Makerbase

广州谦辉信息科技有限公司

Guangzhou Qianhui Information Technology Co.,Ltd.

MKS BASE Motherboard Manual

MAKER BASE

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Firmware version update

Firmware version	*Modified Time*	*Modify Content*	*Note*
V1.5	*2016.11*	*1.Add two normally open output interfaces for fan and LED light interfaces*	
V1.6	*2017.9*	*1. All changed to color terminals;* *2. Modify the power supply part circuit.*	

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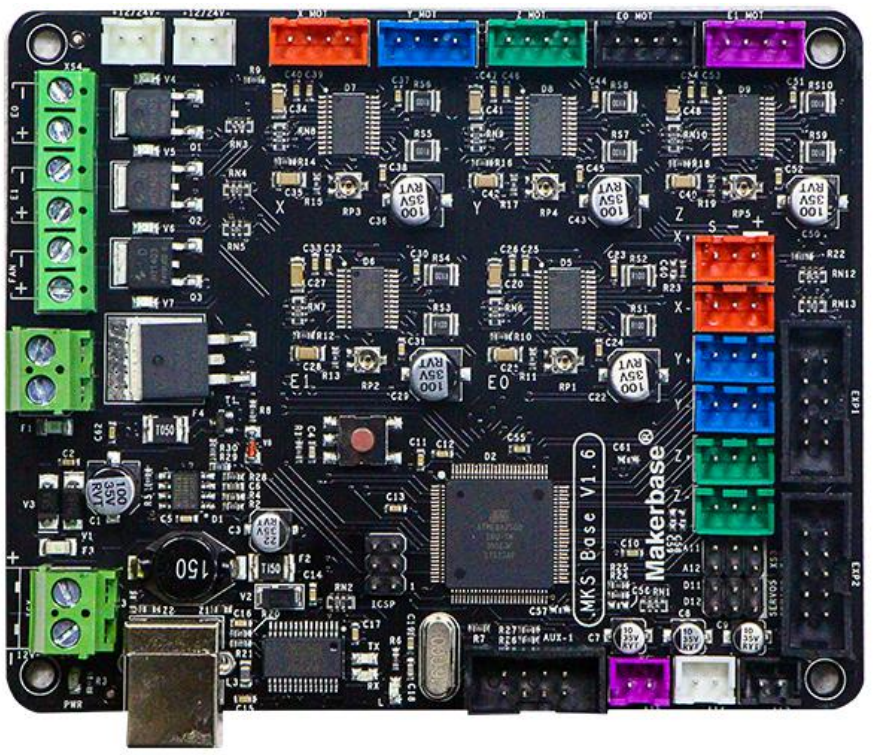
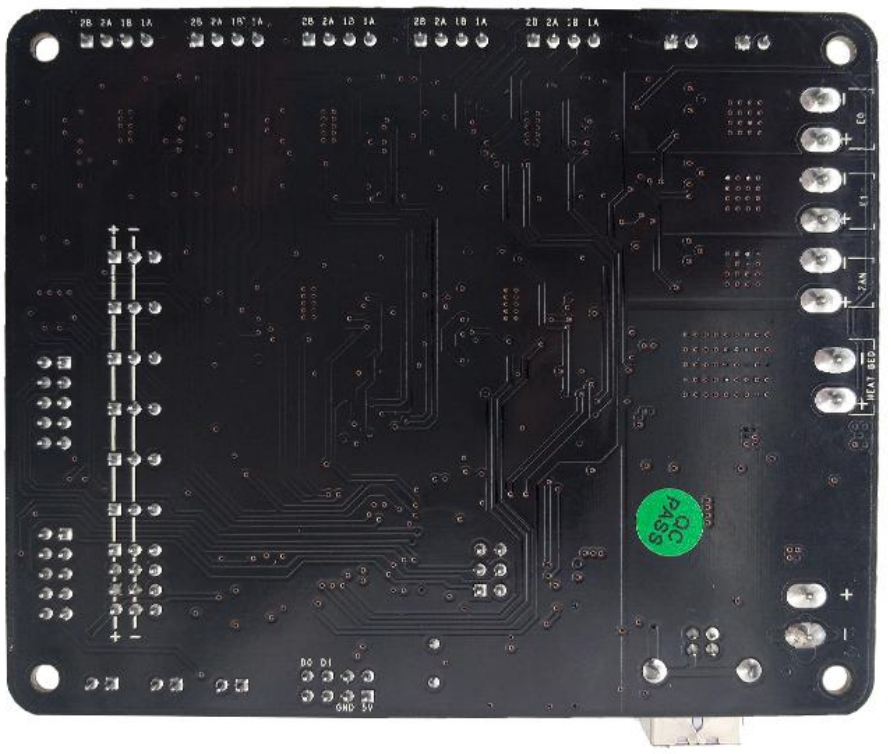
Ⅰ Overview

MKS Base is a product developed by MKS .For the problems of the ramps1.4 open source motherboard, especially optimized R & D.At present, the very stable 3D printer main control board is suitable for mass production of 3D printers as the main control board. Compared with Ramps1.4, it adds one E1 heating output, which is more suitable for double-head printers.





Ⅱ Features

1. The 2560 and ramps1.4 are assembled on one board, which solves the cumbersome and troublesome problem of the Ramps1.4 combination interface.

2. Using the international FT232 high-end USB to serial communication scheme, the data transmission is stable.

3. Using the 4982 as a motor drive, it has the same performance as the 4988, but with a SOP package, the heat dissipation is better.

4. The board uses a high-quality 4-layer board and is specially designed for heat dissipation;

5. High quality MOSFET is used for better heat dissipation.

6. Using a dedicated power chip to support 12V-24V power input, solve the heating problem of Ramps voltage conversion chip.;

7. Can accept 24V input, the same system power can reduce the hot bed current to 1/4, effectively solve the hot bed MOS tube heating problem..

