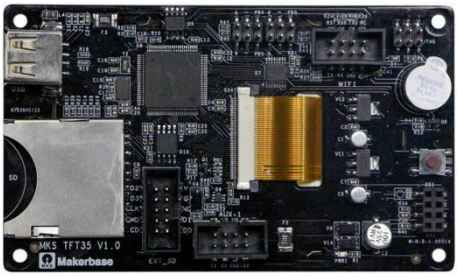
Ⅰ.Overview

MKS TFT3.5 is a product developed by MKS to meet market demand.It uses the CORTEX-M4 main control chip, 168M frequency, the configuration 3.5 inch display screen, operation interface is clearer and concise.Firmware can be easily upgraded by SD card and user interface can be customized.It is able to switch 7 languages online, preview Gcode model pictures.It is suitable to manufacturers who mass production of 3D printers.



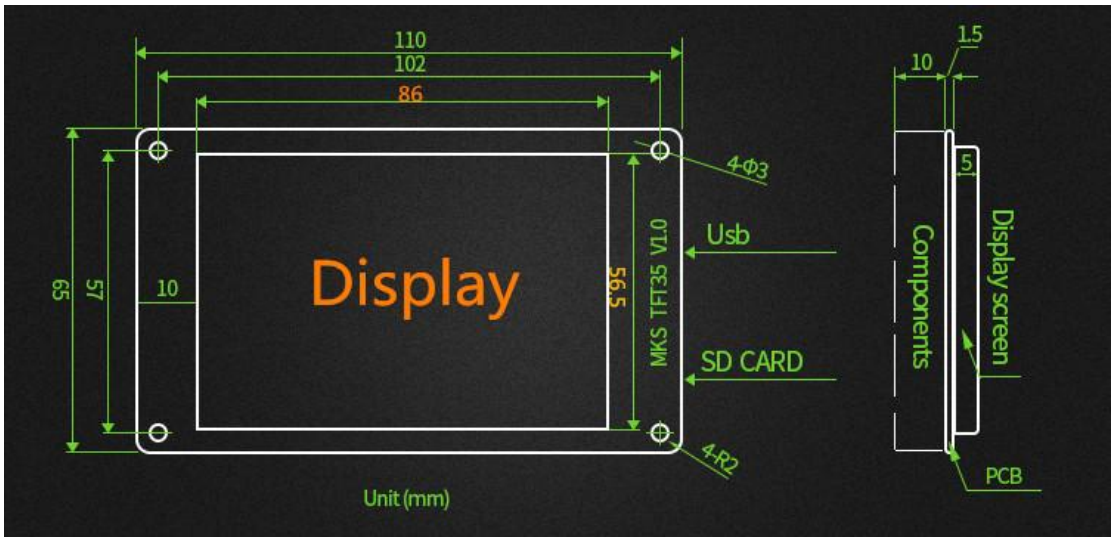
Ⅱ Features

1.Support 7 Languages Online switching.
2.Support Preview File Model and show model picture in print.
3.Use CORTEX-M4 main control chip, 168M frequency,3.5-inch display with higher sharpness.
4.Use 3.5-inch TFT touch screen, simple operation interface, high sensitivity.
5.Support wifi,it can be controled by app or web.Mobile app supports Android, iOS system,with two versions in Chinese and English.
6.Upgrade configuration firmware by sd card, simple and convenient operation.
7.Boot logo and all buttons and other interfaces can be designed by yourself;A maximum of 13 directive functions can be customized.
8.Support multiple functions,such as Breakpoints recovery function,filament detecting function,save the gcode data with power off function,auto off after print finish function.
9.Support for Marlin firmware, Repetier firmware, Smoothieware firmware.
10.Gcode Print to support Chinese filename.

