



# [U20 Instruction Manual]

CE FCC RoHS

2018.8.14

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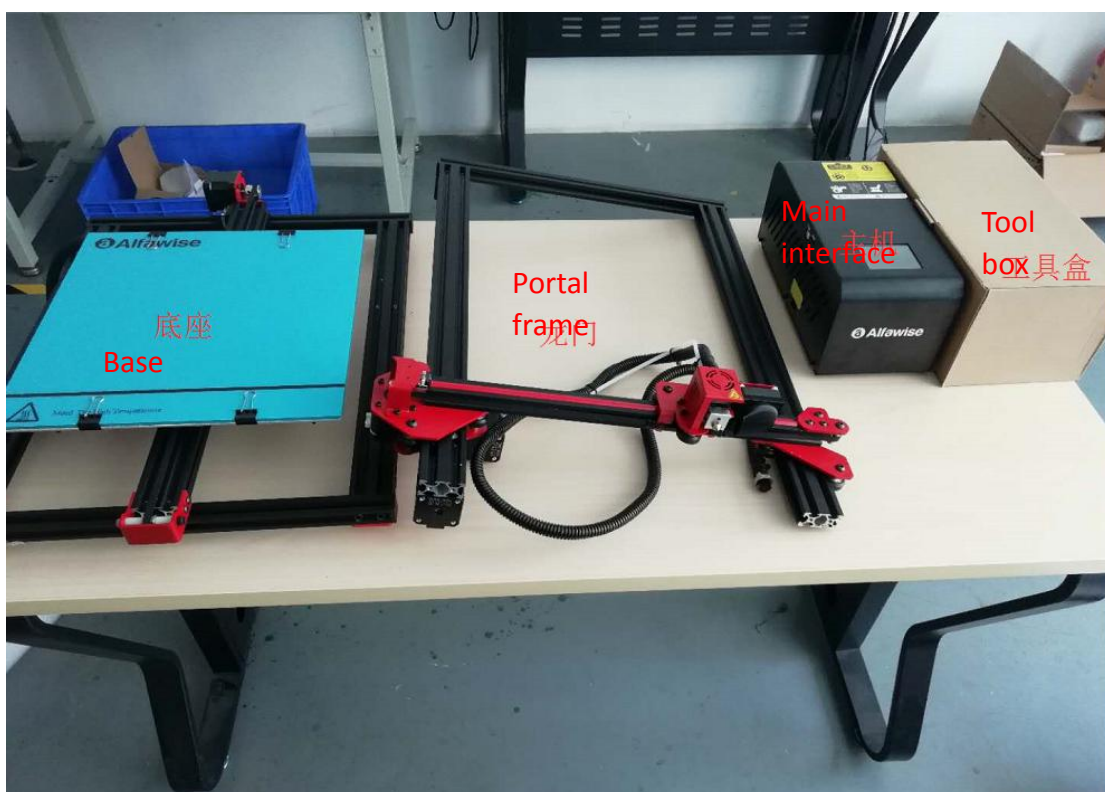
# I. Machine Assembly

The machine is basically installed before leaving the factory, and you only need some simple steps to fix the machine.

## 1. Taking out all parts

Fix the portal frame on the base platform with four screws(M5\*20).

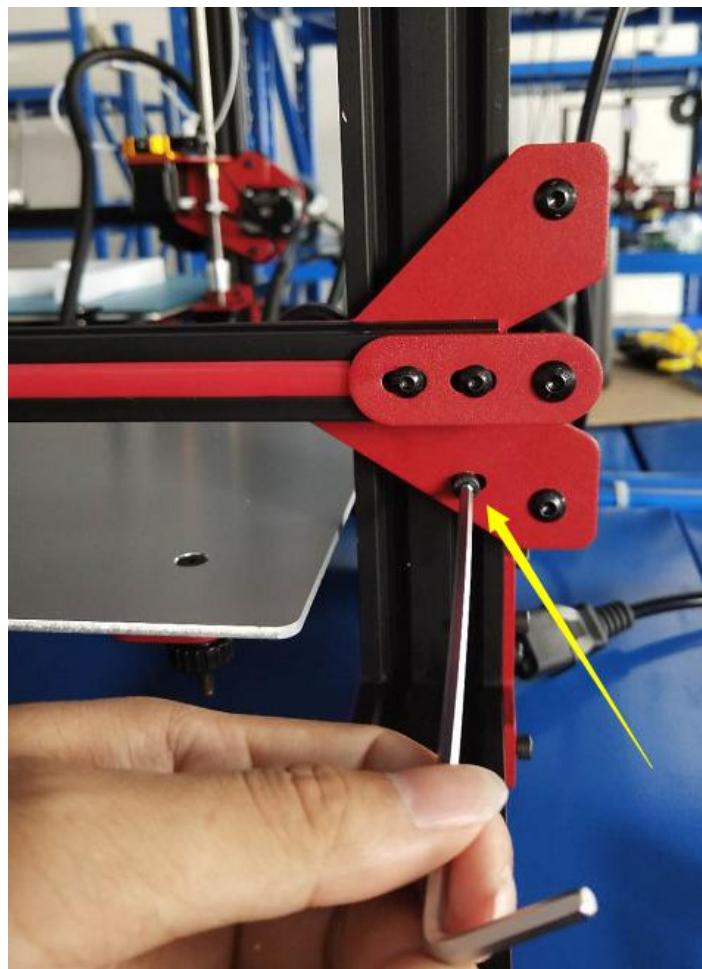
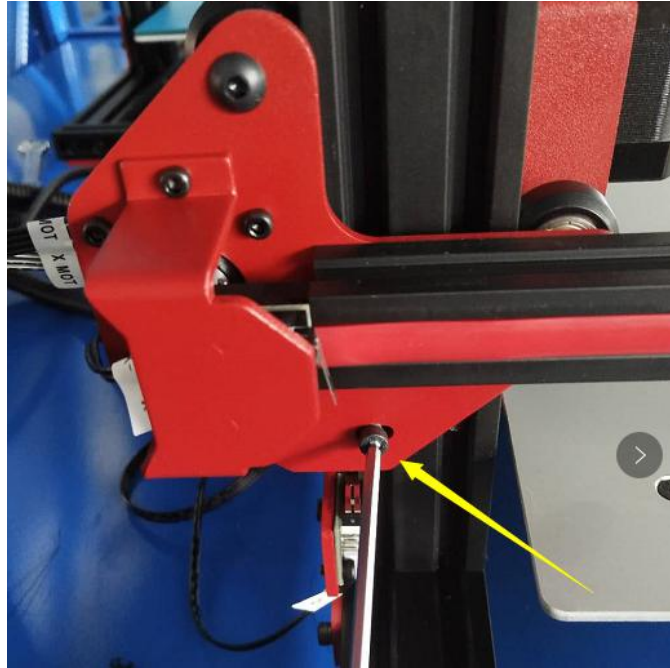




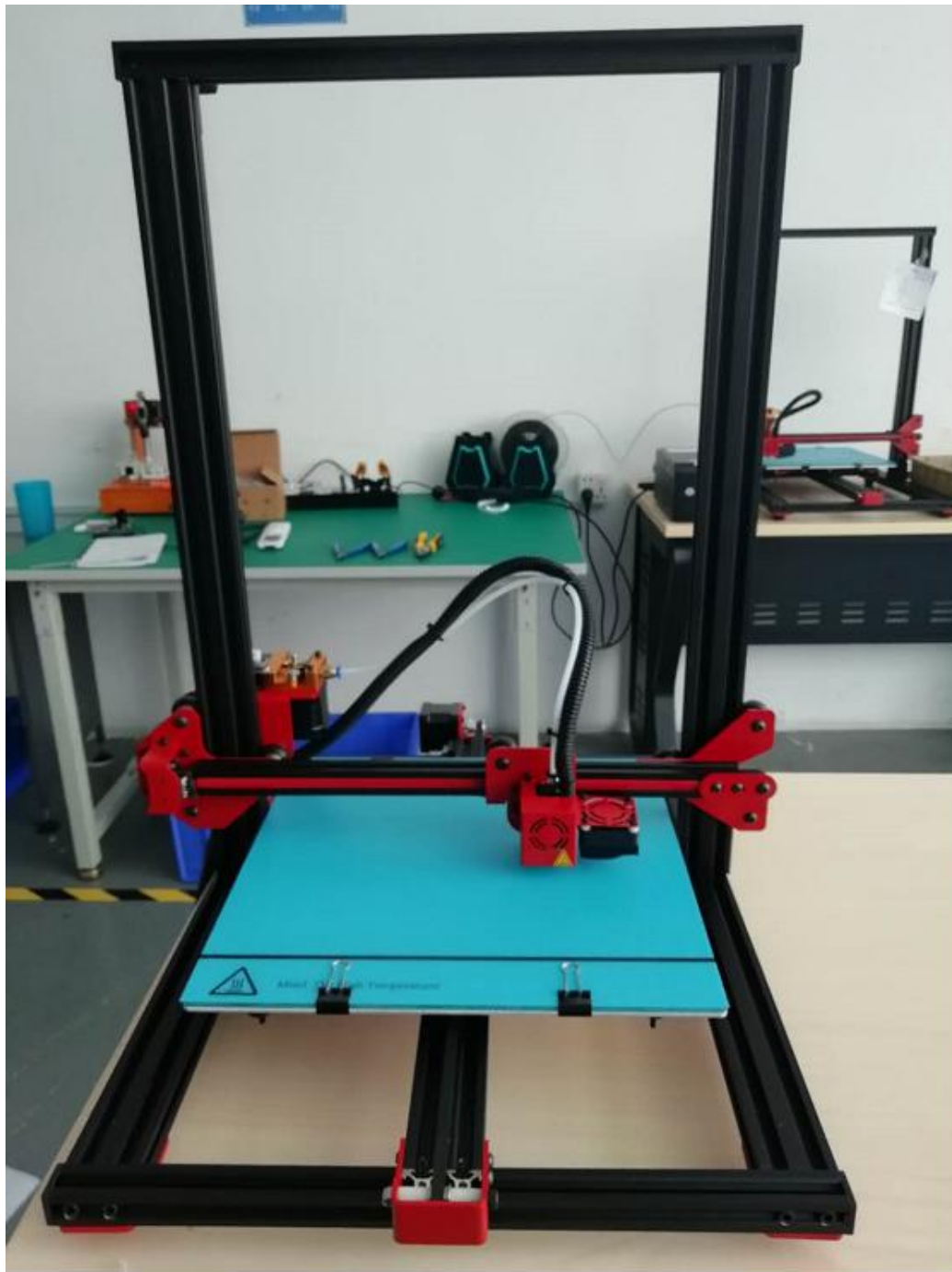
**Note: After opening the package, please check whether the sheet metal on both sides of the gantry frame has two screws fixed, if so, be sure to remove it, otherwise the Z axis will not work properly (Because the batches are different, the fixed mode has changed).**







Take out four M5 screws from the tool box and start installing the frame.



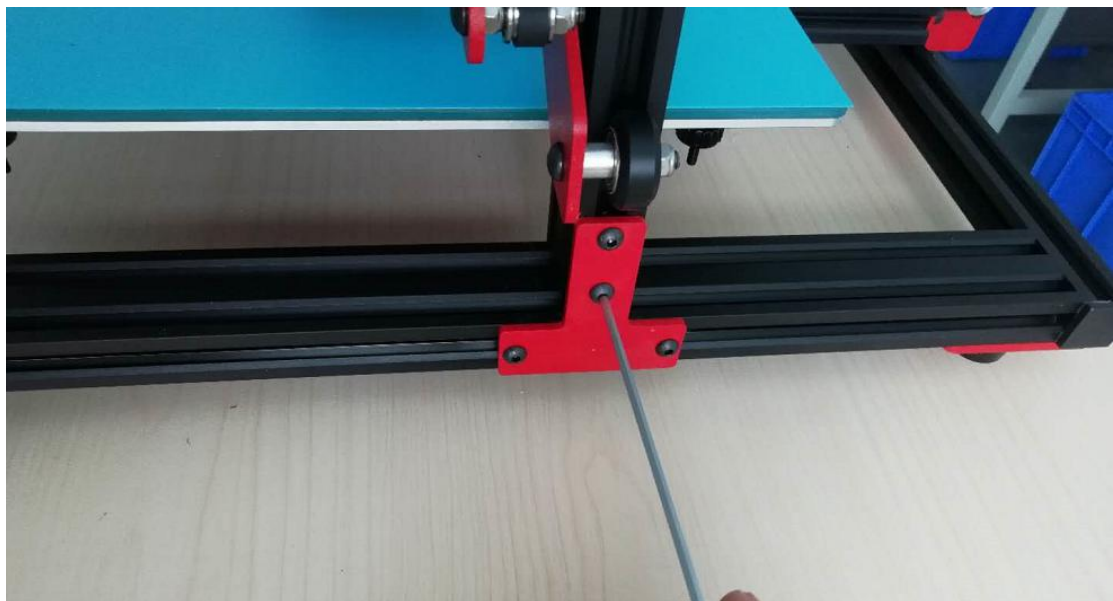
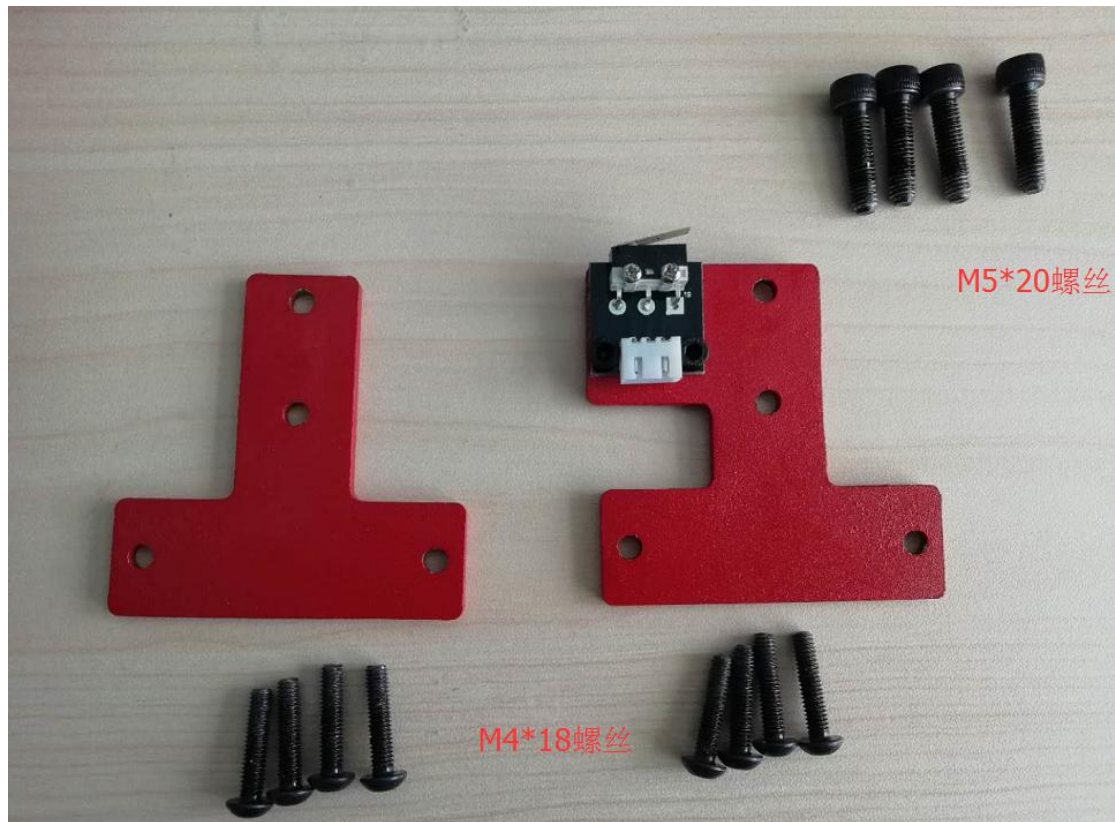
Place the portal frame and base platform as shown in the above picture, and place them in side way. Use an Allen wrench to fix the M5\*20 screws.

