



Makerbase



Guangzhou Qian Hui Information Technology Co.,  
Ltd

MKS TFT28/32      Color      touch      screen

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## Firmware version update

Version	Modification time	Modification content
V1.1.3	2016.5	1.Fixed the problem that TFT can't communicate with controller board after firmware or baud rate updates. 2.Fixed error bug of More Menu .
V1.1.4	2016.6	1.Available to set the Max temp of extruder and bed on config. 2.Available to set value to trigger filament monitoring(high/low leveling). 3.Fixed U dish frozen BUG. 4.Bed leveling icon does not display by default.
V1.1.5	2016.8	Available to set 'Auto Off After Printing Finishes' function on config and display it inside 'More' interface.
V1.2.0	2016.11	1.Improved display speed and screen touching, faster and more sensitive. 2.Available to switch title languages, including simplified Chinese,Chinese traditional,English. 3.Fixed info error of wifi display. 4.Fixed display error that can't find sd card or u disk after reboots. 5.Support manual leveling and filament change. 6.Added "More" icon on printing operation interface for user-defined. 7.Deleted screen calibration function.
V2.0.0	2017.2	1.Updated screen interface, added 3 different home pages for 3 different firmwares. 2.Added 'print from breakpoint' function.(Continue button) 3.Deleted Baud Rate 'connect' button,but available to set it on config. 4.Updated leveling interface. 5.Fixed E position error after printing pause and filament change. 6.Available to see the z axis' height when moving or printing.
V2.0.1	2017.5	1.Fixed the socket of "auto-off after printing". 2.Available to choose "manual leveling" or "auto-leveling". 3.Compatible with "MKS TFT WIFI" , "MKS HLK-WIFI" and the latest version phone APP "MKSCloud". 4.Added "cloud service" and "mobile transfer files" functions. 5.Added Windows style.
V3.0.0	2017.9	1.Added multi-language, available to switch 5 languages on line. 2.Fixed "WIFI transfer" problems. 3. Optimized the "filament replacement" function.

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## I. Overview

MKS-TFT28/32 is color touch screen, researched and developed by Makerbase developers, which is suitable for open sourced 3D printers. It can work with MKS Base, MKS Gen, MKS Sbase and so on. Compared to TFT32, TFT28 supports external DC 12V and works with Ramps1.4.

## II. Main Features

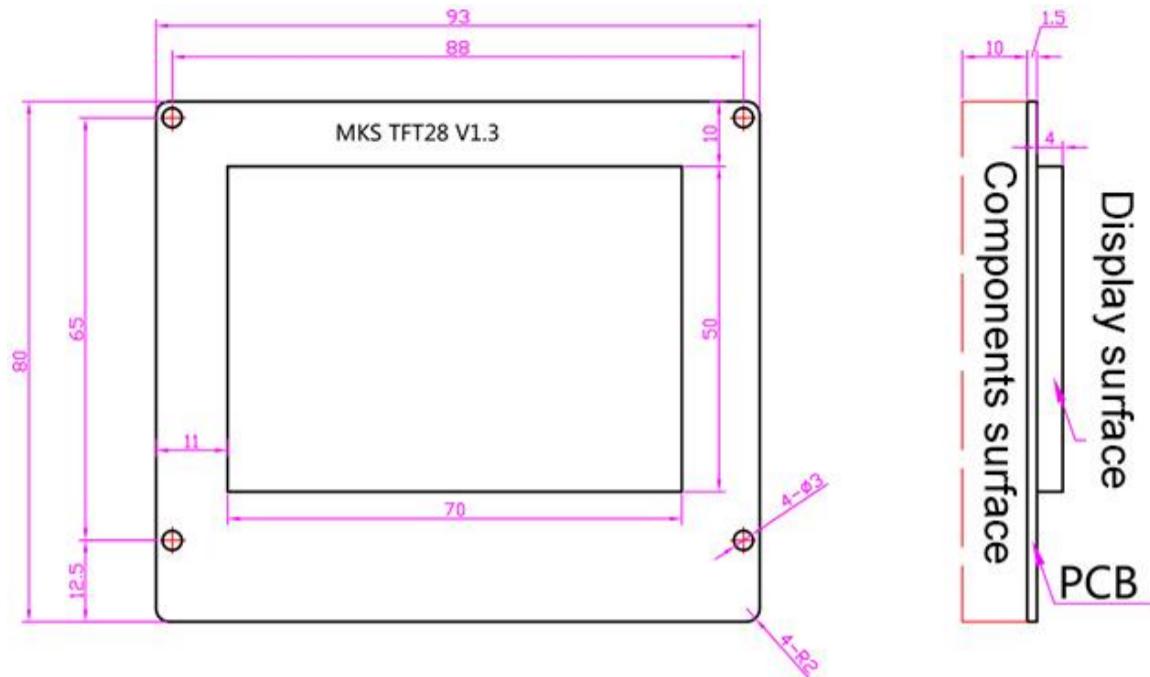
- Support 5 languages online switching.
- 2.8/3.2-inch color touch screen , support U disk and SD card.
- Reserve wifi interface,support wifi function by adding wifi module.
- Three themes, two styles, provide the users with more choices.
- Allowed to self-design the interface of booting logo and all buttons.
- Allowed to add at most 13 customized function buttons.
- Update the configuration and firmware by SD card, easily operate.
- Work with MKS series controller board developed by Makerbase, TFT28 can work with Ramps 1.4 too.
- Support “print from breakpoint”, “print from power outage” and “filament outage detection” function.
- Support “auto off after printing finishes” function with MKS PWC module.

## III. Connection and Dimension

1.MKS TFT28/32 Physical Map

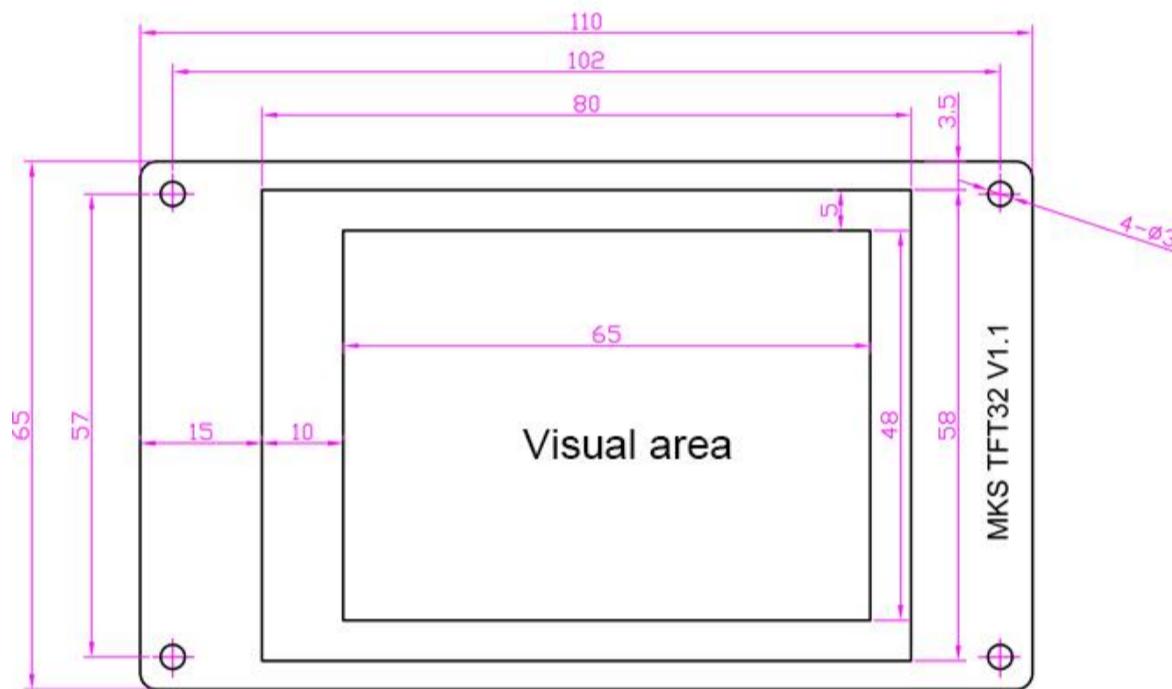


## 2. MKS TFT28 Installation Dimensional Drawing

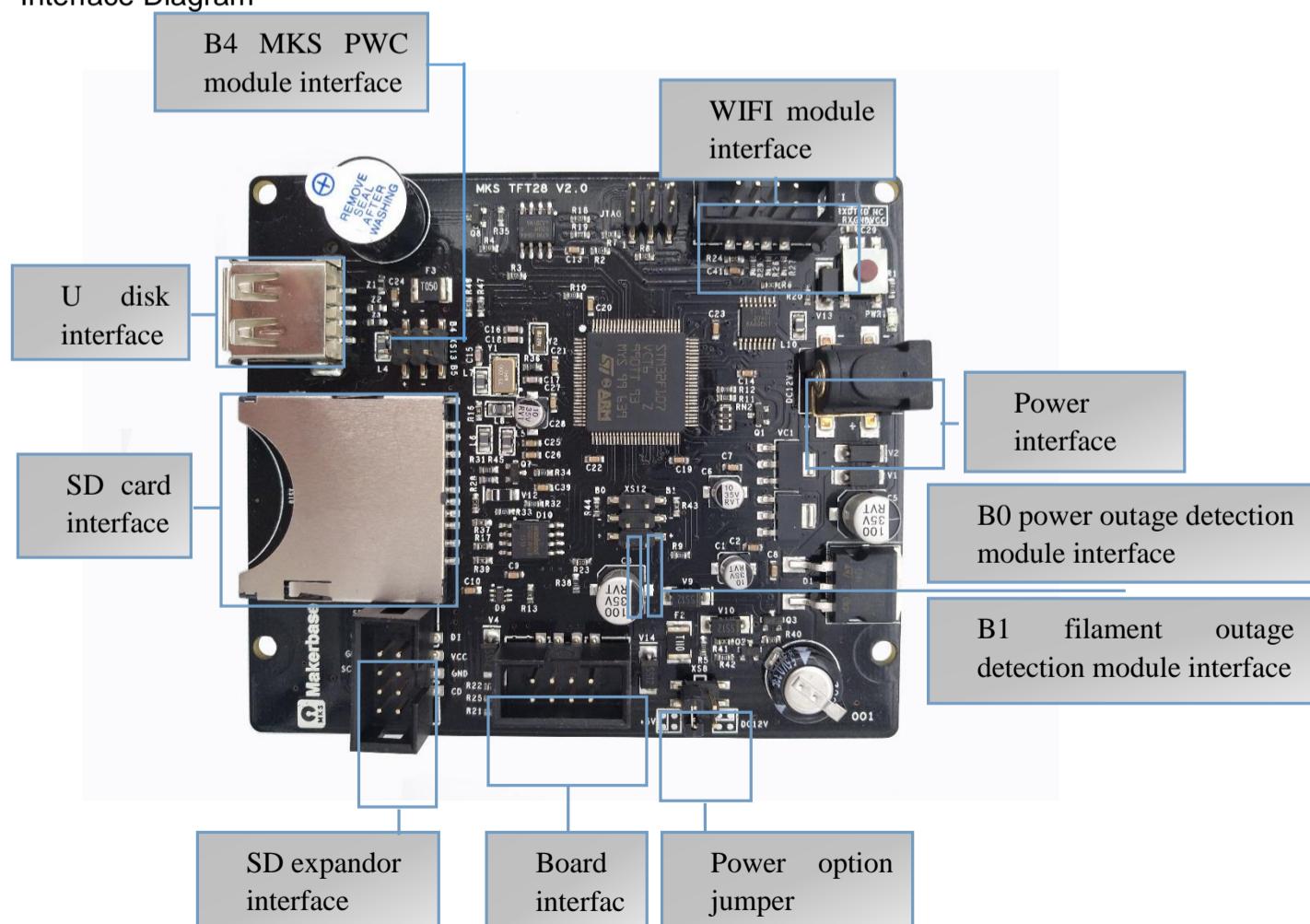


Focus: The unit is mm

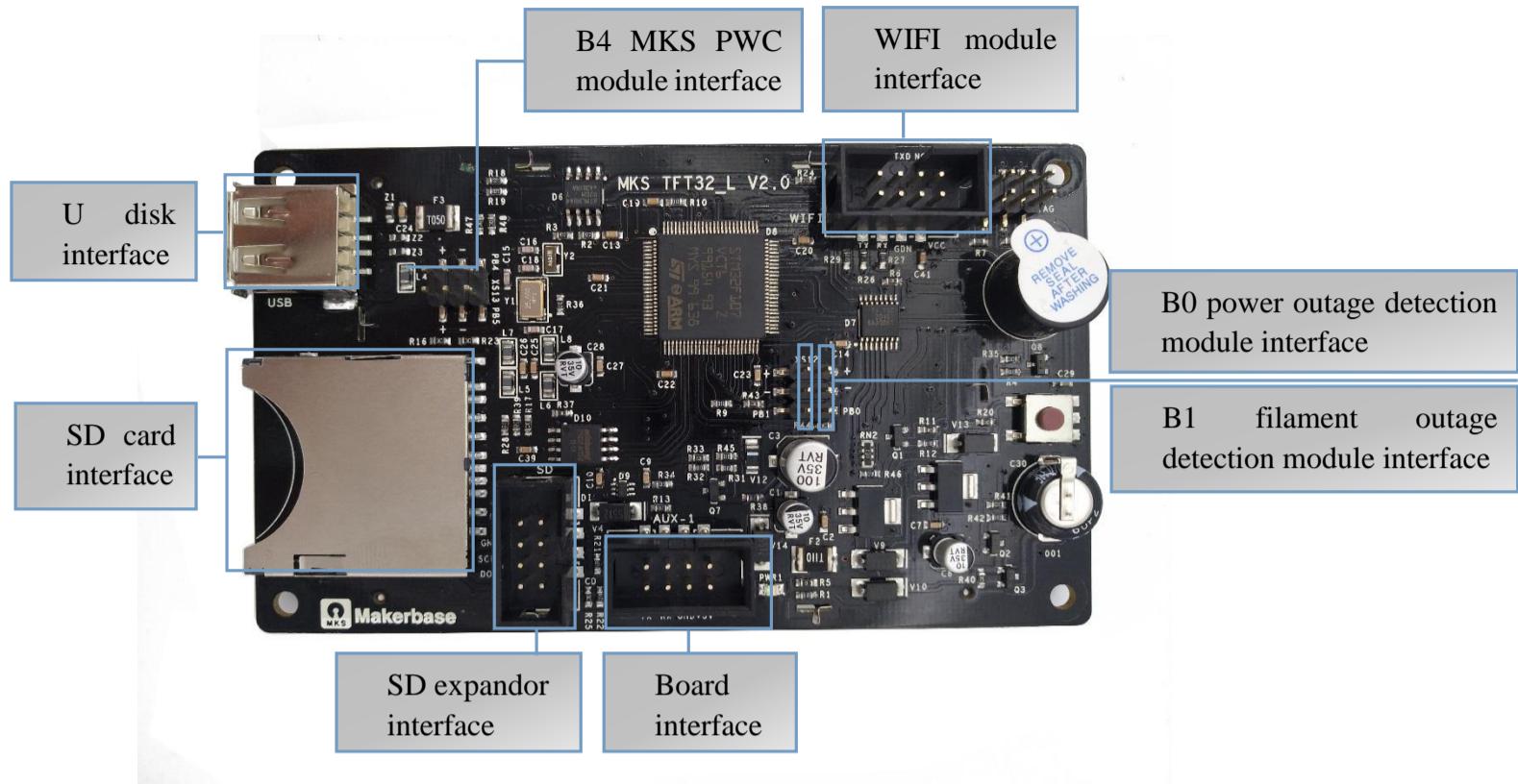
## 3. MKS TFT32 Installation Dimensional Drawin