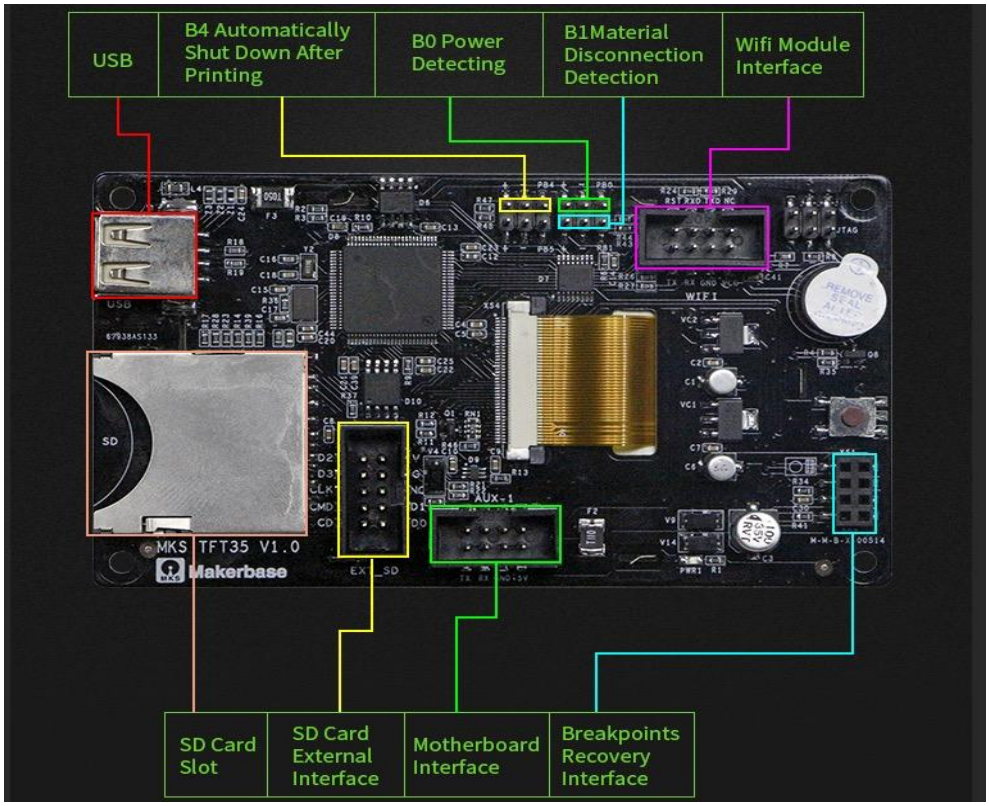
Ⅲ.Port Instructions

3.1 MKS TFT3.5 Front

3.2 MKS TFT3.5 Installation Dimensional Drawing

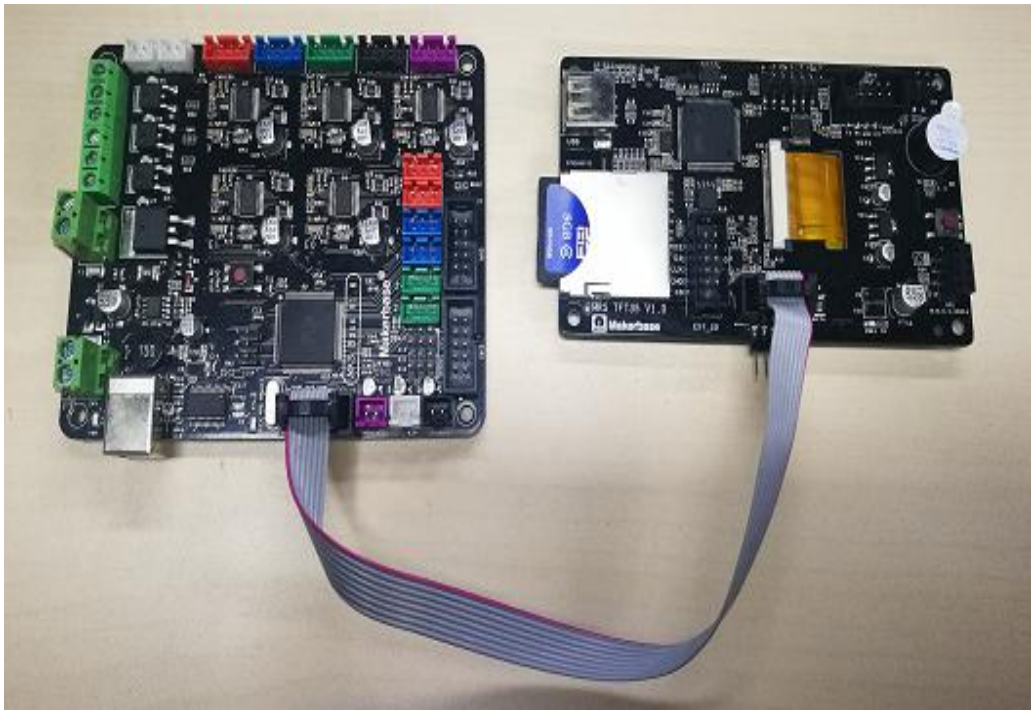


3.3 System connection diagram



3.4 connection with motherboard（Taking MKS BASE V1.6 as an example，connect the motherboard socket AUX-1 with the

TFT 35aux-1 socket）



Ⅳ.Firmware Upgrade Instructions

The factory firmware is up to date, so no updates are required.

4.1 The ways to get the MKS TFT35 Latest Firmware.

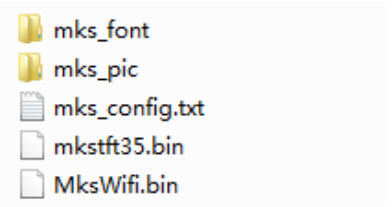
- Get firmware from customer service or technician
- Download the firmware from the makerbase discussion group.