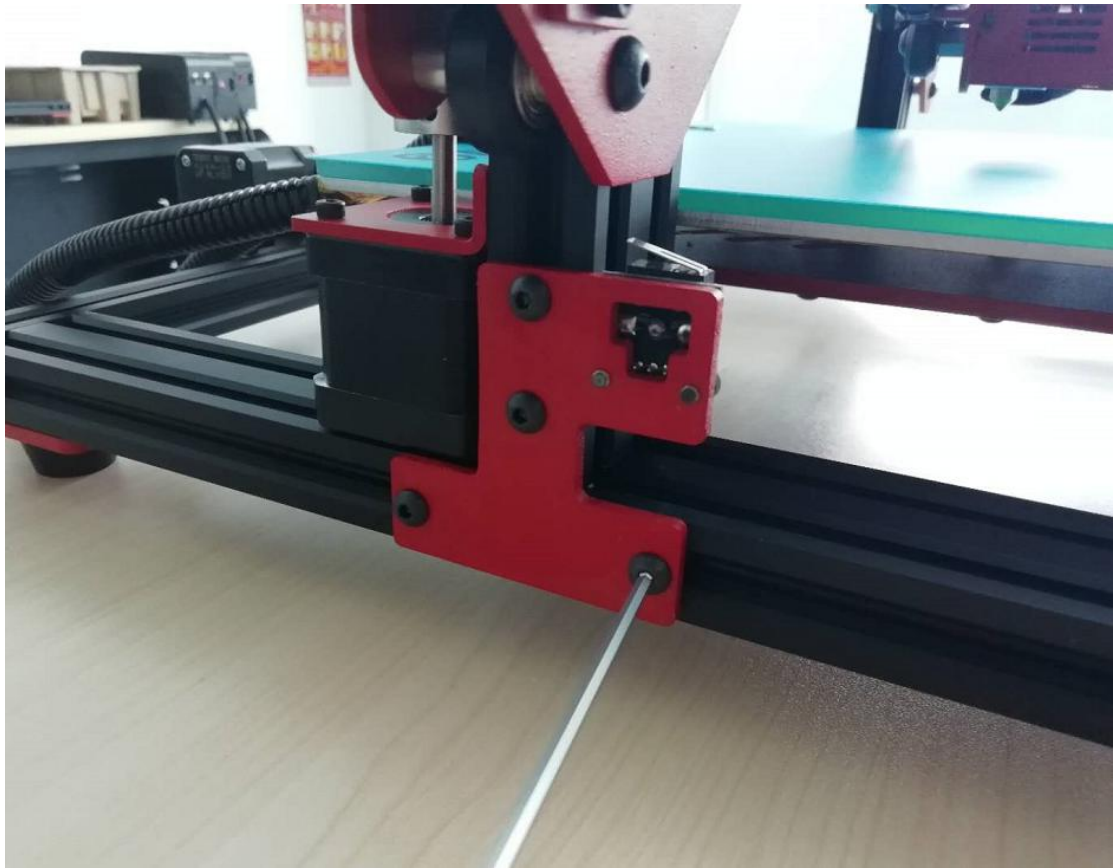




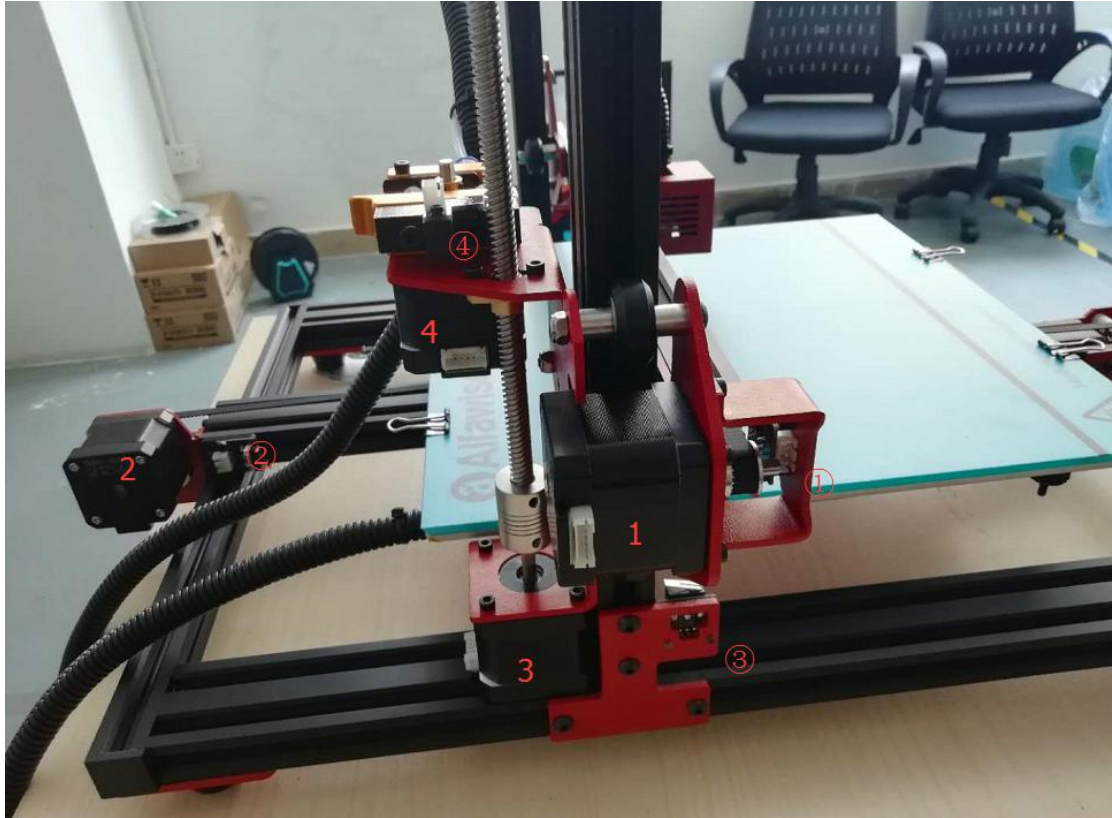
## 2. Installing fixed block and limit switch

The fixed block with limit switch is installed on the left side, and T-type fixed block is installed on the right side.





### 3. Wiring



1. X-axis motor; 2. Y-axis motor; 3. Z-axis motor; 4. Extruder motor.

①: X-axis limit switch ②: Y-axis limit switch ③: Z-axis limit switch

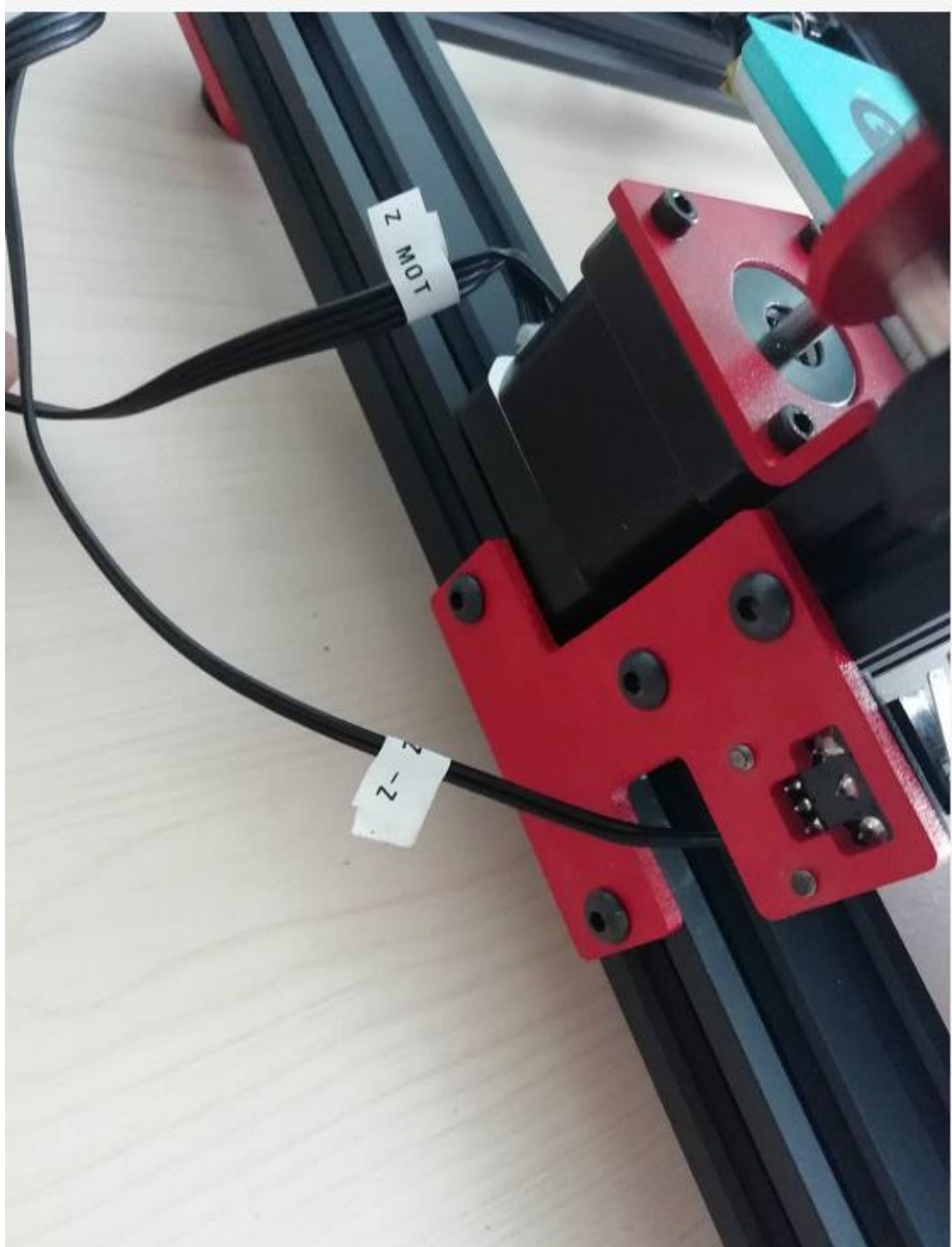
④: Extruder filament run-out detection switch

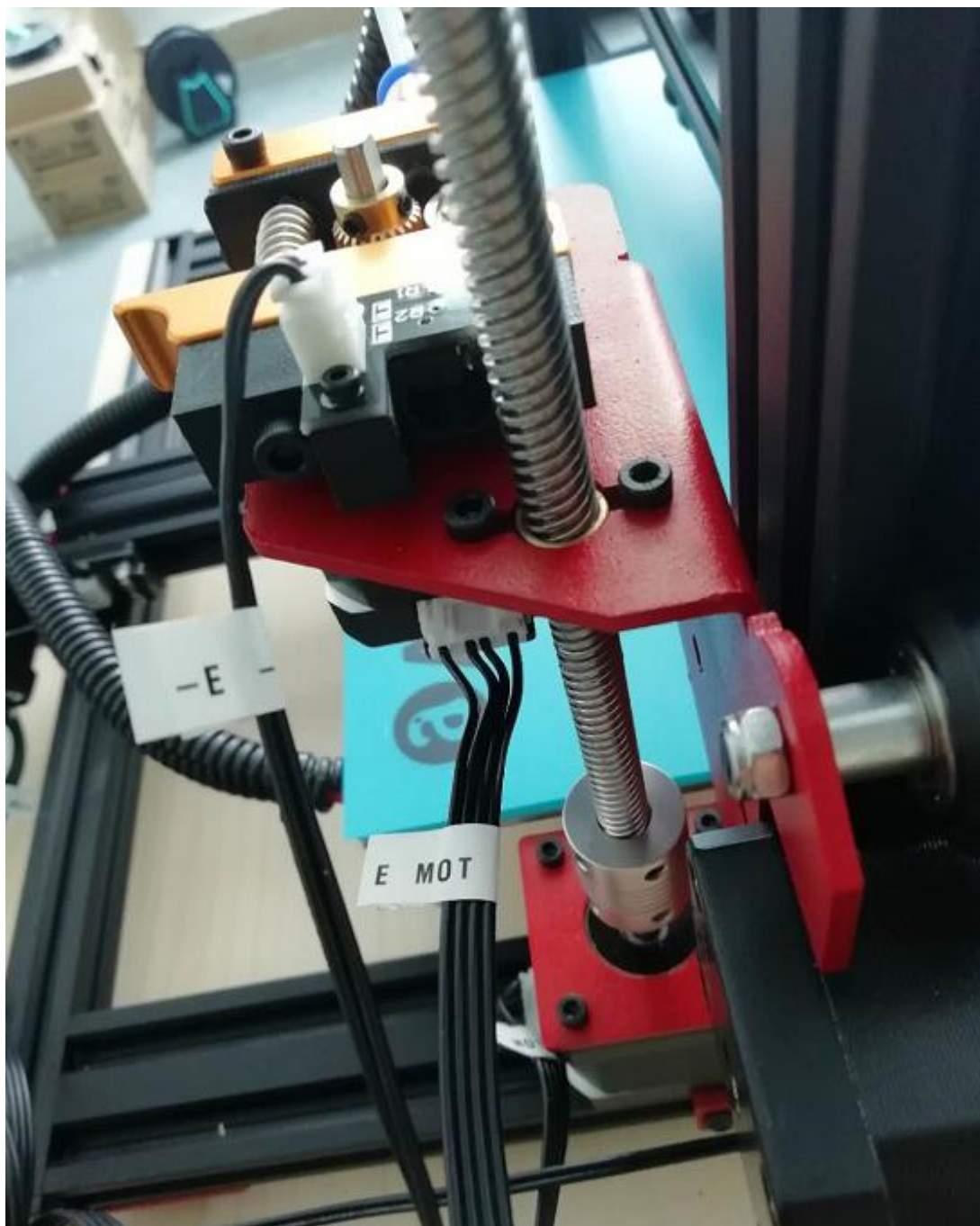






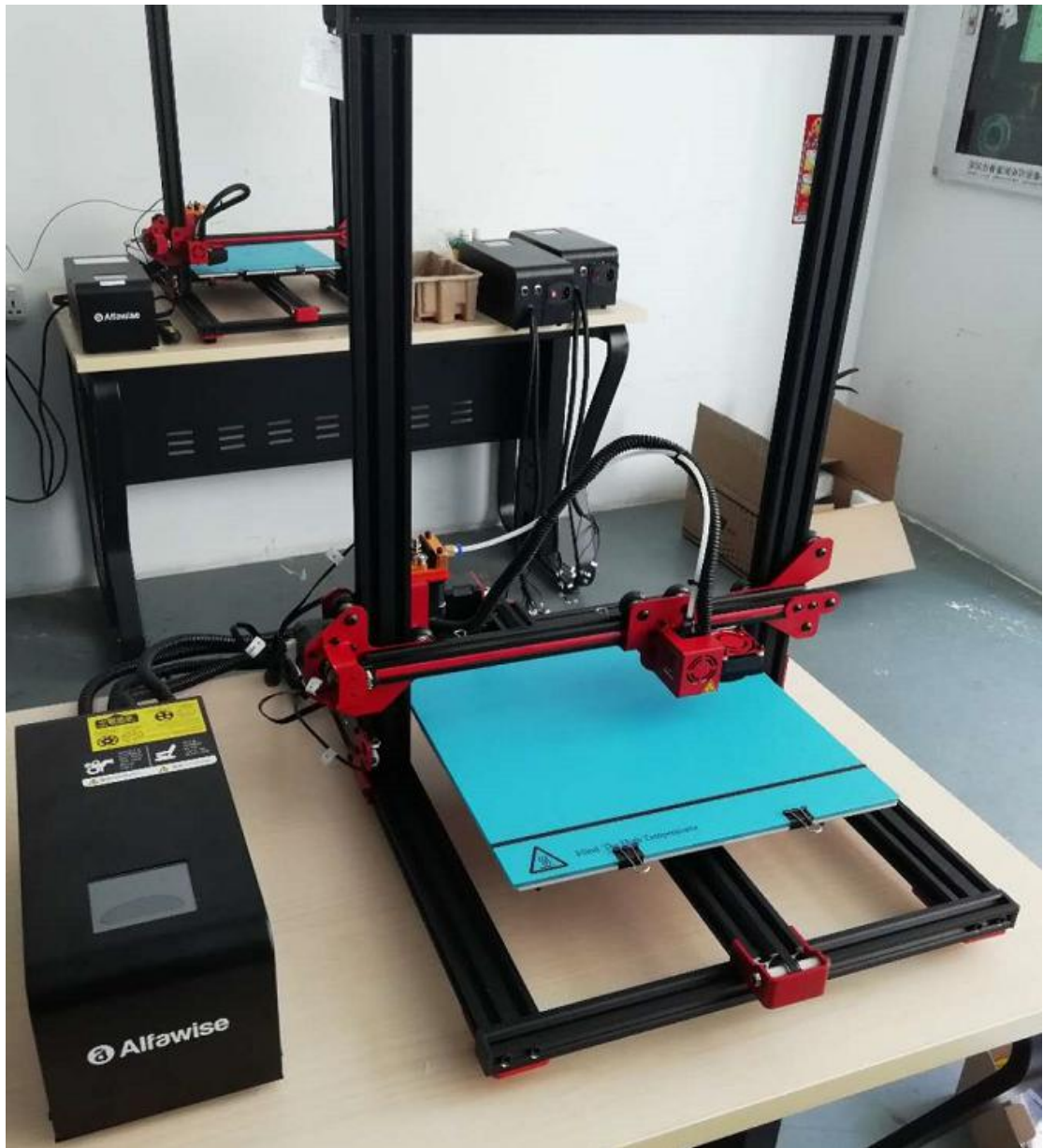






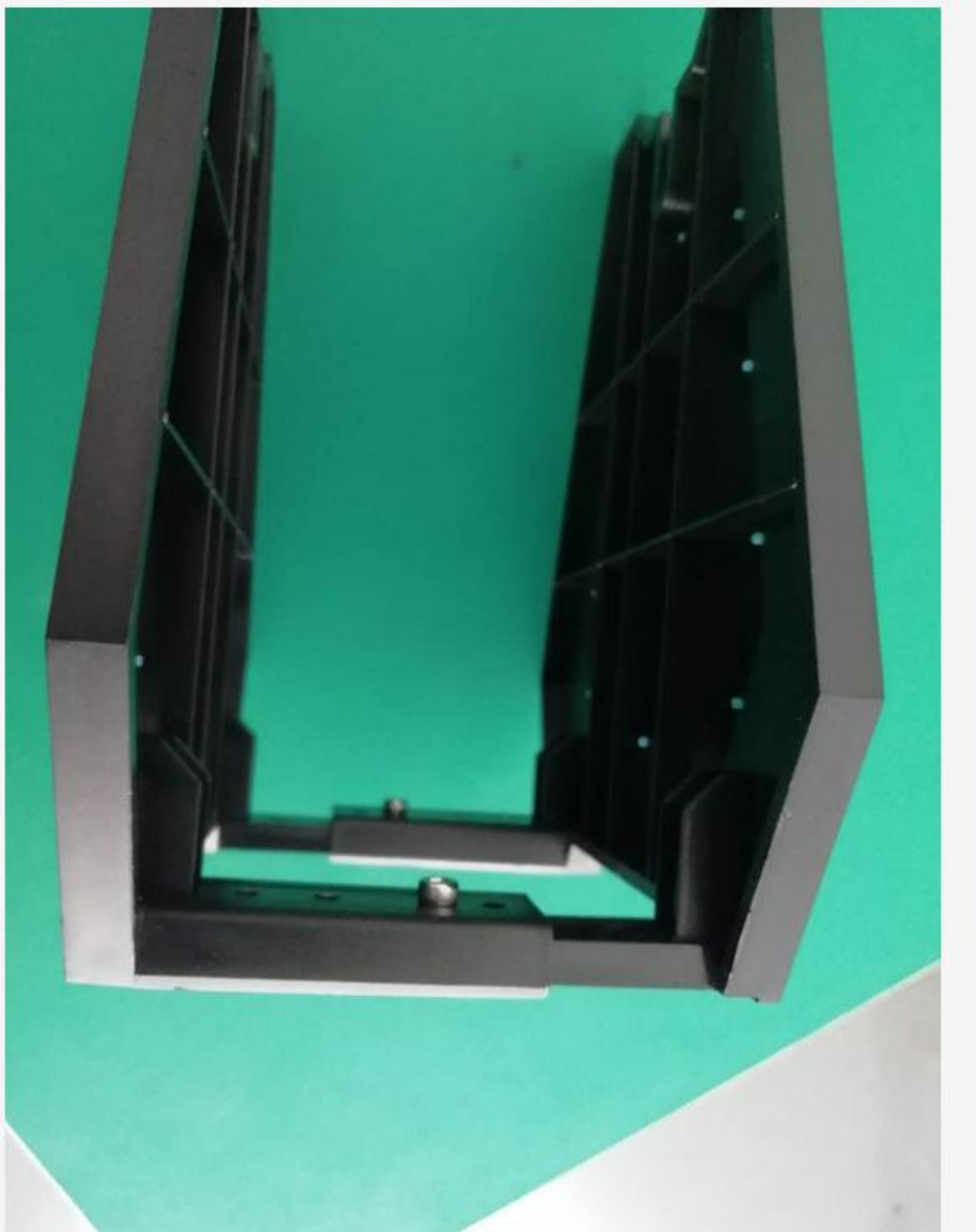
Note: To wire the cable properly, place the Y-axis motor and Y-axis limit switch cable under the base as shown below to prevent the moving part from scraping the cable.



