Flsun

Kossel 3D printer

User's Guide

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URL:http://www.aliexpress.com/store/product/high-quality-factory-delta-3d-printer-for-sale-with-40m-Filament-8GB-SD-card-LCD-masking/431393_32495135437.html?spm=2114.8147860.0.70.uFTFlU
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Contents

1,Install and connect

1)need software as follows:

A: repetier, it's the PC software to control the printer, slice and print the Model

B: arduino, it's the working environment of the firmware(marlin)

C: marlin, it's the firmware, you need flash it to motherboard when you Reset the height of the machine

D: others, you would need the other file like drivers, streamline etc, When your PC cant recognize the board through USB

2)Connect the kossel mini USB port(arduino mega 2560), in device Device manager, verify the COM port number assigned for the arduino Mega 2560(eg.com15) as follow shown

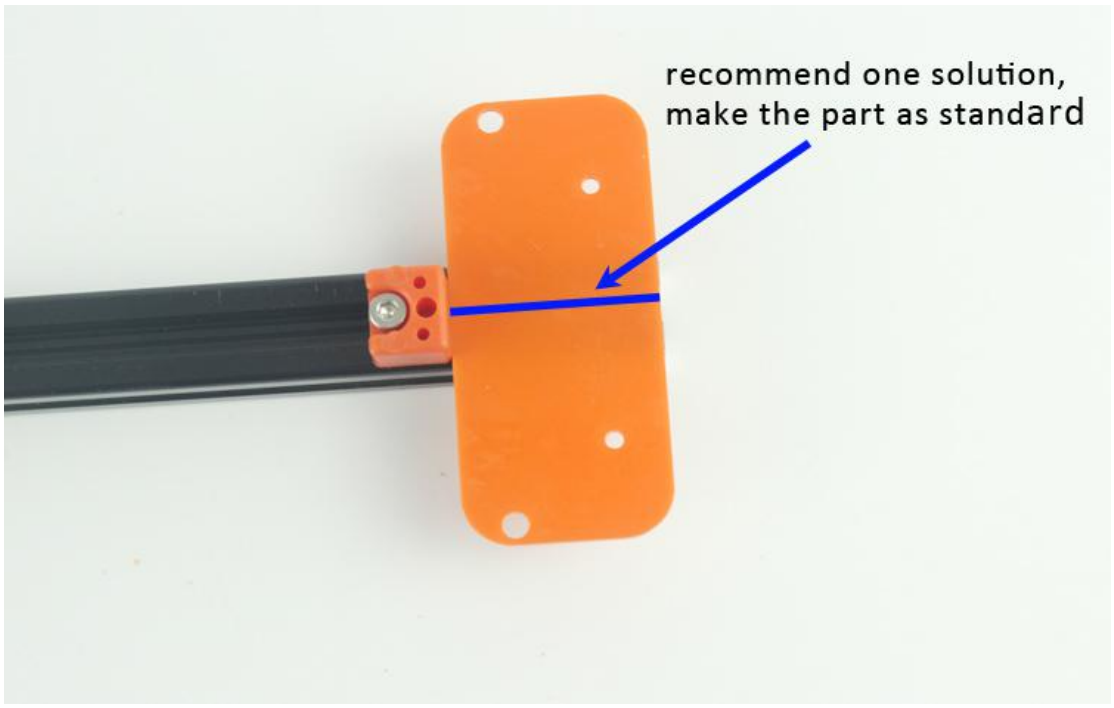
If your PC could not connect the motherboard, need a step to install the driver:

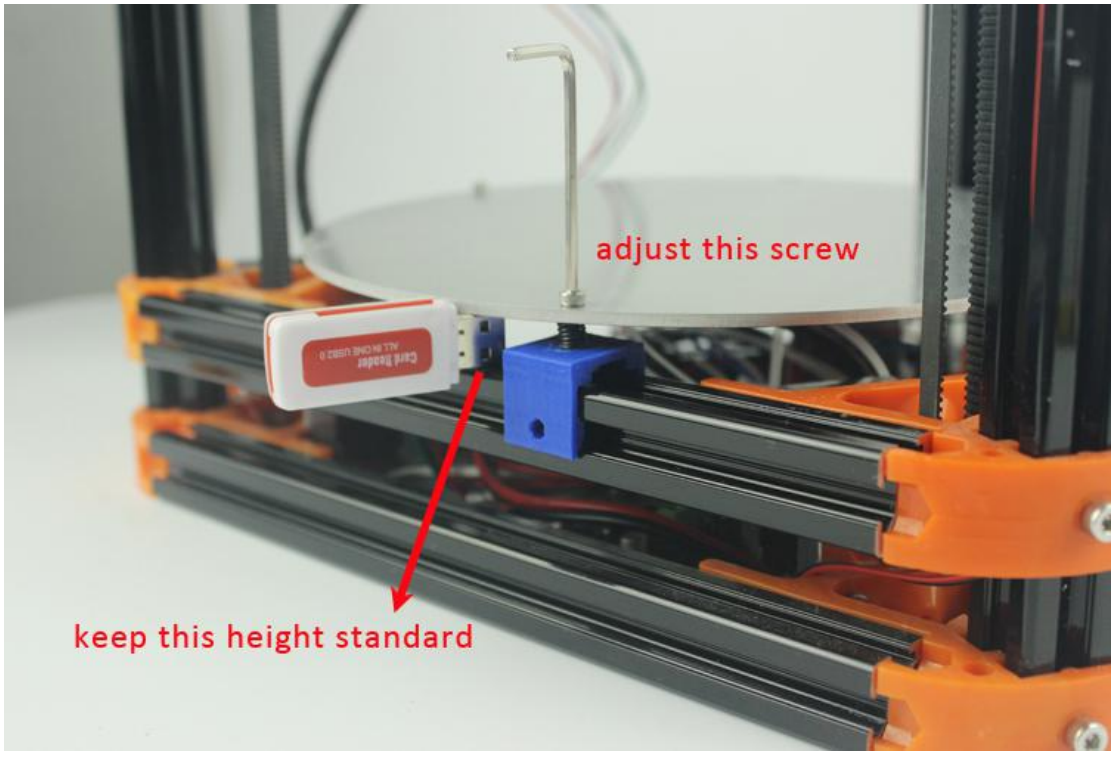
Unzip the “driver” in the software file, and install the file”dpinst-amd64” if your PC is 64 bit; or install the file”dpinst-x86”if your PC is 32 bit, all in all, ensure you could find the “arduino mega 2560” port in the device manager

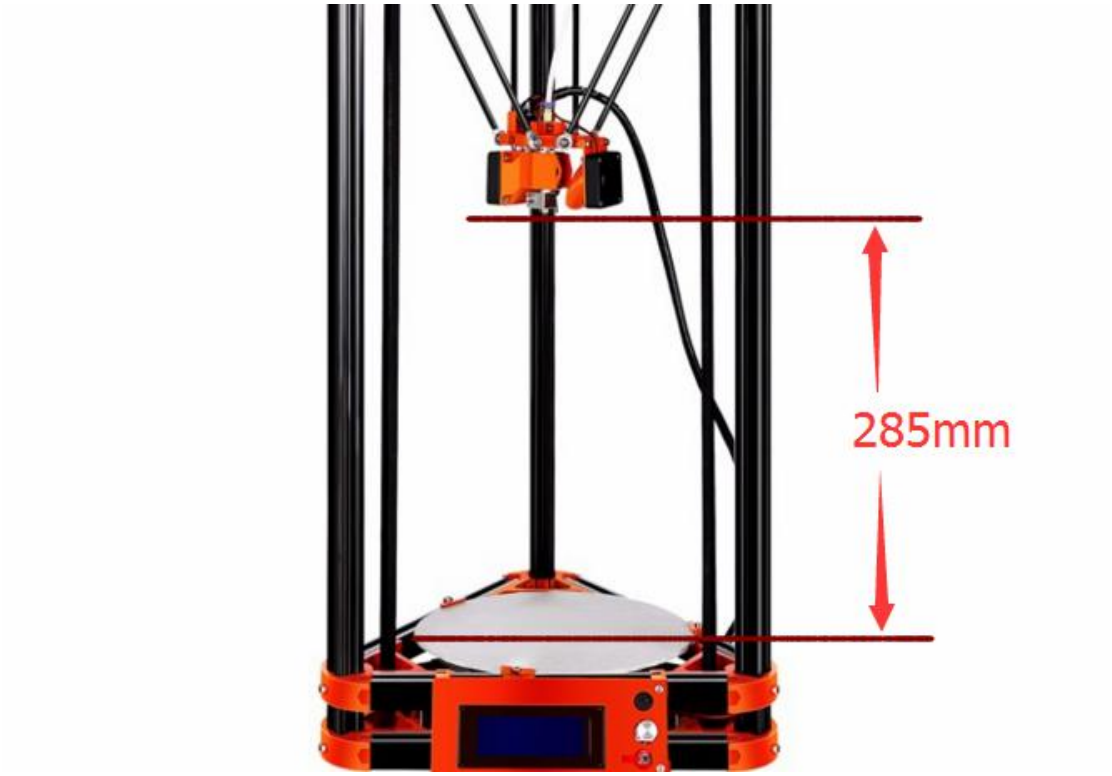
3)install “repetier” in your PC, the software of “repetier” has been packaged in the SD card, you could install from there or download from the internet(https://www.repetier.com/)

4)the other software of marlin and arduino only be used when you reset the height of the machine, so it is need not for the first print

5)The height of the machine has be set already when it is out off the factory, the highest position is decided by the limit switch block, we have determine it’s exact position by the board fix item like the pic1, and the lowest position is decided by the USB interface like the pic2, finally the print height of the machine is determined by the two position, it is 285mm from the highest to the lowest


recommend one solution,
make the part as standard


adjust this screw
keep this height standard

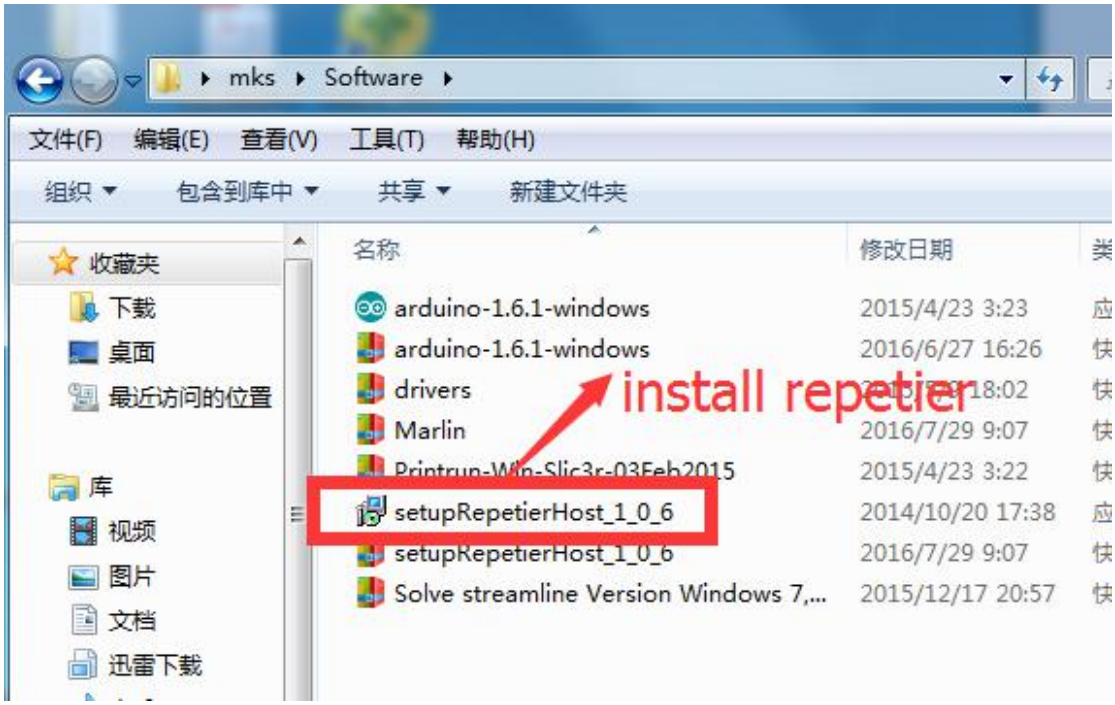


If you want DIY your printer’s height by yourself, you could change the limit switch block’s position to rise or reduce it’s height, and you have to reset the height’s value in the marlin, you could refer to the chapter 5

2,level the bed and auto-leveling

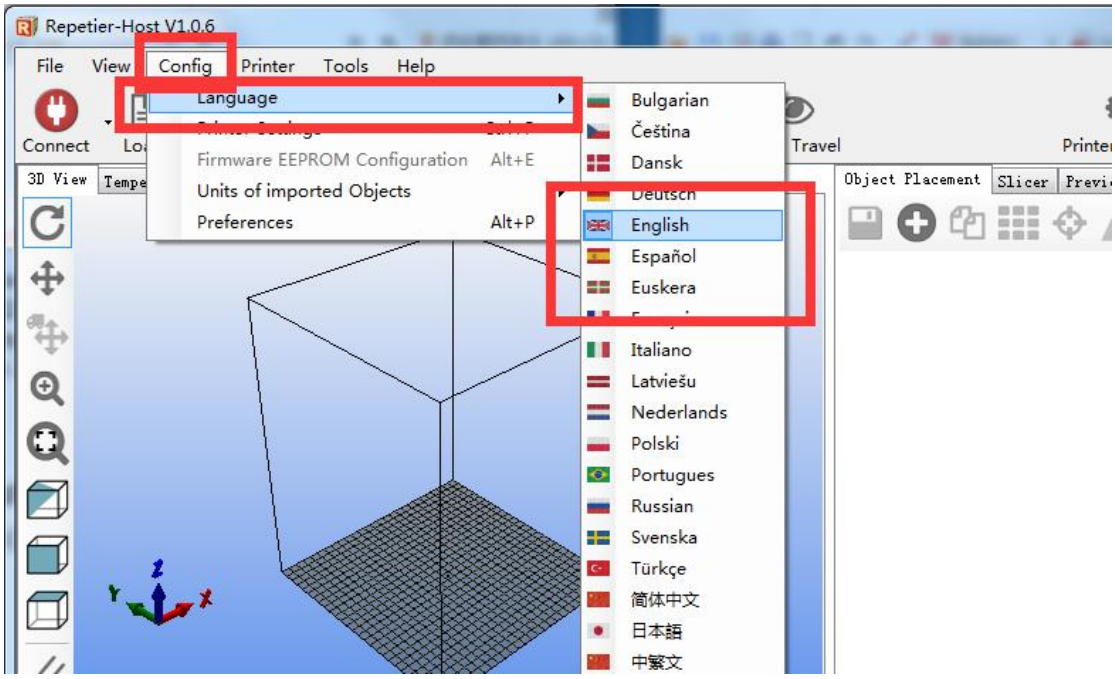
(1)test the function of repetier

1): install the repetier in your PC;

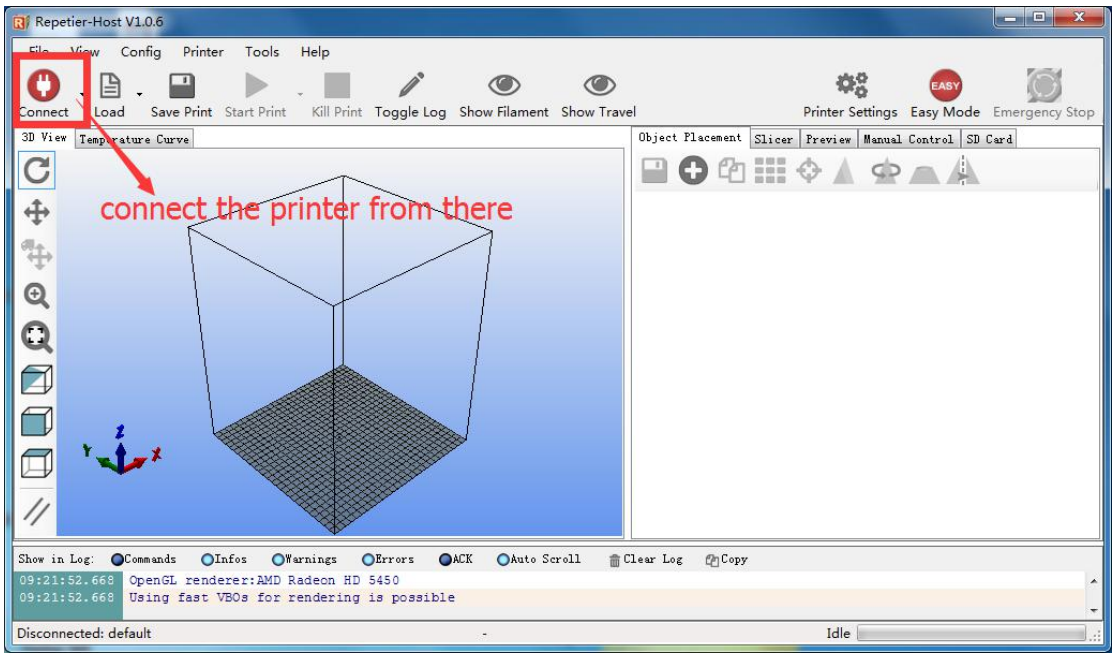


2): run repetier

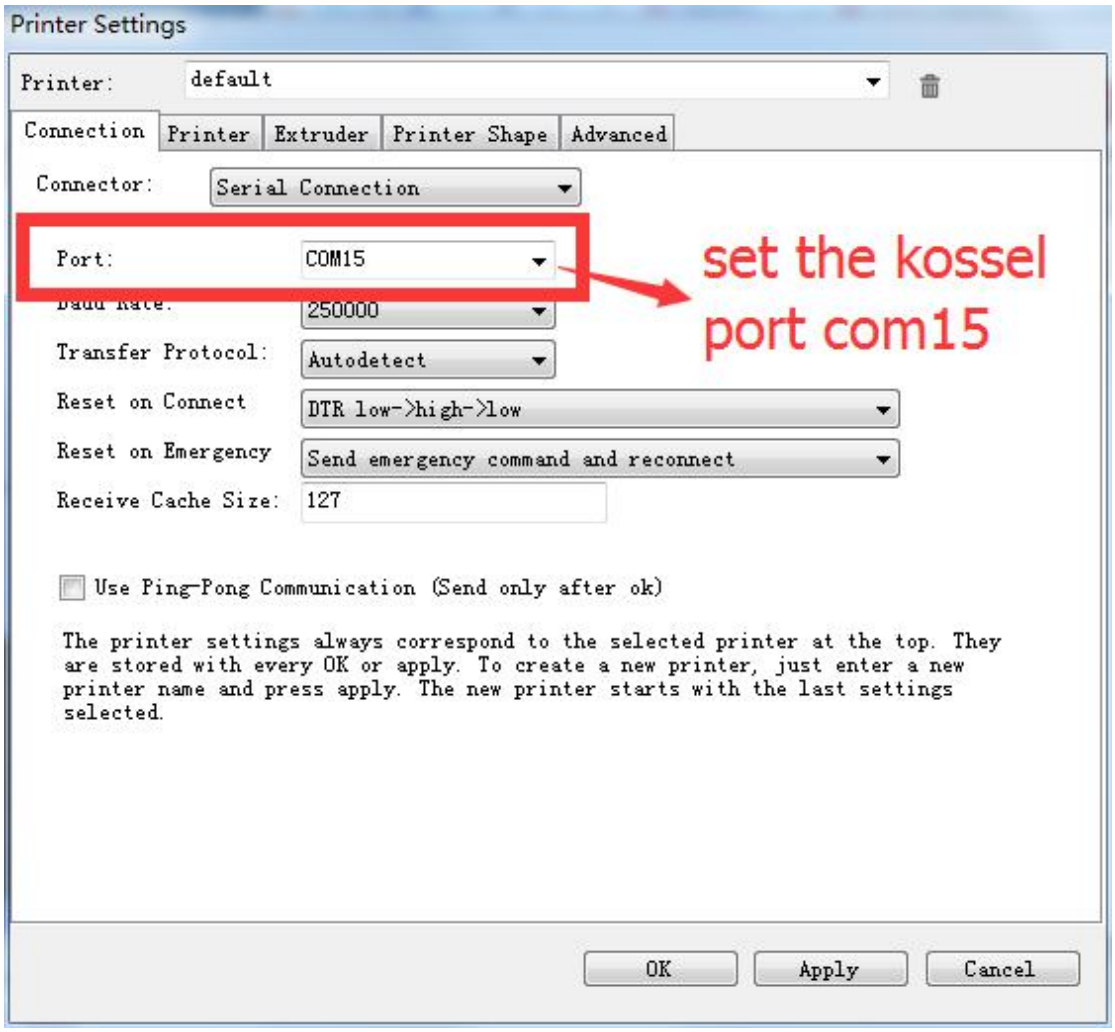
language



Connect

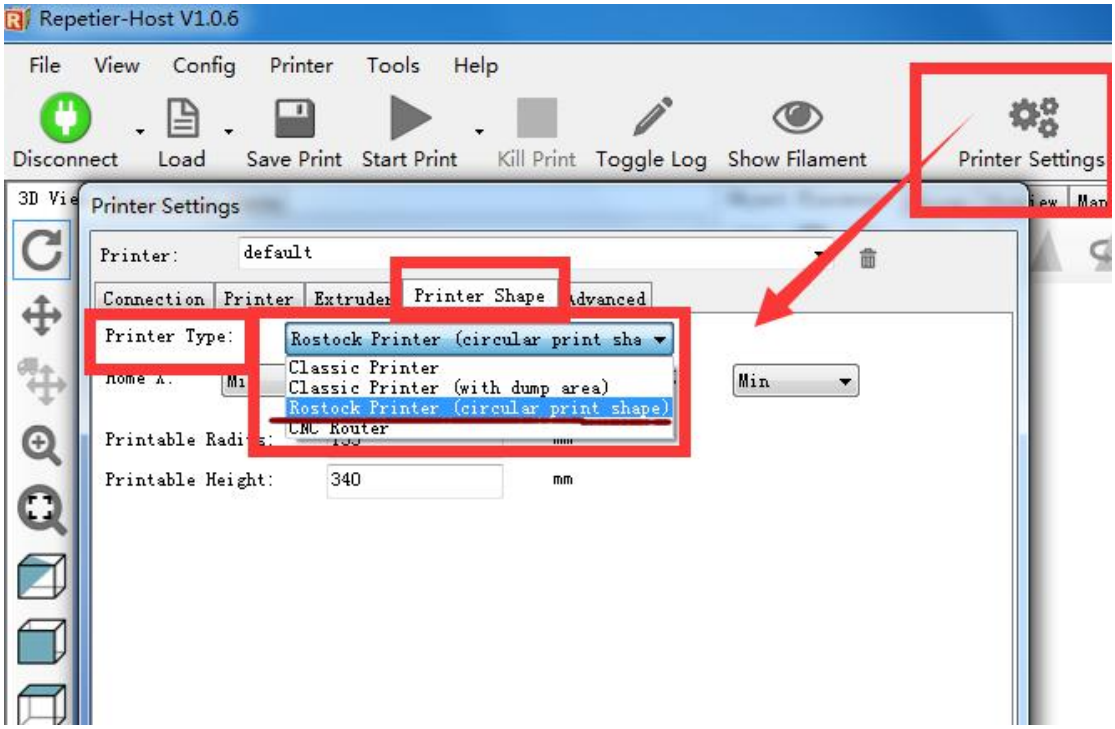


Communication Port

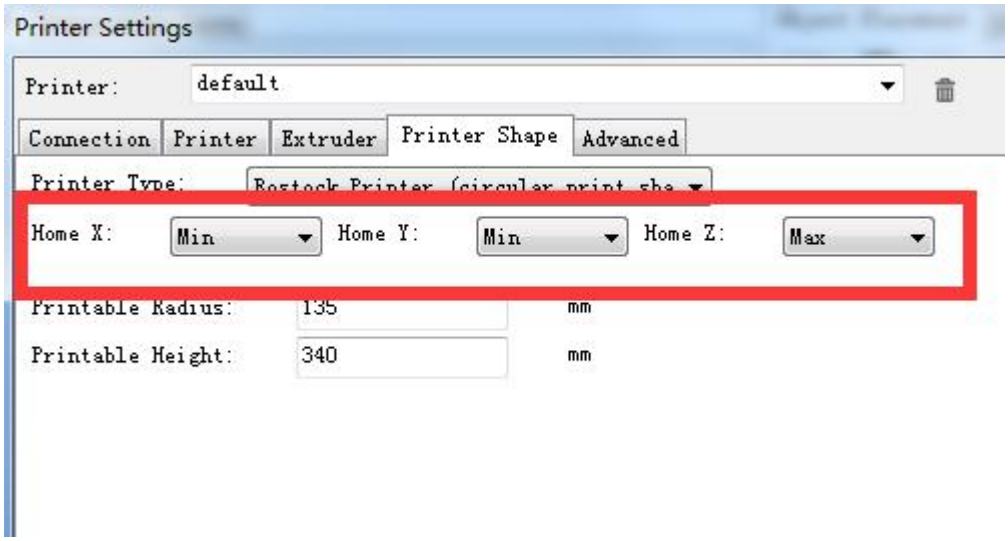


3): printer settings

printer type:rostock printer(circular print hap)



