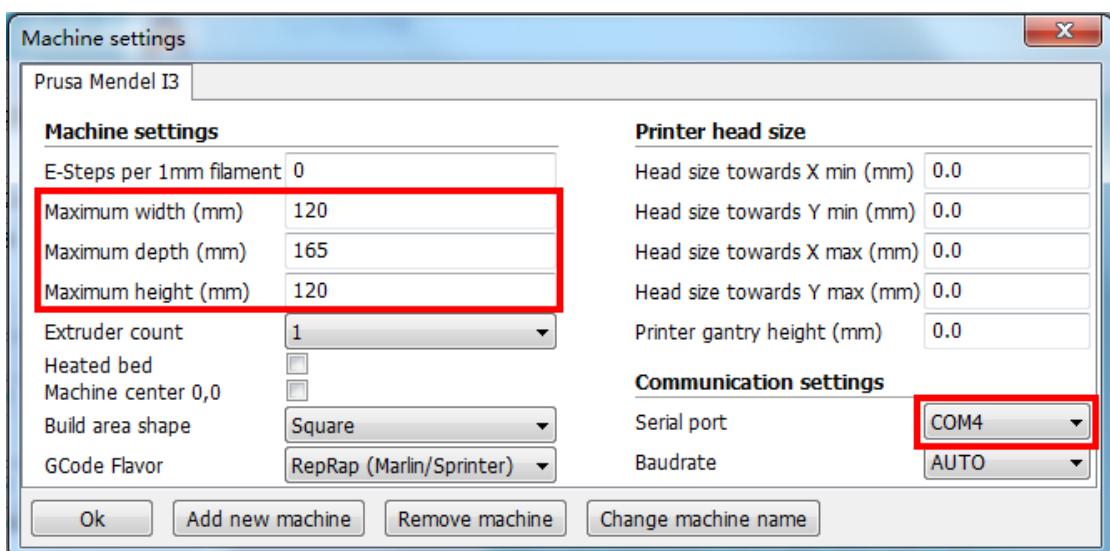


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2. Click "File" -> "Machine settings".

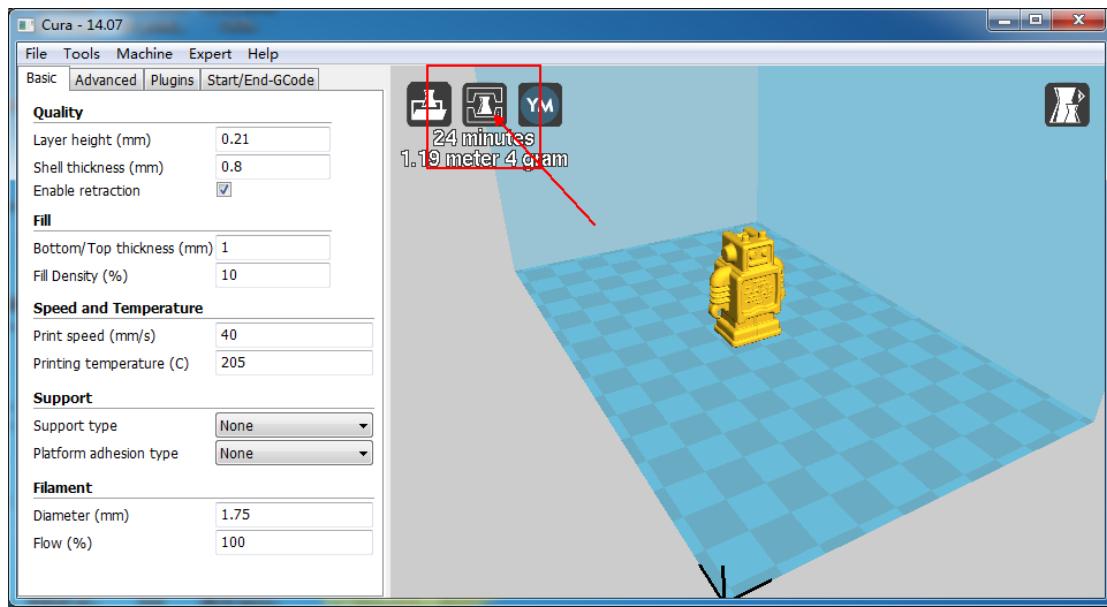


3. Set maximum width(mm) as 120, set maximum depth(mm) as 165, set maximum height(mm) as 120. Note: The serial port is the port you connect the main board to your computer.