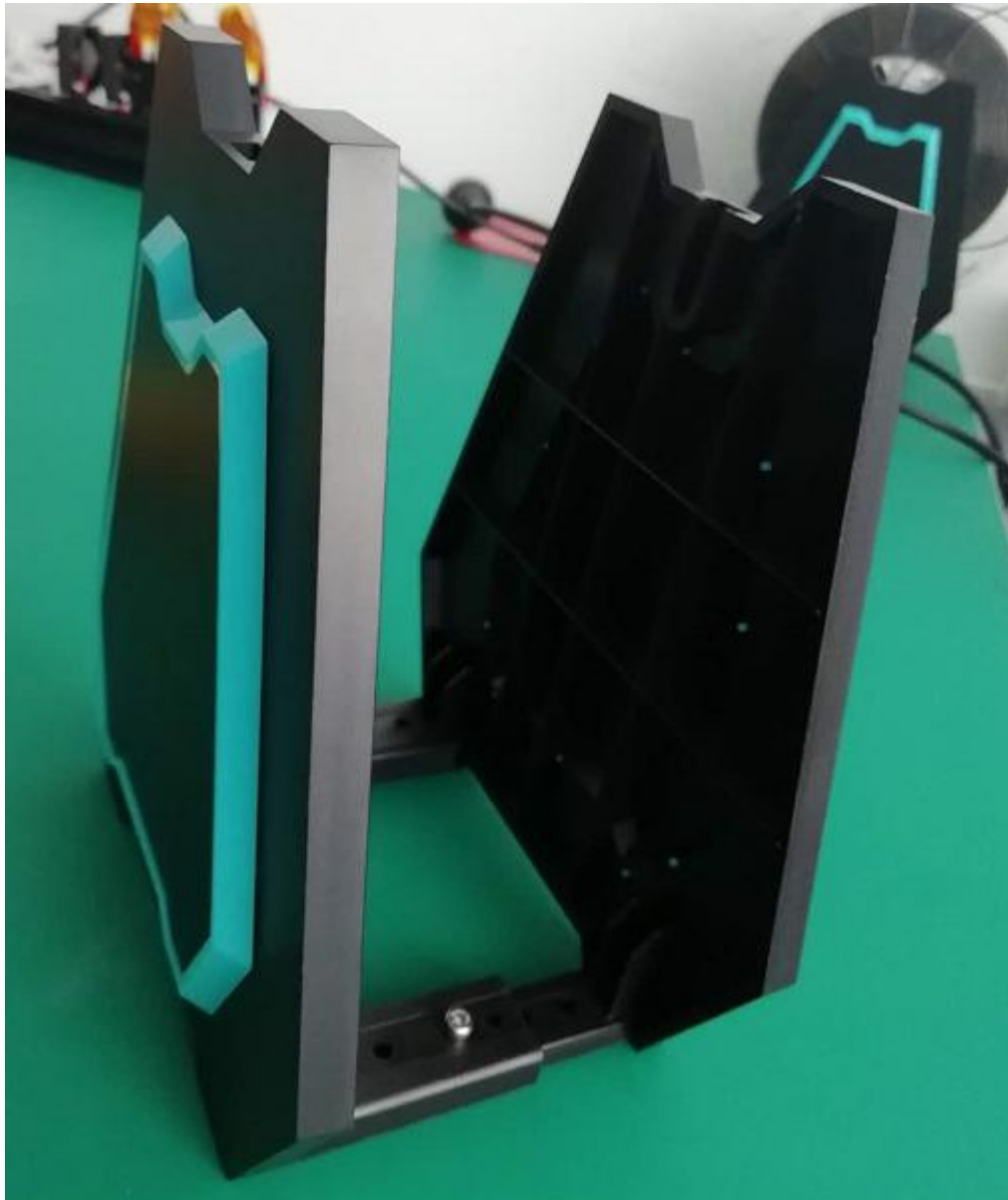


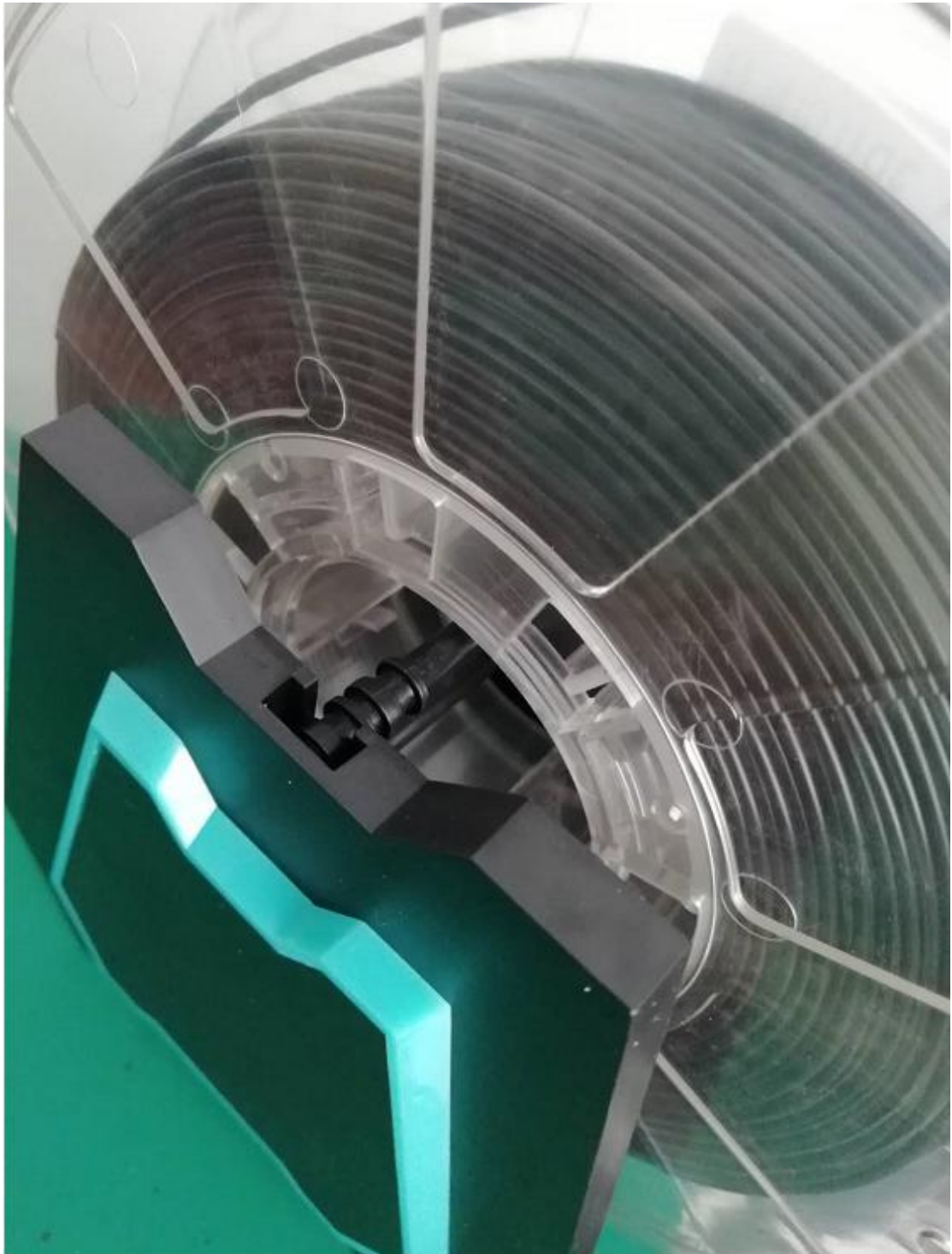


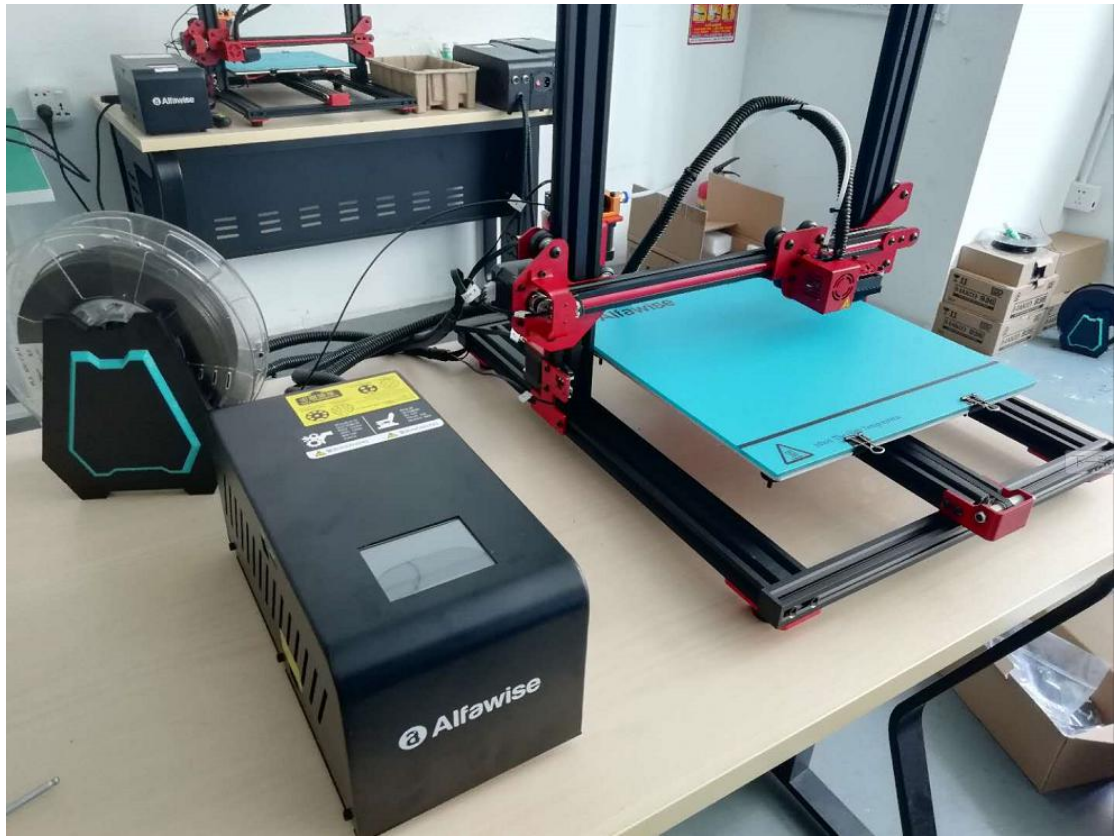
#### 4. Install filament bracket







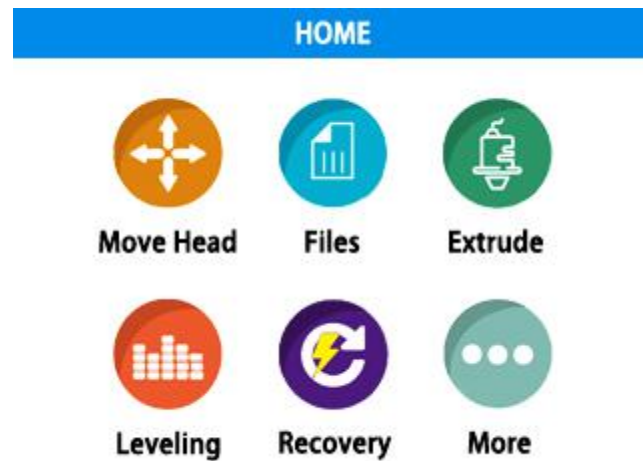




## II. LCD Screen Notes

Menu Item Function Instruction

### 1. Main interface



**Move Head:** Control the movement of X, Y, Z axis; motor is locked or not; the movement distance of nozzle and extrusion volume.

**Files:** Open the printing file and printing interface.

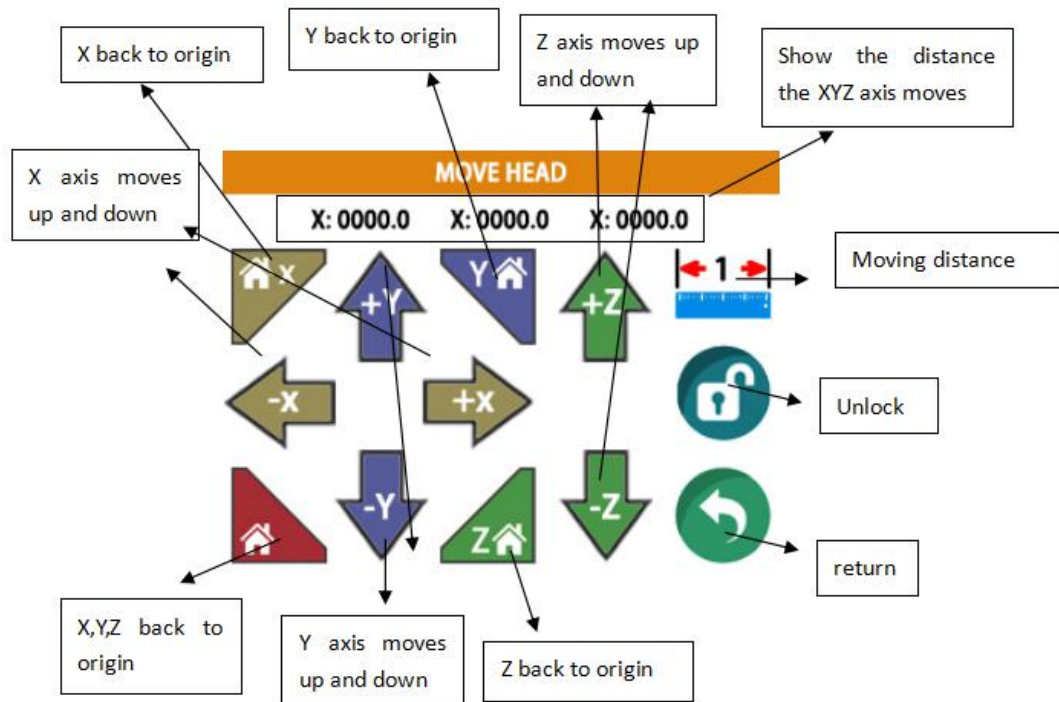
**Extrude:** Control the temperature between the nozzle and heated platform; feed in filament or feed out filament.