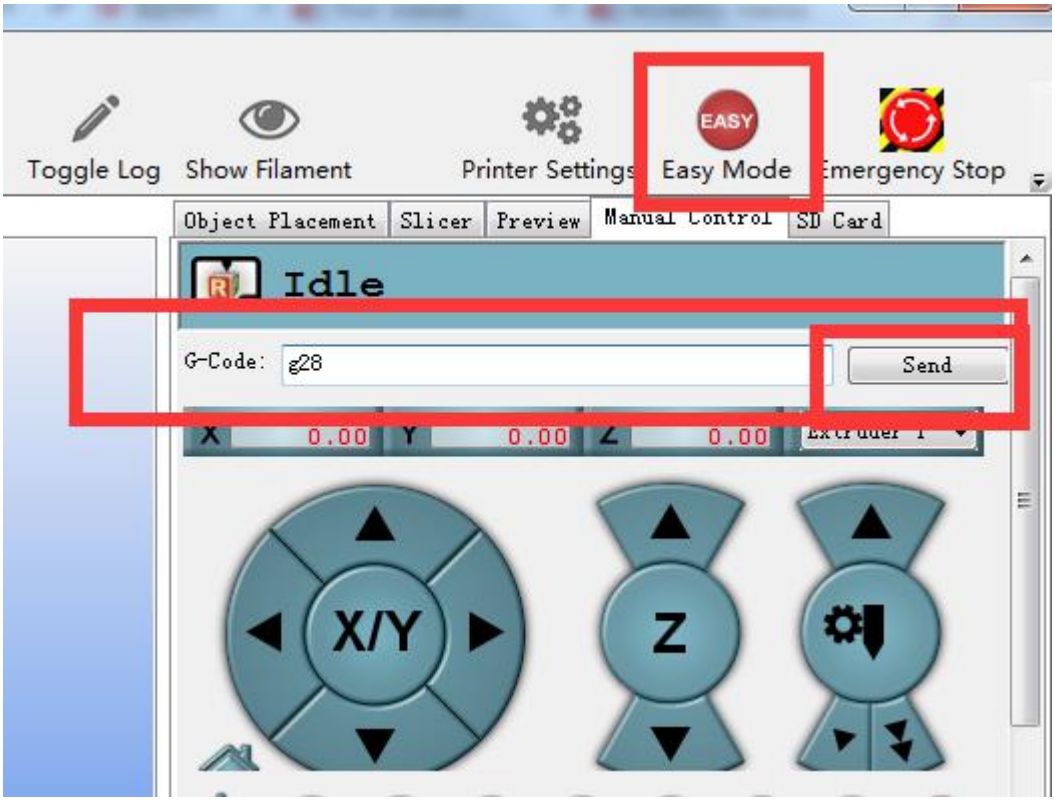
Home X min; hone Y min; home Z max



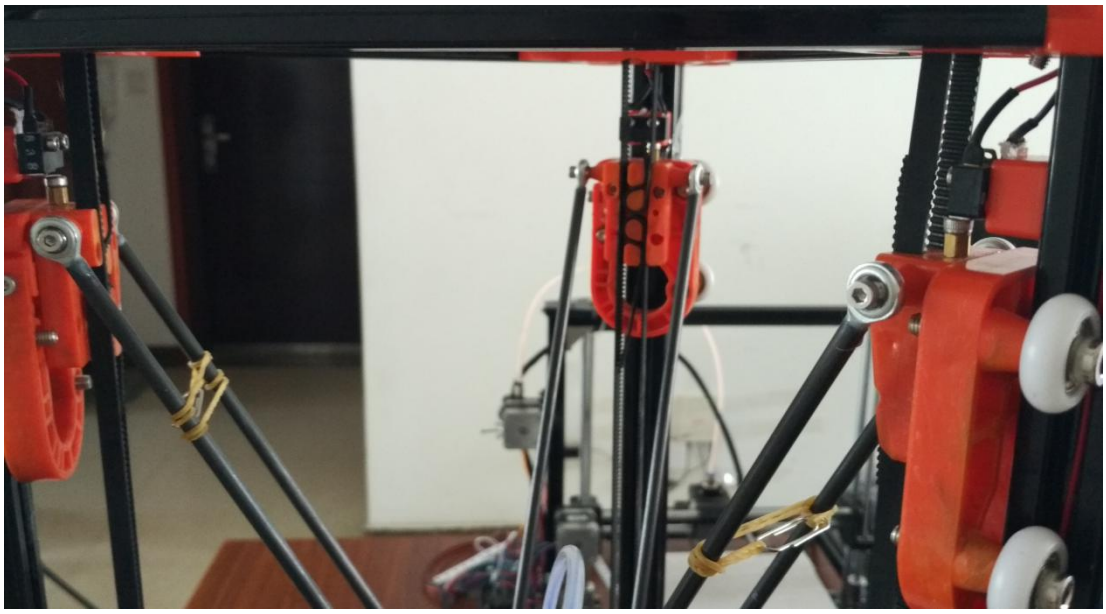
4):home function

CODE: G28 or GUI: 

