Geeetech Rostock 301 3D Printer —USER MANUAL—



TERMS

Please be advised of the following terms (the "Terms") regarding this User Manual (this "Manual"):

All information in this Manual is subject to change at any time without notice and is provided for convenience purposes only. Geetech reserves the right to modify or revise this Manual in its sole discretion and at any time. You agree to be bound by any modifications and/or revisions. Contact the Geetech Support Team for up-to-date information.

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SAFETY INSTRUCTION

Do read all the instructions and cautionary markings in this manual before assembling and operating your Rostock 301.

Rostock 301 printers contain heated moving parts. Never reach inside the printer while it is in operation or before it has cooled down.

Never leave your Rostock 301 printer unattended while powered on or printing.

Disconnect your Rostock 301 printer from the power supply and computer when not in use.

Do not print using materials that have not been approved by GEEETECH for use with the Rostock 301.

Only operate your Rostock 301 printer in a well-ventilated space away from moisture and heat sources with a working smoke/fire alarm.



ABOUT ROSTOCK 301

Rostock 301 makes solid, three-dimensional objects out of melted Filament such as PLA or ABS. First, use software to translate 3D design files into instructions for the Rostock 301. Then transfer those instructions to the Rostock 301 via USB drive, USB cable. The Rostock 301 will melt filament such as PLA or ABS and squeeze it out onto the build plate in thin lines to build your object layer by layer. This method of 3D printing is called fused deposition modeling (FDM).

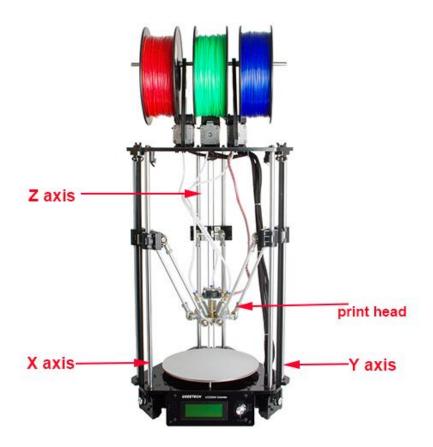
Rostock 301 is an affordable desktop 3D printer for tech enthusiasts, serious hobbyists and educators. This printer provides you with excellent printability and triple-color, mix color capability, offering an intuitive 3D printing experience.

Rostock 301 is a perfect combination of the delta type construction and the 3-in-1-out mix color 3D printing hotend. Delta type construction features faster printing speed and high printing accuracy; the 3-in-1-out mix color 3D printing hotend gives a rich mixture of color combination of the printing object.

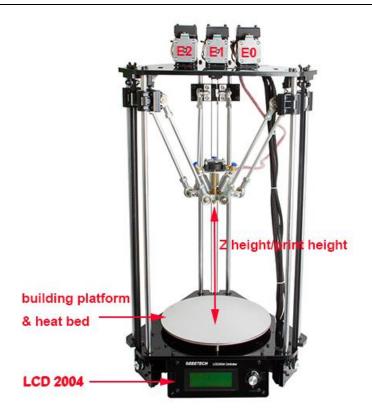
Rostock 301 maintains DIY property, with which you can unleash your creativity to refit or modify it as you like. This kit is just the beginning; you can get more out of it.

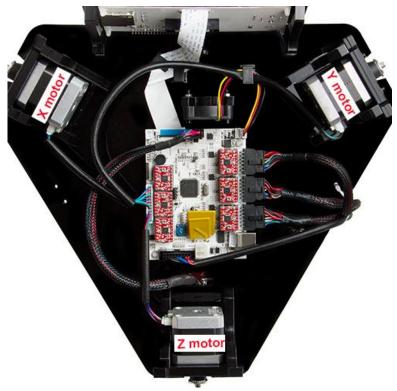












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1. Check Power Supply

Rostock 301 uses DC12V, 29A power supply, choose 110V or 220V according to national power using standard. Please make sure that the voltage of the power supply conforms to current national power using standard.



2. Software Resources

2.1 Repetier-Host

The Repetier-Host is a simple to use host software, which is be compatible with most firmware around. You can add and position your STL files on the simulated print bed and slice them all together. For slicing you can use the built-in Slic3r slicer. Just call "Slice & Load" and the job gets delegated to the current slicer, showing its output in the log window.

Download the Repetier host V 1.6.0 here.

For detailed information of Repetier Host please refer to our wiki.

For detailed using methods of the slicing software, slic3r, which comes with Repetier Host, please also refer to our wiki.

2.3 Firmware resources

Rostock 301 uses GTM32 control board; you need to use STM32 ST-LINK Utility to upload/refresh the firmware.



Download the STM32 ST-LINK Utility here.

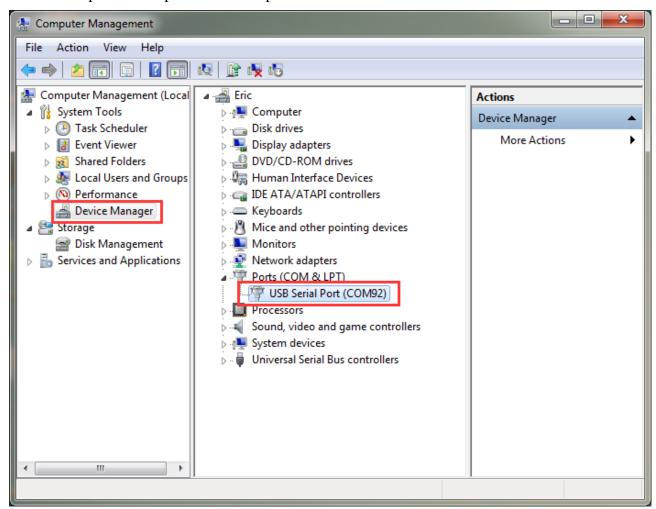
Download the firmware <u>here</u>.

How to upload the firmware?

3 USB Driver Installation

USB Driver Installation for Win7 OS

Power the Rostock 301 up and connect it to computer with the USB cable, the driver will be installed automatically. After installation, please enter Device manager and find the USB Serial Port which is the communication port for the printer and computer.

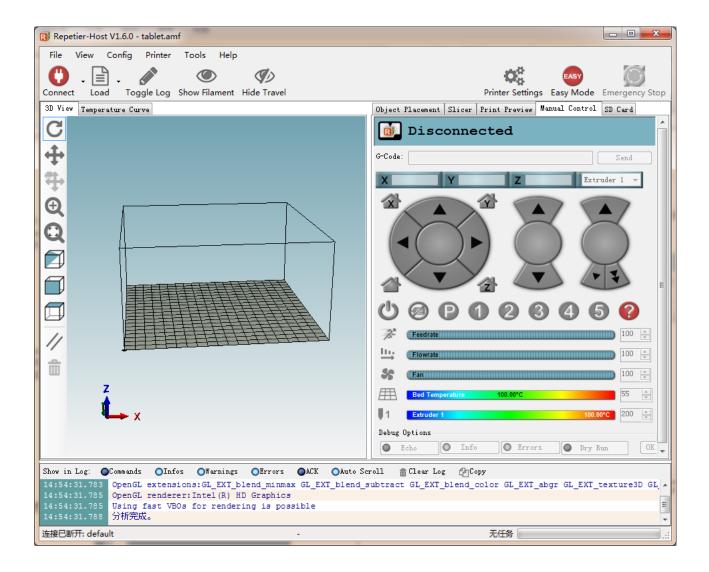


If the driver cannot be automatically installed, please download the USB driver here and manually install it.



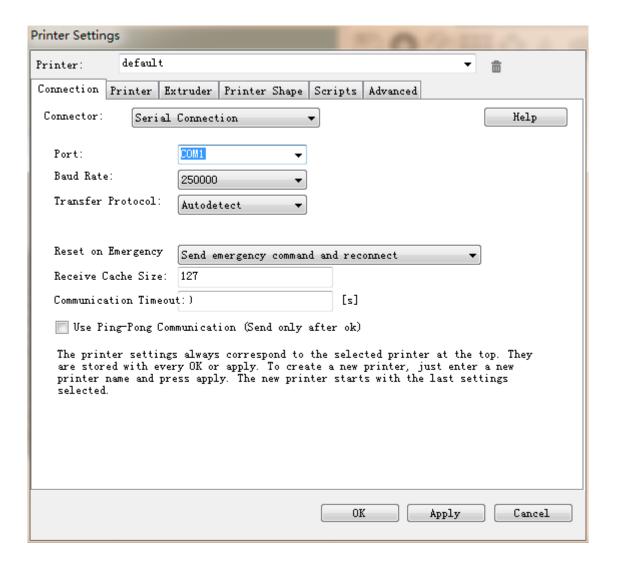
4. Set up Repetier Host

The next step should be to configure your printer so you can connect your computer with the host. Open Repetier Host.



When you start Repetier Host for the first time, you need to set up parameters for Rostock 301. Click the Printer Settings on the top right corner, you will be presented with the following window.

