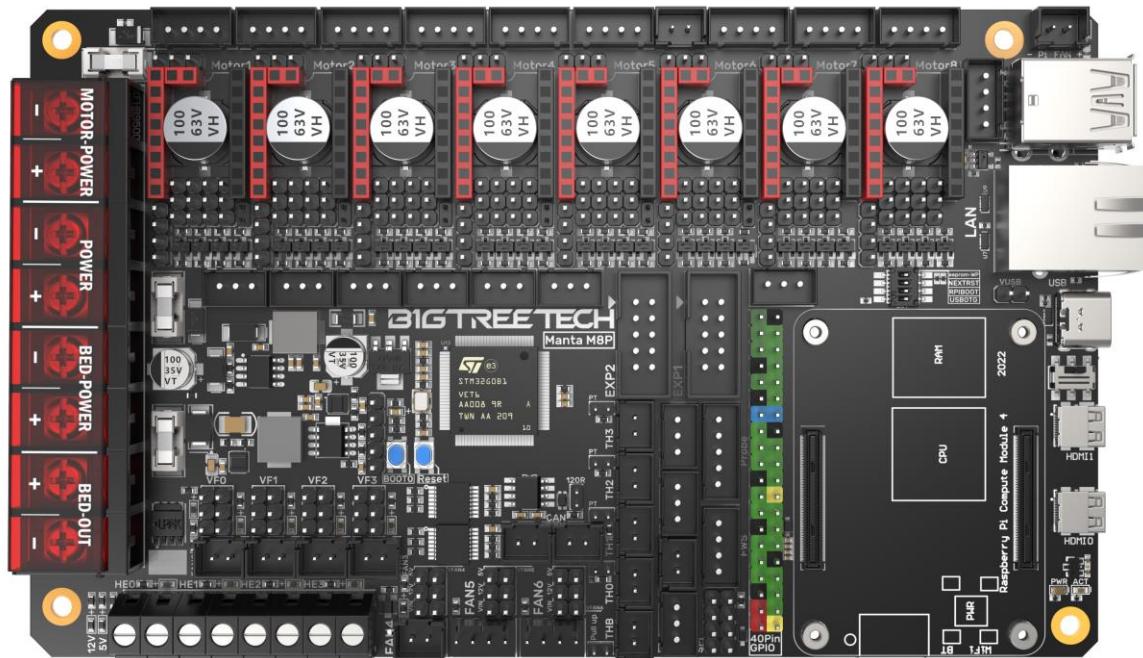


# BIGTREETECH MANTA M8P V1.0&V1.1

## User Manual



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## Revision History

Revision	Description	Date
01.00	First Draft	2022/06/18
01.01	Delete 31865	2022/08/04
01.02	Added an introduction to V1.1	2022/09/30

## 1 Brief Introduction

BIGTREETECH MANTA M8P is a 32-bit printer motherboard developed by the 3D printing team of Shenzhen Big Tree Technology Co., Ltd. for Klipper firmware. You can simply plug in the core board to run the Klipper firmware, which greatly simplifies the connection between the motherboard and the Raspberry Pi, and saves a lot of space. Moreover, the BTB connector is designed to install CM4 or other solutions to solve the current expensive problem of CM4.

### 1.1 Main Features

1. Adopt 32-bit 64MHz ARM Cortex-M0+ series STM32G0B1VET6 as the main control chip;
2. The power chip, TPS5450-5A, supports DC12/24V power input. The output current of the chip is up to 5A, and the peak value can reach 6A, which perfectly supports the power supply of Raspberry Pi;
3. There is a BOOT button reserved on the motherboard, users can update the bootloader through DFU;
4. The thermistor part includes a protection circuit that protects the main control chip from the possibility of burning caused by leakage of the heated bed or heater cartridge;
5. 24V, 12V, and 5V voltages are available for CNC fans, eliminating the need for an external transformer module, thereby reducing the chance of damage to the motherboard due to improper operation;
6. The thermistor can select the pull-up resistor value through the jumper, in this way, it supports PT1000 without an external module, which is convenient for customers to DIY;
7. The MCU firmware can be updated via an SD card, or through Klipper's make flash command using DFU;
8. The motherboard and the core board use the BTB connection to allow using other solutions other than CM4;
9. On-board TMC-driver SPI and UART working modes, on-board DIAG function pins, can be used by simply plugging and unplugging the jumper cap;
10. Support filament runout detection, auto shutdown, BLTouch, RGB lights...
11. High efficiency MOSFET for less heat generation;
12. Adopt replaceable fuse for easy replacement;

13. Three-way four-wire fan interface is reserved, and can be used to connect the water cooling device;
14. The proximity switch interface is reserved, supports NPN and PNP types, (24V, 12V, 5V) voltage selection is available, common voltage selection with VFAN6;
15. Provide the SPI expansion interface to allow Klipper firmware users to connect an external acceleration sensor for acceleration compensation.

## 1.2 Basic Parameters

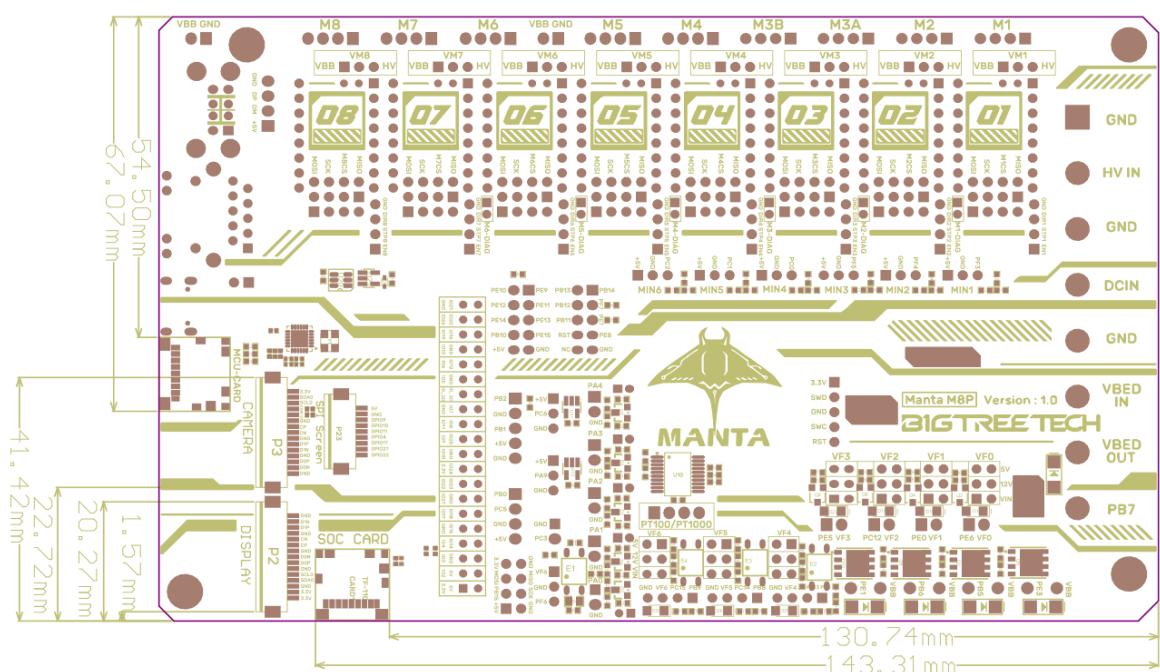
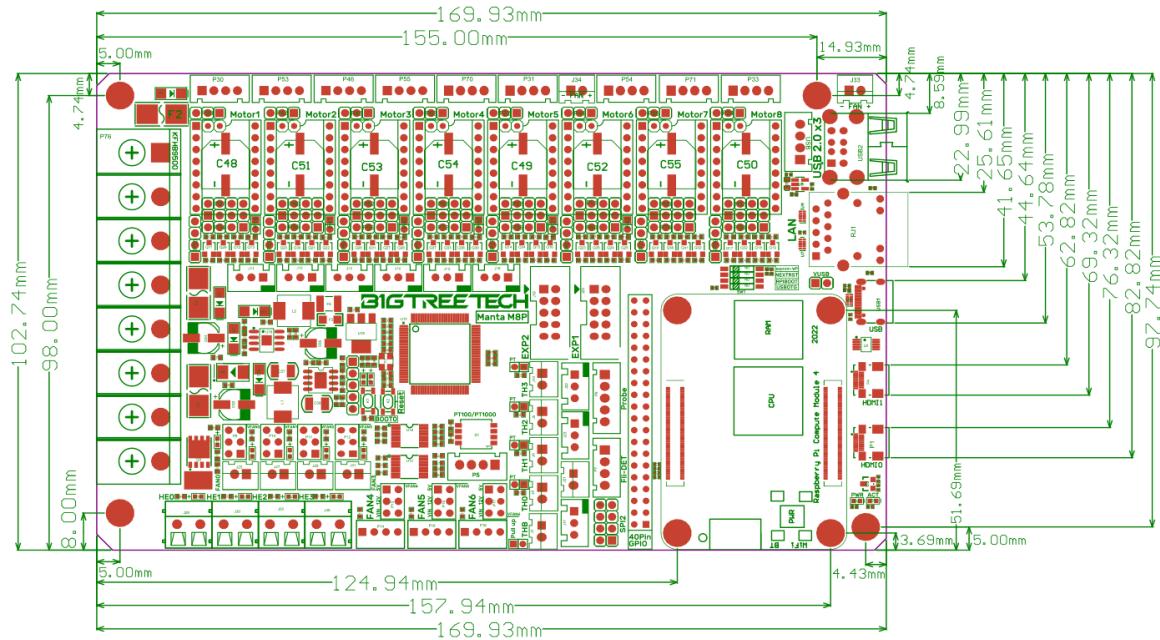
1. Product Size: 170 x 102.7mm, you can read more details here  
**BIGTREETECH MANTA M8P V1.0-SIZE-top.pdf**
2. Installation Size: Please read: **BIGTREETECH MANTA M8P V1.0-SIZE-top.pdf**
3. Microprocessor: ARM Cortex-M0+ STM32G0B1VET6 64MHz
4. Drive Input Voltage: VIN (12V/24V) Or HV( $\leqslant$ 56V)
5. Motherboard Input Voltage: VIN=DC12V or DC24V
6. Heated Bed Input Voltage: BED IN=DC12V or DC24V
7. Logic Voltage: DC3.3V
8. Heating Port: Heated Bed(HB), Heater Cartridge(HE0, HE1, HE2, HE3)
9. The maximum output current of the heated bed port: 10A, Peak Value: 12A
10. The maximum output current of the heater cartridge port: 5.5A, Peak Value: 6A
11. Fan Port: Two-wire CNC Fan (FAN0, FAN1, FAN2, FAN3), four-wire CNC Fan fan (FAN4, FAN5, FAN6), Always-on Fan (24V FAN x 2), among which the CNC Fan voltages are 5V, 12V, 24V optional
12. The maximum output current of the fan port: 1A, Peak Value: 1.5A
13. Total current for heater cartridge + driver + fan: <12A
14. Extended Interface: BLTouch(Servos, Probe), PS-ON, Fil-DET, RGBx2, SPI
15. Motor Driver: Support TMC5160, TMC2209, TMC2225, TMC2226, TMC2208, TMC2130, ST820, LV8729, DRV8825, A4988...
16. Driver Working Mode Support: SPI, UART, STEP/DIR

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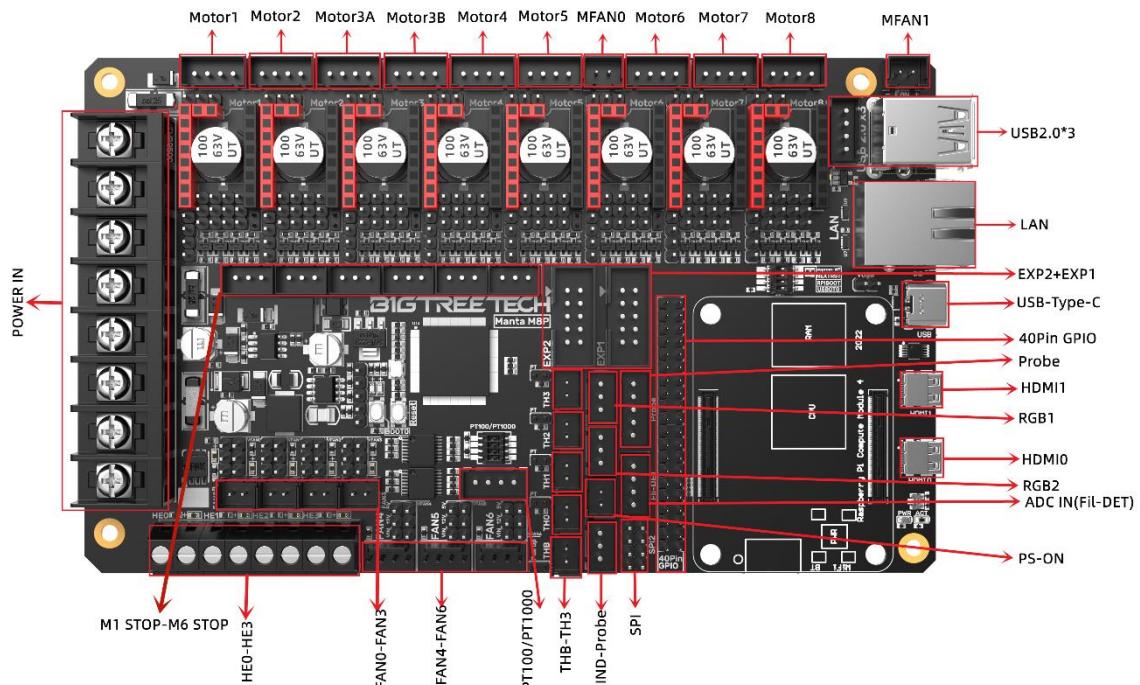
17. Motor Drive Interface: Motor1, Motor2, Motor3(dual motor interface), Motor4, Motor5, Motor6, Motor7, Motor8, a total of Eight
18. Temperature Sensor Interface: 5-way 100K NTC, of which 4-way 100K NTC and PT1000 are optional
19. Support Screen: SPI Touch Screen, LCD Screen
20. PC Communication Interface: Type-C
21. Functional Interface: USB 2.0 x 3, LAN, DSI, CSI, SPI, 40Pin-GPIO, HDMI0 and HDMI1, SOC-Card, MCU-Card
22. Support Machine Structure: Cartesian, Delta, Kossel, Ultimaker, CoreXY
23. Recommended Software: Cura, Simplify3D, Pronterface, Repetier-host, Makerware