4.2 The methods for updating the firmware

4.2.1 Copy the latest upgrade to the SD card root directory, including:

① Mks_font
② Mks_pic
③ Mks_config.txt
④ Mks_tft35.bin
⑤ Mks_WiFI.bin

As figure



Attention:Do not modify file names.

No need to copy mkswifi.bin without WiFi module.

4.2.2 Plug the SD card into the motherboard and power on,hear drops ~ ~ A short sound, touch screen display update process, and so about 30S after the completion of the update.

4.2.3 You can click” Settings--about” on the touch screen , to view current firmware information.

4.2.4 Advice: After the update is complete, delete the pictures and Fonts folder, avoid the next time to update the pictures and fonts.

Ⅴ.Function parameter Configuration

5.1 Pwer-on settings（Important, must be set）

```
#-----------------------------------------------------------------
#########  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 (9600:1; 57600:2; 115200:3; 250000:4)
>cfg_baud_rate:4

#multi-language(enable:1, disable:0)
>cfg_multiple_language:1

#languages setting(simplified (simplified Chinese:1; traditional Chinese:2; English:3; Russian:4; Spanish:5;French:6;Italian:7).
#This configuration is valid when "cfg_multiple_language" is disabled.
>cfg_language_type:3

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

#enable heated bed(yes:1; no: 0)
>cfg_custom_bed_flag:1

#the max target temp of extruder and heated bed
>cfg_max_sprayer_temperature:270
>cfg_max_hotbed_temperature:150

#pause position (-1 is invalid; Z-axis is relative position)
>cfg_XPOS:-1
>cfg_YPOS:-1
>cfg_ZADD:10
```

Attention：1.The baud rate in the configuration file must be the same as the motherboard baud rate, so that you can communicate.

2.Because the touch screen is the use of serial communication, to avoid conflicts with the USB .When connecting to the touchscreen, it is best not to connect the USB port on the motherboard.Similarly, when burning the firmware to the motherboard, it is best to unplug the touchscreen connector.

5.2 Multiple language Settings

Currently, languages can support 7 national languages, 1: Simplified Chinese, 2: Traditional Chinese, 3: English; 4: Russian; 5: Spanish, 6: French, 7: Italian.

1.The language switch mode is configured to 1 , can switch 7 languages at will in setting the "Language option.The following figure:

```
#multi-language(enable:1, disable:0)
>cfg_multiple_language:1
```

2.If the user does not like the factory default font, you can configure the language switch to 0 (the first step), which requires the second step to set the title language (the font of the title can only be default and 7), but the default icon will not display text below. You need to customize the icon and text to personalize the icon and font (that is, text and icons in the same frame, custom methods refer to the following steps: TFT touch screen user interface settings)

```
#multi-language(enable:1, disable:0)
>cfg_multiple_language:0

#languages setting(simplified (simplified Chinese:1; traditional Chinese:2; English:3; Russian:4; Spanish:5;French:6;Italian:7).
#This configuration is valid when "cfg_multiple_language" is disabled.
>cfg_language_type:2
```

5.3 Automatic Leveling and Manual leveling

1.Equipped with a leveling device can be selected in the configuration file automatic leveling (the position of the arrow is configured to 1), in the Touch screen settings interface can be adjusted leveling.Attention:For motherboards using the smoothie firmware, select the command to send as G32, as shown below:

```
############  Leveling Function  ########################################

#leveling mode(manual:0; auto:1; conceal leveling button:2)
>cfg_leveling_mode:1

#the command of auto leveling (G29 is available for Marlin.While G32 is for  Repetier and Smoothieware)
>cfg_auto_leveling_cmd:G28;G29;
```

2.Manual leveling can be used on the general model structure (MB, I3, etc.), set in the configuration file needs to be in the hot bed leveling the three point leveling, four point leveling or five point leveling, the following figure:

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

5.4 Filament Change Function

Filament Change Function, so that you more convenient to replace the supplies, you can also pause in the printing point after the use of the feed function. The extrusion head rotation speed and minimum temperature can be configured in the configuration file, as shown in the following figure:

```
#########  Filament Change Function  ###############################

#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_load_limit_temperature:200


#-------------------------------------------------------------------------
```

5.5 Breakpoints recovery

When you spend most of your time printing a model, the careless error operation causes the print to stop, but does not want to waste the printed model. Then you can use the breakpoint to continue to play the function, save your beloved model. The following illustration requires that you follow these steps

1.First click “Preheat”, the extrusion head and hot bed target temperature set (no hot bed can ignore the hot bed target temperature).as Figure 1

2.When the temperature reaches the target temperature, click “homing”, choose to homing, so that the axes are back to home point.(Attention:Model printing failure to select Breakpoints recovery the operation between the Midway, if there is a power

outage must be homing operation, such as continuous electricity can not return to home point operation).as Figure 2

3.After the axis back to home points, move the z axis will touch the mouth to stop printing of the layer, such as Figure 3, Figure 4, the time to test eyesight (can be selected in the configuration file to allow error, the following figure

```
#set error range of Z-axis on breakpoints recovery
>cfg_breakpoint_z_error:0.2
```

4.Point setting, click on the breakpoint recovery and select the file to be printed on the breakpoint recovery, as shown in Figure 5, figure 6.