**Levelling:** Asissited leveling function can be automatically moved to the corresponding position for easy leveling

**Recovery:** System reset

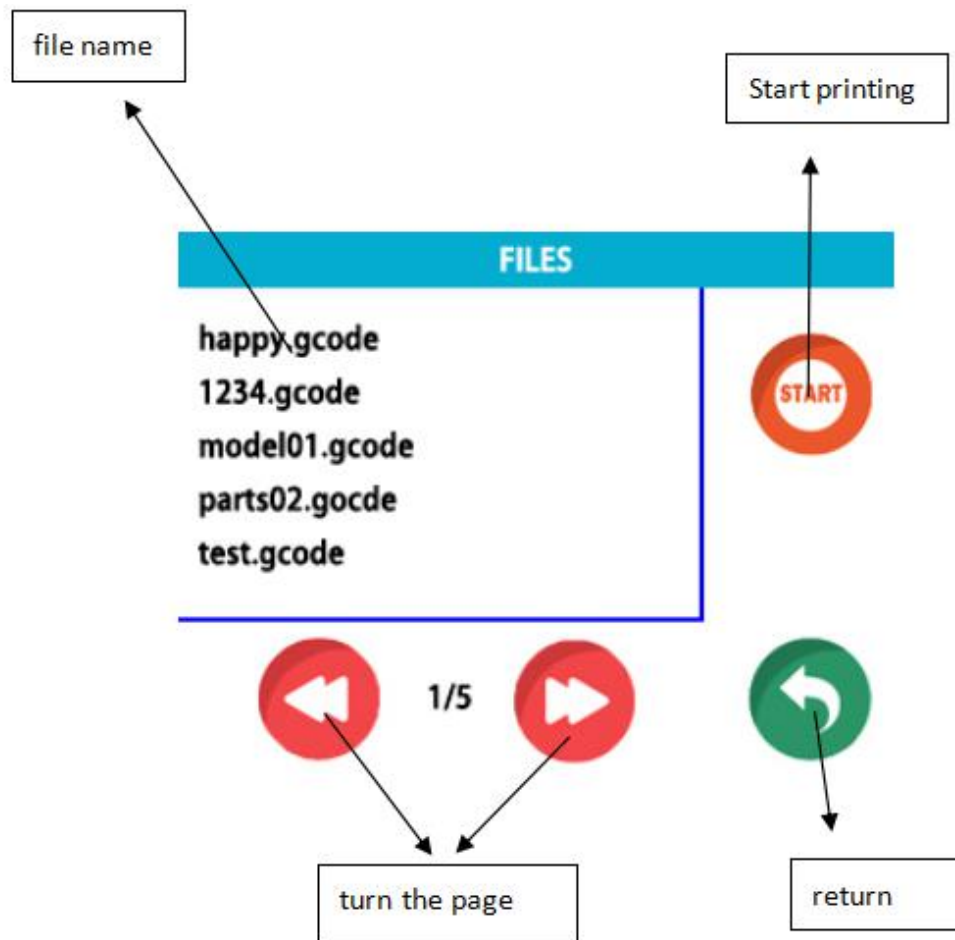
**More:**More

## 2. Move Head

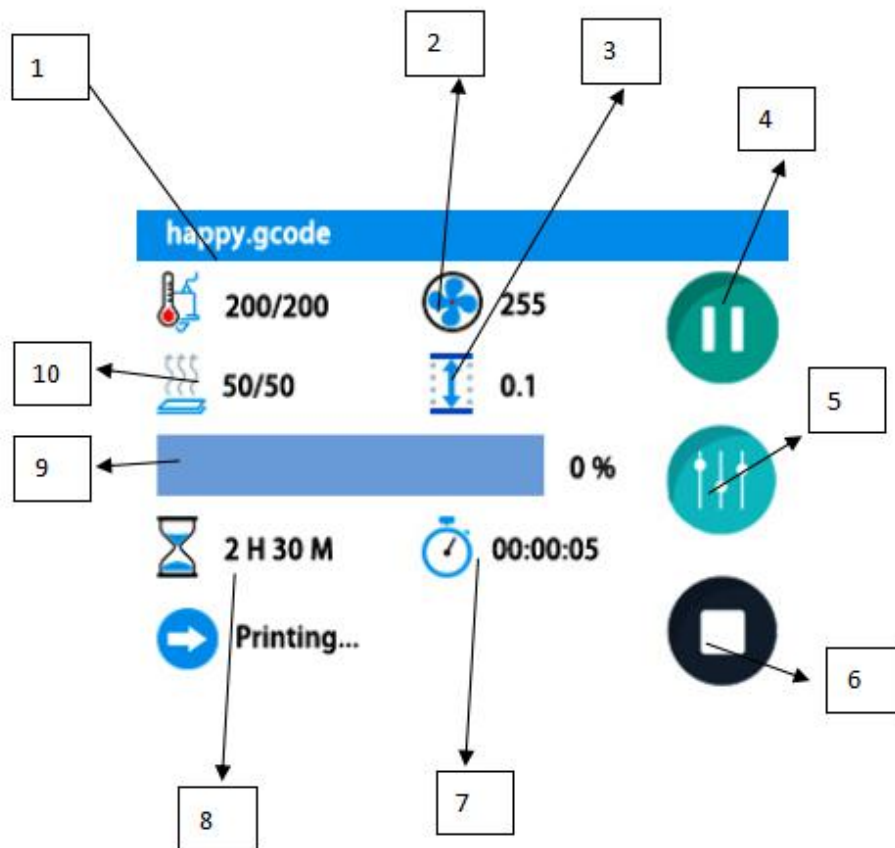




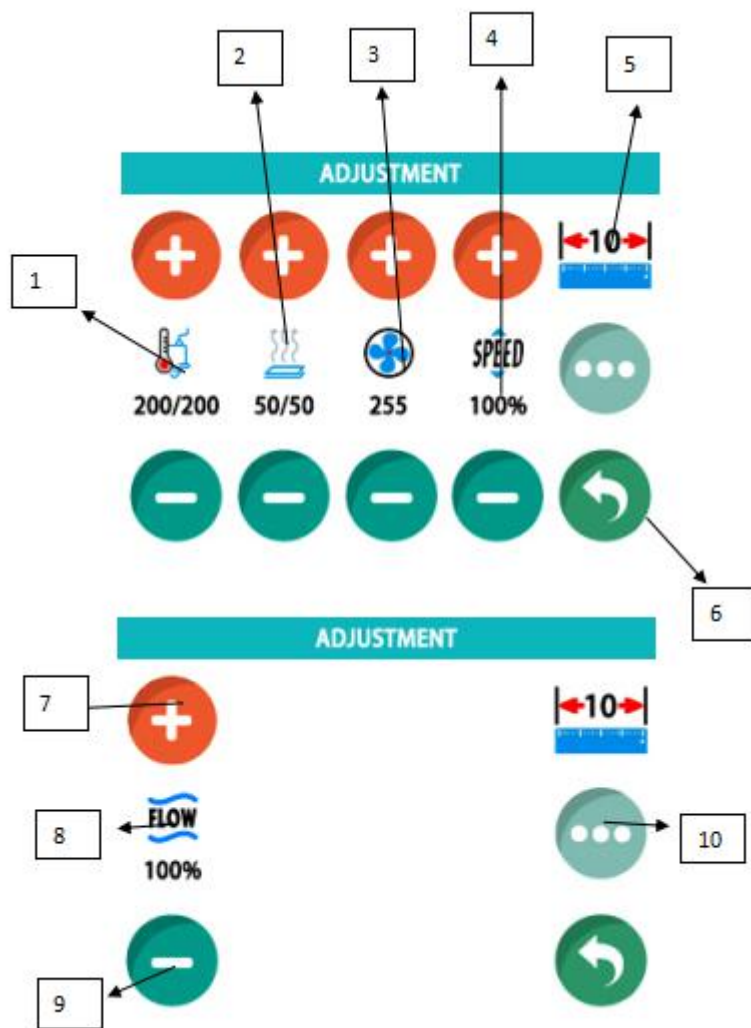
### 3. Files



## Printing interface

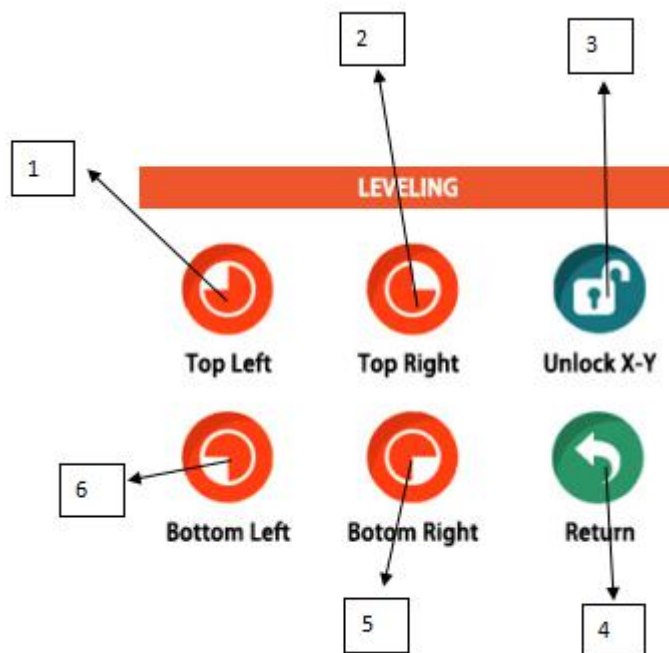


1. nozzle temperature;
2. fan speed;
3. Z axis height;
4. pause printing, can be restored;
5. parameter adjustment, detailed parameters see the picture below;
6. stop printing;
7. used time;
8. remaining time;
9. progress bar;
10. heated bed temperature



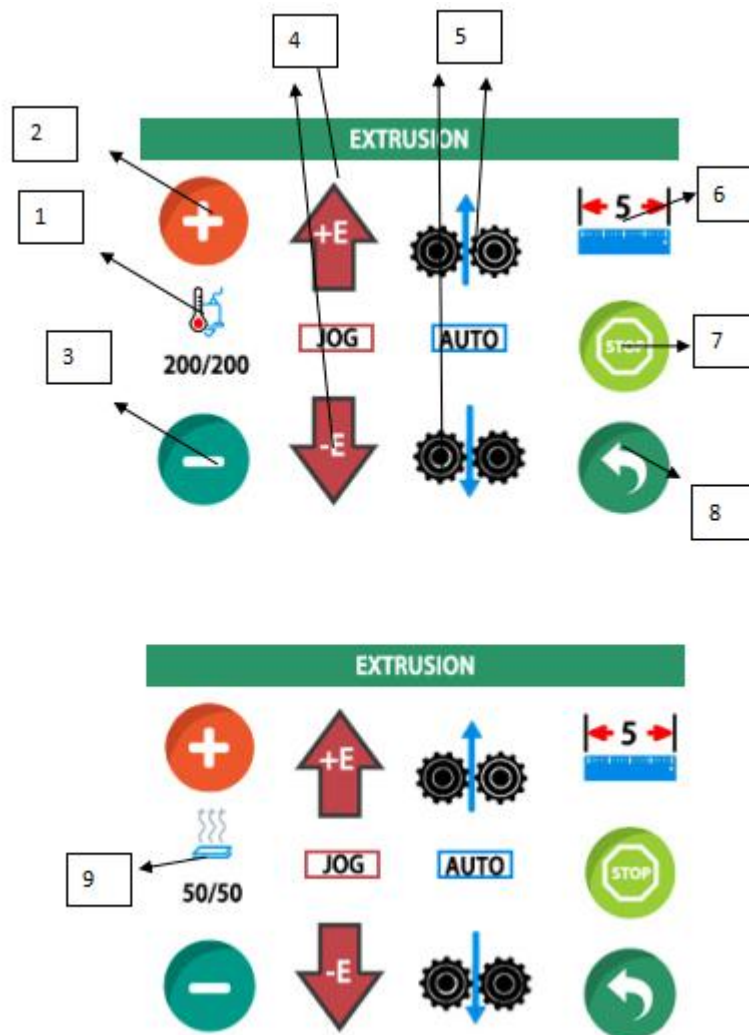
1. nozzle temperature adjustment;
2. heated bed temperature adjustment;
3. fan speed adjustment;;
4. print speed adjustment;
5. Adjustment of distance;
6. return;
7. Upward adjustment;
- 8 .Extrusion flow ratio;
9. Down regulation;
- 10.More;

## 4. Levelling



1. Move the nozzle to the left front;
2. Move the nozzle to the right front;
3. Unlock the XY two-axis motor;
4. Return;
5. Move the nozzle to the right rear;
6. Move the nozzle to the left rear

## 5.Extrude



1. Nozzle temperature
2. Upward adjustment
3. Downward adjustment
4. Slowly feeding and discharging
5. Automatic feeding and discharging
6. Distance adjustment
7. Stop
8. Return
9. Click the icon to switch to the hot bed



## 6.More





1. Click on the file to enter
2. Refresh
3. Return
4. Save the settings
5. Scroll up and down
6. Parameter settings

# III. Cura installation and operation

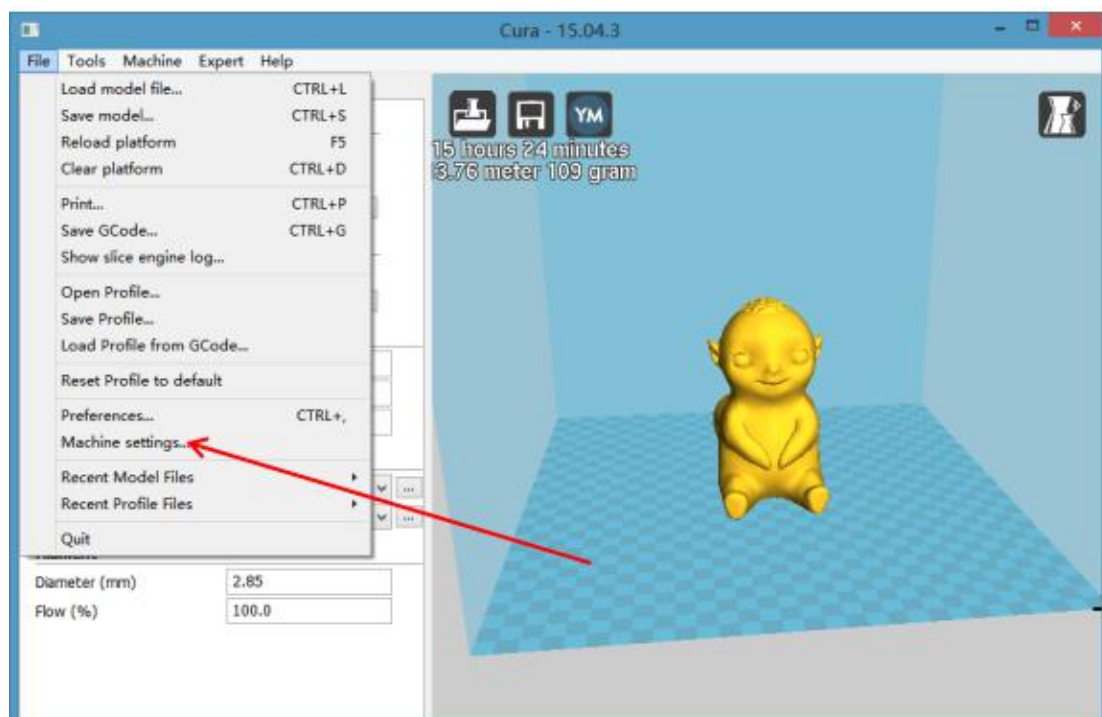
## 1. Slicing software installation

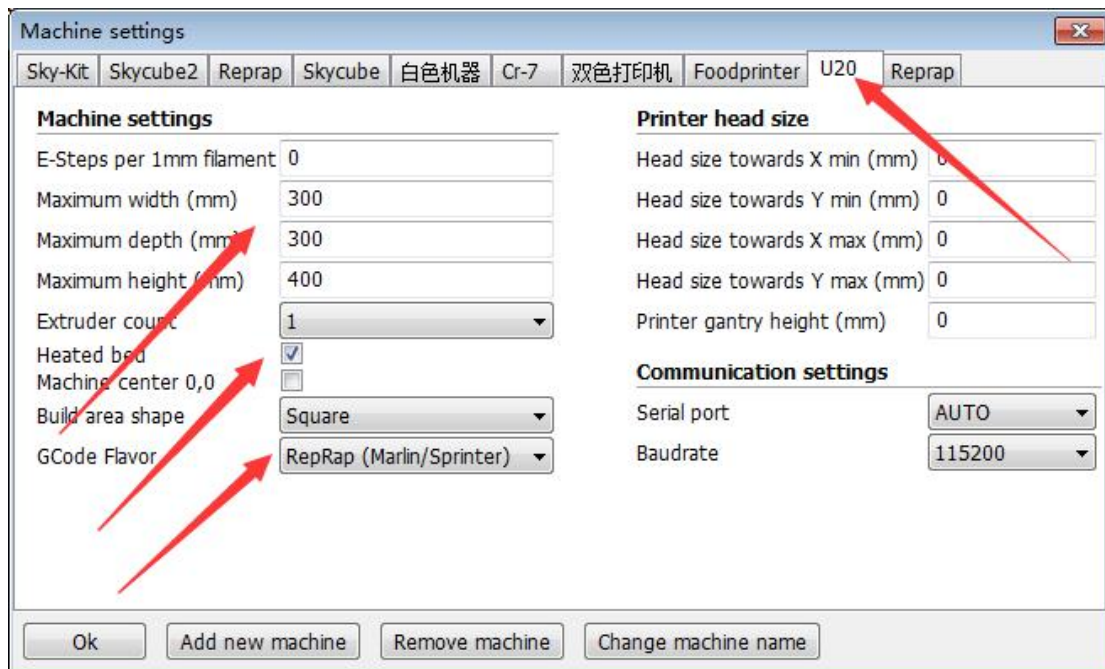
Install the software

Click  Cura\_15.04.3.exe , pop-up installation window, continue to click next step to complete the installation.

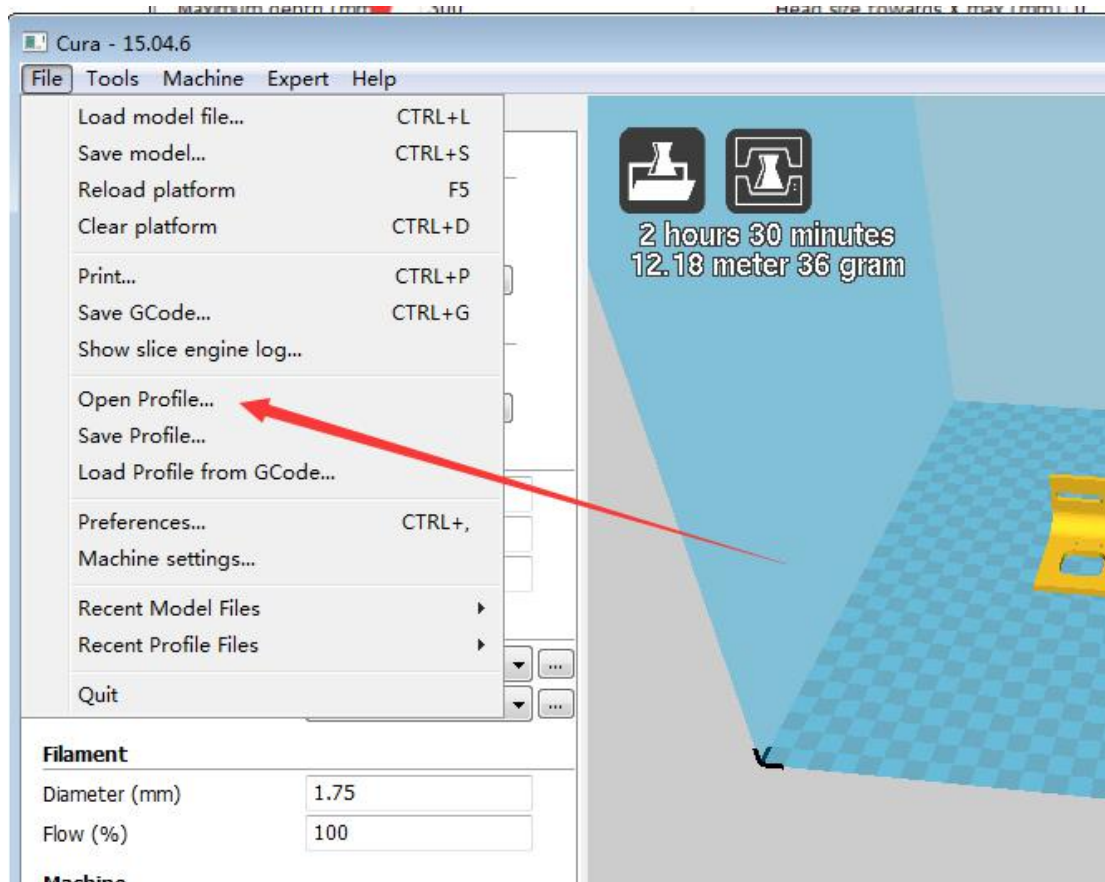
名称	修改日期	类型	大小
util	2018/4/13 14:05	文件夹	
 Cura_15.04.3.exe	2016/3/4 11:05	应用程序	20,418 KB

## A. Machine settings





Modify the corresponding print size, hot bed, Gcode style, change the name, etc.



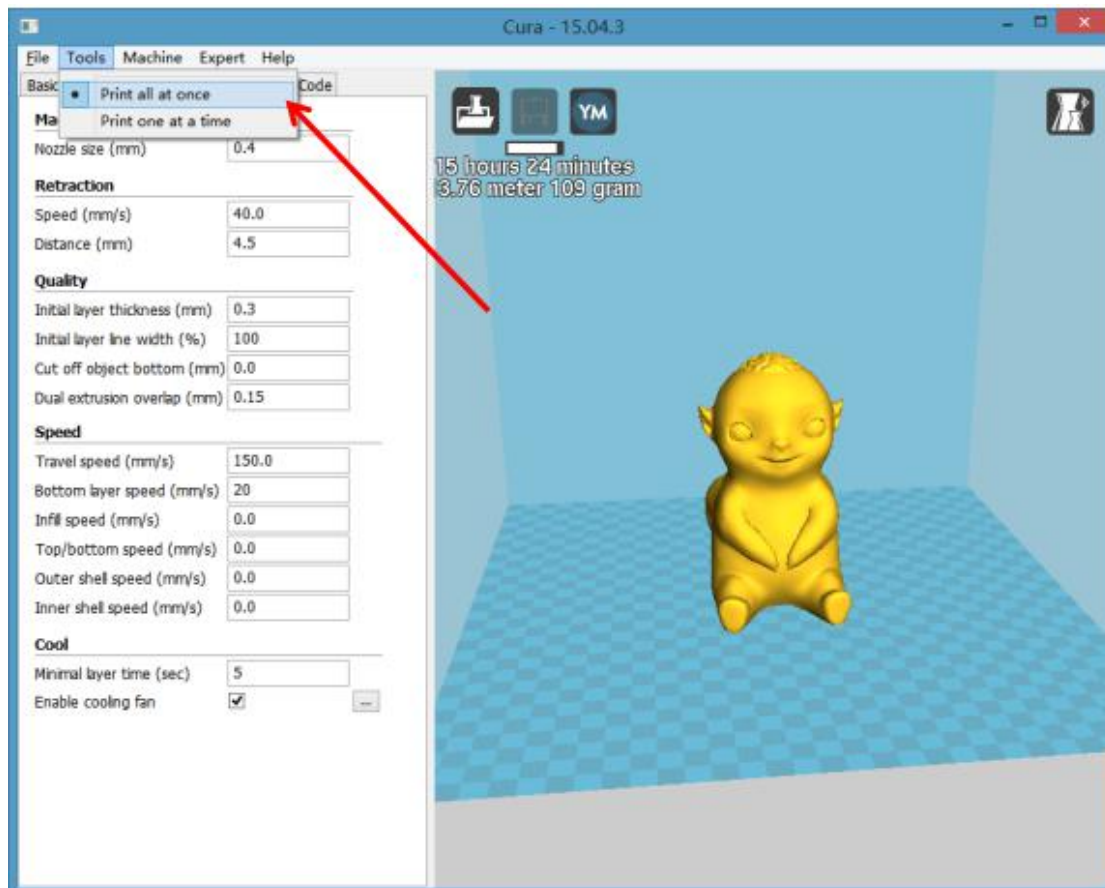
Open the configuration file and configure all the parameters to be the default parameters.