## 1.3 Product Dimension

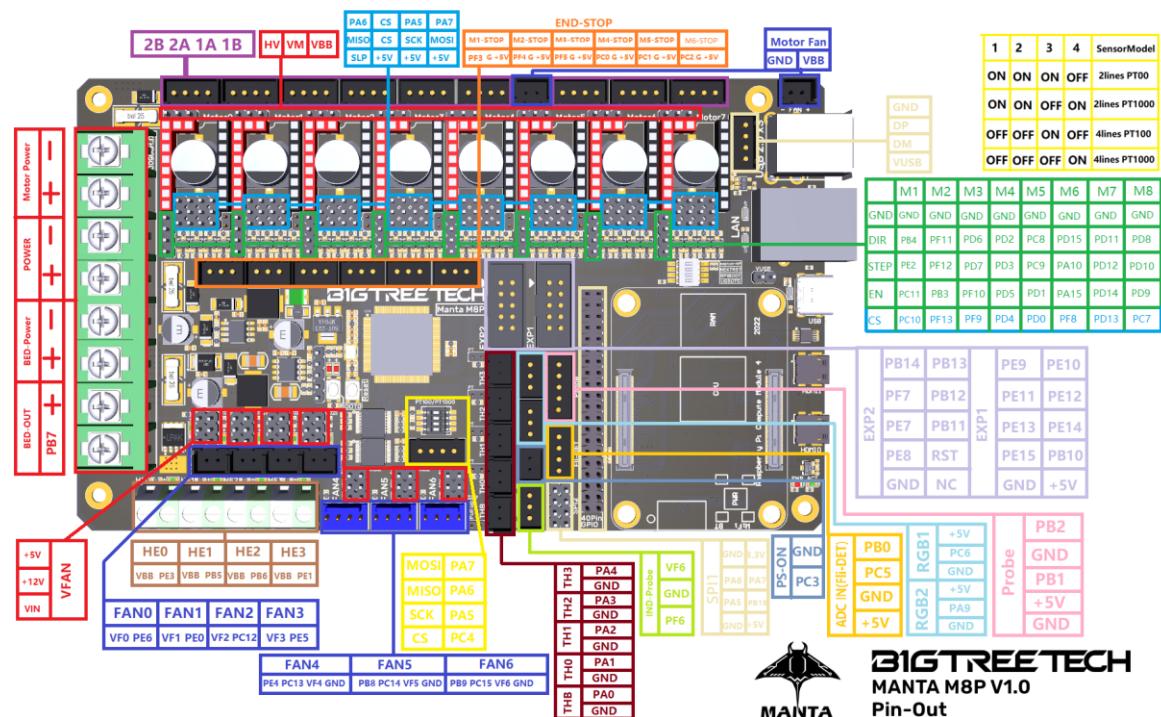


## 2 Peripheral Interface

## 2.1 Interface Diagram



## 2.2 Pin-out



## 3 Interface Instruction

### 3.1 USB Power Supply

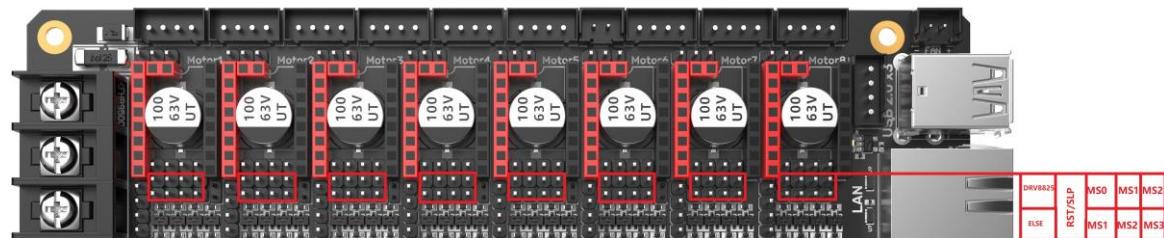
After the M8P motherboard is powered on, the D32 red light on the left side of the MCU will light up, indicating that the power supply is normal. The VUSB in the middle of the board is the power selection terminal. Only when using USB to supply power to the motherboard or need to supply power through USB, do you need to use the jumper to short it.



### 3.2 Stepper Motor Drive

#### 3.2.1 Normal STEP/DIR(STANDALONE) Mode

For example, A4988, DRV8825, LV8729, ST820...use the jumper cap to short MS0-MS2 according to the driver subdivision table.



Note: If using A4988 or DRV8825, RST and SLP must be shorted with jumper caps for normal operation.

Driver Chip	MS1	MS2	MS3	Subdivision	Excitation Mode
A4988 Max 16 Subdivisions 35V 2A	L	L	L	Full Step	2 Phase
	H	L	L	1/2	1-2 Phase
	L	H	L	1/4	W1-2 Phase
	H	H	L	1/8	2W1-2 Phase
	H	H	H	1/16	4W1-2 Phase
Driving Current Calculation Formula $R_s = 0.1\Omega$	$I_{TripMAX} = \frac{V_{REF}}{8 * R_s}$				

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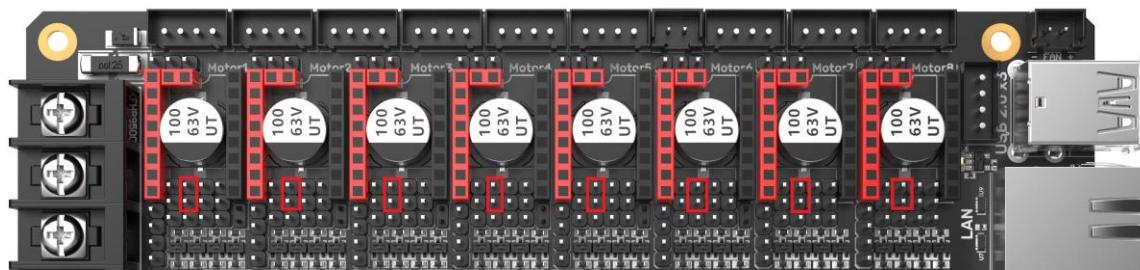
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Driver Chip	MD3	MD2	MD1	Subdivision	Excitation Mode
LV8729 Max 128 Subdivisions 36V 1.8A	L	L	L	Full Step	2 Phase
	L	L	H	1/2	1-2 Phase
	L	H	L	1/4	W1-2 Phase
	L	H	H	1/8	2W1-2 Phase
	H	L	L	1/16	4W1-2 Phase
	H	L	H	1/32	8W1-2 Phase
	H	H	L	1/64	16W1-2 Phase
	H	H	H	1/128	32W1-2 Phase
Driving Current Calculation Formula RF1=0.22Ω	$I_{OUT} = (V_{REF} / 5) / RF1$				

Driver Chip	MS3	MS2	MS1	Subdivision
ST820 Max 256 Subdivisions 45V 1.5A	L	L	L	Full Step
	L	L	H	1/2
	L	H	L	1/4
	L	H	H	1/8
	H	L	L	1/16
	H	L	H	1/32
	H	H	L	1/128
	H	H	H	1/256
Driving Current Calculation Formula Rs=0.15Ω	$I_{peak} = \frac{V_{REF} * V_{DD}}{5 * R_s}$			

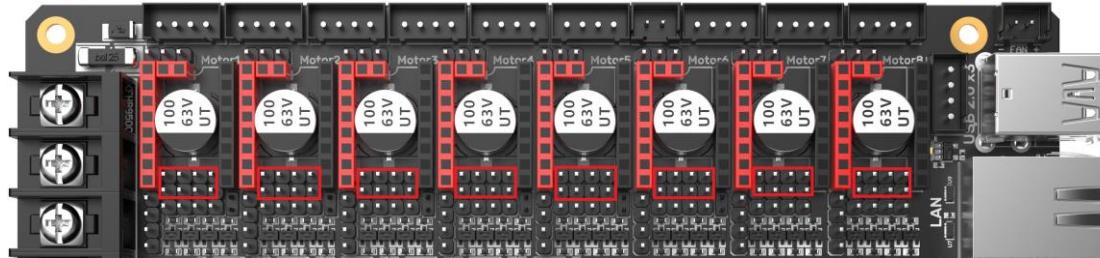
### 3.2.2 UART Mode of TMC Driver

For example, TMC2208, TMC2209, TMC2225... Use a jumper cap for each to connect the position of the red box in the figure, and the subdivision and driver current is set by firmware.



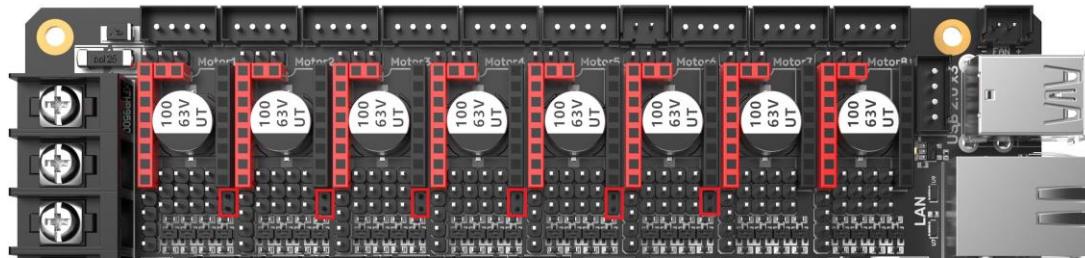
### 3.2.3 SPI Mode of TMC Driver

For example, TMC2130, TMC5160, TMC5161... Use 4 jumper caps for each to connect the position of the red box in the figure, and the subdivision and driver current is set by firmware.

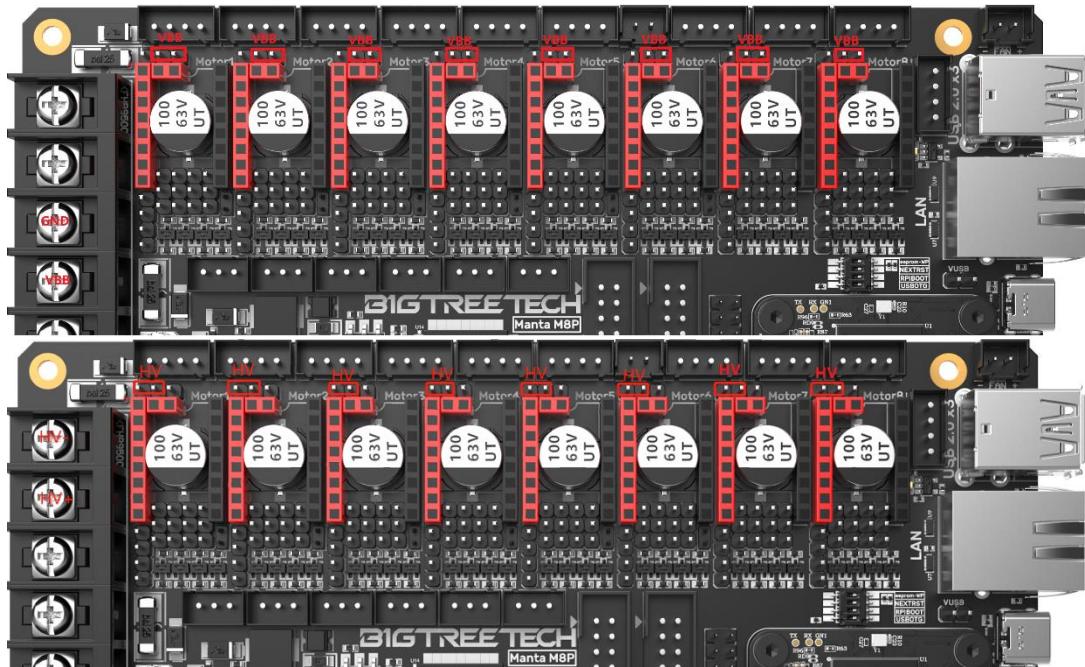


### 3.2.4 DIAG(Sensorless Homing) of TMC Driver

As shown in the figure, plug the jumper cap when using the Sensorless Homing function, and leave it unplugged when it is not used.