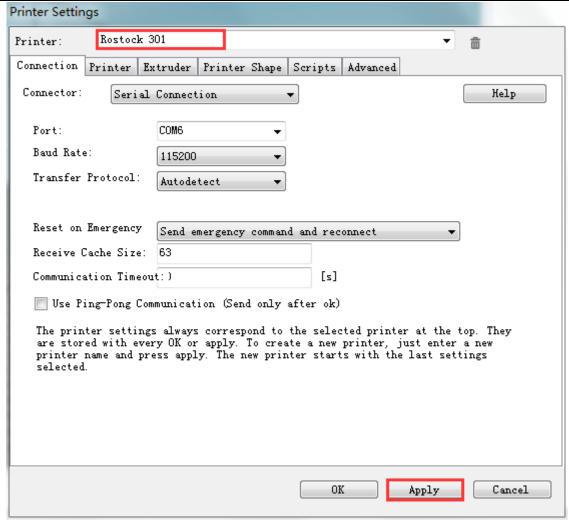




4.1 Create New Printer

At the top you see a drop down box, with the currently selected printer. At the start you have only the default printer. To create a new printer you only need to change the printer name and press "Apply". The new printer will start with the same settings as the last selected printer.





There are six tags in Printer settings in total. Detailed configurations of the 4 relevant tags are as follow.

4.2 Connection

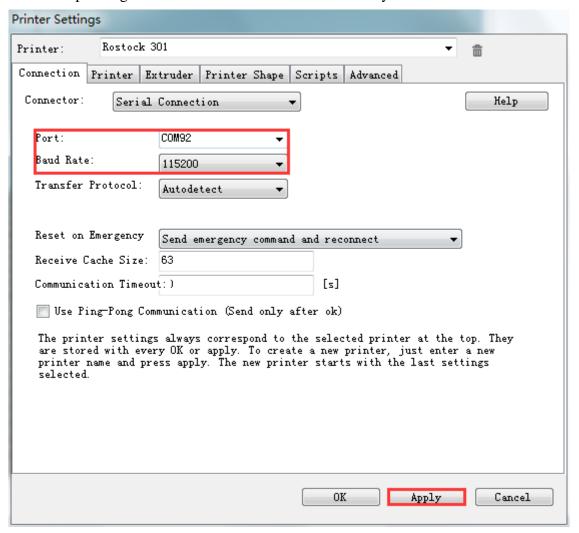
In this first tab, you set how to connect with your printer. In "Port" you select the port, where your printer is connected. At the opening of the window, all available ports were scanned and added to the list. If you connect your printer when this menu is already open, click "Refresh Ports" to detect the new port. Select the right one. Then select the baud rate entered into the firmware

Choose right Port and Baud Rate. For other parameters please leave them as default, and click Apply.



Port: Get the printer connected to the port of computer, which is corresponding to the USB Serial Port in the Device manager.

Baud Rate: Corresponding to the Baud Rate in firmware. Generally it is set as 115200.





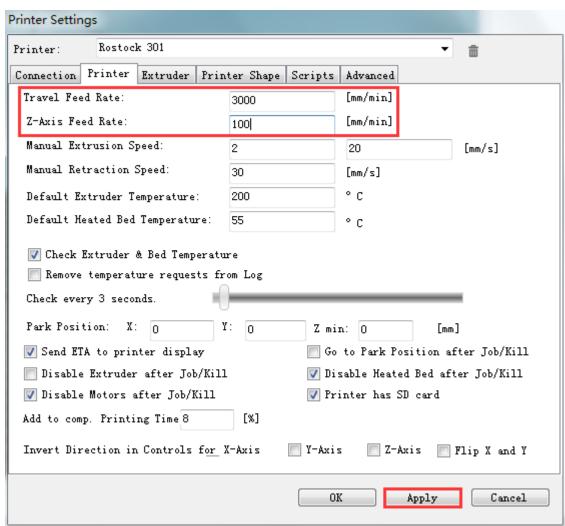
4.3 Printer

The second tab defines important behavior you want. The Travel feed rate and Z-axis feed rate are used, when you move the extruder with the manual controls. The temperatures are set in the manual controls as start values. You can change them there any time.

Set the parameters as shown in the picture

Travel Feed Rate: 3000 mm/min

Z-axis Feed Rate: 100mm/min



We suggest you to cancel the option of **Go to Park Position after Job/Kill**, or it may cause that the print head impacts the printed model when it moves to starting position after finishing printing.

4.4 Extruder

In the "Extruder" tab you can define the numbers of extruder, the max temperature that are shown in the

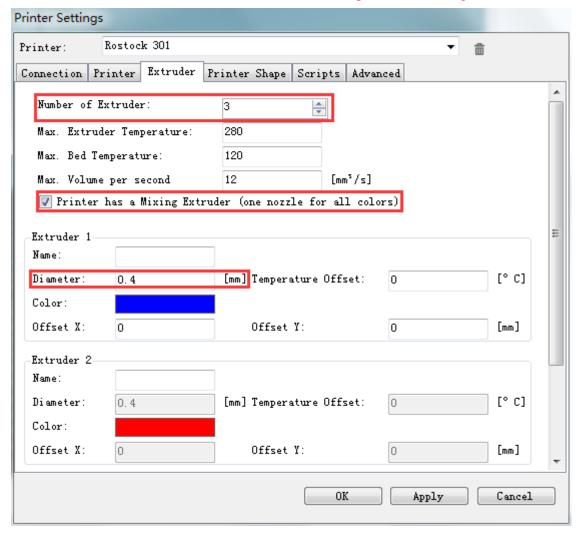


manual control. The max volume per second defines the maximum amount of filament in mm³, the extruder can melt per second.

Number of the extruder: 3

Number of the extruder: 0.4mm

*We use the 3-in-1-out hot end, so we need to check the "printer as Mixing extruder"



4.5 Printer shape

The "Printer Shape" tab defines your printer shape, or to be more exact the shape of your build area. The



host will use this to limit your moves and to check, if your models fit onto the print bed. You can also define the position of the x and y end stop.

Recommended settings:

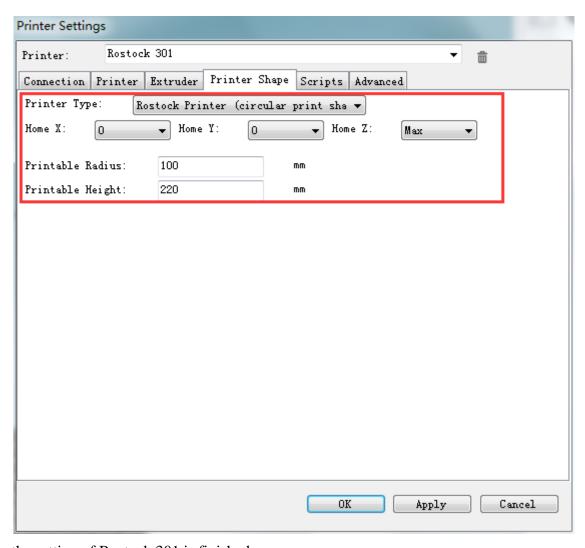
Printer type: Rostock printer

Home X: 0 Home Y: 0 Home Z: Max

Printable Radius:100mm

Printable Height:220mm

(In case the motor direction is wrong, we'd better set the print height as 220mm to avoid clash of the hotend to the platform)

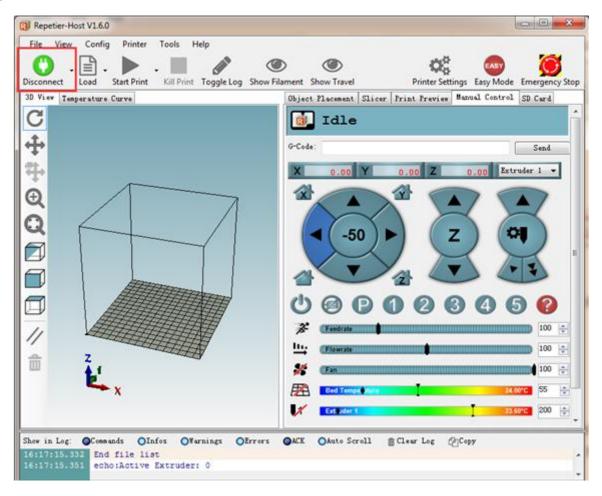


So far the setting of Rostock 301 is finished.



4.6 Connect the Printer

After setting, click the connect button on the top left corner of main interface. When the button turns green, the connection is successful.



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5. Function Testing

The firmware of Rostock 301 is already uploaded based on Windows 7 operating system, and we have done debugging to make sure that every part of it can work normally. However, there may be unpredictable factors during transportation. Please do the following simple test before using it.

5.1 Repetier-Host Test

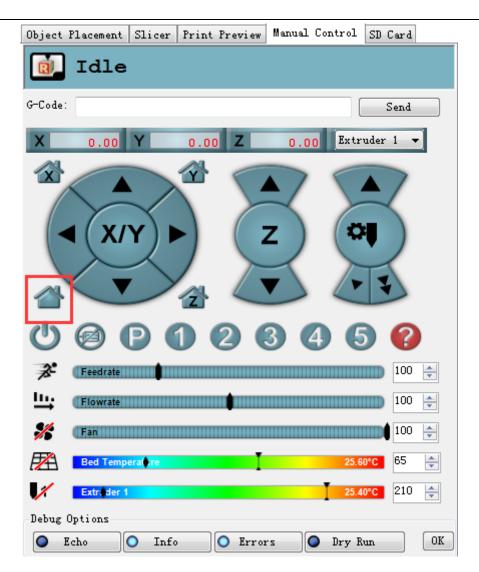
5.1.1 Motor Test

Before the test, manually place the carriage of X / Y / Z axis at the intermediate position of each axis to avoid accidental collision during the test. There is **emergency stop** button on the top right corner , or you can cut off the power directly if anything went wrong. Be prepared for emergency stop.