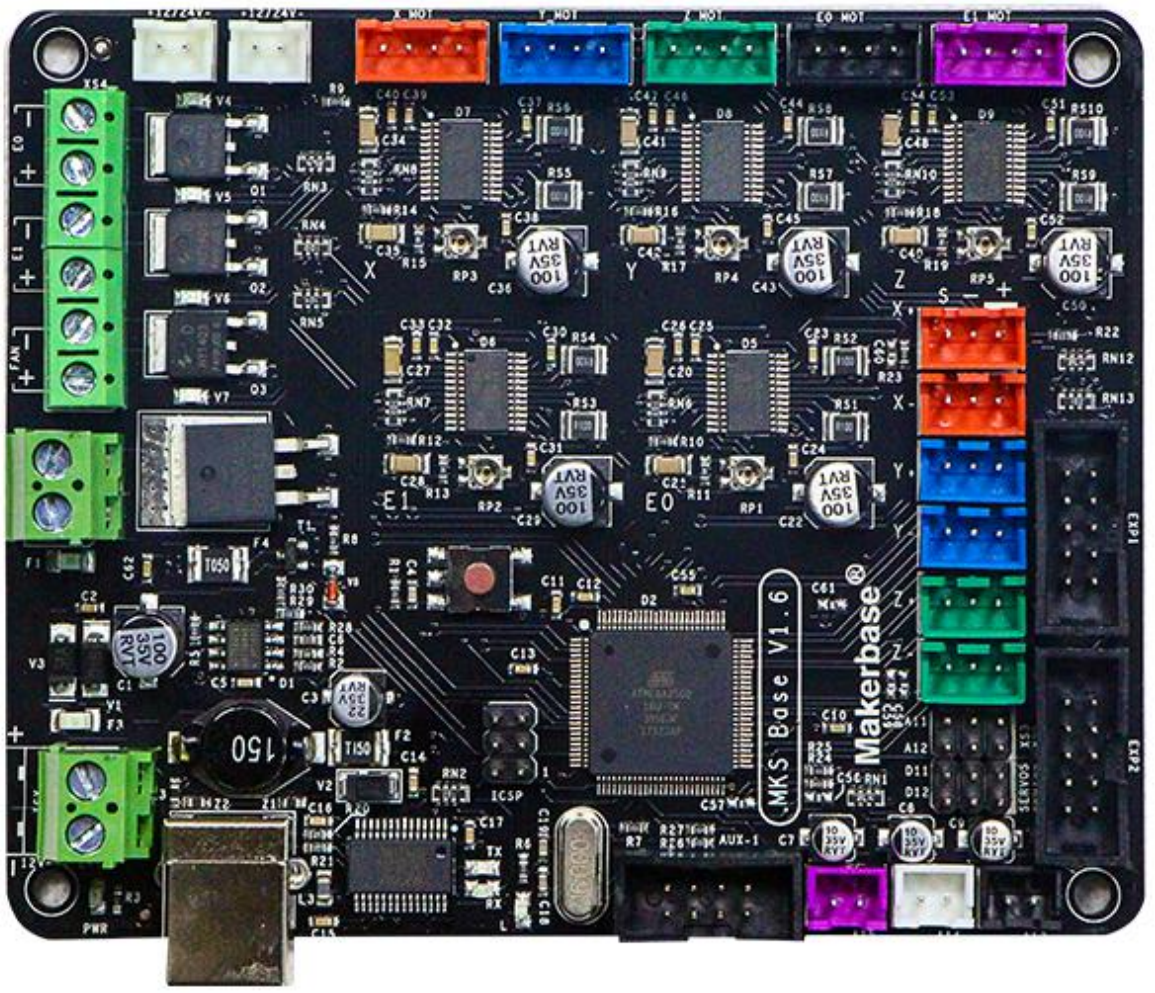
8. Firmware can use the open source firmware Marlin, the configuration is exactly the same as ramps1.4, which can directly replace Ramps1.4.

9. It can be directly connected to Ramps1.4, 2004LCD control panel and 12864LCD control panel.

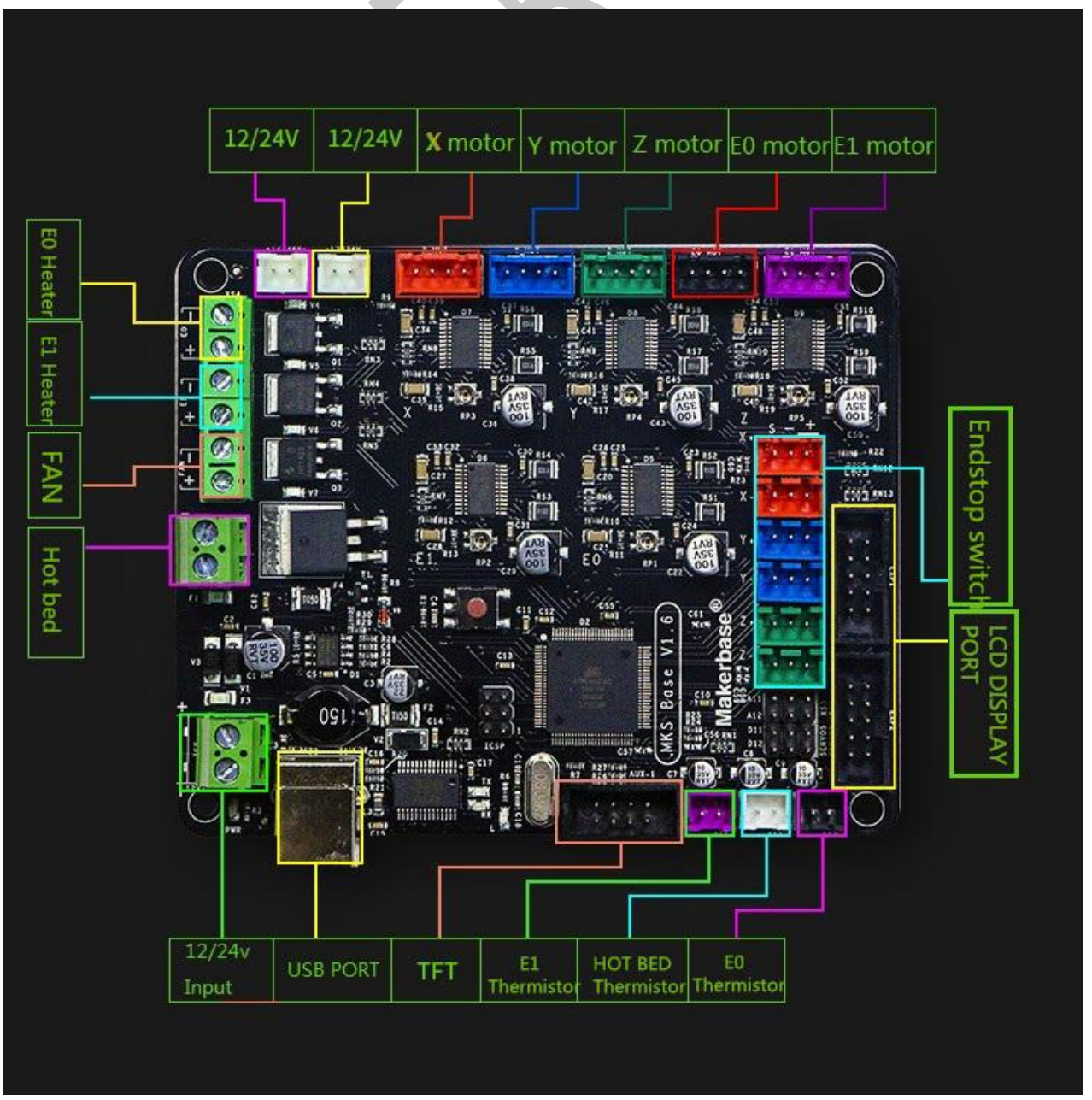
10.Fully consider stability, heat dissipation, and ease of use issues, and pass continuous printing reliability testing.