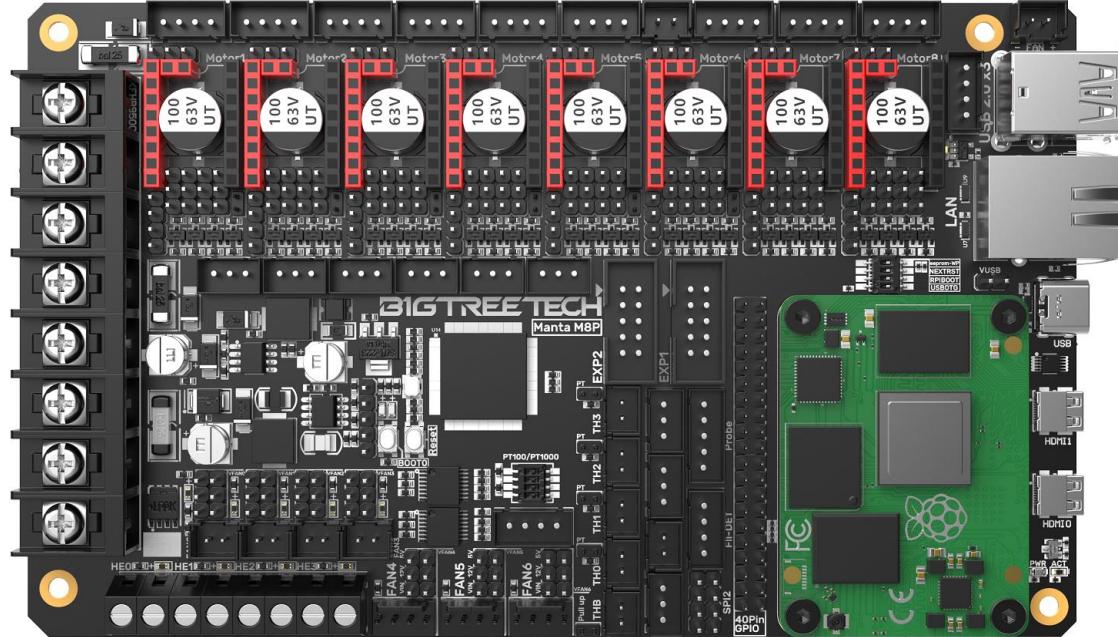


### 3.2.5 Selection of driving power supply for stepping motor

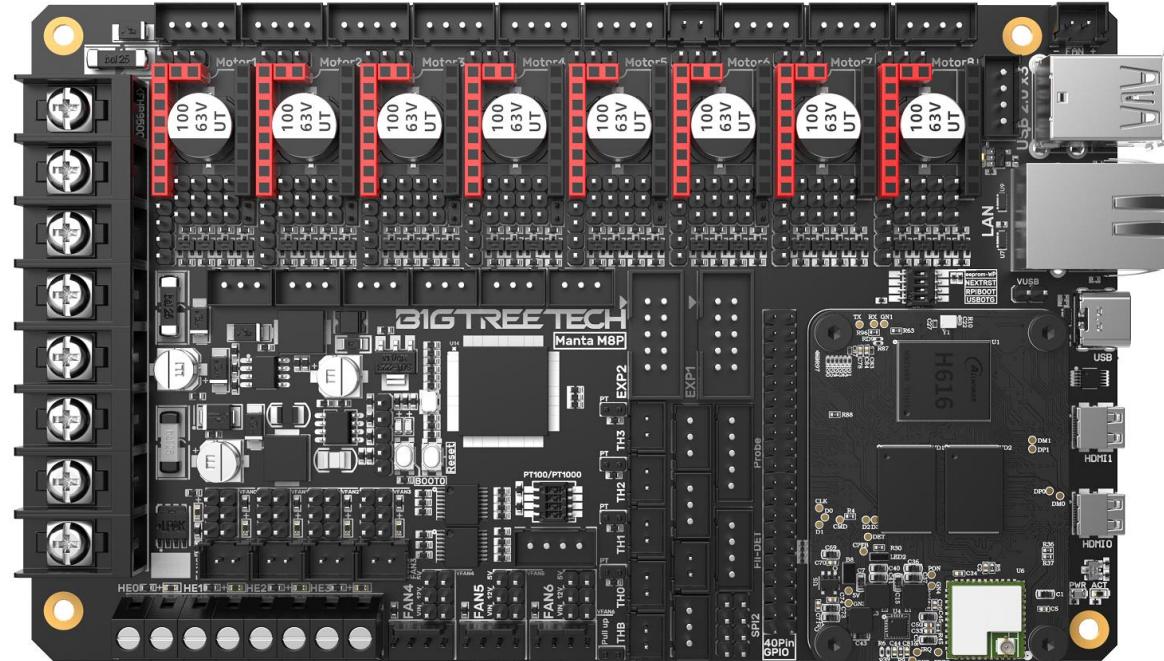


### 3.3 Installing the Core Board

M8P+CM4: Pay attention to the direction, as shown below.

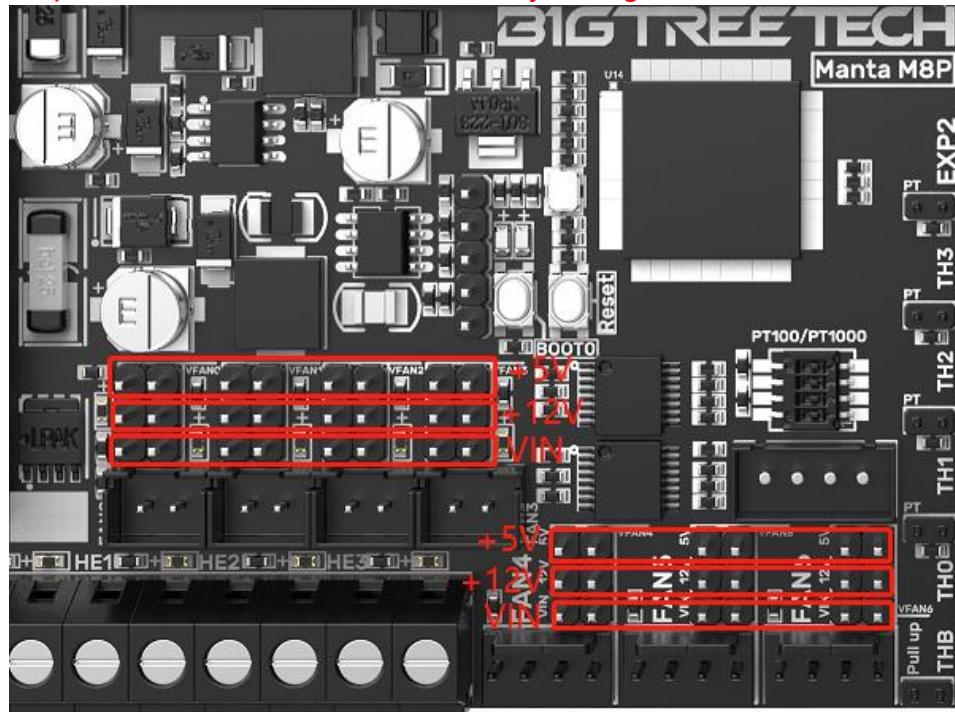


M8P+CB1: Pay attention to the direction, as shown below.



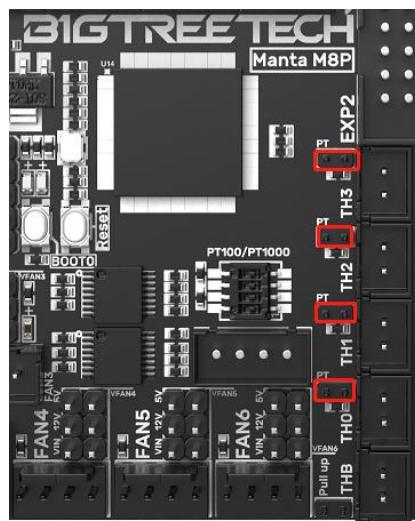
### 3.4 Voltage Selection of CNC Fans

Set the output voltage to 5V, 12V, or 24V with a jumper cap. Note: Please confirm the fan's operating voltage before choosing a voltage. Our company is not responsible for fan burnout caused by wrong selection.

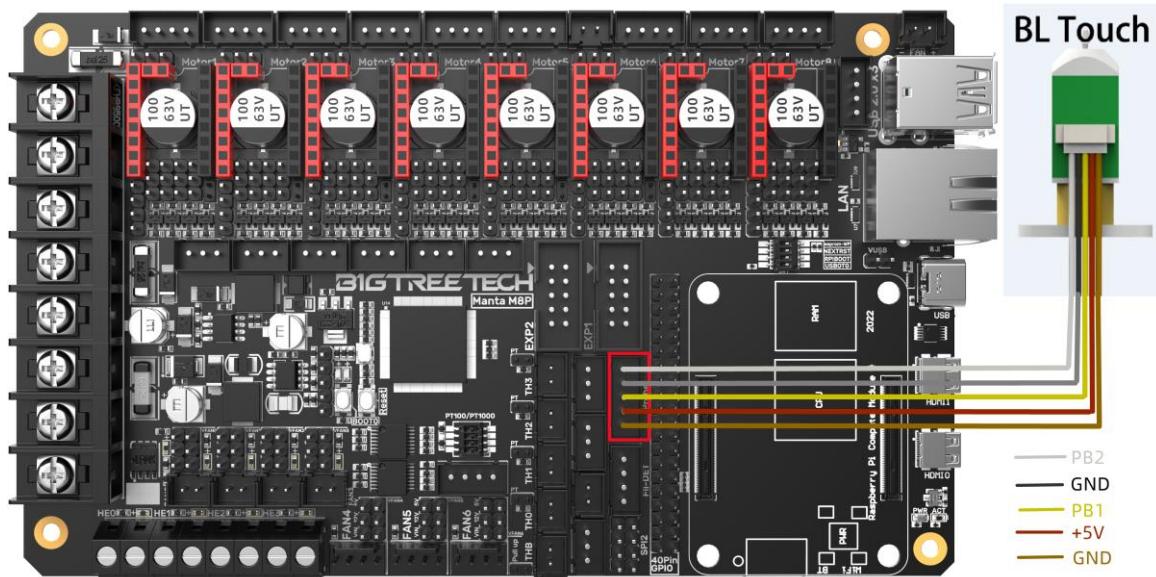


### 3.5 100K NTC or PT1000 Setting

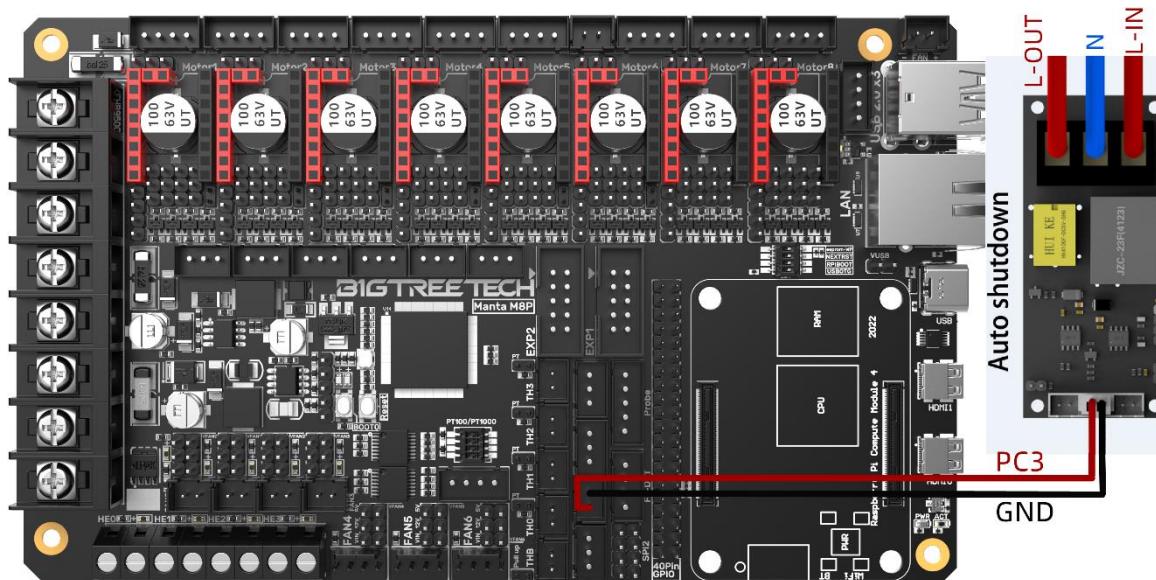
When using a 100K NTC thermistor, there is no need to insert the jumper cap, and the pull-up resistance of TH0-TH3 is 4.7K 0.1%. When using PT1000, you need to use a jumper cap to connect the two pins in the red box in the figure below and connect a 4.12K 0.1% resistor in parallel. At this time, the pull-up resistor of TH0-TH1 is 2.2K (Note: The temperature accuracy read out in this way will be far less accurate than that read out by MAX31865).



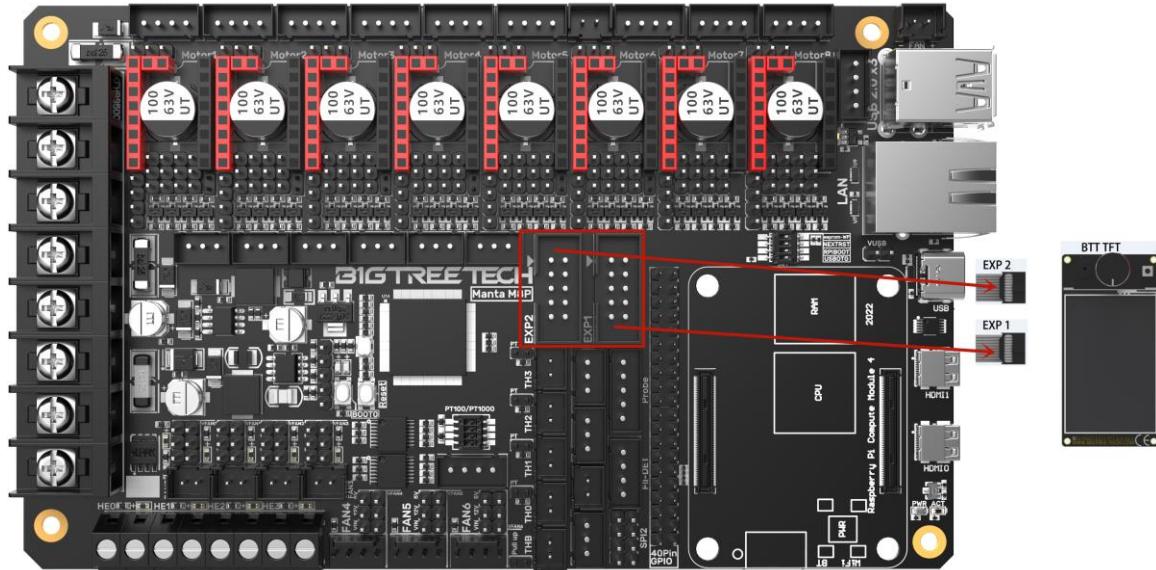
### 3.6 BLTouch Wiring



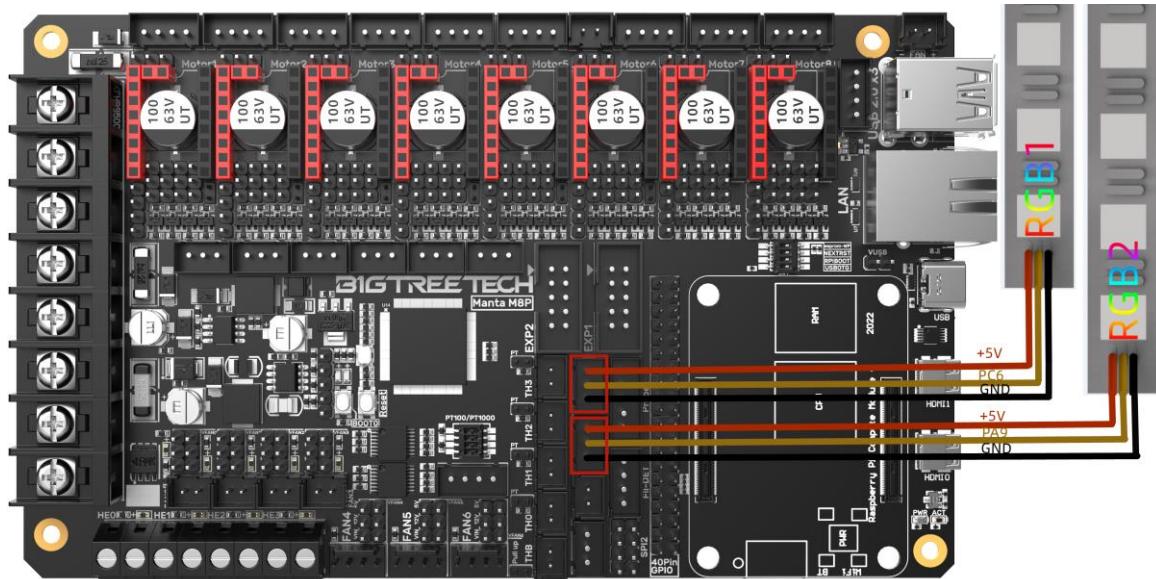
### 3.7 Auto Shutdown Module(Relay V1.2) Wiring