## 4. MKS TFT28 Interface Diagram

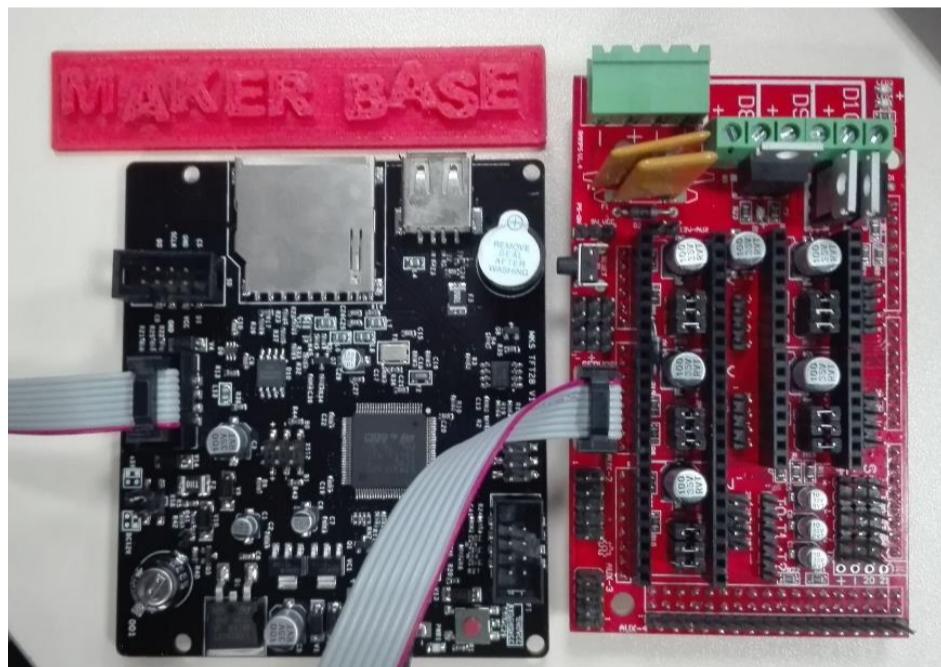


## 5. MKS TFT32 Interface Diagram



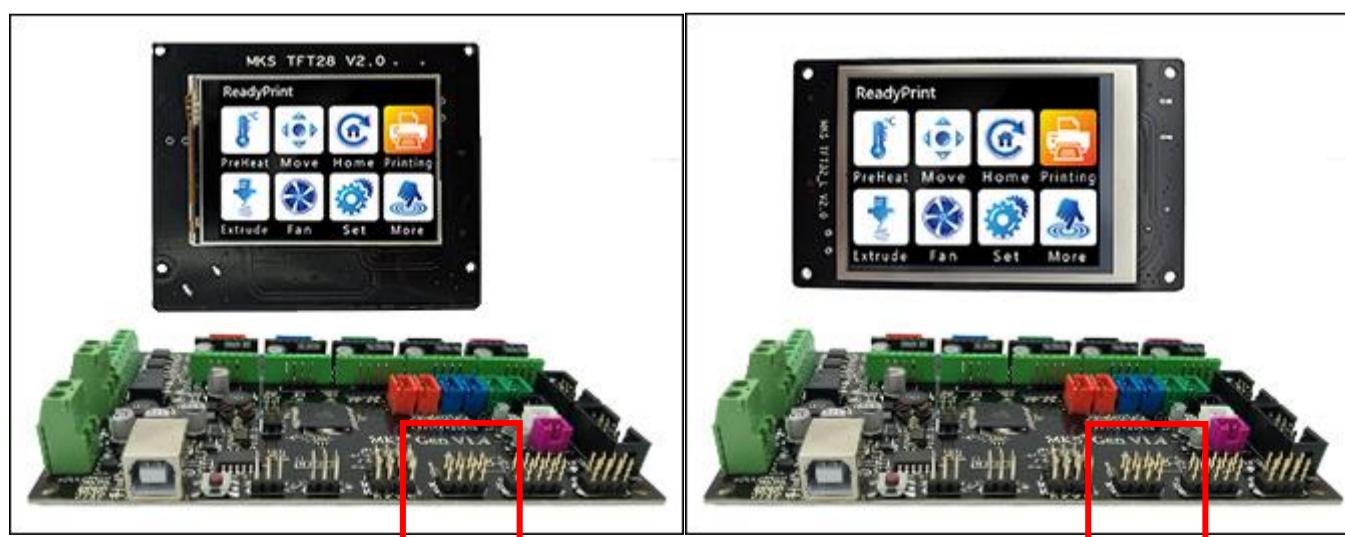
## 6. Hardware Connection Instruction

- 6.1 Connect to Ramps 1.4, only TFT28 can work with Ramps 1.4.
  - 6.1.1. Connect the TFT display to the Aux-1 of Ramps 1.4;
  - 6.1.2. The power option jumps to 12V.
  - 6.1.3. The power of TFT display inputs 12V.



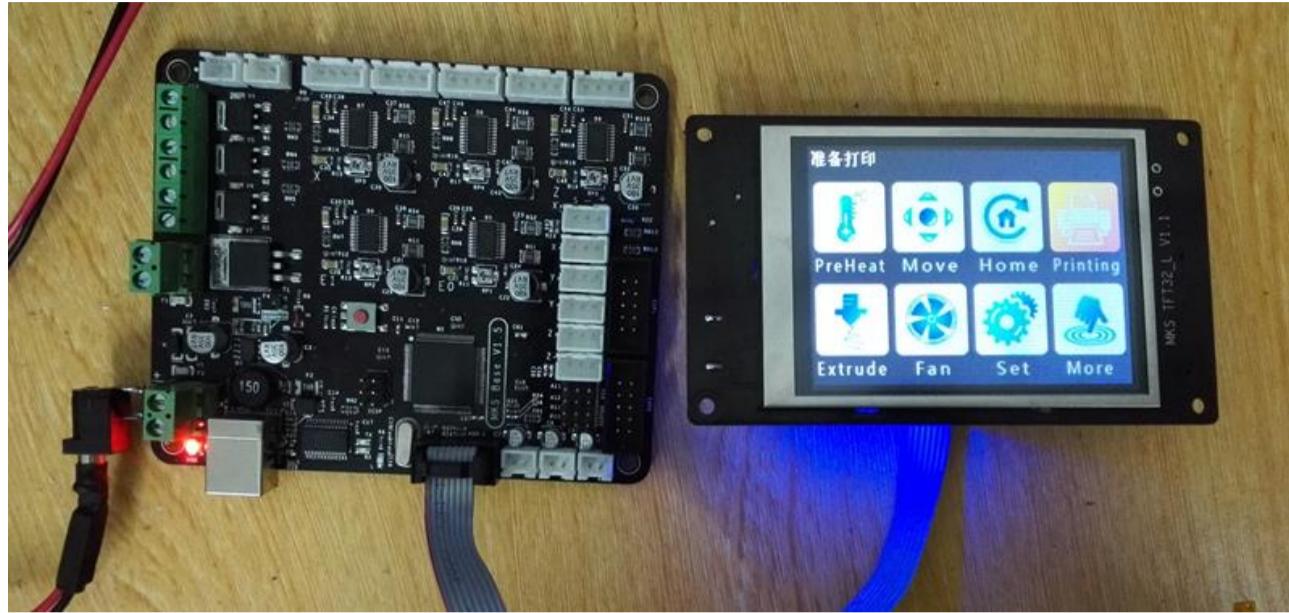
### 6.2. Connect to MKS Gen

Connect the TFT display to the Aux-1 of MKS Gen. The TFT display is not necessary to connect external 12V power supply



### 6.3. Connect to MKS Base, MKS MINI and MKS Base

Connect the TFT display to the Aux-1 of MKS series controller board. The TFT display is not necessary to connect external 12V power supply.



## IV. Function Instruction

### 1. The way to get the latest firmware

- 1.1. Ask the customer services for the latest firmware.
- 1.2. Login this website to download: <https://github.com/makerbase-mks/MKS-TFT>

### 2. The ways to upgrade the TFT firmware

- 2.1. Copy the latest program to the the root directory of the SD card, including:



**Notice: Do not change the file name.**

- 2.2. Plug the SD card, power up again. The screen will show the upgrading progress when hearing a short sound “didi~”, then the upgrading is finish after about 30 seconds.

- 2.3. View the current firmware version through clicking “Set>About”.

- 2.4. Suggest deleting the picture file **mks\_pic** to avoid ugrading the picture again when booting next time.

Notice: when using Ramps 1.4, you must connect external 12V power supply to the TFT display before upgrading the firmware.

### 3. Boot Settings

It's necessary to set the printer type when getting the configuration.

```
#-----
#####Printer type setting#####
#mainboard firmware setting(marlin:1; repetier:2; smoothie:3)
>cfg_firmware_type:1

#machine setting (Normal:1; Delta:2)
>cfg_machine_type:1

#baud rate setting(1:9600;2:57600;3:115200;4:250000)
>cfg_baud_rate:4

#language (Simplified Chinese:1; traditional Chinese:2; English:3)
>cfg_language_type:3

#extruder number(one:1; dual:2)
>cfg_sprayer_counter:1

#whether has heated bed(YES:1; NO: 0)
>cfg_custom_bed_flag:1
```

Notice:

- 3.1. For communicaion, the baud rate of the TFT display must be same as the controller board.
- 3.2. To avoid the conflict with the USB interface, it is not advisable to connect the USB and TFT display at the same time.
- 3.3. Click “set>File Sys>U disk” when using U disk, only on this way can the TFT display show U disk file.

#### 4. Multiple language Settings

Support 5 different languages :

- 1: Chinese
- 2: Traditional Chinese
- 3: English
- 4: Russian
- 5: Spanish

It's available to set whether enable multiple language.

4.1. Disable multiple language: the use is the same as before. The words are on the pictures, so the shown language is achieved by flashing the pictures.

4.2. Enable multiple language: It's available to set whether enable multiple language.

```
#multi-language(enable:1, disable:0)
>cfg_multiple_language:1
#languages setting (simplified Chinese:1; traditional Chinese:2; English:3; Russian:4; Spanish:5). This
configuration is valid when "cfg_multiple_language" is disabled.
>cfg_language_type:1
```

#### 5. Automatic Leveling and Manual Leveling

5.1. It's available to choose auto leveling function if the printers are equipped with the leveling device. You just need to click "set>Leveling" on the UI interface.

Notice: If you use the controller board running smoothieware firmware, you should choose G32 on config.

5.2. Manual leveling can be used to the common printers, such as MB and I3. You just need to set the three points, four points or five points that are needed to level on the heated bed in the TFT config. As shown below,

```
#The point number of manual leveling:(3, 4, 5 point available)
>cfg_point_number:4

#the coordinates of 5 point on manual leveling
>cfg_point1:50,50
>cfg_point2:180,50
>cfg_point3:180,180
>cfg_point4:50,180
>cfg_point5:150,150

#the moving speed of leveling(mm/min)
>cfg_leveling_z_speed:1500
>cfg_leveling_xy_speed:3000
```

#### 6. Filament Replacing Function

Filament replacement function helps easily replace the filament, moreover, users can replace the filament by clicking "Pause" during the printing. Users can set the extruder unload speed and min temperature of "filament replacement process" on the config.

```
#the speed to extrude filament(mm/min)
>cfg_filament_load_speed:1200

#the lenght to extrude filament (mm)
>cfg_filament_load_length:200
```

```
#the speed to retract filament(mm/min)
>cfg_filament_unload_speed:1200

#the lenght to retract filament(mm)
>cfg_filament_unload_length:200
```

#It is the minimum temperature for filament change. It will auto heat up if the current temp doesn't reach the target.