Ⅲ The connection description and size chart

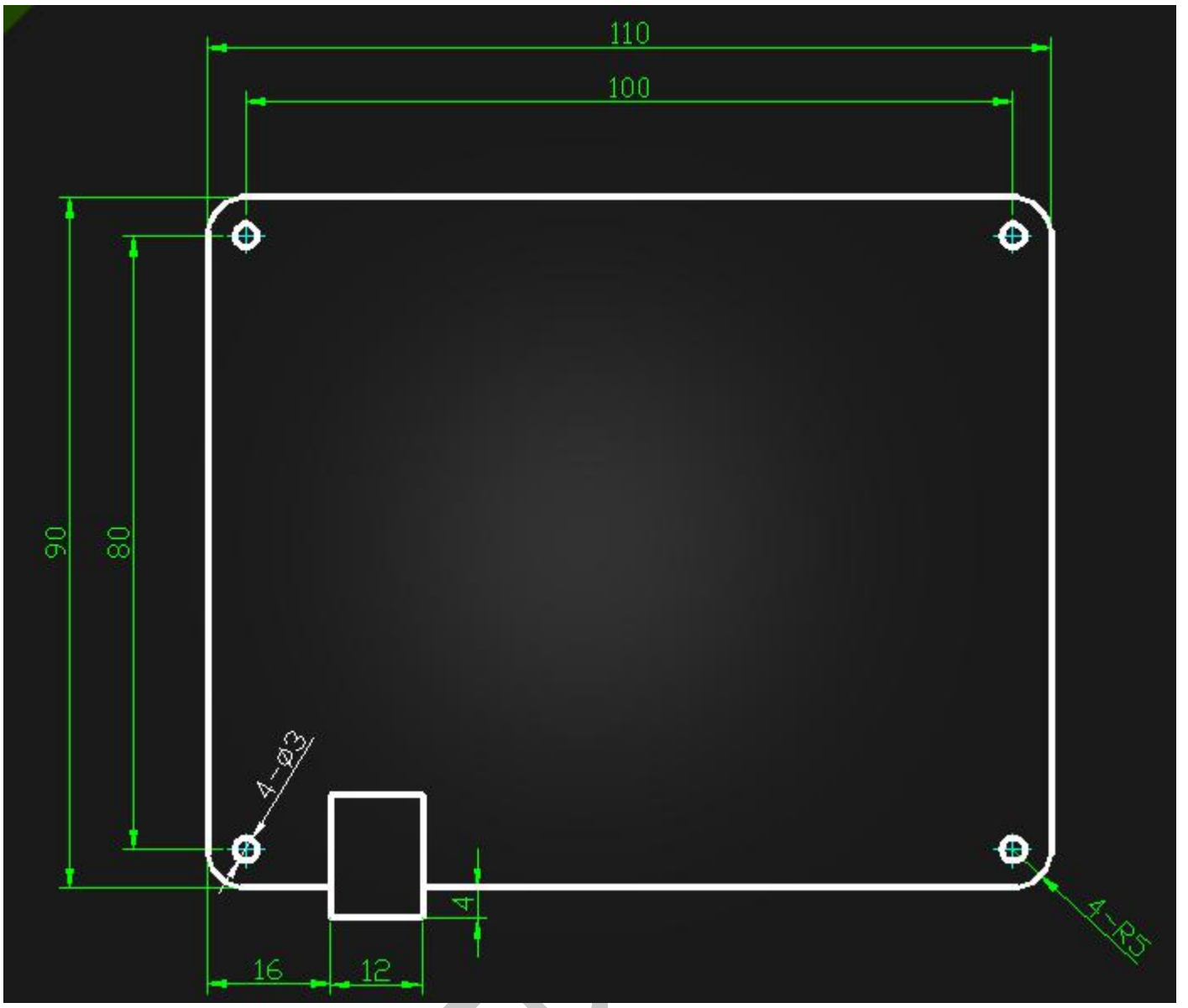
1 MKS Base v1.6 motherboard product



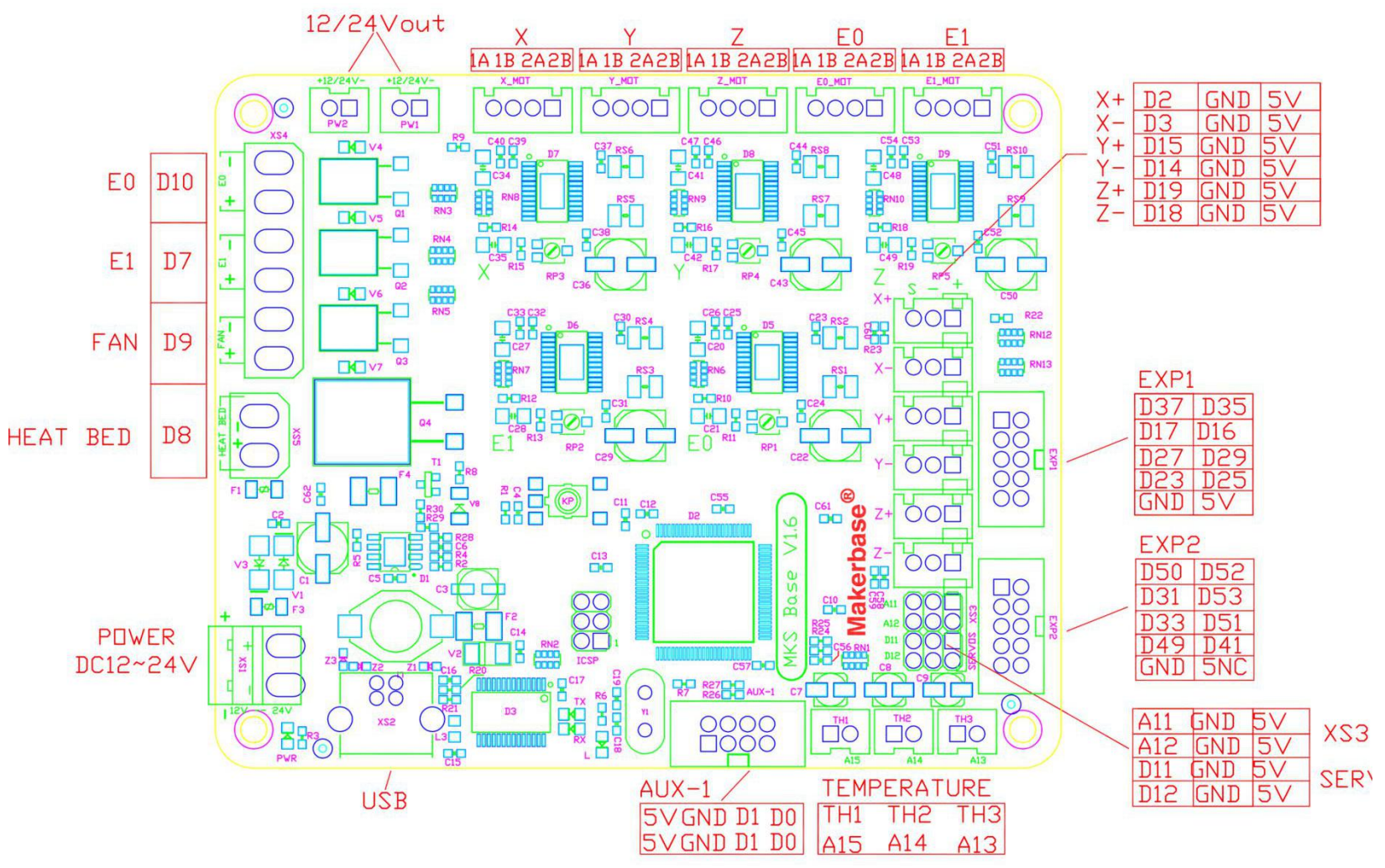
2 System connection diagram



3 MKS Base v1.6 Installation Dimensional Drawing



4 MKS Base V1.6 PIN Port