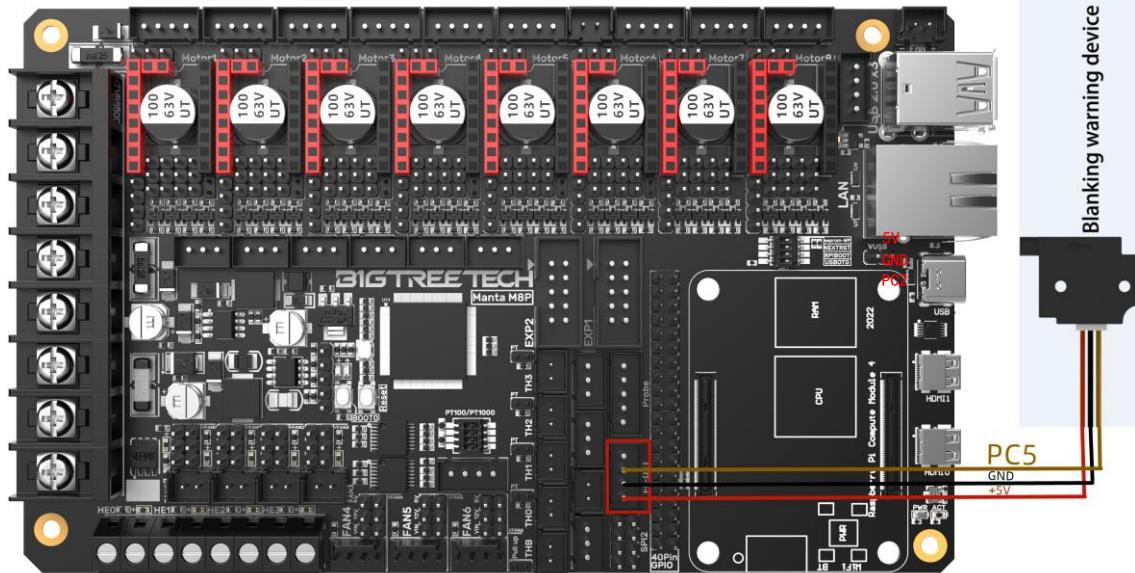
### 3.8 EXP1+EXP2 and LCD Screen Wiring



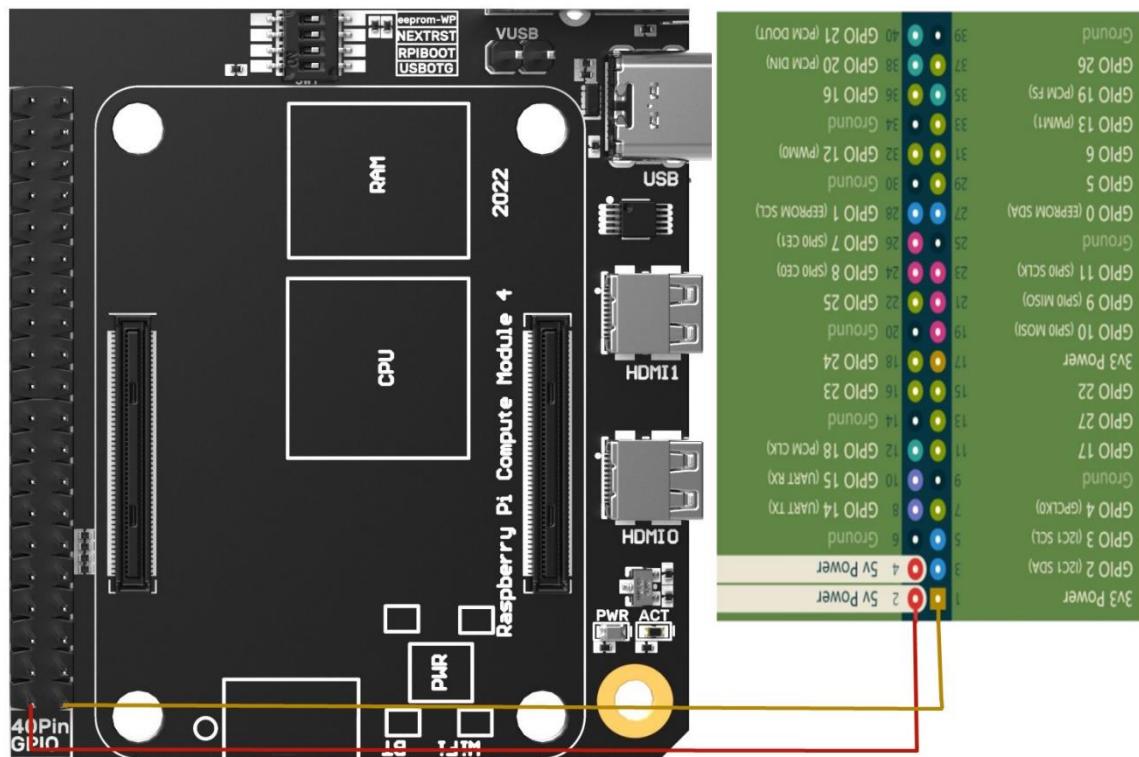
### 3.9 RGB Wiring



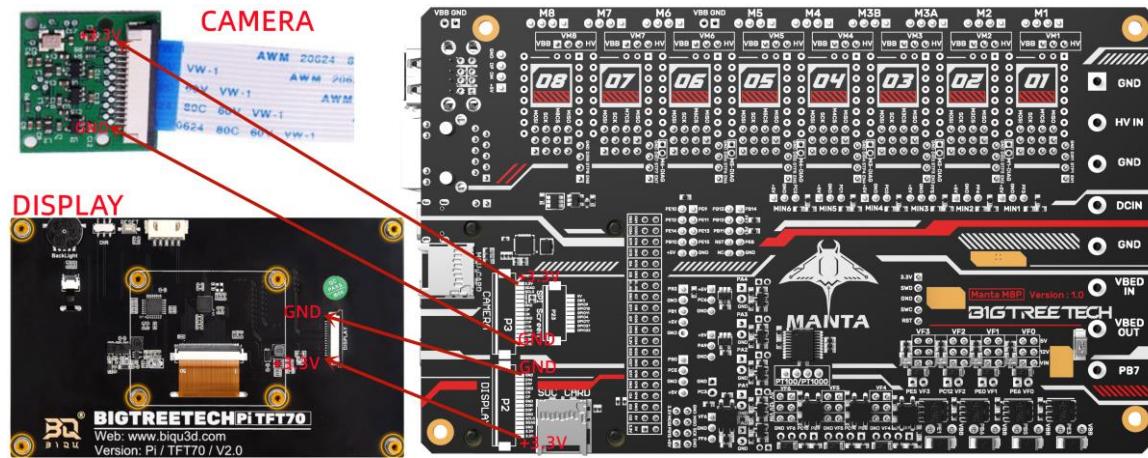
### 3.10 Filament Runout Detection Wiring



### 3.11 40 Pin GPIO

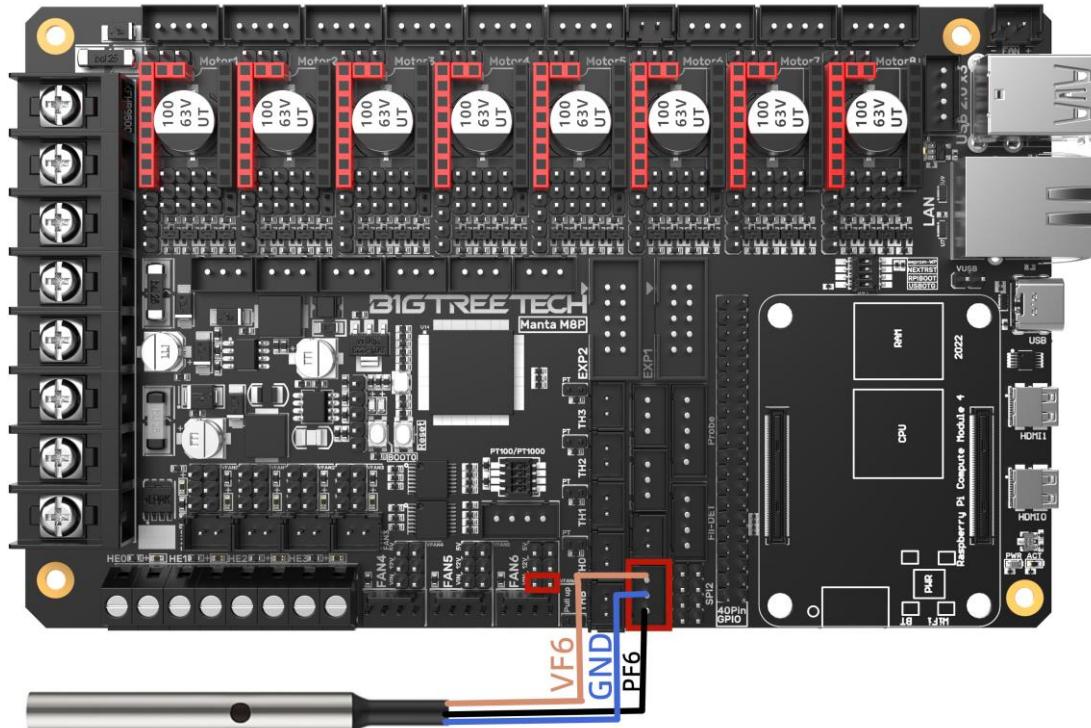


### 3.12 DSI/CSI Connection

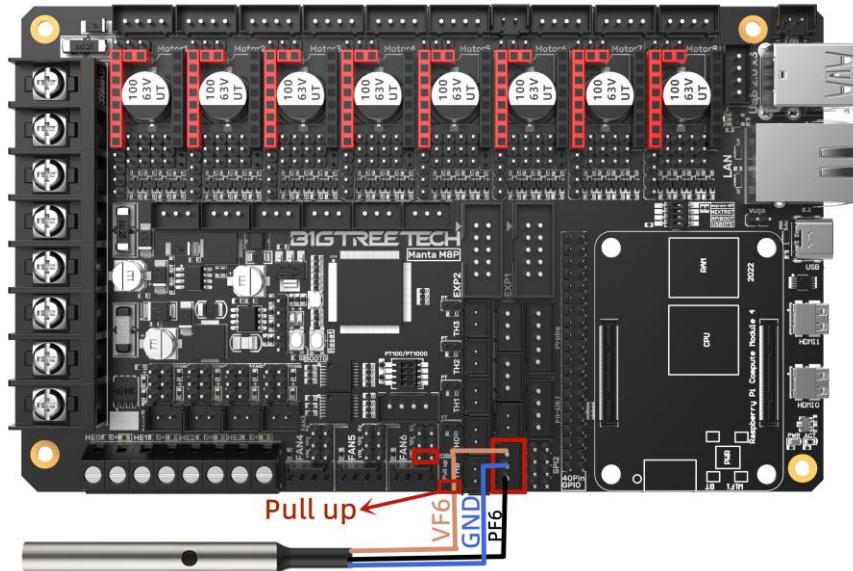


### 3.13 Proximity Switch Wiring

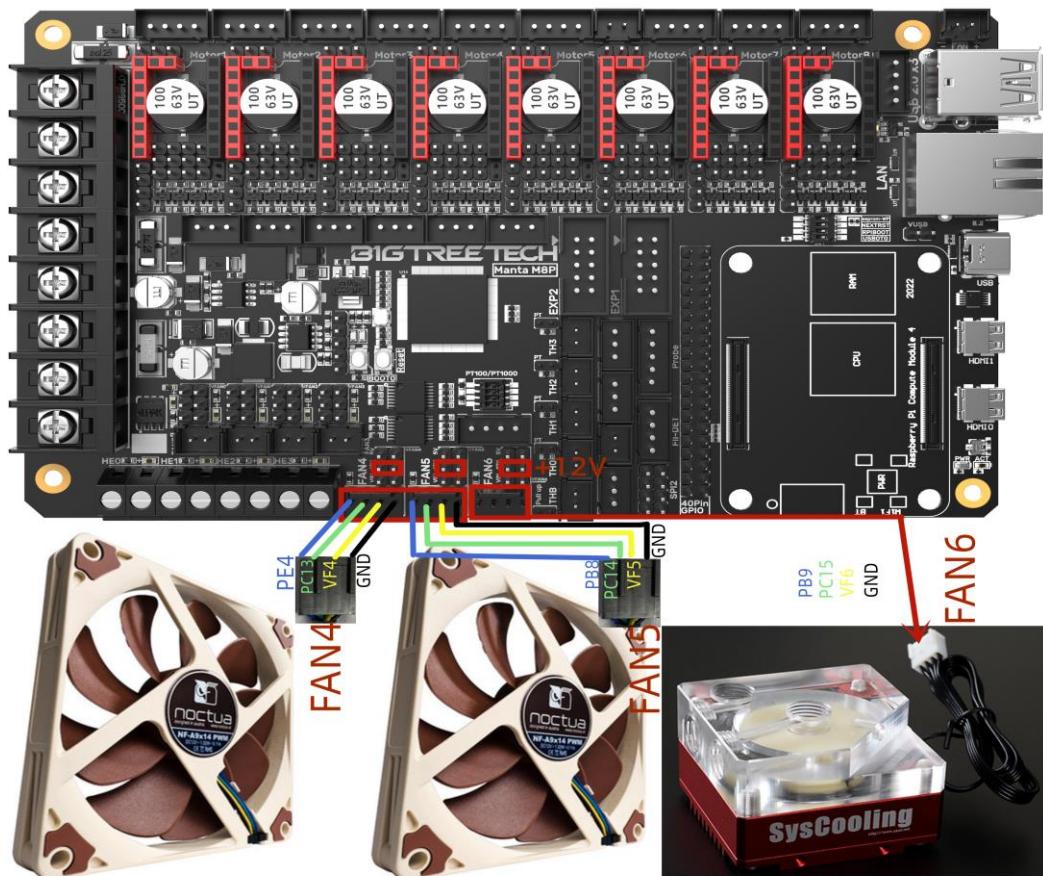
Always on (NPN type), no need to short-circuit via a jumper cap, 24V as an example, as shown in the following figure:



Always off (PNP type), need to short-circuit via a jumper cap, 24V as an example, as shown in the following figure:



3.14 Wiring of the 4-wire CNC Fan and the Water Cooling Device(12V as an example, as shown in the following figure:)



## 4. Raspberry PI CM4 Setup steps

### 4.1 Download OS Image

If CM4 core board is used, You can directly download the images of Fluiid or Mainsail, also can download the OS image from the official website of Raspberry Pi

Fluiid: <https://github.com/fluid-core/FluidPi/releases>

Mainsail: <https://github.com/mainsail-crew/MainsailOS/releases>

Raspberry Pi official OS: <https://www.raspberrypi.com/software/operating-systems>

(CM4 needs to refer to the following system settings to enable the system's USB, DSI and other interfaces, whose operation is slightly different from the standard Raspberry Pi 3B, 4B, etc.)