>cfg\_filament\_limit\_temperature:200

## 7. Print from the Breakpoint Function

Undoubtedly, you must feel crazy when you mistake the operation to stop the printing. Take it easy, the printing from the breakpoint function would help you save your beloved model . The operations are as followed,

7.1. Click “pre-heat , set the target temperature of the extruder and heated bed . (picture1, picture2)  
(No heated bed, you can ignore the target temperature of the heated bed. )

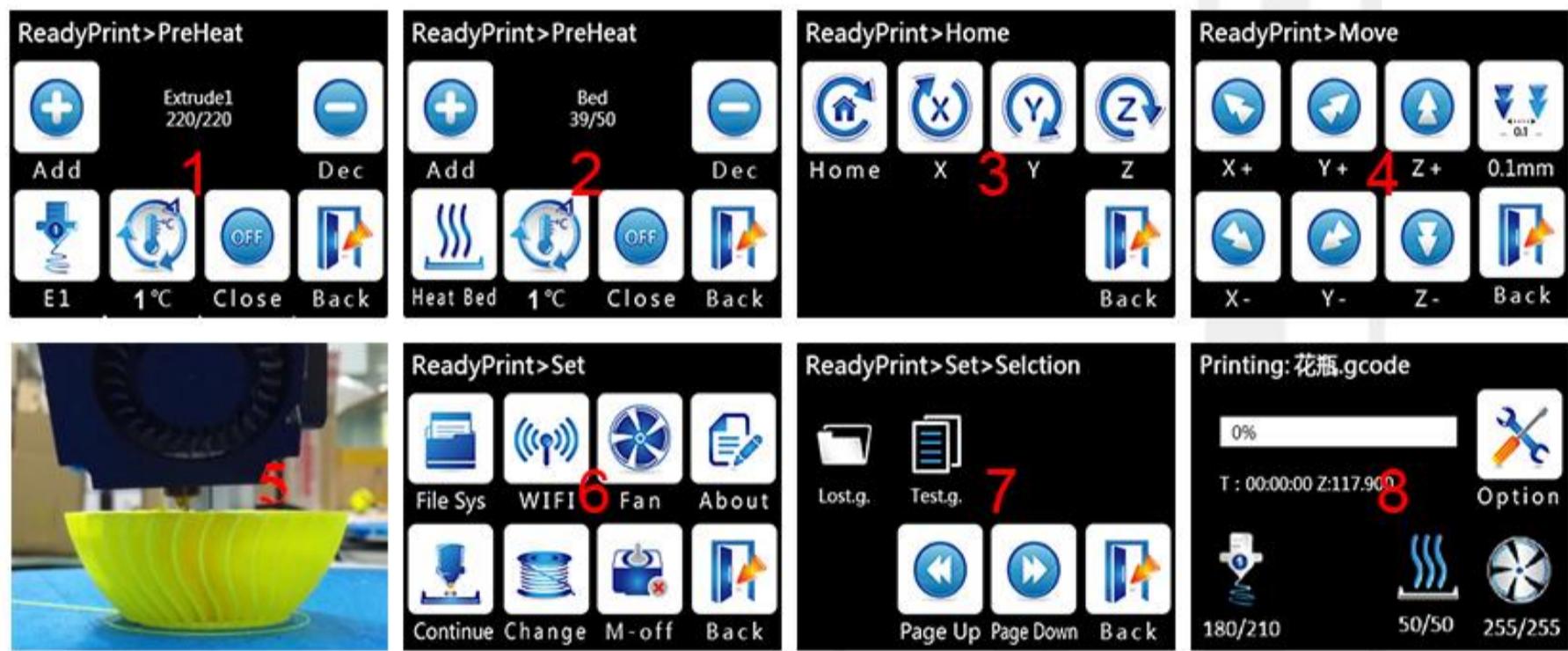
7.2. Click “Home” when the temperature reaches to the target temperature, let every axis go back to the zero point. (picture 3)

7.3. After every axis goes back to the zero point, move the nozzle to the layer where stops printing. (picture4, picture5) As shown below,

```
#Breakpoints continued playing Z-axis error setting
>cfg_breakpoint_z_error:0.2
```

7.4. Click “Set”, then click the printing from the breakpoint, choose the file that print from the breakpoint.( picture6, picture7)

7.5. After choosing the file, just wait to print. (picture8) (After choosing the file, the larger and more complicated the model is, the longer time you need to wait.)



## 8. Power Outage to Save

The printer is allowed to directly turn off if it suddenly enters the pause state while printing. The printing will be continued from the pause when restarting next time.( Remember to delete the upgraded file from the SD card to avoid upgrading firmware again when booting next time, otherwise, it can't print from the power outage point.)

## 9. Power Outage to Continue(only above MKS TFT28 V1.1 can support this function)

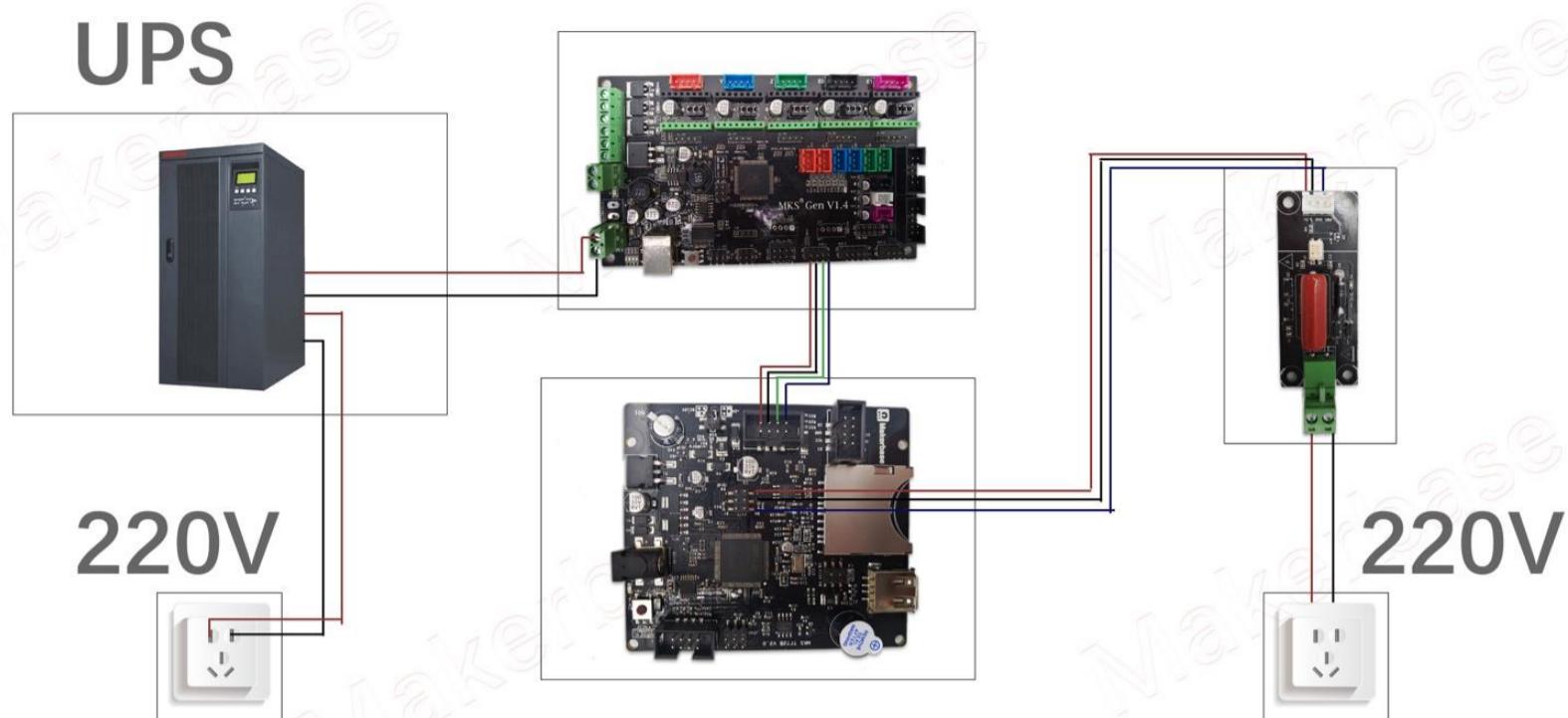
9.1. Don't connect UPS power supply

The printer will continue printing from the pause when restarting, if it suddenly powers out.( The motor can not be driven due to power failure, so the extruder still stay on the model, which may cause defects on the model. If you need a more complete way to deal with such situation, a power outage detection module and UPS is necessary).

### 9.2. Connect UPS

9.2.1 S connects to PB0, negative and positive connects “-“ and “+“ of PB0 .

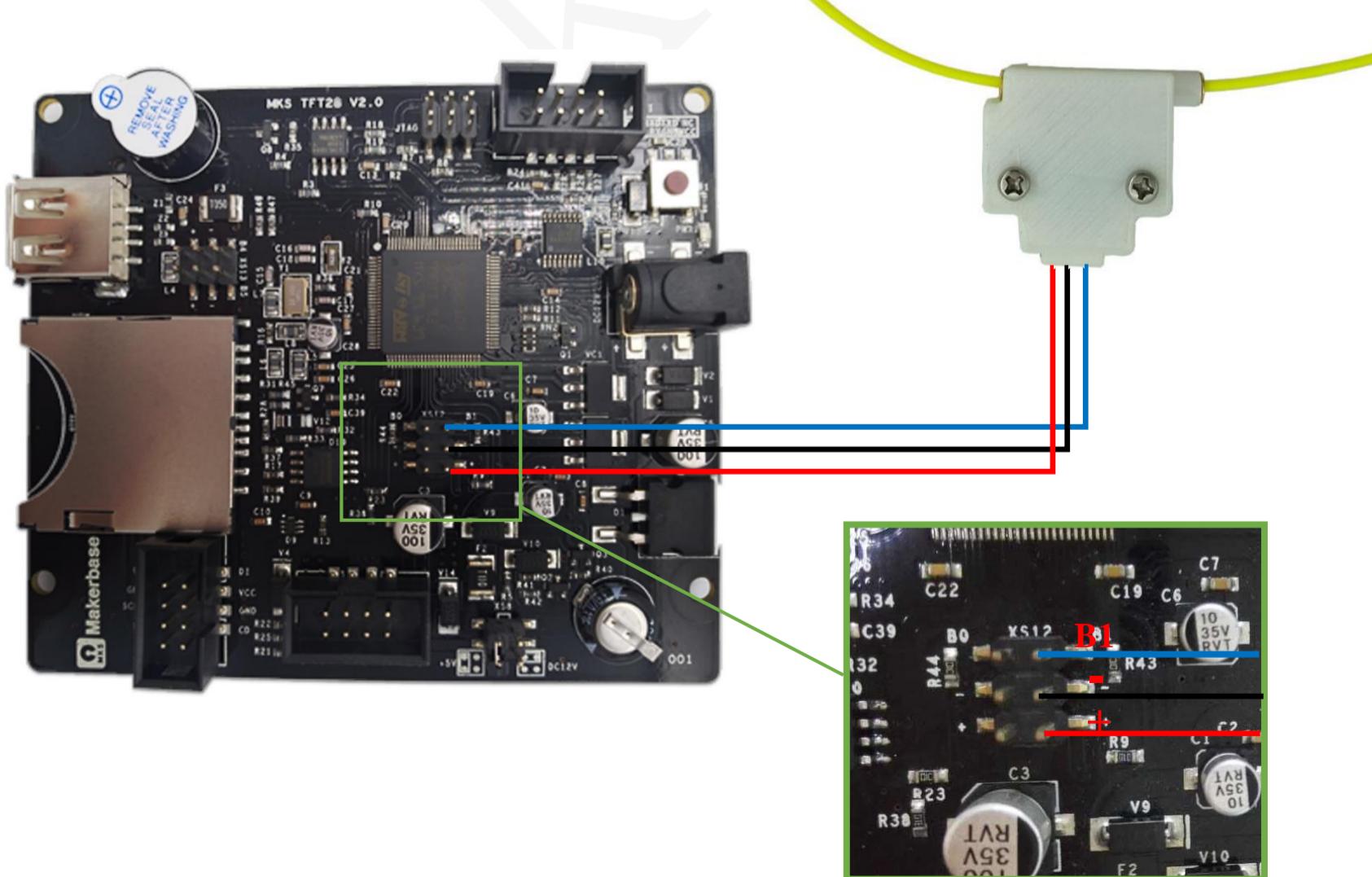
9.2.2 Power outage detection module will inform the TFT display to enter the printing pause state when the system powers out, then the UPS will provide the power for the extruder to leave the model.



#### 10. Filament Outage Detection function(only above MKS TFT28 V1.1 can support the function)

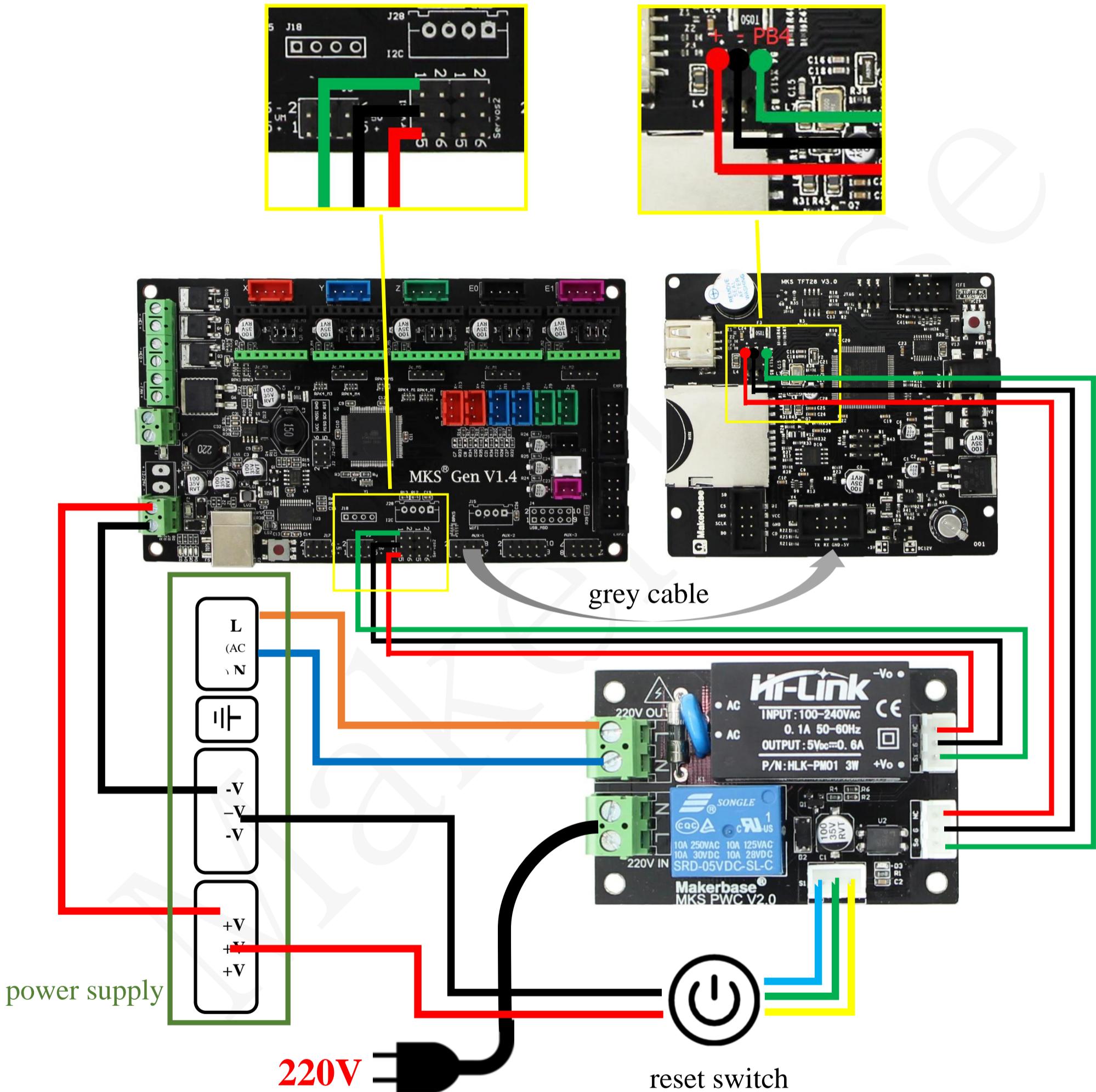
One end of MKS DET connects to the PB1, another end connects to the “-“ or “+“ of the PB1.( If Low Level effective, it connects to “-“, if High Level effective, it connects “+“.) Choose the Low Level effective or High Level effective in the configuration.

```
#the level signal of outage detection module PB1(low level:0; high level:1)
>cfg_PB0_PB1_Level:1
```



11. Auto-off after Printing Finishes Function (only above MKS TFT28 V1.1 can support the function)  
With MKS PWC module, enable the auto-off after printing finishes function on config.

```
#whether set machine auto-off after print finishes(auto-off:1; NO:0)
>cfg_print_finish_close_Machine:0
```



( Note that do not reverse the zero wire and FireWire )

## V. Web-Print Manual

MKS WIFI Module Connection (only above MKS TFT28 V1.1 can support the function)

MKS TFT can support MKS WIFI module, which can be modified in the configuration:

Both MKS TFT28 and MKS TFT32 can use “network printing” function with MKS TFT-WIFI.