5.After you select the file, wait for it to print.as Figure 7.

(After selecting the model, the larger the model, the more complex it is, the longer it waits here.)

The steps of breakpoints recovery:

1

2

3

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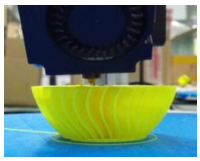


4

5.6 Save the gcode data with power off

In the printing process into a paused state,when without anyone watching you can directly shut down, the next time you can start from the pause to continue printing.

(Attention:Remember to delete the updated file in the SD card, to avoid the reboot and update the firmware, affect this feature).

5.7 Power off recovery

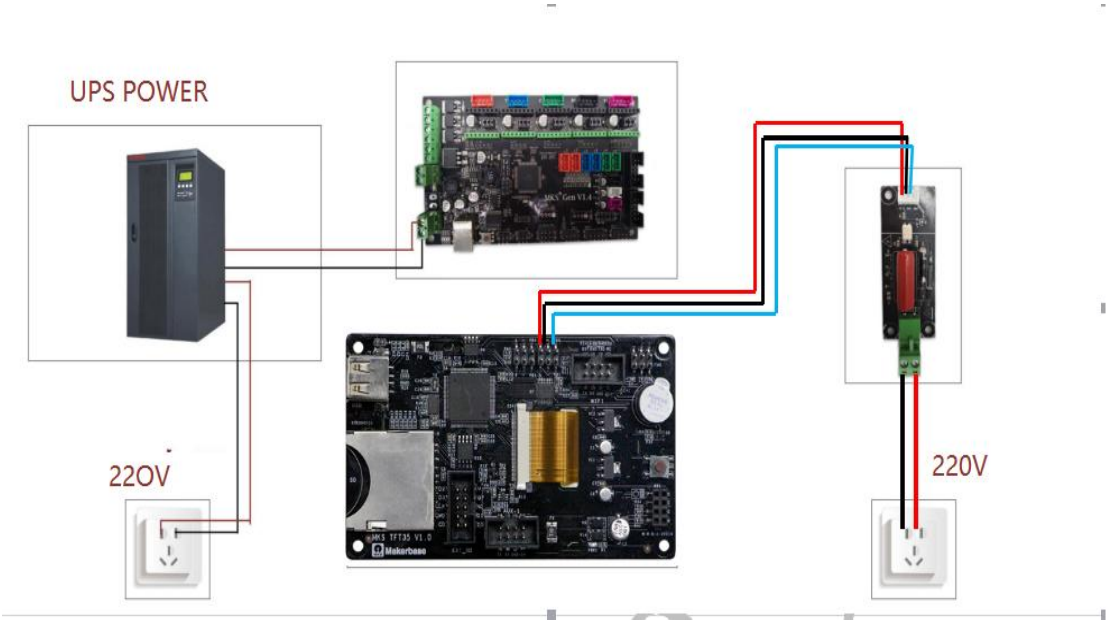
1. No UPS Power

1.1 A sudden power outage during the printing process, machine can continue to print from the power off. (due to power failure can not drive the motor, the print head will still remain on the model, may cause defects in the model, if the need for more complete power off processing, the need for power detection module and UPS).

2. Have UPS power

2.1 Power detecting module signal line s connection PB0, negative positive connection -and + two pins blow the PBO.

2.2 When the system loses power, the Power detection module informs the touch screen to enter the suspend printing state, UPS power supply. Leave the print head out of the model.