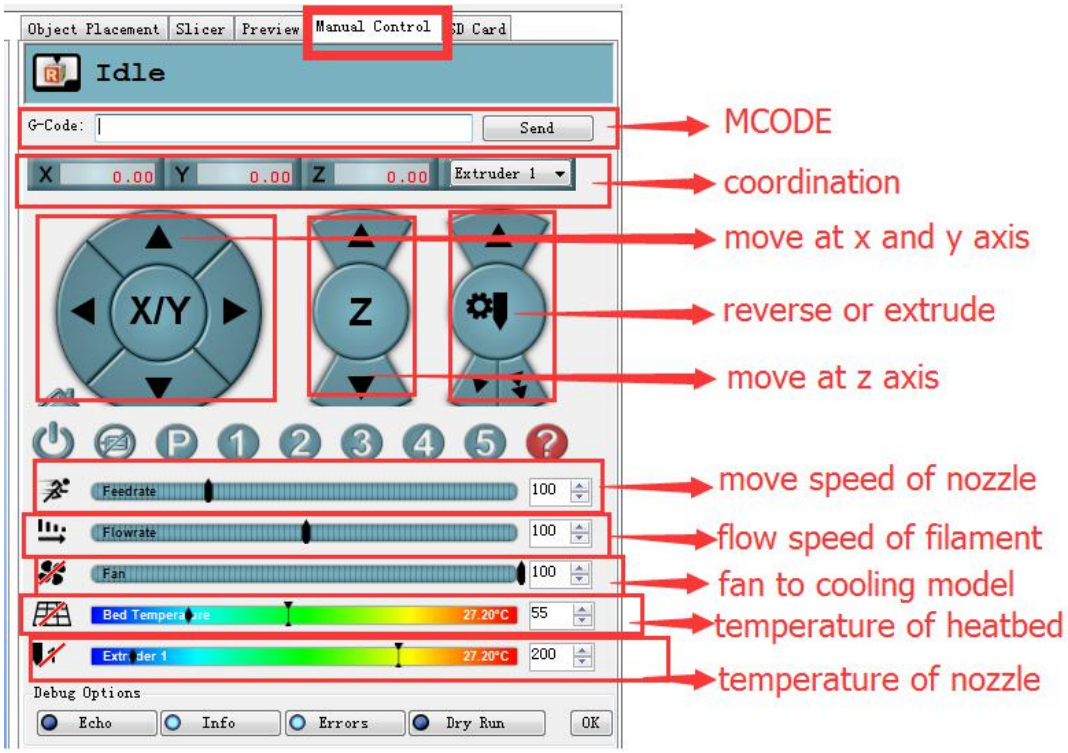
Easy mode then input g28 and send



Then the three axis's pulley will go up to the top until hit the switch

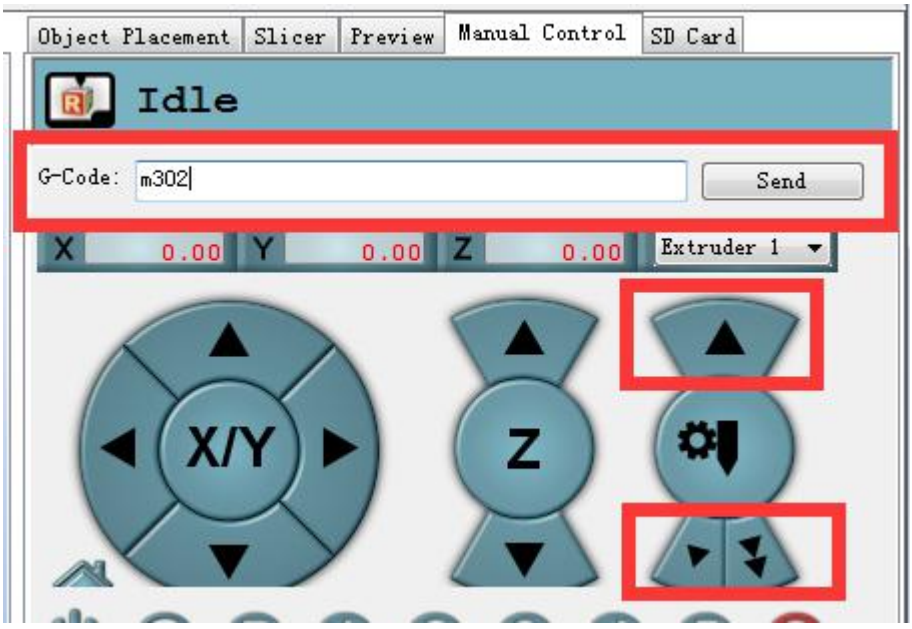


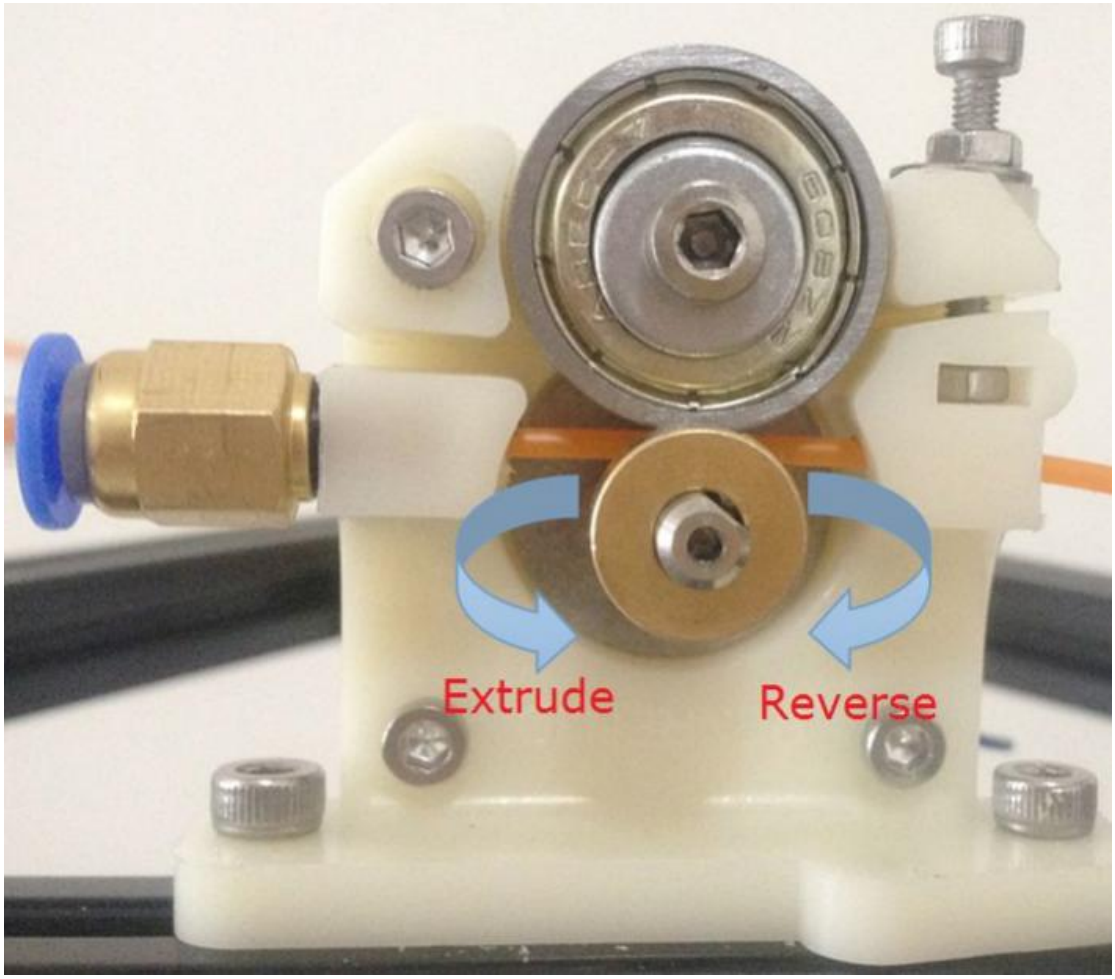
5)Control panel



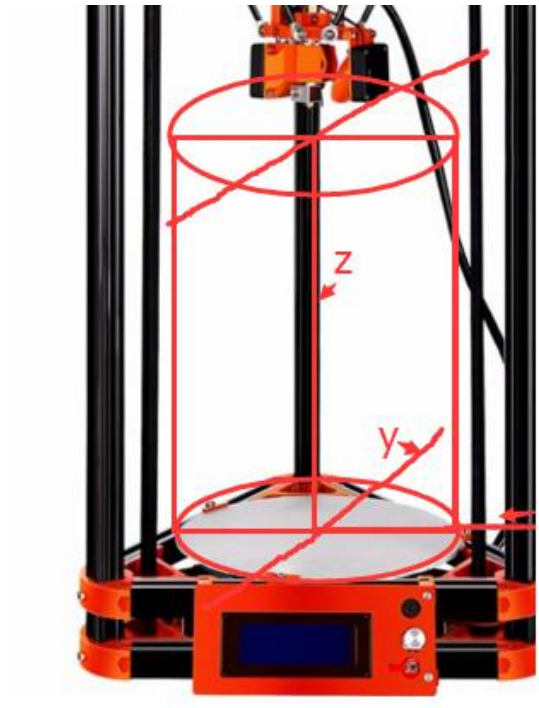
6)Extrude and reverse

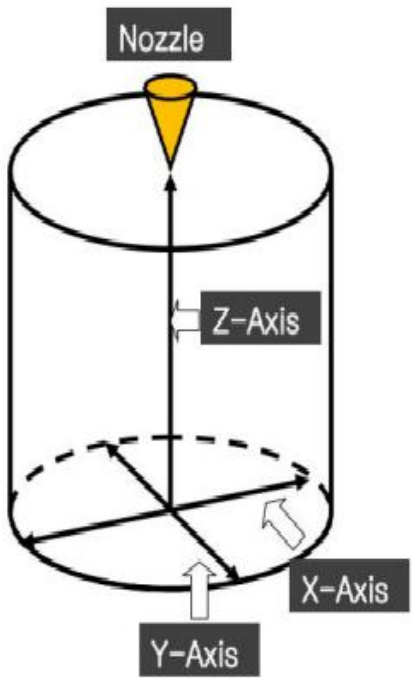
Type m302 before use this function

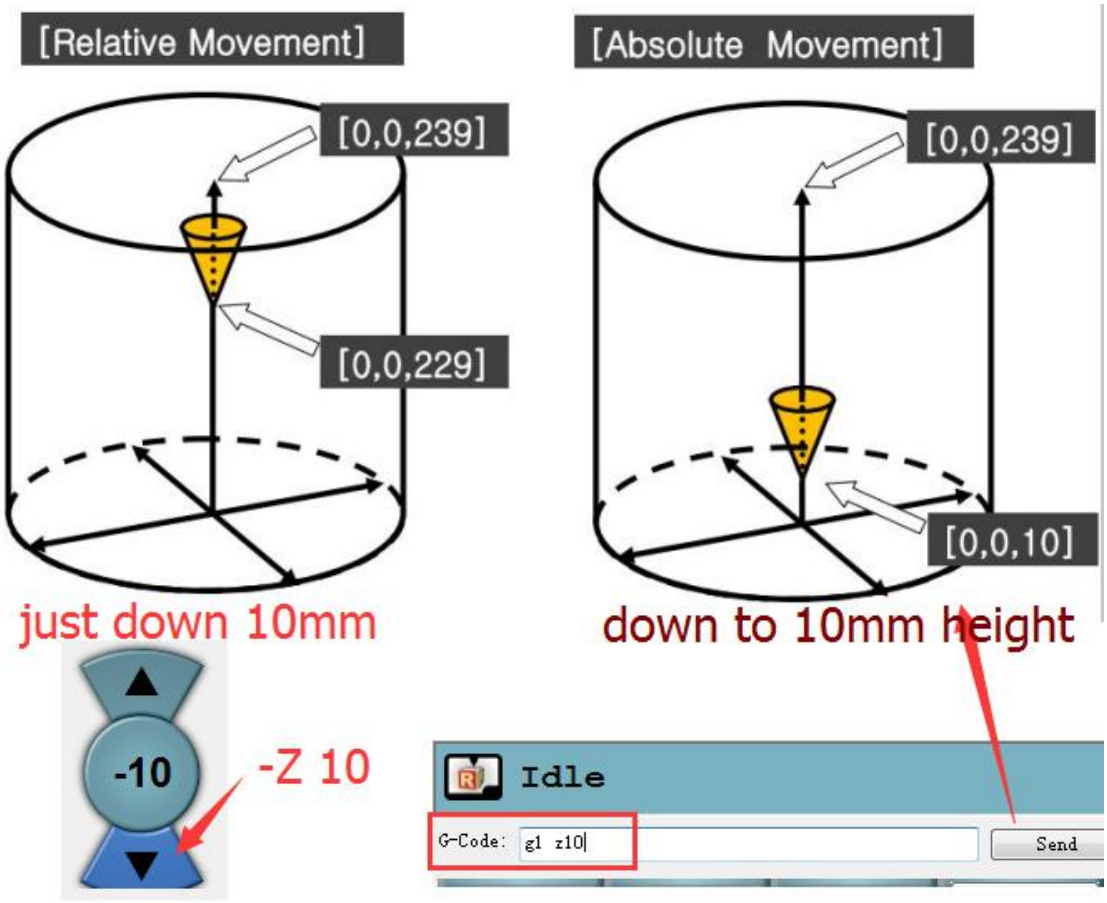




7)Move nozzle at x y and z axis

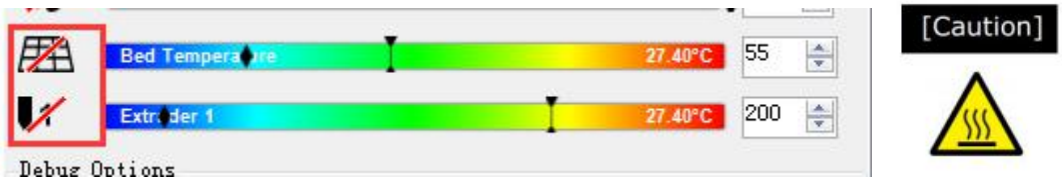




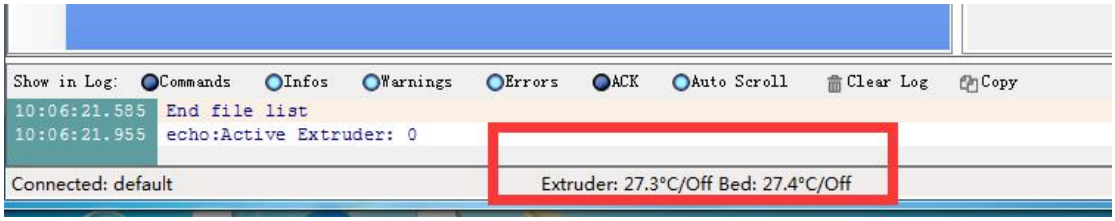


8)Preheat hotend

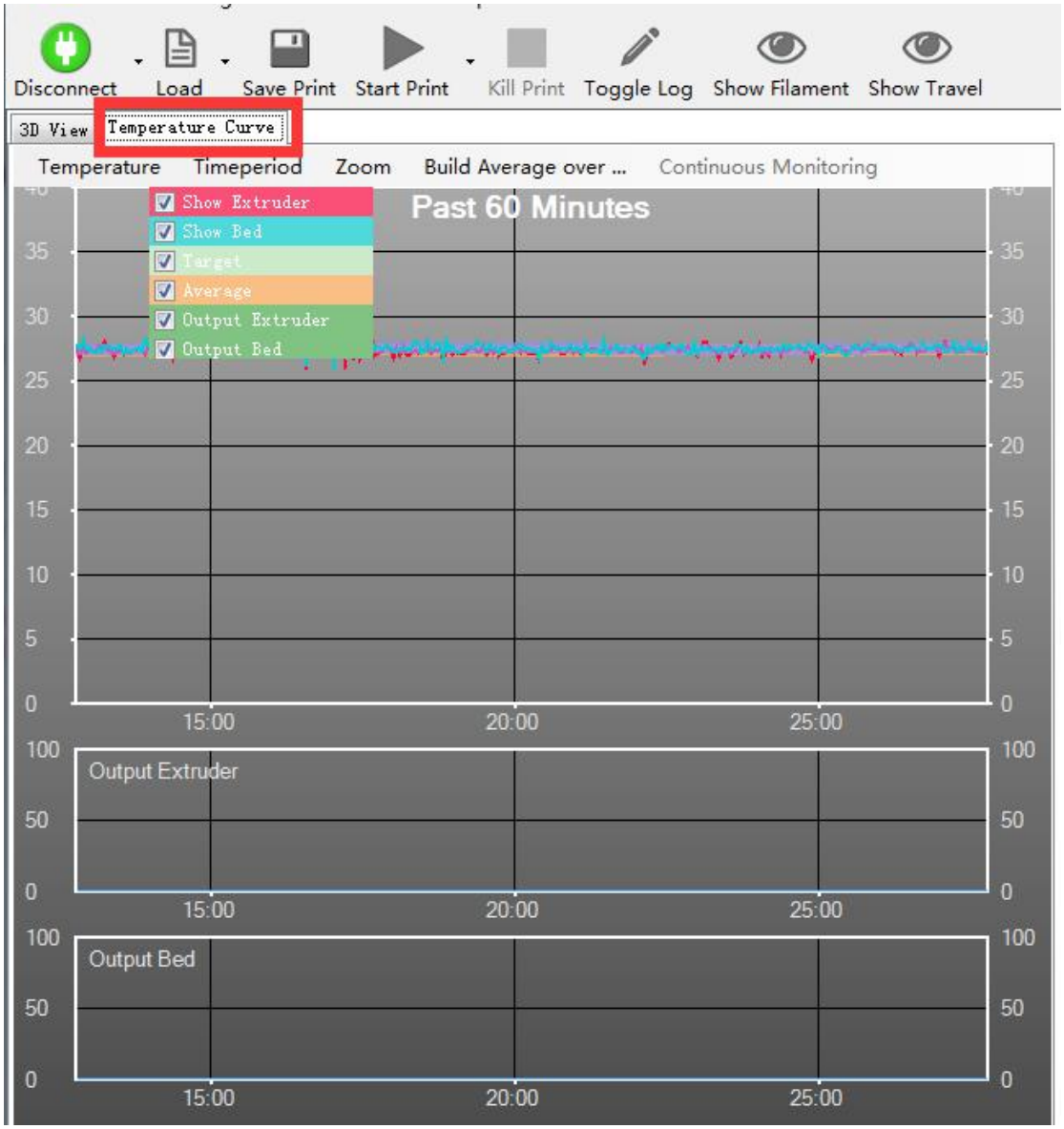
Control panel: adjust from there



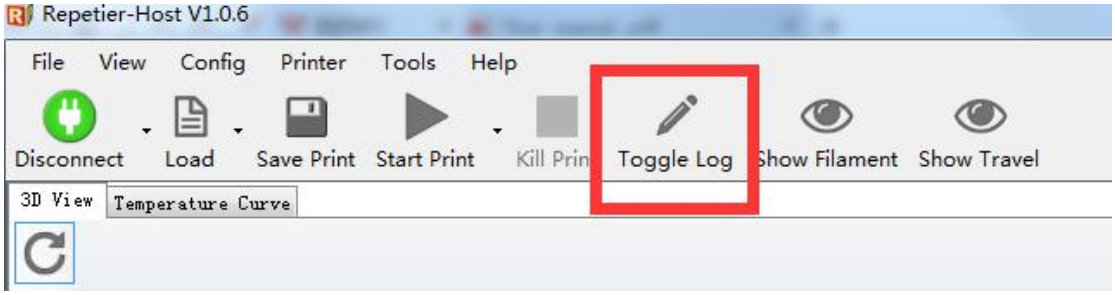
Check from there(bottom of repetier)



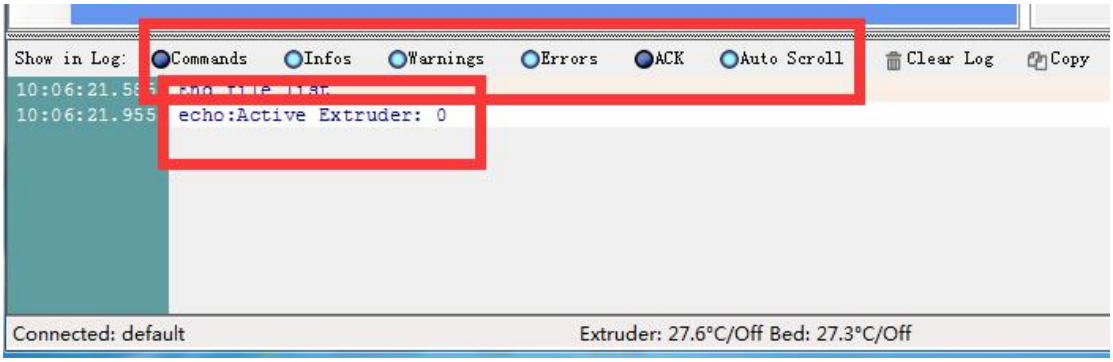
Temperature curve



9)Info of operation

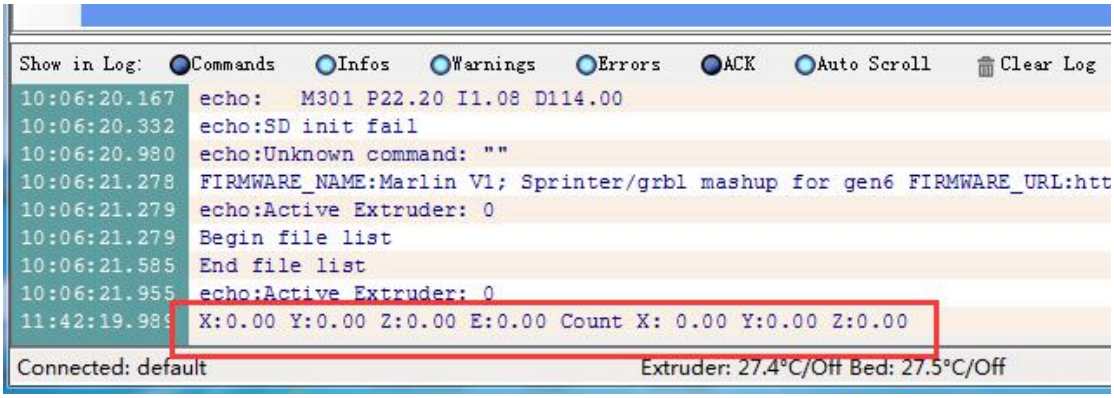


Check at the bottom



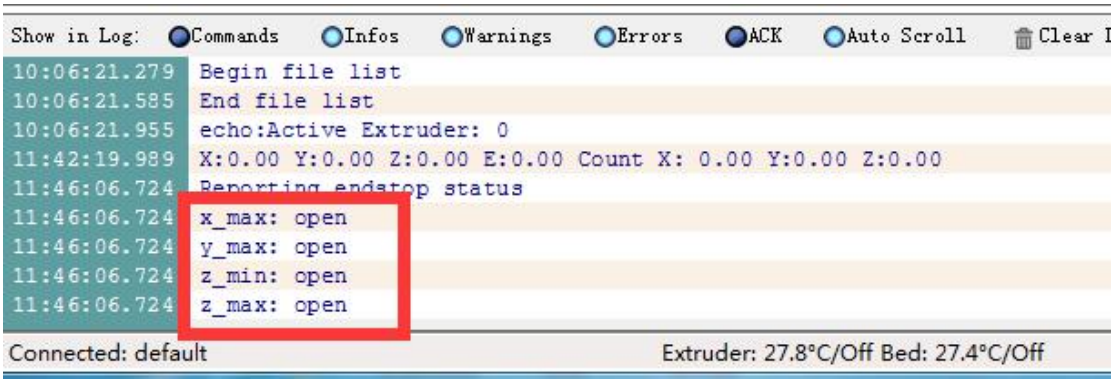
10)Info of coordination

MCODE: type m114 then check at the bottom



11)Info of limit switch

MCODE: type m119 then check at the bottom



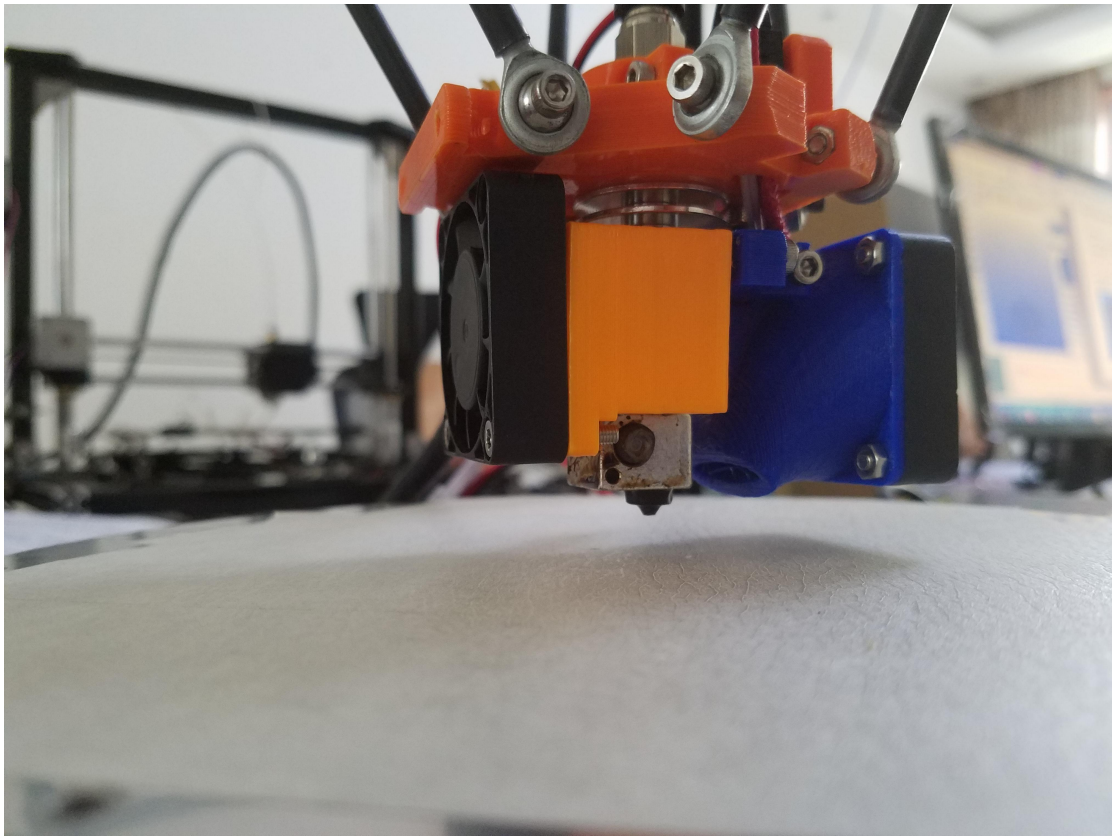
Observation: x_max, y_max, z_max, z_min

Hit the switch= triggered

Not hit switch= open

(2)level the bed

1): input g1 z0 : the nozzle will goes down to the position which is very close to bottom plate

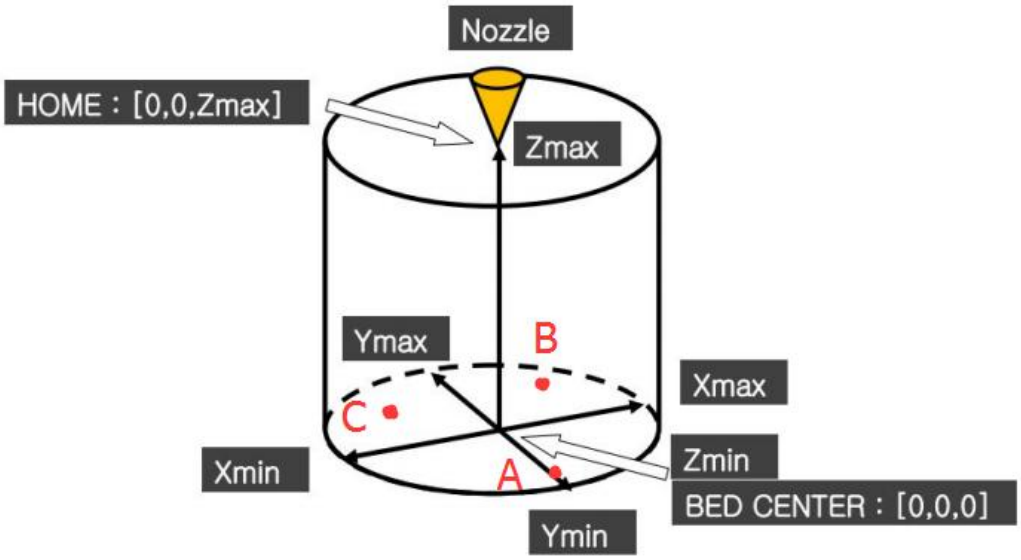


2) adjust the springs to ensure the plate is leveled at three coordination

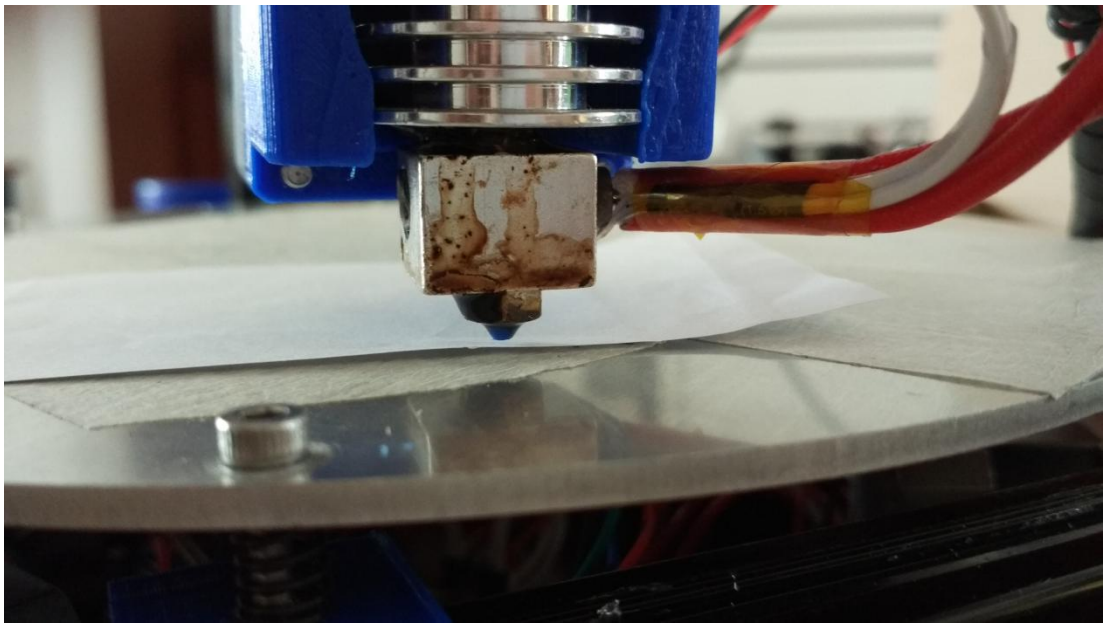
A: g1 x0 y-60 z0;

B: g1 x50 y30 z0;

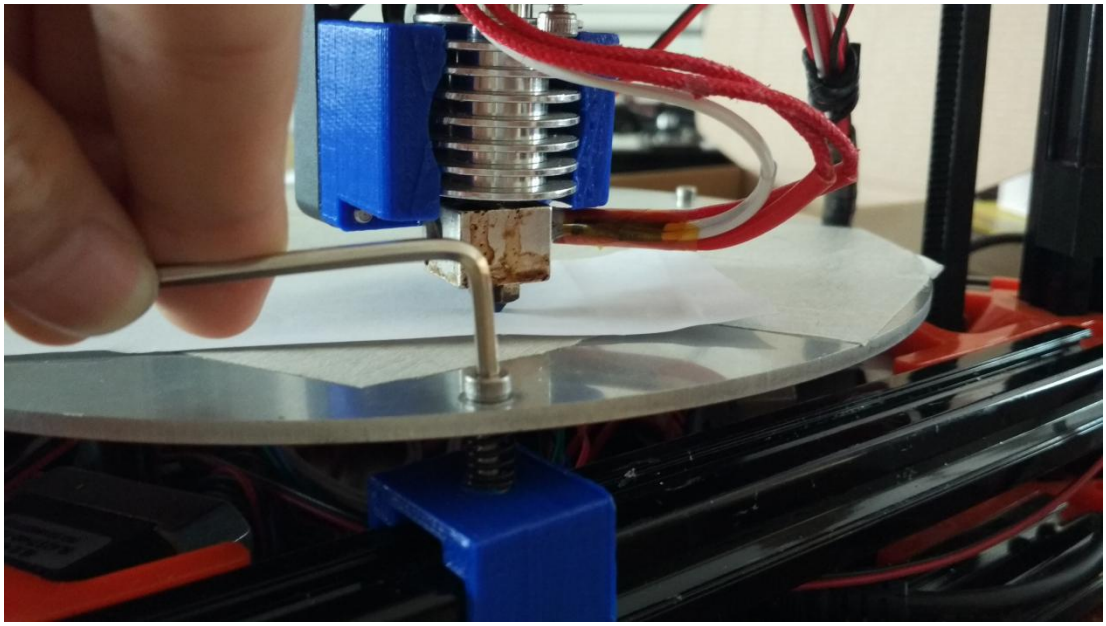
C: g1 x-50 y30 z0;

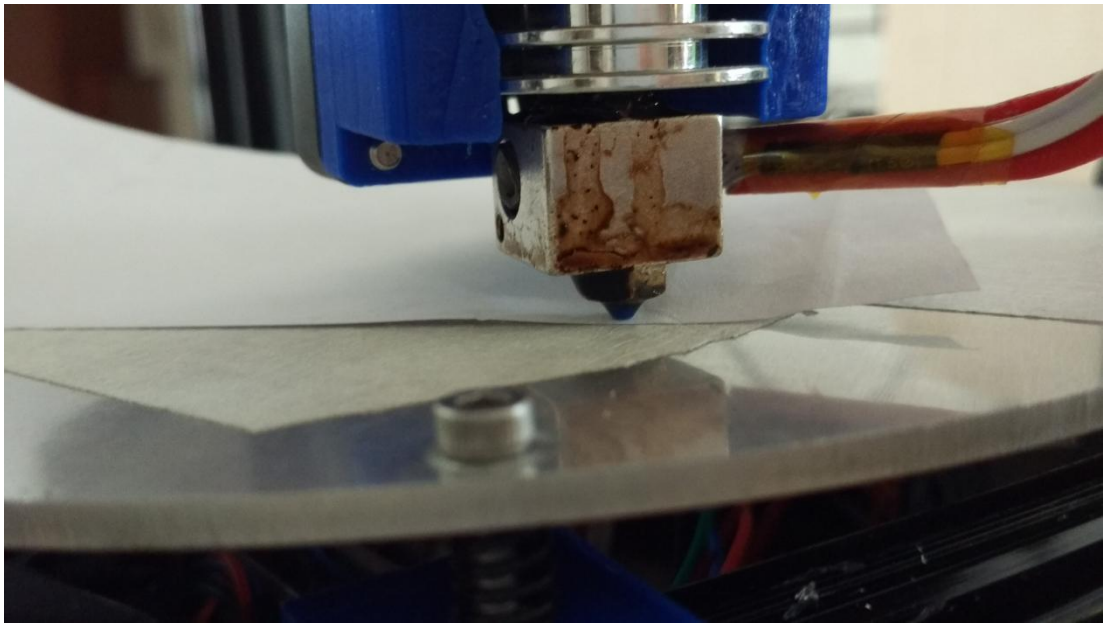


A point:



adjust the screw, ensure the bed nearly touch the nozzle(there should be a gap of a paper between the nozzle and the bed)