#### Raspberry Pi OS

Our recommended operating system for most users.

Compatible with:

All Raspberry Pi models

#### Raspberry Pi OS with desktop

Release date: January 28th 2022  
System: 32-bit  
Kernel version: 5.10  
Debian version: 11 (bullseye)  
Size: 1.246MB  
[Show SHA256 file integrity hash](#)  
[Release notes](#)

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#### Raspberry Pi OS with desktop and recommended software

Release date: January 28th 2022  
System: 32-bit  
Kernel version: 5.10  
Debian version: 11 (bullseye)  
Size: 3.267MB  
[Show SHA256 file integrity hash](#)  
[Release notes](#)

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#### Raspberry Pi OS Lite

Release date: January 28th 2022  
System: 32-bit  
Kernel version: 5.10  
Debian version: 11 (bullseye)  
Size: 482MB  
[Show SHA256 file integrity hash](#)  
[Release notes](#)

[Download](#)

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### 4.2 Download and Install Raspberry Pi Imager

Install the official Raspberry Pi Imager: <https://www.raspberrypi.com/software/>

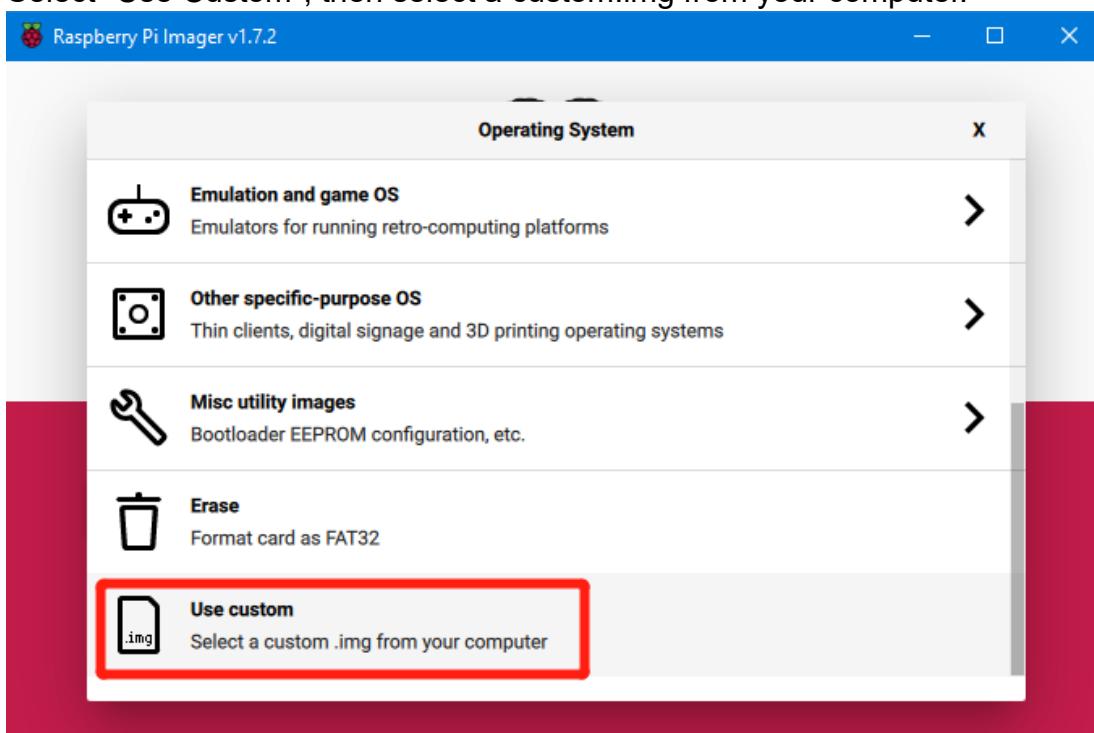
## 4.3 Write OS Image

### 4.3.1 CM4 LITE Version (Micro SD Card)

1. Plug the Micro SD card into the computer via a card reader.
2. Select Operating System.



3. Select "Use Custom", then select a custom.img from your computer.



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4. Click the setting icon in the lower right corner

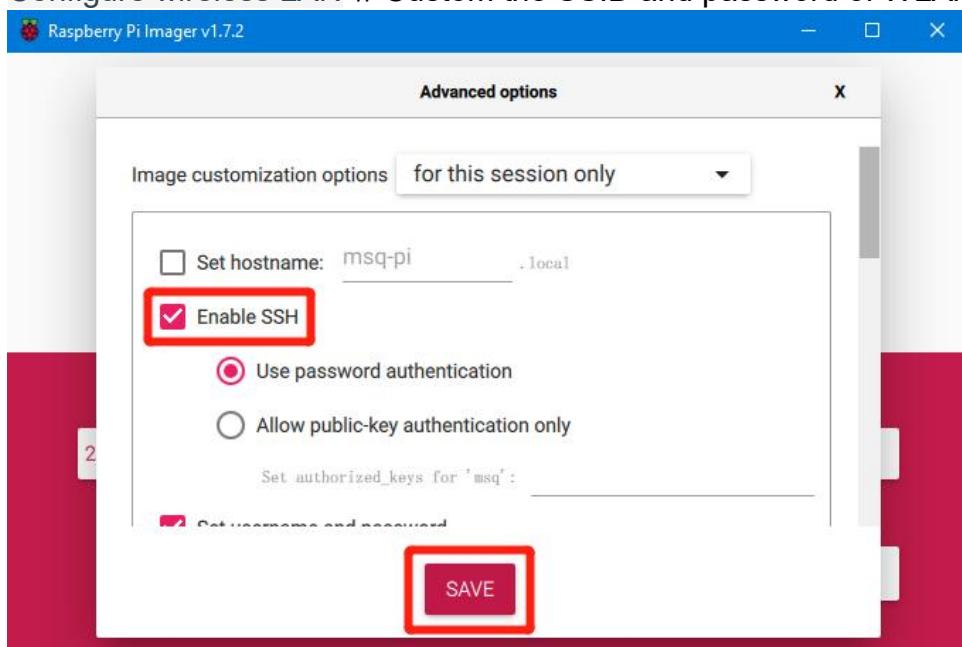


5. “Enable SSH”and click“SAVE”, There are other features that can be set in this menu. Please modify them according to your own needs. Details are as follows:

Set hostname: raspberrypi.local //Custom hostname Default:raspberrypi.local  
Enable SSH

Set username and password // Custom username and password, Default  
username: pi password: raspberry

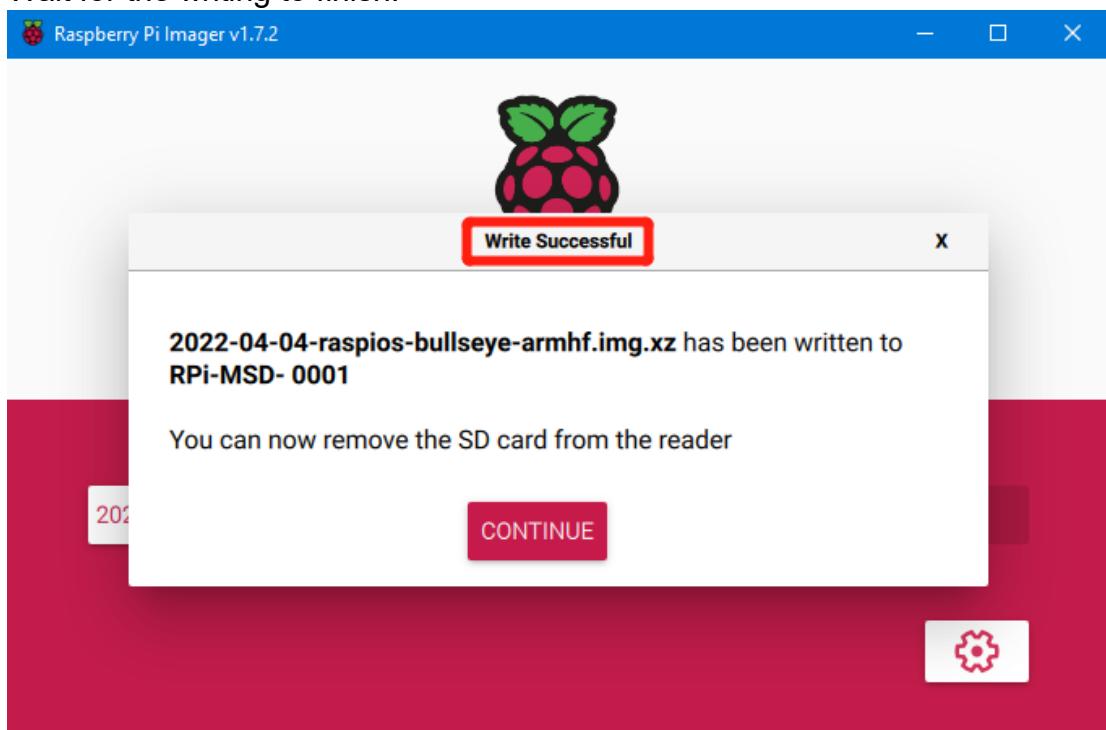
Configure wireless LAN // Custom the SSID and password of WLAN



6. Select the Micro SD card and click "WRITE" (Writing the image will format the Micro SD card. Be careful not to select the wrong storage device, otherwise, the data will be formatted).



7. Wait for the writing to finish.



4.3.2 CM4 eMMC Version (Note: eMMC version will not run the system from the Micro SD card.)

1. Install rpiboot

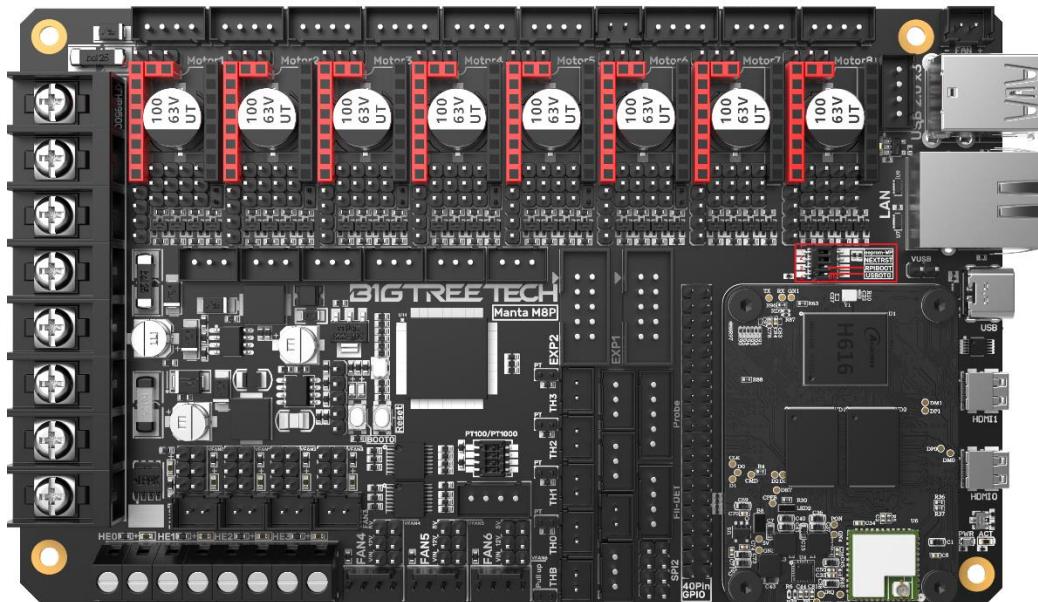
For Windows:

[http://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot\\_setup.exe](http://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot_setup.exe)

For Mac and Linux:

<https://github.com/raspberrypi/usbboot#building>

2. Push the DIP switch 4 (USB OTG) and 3 (RPIBOOT) to ON to enter BOOT mode.



3. Plug the Type-C into the USB port of the computer (in order to avoid problems caused by the insufficient USB power supply of the computer, it is best to use an external 24V power supply to power the motherboard). Run `sudo ./rpiboot`(Mac/Linux) or `rpiboot.exe` on Windows, then the eMMC of CM4 will be recognized as a mass storage device by the computer (if rpiboot reports an error at this time, you can try to re-plug the USB).
4. The step of using the Raspberry Pi Imager to write the OS image is exactly the same as the LITE version. Note: the SSH function should also be enabled.
5. When the writing is completed, push the DIP switch 4 (USB OTG) and 3 (RPIBOOT) back to OFF after power off, and power on again to enter the normal working mode.

## 4.4. System Settings (CM4)

### 4.4.1 USB 2.0 Hub Ports

MANTA M8P is designed with a USB 2.0 Hub, in order to save power consumption, the USB port of CM4 is disabled by default. If you want to enable it, you need to add the following content to the config.txt file:

dtoverlay=dwc2,dr\_mode=host

### 4.4.2 DSI1 Display Interface

The default display interface is HDMI. The onboard DSI port of MANTA M8P uses the DSI1 interface. You need to download the DSI1 driver and enter the following sentence in the command line:

```
sudo wget https://datasheets.raspberrypi.com/cmio/dt-blob-disp1-cam1.bin -O /boot/dt-blob.bin
```

After downloading this driver and restarting, the screen of DSI1 will work normally. If you want to use the HDMI interface, you need to delete the downloaded /boot/dt-blob.bin driver and restart, then the HDMI can output normally.