Open Repetier host and connect the printer. Turn on the power supply. Connect the printer.

Click Home button , then the three axes will move towards the endstop in turn. After they touch the endstop they will move back for a short distance and then stop the movement.





Right position of Homing:

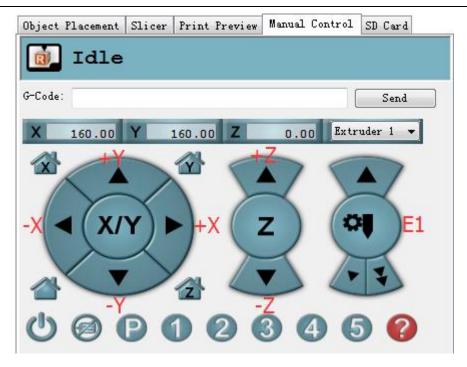






Note: the origin point is the corner of the platform when printing. So when the printer is at home position, the coordinates of X/Y axis are: X=0mm, Y=0mm, Z=220mm. As a result:





图片

Tips: In manual control, the high-light part of the panel stands for the current selected direction, and it moves 1mm every click. You can also choose to move 10mm or 50mm every click, but here we choose 1mm in order to avoid possible incorrect operation.





If the motor direction is reverse, you can alter the direction in LCD. You can follow the steps below Control>printer settings>X/Y/Z DIR





Scroll down to Motor Dir. If X axis direction is reversed, you can choose the X motor Dir, press the knob,



it will be changed from True to False. Vice versa.



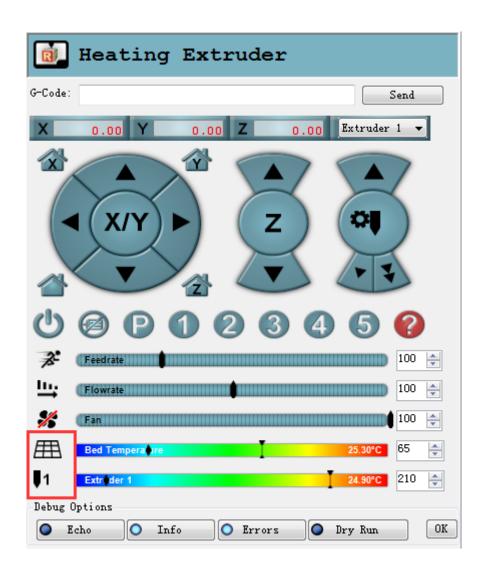
*After the modification, do remember to go back to control menu and choose Store memory.



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5.1.2 Heating Test

Click the heating button of the hot bed and the extruder . When the slash disappeared as shown below, it indicates the heating is ongoing and you can see the number rising up.



Meanwhile you can see the temperature at the bottom status bar of Repetier Host. If the number has no change or obviousely abnormal, e.g. above 300° C, please refer to this post.

5.1.3 Extruder test

Please note: It is set in the firmware that the extruder will not work until the temperature reaches above 170°C. Therefore, please heat up the extruder above 200°C before testing the extruder. Otherwise the extruder motor will not have any response.

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Heat up the extruder.

- 1. While wait for the extruder to heat, cut the end of your filament to create a clean edge.
- 2. When the extruder is fully heated, grasp the top of the extruder assembly and push the free end of filament into the loading tube. Keep pushing on the filament and click the loading filament arrow on manual control until you feel the extruder pulling it in.
- 3. Wait until you begin to see plastic emerging from the extruder nozzle.then you can stop.
- 4. Wait a moment for the extruded plastic to cool, and then pull it away from the extruder. Do not touch the nozzle; it may still be hot.



If the extruder cannot work normally or the extrusion is not fluent, please refer to this post.

5.2 LCD Controller Test

5.2.1 LCD Menu Introduction

Functions of LCD rotary knob:

- 1. Press the knob: confirm or enter sub-menu
- 2. Rotate the knob: roll to choose options or change parameters

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LCD homepage:

- 1. Extruder temperature: current temperature/target temperature
- 2. Hotbed temperature: current temperature/target temperature
- 3. Current feeding rate of X/Y/Z
- 4. Current height of print head
- 5. Current printing speed rate: current printing rate
- 6. Current rate of printing process

Note: Rotate the knob during printing will change the federate in real time. Do not adjust it too high to affect the printing quality.



Press the knob to enter the next level menu:

- 1. Prepare: Preparing work before printing
- 2. Control: Setting of temperature and motion parameters of the printer
- 3. Mixer: A feature to define the feeding rate of each extruder to generate different color effect.

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Main functions of Prepare menu:

- 1. Disable steppers: unlock the motor so that you can move them freely.
- 2. Auto home: automatically homing of each axis.
- 3. Preheat PLA: manually preheat the hotbed and the extruder before printing PLA.
- 4. Preheat ABS: manually preheat the hotbed and the extruder before printing ABS.
- 5. Move axis: manually move each axis and each extruder.











Main functions of Control menu:

- 1. Temperature: You can change the temperature of the hotbed and the extruder in real time in printing process. Meanwhile you can set the temperature of Pre-heat PLA and Pre-heat ABS.
- 2. Motion: setting of the motion parameters in the firmware. You need choose store memory to save after altering the setting.
- 3. Store memory: to save the altered parameters.





For other detailed functions please read the following introduction of function tests.

5.2.2 Use LCD for Motor Test

After understanding the functions of LCD, press the knob on LCD to enter the sub-menu, and choose **Prepare:**





Choose **Auto home** in menu to do home operation:





If you want to move the motor, choose Move axis:



Choose Move 1mm:

Note: only 10mm and 1mm are available for the printer, and 0.1mm invalid. We recommend you to use move 1mm to test each axis.





Choose the axis you need to move: Move **X/Y/Z** to test the 3 axis. Move **E0/E1/E2** to test the extruder. Rotating the knob can make each axis move.







After testing each axis, if you want to unlock the motors, choose **Prepare>Disable steppers**:

6. Build platform leveling

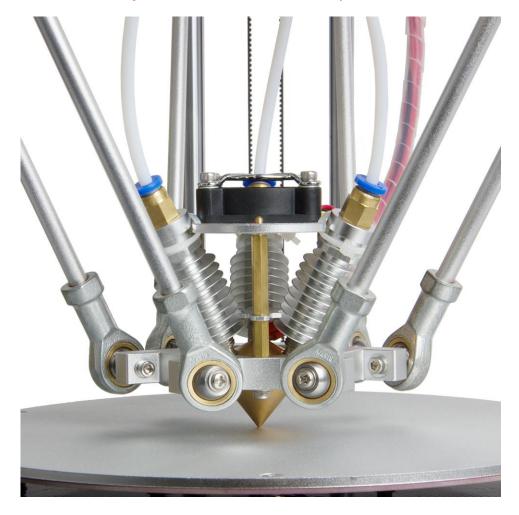
Before printing, please check whether the moving path of the extruder is parallel with the heatbed or not, which is called leveling. We need make sure the distances from the nozzle of the extruder to the four cornered of the heatbed are the same, and only in this way can we get good printing quality.

You can check the level of the heated platform by using a piece of paper to check the gap under the nozzle. It is best to do this with the platform heated to account for any change due to expansion.

Put the paper under the nozzle near one of the front screws and raise the bed .1mm at a time using the manual controls in the software interface while sliding the paper back and forth. Stop when you feel the nozzle start to grab a little bit.



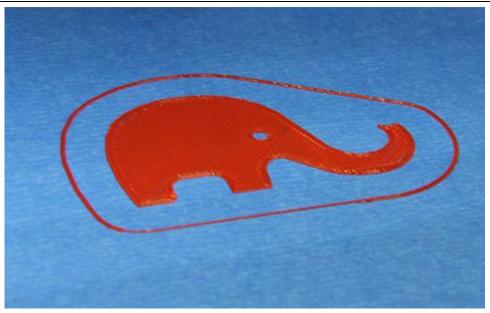
Move the nozzle to the other front screw and adjust the screw until you get the same amount of friction as you felt with the first one. Then adjust the back screw the same way.



Once you have adjusted each of the three screws, go back and check each one again, since adjusting one screw can affect another. You shouldn't need to go around the bed more than twice.