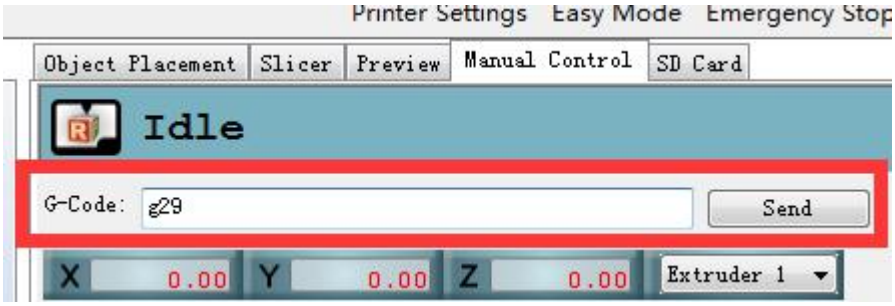


The same method at B and C points then the bed would be leveled enough

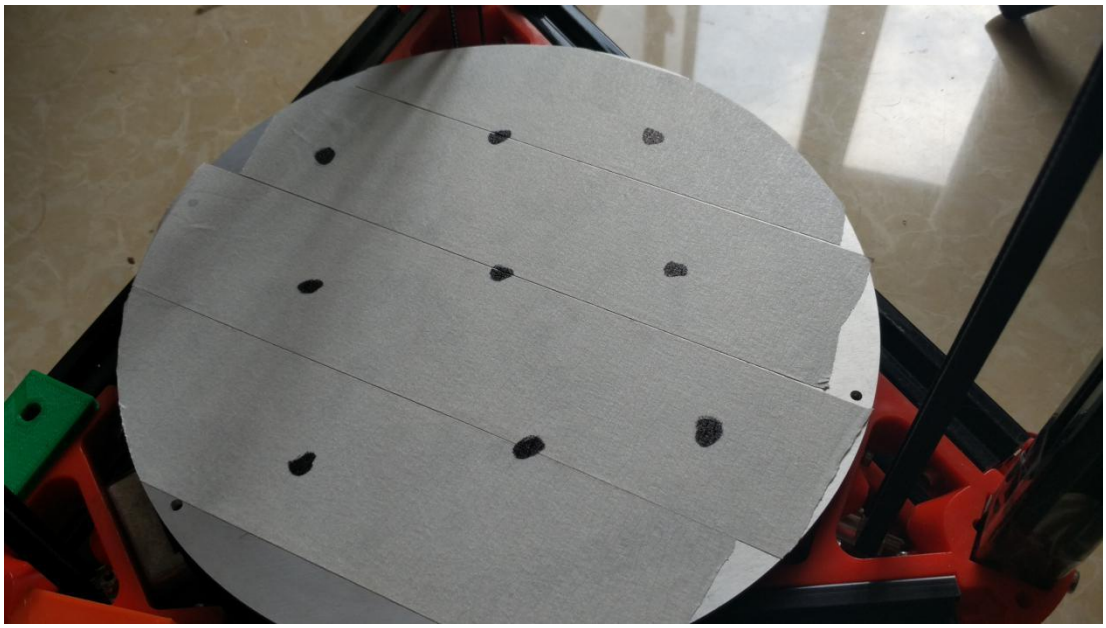
(3)Auto-leveling

1) home the nozzle

2) then do the auto-leveling by input g29



Then the nozzle will goes down and touch the plate by 9 points

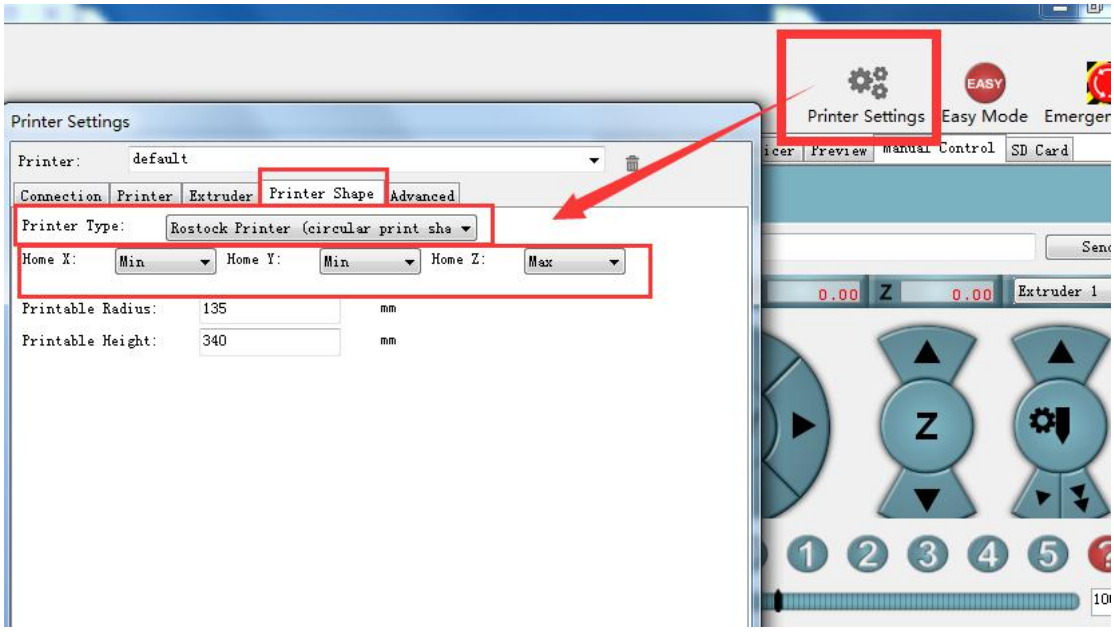


It is the process of auto-leveling

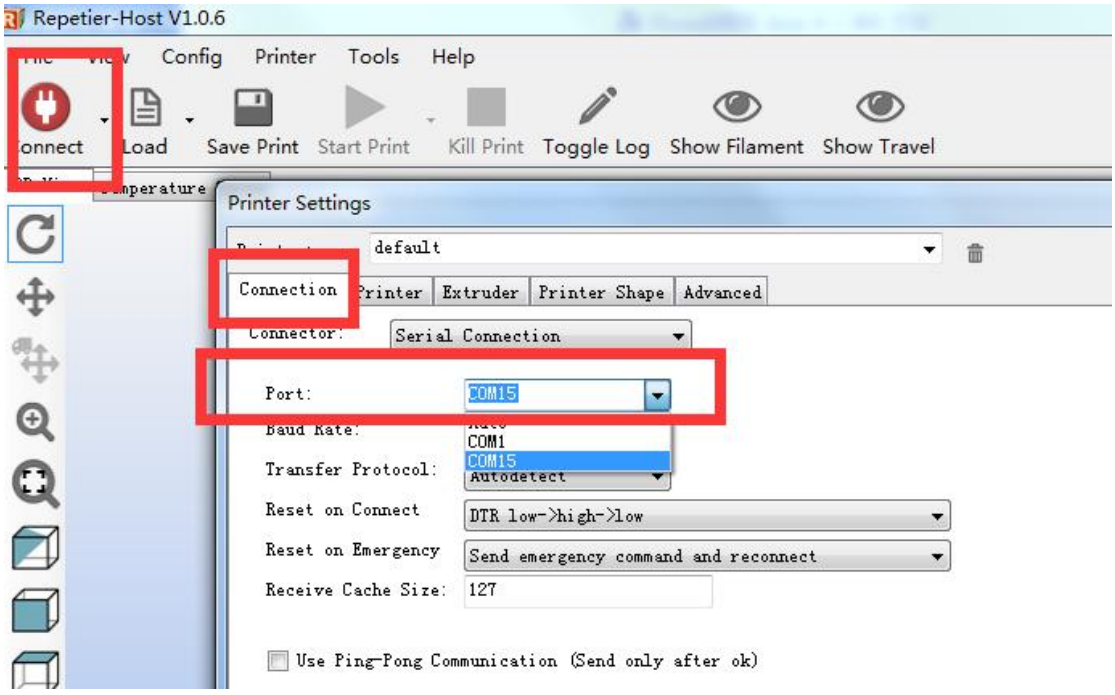
3,steps of printing

(1)Settings

1): open repetier >settings  >printer shap >rostock printer(circular print hap)



2): repetier >connect >select port

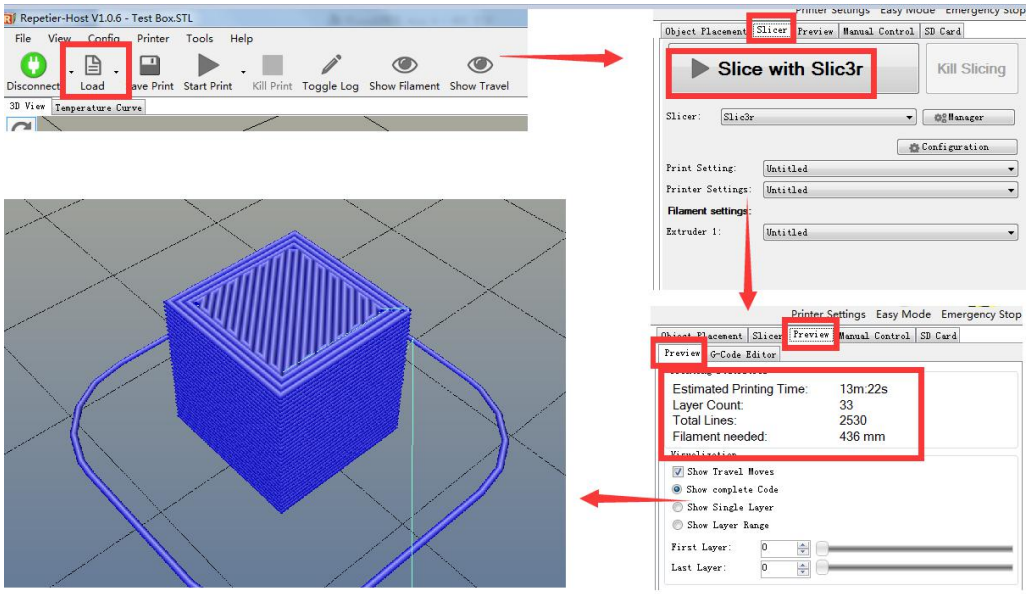


(2)prepare

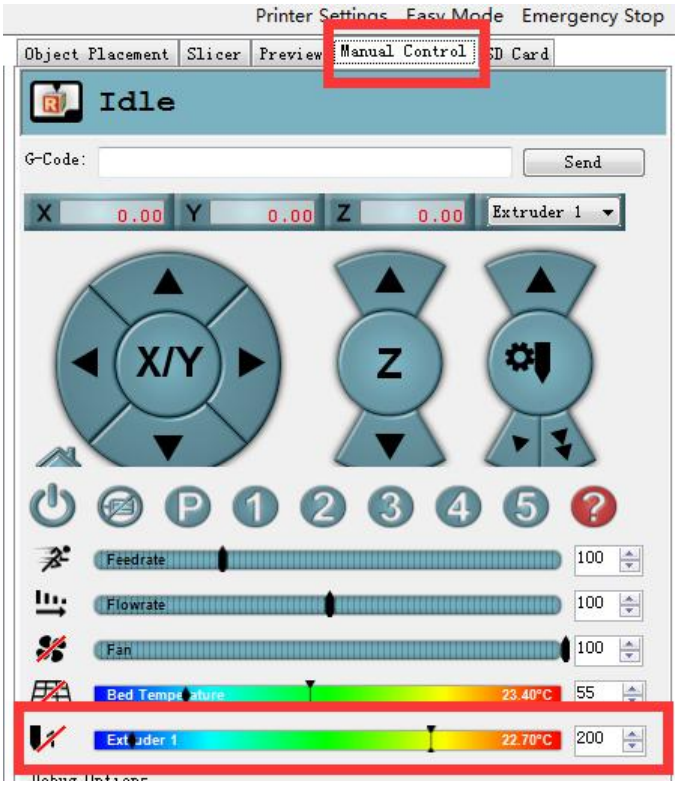
1): load 

2): slice 

3): preview

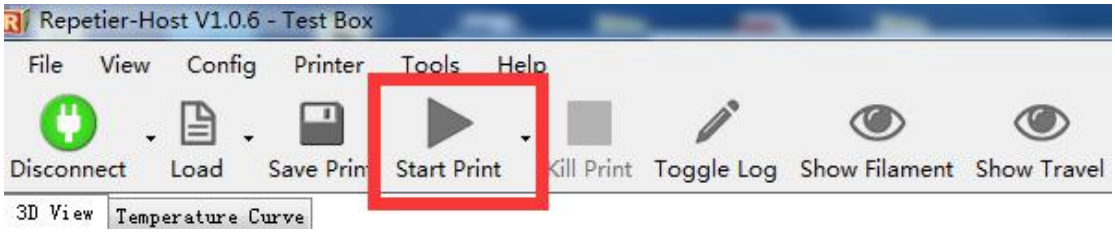


4): preheat the nozzle to 210 degree(click the red marked)

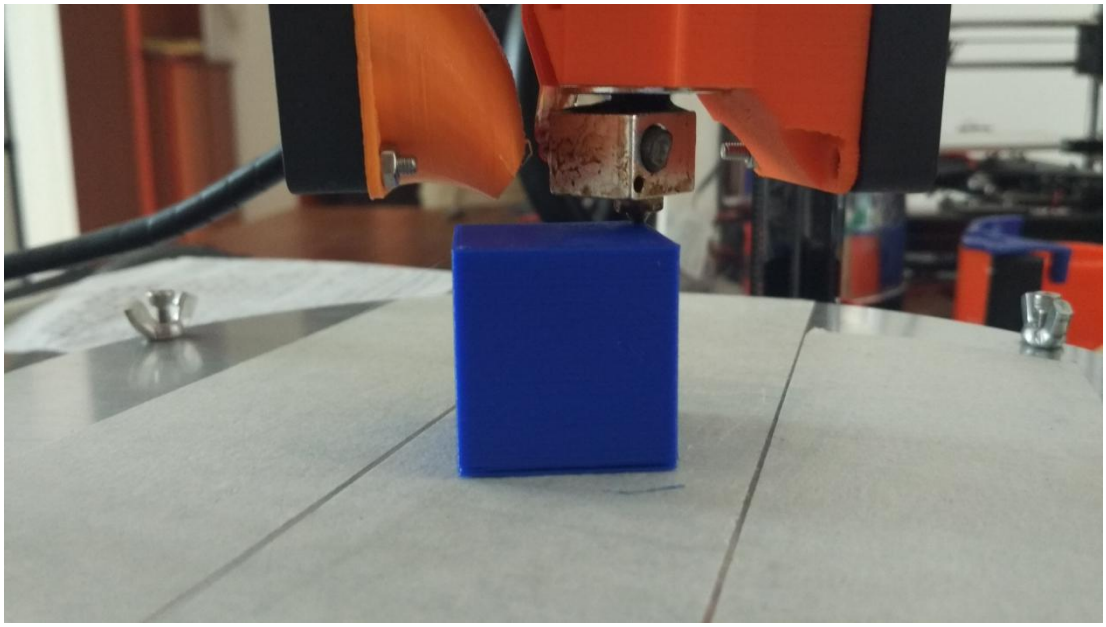


(3)Start print

1): start print (do this step after the temp rise to 210 degree)

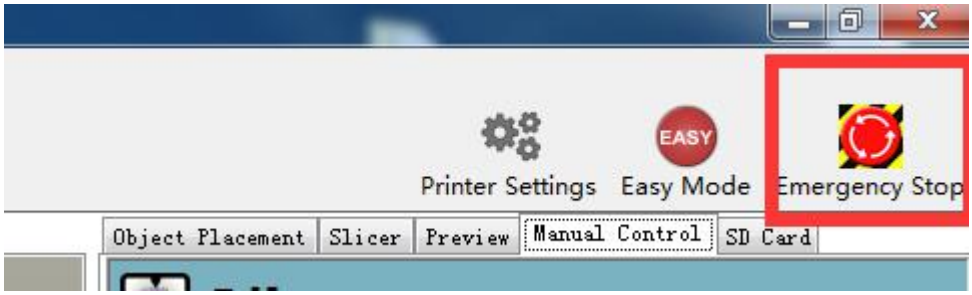


2): the machine will finish the model by itself

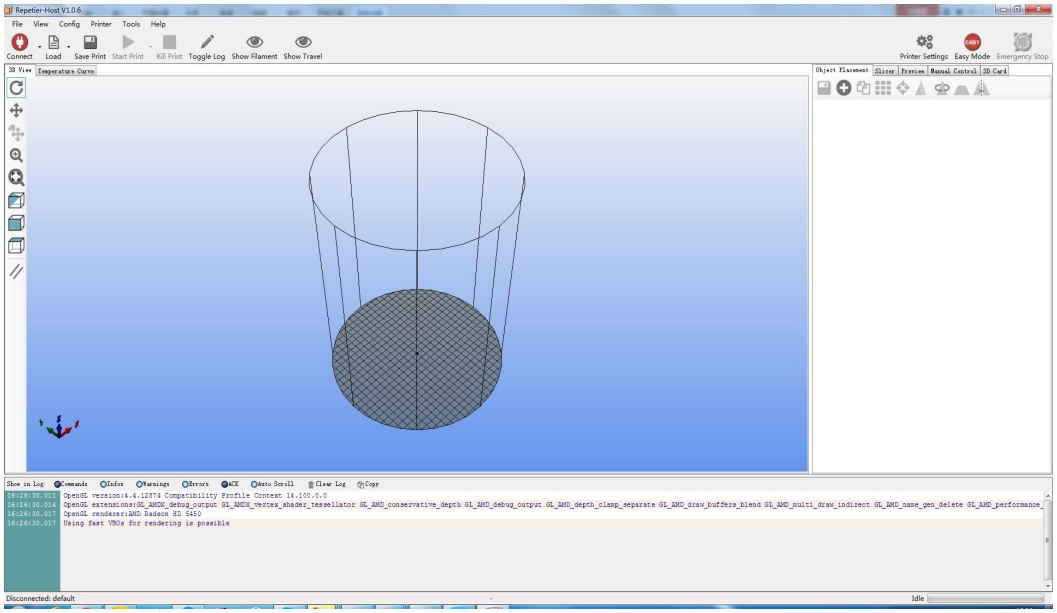


notice

▪if there happen some accident, pls press the emergency stop 



4, Repetier



(1)Basics

1)printer settings  >printer shap >Rostock printer(circular print hap); set the bottom plate

2) connect  ; connect the repetier with the printer

3)load  ; load a stl format model from your PC

4)start  ; print the model

5)toggle log  ; search the info from the bottom of the repetier screen after Input code

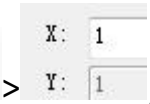
6) easy mode 

> 

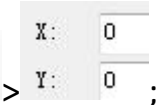
; input commend under the easy mode

7) emergency stop  ; stop all the action

8)object placement>export  ; you could modify a model with repetier then export as a new stl.file

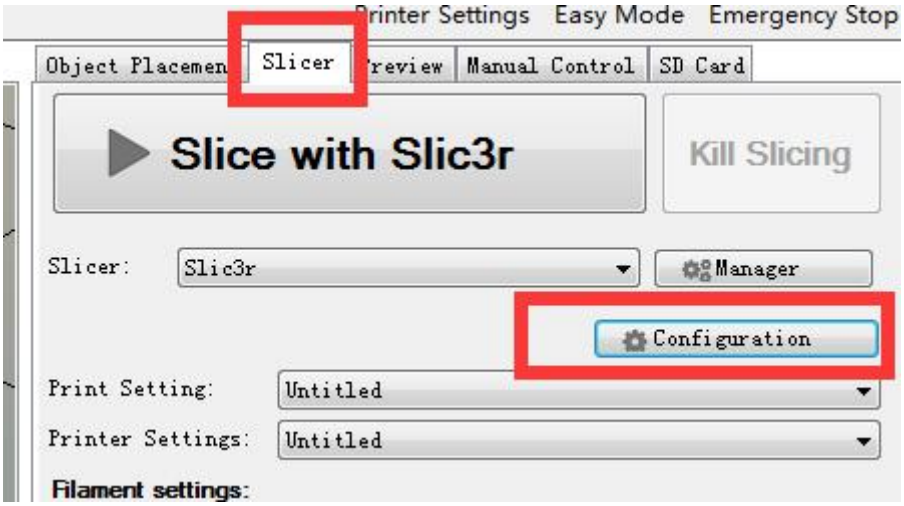
9)scale object  > 

; change the size of the model

10) rotate object  > 

; change the direction of the model

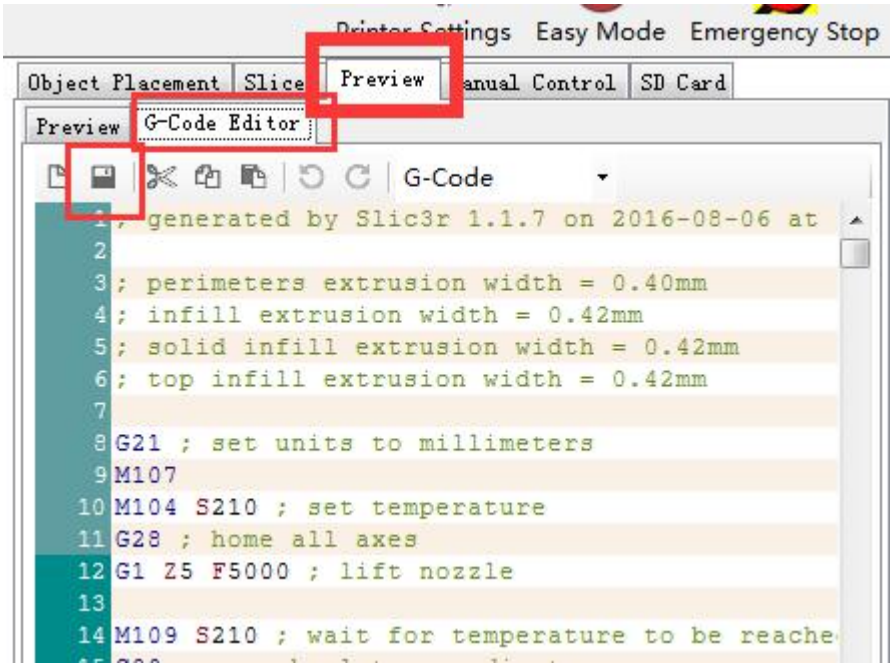
11)slicer>configuration; change the settings of the printer



12)slice with slic3r 

; slice before start print

13)preview >G-Code Editor >save  ;save the code to SD Card



14)manual control> 

;move x and y axis

15)manual control > 

; move the z axis

16)Manual control

;

heat nozzle by click 

(2)Settings

1) Slice >configuration >print settings >layers and perimeters >layer

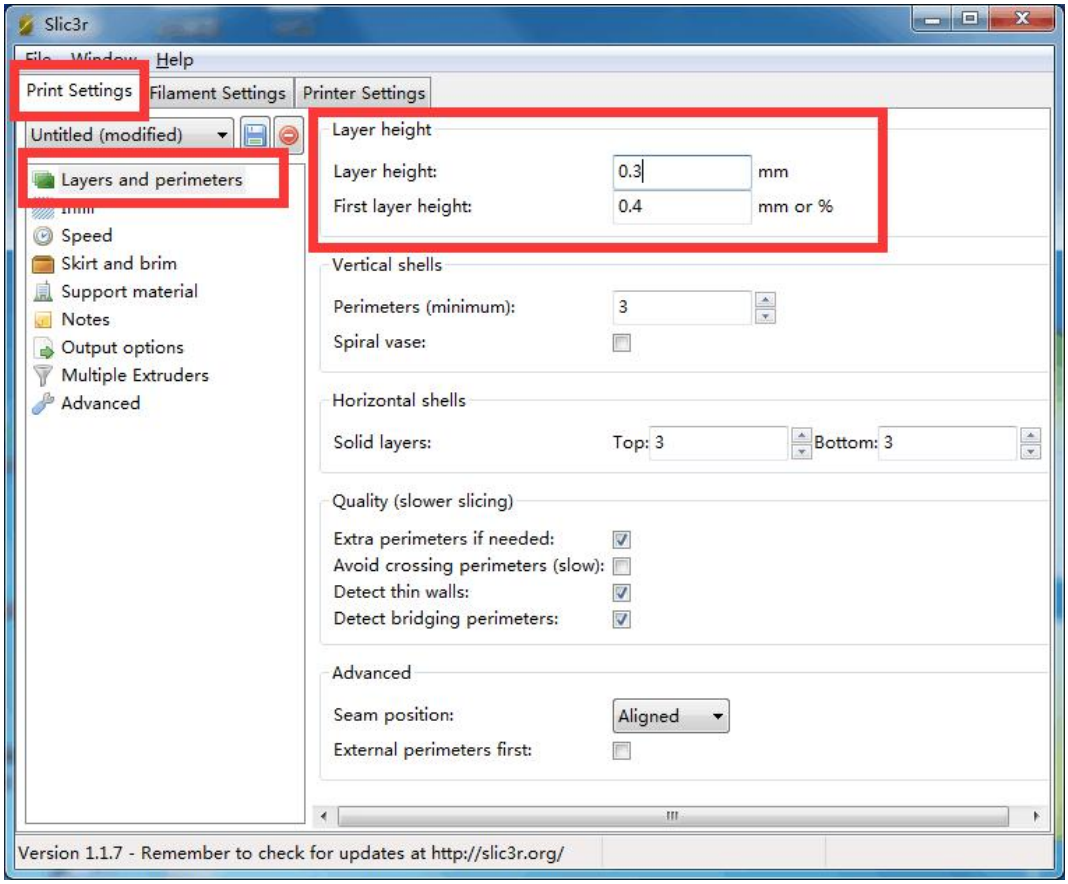
height:0.35mm/first layer height:0.4mm then save the settings