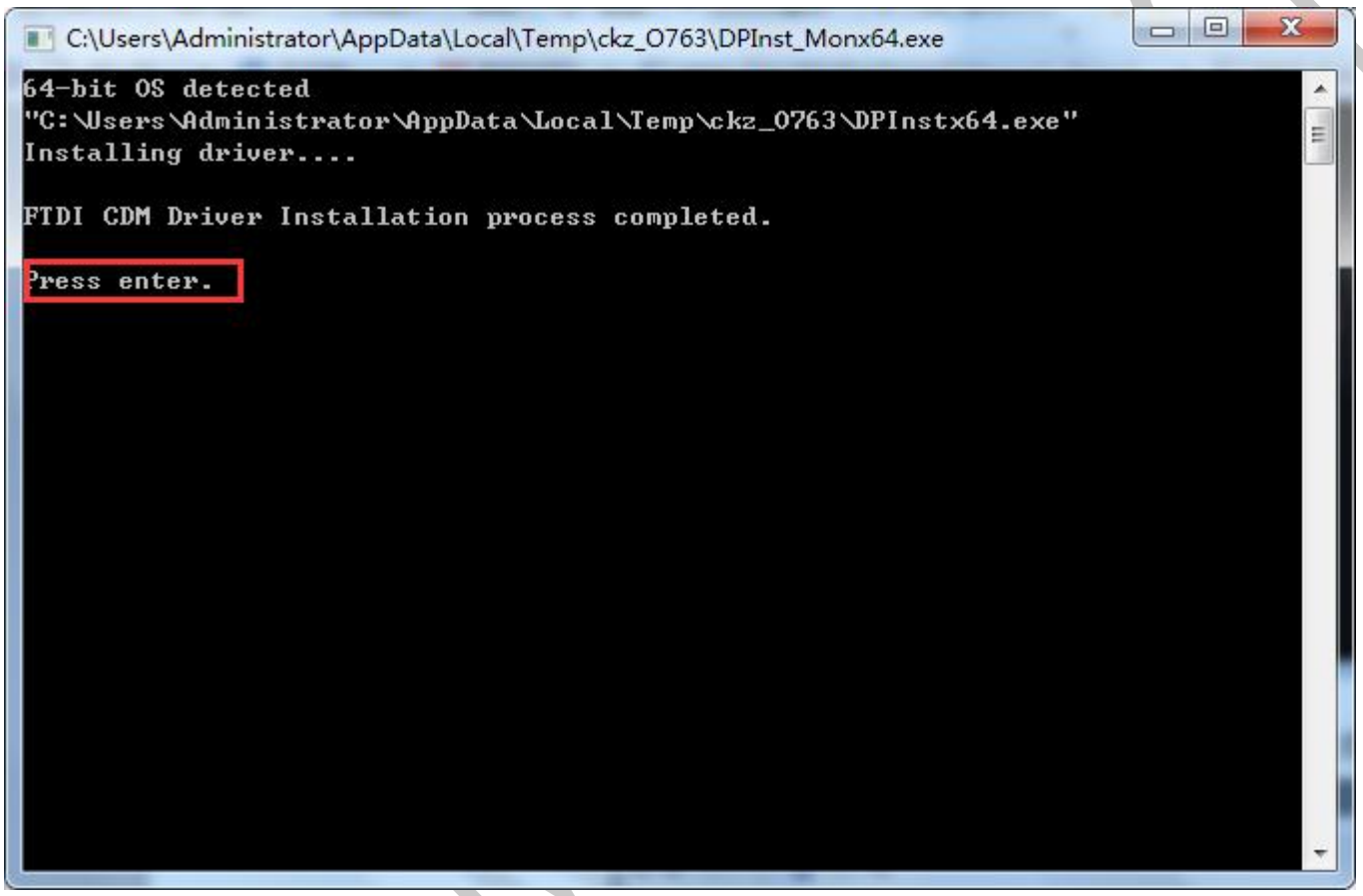
Ⅳ Instructions

1 The ways to get the MKS Base v1.6 Latest Firmware.

- Get firmware from customer service or technician
- Download the firmware from the makerbase discussion group.
- Download on Web:
  https://github.com/makerbase-mks?tab=repositories