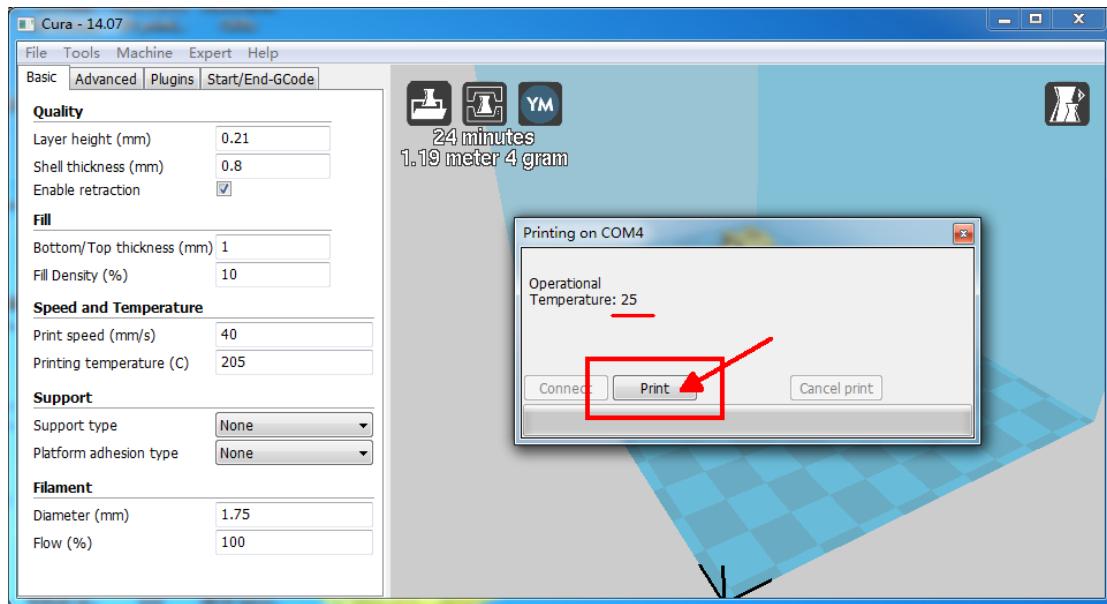


Makeblock Constructor I 3D Printer Kit

4. When the cura software is connected to the main board successfully, there is a new icon shown on the cura interface. Then click the icon in the red box.



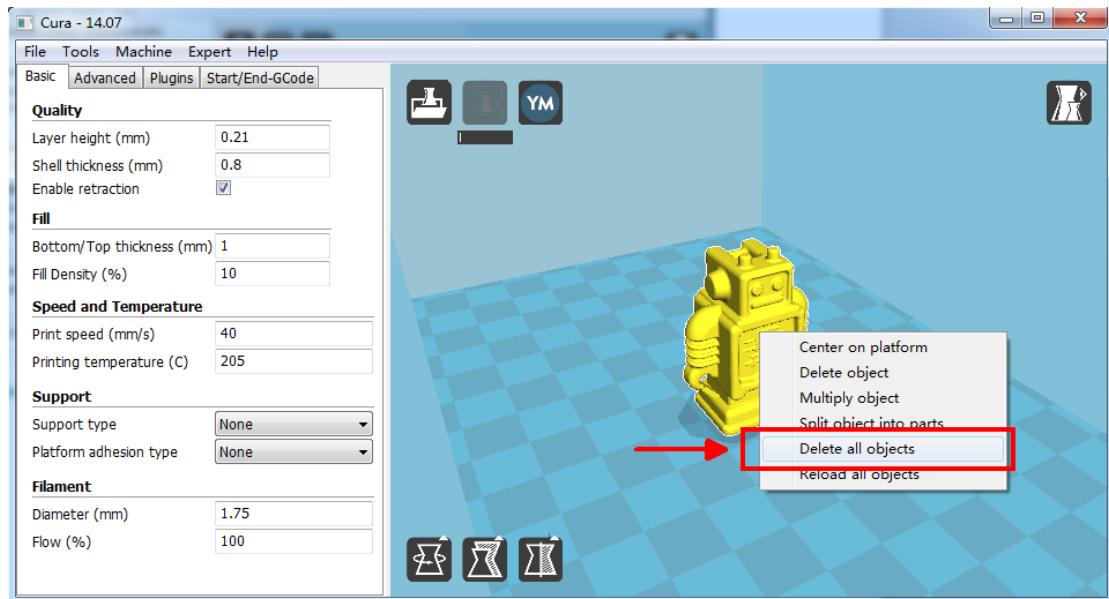
5. It displays the current temperature of nozzle, click *Print* button to get started. You can check current temperature from left status area, and it will rise up.