### 1. Web-Print Mode Introduction

#### 1.1 Cloud Print Mode

It is recommended when router is available to Internet. Printer is ability to connect Cloud after successfully configure network parameters of WIFI module. That you can powerful control your printers by APP or MKS Cloud platform from anywhere around the world. Certainly, it is capable to monitor printers by LAN on host-software, such as Printron, proterface.

#### 1.2 LAN Print Mode

If WIFI router can't access to the Internet or at a slow speed, recommend this mode. You can remote monitor of all your 3D printers. Start, stop, pause or edit prints, etc.

#### 1.3 AP Mode

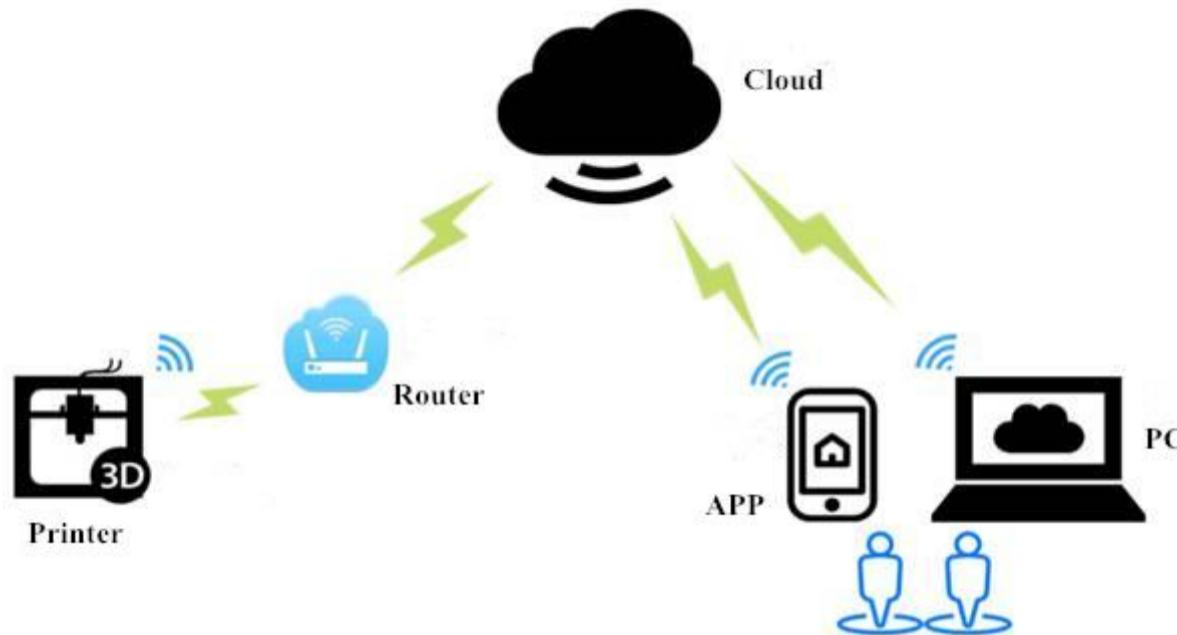
This mode will activate under following network environment.

- a. Without wifi router.
- b. WIFI is unconfigured.
- c. WIFI is configured, but unable to connect .

Then, the WIFI will generates a open hotspot “MKS WIFI-XXXX” which enter freely without password.

Support to control printers by APP, Web, Host-software.

## 2. Cloud Mode



### 2.1 WIFI Config

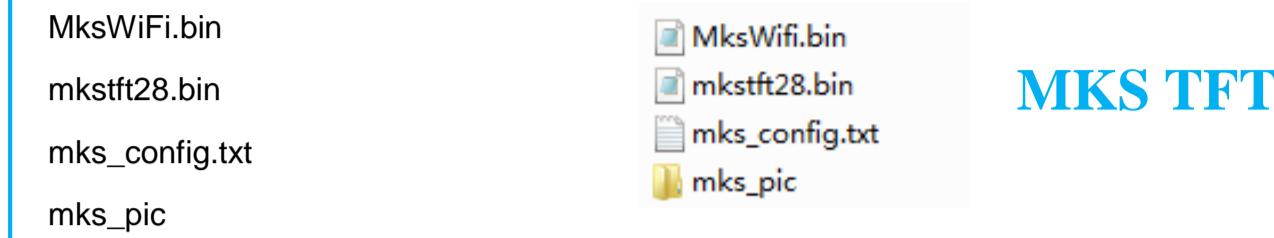
#### 2.1.1 MKS TFT-WIFI

Please configure wifi firmware as follow:

mks_config.txt	Tip
#wifi type(0: MKS TFT-WIFI 1:MKS HLK-WIFI >cfg_wifi_type:0	Select : MKS TFT-WIFI
#wifi mode(0:sta;1:ap) >cfg_wifi_mode:0	Select : STA
#wifi name >cfg_wifi_ap_name:TP-LINK_C944	Set the WIFI name as the same as the router required.
#wifi password >cfg_wifi_key_code:makerbase	Set the password as the same as the router required.
#cloud services(0:disable;1:enable) >cfg_cloud_enable:1 #cloud ip >cfg_wifi_cloud_host:www.baizhongyun.cn # cloud services port >cfg_cloud_port:10086 # dynamic IP >cfg_ip_dhcp_flag:1 #IP/mask/gateway >cfg_ip_address:192.168.3.100 >cfg_ip_mask:255.255.255.0 >cfg_ip_gate:192.168.3.1	Not require to edit.

## 2.2 Firmware Upgrade

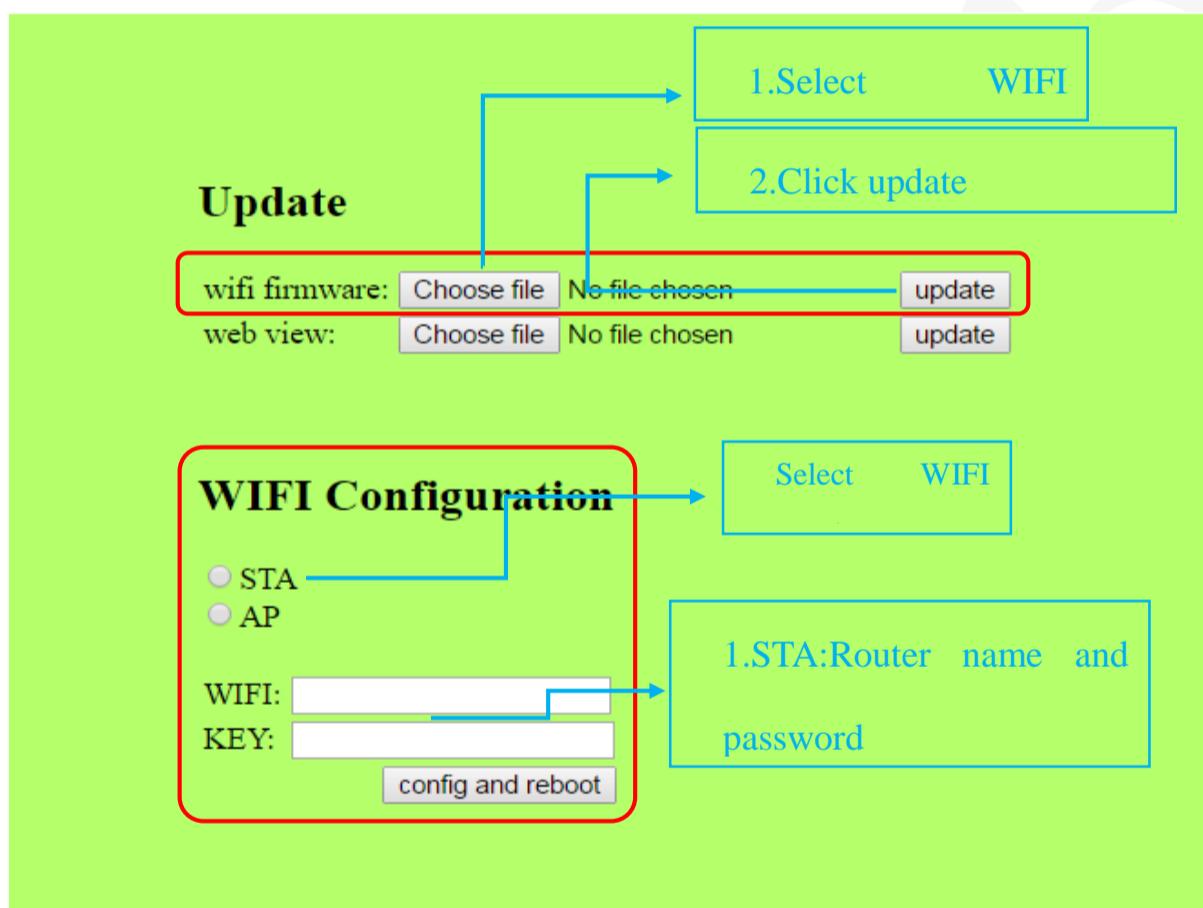
### 2.2.1 Copy latest firmware to root of SD card, include:



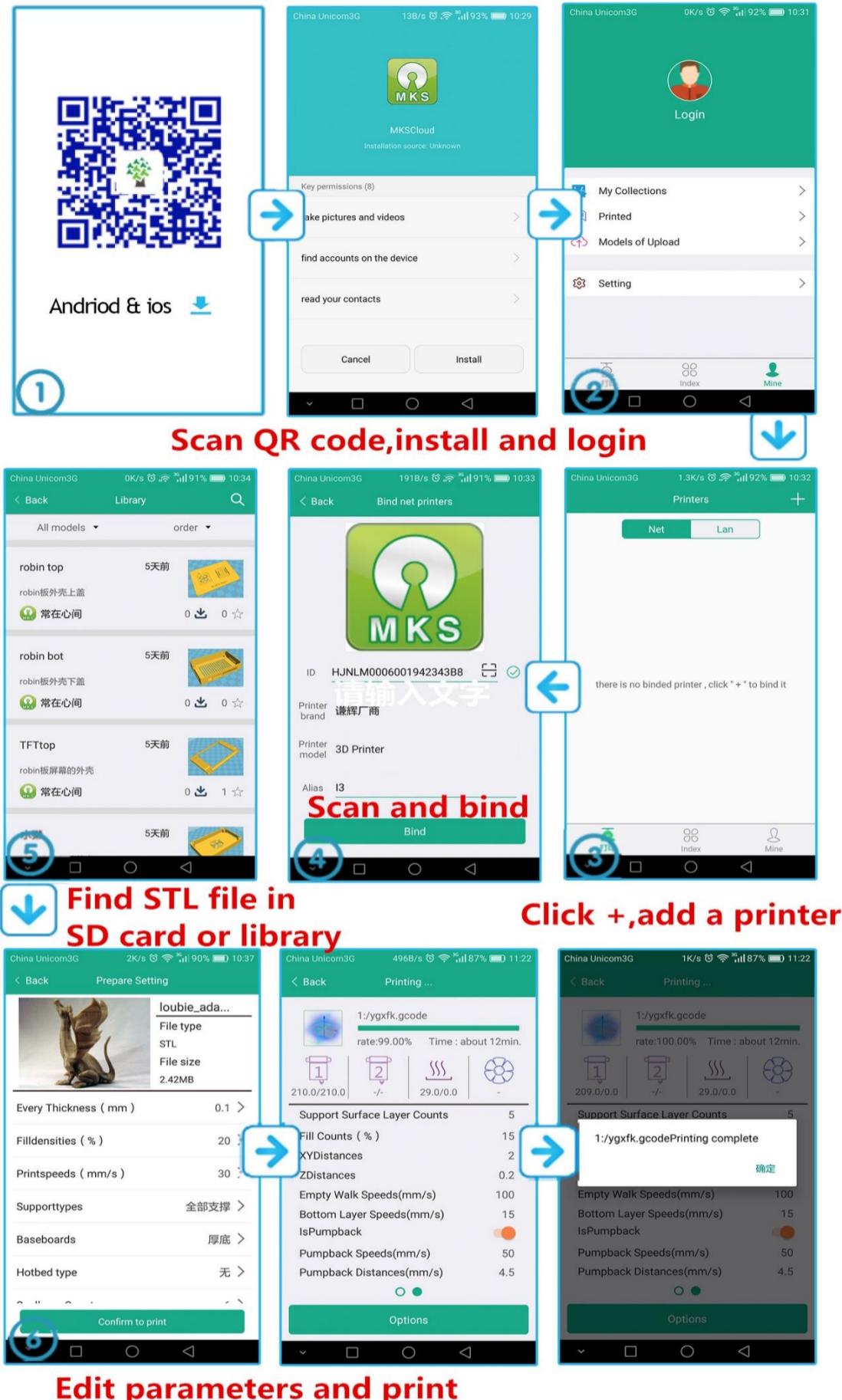
### 2.2.2 Notes on Upgrade

- a. Document names are not allowed to edit. Or will fail to upgrade.
- b. The document names will get changed after update successfully.
- c. Available to check current version in About interface.