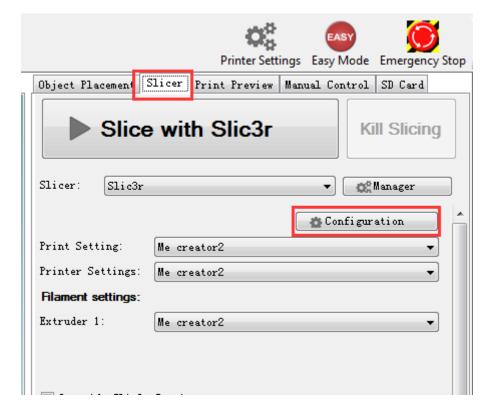
The proper printing effect of the first layer is like following picture:





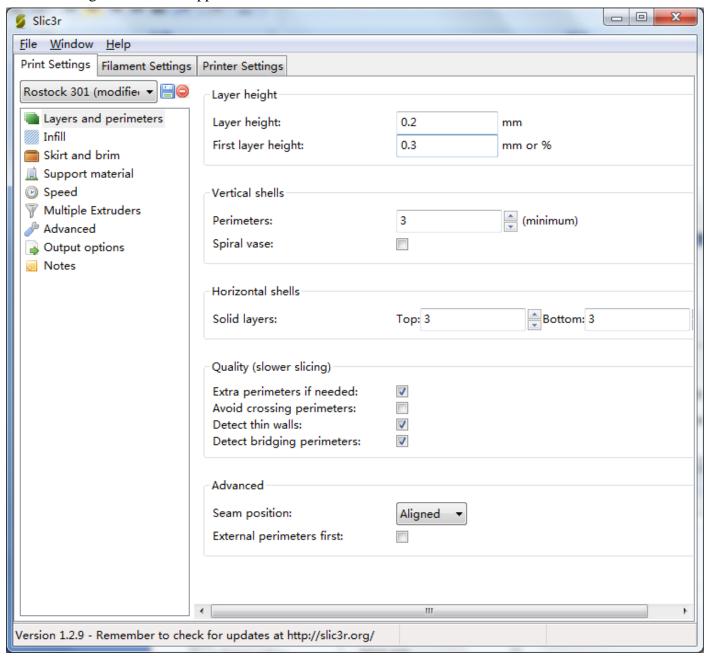
7 Slic3r Setting

So far we can begin printing. But in order to achieve better effect, we need set the slicing parameters such as the diameter of the filament, speed, layer height. Open the slicing software, slic3r, which comes with Repetier host. Shown as below:





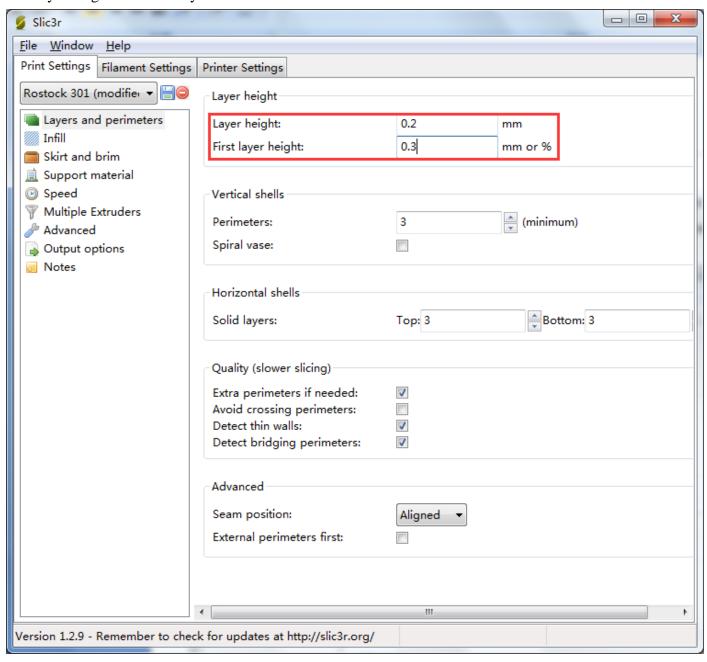
The following interface will appear:





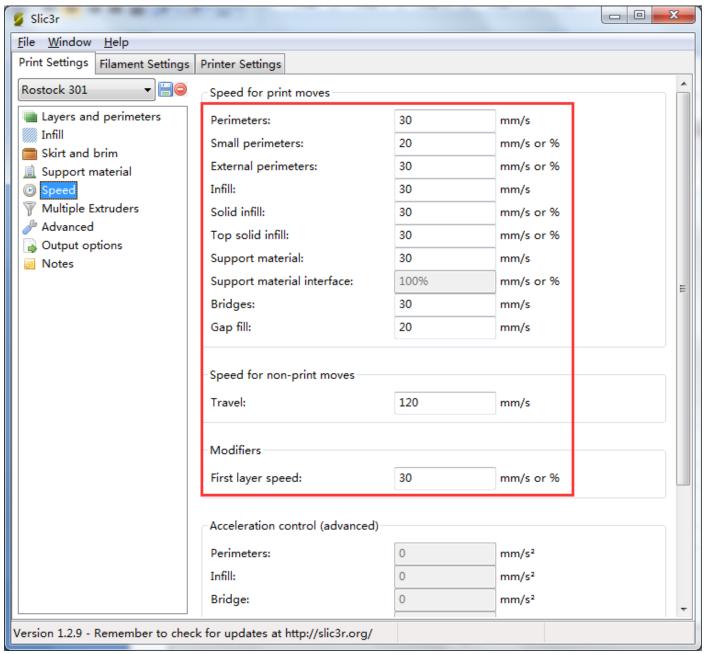
7.1 Printing Setting

Set the layer height and height of the first layer in the option of Print settings. The layer height of Rostock 301 can be between 0.05-0.3mm. Considering of precision and speed, 0.2mm is the most appropriate. Set the first layer height as 0.3mm by default.





You can set the printing speed here:



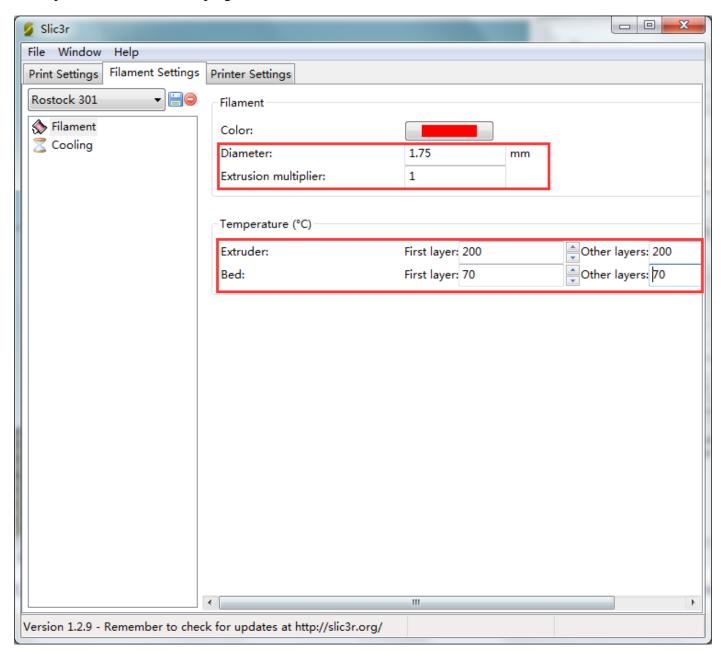
7.2 Filament Setting

Set the filament diameter and printing temperature in the tab of Filament settings. Here we use 1.75mm PLA. Usually the temperature of the print head is $195-210^{\circ}$ C, the hot bed is $60-70^{\circ}$ C. Here we set them as 200° C and 65° C. If you use ABS filament, the recommended temperature of the print head is $230-240^{\circ}$ C (for the



actual temperature please refer to the data from manufacture of filament) and 90-110°C for the hot bed.

You need to use glue on the hot bed when printing with ABS, which can effectively help the first layer stick to the platform and avoid warping.

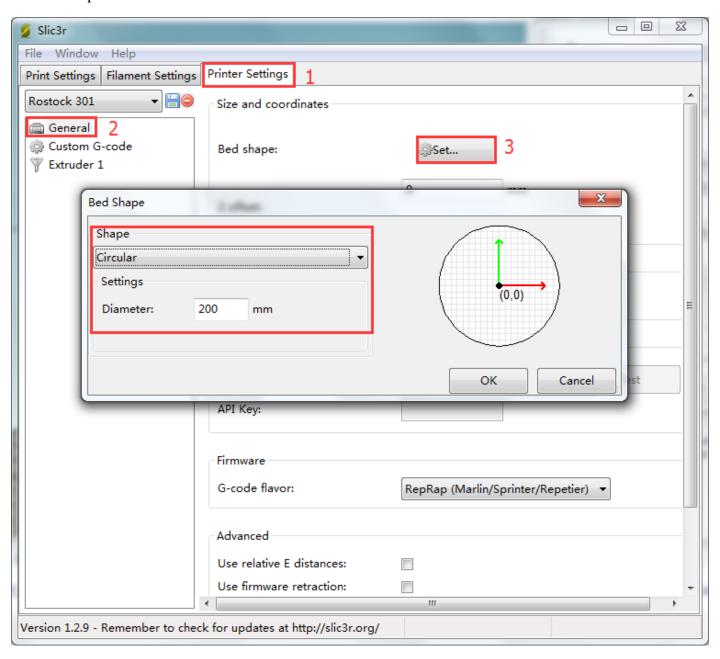


7.3 Printer Setting

Set the shape and size of the hot bed and the number of extruder in the option of *Printer settings*> *General*.