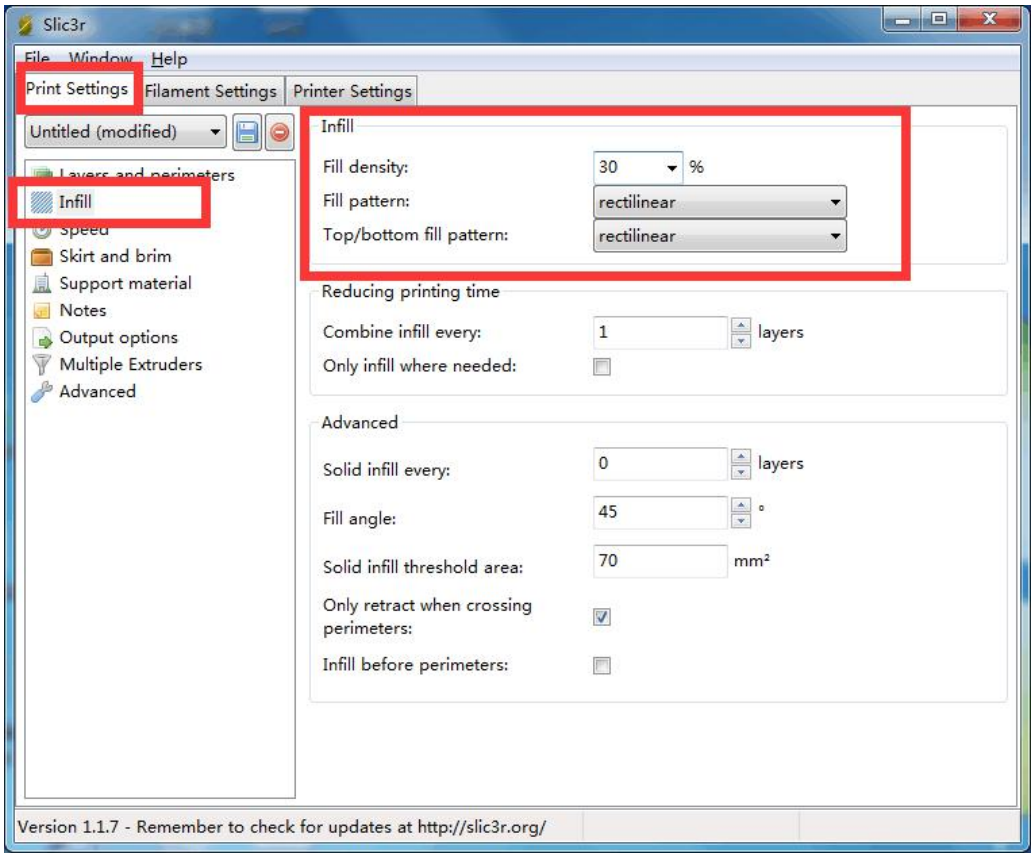
2)Print settings>infill >fill density: 40%/fill pattern:rectilinear/top,bottom fill pattern:rectilinear >advanced >solid infill every: 1 layer, then save

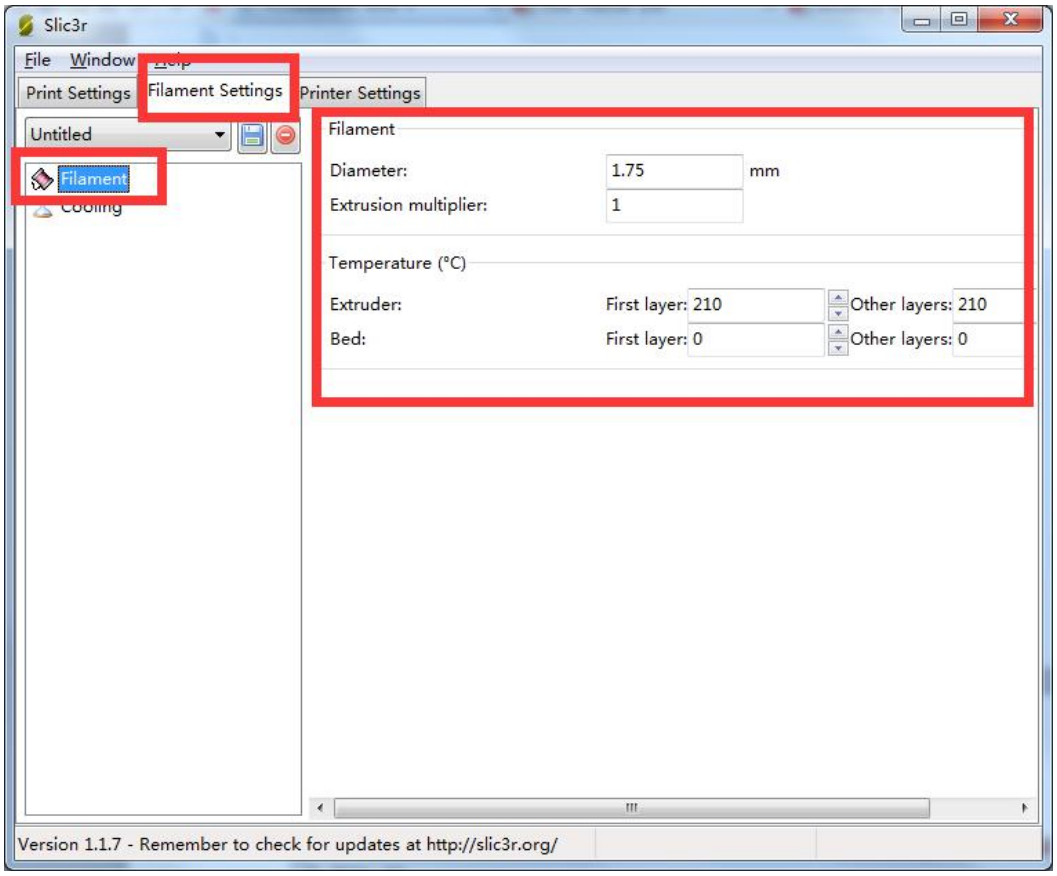
3) Filament settings >filament >diameter:1.75mm then save it

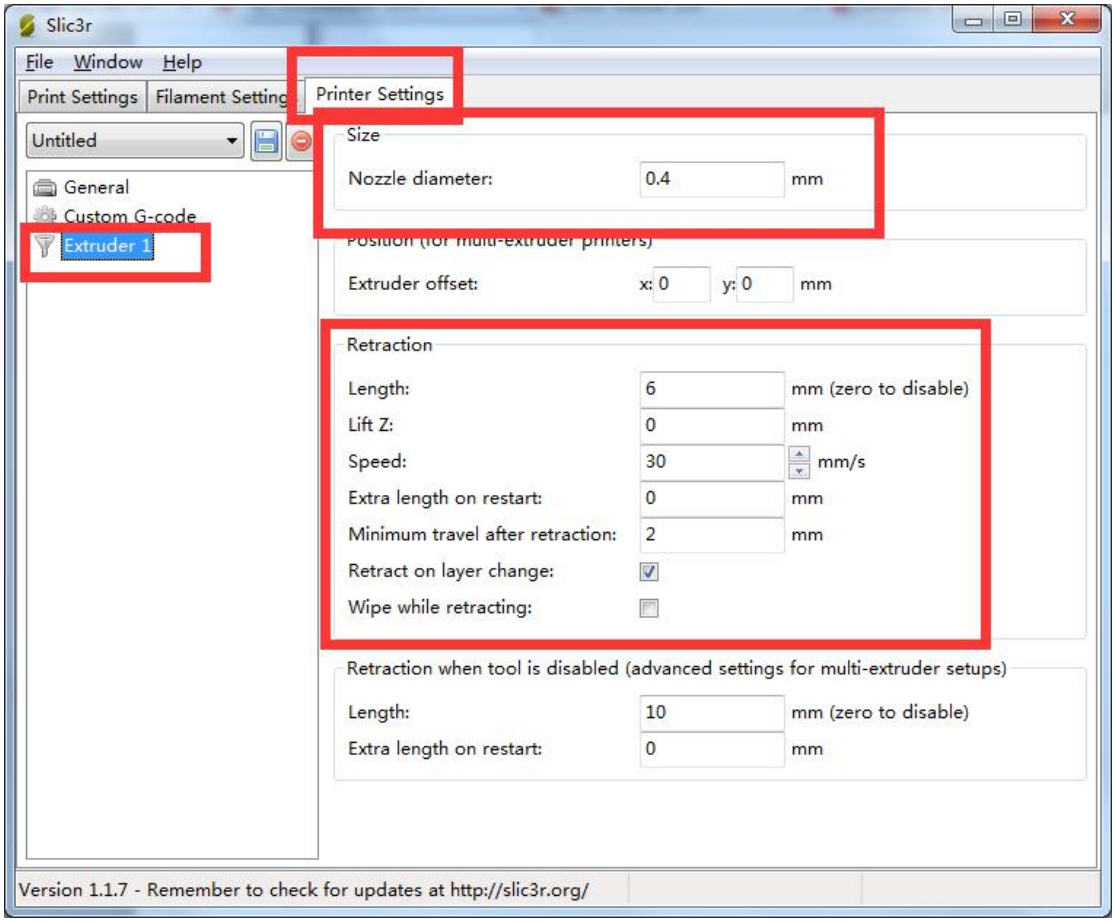
4)Printer settings >extruder 1 >nozzle diameter:0.4mm then save it

5)Printer settings >retraction >length:5mm/speed:30mm/minimum travel after retraction:2mm then save it




Slic3r
File Window Help
Print Settings
Filament Settings
Printer Settings
Untitled (modified)
Infill
Skirt and brim
Support material
Notes
Output options
Multiple Extruders
Advanced
Infill
Fill density: 30 %
Fill pattern: rectilinear
Top/bottom fill pattern: rectilinear
Reducing printing time
Combine infill every: 1 layers
Only infill where needed:
Advanced
Solid infill every: 0 layers
Fill angle: 45 °
Solid infill threshold area: 70 mm²
Only retract when crossing perimeters:
Infill before perimeters:
Version 1.1.7 - Remember to check for updates at http://slic3r.org/

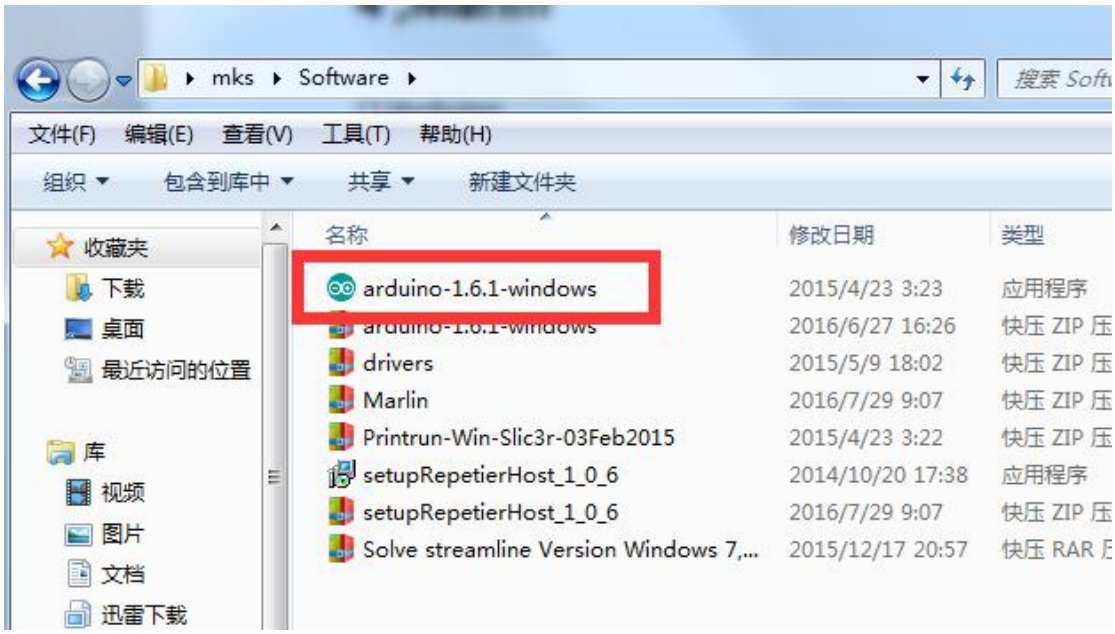

Slic3r
File Window
Print Settings
Filament Settings
Printer Settings
Untitled
Filament
Filament
Diameter: 1.75 mm
Extrusion multiplier: 1
Temperature (°C)
Extruder: First layer: 210 Other layers: 210
Bed: First layer: 0 Other layers: 0
Version 1.1.7 - Remember to check for updates at http://slic3r.org/


Slic3r
File Window Help
Print Settings
Filament Setting
Printer Settings
Untitled
General
Custom G-code
Extruder 1
Size
Nozzle diameter: 0.4 mm
Extruder offset: x: 0 y: 0 mm
Retraction
Length: 6 mm (zero to disable)
Lift Z: 0 mm
Speed: 30 mm/s
Extra length on restart: 0 mm
Minimum travel after retraction: 2 mm
Retract on layer change:
Wipe while retracting:
Retraction when tool is disabled (advanced settings for multi-extruder setups)
Length: 10 mm (zero to disable)
Extra length on restart: 0 mm
Version 1.1.7 - Remember to check for updates at http://slic3r.org/

5,Marlin

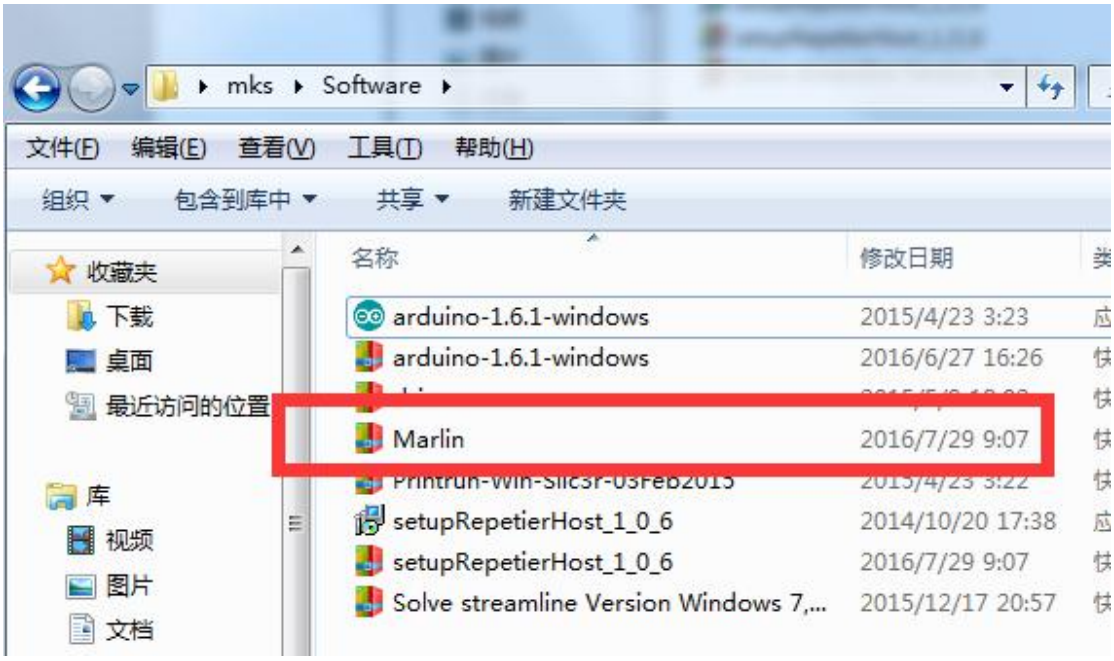
(1) Arduino

the Arduino is an environment for marlin, only when install the arduino could the marlin be opened, and remember don’t change any parameters of it

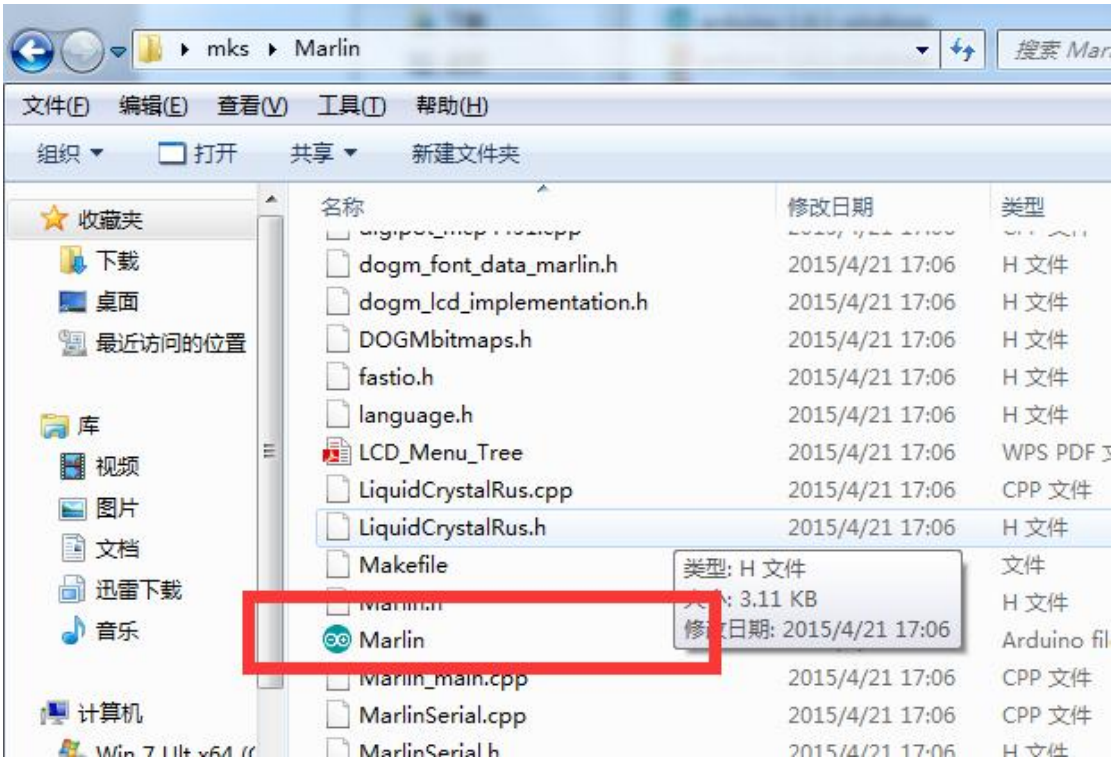


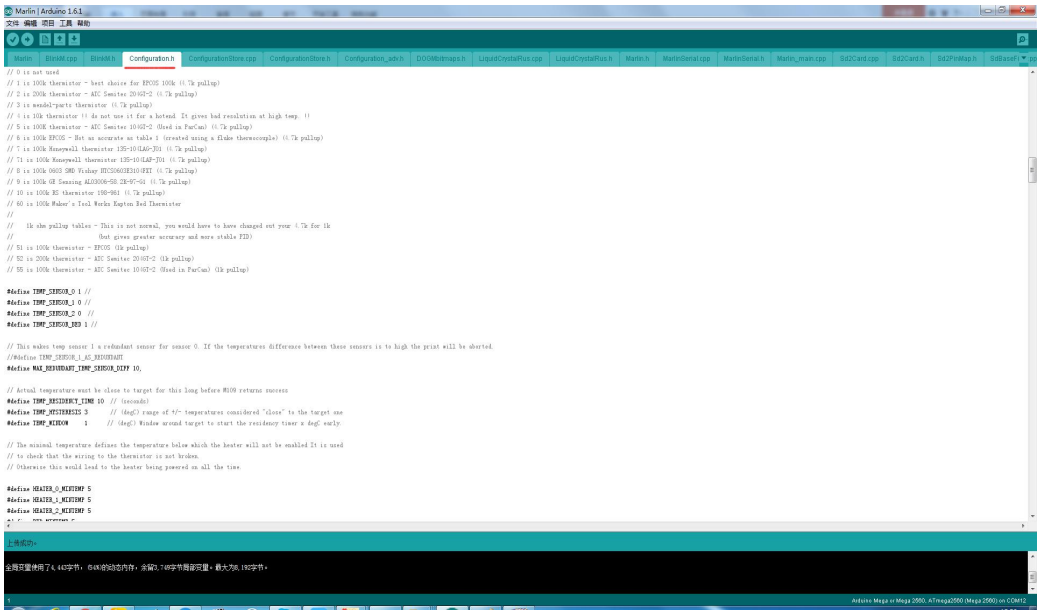
(2) Marlin

1)install the marlin



Run the “marlin”





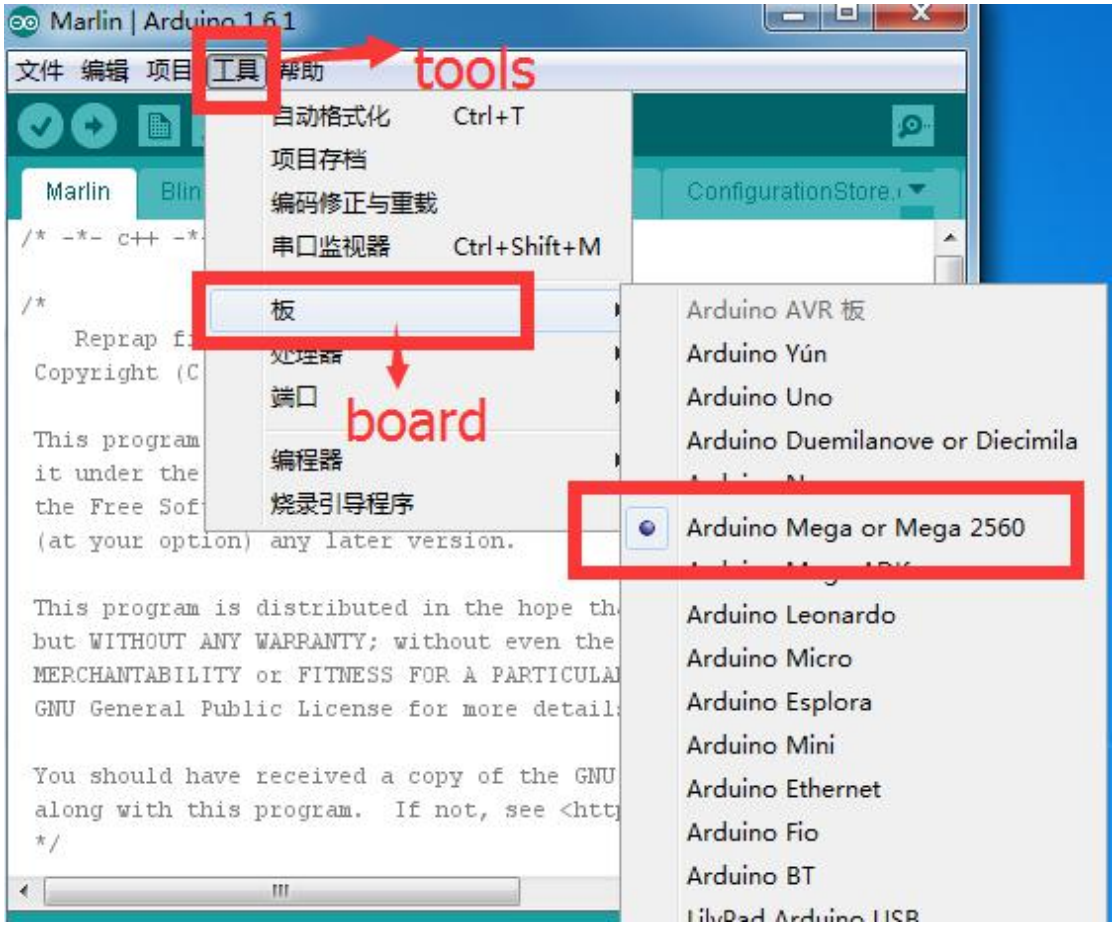
Notice: It’s shortcut is similar to Arduino, don’t mistake them