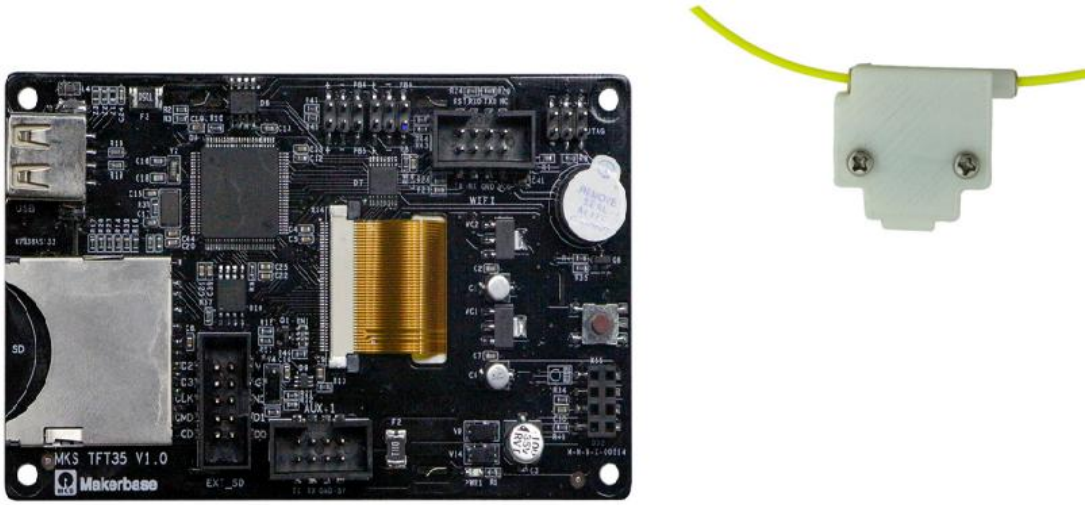


MKS TFT35 Pin Reference system connection diagram

5.8 Filament detecting

The end of the break detection switch is connected to the PB1, the other end is connected to the PB1 under the"-"pin, can be in the configuration file to select a high level of effective or low level effective, the following figure

```
#set PB1 signal (high level:1; low level:0)
>cfg_PB1_trigger_Level:0
```

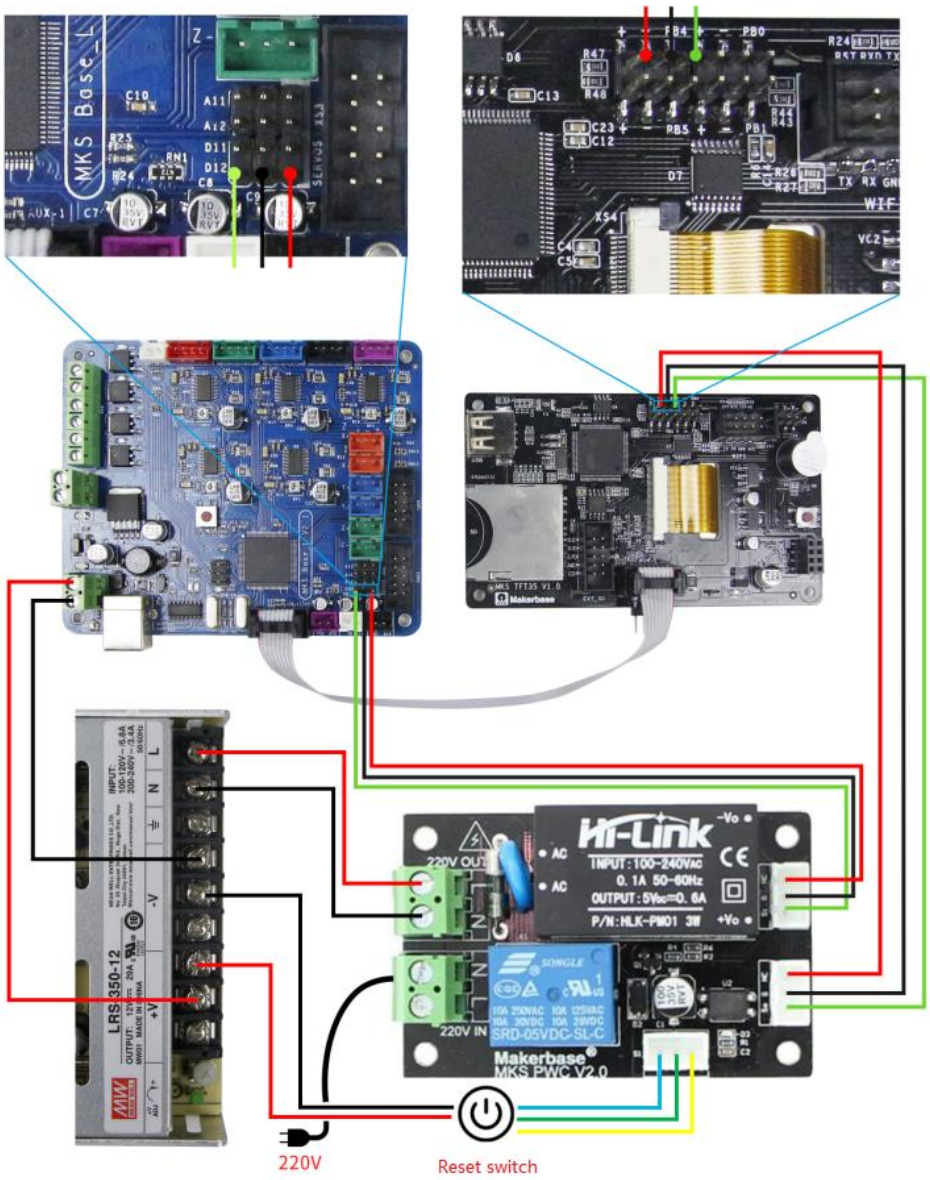


MKS TFT35 Pin Reference system connection diagram

5.9 Auto off after print finish function

Open the auto off after print finish function in the configuration file, cooperate with PWC to complete the shutdown module, you can use the shutdown function after playing.

```
#enable auto off after print finish function (no:0; Yes:1)
>cfg_print_finish_close_Machine:1
```