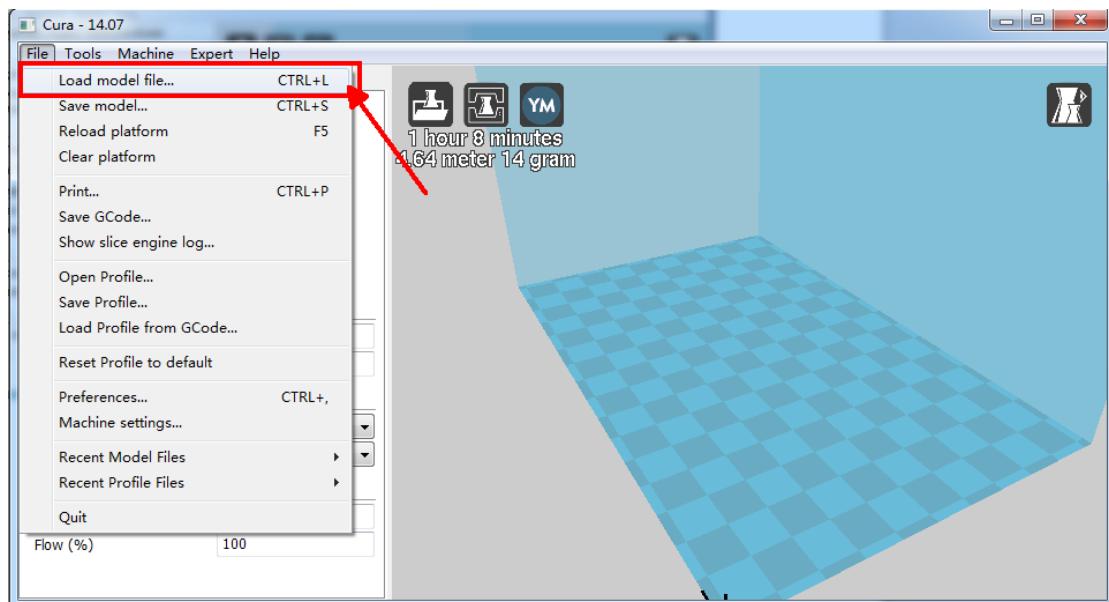
Makeblock Constructor I 3D Printer Kit

4.4.4. Print

If you don't want to print this robot, just right-clicking and select *Delete all object*.