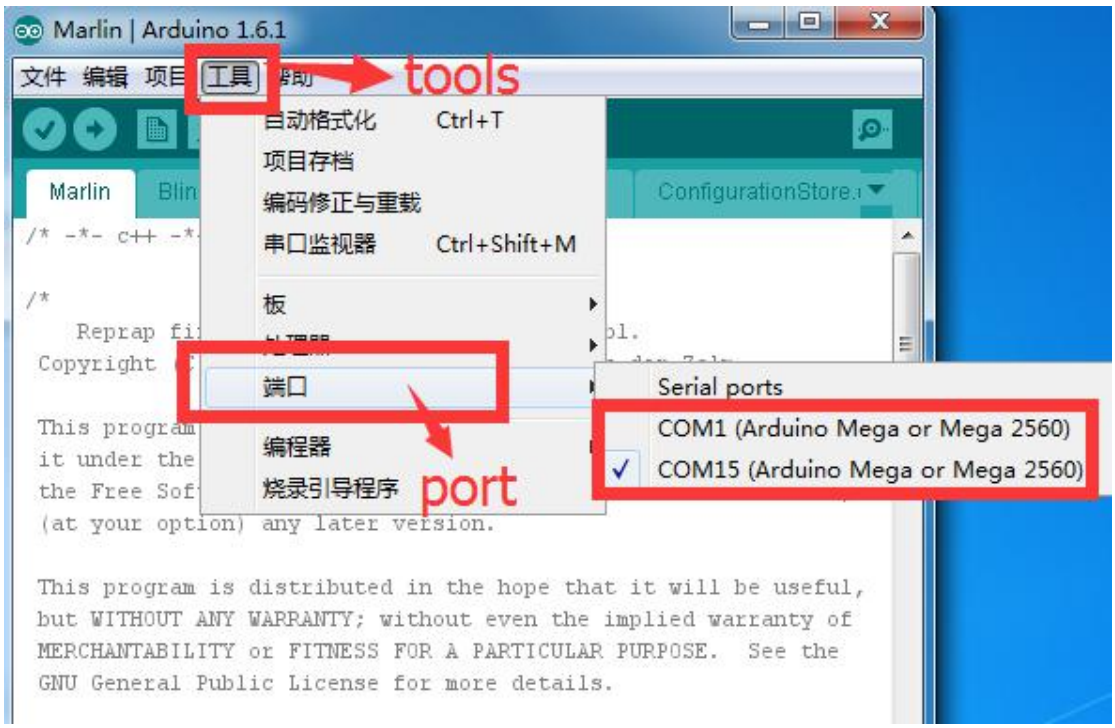
2)settings

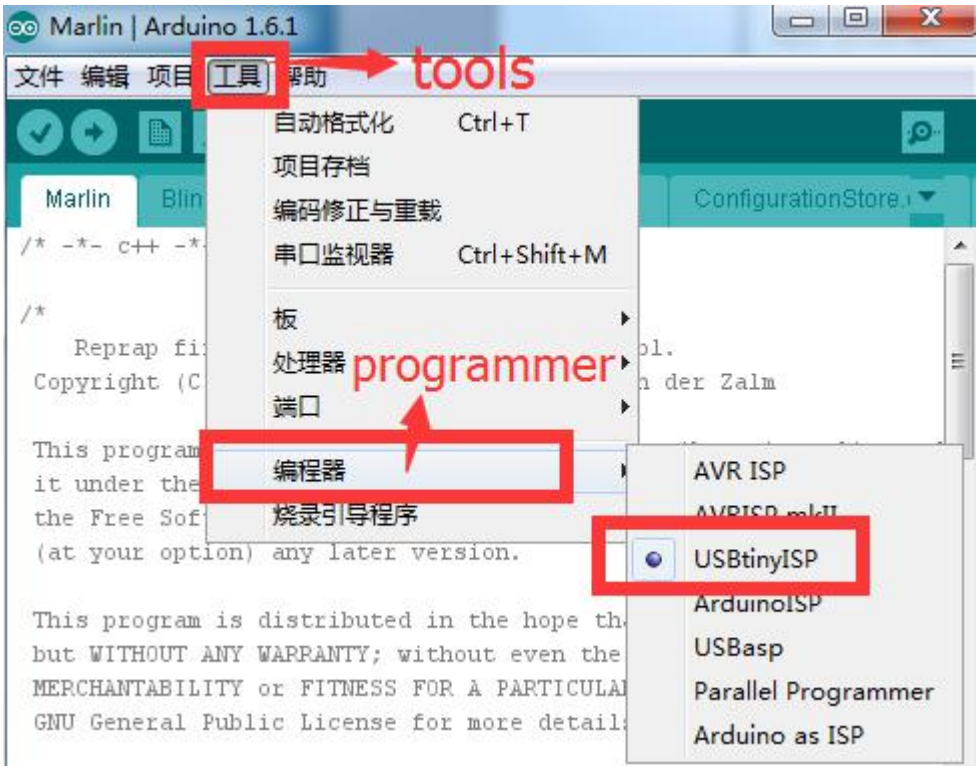
Go to tools > board >arduino mega 2560

Go to tools > port, select the COM port

Go to tools > programmers > USBtinyISP


Marlin | Arduino 1.6.1
文件 编辑 项目 工具 帮助
tools
自动格式化 Ctrl+T
项目存档
编码修正与重载
串口监视器 Ctrl+Shift+M
板
端口
编程器
烧录引导程序
board
Arduino AVR 板
Arduino Yún
Arduino Uno
Arduino Duemilanove or Diecimila
Arduino Mega or Mega 2560
Arduino Leonardo
Arduino Micro
Arduino Esplora
Arduino Mini
Arduino Ethernet
Arduino Fio
Arduino BT
Marlin
ConfigurationStore.
/* -*- c++ -*-
/*
Reprap fi
Copyright (C
This program
it under the
the Free Sof
(at your option) any later version.
This program is distributed in the hope th
but WITHOUT ANY WARRANTY; without even the
MERCHANTABILITY or FITNESS FOR A PARTICULA
GNU General Public License for more detail
You should have received a copy of the GNU
along with this program. If not, see <htt
*/

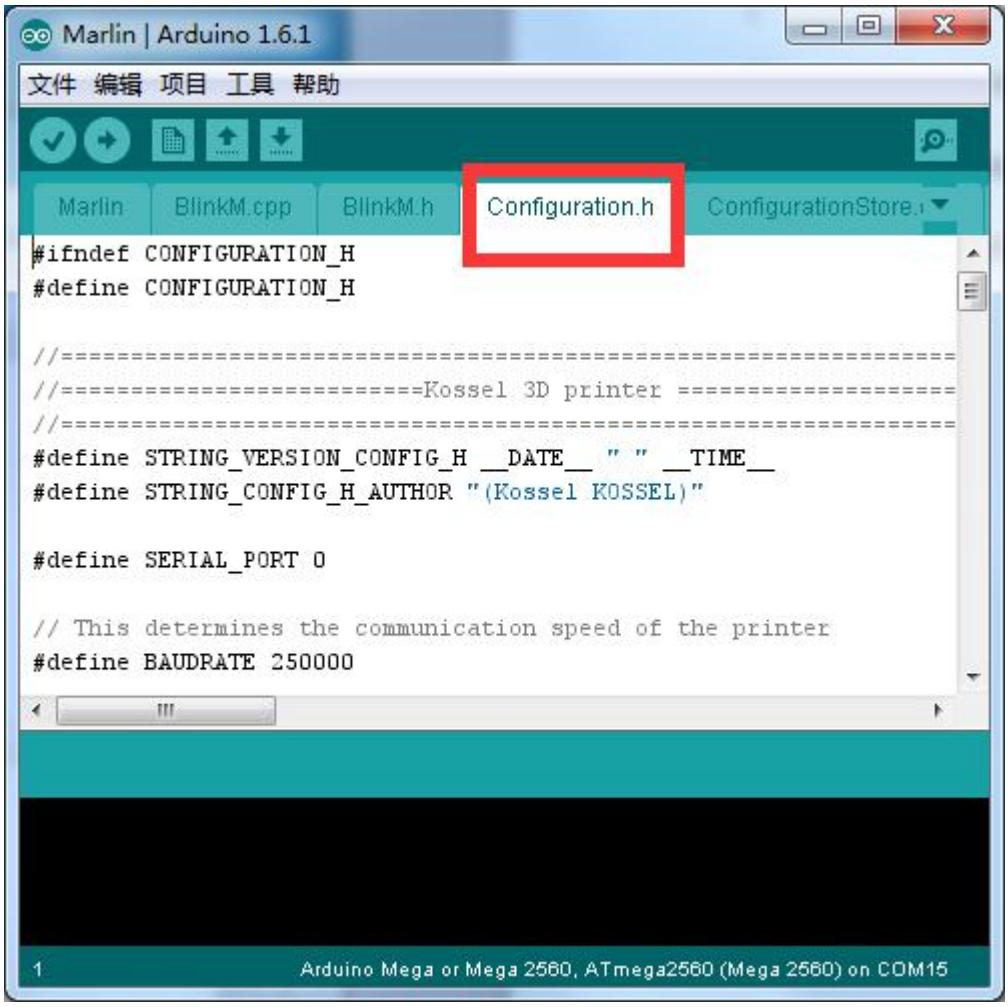

Marlin | Arduino 1.6.1
文件 编辑 项目 工具 帮助
tools
自动格式化 Ctrl+T
项目存档
编码修正与重载
串口监视器 Ctrl+Shift+M
板
端口
编程器
烧录引导程序
port
Serial ports
COM1 (Arduino Mega or Mega 2560)
COM15 (Arduino Mega or Mega 2560)
Marlin
ConfigurationStore.
/* -*- c++ -*-
/*
Reprap fi
Copyright
This program
it under the
the Free Sof
(at your option) any later version.
This program is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
GNU General Public License for more details.



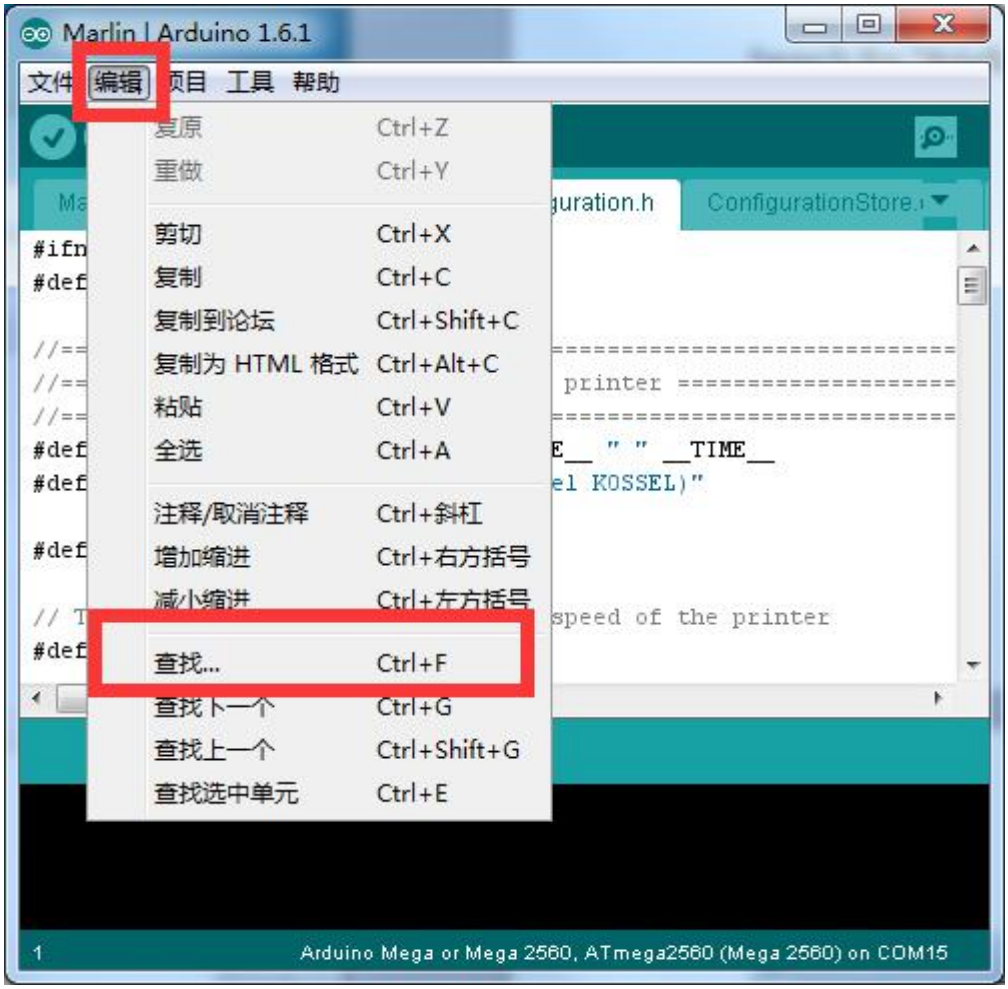
Firmware could only be upload succeed when it’s settings like the above

(3)Calibrating Height

1)Open the marlin /Configuration.h



Editor > search



Search for “#define MANUAL_Z_HOME_POS”

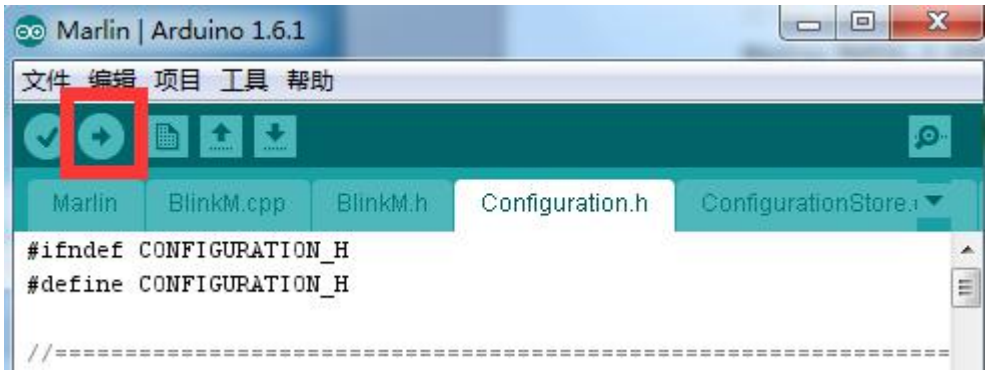
```
//Manual homing switch locations:
// For deltabots this means top and center of the carte
#define MANUAL_X_HOME_POS 0
#define MANUAL_Y_HOME_POS 0
#define MANUAL_Z_HOME_POS 270//306.6 // For delta: Dist
//Because there will be differences for each machine ir
```

Notice: 270 is the height of the machine

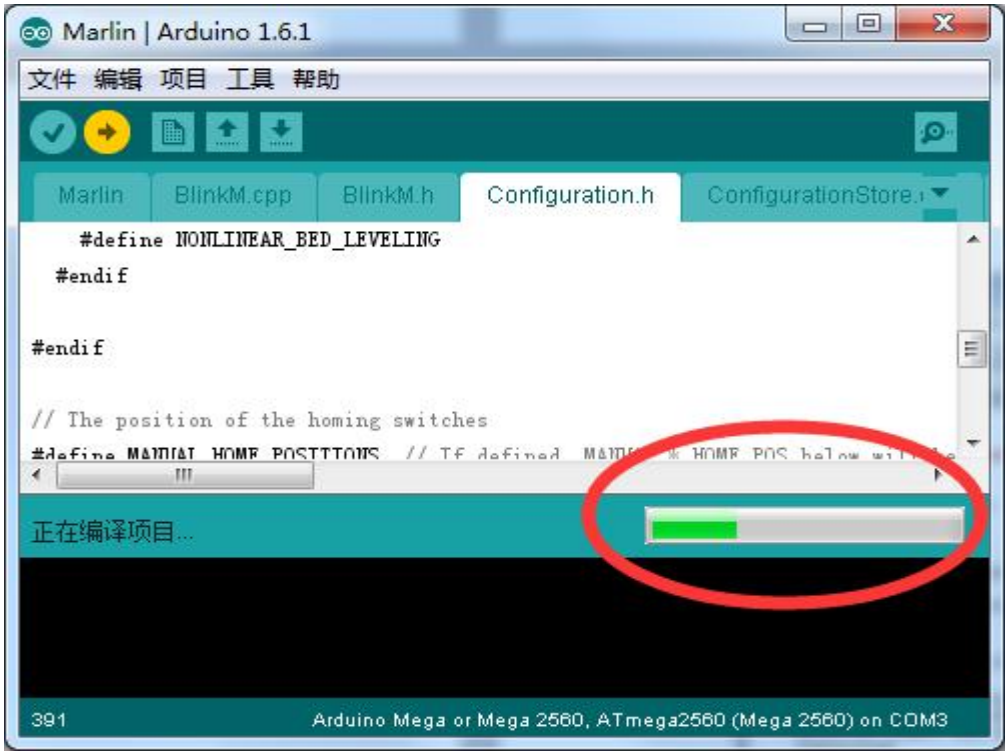
Replace it with 310

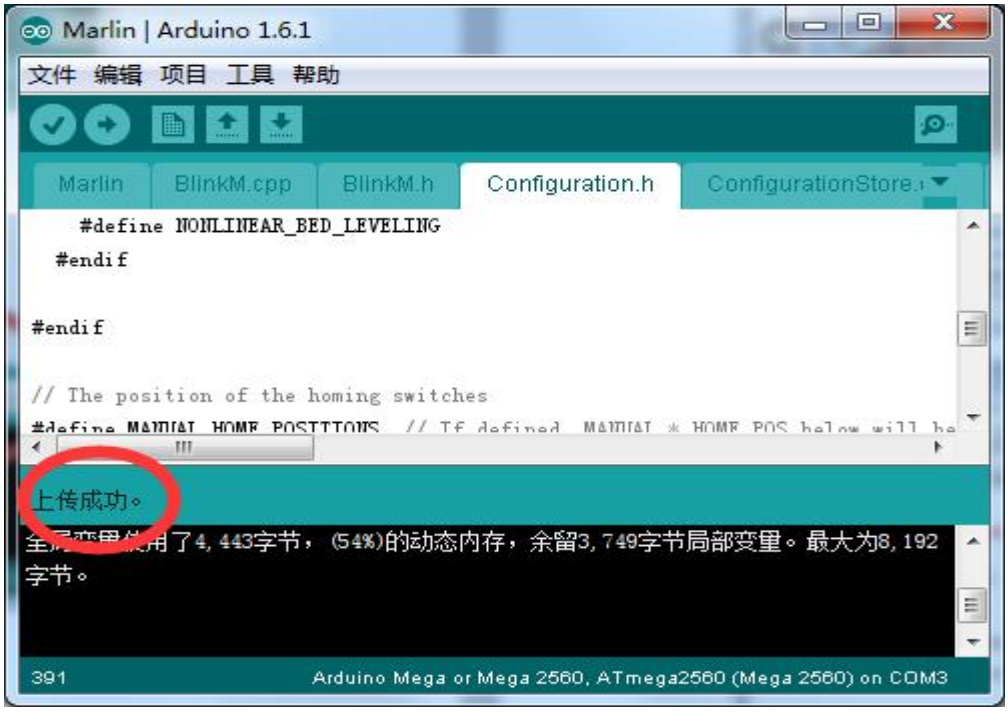
```
//Manual homing switch locations:
// For deltabots this means top and center of the
#define MANUAL_X_HOME_POS 0
#define MANUAL_Y_HOME_POS 0
#define MANUAL_Z_HOME_POS 310//306.6 // For delta
//Because there will be differences for each mach:
```

Then upload



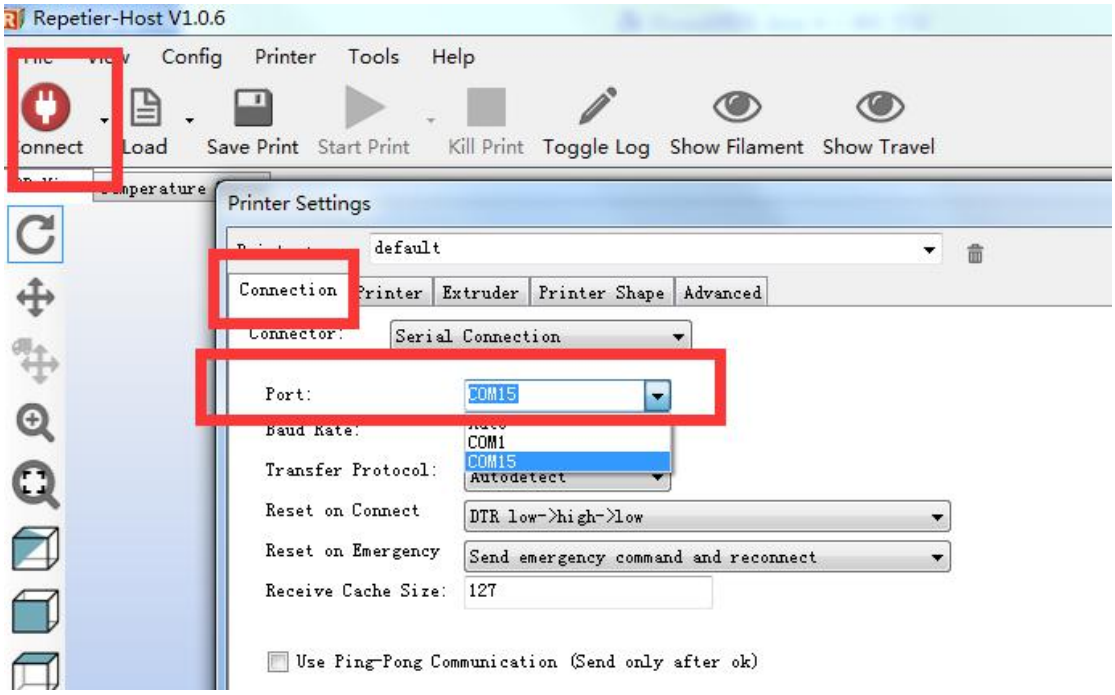
You could Check the progress of the upload from there