### 2.2.3 Greatly, it is able to upgrade WIFI firmware by WEB. At same LAN, enter IP on PC, then go into web. As follow:



## 2.3 MKS APP



### 3.LAN Print Mode



#### 3.1 WIFI Config

##### 3.1.1 MKS TFT-WIFI

mks_config.txt	Tip
#wifi type(0: MKS TFT-WIFI 1:MKS HLK-WIFI) >cfg_wifi_type:0	Select : MKS TFT-WIFI
#wifi Mode(0:sta;1:ap) >cfg_wifi_mode:0	Select : STA
#wifi name >cfg_wifi_ap_name:TP-LINK_C944	Set the WIFI name as the same as the router required.
#wifi password >cfg_wifi_key_code:makerbase	Set the password as the same as the router required.
# cloud services(0:disable;1:enable) >cfg_cloud_enable:0 # cloud ip >cfg_wifi_cloud_host:www.baizhongyun.cn # cloud services port >cfg_cloud_port:10086 # dynamic IP >cfg_ip_dhcp_flag:1	Disabled cloud services is recommended when control via LAN.
# IP/mask/gateway >cfg_ip_address:192.168.3.100 >cfg_ip_mask:255.255.255.0 >cfg_ip_gate:192.168.3.1	

## 4.1 Software Upgrade

### 4.2.1 Copy latest firmware to root of SD card, includes:

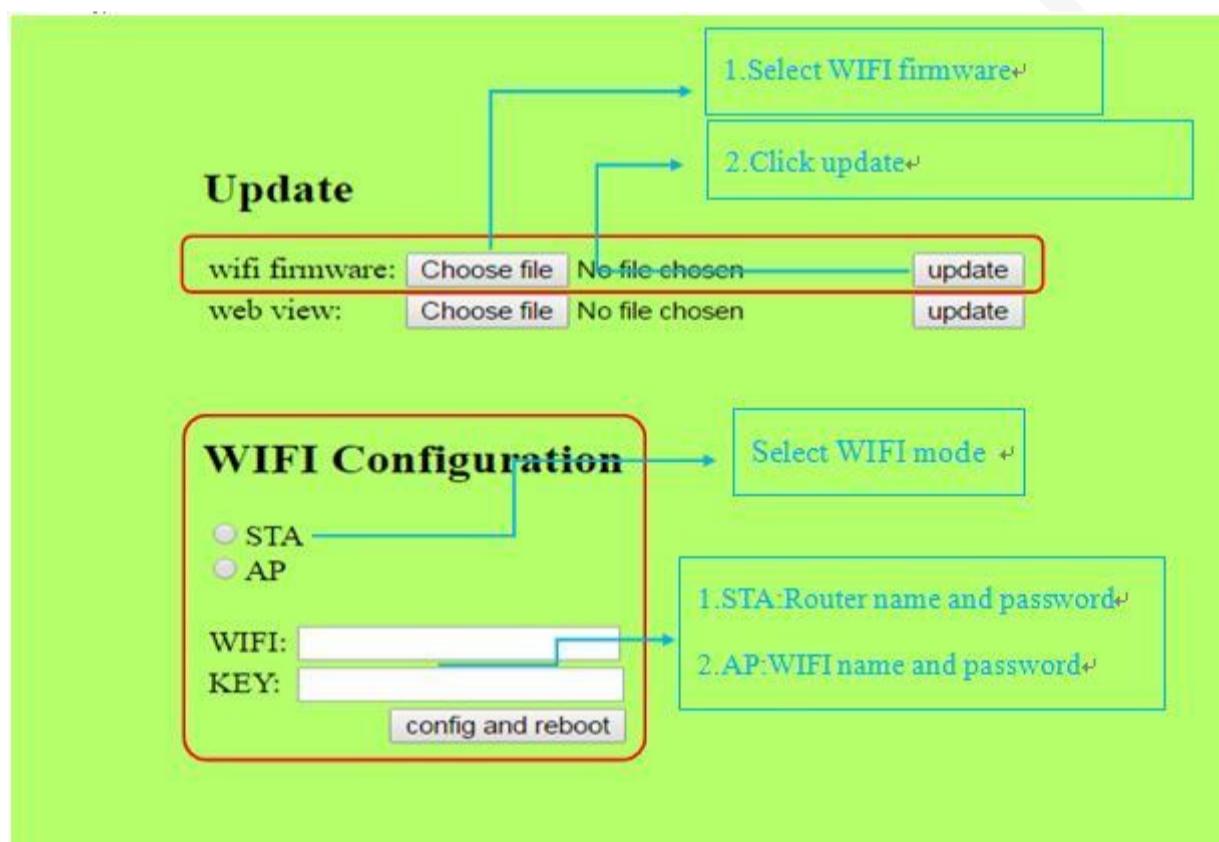
MksWiFi.bin	MksWiFi.bin	<b>MKS</b> <b>TFT</b>
mkstft28.bin	mkstft28.bin	
mks_config.txt	mks_config.txt	
mks_pic	mks_pic	

#### Notes on Upgrade

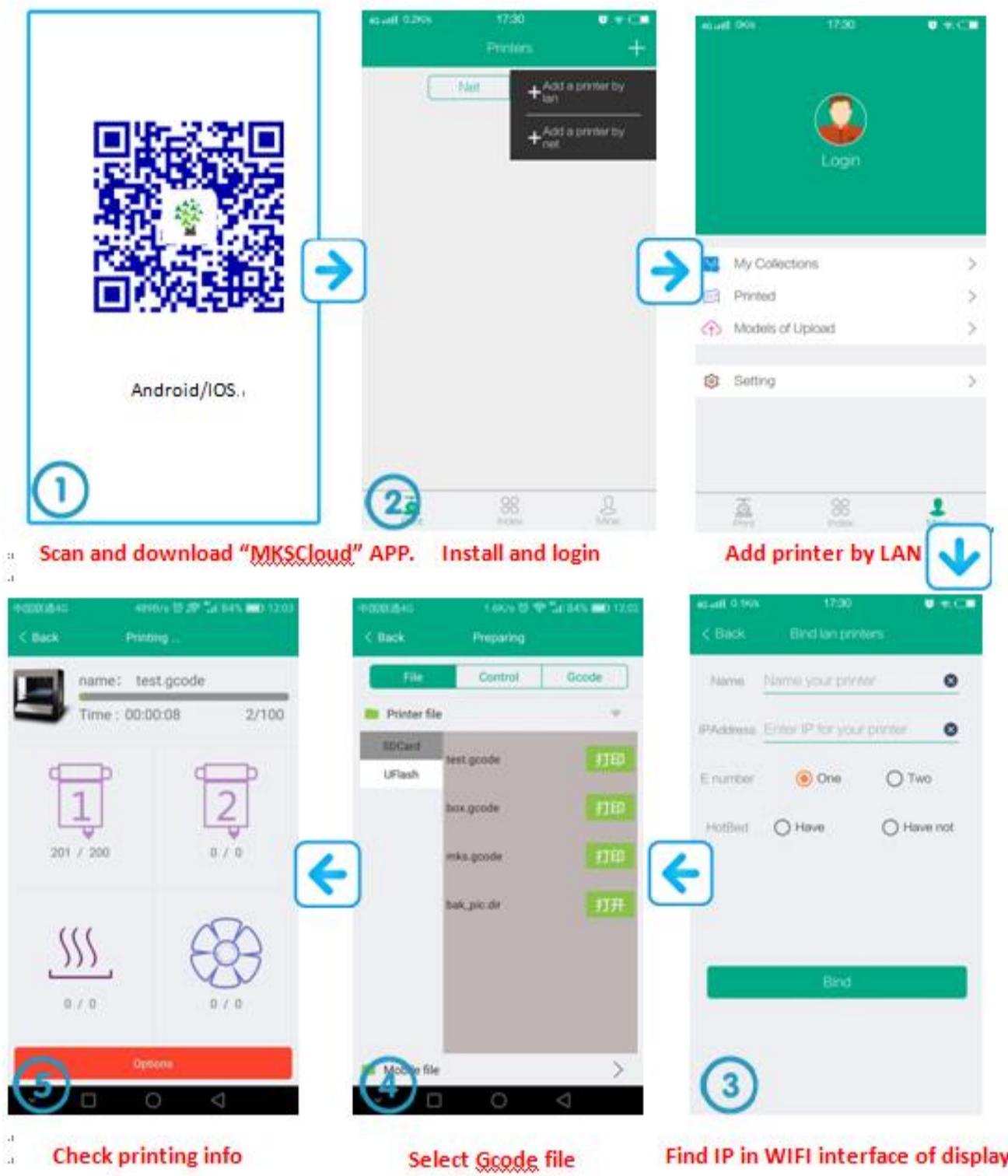
- a. Document names are not allowed to edit. Or will fail to upgrade.
- b. The document names will get changed after update successfully.
- c. Available to check current version in About interface.

4.2.2 Greatly, it is able to upgrade WIFI firmware by WEB. At same LAN, enter IP on PC, then go into web. As follow:

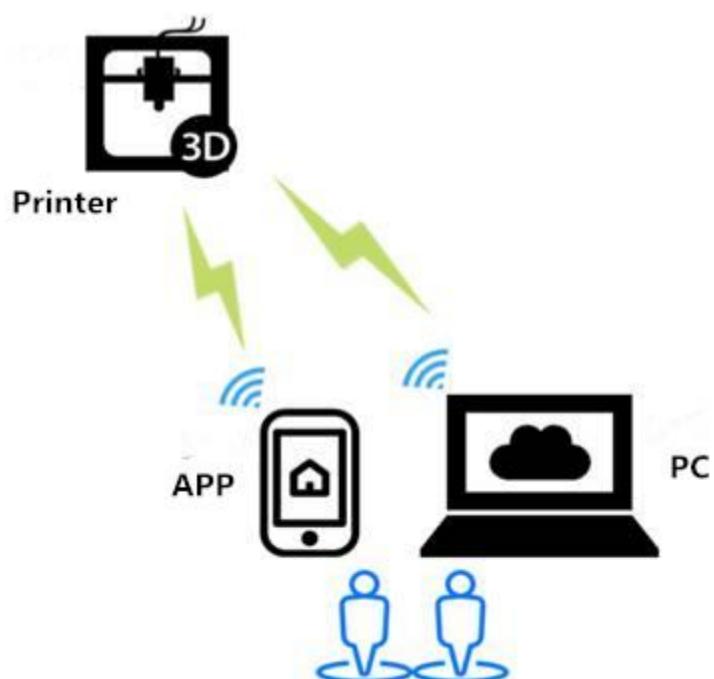
Greatly, it is able to upgrade WIFI firmware by WEB. At same LAN, enter IP on PC, then go into web. As follow:



### 4.3 APP



## 4.AP Print Mode



Feature: The WIFI will generate a open hotspot “MKSWIFI-XXXX” which is no password required, can be connected directly.

## 4.1 WIFI

### 4.1.1 MKS TFT-WIFI

mks_config.txt	Tip
#wifi type(0: MKS TFT-WIFI 1:MKS HLK-WIFI >cfg_wifi_type:0	Select : MKS TFT-WIFI
#wifi mode(0:sta;1:ap) >cfg_wifi_mode:1	Select AP mode, and take WIFI module as a hotspot.
#wifi name >cfg_wifi_ap_name:TEST-WIFI	Set name freely.
#wifipassword >cfg_wifi_key_code:makerbase	Set wifi password freely.
#Cloud(0:disable;1:enable) >cfg_cloud_enable:0 # cloud ip >cfg_wifi_cloud_host:www.baizhongyun.cn # cloud services port >cfg_cloud_port:10086 # dynamic IP >cfg_ip_dhcp_flag:1  # IP/mask/gateway >cfg_ip_address:192.168.3.100 >cfg_ip_mask:255.255.255.0 >cfg_ip_gate:192.168.3.1	Disabled cloud services is recommended when select AP mode.

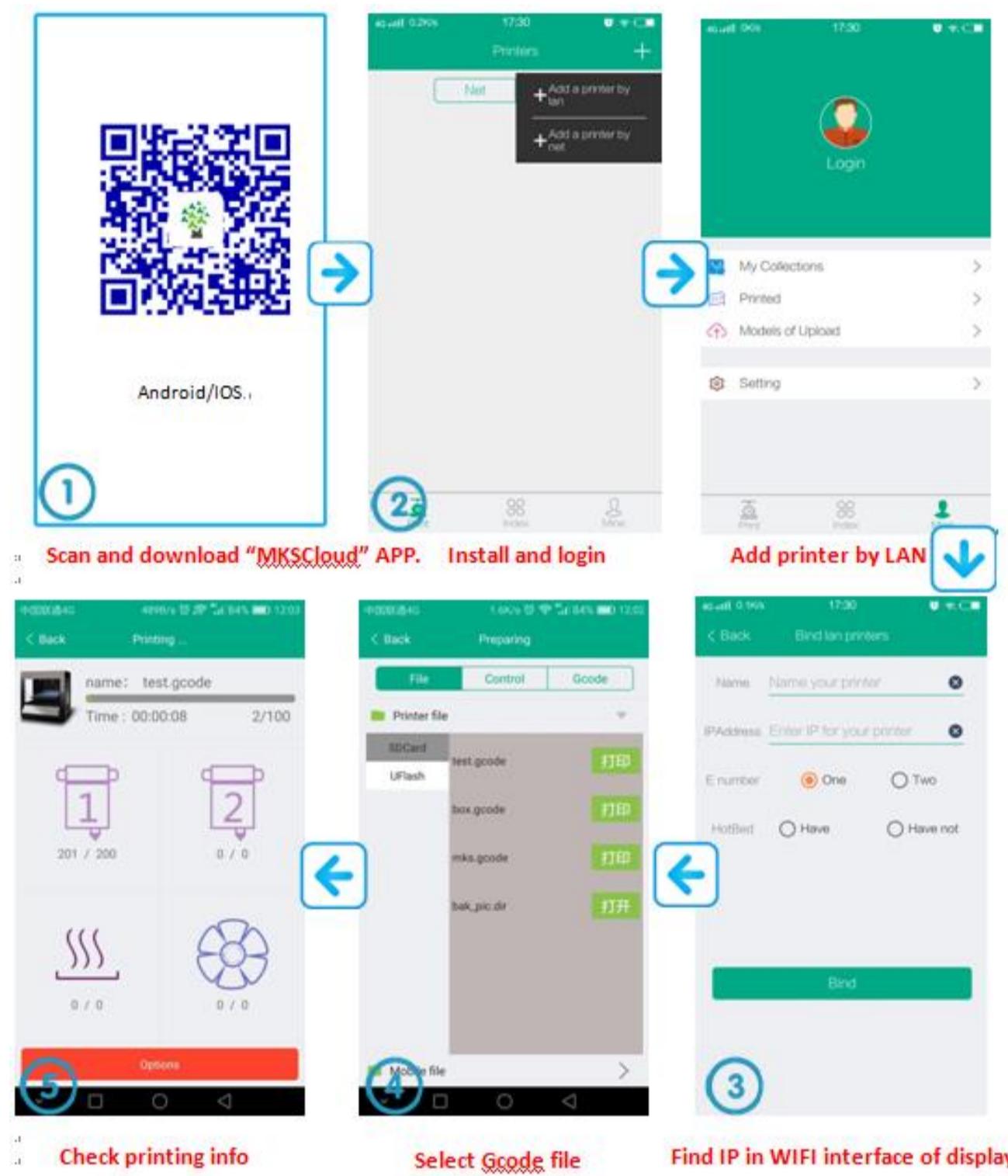
## 4.2 Software Upgrade

Upload the latest firmware to wifi module.