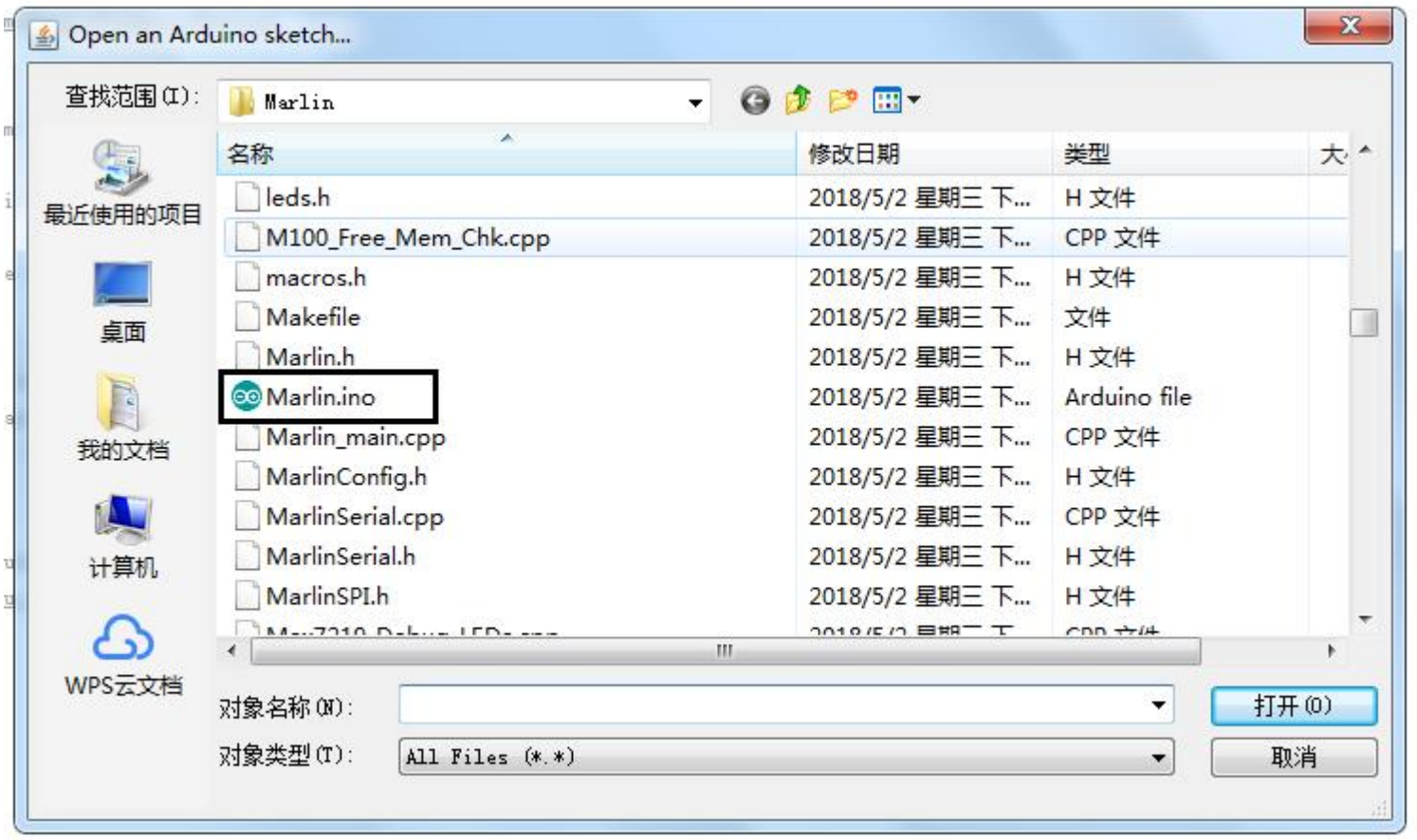
2 USB driver Installation

2.1 First find the driver installation file on the computer, click ftdi_ft232_drive.exe to install the driver

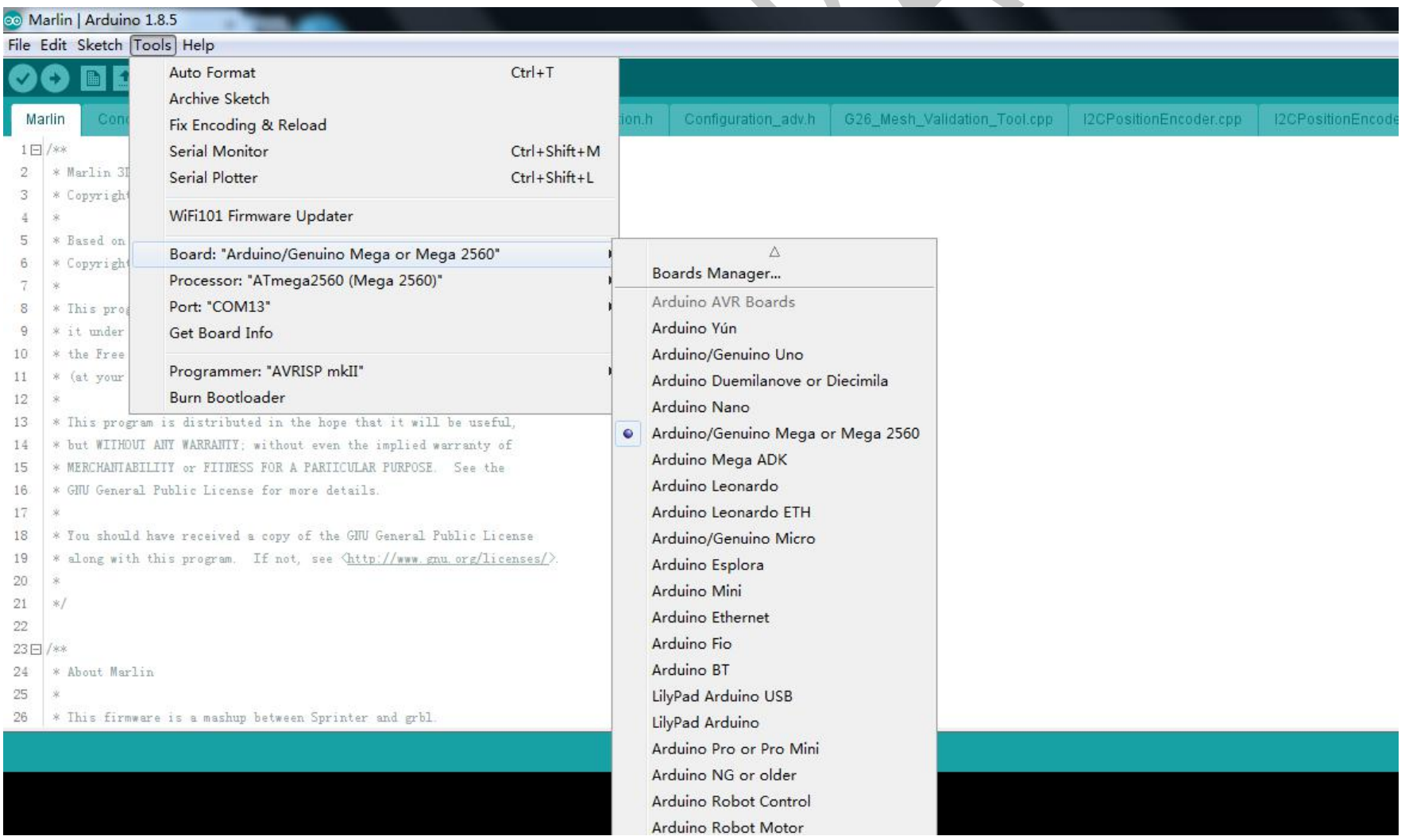