### 4.4.3 CSI1 Camera

The DSI1 driver downloaded in **4.4.2 DSI1 Display Interface** also includes the CSI1 driver. If you just want to install the CSI1 driver, not DSI1, please find the driver you want to use at <https://datasheets.raspberrypi.com/licence.html> and download it in the boot folder of CM4 and rename it to dt-blob.bin, and then refer to the settings here.

<https://projects.raspberrypi.org/en/projects/getting-started-with-picamera/>

## 5. BIGTREETECH CB1 Setup steps

### 5.1 Download OS Image

If **BIGTREETECH CB1 core board is used**, You can only download and install the system image provided by BIGTREETECH:

<https://github.com/bigtreetech/CB1/releases>

### 5.2 Download and Install Raspberry Pi Imager

Install the official Raspberry Pi Imager: <https://www.raspberrypi.com/software/>  
The system image of **CB1** can also be written with this software.

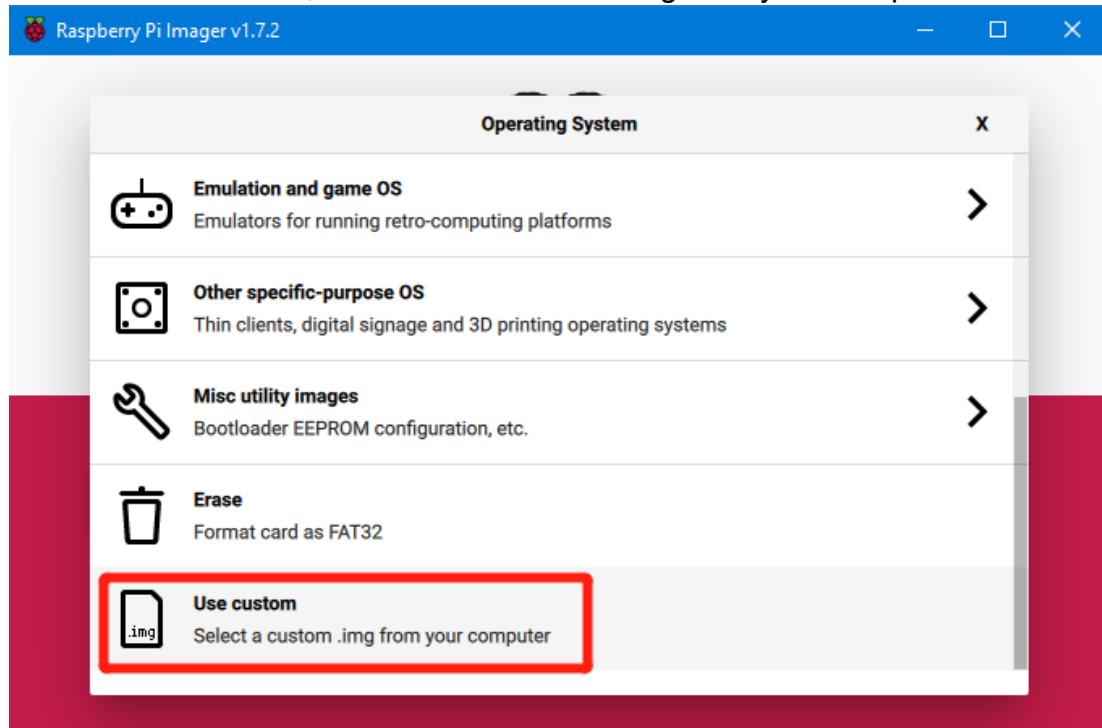
### 5.3 Write OS Image

1. Plug the Micro SD card into the computer via a card reader.
2. Select Operating System.



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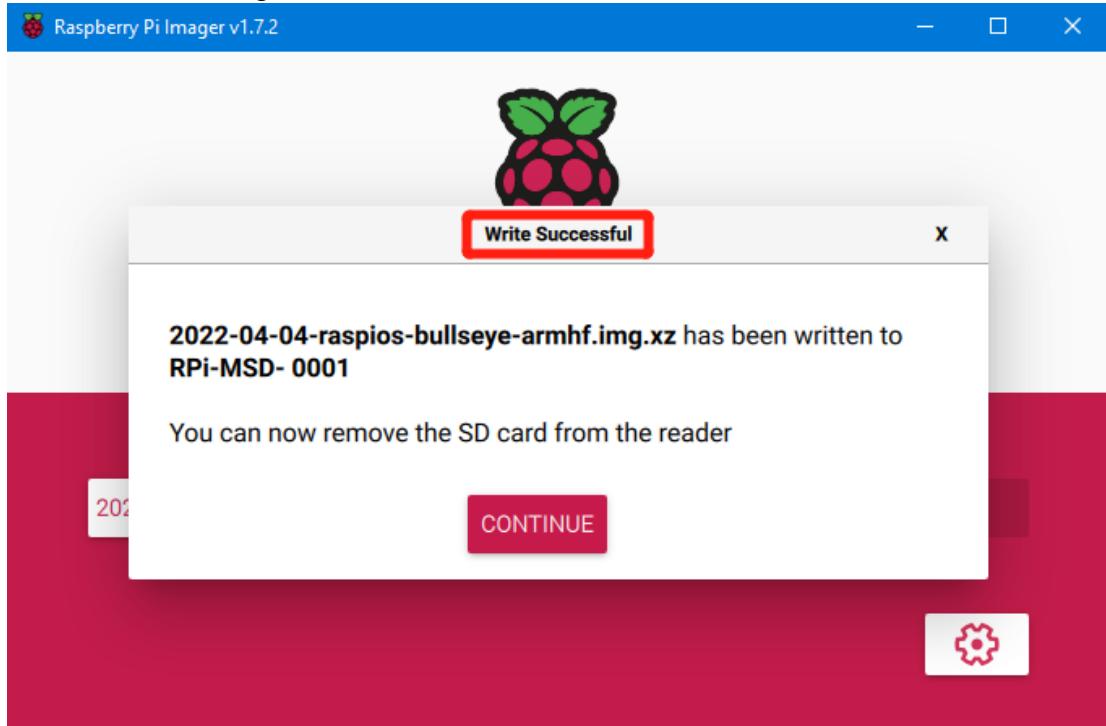
3. Select "Use Custom", then select a custom.img from your computer.



4. Select the Micro SD card and click "WRITE" (Writing the image will format the Micro SD card. Be careful not to select the wrong storage device, otherwise, the data will be formatted).



5. Wait for the writing to finish.



## 5.4 WIFI Setting

note: skip this step if you are using ethernet port not using WIFI

CB1 cannot directly use the Raspberry Pi Imager software to set the WiFi name and password like CM4. After the system image writing is completed, the Micro SD card will have a FAT32 partition recognized by the computer, Find "wpa\_supplicant.conf" file

U 盘 (J:)				
名称	修改日期	类型	大小	
gcode	2022/6/22 14:01	文件夹		
wpa_supplicant.conf	2022/6/17 10:28	CONF 文件	1 KB	

Open it with Notepad, and replace WIFI-SSID with the actual WiFi name, and PASSWORD with the actual password

```
*wpa_supplicant.conf - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=0
update_config=1

network={
    ssid="WIFI-SSID"
    psk="PASSWORD"
}
```

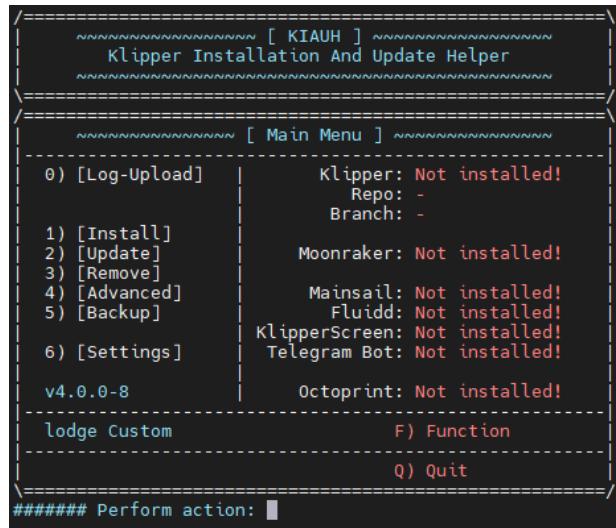
## 5.5 Install Klipper with kiauh Script

1. Download kiauh:

```
git clone -b CB1 --depth 1 https://github.com/bigtreetech/kiauh.git
```

2. Run kiauh:

```
./kiauh/kiauh.sh
```



The screenshot shows a terminal window with the KIAUH installation script. The title bar says "Klipper Installation And Update Helper". The main menu is displayed in a box:

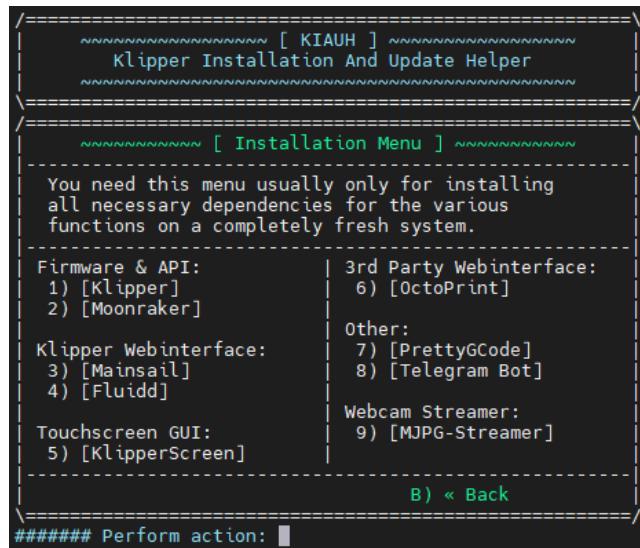
0) [Log-Upload]	Klipper: Not installed! Repo: - Branch: -
1) [Install]	Moonraker: Not installed!
2) [Update]	Mainsail: Not installed!
3) [Remove]	Fluidd: Not installed!
4) [Advanced]	KlipperScreen: Not installed!
5) [Backup]	Telegram Bot: Not installed!
6) [Settings]	Octoprint: Not installed!
v4.0.0-8	lodge Custom F) Function
	Q) Quit

At the bottom, it says "##### Perform action: █".

On the left side of the Main Menu: install, remove, upgrade, etc.

On the right side of the Main Menu: show the installation status.

3. Select 1 to enter the Installation Menu and install the software you need.



The screenshot shows a terminal window with the KIAUH installation menu. The title bar says "Klipper Installation And Update Helper". The installation menu is displayed in a box:

You need this menu usually only for installing all necessary dependencies for the various functions on a completely fresh system.

Firmware & API:	3rd Party Webinterface:
1) [Klipper]	6) [OctoPrint]
2) [Moonraker]	Other:
Klipper Webinterface:	7) [PrettyGCode]
3) [Mainsail]	8) [Telegram Bot]
4) [Fluidd]	Webcam Streamer:
Touchscreen GUI:	9) [MJPG-Streamer]
5) [KlipperScreen]	B) « Back

At the bottom, it says "##### Perform action: █".

The 3D printer can work normally when having 'Klipper', 'Moonraker' and 'Fluidd', if you have a touch screen, you can also install 'KlipperScreen'.

- During the installation process, when prompted for confirmation, you can select the configuration by default. After the installation is complete, back to the Main Menu to ensure that the installed software is in the 'Installed' status.

The screenshot shows the KIAUH Main Menu. It lists several software packages and their installation status:

- Klipper: Installed: 1(py3)
- Repo: EchoHeim/Klipper
- Branch: lodge
- Moonraker: Installed: 1
- Mainsail: Not installed!
- Fluidd: Installed!
- KlipperScreen: Not installed!
- Telegram Bot: Not installed!
- Octoprint: Not installed!

At the bottom, it says "Perform action: █".

## 5.6 Checkout Klipper Branch

If you want to customize the functions of Klipper, which the official does not support, you can fork the Klipper repository to your own repository, and use the kiauh script to update after completing the function modification. The specific operations are as follows:

- On the kiauh Main Menu, select F to enter the Custom Function Menu.

The screenshot shows the Custom Function Menu. It contains the following options:

- 0) Custom klipper with lodge
- 1) usb device auto mount
- 2) fix KlipperScreen

At the bottom, it says "B) « Back" and "Perform action: █".

- Select 0, automatically add custom text, after the prompt of successful, select B to back to the Main Menu.

3. Select 6 to enter Settings, then select 2 to enter the checkout Klipper repository.

```
/=====
| ~~~~~ [ KIAUH ] ~~~~~
| Klipper Installation And Update Helper
| ~~~~~
\=====
| ~~~~~ [ Set custom Klipper repo ] ~~~~~
| -----
| 0) Klipper3d/klipper -> master
| 1) EchoHeim/klipper -> lodge
| -----
| B) << Back      | H) Help [?]
\=====
##### Perform action: ■
```

0 is the official repository of Klipper, it is recommended not to modify it, it can be used to restore; 1 is the Klipper repository after we added our own modification function. The specific way to add is to modify the `~/kiauh/klipper_repos.txt` file.

```
# This file acts as an example file.
#
# 1) Make a copy of this file and rename it to 'klipper_repos.txt'
# 2) Add your custom Klipper repository to the bottom of that copy
# 3) Save the file
#
# Back in KIAUH you can now go into -> [Settings] and use action '2' to set a different Klipper repository
#
# Make sure to always separate the repository and the branch with a ','.
# <repository>,<branch> -> https://github.com/Klipper3d/klipper,master
# If you omit a branch, it will always default to 'master'
#
# You are allowed to omit the 'https://github.com/' part of the repository URL
# Down below are now a few examples of what is considered as valid:
https://github.com/Klipper3d/klipper,master
https://github.com/EchoHeim/klipper,lodge
```

Add your own repository name and branch name after the file, separated by an English comma (,). If you do not specify a branch name, the default is the master branch. When the addition is completed, you can view it in the kiauh script.

4. Choose the Klipper branch you want, and a proceeding confirmation prompt will appear.

```
/=====
| ~~~~~ [ KIAUH ] ~~~~~
| Klipper Installation And Update Helper
| ~~~~~
\=====
| ~~~~~ [ Set custom Klipper repo ] ~~~~~
| -----
| 0) Klipper3d/klipper -> master
| 1) EchoHeim/klipper -> lodge
| -----
| B) << Back      | H) Help [?]
\=====
##### Perform action: 1
[+] Repo: EchoHeim/klipper Branch: lodge
/=====
| !!! ATTENTION !!!
| Existing Klipper folder found! Proceeding will remove
| the existing Klipper folder and replace it with a
| clean copy of the previously selected source repo!
\=====
##### Proceed? (Y/n): ■
```

Just confirm.