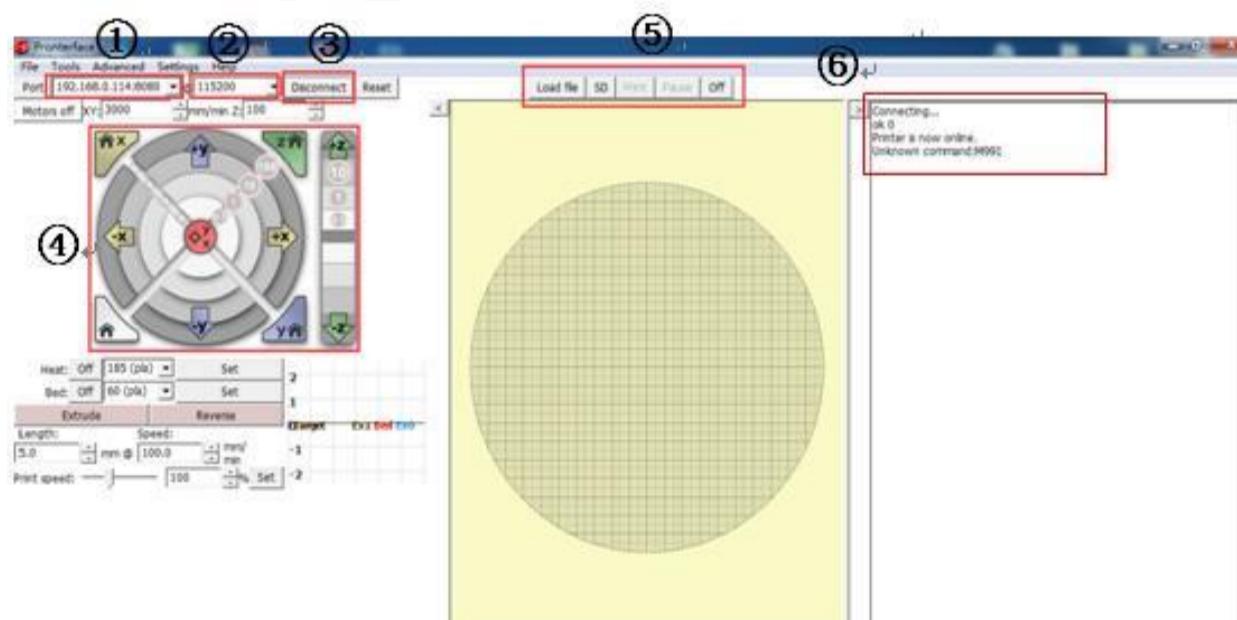
## 4.3 Notes on Upgrade

- a. Document names are not allowed to edit. Or will fail to upgrade.
- b. The document names will get changed after update successfully.
- c. Available to check current version in About interface.

#### 4.4APP



#### 4.5 Printron



①Here is “IP+8080”,which is easy to find in WIFI setting.

For example: 192.168.0.114:8080.

②Baudrate: 115200

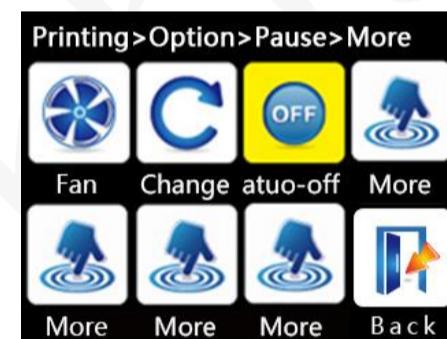
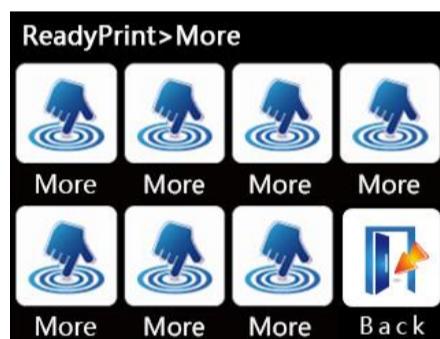
③Connect.

④It means that get connected successfully when the icons can control.

⑤Print from SD card or PC are available.

⑥Check out the responds from printer.

## VI. Special Function Button Customization



**1 : function\_btn1\_cmd**

**2 : function\_btn2\_cmd**

```
#user-defined function1 and 2.
(disable: 0; enable: 1)
>cfg_function_btn1_display:1
>cfg_function_btn2_display:0

#command of user-defined
function
>function_btn1_cmd:M84;
>function_btn2_cmd:M81;
```

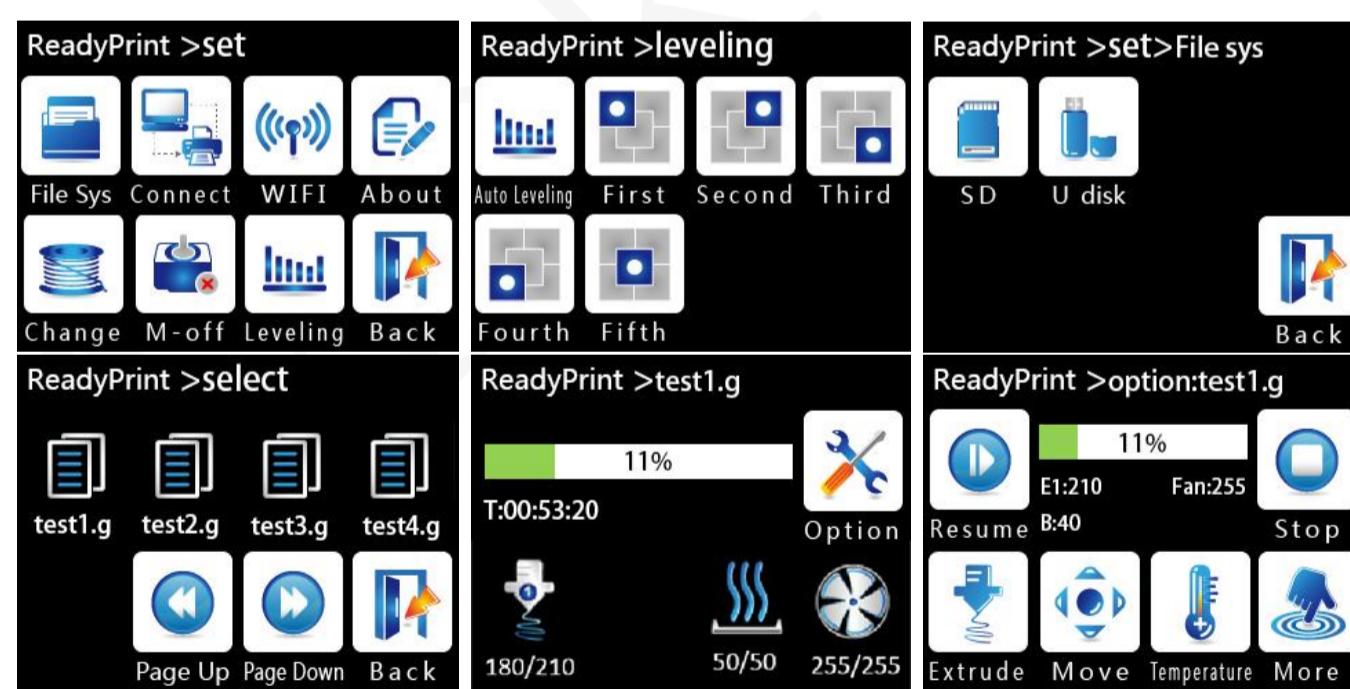
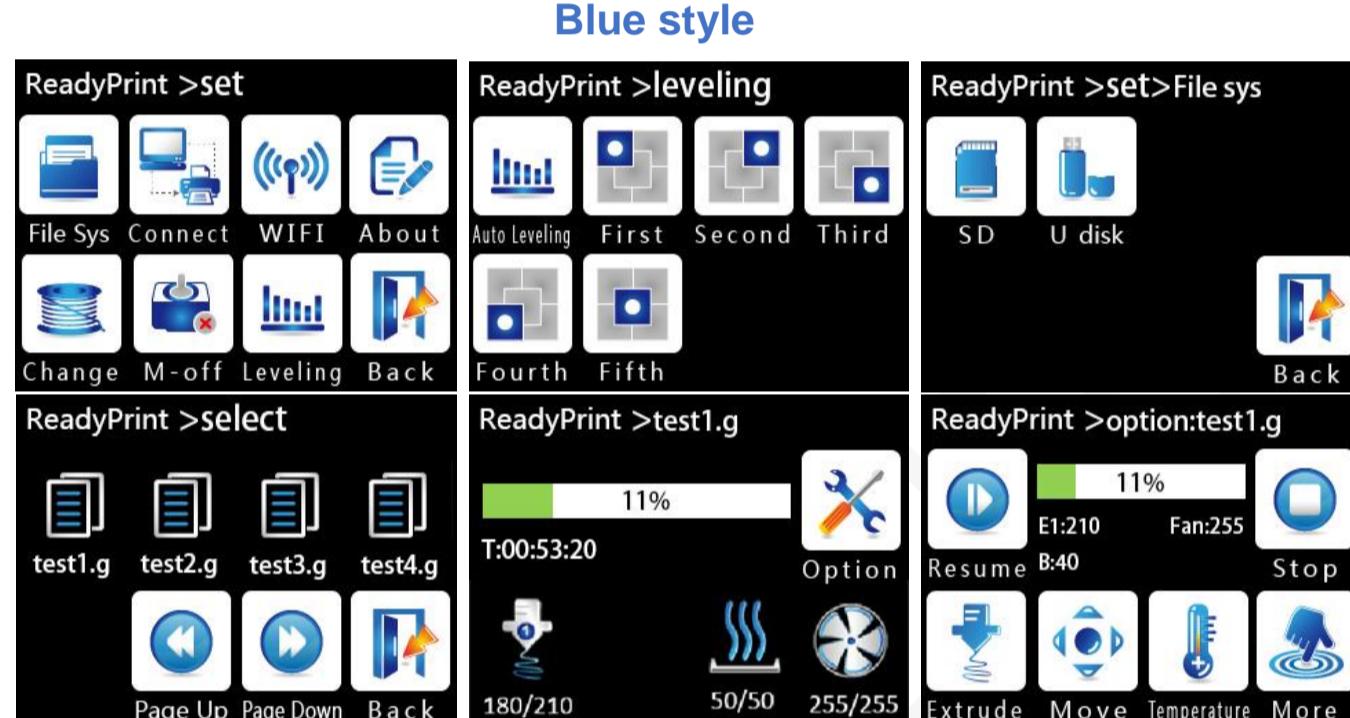
```
#edit command for 1~7 "More"
button, each command must be
separated by semicolon ;
>moreitem_button1_cmd:G28 X0;
>moreitem_button2_cmd:G28 X0;
>moreitem_button3_cmd:G28 Y0;
>moreitem_button4_cmd:G28 Y0;
>moreitem_button5_cmd:G28 Z0;
>moreitem_button6_cmd:G28 Z0;
>moreitem_button7_cmd:G28;
```

```
#how many "More" button show on screen interface
>morefunc_cnt:0
```

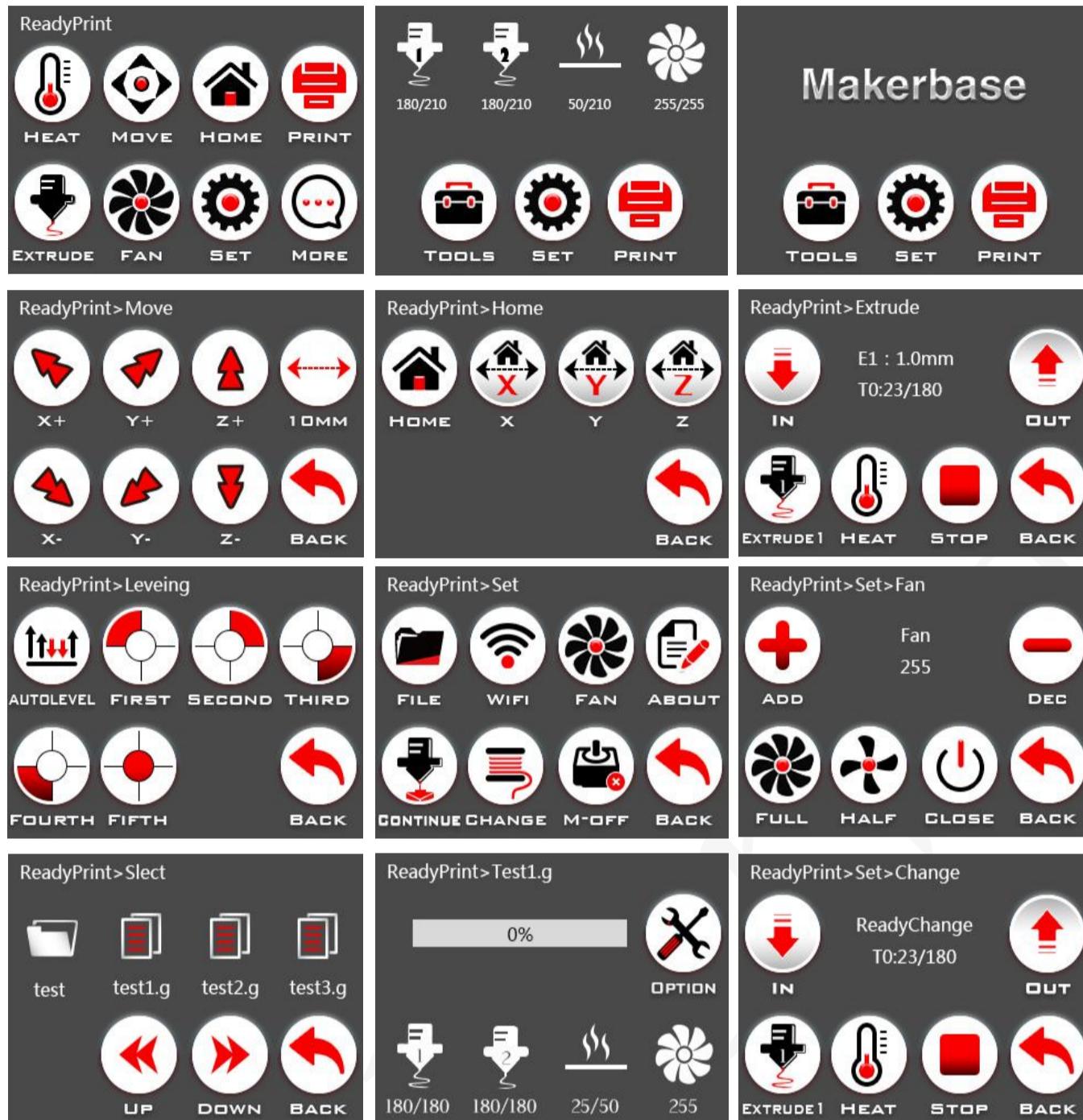
```
#command setting on button1~6
>morefunc1_cmd:G28;
>morefunc2_cmd:G28;
>morefunc3_cmd:G28;
>morefunc4_cmd:G28;
>morefunc5_cmd:G28;
>morefunc6_cmd:G28;
```

## VII. Themes Interface Display

Three themes



## Red style



Special explanation :

The red style is modified from the UI designed by Isaac Norris, which provides the users with more choice. The following is the designer Isaac Norris words:

"Hello and thank you for downloading my modified version of the MKS TFT User Interface.