MKS TFT35 Pin Reference system connection diagram

(Attention:can not connect insteadly with NEUTRAL and LIVE)

5.10 Preview Print Model features

There are two ways to implement a model preview MKS TFT3.5

NO.1 The model that is sliced out using the MKS host slicing software developed by the makerbase has a preview function, as figure.(MKS Host installation Information and instructions can be consulted customer service, technical support to obtain, or download in the makerbase group.)

NO.2. The cura slicing software installs the MKS Plugin (plug-in) developed by the makerbase, its sliced model also has the preview function, the preview effect is shown in the following figure.(MKS plugin installation Information and instructions can be consulted customer service, technical support to obtain, or download in the makerbase group.)

Ⅵ. The network printing function

MKS TFT35 with MKS TFT-wifi can realize the network printing function.The operation steps of the network printing function please refer to MKS Cloud app manual. Information can be consulted customer service, technical support to obtain, or download in the makerbase group.

Ⅶ. TFT touch Screen User interface configuration

Conventions:

If the customer needs to customize the display picture of the touch screen, the first should follow the following conventions:

1. Scope of customization:

A. Power-on interface logo;

B. Screen background color (see figure "1" below);

C. Title text color (see figure "2" below);
D. Status bar background color and font color (see figure "3" below);
E. file directory button background color and font color (see figure below "4");
F. Universal button Background color and text color (see figure below "5");
G. Status button background color and font color (see figure "6" below);
H. " Returns the key background color and font color (see figure "7" below);
I. Select the button background color and font color (see figure "8" below);

1

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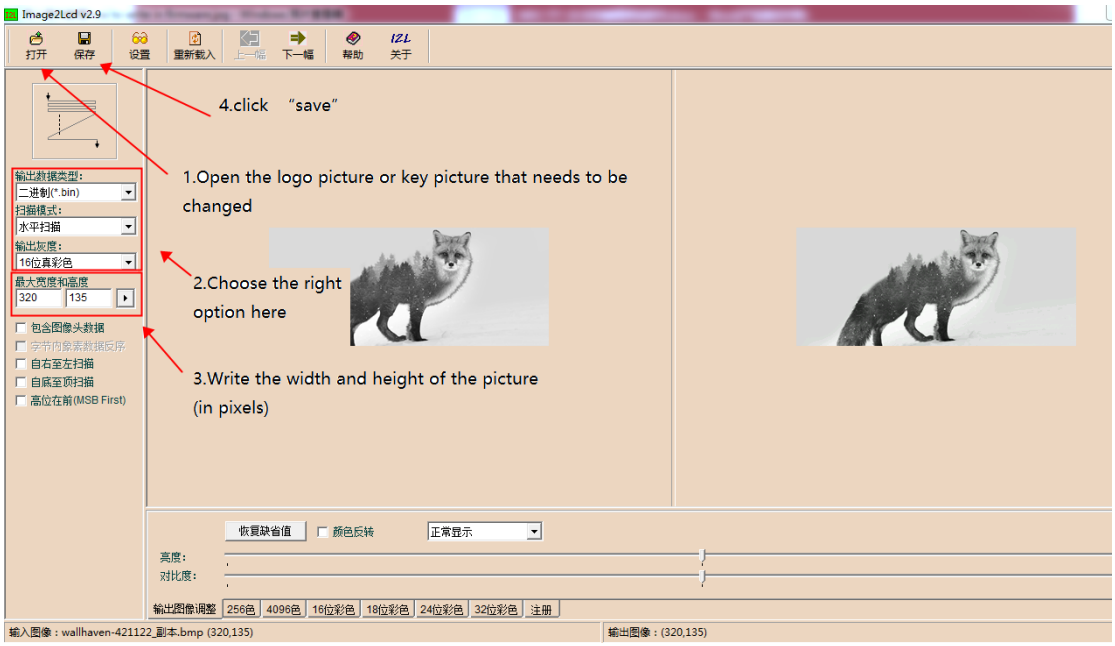
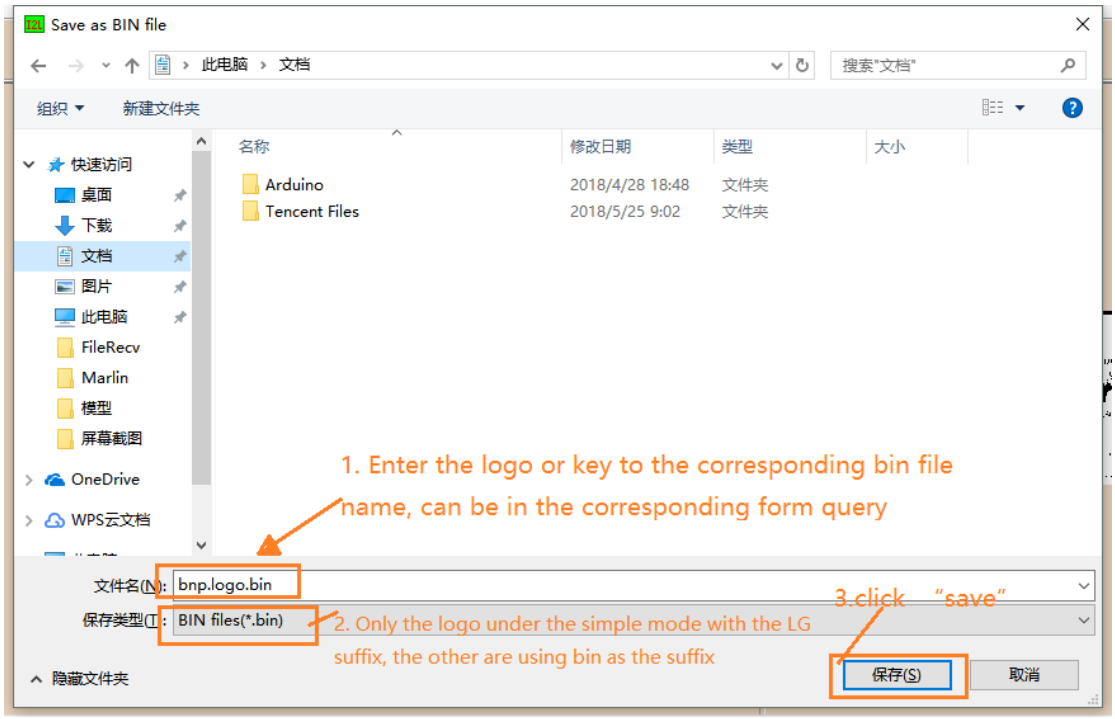
4