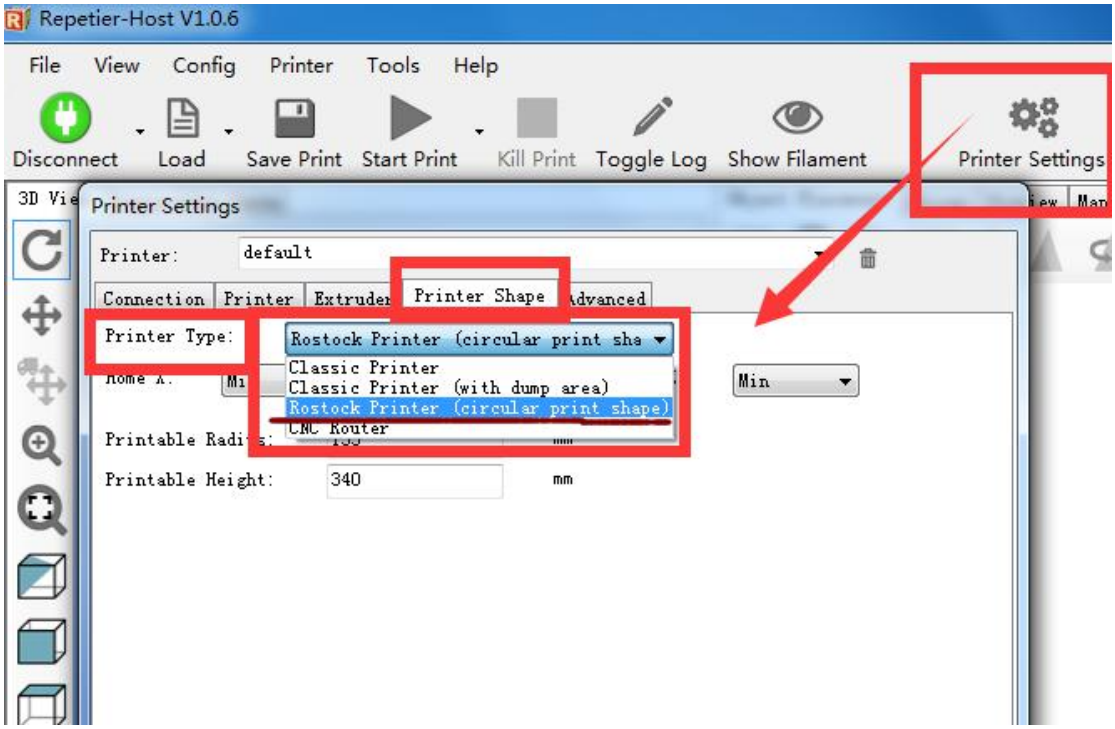


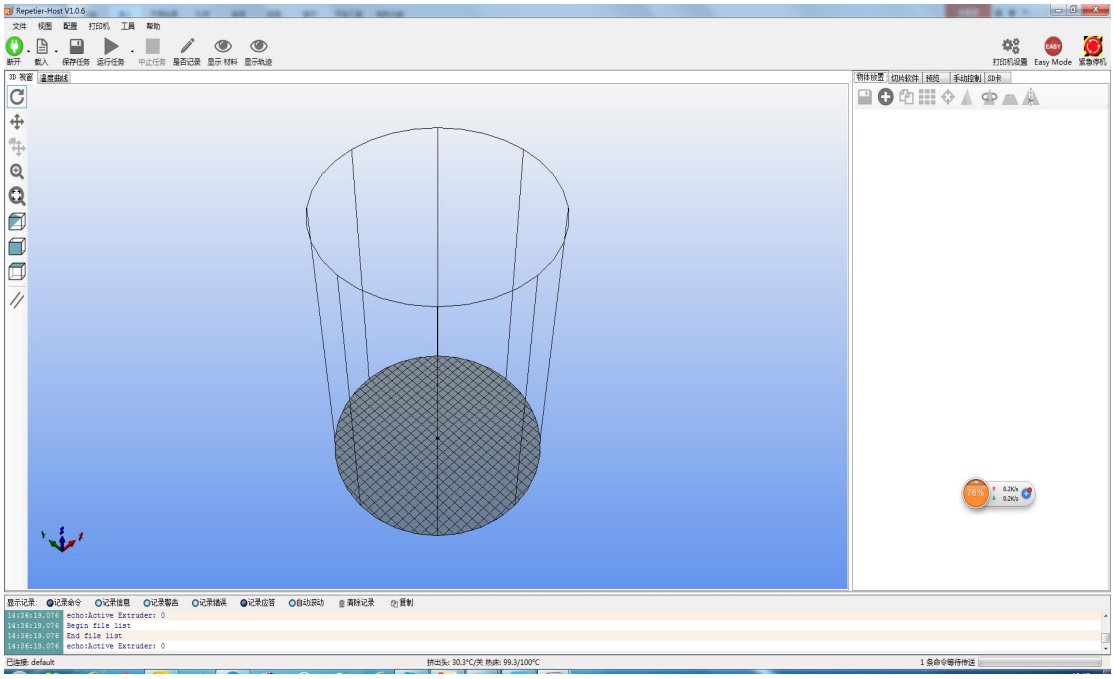
When it read finished, the upload is succeed.

Connect repetier to your PC

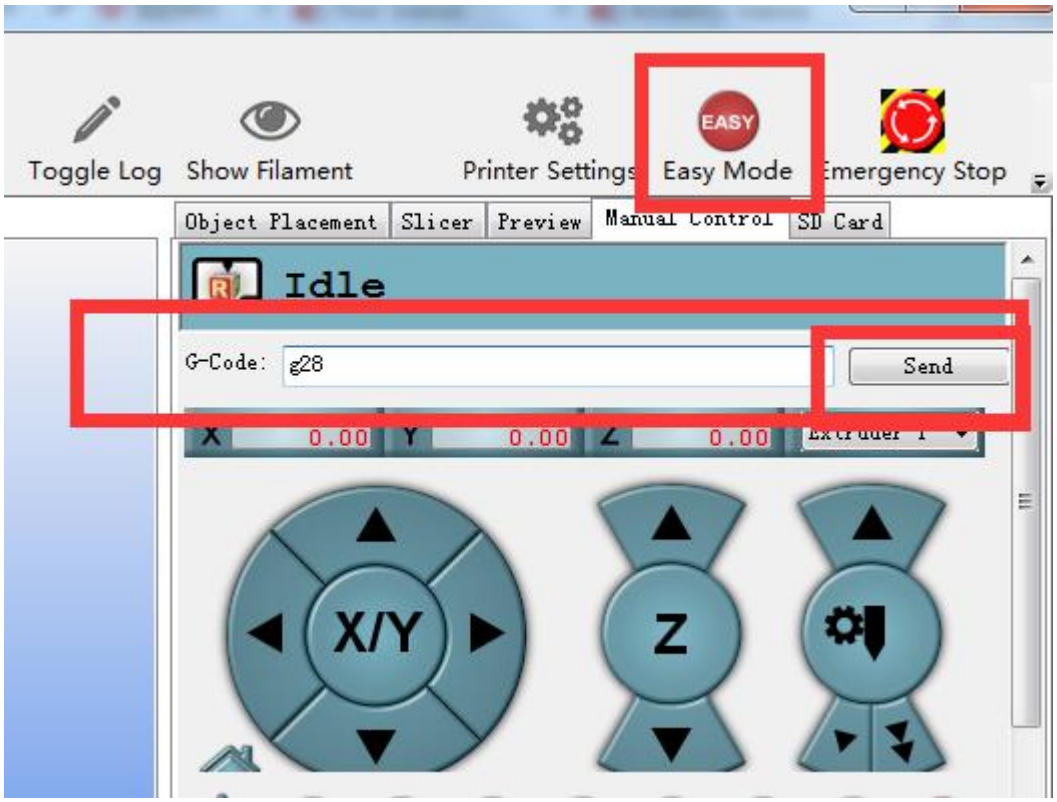


Set the shape of the bottom of the plate /rostock printer(circular print hap)

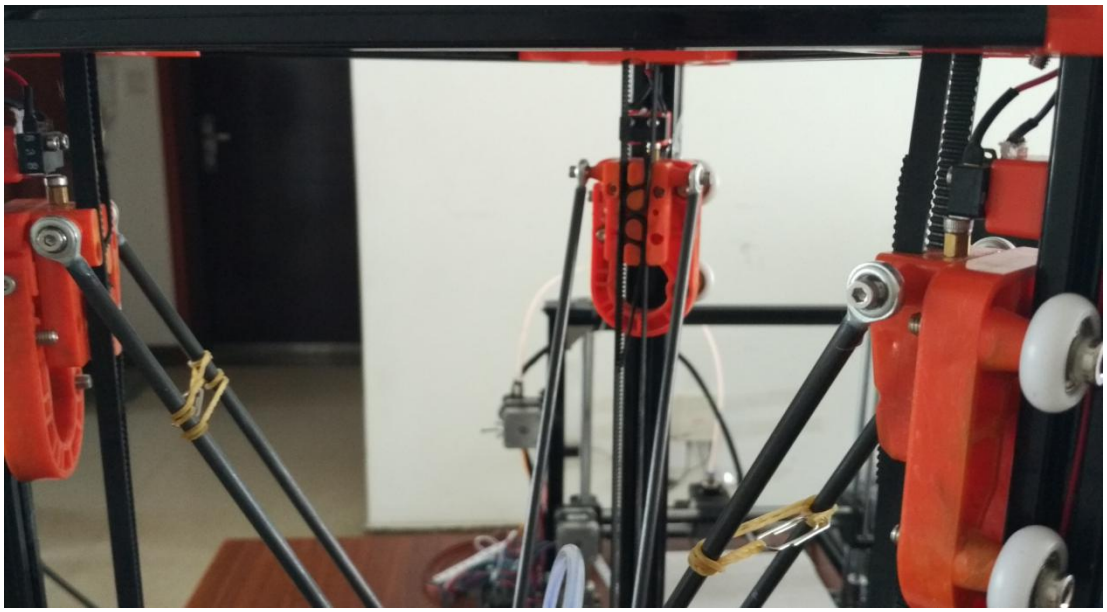




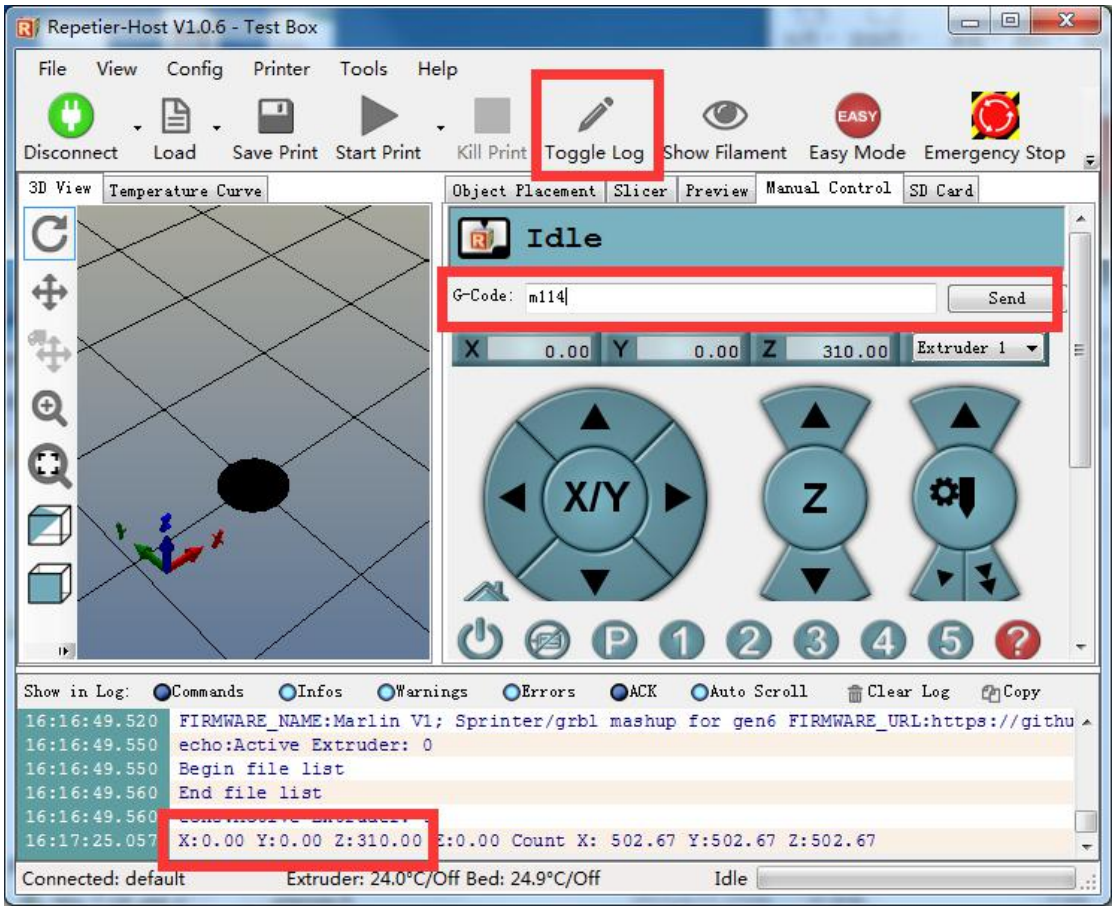
Home the axis's pulley(input g28 on the Manual Control)



All axis will go up to the top position after that

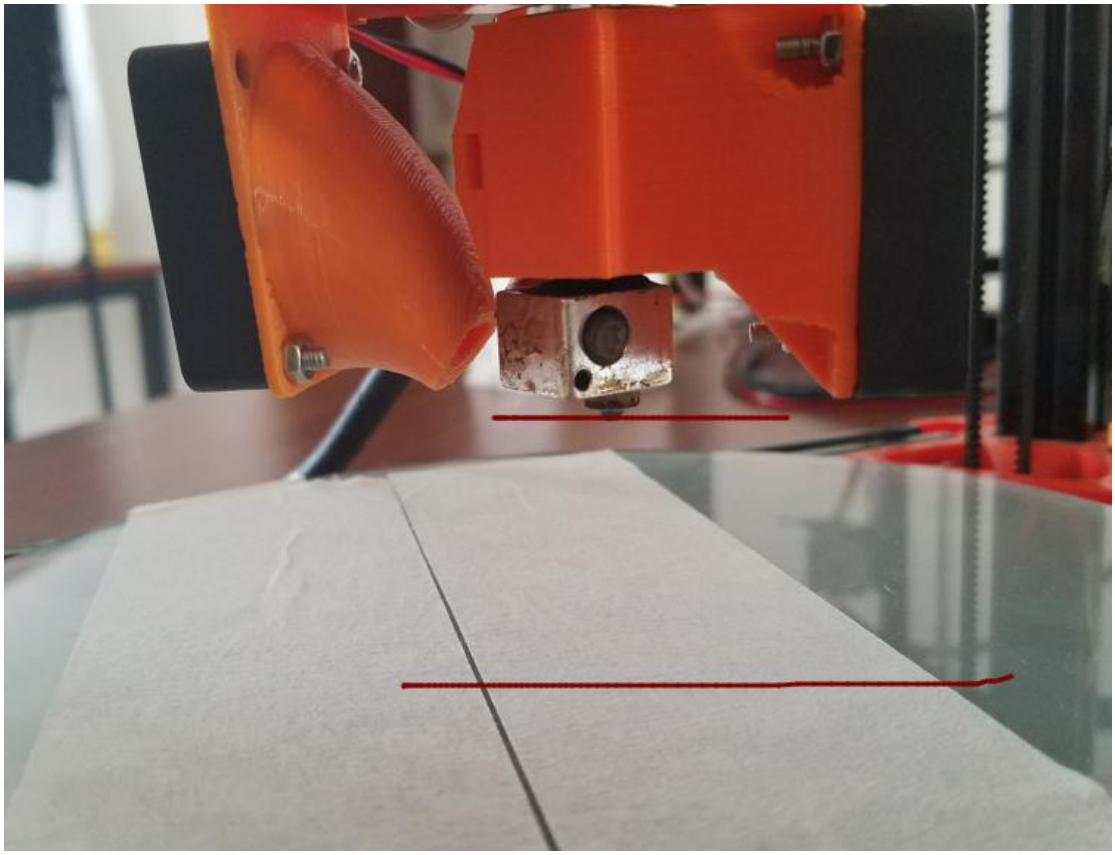


Type m114 to check the Z axis's coordination

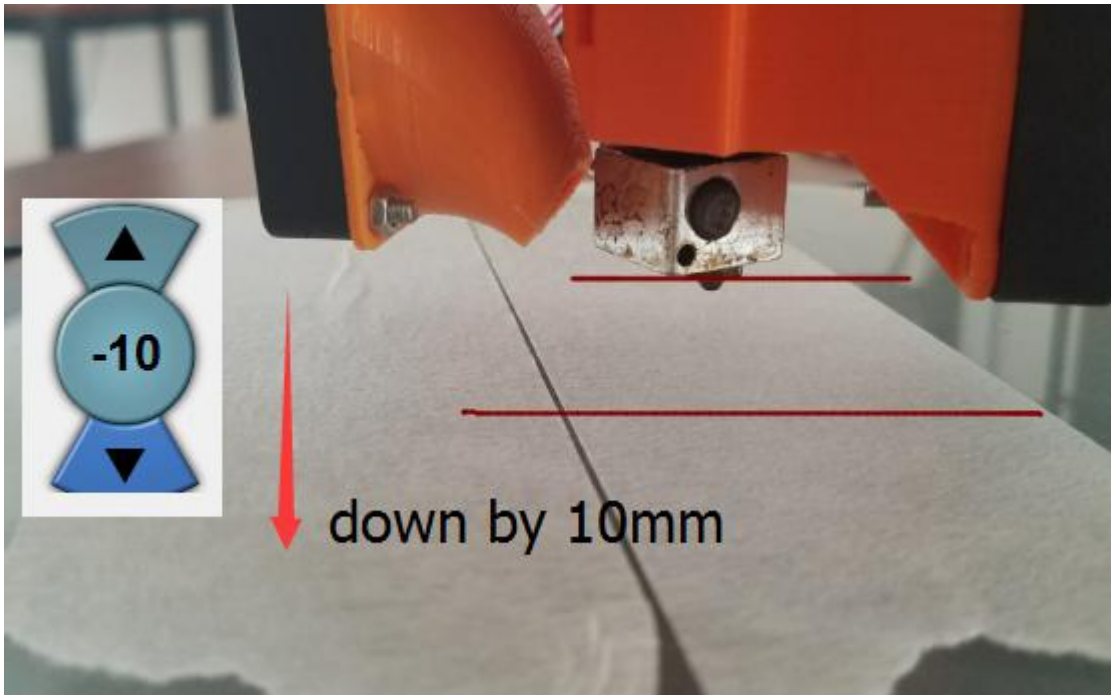


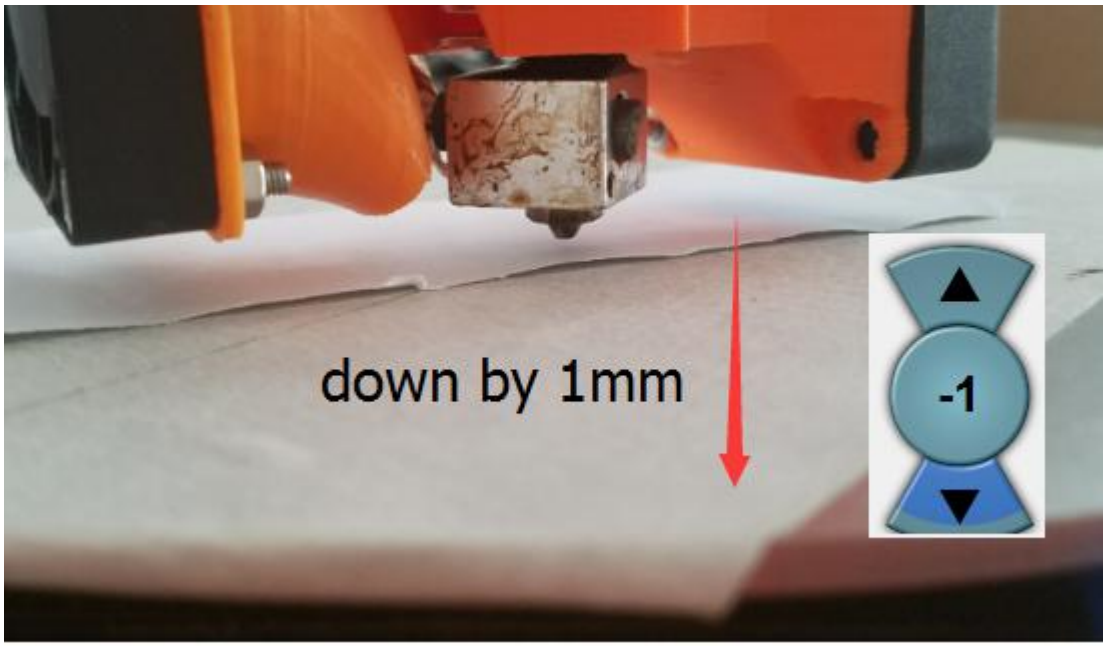
As you could see The Z axis is 310mm at this time（record as A）

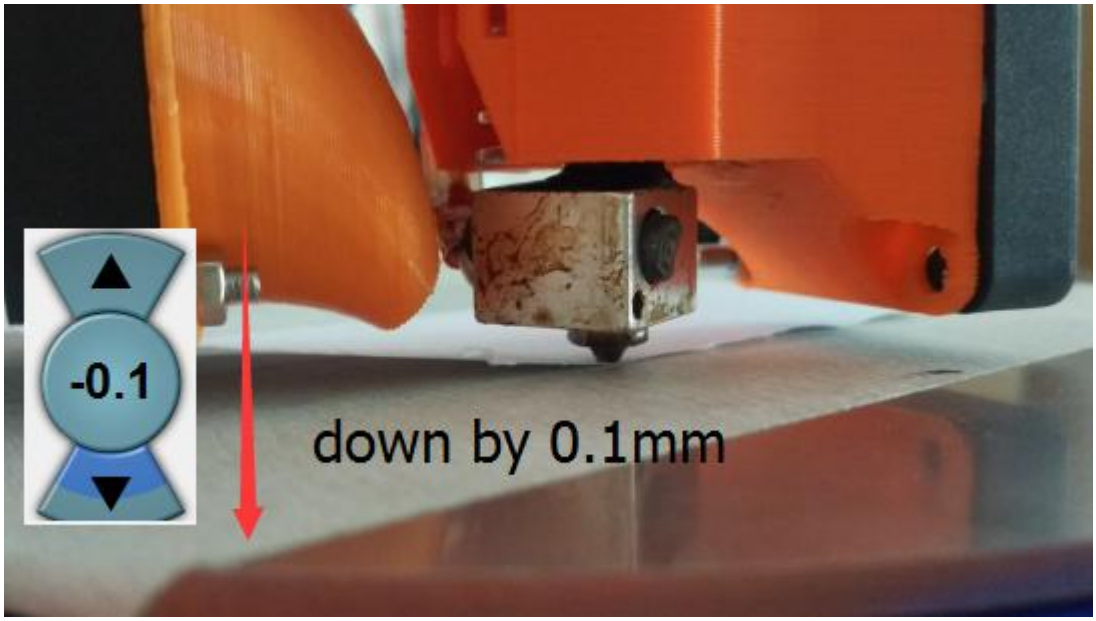
Type”g1 z40” to let the nozzle down to the position higher than the plate about 20cm



Then Down the nozzle close to the plate manually by 10mm， then down 1mm every steps until it nearly touch the plate，(put a A4 paper between the nozzle and the plate） down the nozzle by 0.1mm carefully until the nozzle touch the paper would be OK