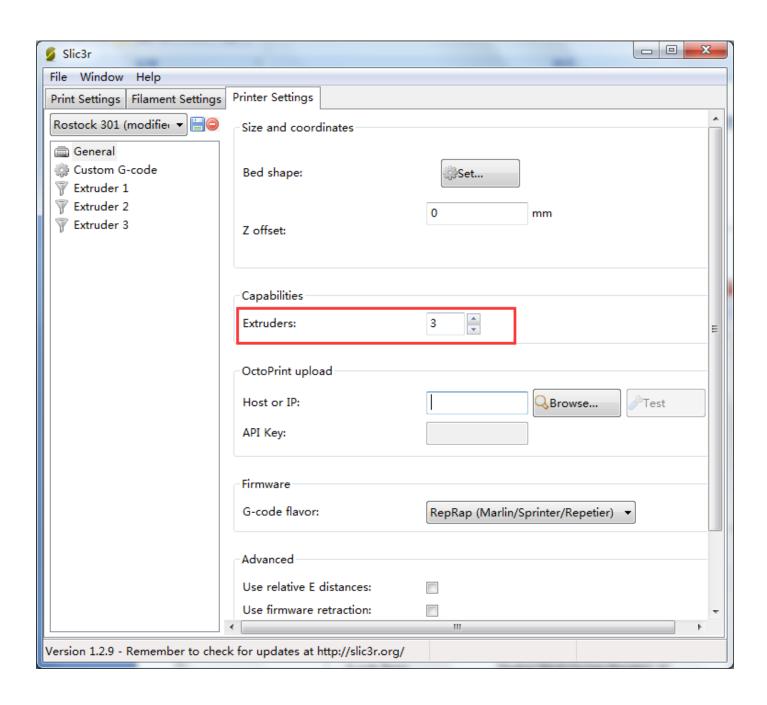


Hot bed shape:



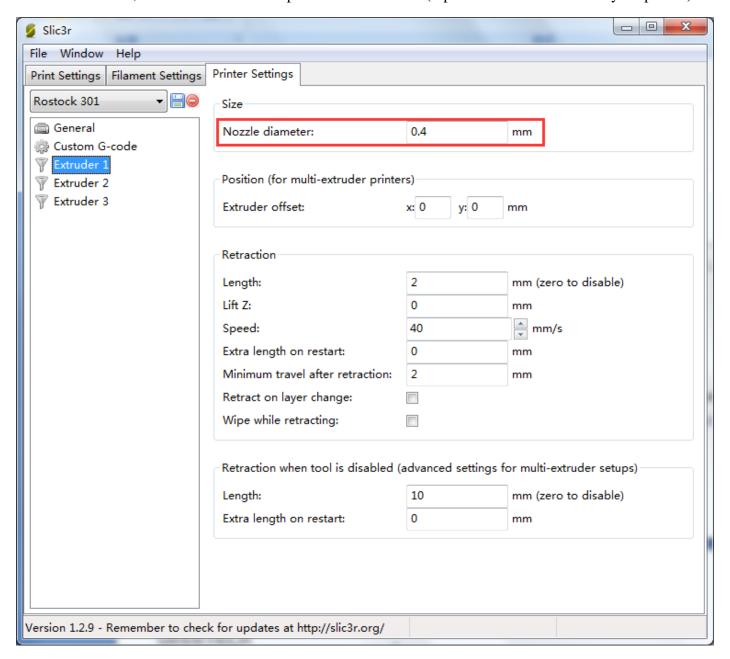


Number of extruder: 1





At the same time, set the diameter of the print head as 0.4mm. (input the actual diameter of your printer)



After the setting, do remember to **save** the three main settings separately.

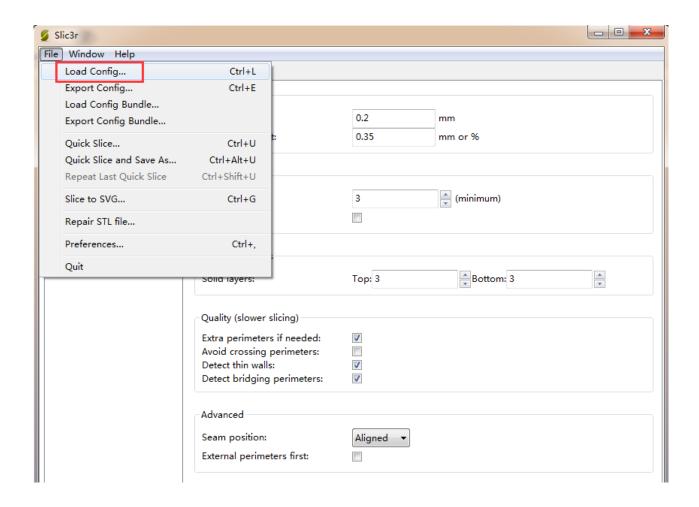
7.4 Other parameters

Except for above settings, parameters like speed are also important to the printing effect, which requires your long time using experience of 3D printing. Here we give you a reference setting, please download the attachment config.ini. You can import it into slic3r according to the following steps.



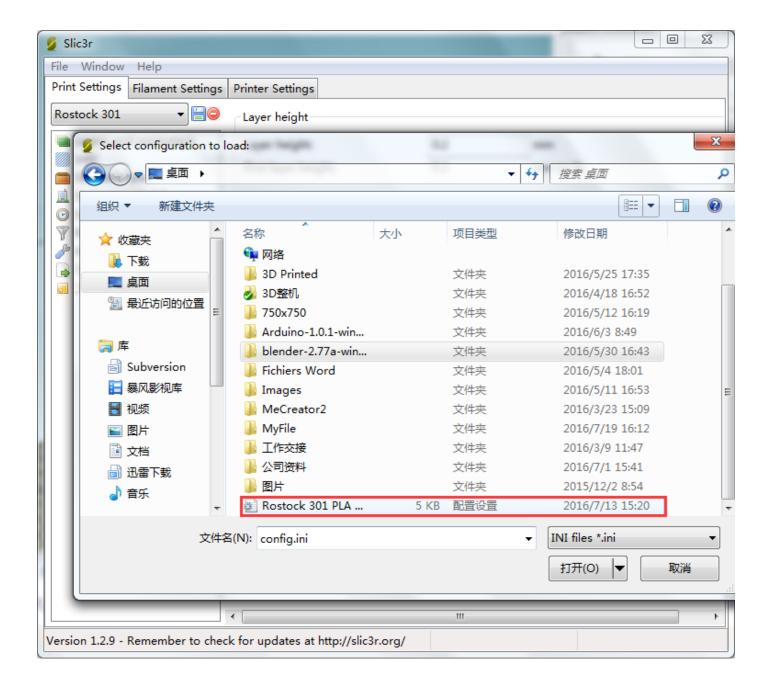
Note: the configuration uses 1.75mm PLA filament and 0.4mm nozzle diameter, and it slices with slic3r engine which is built-in in Repetier host 1.6.0.

Open slic3r>File>Load Config:



Direct to the file **Rostock 301 PLA config.ini** and open it.



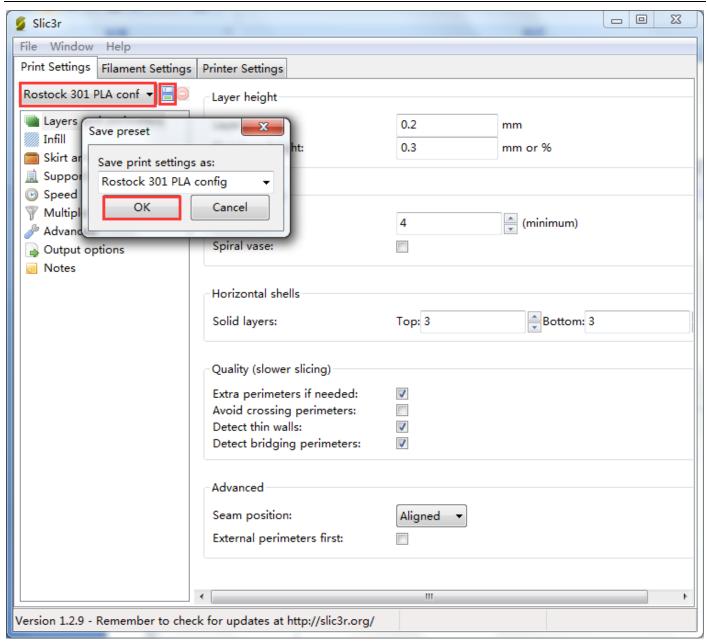


After you import the config.ini file Click the save button to rename and save.

Click to save in the tab of **Print Settings:**

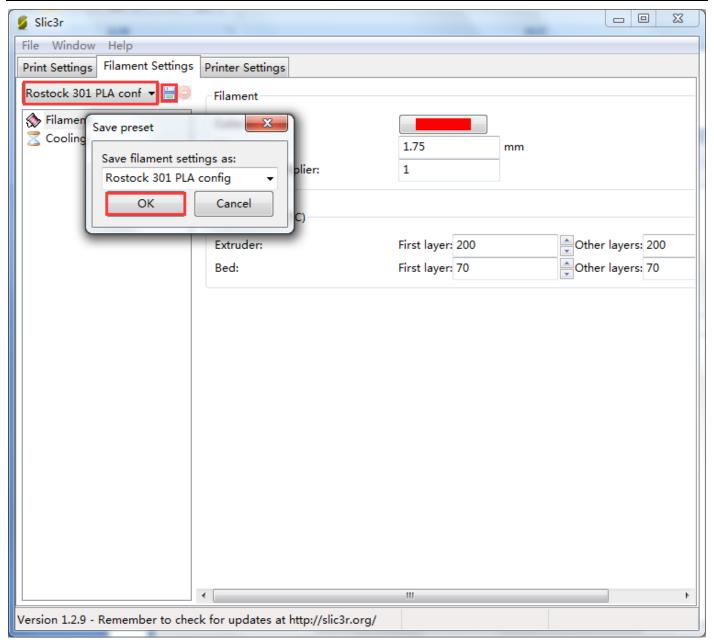
Note: all the three settings need to be saved in turn!