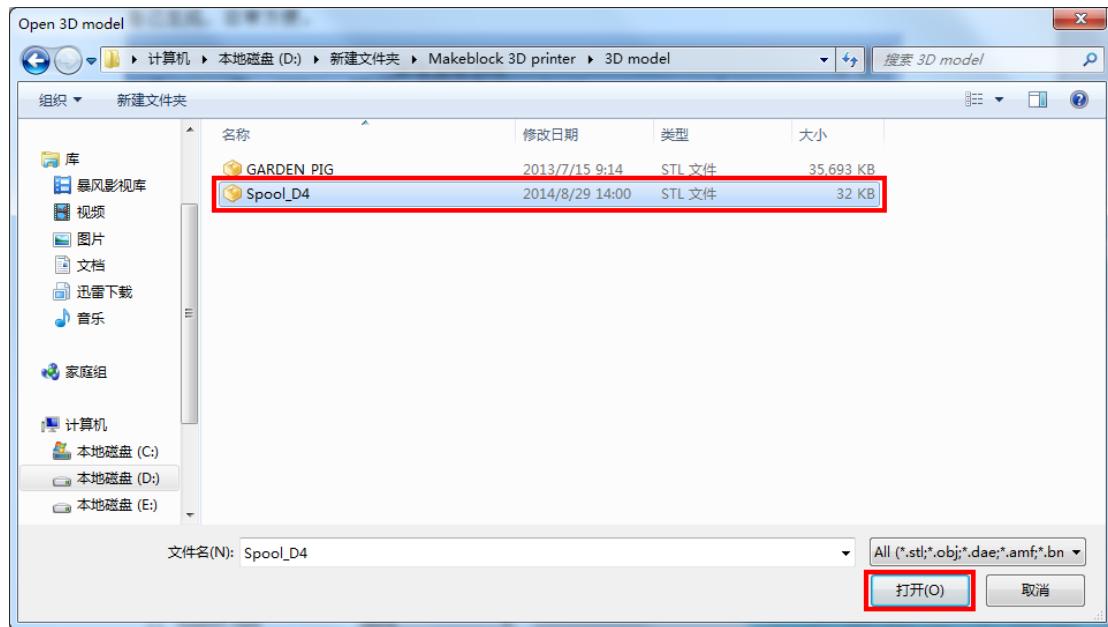


17. Import the 3D model File|“Load model file”

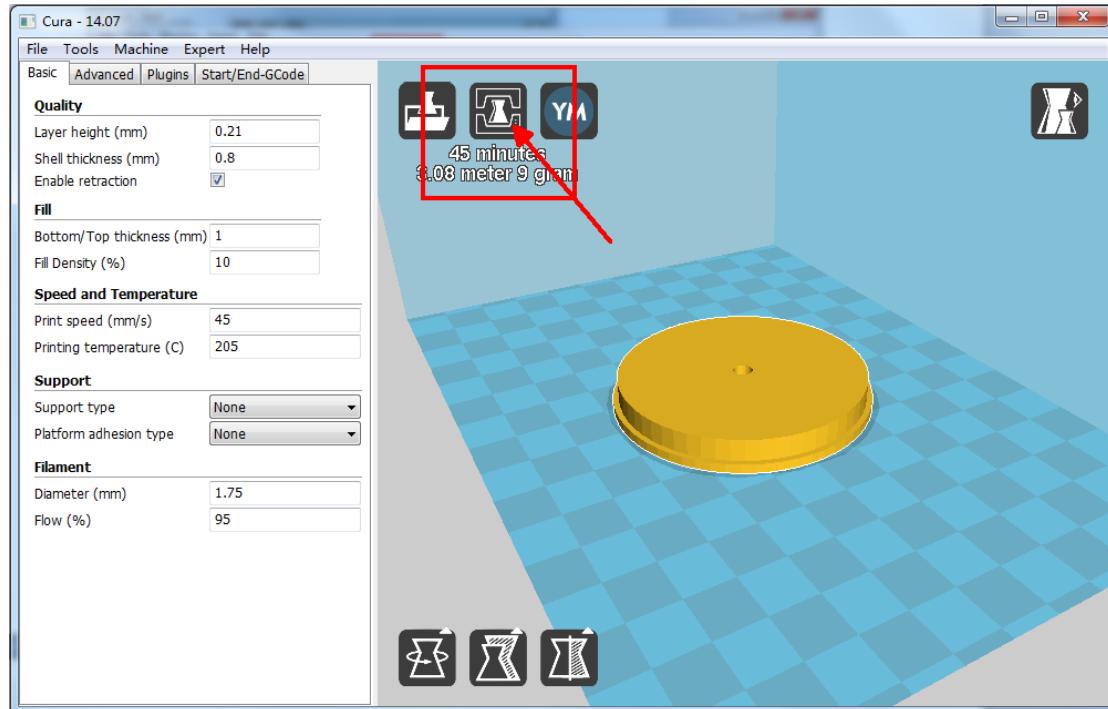


Makeblock Constructor I 3D Printer Kit

Select the STL file of the model.



19. Click the icon (*Print* button) inside the red box, get started to print.



Makeblock Constructor I 3D Printer Kit

20. Click the *Print* button again, the temperature of nozzle will heat up until it reach the target temperature higher than 10 degree, and cooling back to the target temperature soon. Once it cooled down to setting temperature the machine will start to print. You can wait until the 3D model is complete.