Locate the folder in which the Cura installer is located and open the U20.ini to configure the default parameters.

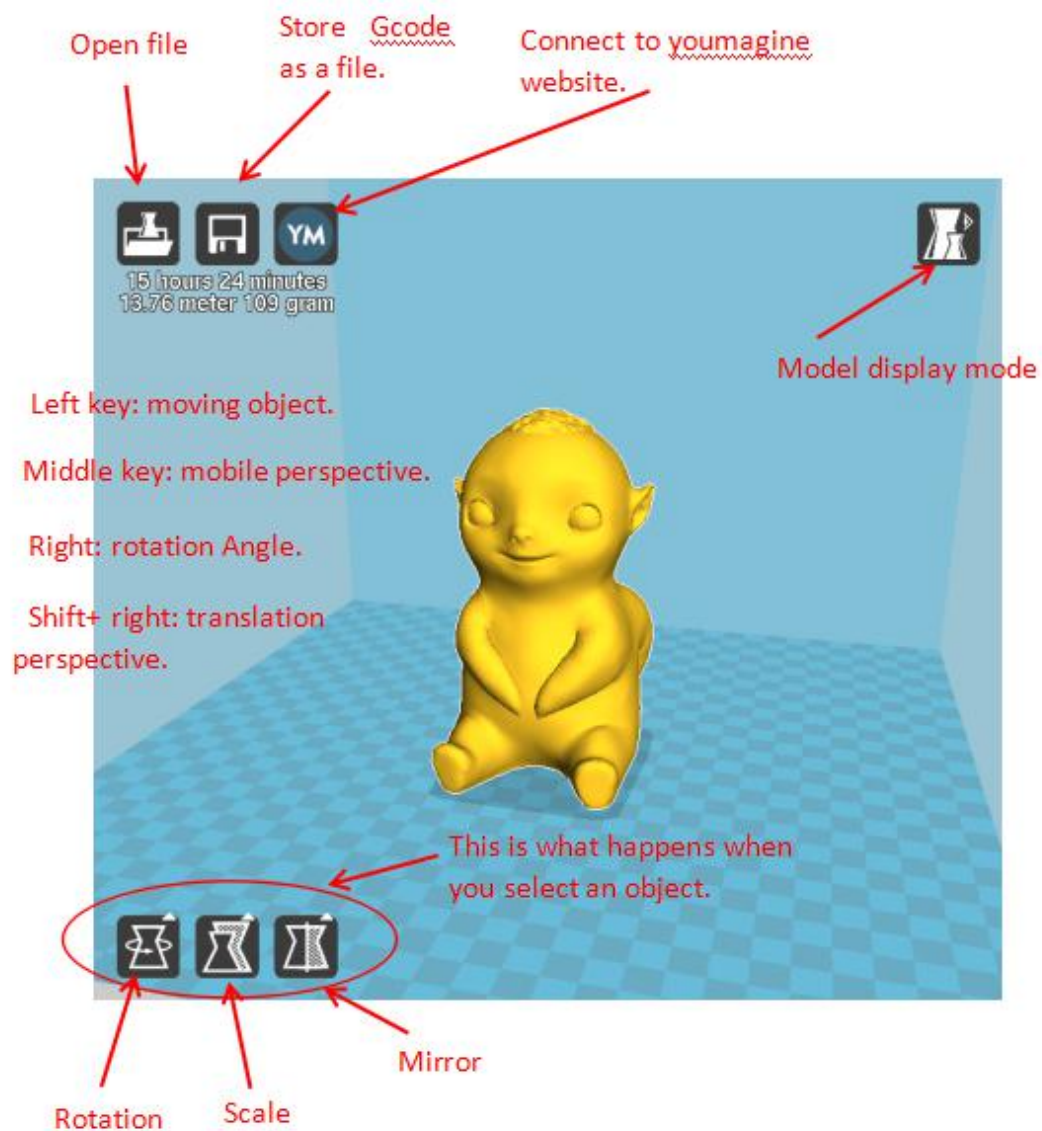
## 2. Slicing software operation for offline printing

For offline printing, do not need to connect to computer, easy to operate by SD card. After install Cura software, Select "print all at once" from the "Tools".



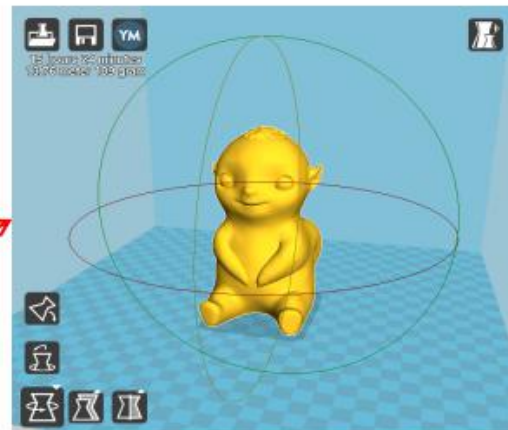
Open "File" > "Read Model File" or open the file target or drag the model file directly into the software, through these ways to import the model, the operation of the multiple models refer to the following instructions





## Object operation

It works under  
Normal conditions.

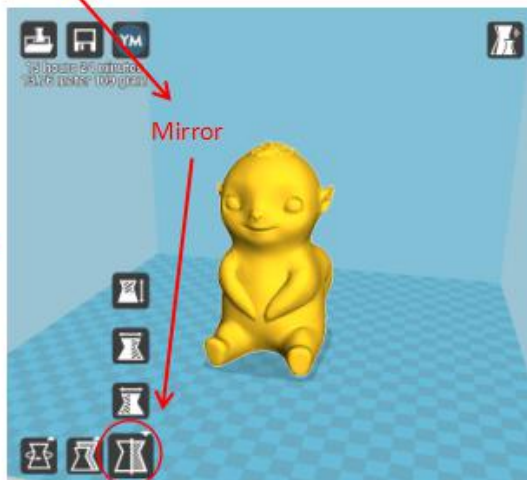


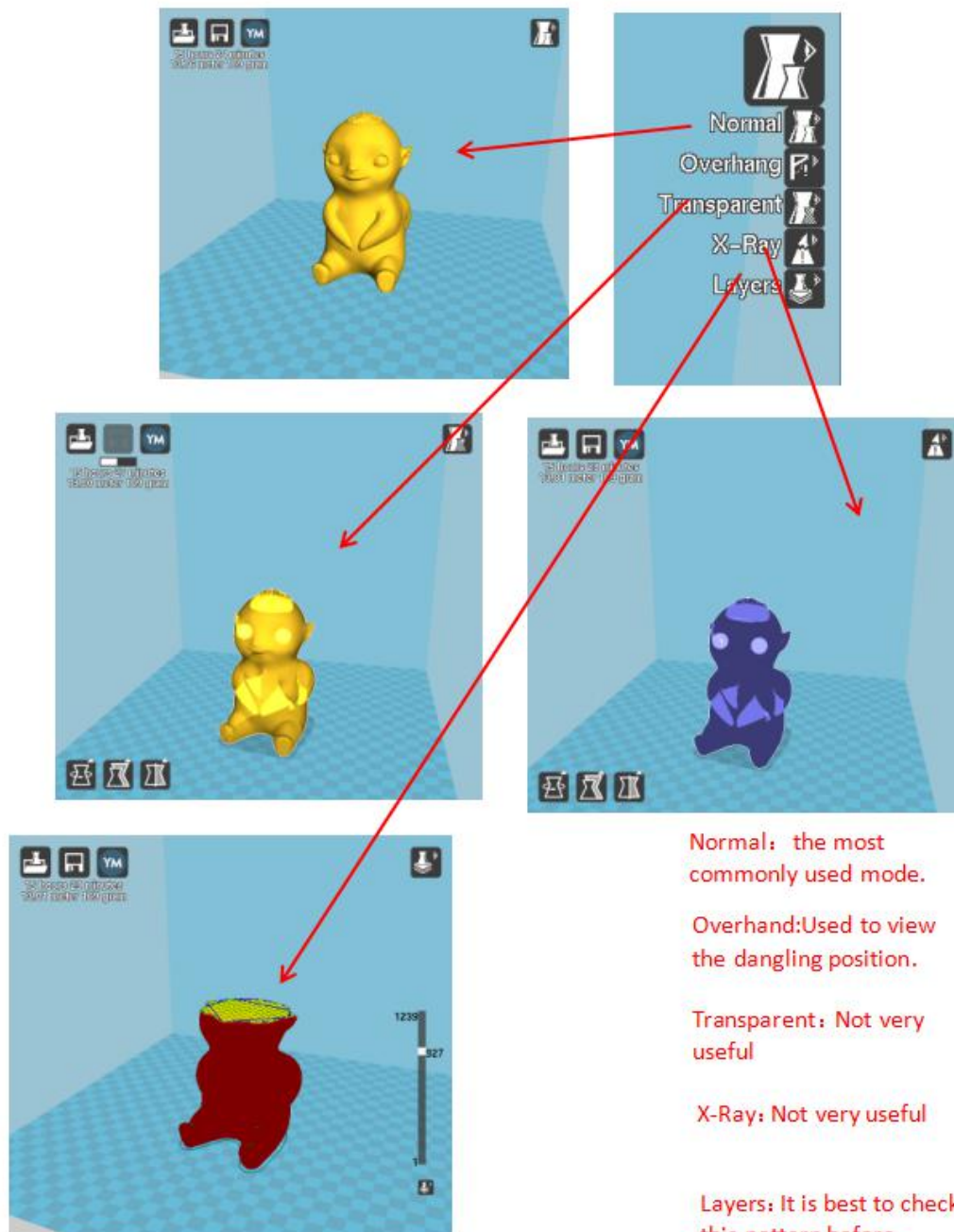
1. Click on the rotating
2. Pull the rotation control circle, by default 15 degrees, hold shift and shake the control circle, you can rotate the unit by 1 degree.



Uniformly scaled size

The scale button





Normal: the most commonly used mode.

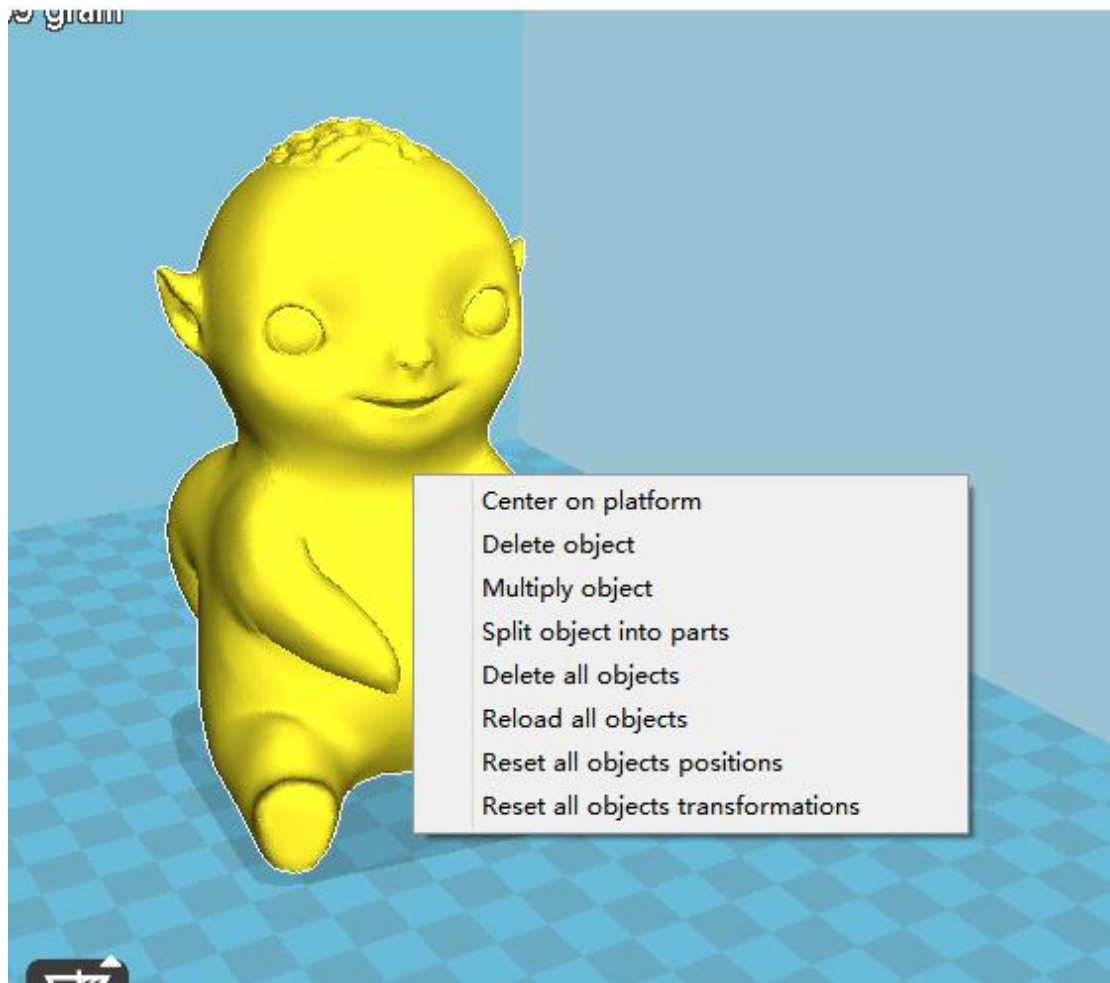
Overhang: Used to view the dangling position.

Transparent: Not very useful

X-Ray: Not very useful

Layers: It is best to check this pattern before printing to confirm that the pattern is sliced correctly.

Click right mouse function

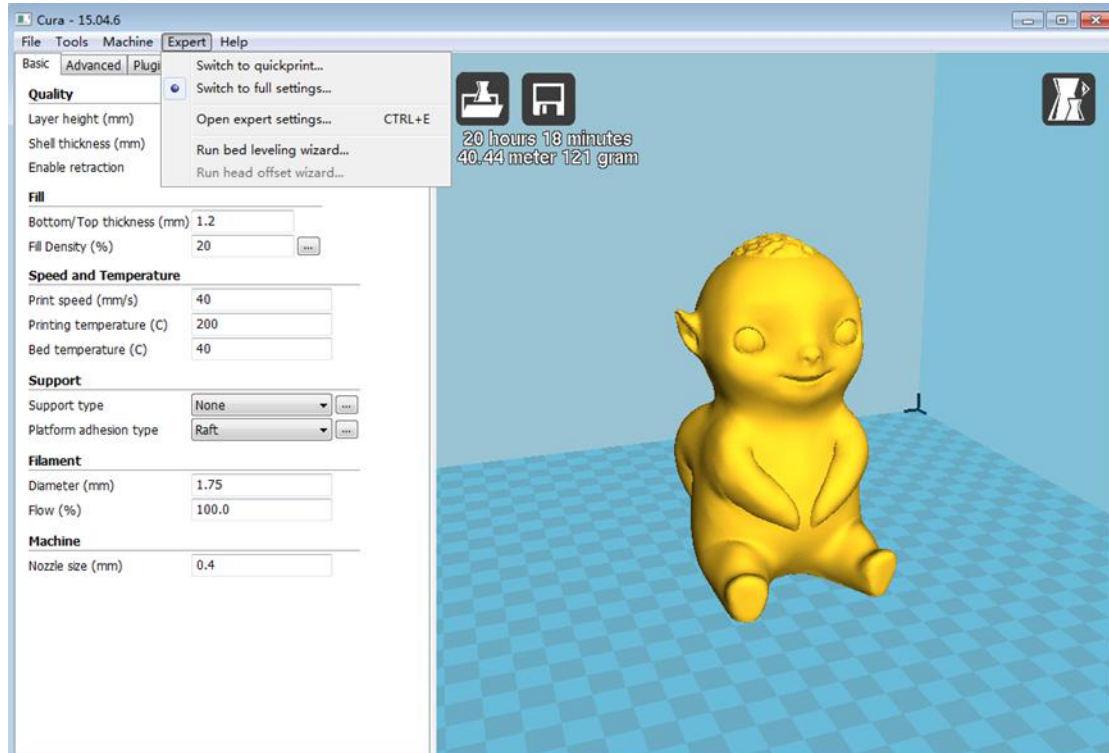


The name of "filename. gcode" file must be in English or number, do not name it into Chinese characters or others. Save the file to the SD card, then insert it into the card slot and turn on the power. Select "Folder" in the main menu from LCD Control Screen, then select the "filename.gcode" file you just saved and confirm it and begin to print.

### **3. Software parameter settings**

Open cura software, you can modify all of the printing parameters on the display screen.

Select "Switch to full settings".





The screenshot shows the 'Basic' settings tab of a 3D printing software. The interface includes a menu bar (File, Tools, Machine, Expert, Help) and a tabbed interface with 'Basic', 'Advanced', 'Plugins', and 'Start/End-GCode'. The 'Basic' tab is active, displaying the following settings:

- Quality:**
  - Layer height (mm): 0.1
  - Shell thickness (mm): 1.2
  - Enable retraction: ☒
- Fill:**
  - Bottom/Top thickness (mm): 0.6
  - Fill Density (%): 20
- Speed and Temperature:**
  - Print speed (mm/s): 50
  - Printing temperature (C): 210
  - Bed temperature (C): 50
- Support:**
  - Support type: None
  - Platform adhesion type: Raft
- Filament:**
  - Diameter (mm): 1.75
  - Flow (%): 100.0

**Layer thickness:** 0.1~0.4mm available. 0.1mm high precision but long printing time, 0.4mm low precision but printing time is too short, in general select 0.2mm.

**Shell thickness:** 0.4mm is very thin, in general select 1.2mm, that will increase printing time.

**Enable retraction:** To prevent the wire from leaking when printing quickly, otherwise it will affect the appearance.

**Bottom/Top thickness:** In order to make the top layer print more perfect and flat bottom layer.

**Fill density:** If the intensity is not high, select 20%. If the intensity is high, increase it and the printing time also will increase.

**Print speed:** Generally set 30-100, the print speed is higher and the precision is lower.

**Printing temperature:** Depends on the filament, generally select 190 ~ 210 degrees.

**Support type:** Include half-support and full support. In general the model with suspended structure needs to set support, but surface will be rough after removing support.

**Platform adhesion type:** "None" means do not set any support, "Brim" increases the bottom area. "Raft" base makes the model more adherent. To make the model better adhere to the base, add a base or edge. But best to increase a base and a edge relative to the small bottom area.

**Diameter:** 1.75mm

**Flow:** 100%

The screenshot shows the 'Advanced' settings tab of a 3D printing software. The settings are organized into sections: Machine, Retraction, Quality, Speed, and Cool. Each section contains several adjustable parameters with input fields and checkboxes.