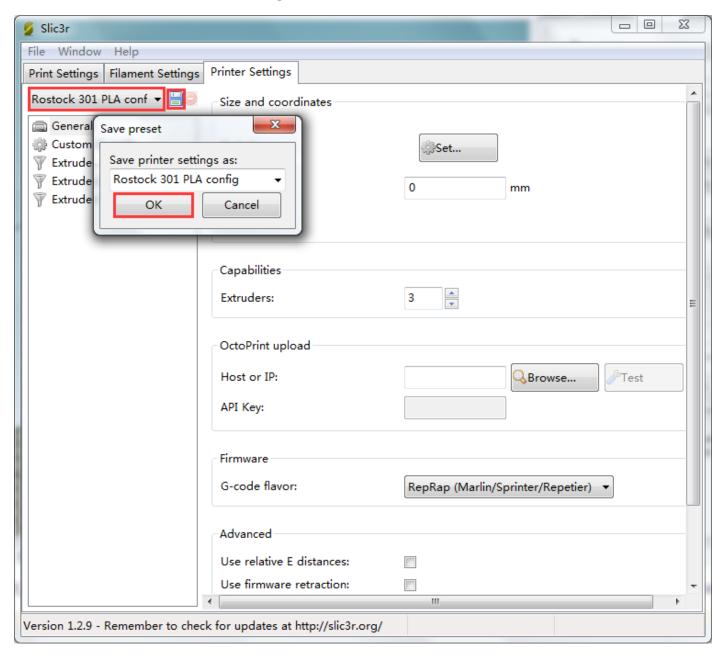
Click to save in the tab of **Filament Settings**:







Click to save in the tab of **Printer Settings:**



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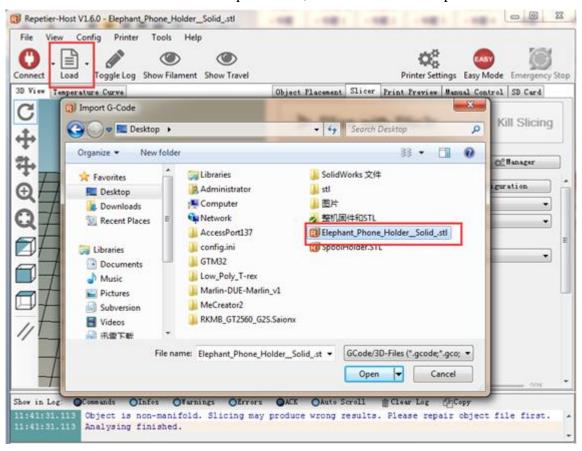
8 Start Printing

So far the preparation work is finished. Next step is to load model, slicing and printing.

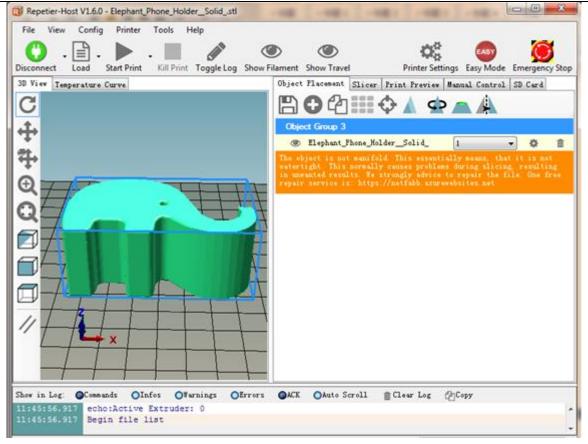
The file format of the model file for 3D printer is usually .stl. Rostock 301 supports following file format: **STL**, **3ds**, **obj**, **mf**, **dae**, **G-code**. You can download models on the internet for printing. Of course you can also design your own creative models for printing. Here we print a small elephant phone holder. You can download the model here: Elephant Phone Holder Solid.stl

8.1 Load the Printing Model

Click **Load** button in the main interface of Repetier host, choose the file and open it.

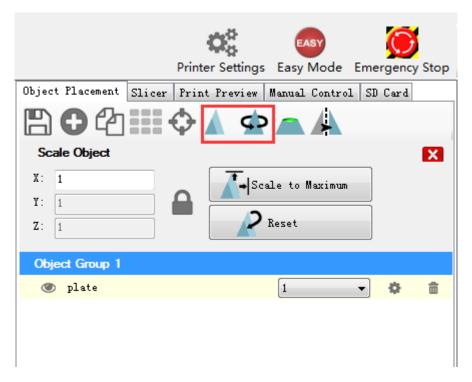






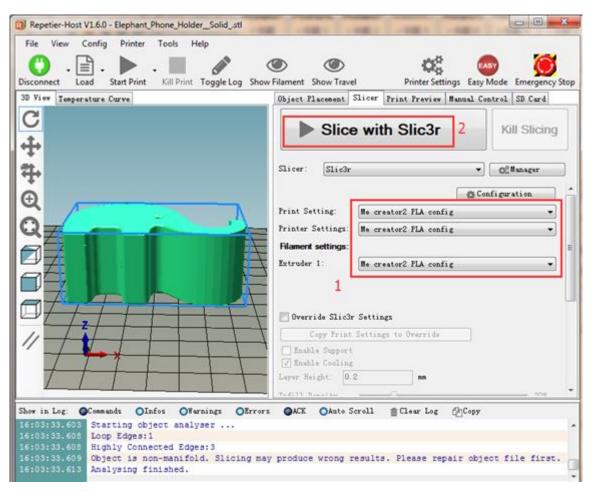
8.2 Slicing

You can use the following button to enlarge, shrink or rotate it.



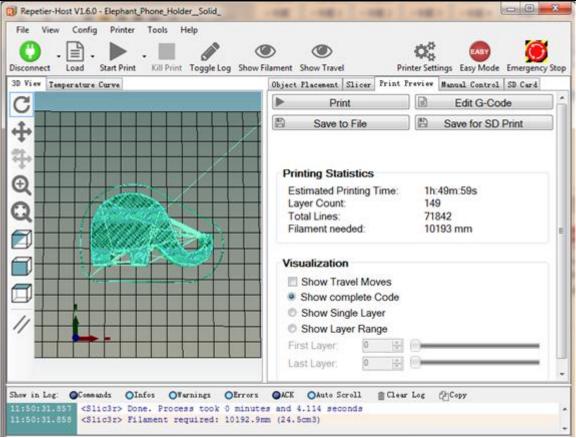


After setting the size, choose the slicing parameters which were imported before in **slicer** window, and click slicing.



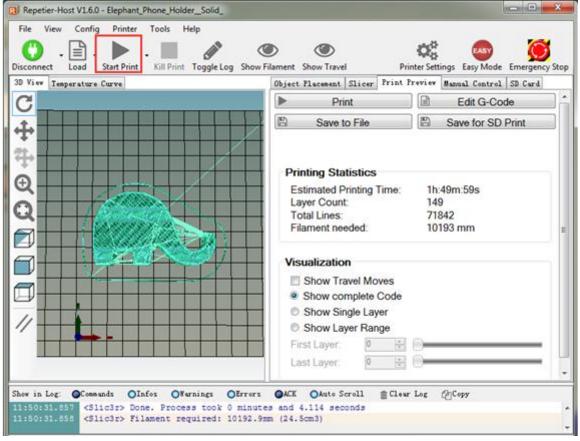
Now the .gcode file which can be recognized by the printer is generated.





click printing button to start printing.





8.3 Stand-alone Printing with SD card

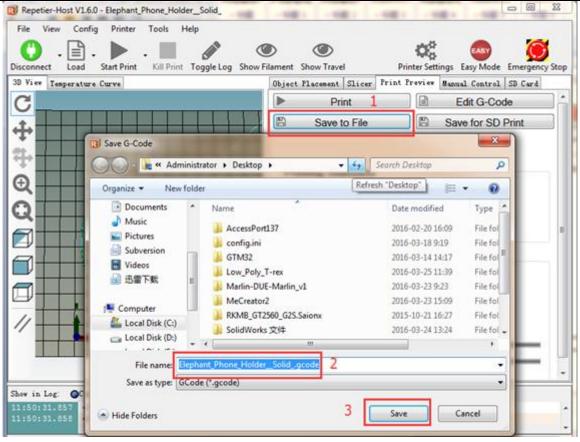
If you want to use SD card to print, we can save g.code file into SD card for printing.

Note: the printer can only recognize .gcode file, and it must be put in the root directory of the SD card.

8.3.1 Save

Click **Save to File**, and choose save button in the dialog. Choose the saving path, and produce g.code file which can be used for printing with SD card.





8.3.3 Printing

Insert the SD card into the printer, choose corresponding .gcode file to print.

Press the knob on LCD, enter the main menu, and choose the SD card.





Choose corresponding g.code file to begin printing.



It will automatically print after heating is finished.