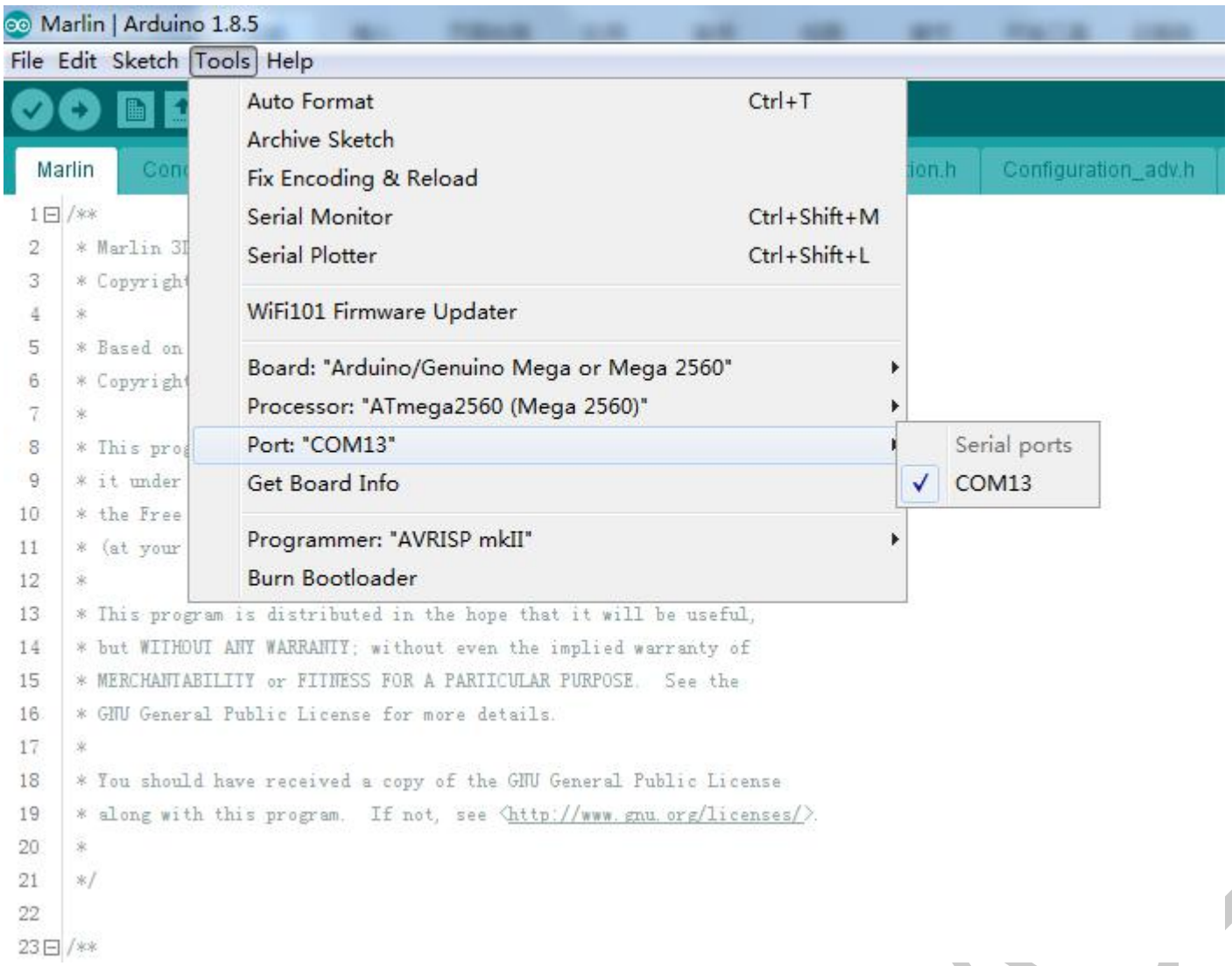
3 Upload the marlin firmware

Start uploading the marlin firmware, open the Arduino, execute "File" "Open", select the marlin firmware to be uploaded, and select the file with the suffix ***.pde or ***.ino to open;