## 5.7 Fix KlipperScreen

KlipperScreen can't be displayed directly on CB1. You need to follow the following steps to repair it.

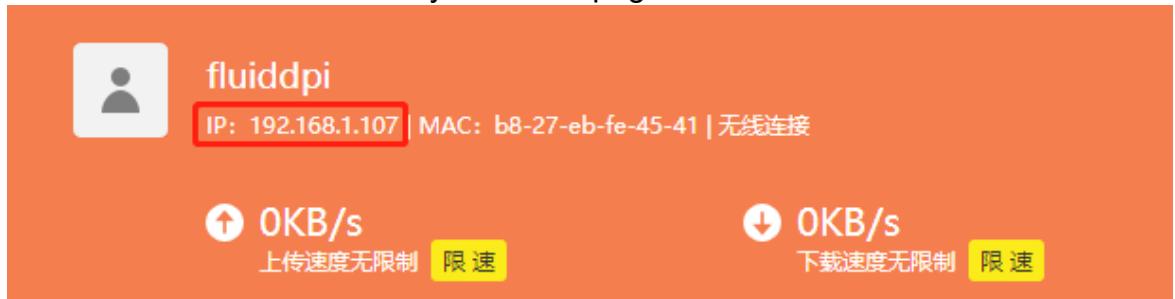
On the kiauh script Main Menu, select F to enter the Custom Function Menu, and then select 2 to fix.

```
/=====
 [ KIAUH ] =====\
 | Klipper Installation And Update Helper |
 \=====/
 /=====\
 [ Custom Function Menu ] =====\
 |-----|
 0) Custom klipper with lodge
 1) usb device auto mount
 2) fix KlipperScreen
 |-----|
 B) << Back
 \=====/
 Perform action: █
```

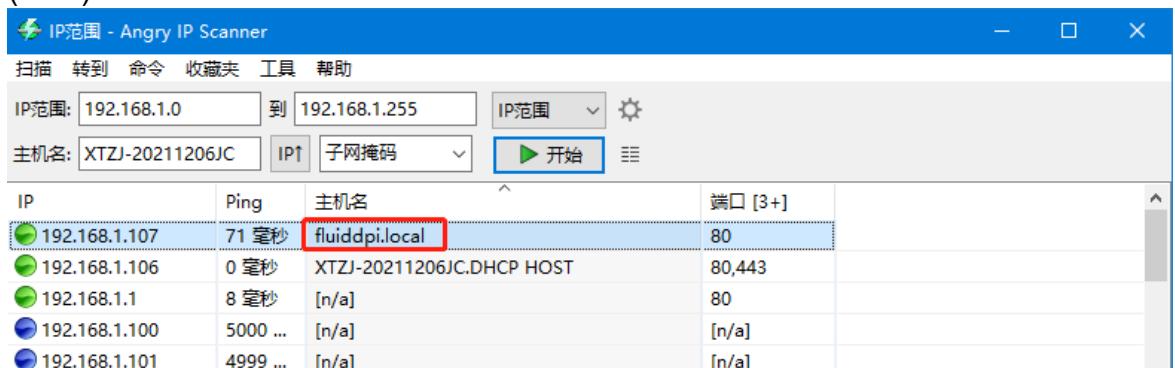
## 6. Configure the motherboard

### 6.1 ssh connect to device

1. Install the ssh application Mobaxterm:  
<https://mobaxterm.mobatek.net/download-home-edition.html>
2. Insert Micro SD card to MANTA M8P, wait for system to load after power on, approx. 1-2min
3. The device will automatically be assigned a IP address after successfully connected to the network
4. Find the device IP address in your router page

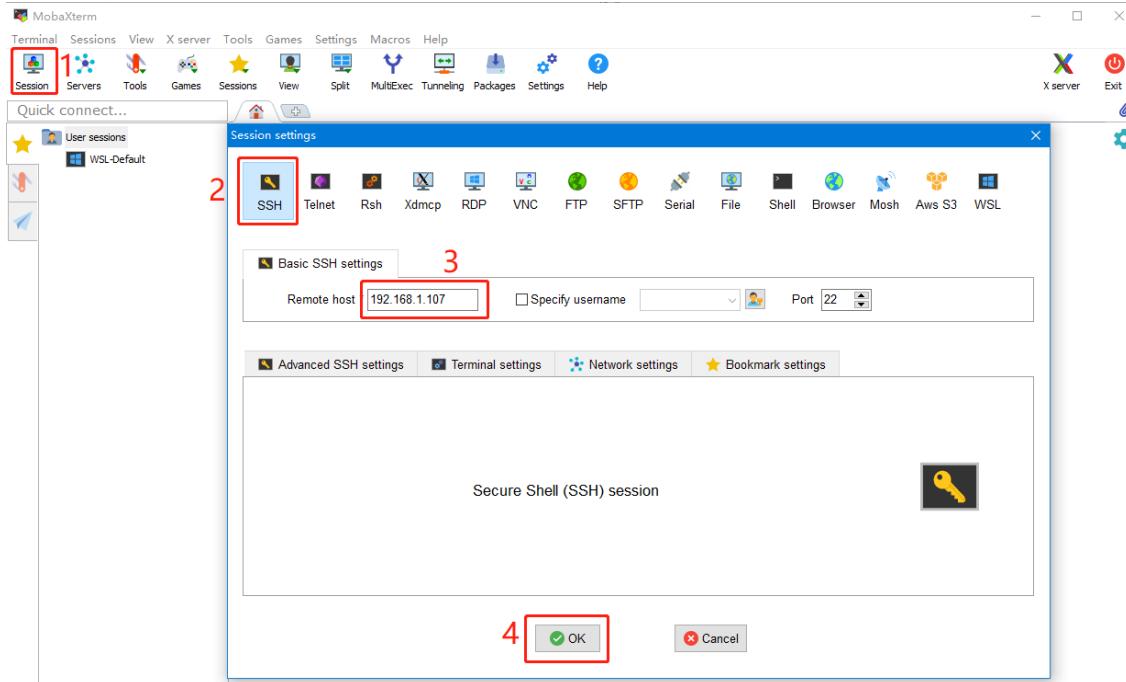


5. Or use the <https://angryip.org/> tool, scan all IP address in the current network organize by names, find the IP named Fluid, Mailsail (CM4) or Hurakan (CB1) like shown below



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6. Open Mobaxterm and click “Session”, and click “SSH”, inset the device IP into Remote host and click “OK” (note: your computer and the device needs to be in the same network)



7. Input the login name and password to enter the SSH terminal interface  
**CM4:**

login as: pi  
password: raspberry

**CB1:**

login as: biqu  
password: biqu

The screenshot shows the SSH terminal session window. It displays the following text:  
? MobaXterm Personal Edition v21.5 ?  
(SSH client, X server and network tools)  
SSH session to pi@192.168.1.107  
? Direct SSH : ✓  
? SSH compression : ✓  
? SSH-browser : ✓  
? X11-forwarding : ✓ (remote display is forwarded through SSH)  
For more info, ctrl+click on help or visit our website.  
Linux fluidddpi 5.10.92-v7+ #1514 SMP Mon Jan 17 17:36:39 GMT 2022 armv7l  
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/\*copyright.  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Tue Mar 8 08:21:37 2022 from 192.168.1.106  
SSH is enabled and the default password for the 'pi' user has not been changed.  
This is a security risk - please login as the 'pi' user and type 'passwd' to set a new password.  
pi@fluidddpi:~ \$

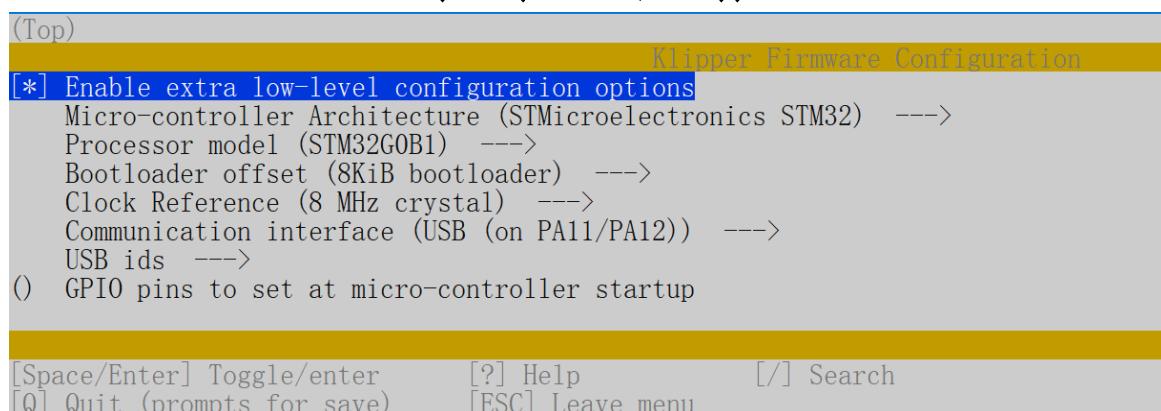
## 6.2 Compile firmware

- After ssh successfully connected to the device, enter in terminal:

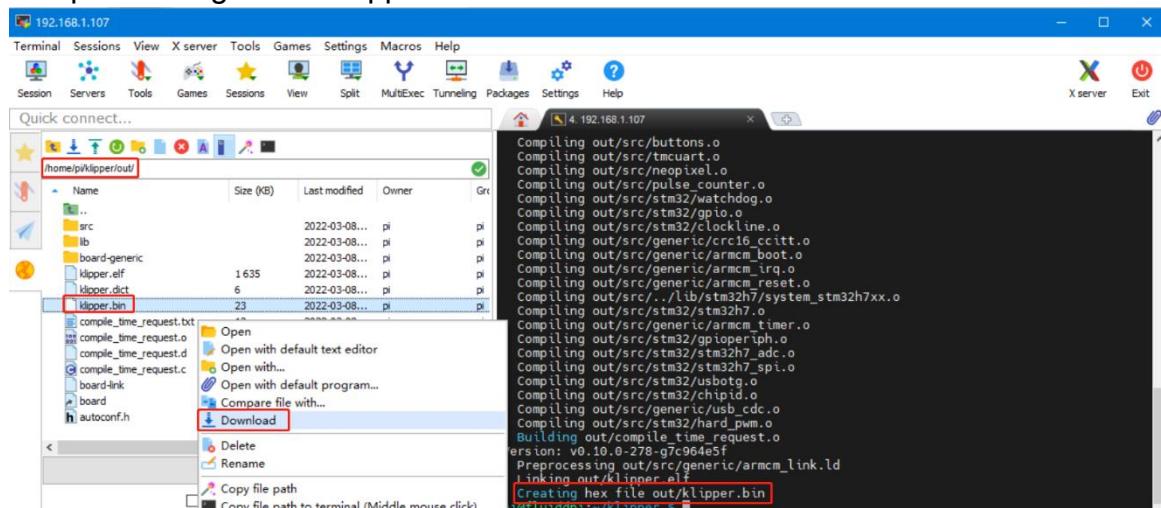
```
cd ~/klipper/
make menuconfig
```

Compile with the configuration shown below(if the options below is not available, please update you Klipper source code to the newest version)

- \* [\*] Enable extra low-level configuration options
- \* Micro-controller Architecture (STMicroelectronics STM32) —>
- \* Processor model (STM32G0B1) —>
- \* Bootloader offset (8KiB bootloader) —>
- \* Clock Reference (8 MHz crystal) —>
- \* Communication interface (USB (on PA11/PA12)) —>



- Press q to exit, and Yes when asked to save the configuration
- Run **make** to compile firmware, "klipper.bin" file will be generated in **home/pi/klipper/out** folder when **make** is finished, download it onto your computer using the ssh application.



## 6.3 Firmware update

### 6.3.1 Update using SD Card

1. Rename klipper.bin to "firmware.bin", Copy to the SD card root directory, insert the SD card into the SD card slot of the MANTA M8P, click the "reset" button or power on again. The firmware will be updated automatically. After the update, the "firmware.bin" in the SD card will be renamed as "FIRMWARE.CUR".
2. Enter: `ls /dev/serial/by-id/` in terminal to check motherboard ID to confirm whether firmware is updated successfully like shown below.

```
pi@fluidppi:~/klipper $ ls /dev/serial/by-id/  
usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00  
pi@fluidppi:~/klipper $
```

copy and save this ID, it is needed when modifying klipper config

### 6.3.2 Update using DFU

If the MCU klipper device ID can be found by `ls /dev/serial/by-id/`, we can input:

```
make flash FLASH_DEVICE= /dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00
```

to update firmware (NOTE: Replace `/dev/serial/by-id/xxx` with the actual ID found in the previous step)