Section	Parameter	Value
Machine	Nozzle size (mm)	0.4
Retraction	Speed (mm/s)	40
	Distance (mm)	6.6
Quality	Initial layer thickness (mm)	0.3
	Initial layer line width (%)	100
	Cut off object bottom (mm)	0.0
	Dual extrusion overlap (mm)	0.15
Speed	Travel speed (mm/s)	50
	Bottom layer speed (mm/s)	20
	Infill speed (mm/s)	0.0
	Top/bottom speed (mm/s)	0.0
	Outer shell speed (mm/s)	0.0
	Inner shell speed (mm/s)	0.0
Cool	Minimal layer time (sec)	5
	Enable cooling fan	<input checked="" type="checkbox"/>

**Nozzle size:** 0.4mm.

**Retraction Speed:** The speed of retraction when printing.

**Retraction distance:** The length of material retraction, generally select 4.5~8mm.

**Initial layer thickness:** The first layer thickness of printing. Select default option.

**Initial layer line width:** 100% will be thicker and denser, Select default option.

**Cut off object bottom:** The length of cutting off the bottom of model.

**Dual extrusion overlap:** 0.15mm. Select default option.

**Travel speed:** The moving speed when nozzle does not extrude filament.

**Bottom layer speed:** The speed of printing the first layer. Setting a slower speed to make object better attached to base plate.

**Infill speed, Top / bottom speed, Outer shell speed, Inner Shell speed:** Select default option.

**Minimal layer time:** Select default option.

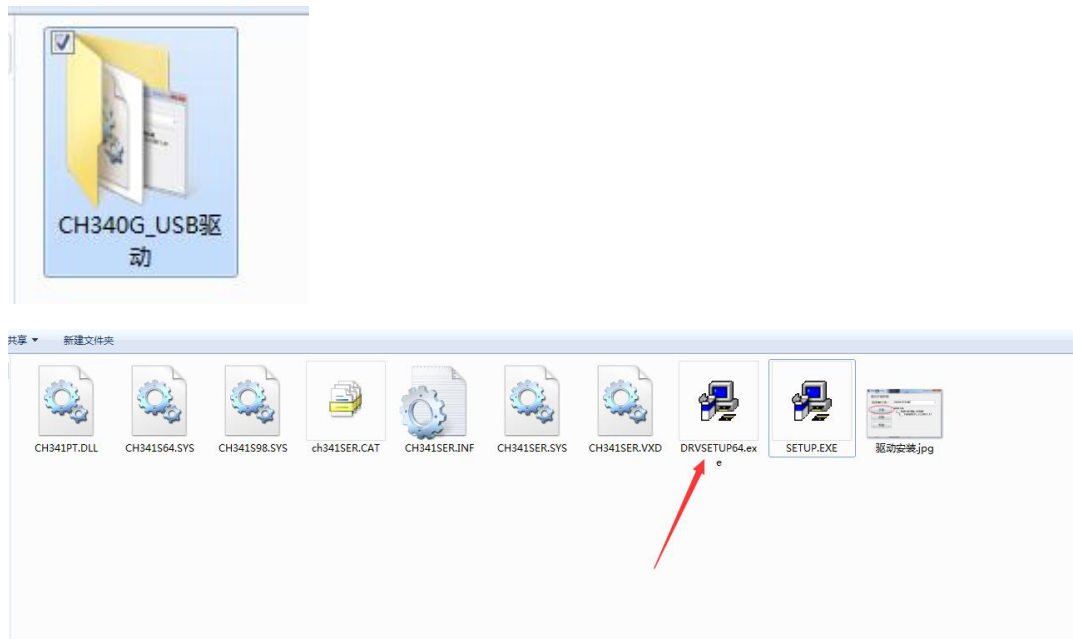
**Enable cooling fan:** To cool the temperature of nozzle.

## IV. Operation for online printing

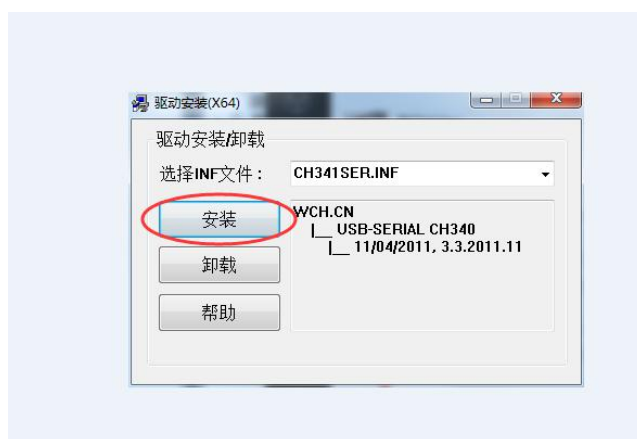
Note: For online printing, you need to connect computer to the 3D printer through the data cable. During the printing process, do not turn off the computer power, do not make computer screen save or hibernate to prevent data transmission failure. In general do not suggest users to use it for the complicated operations.

Firstly load model file, set printing parameter including “Basic” and “Advanced”

**1. Power on the printer, connect USB to a computer, the driver will be installed automatically. If it doesn't install automatically, find the driver under the driver folder and install it manually.**



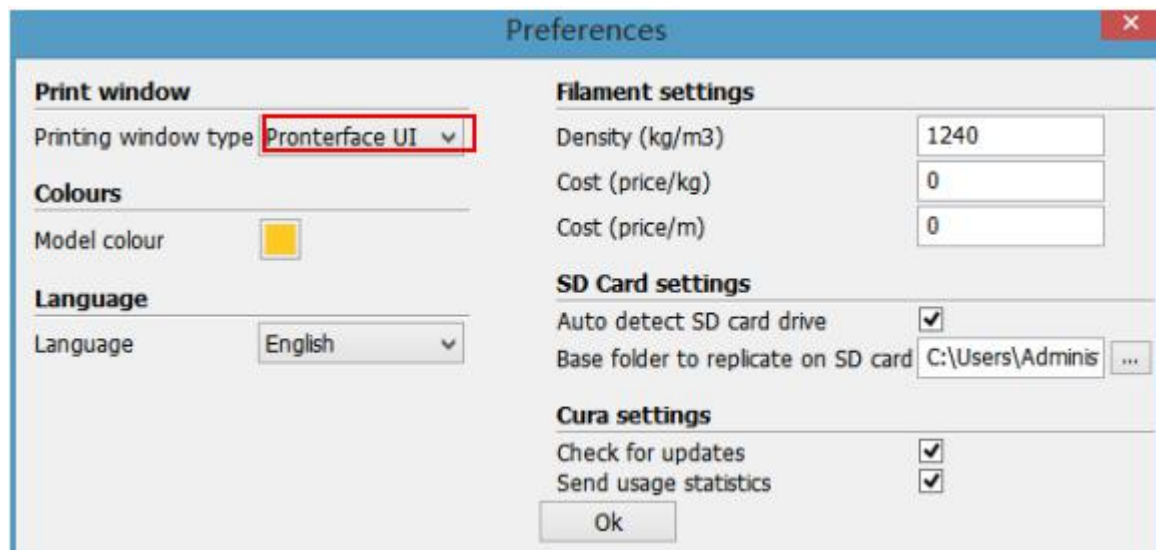
Double-click the program that the arrow points to.



Click Install and wait.



After installing the driver, use the shortcuts “Ctrl” + “,” to open “Preferences”.



Printing window shown as the above picture. Click “OK” , then click “Machine settings” shown as the below picture.

Machine settings		Printer head size	
E-Steps per 1mm filament	0	Head size towards X min (mm)	0
Maximum width (mm)	125	Head size towards Y min (mm)	0
Maximum depth (mm)	125	Head size towards X max (mm)	0
Maximum height (mm)	125	Head size towards Y max (mm)	0
Extruder count	1	Printer gantry height (mm)	0
Heated bed	<input type="checkbox"/>	<b>Communication settings</b>	
Machine center 0,0	<input type="checkbox"/>	Serial port	COM5
Build area shape	Square	Baudrate	AUTO
GCode Flavor	RepRap (Marlin/Sprinter)		

Select correct port(COM), baudrate is “AUTO”, click “OK” .

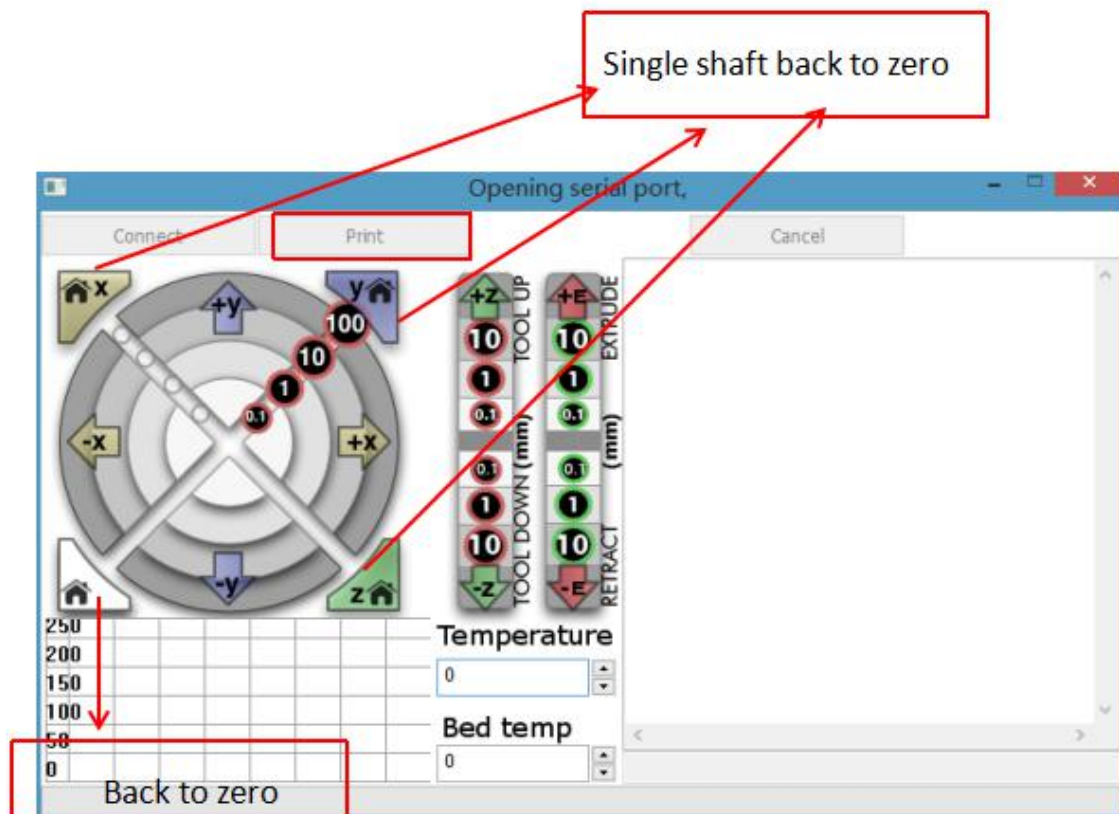
**Note:** Different computer and COM number of the port is different, please open the “Device Management” on computer, click “Port” for checking it.



Status shows connected successfully

**2. After loading a file,** click the icon as above picture show or click “Ctrl+P” to start printing.





Clicking the gray circle ring to control the movement of XYZE axis. 0.1,10,100 means the moving distance. You can enter Gcode in the blank text box. Do not set it if you do not understand.

Click "Print" to start printing. Please be careful during printing to prevent printing failures.

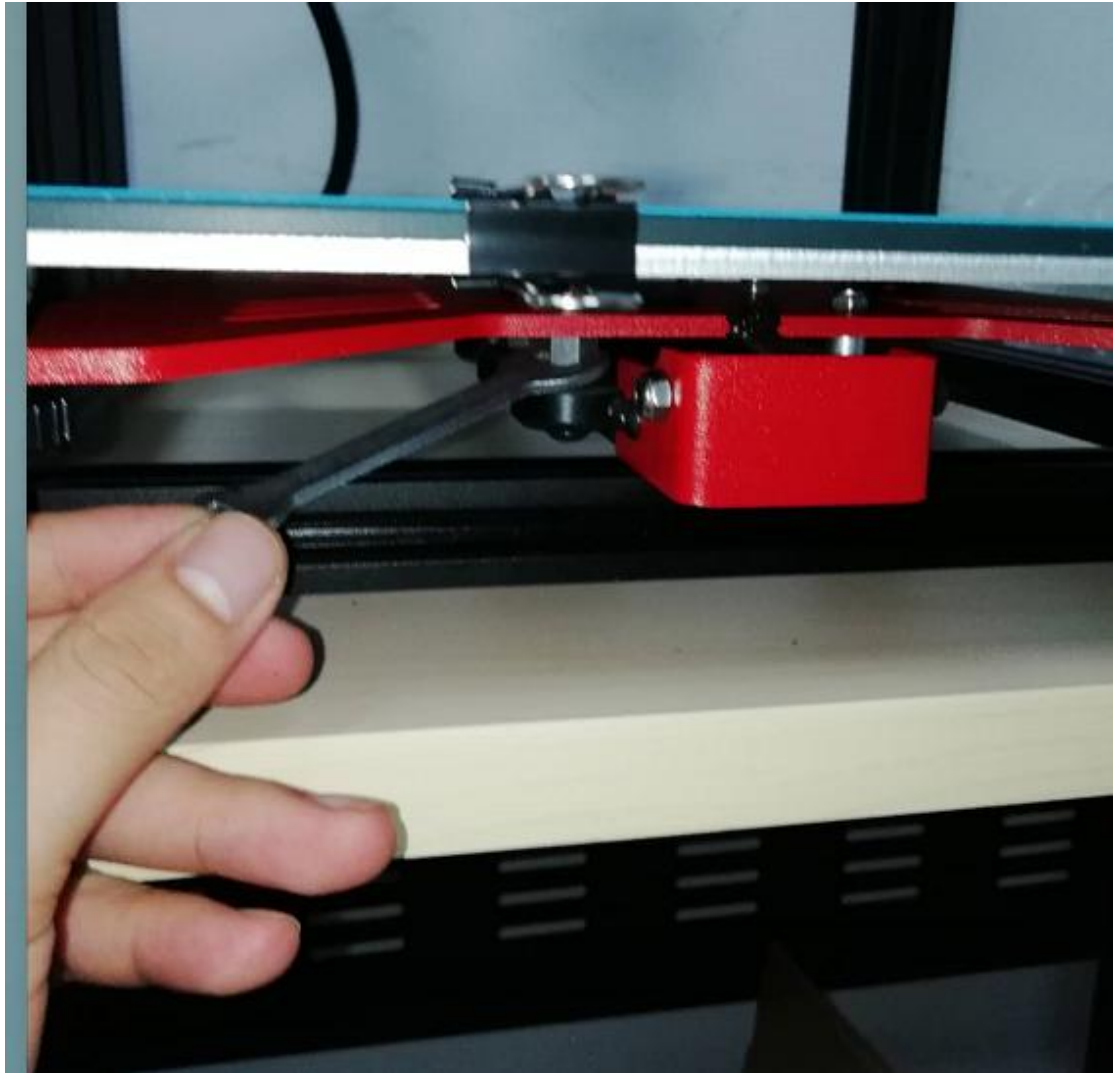
## V. Check before use and levelling

### 1. Machine assembly to complete inspecting

After the machine assembly is completed, please arrange the cable and move the three-axis movement manually to see if there is any effect on the movement and the stall phenomenon. You can shake the hot bed and the nozzle with your hands to see if there is any gap and shaking. If there is shaking, you can take the open end wrench. Twist the hexagonal sleeve on the corresponding pulley to adjust the tightness of the hot bed and spray head.

As shown below:





## **2. Machine levelling**

After the equipment is inspected, before starting up, please check the input voltage level of the switching power supply. The European Regulations set a position at 220V and the US regulations set a position at 110V.



#### European regulations 220V gear



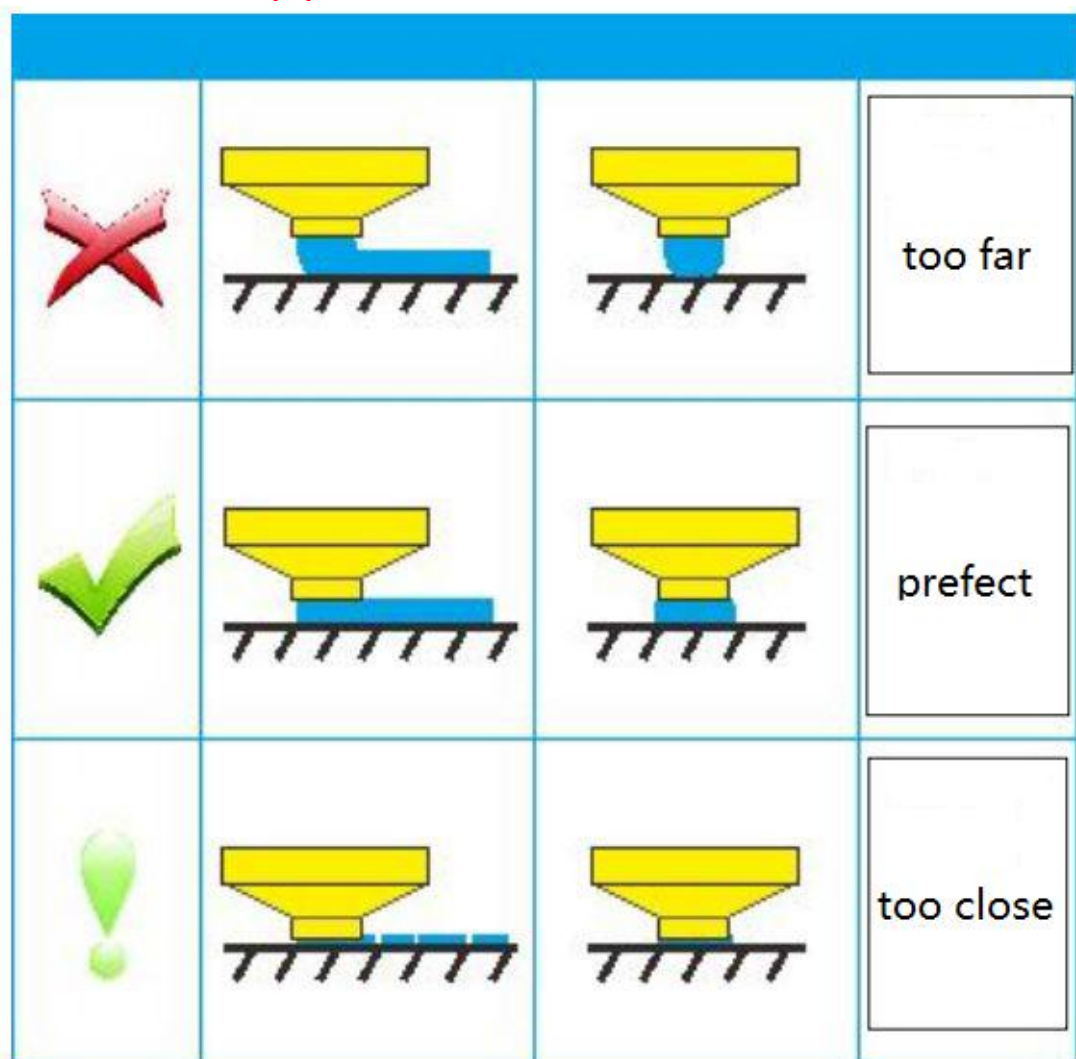
#### US regulations 110V gear

Start the machine and click the levelling button, click the four buttons in turn, the nozzle will be moved to the corresponding position accordingly, waiting to move to the appropriate position, you can adjust the hand nut manually, so that the distance between the nozzle and the hot bed will be adjusted to about **the thickness of the A4 paper**, tighten the screw [tighten counterclockwise] will increase the distance between the heating plate and the nozzle.