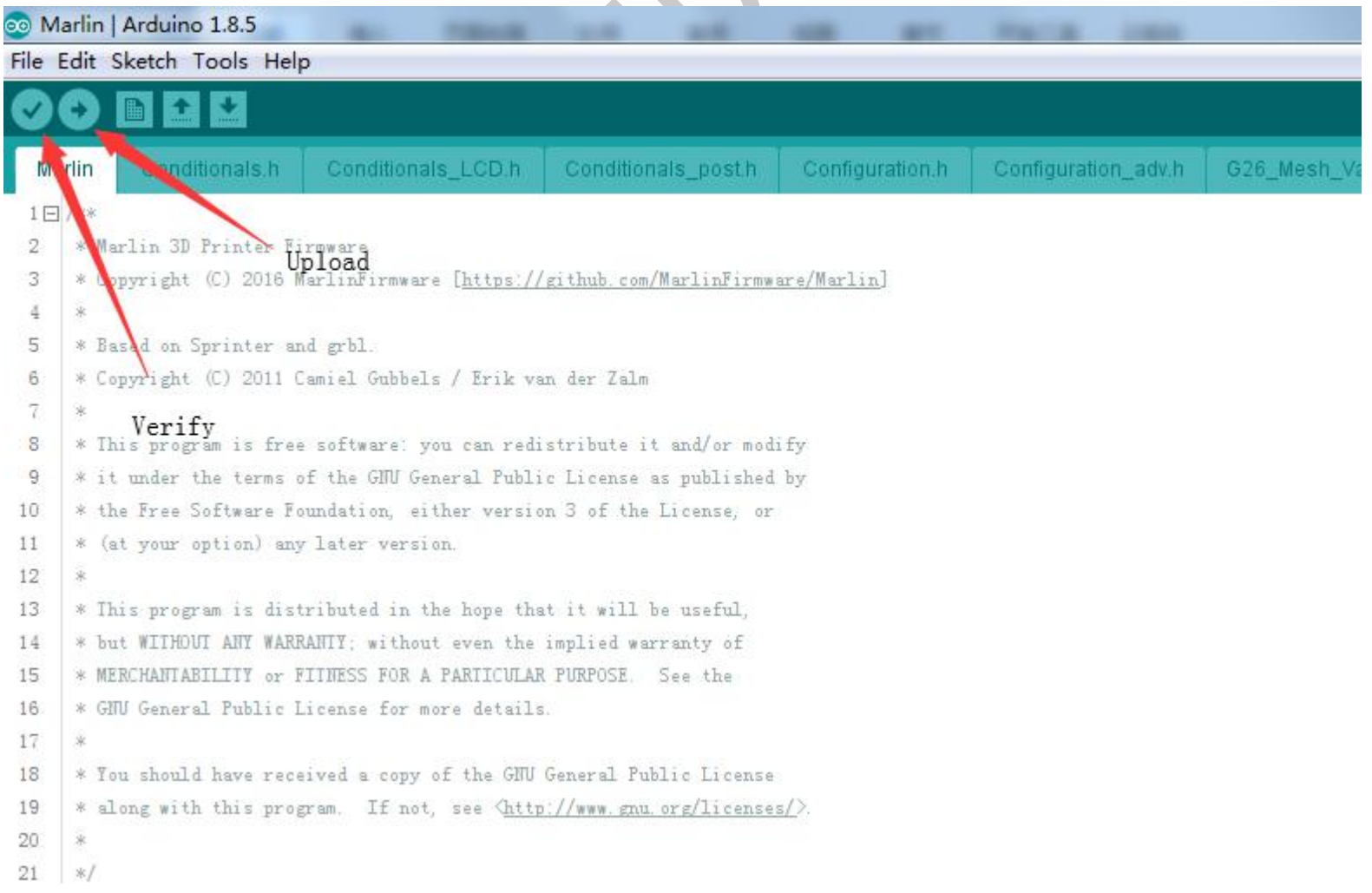


After opening, select the board type in the toolbar on the Arduino software and select the COM port of the port.





Click "Upload" (you can also verify first, then upload)



After clicking upload, it will compile and download again. When downloading, you can see that the indicator light of the motherboard will flash, indicating that the firmware is being uploaded. After the firmware upload is completed, the indicator light stops flashing, and Arduino shows that the upload is successful.

```
 8  * This program is free software: you can redistribute it and/or modify
 9  * it under the terms of the GNU General Public License as published by
10  * the Free Software Foundation, either version 3 of the License, or
11  * (at your option) any later version.
12  *
13  * This program is distributed in the hope that it will be useful,
14  * but WITHOUT ANY WARRANTY; without even the implied warranty of
15  * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
16  * GNU General Public License for more details.
17  *
18  * You should have received a copy of the GNU General Public License
19  * along with this program.  If not, see <http://www.gnu.org/licenses/>.
20  *
21  */
22
23 /**
24  * About Marlin
```

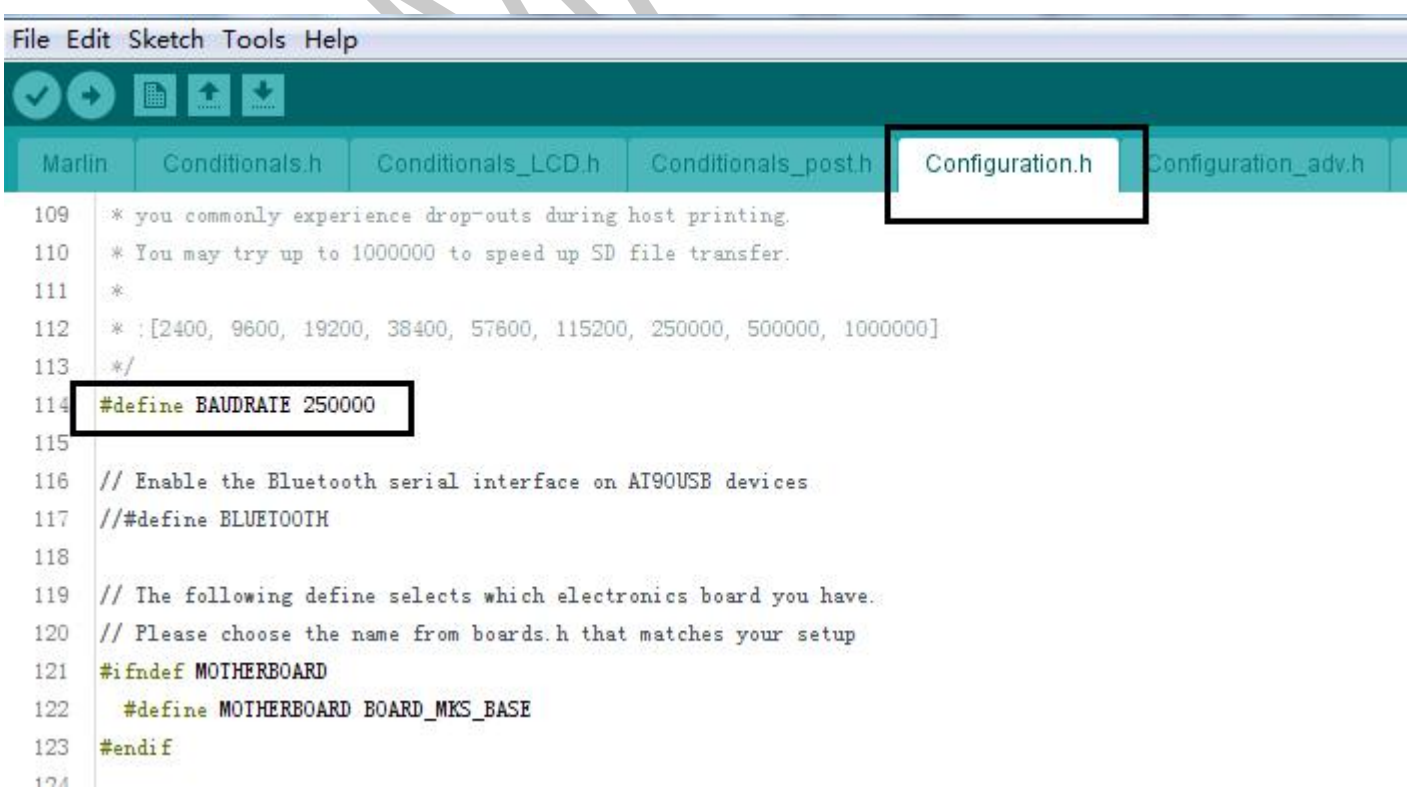
```
Done uploading.

avrdude: 112454 bytes of flash verified

avrdude done.  Thank you.
```