J. dialog box button background color and font color (see figure "9" below);
2. Custom boot logo picture, 16DPP, wide =480 pixel, high =320 pixel;
3. Customized button picture, 16DPP, wide =117 pixel, high =140 pixel;
4. The customized picture name must be in accordance with the appendix name;
5. Custom color value is 16, in accordance with 3 primary colors blue, green, red order;
6. Customize the "More" menu function button, can be customized up to 7 function buttons;
Steps
1.1 Preparation Tools

- IMG2LCD software (cracked version of no watermark, ask customer service to obtain)
- corresponding to the. bmp suffix name of the picture, pixels to correspond, do not know the pixel, please see above.
- You can ask the customer to obtain the key source AI file to make two modifications.





Copy the saved files to the Mks_pic folder

logo and key picture naming

Picture naming rules (note that some pictures are duplicated, just provide one)

1. Boot Cover logo

bmp_logo.bin

2. "Ready to print" interface:

preheat: bmp_preHeat.bin	extruct: bmp_extruct.bin	move: bmp_mov.bin	zero: bmp_zero.bin
leveing: bmp_leveling.bin	filamentchange: bmp_filamentchange.bin	more: bmp_more.bin	return: bmp_return.bin

3. "Preheat" interface:

add: bmp_Add.bin			dec: bmp_Dec.bin
Preheat object: Hot bed: bmp_bed.bin extru1: bmp_extru1.bin extru2: bmp_extru2.b	step: step1: bmp_step1_degree.bin step5: bmp_step5_degree.bin step10: bmp_step10_	close: bmp_speed0.bin	return: bmp_return.bin

4. "Extrude" interface

in: bmp_in.bin			out: bmp_out.bin
extru(E): E1: bmp_extru1.bin E2: bmp_extru2.bin	step: 1mm: bmp_step1_mm.bin 5mm: bmp_step5_mm.bin 10mm: bmp_step10_mm.bin	speed_slow: bmp_speed_slow.bin speed_normal: bmp_speed_normal.bin speed_high: bmp_speed_high.bin	return: bmp_return.bin

5. Move interface:

X+: bmp_xAdd.bin	Y+: bmp_yAdd.bin	Z+: bmp_zAdd.bin	步进: 0.1mm : bmp_step_move0.1.bin 1mm: bmp_step_move1.bin 10mm: _step_move10.bin bmp
X-: bmp_xDec.bin	Y-: bmp_yDec.bin	Z-: bmp_zDec.bin	return: bmp_return.bin