Loosen the screw [turn clockwise] will make the heater plate closer to the nozzle.  
Adjust the other three points in order to complete the leveling.



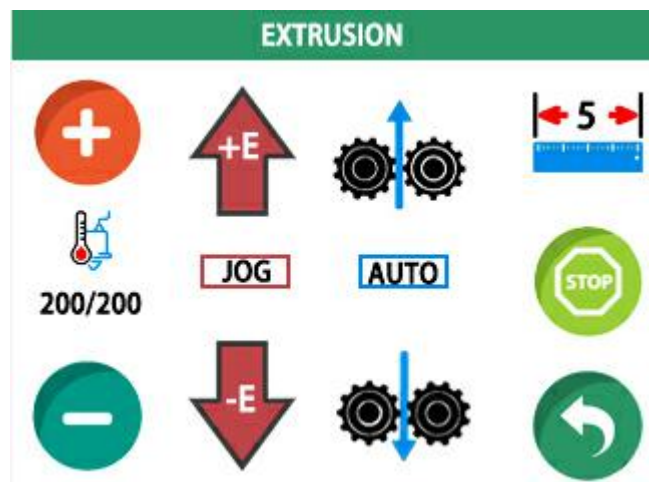
Or you can manually click the XY zero return and Z zero return on the Move interface, and then unlock, manually move the heated bed and nozzle head, and then adjust the leveling nut so that the distance between the nozzle head and the heated bed is about **the thickness of A4 paper**.





### 3. Place the filament and feeding

Click the Extrude icon to enter the nozzle operation interface:



Click the E+ button, the temperature can be automatically set to 200 degrees, wait for the temperature to reach the target temperature, click AUTO FEED IN button, able to continuous feeding, then insert the end of the filament into the feeding mechanism, waiting for filaments extrusion from the nozzle, click the middle stop button to stop the extrusion.

At this moment you can click on the Files icon, click on the file to print the file.

## VI. Resume printing and filament run-out detection function

### 1. Power outage recovery

The normal 3D printer when in the factory, and the main interface after finishing the prints has no power outage recovery icon, as shown below:

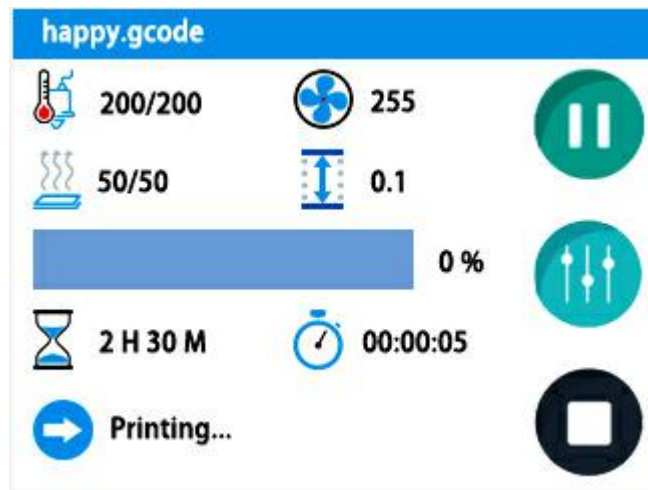


When printing for a period of time, the height of printing exceeds 0.5mm, the power outage recovery icon will appear, when re-powered, you can click this icon, after waiting for temperature rise, you can resume normal printing.

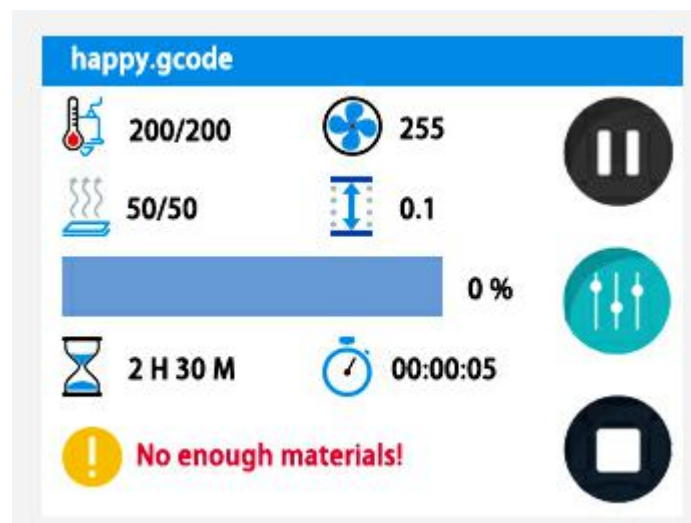


## 2. Filament run-out detection

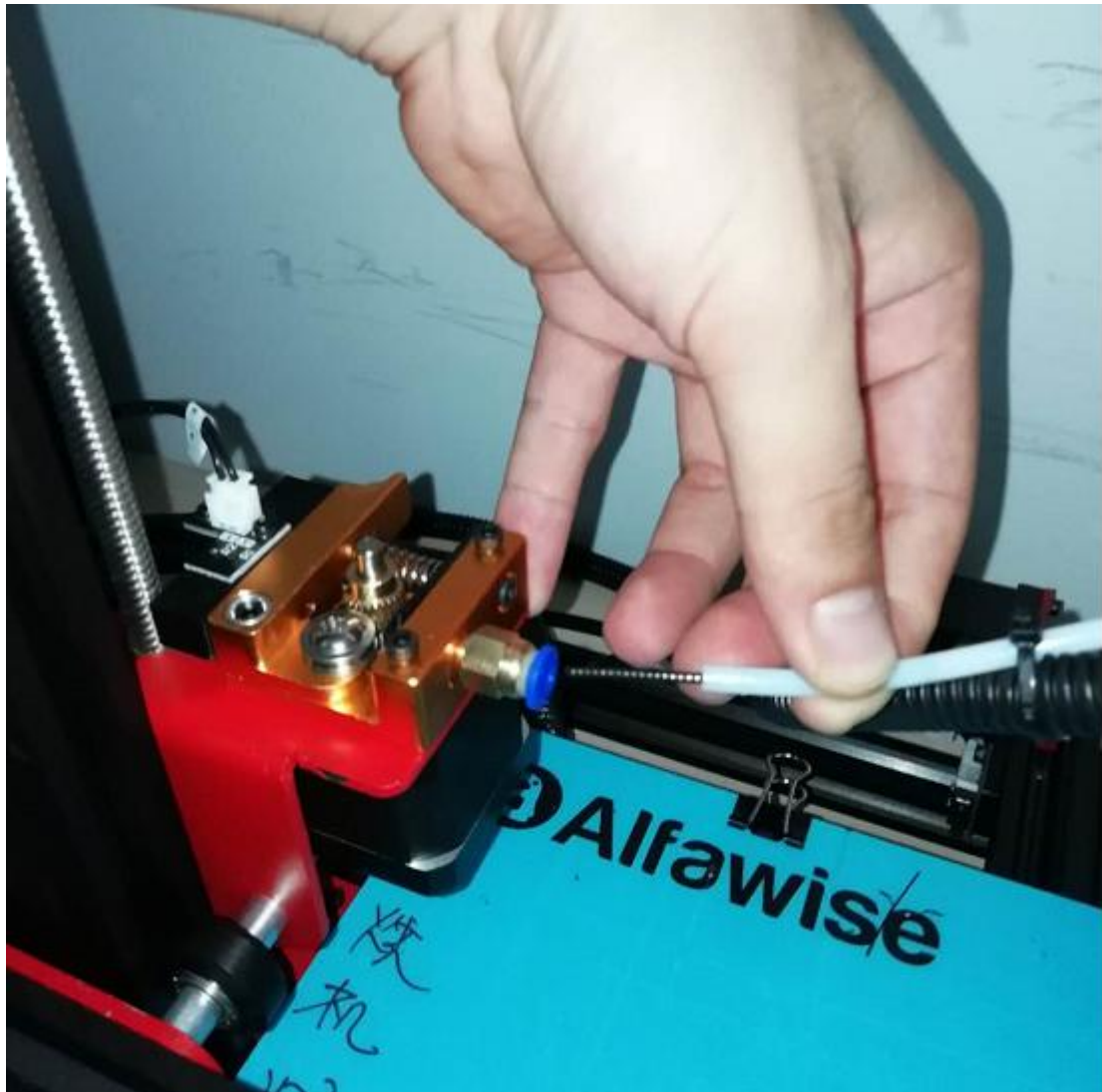
During normal printing, the interface is as follows:

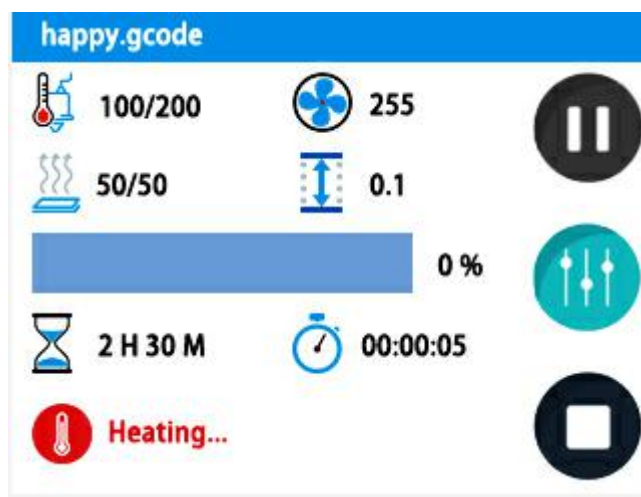
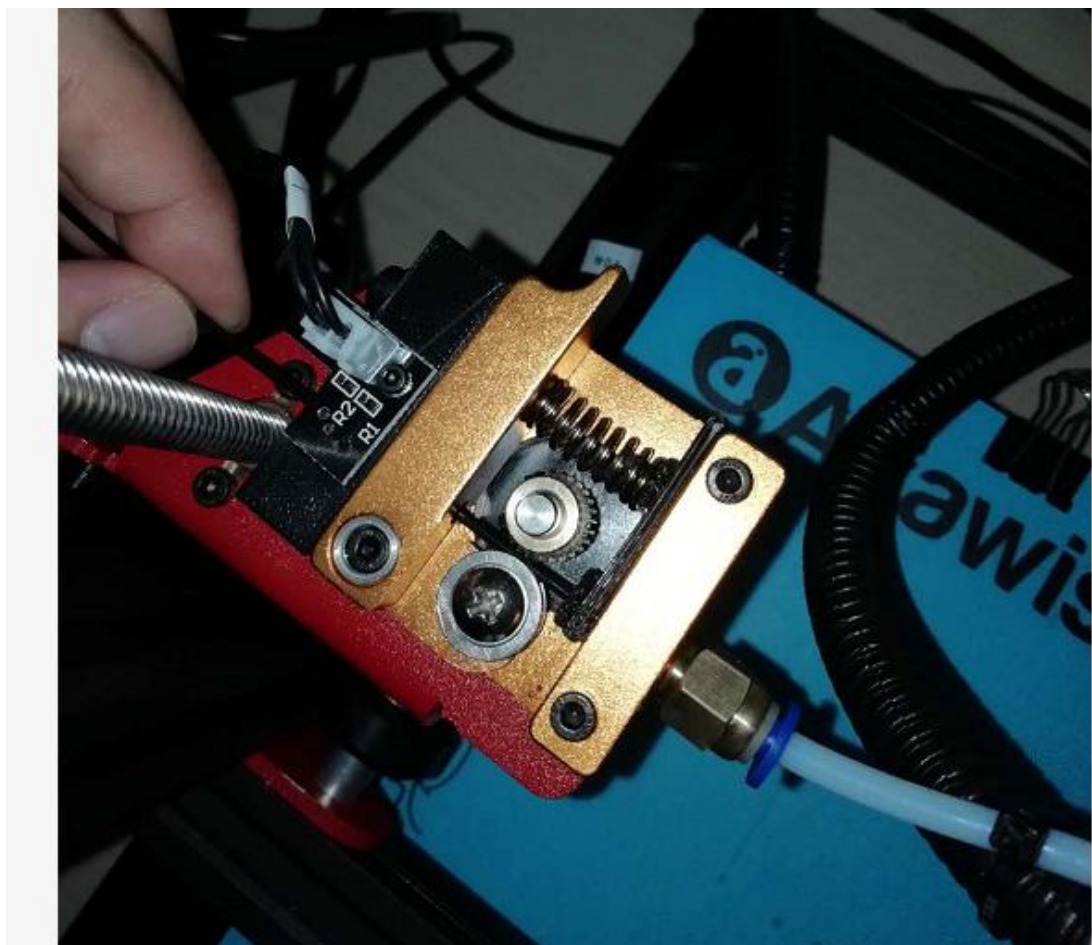


When the filament runs out, an alarm occurs and the printing is suspended.



Now, pull the Teflon tube from the extruder end, remove the broken filament, refill the filament to the print head, and then click the Resume button to resume printing.

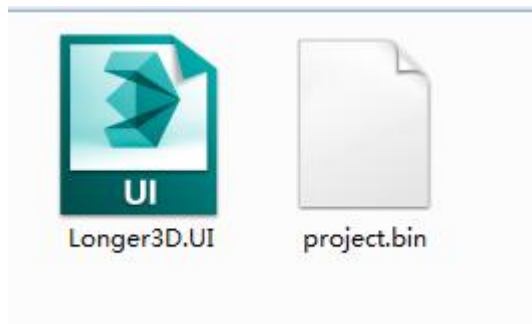




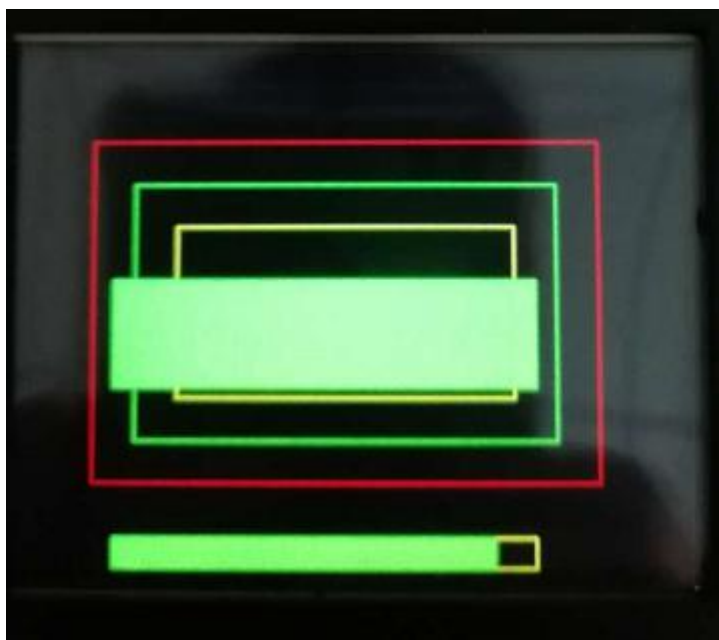
## VI. FAQ manual

### Question1: How to update the firmware?

The firmware upgrade for this machine is very convenient, if the machine's firmware has a major change that needs to be updated, the manufacturer will provide two files to the user, as follows:



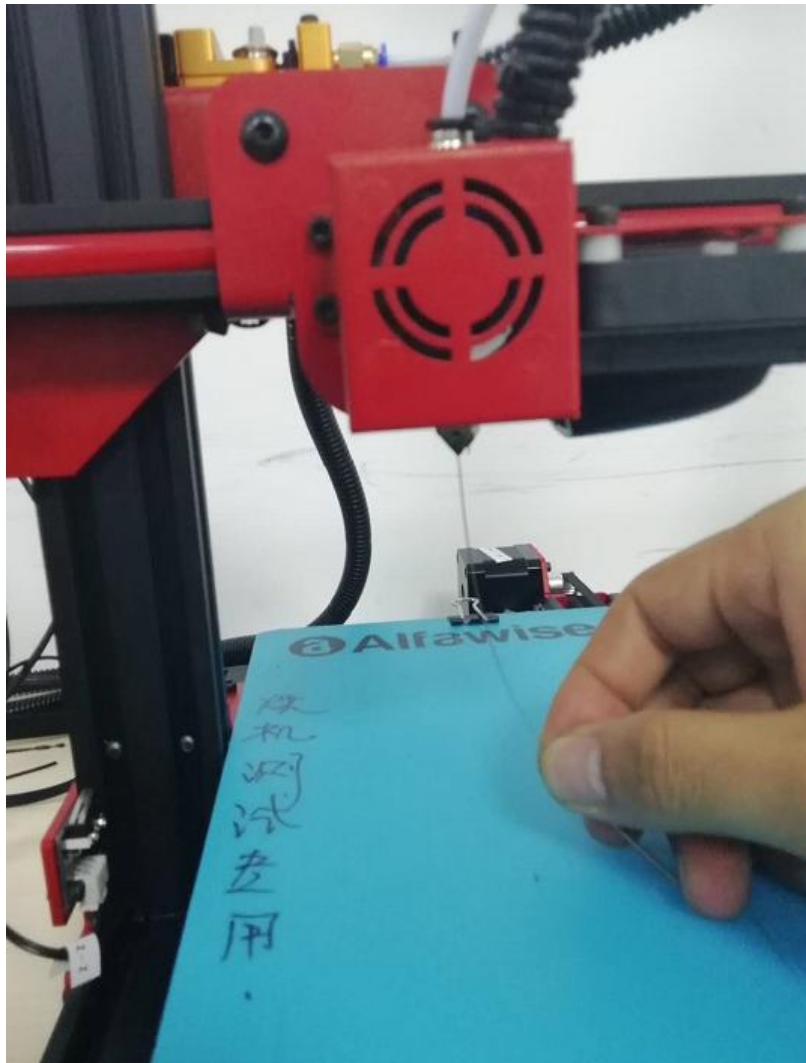
Users only need to copy these two files to the SD card, and then restart the machine. After the machine progress bar is completed, the firmware is refreshed. Then the user needs to delete the two files in the SD card before the machine is used normally. Otherwise, the firmware will be refreshed each time when started the machine.