Instructions-

1. copy the contents of the firmware folder to an SD card then insert the card into the reader on the MKS TFT Display. I am using the 3.2" variant and that is all that will work with this OS.
2. Power on the board, it will automatically install the firmware.
3. Once it powers on you are ready to go!

This interface took a lot of design time and effort to put together so I hope that you all appreciate it as a step forward in User Interfaces for 3D Printers.

All Credit for this UI's Design and assembly goes to me, Isaac Norris, the owner and operator of Dimension 3 Fabrication in Asheville NC.

I hope that you all get the best from this user interface and share it freely, but I do not want this UI sold as it is Copywritten under the Creative Commons Copywrite.

The purpose for designing this UI was for the custom Delta 3D Printers that my company, Dimension 3, will be manufacturing and the reason that I am sharing this with all of you is that I believe in sharing information,

as the only way to make the world better is to help the spread of ideas.

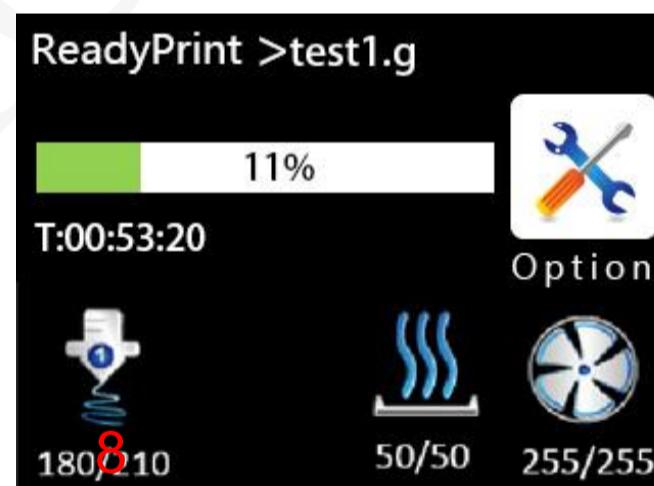
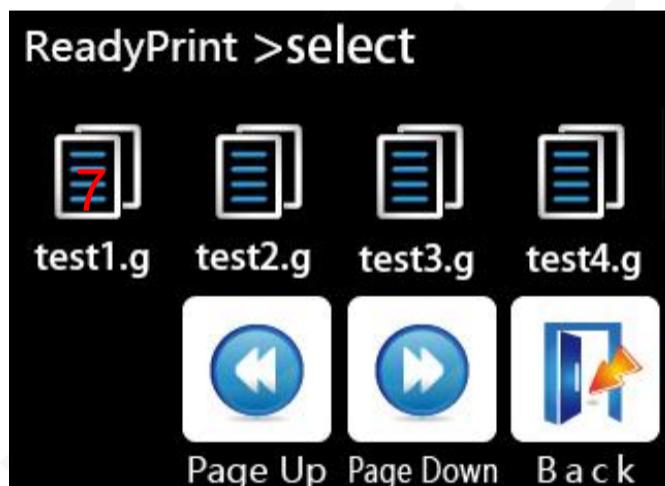
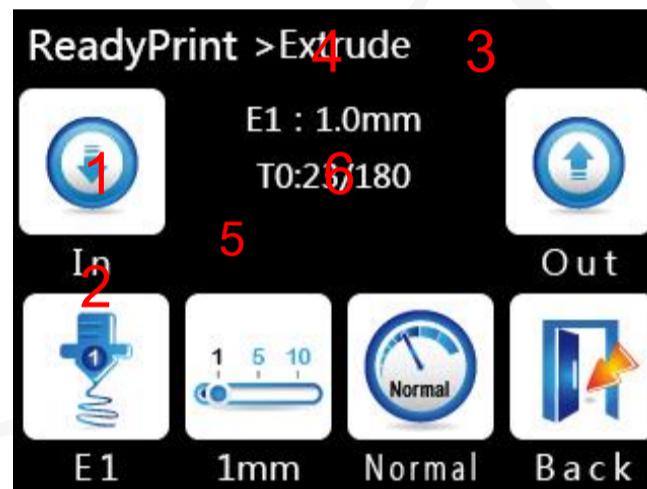
Thanks everyone for your support and if you have any questions email me at Dimension3fab@gmail.com or personally at Flightfixit@gmail.com.

If you want to find me online search FlightFixit for my 3D modeling and Dimension 3 Fabrication for the Delta 3D Printers. Hope you all get the best out of my UI.

## VIII. Booting Logo & Button Pictures Customization Function

### 1. Convention:

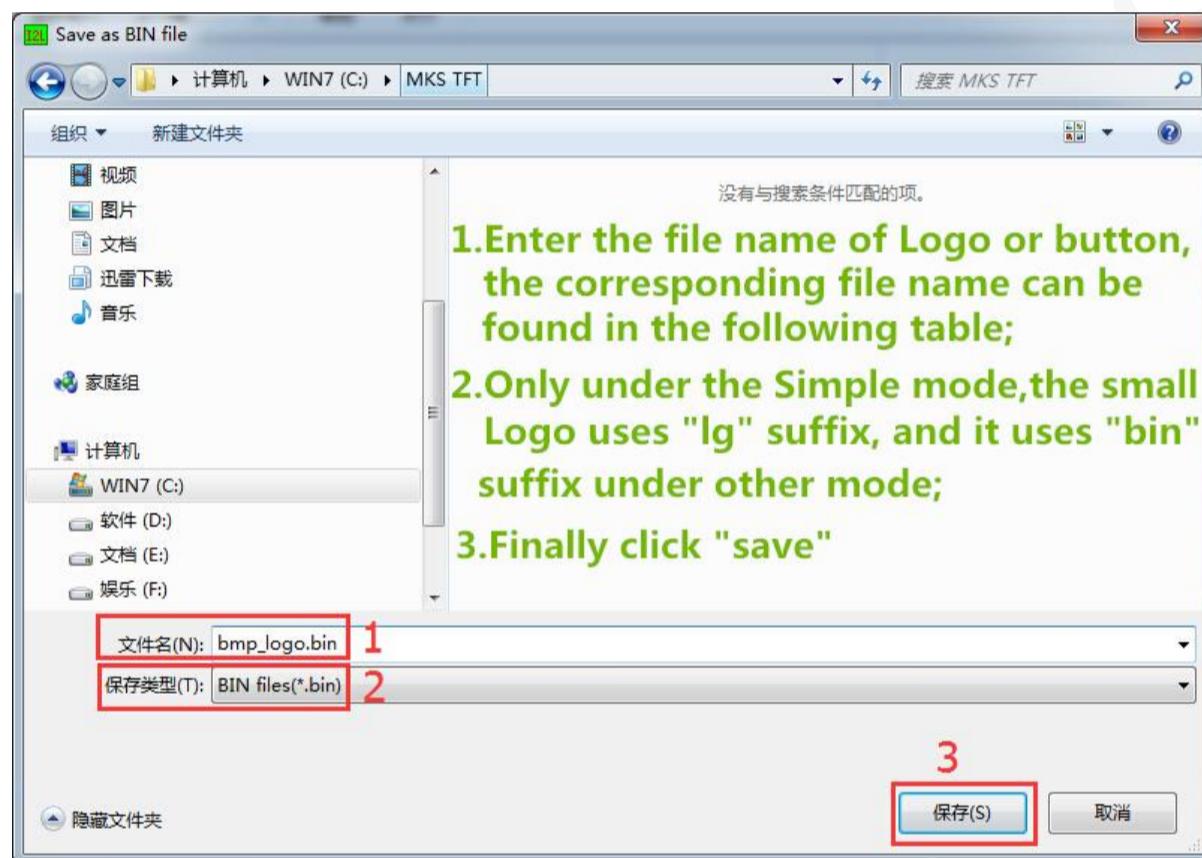
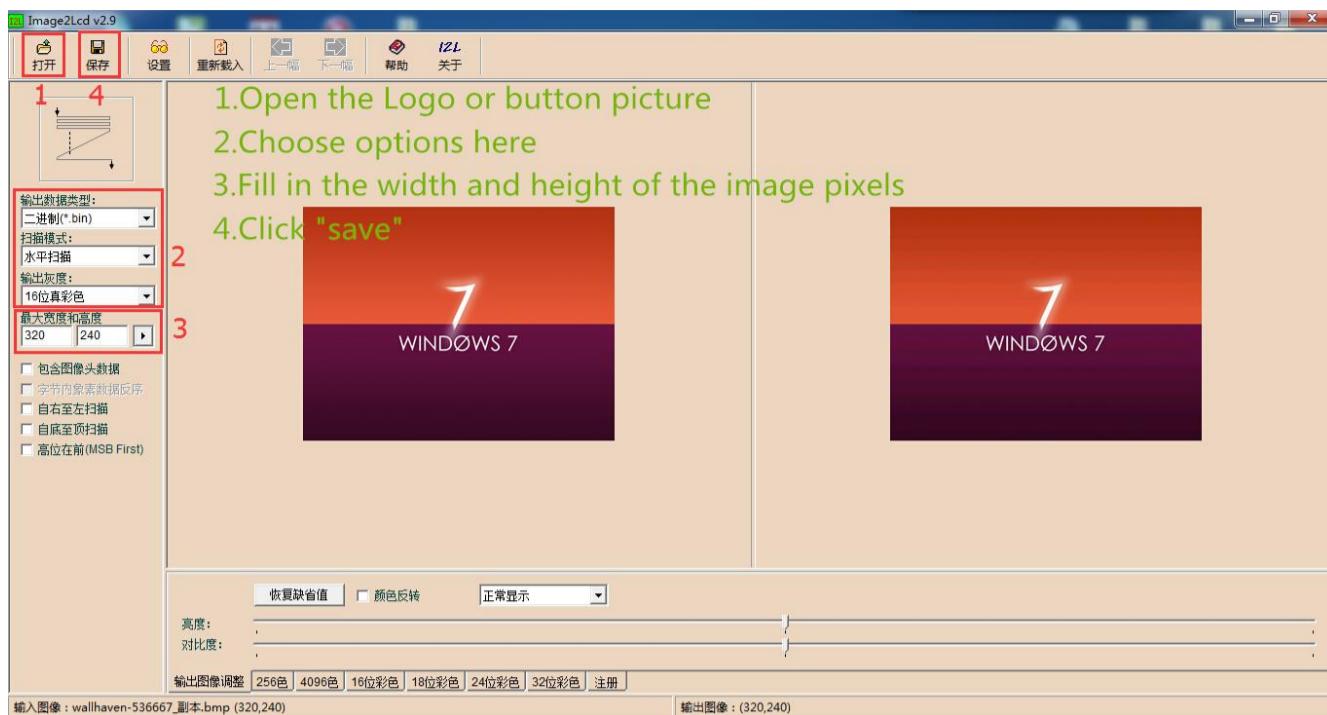
- 1.1 Customization range
  - 1.1.1 Booting interface logo.
  - 1.1.2 Button pictures (Figure 1 and 2), Include button picture and text.
  - 1.1.3 The screen background color (Figure 3, the default color is black).
  - 1.1.4 The title text color (Figure 4, the default color is white).
  - 1.1.5 The background color that shows temperature, ect, status (Figure 5, the default color is blue).
  - 1.1.6 The text color that shows temperature, ect, status (Figure 6, the default color is white).
  - 1.1.7. The text color of file name in the “ChooseFile” interface (Figure 7, the default color is white).
  - 1.1.8. The text background color of file name in the “ChooseFile” interface.
  - 1.1.9. The text background color of printing status in the “Printing” interface. (Figure 8)
  - 1.1.10. The text color of printing status in the “Printing” interface.
  - 1.1.11. Whether the buttons need 3D effect, it is required by default.



- 1.2. Customized logo picture: 16dpp, width=320 pixel, height=240 pixel.
- 1.3. Small logo picture: 16dpp, width=320 pixel, height=135 pixel.(Only for Simple version)
- 1.4. Customized button picture: 16dpp, width=78 pixel, height=104 pixel.
- 1.5. The name of the customized picture must be same as the required name.
- 1.6. The color value of the customized picture is hexadecimal, according to 3 primary colors -blue, green and red in the order.
- 1.7. It's allowed to customize at most 7 function buttons in the “More” menu.
- 1.8. It's allowed to customize at most 6 function buttons in the “Printing>More” menu.

### 2. Customize the pictures

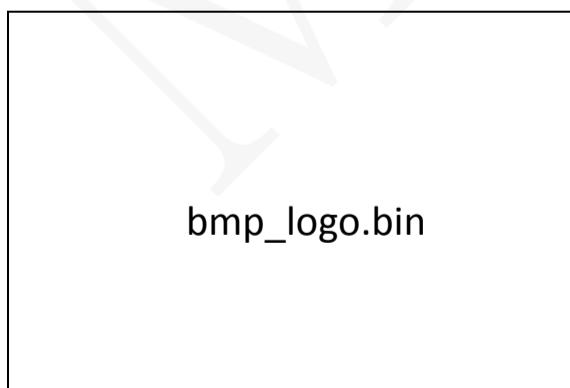
- 2.1 Install “Image 2Lcd” software, modify the bmp format picture to the BIN file.