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9. Introduction of Mixer

Mixer is used to adjust the mixing proportion of two kinds of filaments in order to realize the printing effect of different colors and blending colors.



The menu in Mixer is shown as below:

Prepare: used for returning to upper Prepare Menu

Filament 0: displaying current proportion of Filament 0. Press to enter, the value can be adjusted.

Filament 1: displaying current proportion of Filament 1. Press to enter, the value can be adjusted.

Filament 2: displaying current proportion of Filament 2. Press to enter, the value can be adjusted.

Note: extruder order should be equivalent to filament order.

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The sum of the proportion of Filament 0, Filament 1 and Filament 2 is 100%. If you manually adjust either of the two values, system will automatically work out the other value. The proportion will not change unless you readjusting it or choosing template again.

You need to know the logic of the three values.

The increase (or decrease) of Filament 0 will decrease (or increase) filament 2, vice versa

The increase (or decrease) of Filament 1 will decrease (or increase) filament 2, not vice versa

The increase (or decrease) of Filament 0 will not decrease (or increase) filament 1 directly, vice versa

For example, the initial proportion of F0/F1/F2 is 100%/ 0%/ 0%. If you want to print with the following proportion:

 $F \frac{0}{F1} = \frac{80\%}{7\%} \frac{13\%}{13\%}$. Only two steps are required.

Step1: Decrease F0 to 60%, now the proportion will be F0/ F1/ F 2=80% / 0% / 20%.





Step2: Increase F1 to 7%, now the proportion will be F0/ F1/ F 2=80% / 7% / 13%.



The feeding proportion will change immediately; you do not need to store memory.



With the Mixer feature, we can print different color combinations and effects.

9.1 print with alternating color

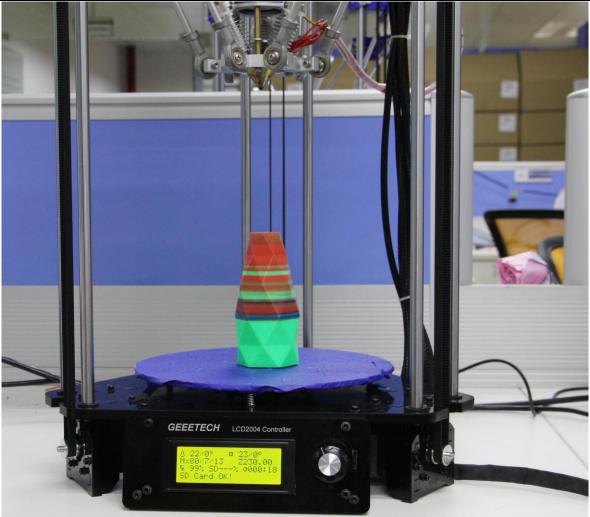
You can use Rostock 301 to print alternating color like using other printers with multi extruders. Please calculate the printing time in advance, and adjust the proportion of F0/F1/F2 when it is time to change color.



9.2 Blending color

You can blend any two of the three filaments or you can blend the three filaments. If you are good at color blending, you can print any color you want.





9.3 Gradient color

This printing model only applies to F0 and F1. When you choose this model, the proportion of F2 will be 0% as default.

Custom template allows user to set the parameters of gradient color printing. It provides six customizable templates for user to set and they are named as Custom1 to Custom6. User can set under the Mixer >Custom menu. Each template includes parameters of Start Gradient Percent, End Gradient Percent, Start Height, and End Height. Perform a Store Memory to save it when the setting is done.

Next I will show you how to set and use a customized template.

9.3.1 Parameters Setting Instructions:

1. All the settings are set based on Filament0 by default.



- 2. According to the work principle of Mixer, the sum feeding rate of Filament0 and Filament1 is 100%. After Filament0 is set, the system will automatically calculate the corresponding feeding rate of Filament1.
- 3. Start percent and end percent can be set at will. The sum of them is not always 100%. Users can adjust it according to their requirements.

E.g., you can set the start percent of Filament0 as 30% and the end percent 60%.

	Filament0	Filament1	Total
Start percent	30%	70%	100%
End percent	60%	40%	100%
Total	90%	110%	

4. Start height and end height are print heights above the bed not the current printing height. Start height and end height must be greater than current printing height; otherwise they will be regarded as invalid.

For example:

Current height is 40mm above the bed, but the start height in the template setting is 20mm and the end height is 30mm. It has overlapped part with current print height, so the system will automatically ignore this template and continue printing with the current template.

5. When one template is finished, printing will continue with the feed rate percent that is fixed, without gradient effect, until you choose a new template.

9.3.2 Custom Template Setting

Choose Mixer->Custom on LCD control panel:







Let's take custom 1 as example.





Here we set custom 1 conf as follows:

Start Percent: 20%

End Percent: 62%

Start Height: 0mm

End Height: 32mm

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When the setting is done, please press Store memory to save it:

Similarly you can set other custom templates, for example, custom 2:

Start Percent: 25%

End Percent: 40%

Start Height: 32mm

End Height: 100mm

(Note: there is no overlapped height)











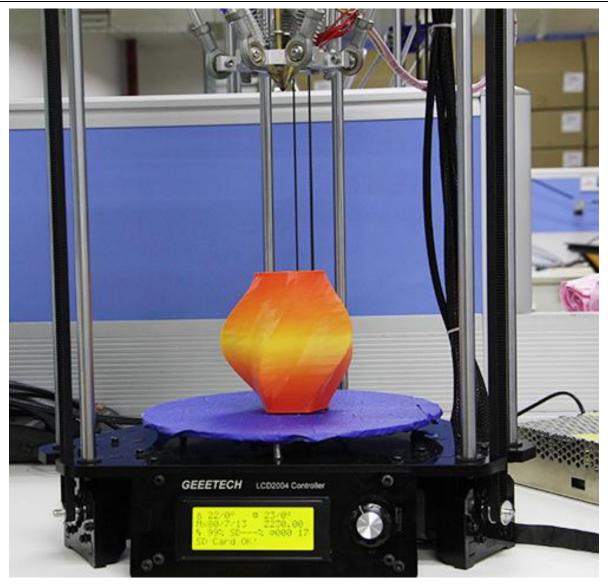
The templates which have been set can be found in Mixer->Templates.

You can change setting parameters at any time during the printing process. When the setting is done, you can start printing. Select the corresponding template in Mixer-> Templates during the printing process.



Note: the "*" after the template means the current template you are choosing and using. System will follow your last chosen operation by default.





9.4 Other mix effect

For the above 3 printing effects, they are used to print 3d models that are a whole part and the color changes in verticle. For those 3D models that consists of multiple parts and the color changes in horizontal, for such models, we can assign different color for different parts. But there is no blending and gradient effect.





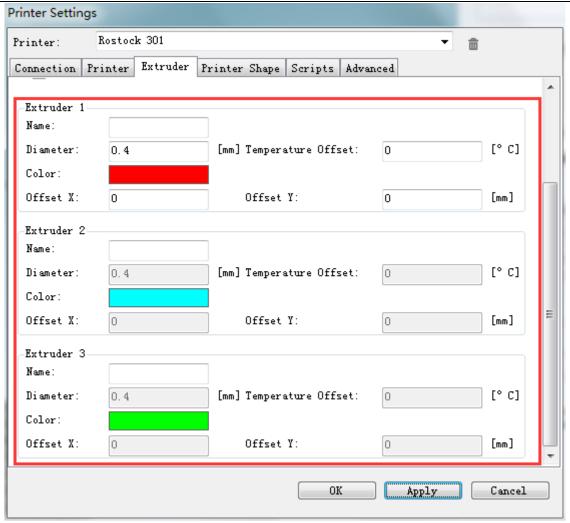
Let's take the heart-bracelet as an example.

Click to download the .stl file.

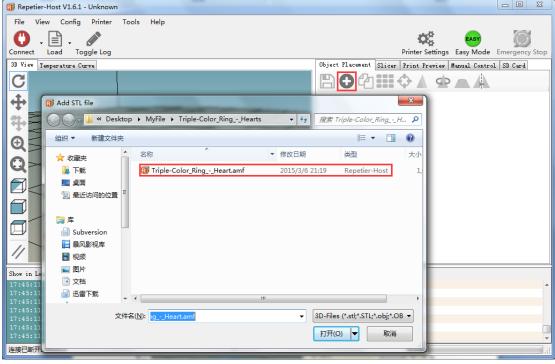
Step1. Actually we have done this step before, but to be sure, we need to check again.

Choose different colors for the three extruder at Printer setting->Extruder

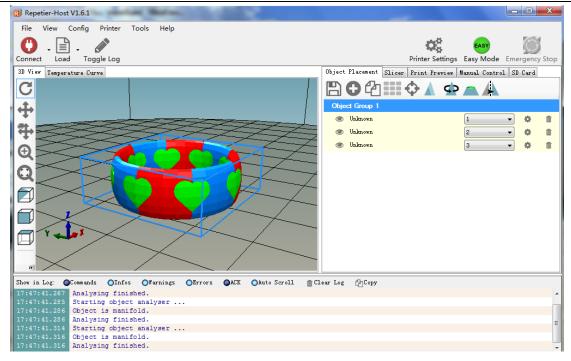




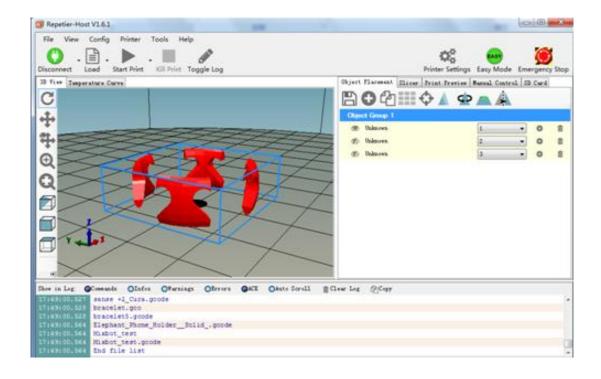
Step2. Load the .stl to repetier host.