## Question 2: What if the filament does not discharge from the machine?

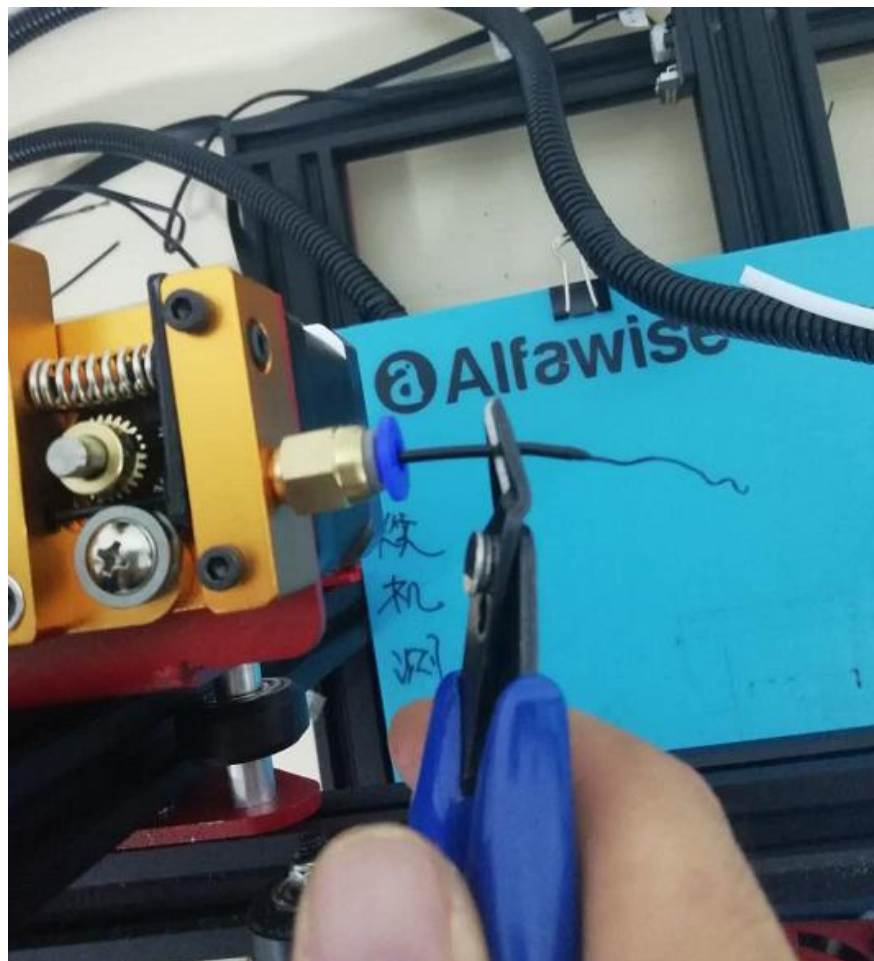
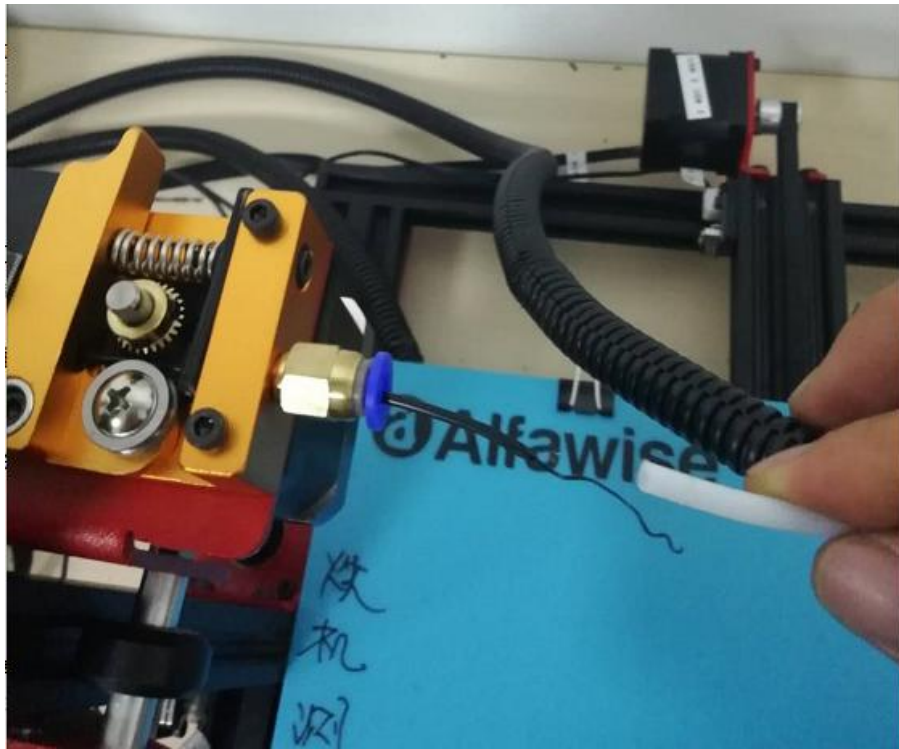
After the nozzle of the machine is heated, the filament is normally hand fed into the feeding mechanism and enters the nozzles after passing through the Teflon tube. When the gears of the feeding mechanism are found to emit a “click” noise, please first check to see if the filaments are curled so that the extruding mechanism are not able to pull the filaments moving. If it is not for this reason, the machine nozzle can be lifted up. Use a 0.4mm needle in the tool box to insert it from the bottom of the copper mouth and insert it while rotating. Generally, this needle can be used. Open the copper mouth to feed smoothly. This blocking filament is generally caused by impurities in the materials, resulting in clogging.

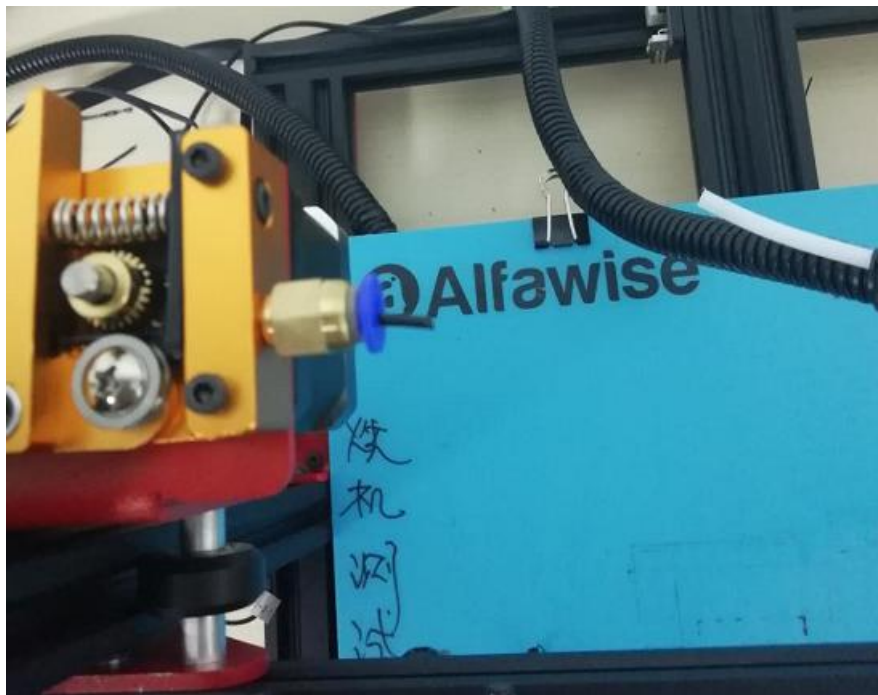




**Question 3: When the machine returns the filament, it can't be returned. What should I do when stuck in the pneumatic joint?**

Before returning the filament, be sure to heat the nozzle first and then pull out the filament as soon as possible. If you can't move it, you can push to retreat the filament and melt out the block formed at the end of the filament inside the nozzle. When the filaments are withdrawn, before the end of the filaments reaches the pneumatic fittings, Teflon will be pulled out directly, cutting the end of the filament and allowing it to be withdrawn smoothly. Because the end of the filament inside the nozzle head is deformed by heat, if the filaments that are deformed at the end are extracted directly, they may get stuck in the pneumatic joints or damage the limit switch for the filament run-out detection (the limit switch for filament run-out detection is unidirectional.).





**Question 4: What should I do if I cannot resume printing after power shutdown?**

If you suddenly lose power when you start printing parts, the machine will not save the print data. Unless we print more than 0.5mm in height, we will support the power outage recovery. If the height is less than 0.5mm, we suggest printing again.

**Question 5: When the machine is leveling, the nozzle moves to the left, it can be leveled normally. When the nozzle moves to the right, it is found that the distance between the nozzle and the heated bed are very far or very close. If the spring is adjusted to the extreme position, it still cannot be leveled. What should I do?**

If this happens, the X-axis beam is generally loose. Use a wrench to adjust the hex sleeve on the right side of the machine to adjust the tension.

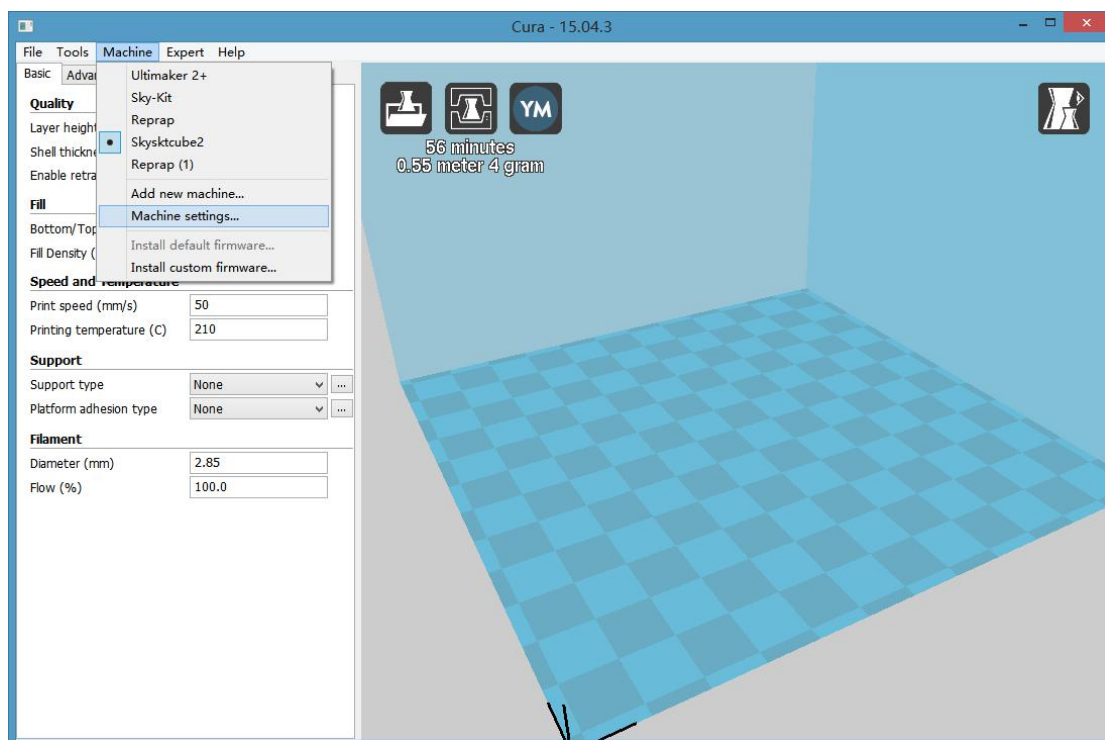


**Question 6: After the machine heats up, the filament is discharged normally. However, when the printing is performed for the first time, the curling occurs on the platform. After printing several layers, the filaments get out of the platform. What can I do?**

After the user gets the 3D printer, if the leveling coils on the first layer are found to be curled, it feels as if it is gently falling on the platform. It can be judged that the leveling is not adjusted and the nozzle is too high from the heated bed. So we need to re-level, the leveling quality can largely determine the success rate of the parts. In addition, in order to ensure good contact between the model and the platform, we can point the larger plane of the model downwards during the slicing. It can also be set in the slicing software, adding Raft to the model to make the model stick to the platform more firmly.

**Question 7: What should I do if the machine setting is wrong in slicing software?**

After installing the slicing software, if any problems are found in the model settings or the settings are incorrect, you can modify the corresponding settings or add new machine as follows:





Machine settings

Ultimaker 2+

Sky-Kit

Reprap

Skysktcube2

Reprap (1)

Machine settings

E-Steps per 1mm filament

0

Maximum width (mm)

125

Maximum depth (mm)

125

Maximum height (mm)

125

Extruder count

1

Heated bed

☐

Machine center 0,0

☐

Build area shape

Square

GCode Flavor

RepRap (Marlin/Sprinter)

Printer head size

Head size towards X min (mm)

0

Head size towards Y min (mm)

0

Head size towards X max (mm)

0

Head size towards Y max (mm)

0

Printer gantry height (mm)

0

Communication settings

Serial port

AUTO

Baudrate

AUTO

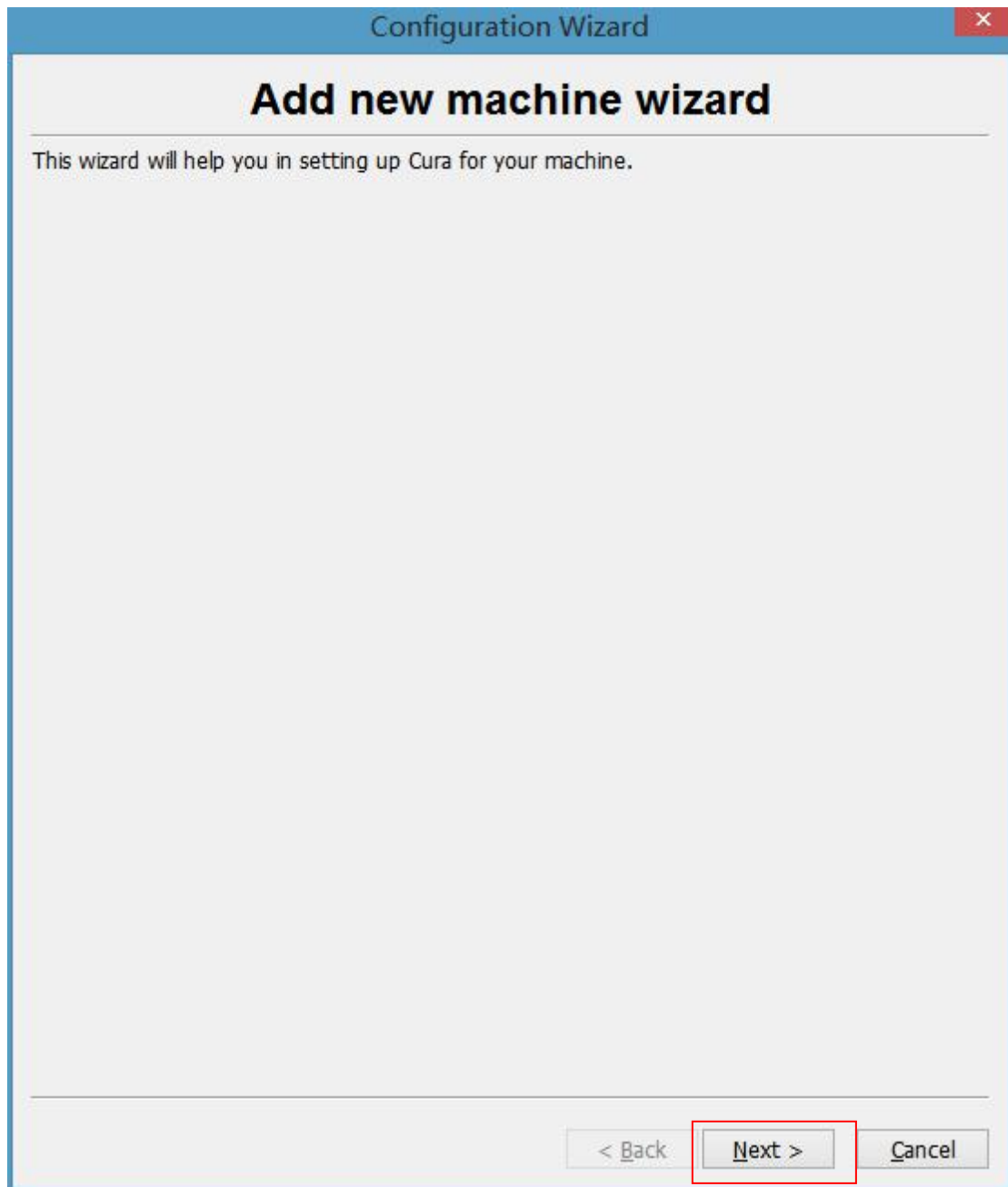
Ok

Add new machine

Remove machine

Change machine name





Configuration Wizard

×

Select your machine

What kind of machine do you have:

☐ Ultimaker2

☐ Ultimaker2extended

☐ Ultimaker2go

☐ Ultimaker Original

☐ Ultimaker Original+

☐ Printrbot

☐ Lulzbot TAZ

☐ Lulzbot Mini

☒ Other (Ex: RepRap, MakerBot, Witbox)

The collection of anonymous usage information helps with the continued improvement of Cura.  
This does NOT submit your models online nor gathers any privacy related information.  
Submit anonymous usage information: ☒  
For full details see: <http://wiki.ultimaker.com/Cura:stats>

< Back

Next >

Cancel

Configuration Wizard

## Other machine information

The following pre-defined machine profiles are available

Note that these profiles are not guaranteed to give good results, or work at all. Extra tweaks might be required.

If you find issues with the predefined profiles, or want an extra profile. Please report it at the github issue tracker.

☐ BFB

☐ DeltaBot

☐ Hephestos

☐ Hephestos\_XL

☐ Kupido

☐ MakerBotReplicator

☐ Mendel

☐ Ord

☐ Prusa Mendel i3

☐ ROBO 3D R1

☐ Rigid3D

☐ Rigid3d\_Zero

☐ RigidBot

☐ RigidBotBig

☐ Witbox

☐ Zone3d Printer

☐ julia

☐ punchtec Connect XL

☐ rigid3d\_3rdGen

☒ Custom...

< Back

Next >

Cancel

Configuration Wizard

×

## Custom RepRap information

RepRap machines can be vastly different, so here you can set your own settings.  
Be sure to review the default profile before running it on your machine.  
If you like a default profile for your machine added,  
then make an issue on github.

You will have to manually install Marlin or Sprinter firmware.

Machine name	<input type="text" value="RepRap"/>
Machine width X (mm)	<input type="text" value="80"/>
Machine depth Y (mm)	<input type="text" value="80"/>
Machine height Z (mm)	<input type="text" value="55"/>
Nozzle size (mm)	<input type="text" value="0.5"/>
Heated bed	<input type="checkbox"/>
Bed center is 0,0,0 (RoStock)	<input type="checkbox"/>

< Back

Finish

Cancel

Machine settings

Ultimaker 2+

Sky-Kit

Reprap

Skysktcube2

Reprap (1)

Reprap1

Machine settings

E-Steps per 1mm filament

0

Maximum width (mm)

300

Maximum depth (mm)

300

Maximum height (mm)

400

Extruder count

1

Heated bed

☐

Machine center 0,0

☐

Build area shape

Square

GCode Flavor

RepRap (Marlin/Sprinter)

Printer head size

Head size towards X min (mm)

0

Head size towards Y min (mm)

0

Head size towards X max (mm)

0

Head size towards Y max (mm)

0

Printer gantry height (mm)

0

Communication settings

Serial port

AUTO

Baudrate

AUTO

Ok

Add new machine

Remove machine

Change machine name