6.home interface

(Home): 	X: bmp_zer	Y: bmp_zer	Z: bmp_zeroZ.bi
			(Back): bmp_return.bin

7.Language interface

simplified_cn: bmp_simplified_cn.bin simplified_cn: bmp_simplified_cn_sel.bin	_traditional_cn.: bmp_traditional_cn.bin traditional_cn.: bmp_traditional_cn_sel.bin	english : bmp_english.bin english : bmp_english_sel.bin	russian: bmp_russian.bin russian : bmp_russian_sel.bin
spanish: bmp_spanish.bin spanish: bmp_spanish_sel.bin	french: bmp_french.bin french: bmp_french_sel.bin	_italy: bmp_italy.bin italy: bmp_italy_sel.bin	（Back）: bmp_return.bin

8. Manual leveling "interface

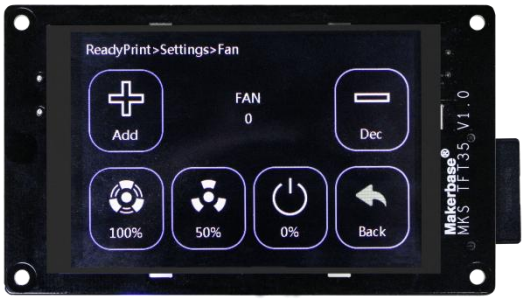
leveling1: bmp_leveling1.bin	leveling2: bmp_leveling2.bin	leveling3: bmp_leveling3.bin	leveling4: bmp_leveling4.bin
leveling5: bmp_leveling5.bin			return: bmp_return.bin

9. Setting interface

fileSys: bmp_fileSys.bin	wifi: bmp_wifi.bin	fan: bmp_fan.bin	about: bmp_about.bin
breakpoint: bmp_breakpoint.bin		language: bmp_language.bin	return: bmp_return.bin

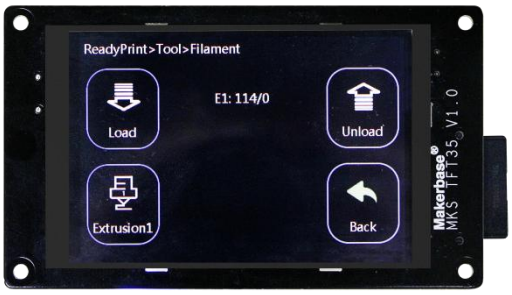
10. Fan interface

Add: bmp_Add.bin			Dec: bmp_Dec.bin
speed 255: bmp_speed255.bin	speed127: bmp_speed127.bin	speed0: bmp_speed0.bin	return: bmp_return.bin



11. Filament change interface

in: bmp_in.bin			out: bmp_out.bin
extru1: bmp_extru1.bin extru2: bmp_extru2.bin			return: bmp_return.bin



12.More interface

Custom1: bmp_ custom1. bin	Custom2: bmp_ custom2. bin	Custom3: bmp_ custom3. bin	Custom4: bmp_ custom4. bin
Custom5: bmp_ custom5. bin	Custom6: bmp_ custom6. bin	Custom7: bmp_ custom7. bin	return: bmp_ return. bin

13.Select the file interface

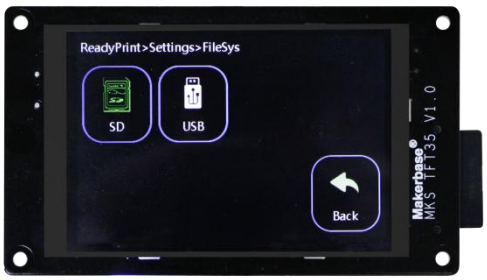
file: bmp_ file.bin			pageup: bmp_pageUp.bin
			pagedown: bmp_pageDown.bin
direct: bmp_dir.bin			return: bmp_return.bin

14. Printing interface

pause: bmp_paus e.bin	stop: bmp_stop. bin	menu: bmp_menu.bin

15. File system interface

SD card: bmp_sd.bin SD card: bmp_sd_sel.bin	U disk: bmp_usb.bin U disk: bmp_usb_sel.bin		
			Return: bmp_return.bin



16. Variable Speed interface

add: bmp_Add.bin			dec: bmp_Dec.bin
move: bmp_mov.bin Move sel: bmp_mov_sel.bin	extruct: bmp_extruct.bin extruct_sel: bmp_extruct_sel.bin	step: 1mm: bmp_step1_mm.bin 5mm: bmp_step5_mm.bin 10mm: bmp_step10_mm.bin	return: bmp_return.bin

Common color corresponding to the hexadecimal value

Blue		0x0000FF
Green		0x00FF00
Red		0xFF0000
Yellow		0xFFFF00
Light blue		0xE1FFFF
Light green		0x80FF80
Light red		0xFF8080
Cyan		0x00FFFF
Light Cyan		0x80FFFF
Light Yellow		0xFFFF80
Dark Green		0x008000
Dark Red		0x800000
Dark Blue		0x000080
Dark Yellow		0x808000
Black		0x000000
White		0xFFFFFF