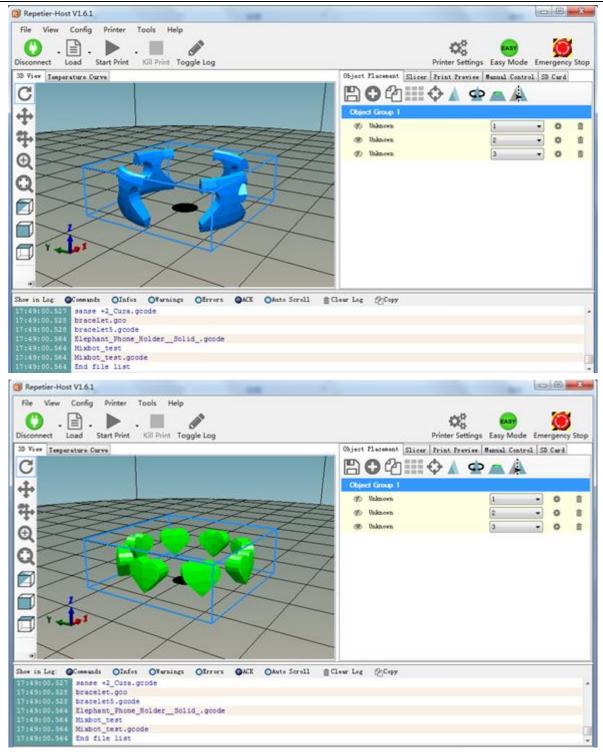




Step3. The model is combined together, and was divided into 3 groups, which makes it easier for us to differentiate each part. Click the eye icon to hide the part.







Now you have differentiated them, you can assign different extruders / colors for each part.

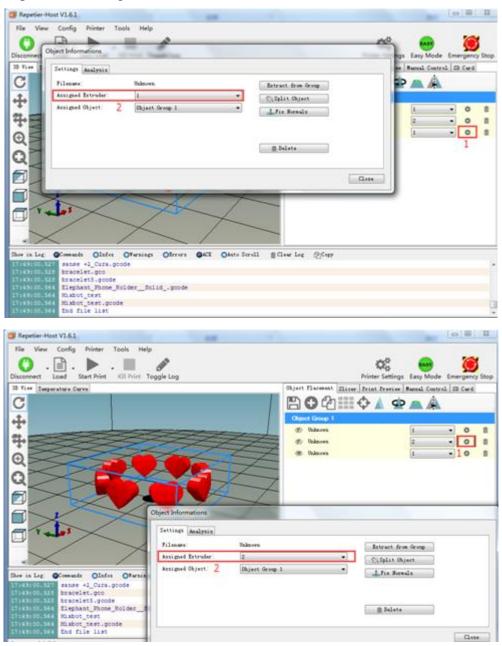
Note: the extruder 1 in repetier host is coorespinding to the E0 of Rostock 301

the extruder 2 in repetier host is coorespinding to the E1 of Rostock 301

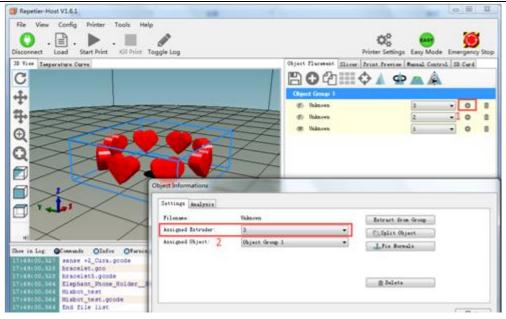
the extruder 3 in repetier host is coorespinding to the E2 of Rostock 301

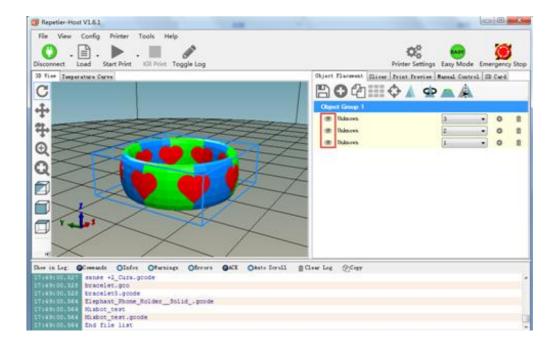


Step4. Assign extruder for each group of the model. Choose the group, and click the setting icon, choose the extruder in the drop menu of Assigned Extruder:



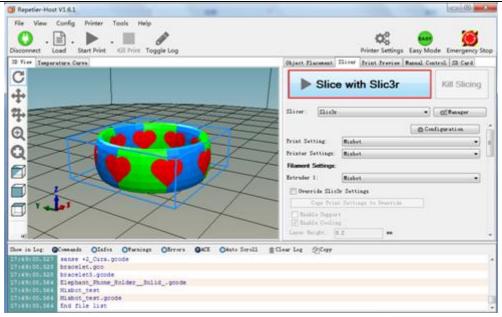




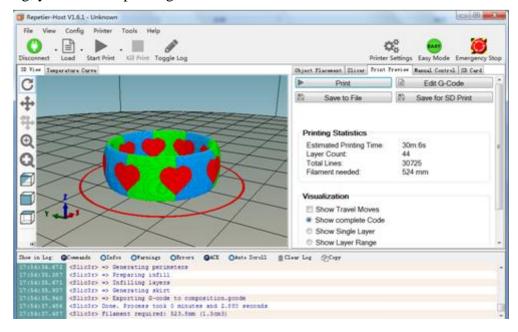


Step 5 Slicing





Step6 done slicing, you can start printing.



10. FAQ

If you have any problem when you use the printer, you can visit our forum

http://www.geeetech.com/forum/there are detailed solutions on the forum. FAQ are as follows:

10.1 Motors cannot work

When your are testing the motors, if the motor of an axis has no response or cannot work normally (the

extruder can work when it is above 170°C), you need check whether the motor, motor driven board or

voltage of this axis can work normally or not. Meanwhile you need make sure whether the bearing is

damaged or not, whether the smooth rod/screw rod is bent or not, whether the tension of belt is normal or

not, whether each axis is installed correctly or not. For detailed solutions, please refer to:

http://www.geeetech.com/forum/viewtopic.php?f=17&t=17038

10.2 Extruder cannot work/ extrusion not fluent

When you are testing the extruder, make sure the temperature is over 170°C. If you find that the extruder

doesn't work or the extrusion is not fluent, or there is click noise, you need check the motor or clean the

barrel and nozzle of the extruder. For detailed method please refer to

http://www.geeetech.com/forum/viewtopic.php?f=19&t=17097

10.3 Printing quality optimization

If there are problems such as stringing, warped edge, the first layer not sticking to the bed, and poor surface

quality, you can refer to following link to do adjustment for parameters:

http://www.geeetech.com/forum/viewtopic.php?f=26&t=17183

1Specifications

Printing specifications:

Print technology: FDM

Build volume: D170mm, H230mm

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Printing precision: 0.05mm

Print Speed: 80-120mm/s

Positioning precision: X/Y: 0.05mm. Z: 0.05mm

Filament diameter: 1.75mm Nozzle diameter: 0.4mm

Filament type: ABS/PLA

Software:

Operating system: Windows/Mac/Linux

Control software: Repetier-Host, Printrun

Slicing software: Slic3r, Cura-engine

File format: .STL, 3ds, obj, amf, dae, G-code

Temperature:

Max heated bed temperature: About 110 $\,^{\circ}$ C

Max extruder temperature: About 240 $^{\circ}$ C

Electrical:

Connectivity: USB, SD card (support stand-alone printing)

Mechanical:

Build Platform: Aluminum alloy plate+ heatbed

XYZ Rods: Wear-resistant, stainless steel

Stepper Motors: 1.8 step angle with 1/16 micro-stepping

Physical Dimensions & Weight

Machine Dimension: 320x320x870 mm



Shipping box Dimension: 495x395x195mm

Machine Net weight: 9.05kg

Machine shipping weight: 17.5kg

Contact us



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	1. There are lots of documents and troubleshooting		
	for Rostock 301 on our website. They are good		
	resources if you would like to quickly solve		
	problems by yourself.		
Technical support	2.If you still can not solve problems yourself even		
	with the help of above files, you can send e-mail to		
	technical@geeetech.com,we will reply to you within		
	24 hours.		
	For more products of Geeetech, please visit		
	www.geeetech.com or send e-mail to		
Sales	sales@geeetech.com		
	In order to improve our products to provide better		
	user experience, please send your comments and		
Feedback	suggestions to Rita.xiang@geeetech.cn. We will		
	appreciate to hear your valuable suggestions.		