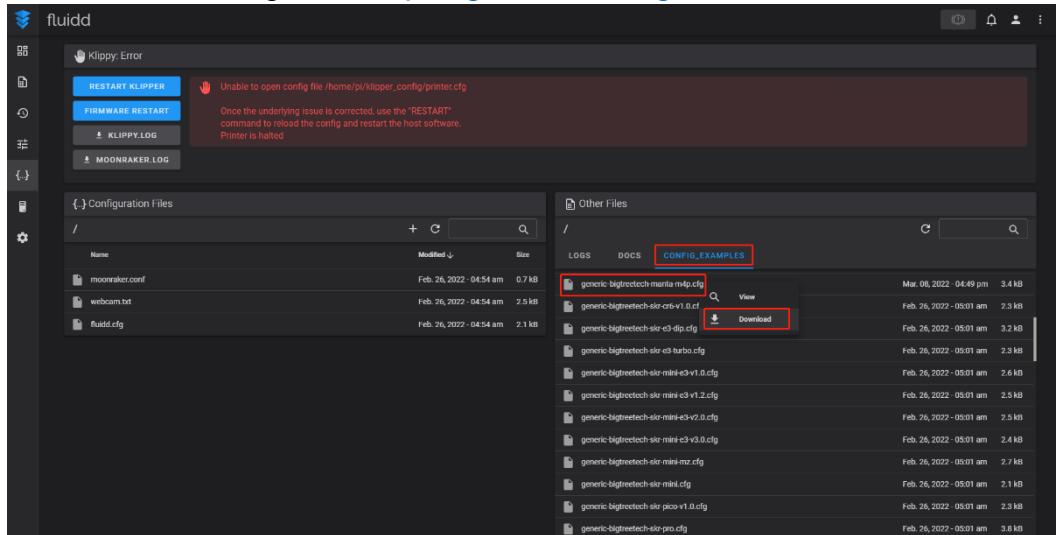
```
bigu@Hurakan:~/klipper$ make flash FLASH_DEVICE=/dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00  
Building hid-flash  
/bin/sh: 1: pkg-config: not found  
    hid-flash requires libusb-1.0, please install with:  
    sudo apt-get install libusb-1.0  
    Flashing out/klipper.bin to /dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00  
Entering bootloader on /dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00  
Device reconnect on /sys/devices/platform/soc/5200000.usb/usb1/1-1/1-1.1/1-1.1:1.0  
sudo dfu-util -p 1-1.1 -R -a 0 -s 0x8002000:leave -D out/klipper.bin  
dfu-util 0.9  
  
Copyright 2005-2009 Weston Schmidt, Harald Welte and OpenMoko Inc.  
Copyright 2010-2016 Tormod Volden and Stefan Schmidt  
This program is Free Software and has ABSOLUTELY NO WARRANTY  
Please report bugs to http://sourceforge.net/p/dfu-util/tickets/  
  
dfu-util: Invalid DFU suffix signature  
dfu-util: A valid DFU suffix will be required in a future dfu-util release!!!  
Opening DFU capable USB device...  
ID 0483:df11  
Run-time device DFU version 011a  
Claiming USB DFU Interface...  
Setting Alternate Setting #0 ...  
Determining device status: state = dfuIDLE, status = 0  
dfuIDLE, continuing  
DFU mode device DFU version 011a  
Device returned transfer size 1024  
DfuSe interface name: "Internal Flash"  
Downloading to address = 0x08002000, size = 25264  
Download [=====] 100% 25264 bytes  
Download done.  
File downloaded successfully  
dfu-util: Error during download get_status  
  
Failed to flash to /dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00: Error running dfu-util  
  
If the device is already in bootloader mode it can be flashed with the  
following command:  
make flash FLASH_DEVICE=0483:df11  
OR  
make flash FLASH_DEVICE=1209:beba  
  
If attempting to flash via 3.3V serial, then use:  
make serialflash FLASH_DEVICE=/dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00
```

There will be an error message "dfu-util: Error during download get\_status" after update. Just ignore it.

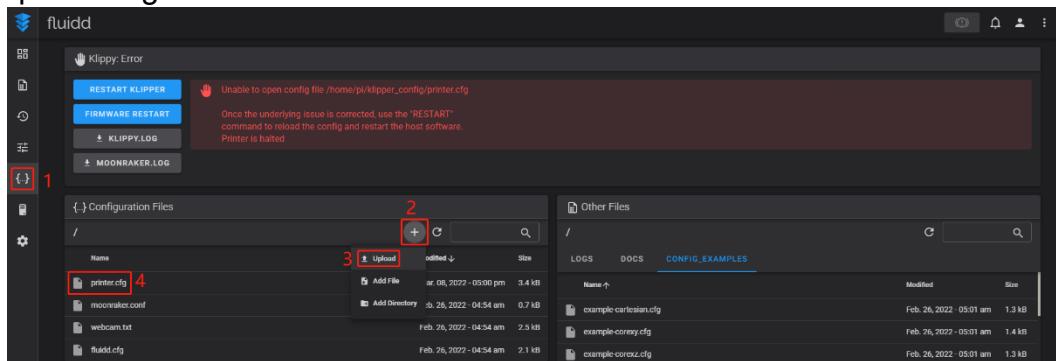
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## 6.4 Configure Klipper

1. Enter your device IP address into your browser to open the webUI, find the reference config for motherboard in the directory shown below, if there is no such config available, update your klipper source code to the newest version or download from github: <https://github.com/bigtreeTech/Manta-M8P>



2. Upload your finished config file into Configuration Files, and rename to "printer.cfg"



3. Insert the correct motherboard ID

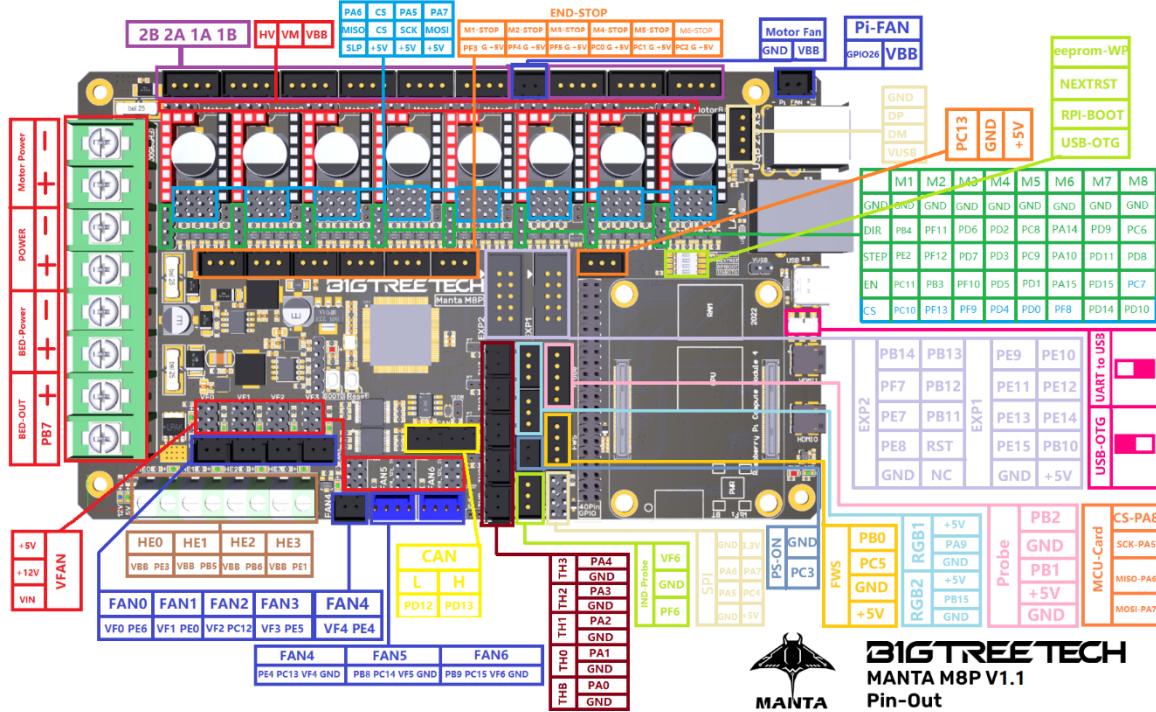
```
81
82 [mcu]
83 serial: /dev/serial/by-id/usb-Klipper_stm32g0b1xx_190028000D50415833323520-if00
84
```

The screenshot shows a terminal window with the command 'cat printer.cfg' entered. The output shows the Klipper configuration file with the 'mcu' section and a 'serial' line set to '/dev/serial/by-id/usb-Klipper\_stm32g0b1xx\_190028000D50415833323520-if00'. A red box highlights the 'mcu' section.

Refer to <https://www.klipper3d.org/Overview.html> for detailed configuration guide according to your machine type.

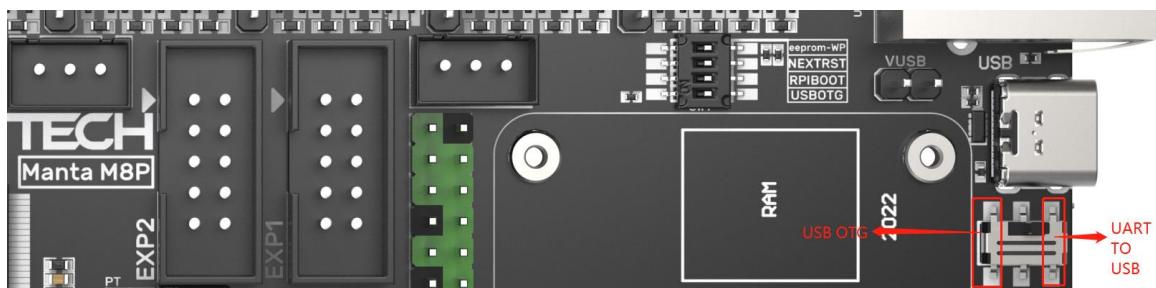
## 7 Differences between V1.0 and V1.1

7.1 Pin-out: (Changes in V1.1 include: M6, M7, M8, SPI, MCU-Card, RGB1&RGB2, FAN4, CAN, Pi-FAN)



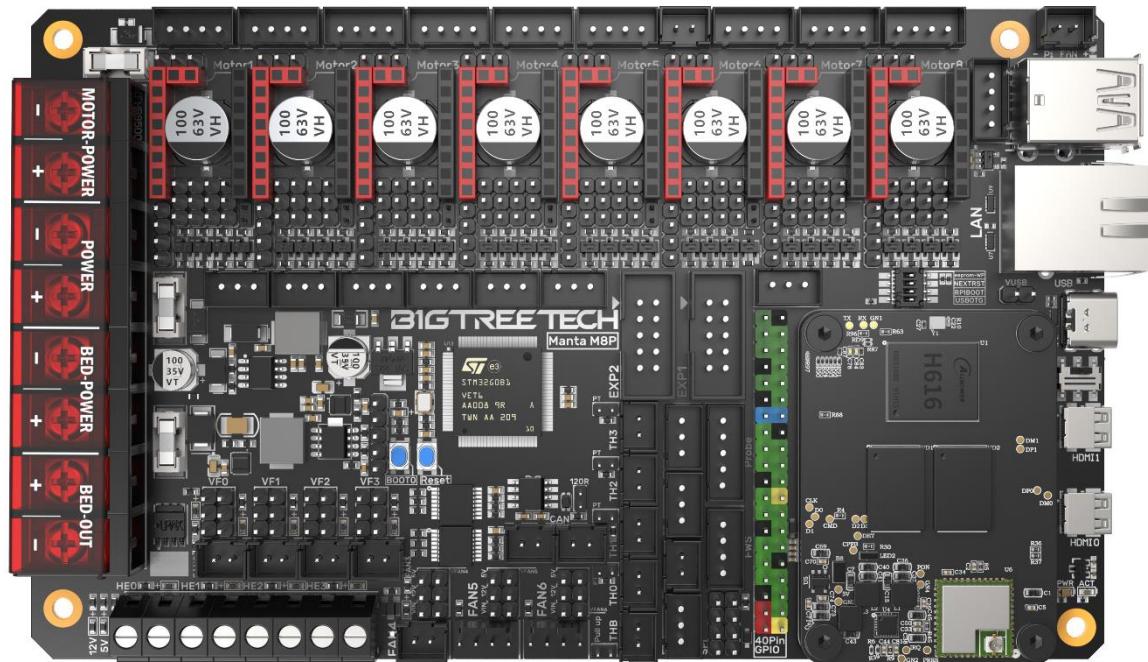
7.2 Introduction to V1.1 added functions:

CAN interface (2Pin\*2 XH2.54), USB port function selection (UART to USB, USB OTG), Pi-FAN (Controlled by GPIO26), FAN4 becomes a 2-wire CNC fan.

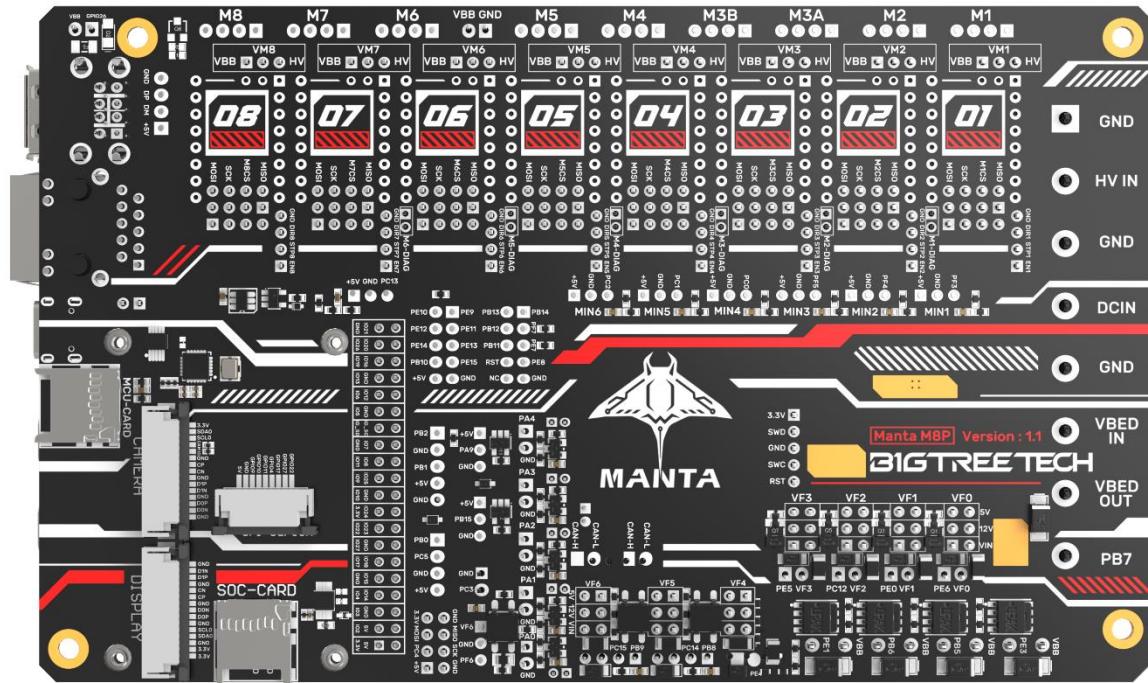


The 5V and 12V power output ports are added with E-FUSE protection, which has short reaction time, strong protection and realizes over-current protection, short circuit protection and spark protection.

M8P V1.1+CB1:



M8P V1.1-Bot:



## 8 Precautions

1. All unplugging and plugging operations should be performed under the condition of power off, including enabling the eMMC writing.
2. Pay attention to the heat dissipation of CM4 and CB1. The CM4/CB1 may become quite hot if the running application consumes too many system resources.

Other resources for this product can be found on <https://github.com/bigtreetech/>. If you cannot find the resources you need, you can contact our after-sales support.

We want to hear from you if you encounter any other problems while using our products, and we will answer them as quickly as possible; any good ideas or suggestions on our products will also be considered carefully. Thank you for choosing BIGTREETECH. Your support means a lot to us!