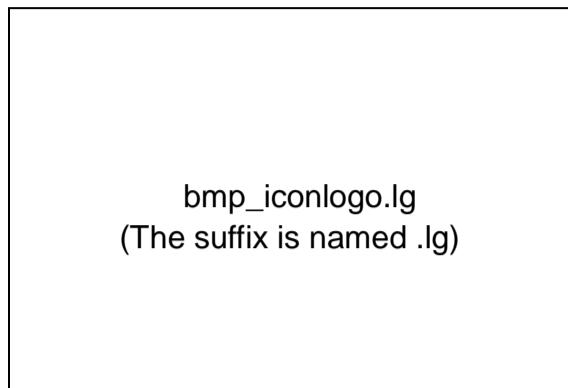
2.2 Copy "mks\_config.txt" and "mks\_pic" to SD card root, plug the SD card to MKS TFT, restart, then the system will update automatically

### 3. Name the pictures of LOGO and buttons

#### 3.1. Booting cover LOGO

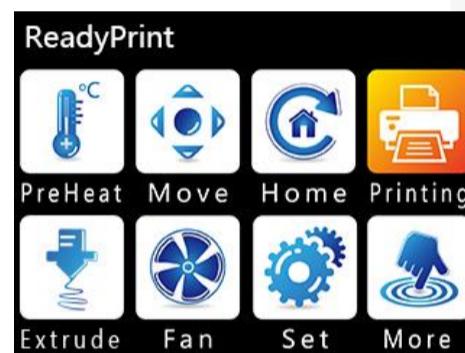


### 3.2. Small LOGO(Simple version)



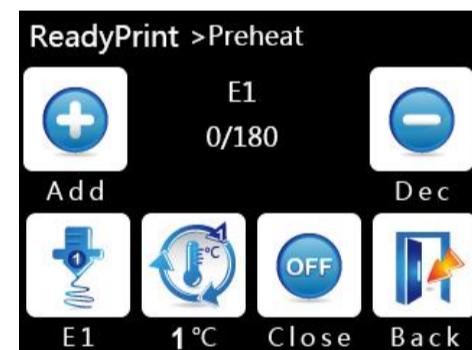
bmp_pre Heat.bin	bmp_mo v.bin	bmp_ze ro.bin	bmp_printin g.bin
bmp_ext ruct.bin	bmp_lev eling.bin	bmp_se t.bin	bmp_more.bi n

### 3.3. "ReadyPrint" Interface



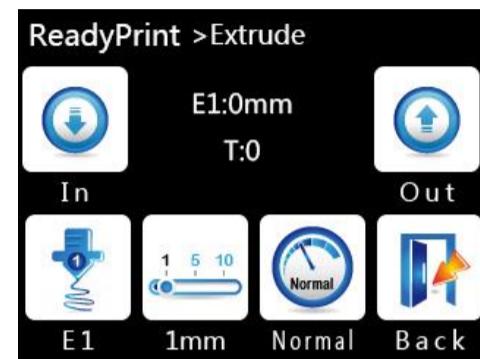
### 3.4. Preheat" Interface

bmp_Add.bi n	step: 1 °C : bmp_step1_ degree.bin	close: bmp_speed0.bin	bmp_Dec.bi n
bed: bmp_bed.bin	extru1: bmp_extru1. bin	back: bmp_return. bin	



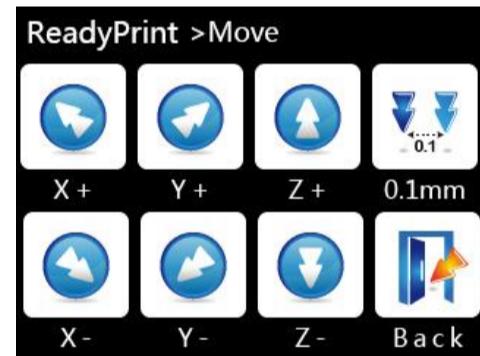
### 3.5. "Extruder" interface

bmp_in.bin			bmp_out.bin
extrude (E):	Move step:	speed:	bmp_return.
E1:	1mm:	slow:	bin
bmp_extru 1.bin	bmp_step1_m m.bin	bmp_speed_slo w.bin	
E2:	5mm:	normal:	
bmp_extru 2.bin	bmp_step5_m m.bin	bmp_speed_nor mal.bin	
	10mm:	high:	
	bmp_step10_m m.bin	bmp_speed_hig h.bin	



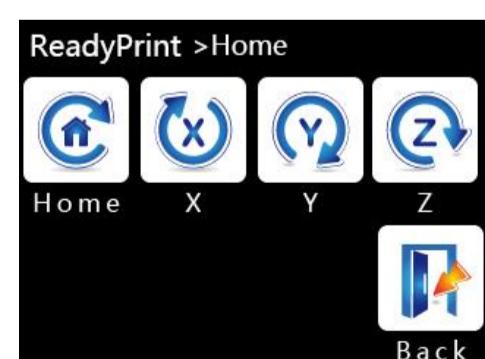
### 3.6. "Move" Interface

X+: bmp_xA dd.bin	Y+: bmp_y Add.bi n	Z+: bmp_zAdd. bin	Move step : 0.1mm : bmp_step_move 0_1.bin 1mm : bmp_step_move 1.bin 10mm : bmp_step_move 10.bin
X-: bmp_xD ec.bin	Y- : bmp_y Dec.bi n	Z- : bmp_zDec. bin	back : bmp_return.bin



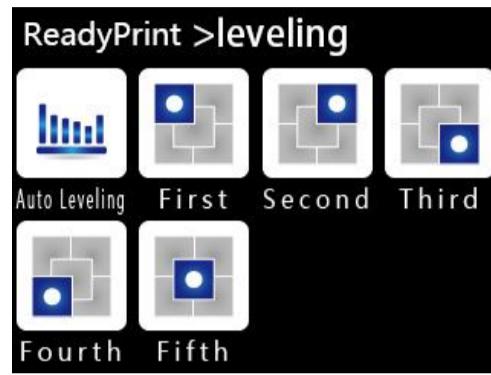
### 3.7. "Home" Interface

Home: bmp_zeroA.bin	X: bmp_zeroX.bin	Y: bmp_zeroY.bin	Z: bmp_zeroZ.bin
			Back: bmp_return.bin



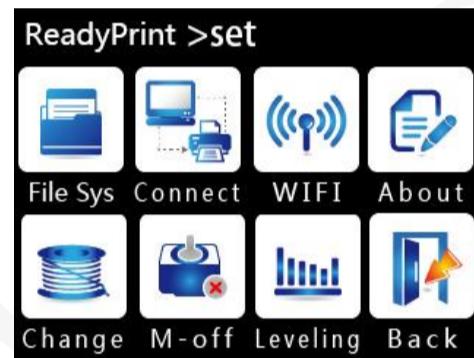
### 3.8. "Leveling" Interface

bmp_autoleveling.bin	bmp_leveling1.bin	bmp_leveling2.bin	bmp_leveling3.bin
bmp_leveling4.bin	bmp_leveling5.bin		



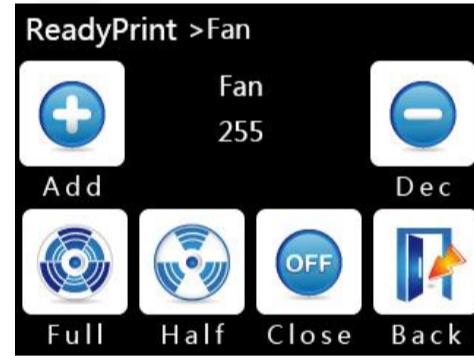
### 3.9. "Set" Interface

bmp_fileSys.bin	bmp_wifi.bi	bmp_fan.bi	bmp_about.bin
bmp_breakpoint.bin	bmp_function1.bin	bmp_function2.bin	bmp_returnbin



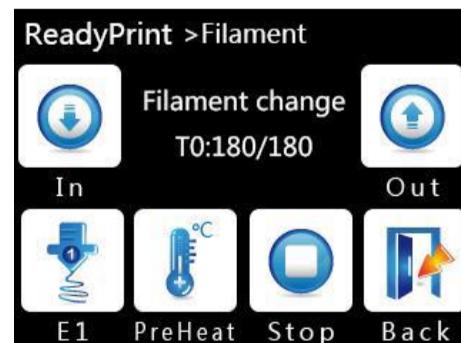
### 3.10. "Fan" Interface

bmp_Add.bin			bmp_Dec.bin
bmp_speed255.bin	bmp_sped255.bin	bmp_sped0.bin	bmp_returnbin



### 3.11. "Filament" Interface :

bmp_in.bin			bmp_out.bin
E1 : bmp_extruder1.bin	bmp_presetHeat.bin	bmp_stopbin	bmp_returnbin
E2 : bmp_extruder2.bin			



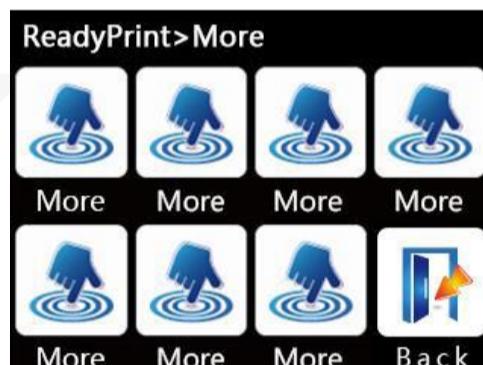
### 3.12. "Filesys" Interface

SD: no selection: bmp_ sd.bin selected: bmp_sd _sel.bin	udisk: no selection: bmp_ usb.bin selected : bmp_usb _sel.bin		
			Back: bmp_return.bin



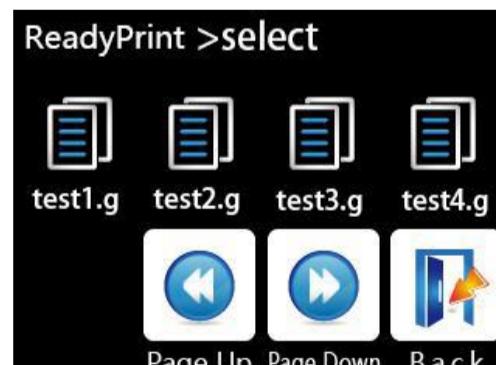
### 3.13. "More" Interface

bmp_ custom1. bin	bmp_ custom2. bin	bmp_ custom3. bin	bmp_ custom4. bin
bmp_ custom5. bin	bmp_ custom6. bin	bmp_ custom7. bin	bmp_ return. bin



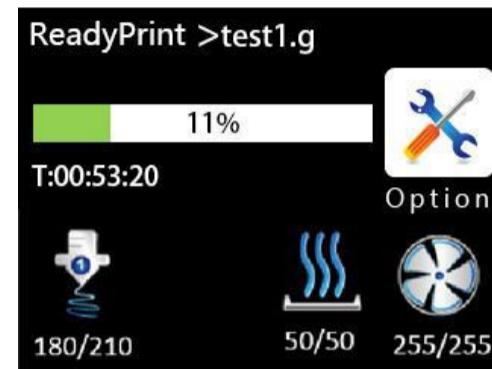
### 3.14. "ChooseFile" Interface

File : bmp_ file.bin Directory : bmp_dir.bin			
	Last page : bmp_ pageUp.bin	Next page : bmp_ page Down.bin	back: bmp_ return.bin



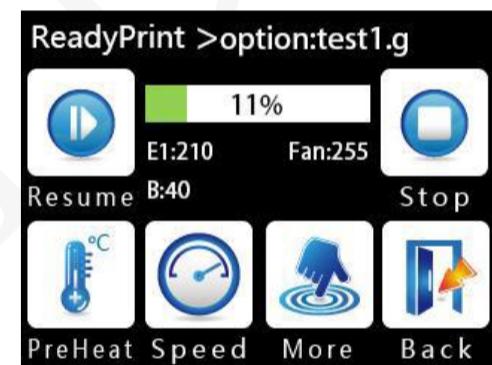
### 3.15. "Printing" Interface

			option: bmp_menu.bin
E1: bmp_ extru1_ no_ words. bin	E2: bmp_extr u2_ no_words. bin	bed: bmp_bed_ no_words. bin	fan: bmp_fan_ no_words.bin fan move: bmp_fan_ move.bin



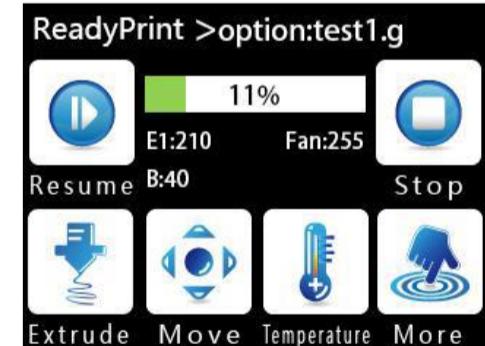
### 3.16. "Operate" Interface

pause: bmp_paus e.bin			stop: bmp_stop.bin
bmp_ temp.bin	bmp_ speed.bin	move: bmp_ more.bin	bmp_ return.bin



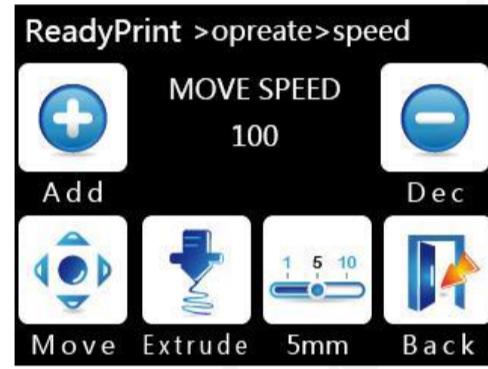
### 3.17. "Pause" Interface

bmp_ resume.bin			stop: bmp_stop.bin
bmp_ extract.bin	bmp_ mov.bin	bmp_ temp.bin	move: bmp_ more.bin



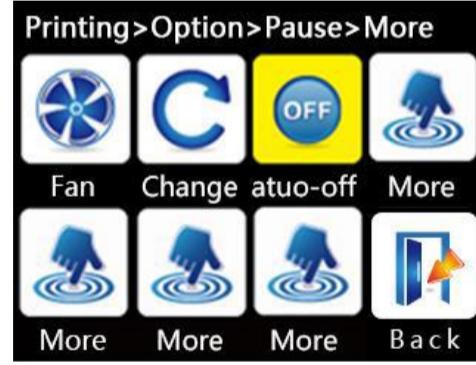
### 3.18. "Speed" Interface

bmp_Add. bin			bmp_Dec.bin
move : no selection : bmp_mov .bin selected : bmp_mov _sel.bin	extruct : no selection : bmp_extruc t.bin selected : bmp_extruc t_sel.bin	Move step : 1mm : bmp_step1 _mm.bin 5mm : bmp_step5 _mm.bin 10mm : bmp_step1 0_mm.bin	back : bmp_return.bin



### 3.19. "ReadyPrint>Operate>Pause>More" Interface

bmp_f an.bin	bmp_fila mentcha nge.bin	Auto close: selected : bmp_auto_off.bin  no selection : bmp_manual_off.bin	bmp_morefunc 1.bin
bmp_ moref unc2.b in	bmp_mo refunc3.b in	bmp_morefunc4.bin	back: bmp_return.bin



4. The hexadecimal value for the common color

	0xFFFF80
	0x80FFFF
	0x008000
	0x000080
	0x800000
	0x008080
	0x000000
	0xFFFFFFF

	0xFF0000
	0x00FF00
	0x0000FF
	0x00FFFF
	0xFF8080
	0x80FF80
	0x8080FF
	0xFFFF00

## IX. Assurance

1. Power test before delivery.
2. Ensure the normal use before delivery.
3. Any problems you can contact Miss Zhong:king@makerbase.com.cn