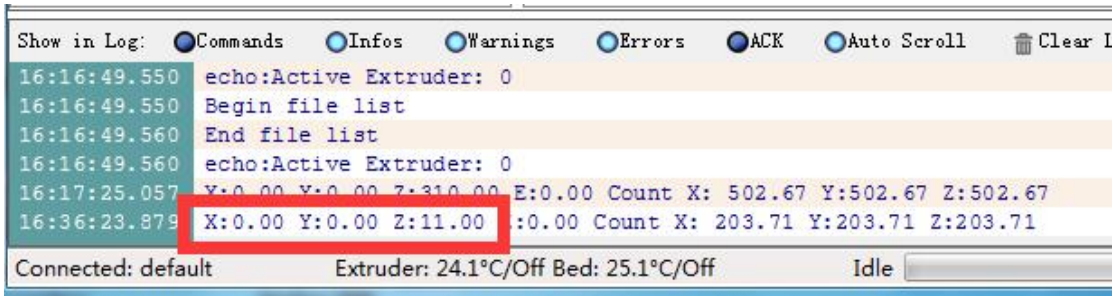

-10
down by 10mm


down by 1mm
-1



There should be a A4 paper gap between the nozzle and the plate at this time

Input m114 to check the coordination of Z axis again



The height of the nozzle is 11.4mm at this time（record as B）

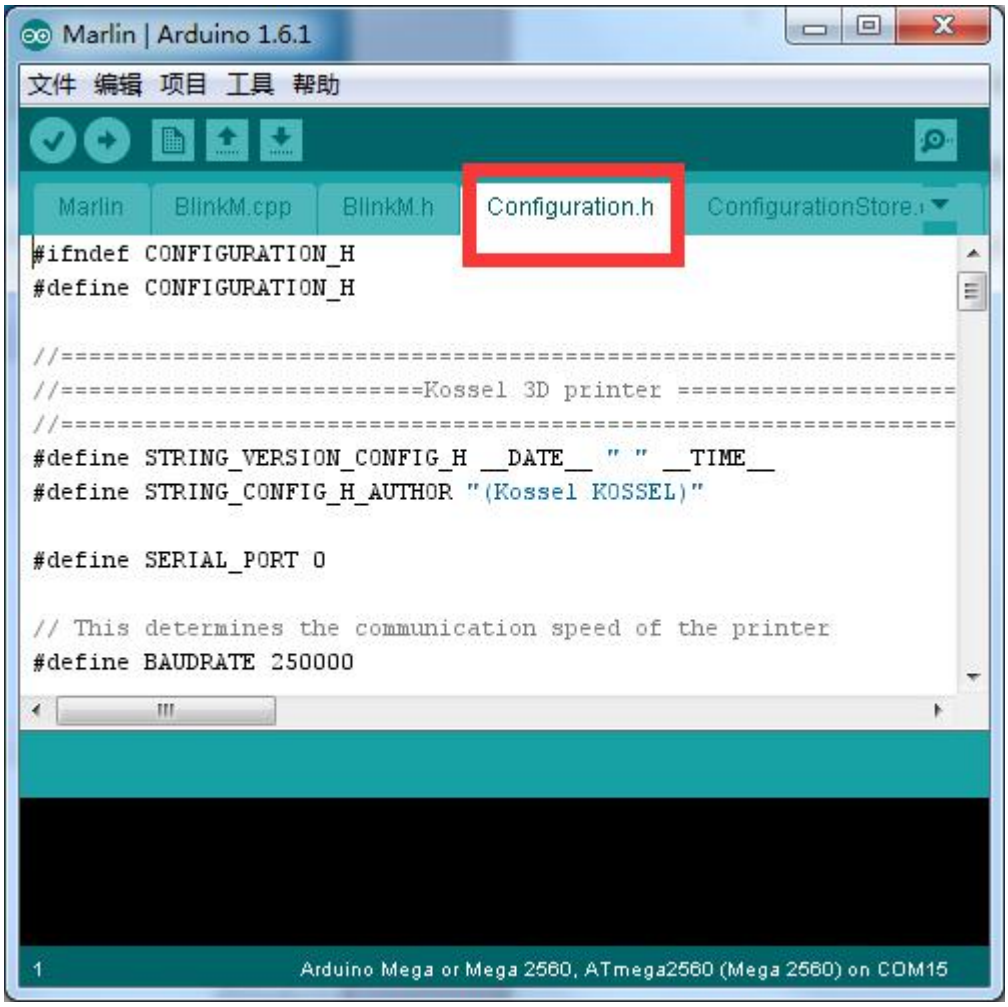
The right height of the machine could be figure out with A and B:

right height = A - B

310mm-11.4mm=298.6mm

Disconnect repetier and open marlin

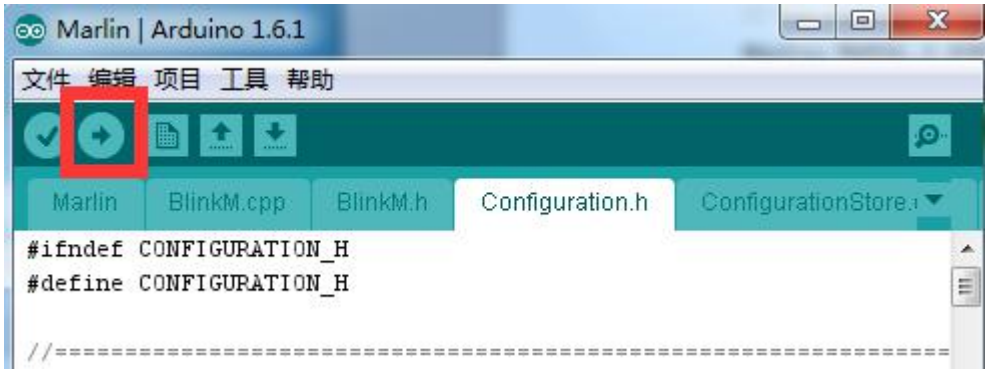
/Configuration.h



editor—search：#define MANUAL_Z_HOME_POS

```
//Manual homing switch locations:
// For deltabots this means top and center of
#define MANUAL_X_HOME_POS 0
#define MANUAL_Y_HOME_POS 0
#define MANUAL_Z_HOME_POS 310//306.6 // For de
//Because there will be differences for each m
```

replace 350 with 298.6 then upload


Marlin | Arduino 1.6.1
文件 编辑 项目 工具 帮助
Marlin
BlinkM.cpp
BlinkM.h
Configuration.h
#ifndef CONFIGURATION_H
#define CONFIGURATION_H
//

6, LCD

(1)Basics

1)button 1: twist to select option, click to enter

2)button 2:click to reset

(2)Print off line

1)insert the SD Card to LCD >click button

2)control >temperature >nozzle >200

3) prepare >preheat PLA

(3)print from SD card >select the g-code file


R1
C1
R1
JP4
C2
J1
J2

7 ,Safety and Handling

(1)Important Safety Information

1)pls click the emergency stop button  or pull out the power supply if there happen some dangers

2)don’t touch the nozzle by hand when it is heating

3) pls place the special power supply carefully when you heat the hotbed

(2)Important Handling Information

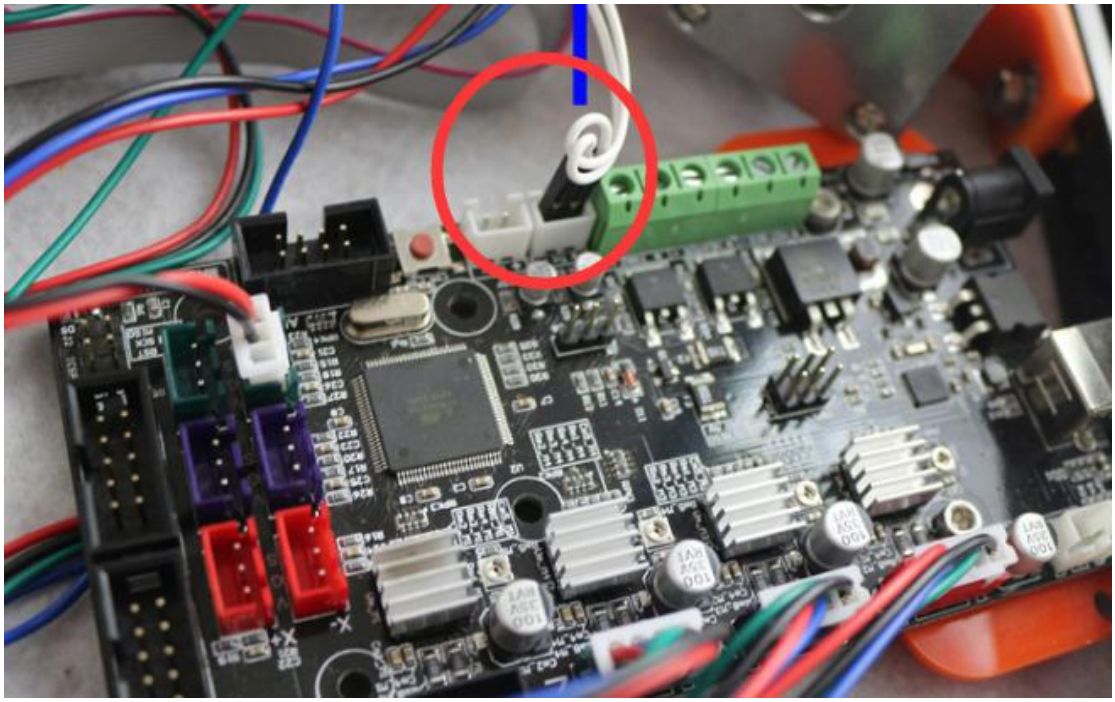
1)pls put the filament in the nozzle by hand instead of using extruder motor when you assemble filament

2) remember preheat the nozzle to 200 degree before you start print

8,Tips and Troubleshooting

(1)General Suggestions

1)ensure the wire plug the right socket on the board, especially the temp sensor, ensure it is tight enough

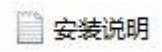


2)the suitable temp for PLA is 200-210; for ABS is 240-250; for hotbed is 80

(2)Uploading Firmware

1)If you could not find the Mega2560 in the device manager, try to install the driver amd64 (you could find the drivers in the SD Card,

If your PC is 32bit, pls install x86)

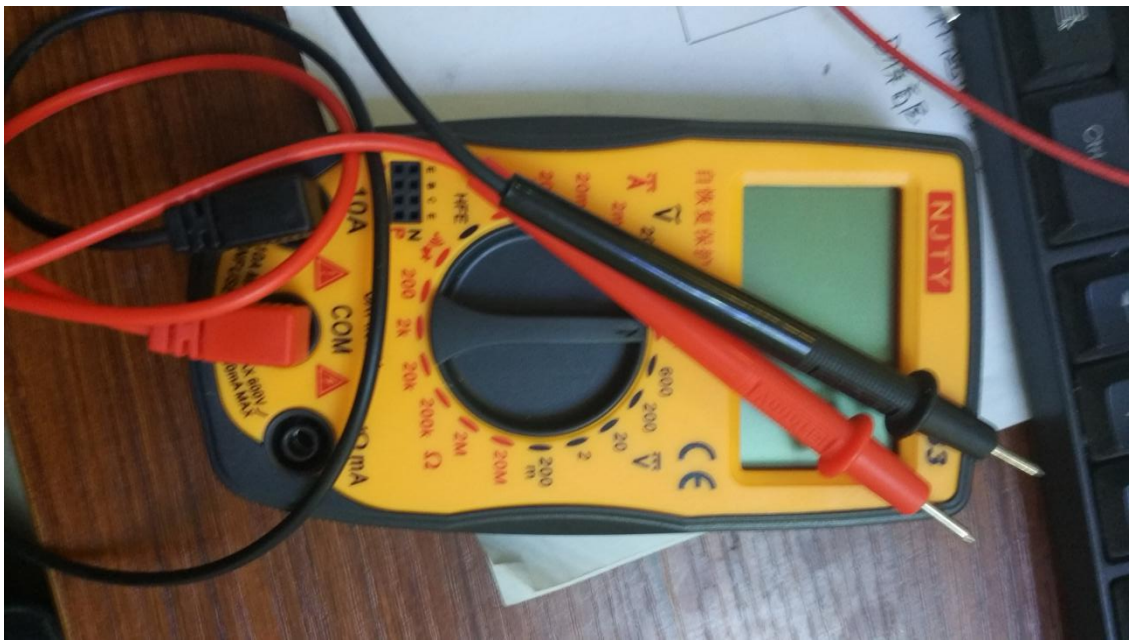
2)If the “driver amd64” can not works, open the file-“solve streamline version windows7...”, then copy the file as the  said

3) if the all the above doesn’t works, maybe you installed arduino/marlin into C disk, try with D disk or others

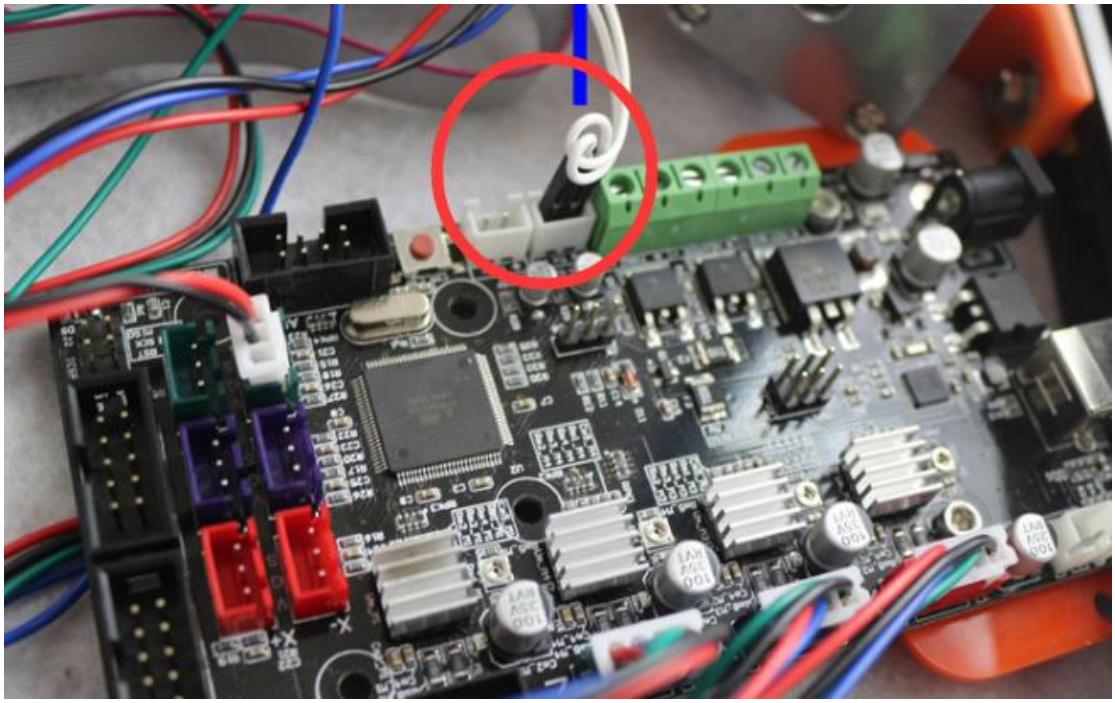
4) if the repeteir cant connect, replug the USB wire again

(3)Operating printer

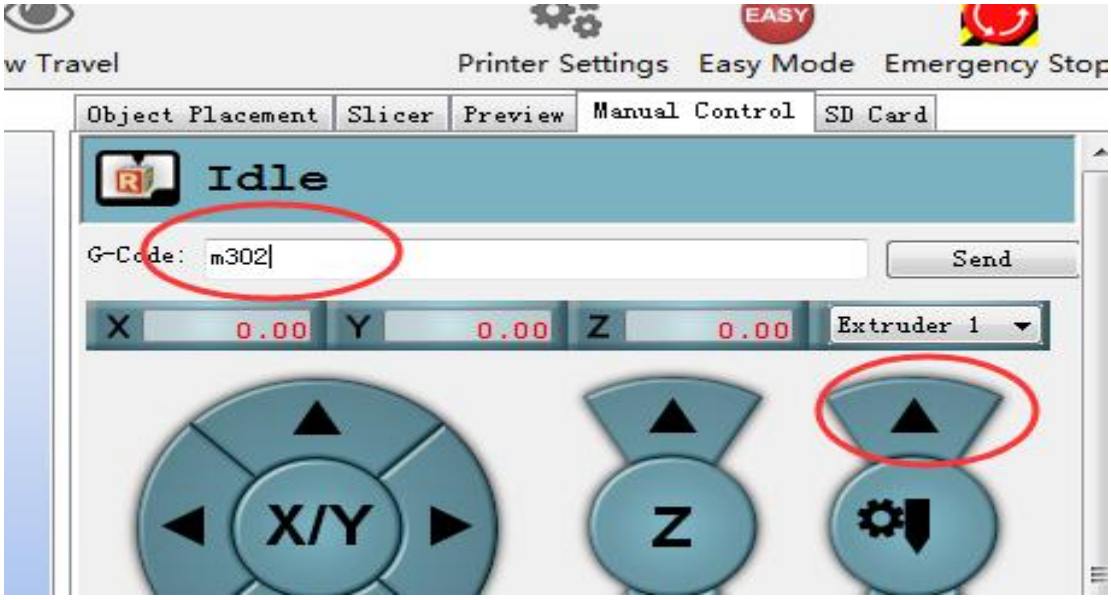
You need a multimeter



1) if you meet “MINTEMP”, it is due to the temp sensor, plug it tightly enough, otherwise it maybe broken, measure it’s resistance with a multimeter(the normal value is 100k)

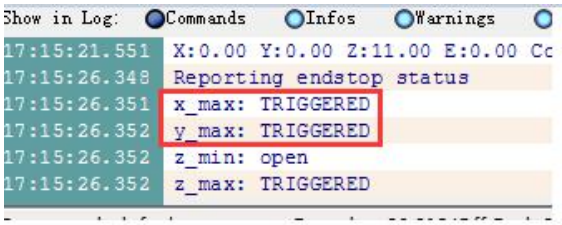


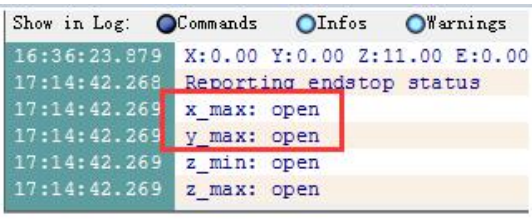
2) if the “extruder motor doesn’t move” with extruder button, pls input m302 before you do it



3) if the “pulley can’t go up” succeed with g28, it may due to the limit switch, input m119 and press the switch on/off to see whether the message is always “triggered” at the bottom of the repetier, or measure the output volt of the motor driver(normal value is 0.5v)

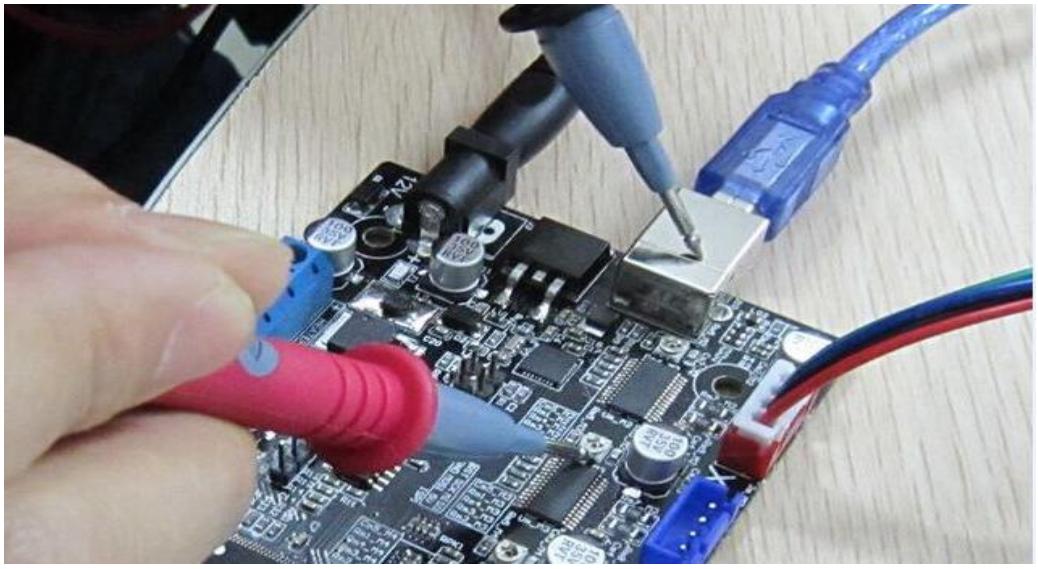
switch on switch off



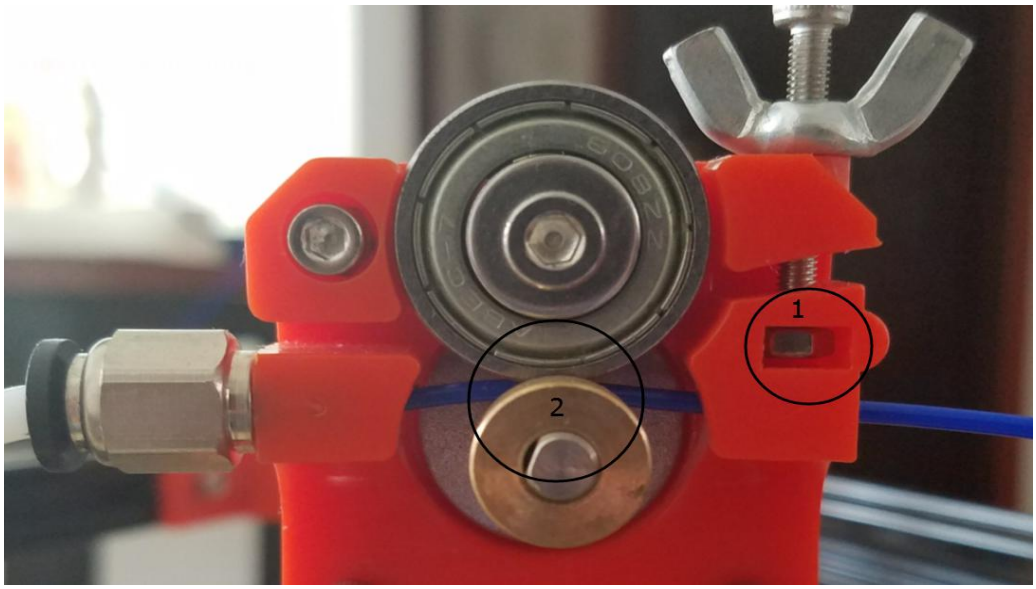


switch on

switch off



4)if the “filament cant extruded” smoothly, check the extruder motor parts, ensure there exist no stuck with the part1 and part2 in the picture; and assemble filament into nozzle by hand carefully to see whether it could came out in this case, otherwise replace the nozzle with a new one.



5)if the LCD can not show the value normal pls upload the firmware(marlin) again with the LCD disconnected or click the reset button, or maybe you have mistake the two wire of the LCD

9,Learning more

(1)More Information

Repetier: https://www.repetier.com/

Slice: http://slic3r.org/

Cura: https://ultimaker.com/en/products/cura-software

Marlin: https://github.com/ErikZalm/Marlin

Arduino: https://www.arduino.cc/