Ⅴ modify the firmware

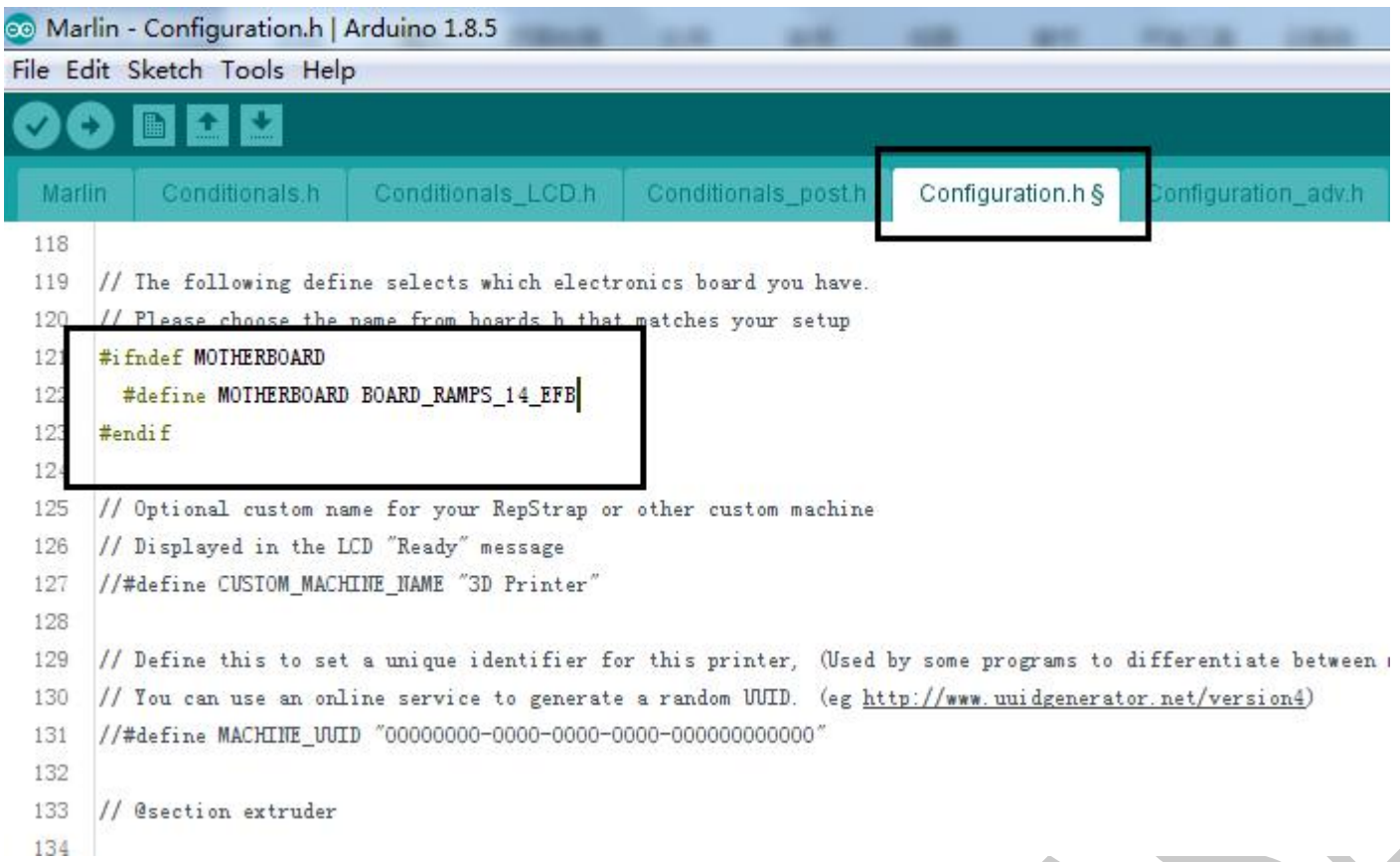
The basic configuration of Marlin firmware is generally carried out in the configuration.h file. I need to modify it to list it in the table. Download the corresponding firmware in the group file only need to modify the sensor type, motor direction, maximum stroke, pulse. That's it.

Number	Types	explanation
1	Baud rate	The baud rate must be consistent with the host computer to communicate.
2	Motherboard type	The type for mks is BOARD_RAMPS_14_EFB
3	Sensor type	Sensor type for temperature detection
4	End stop switch type	Set the switch type to normally open or normally closed
5	Motor direction	Set the direction in which each motor returns to zero
6	Maximum stroke of each axis	Set according to the size of the model itself
7	Pulse	Set the number of pulses per mm for each axis
8	LCD display type	The type of display used when printing offline (if the touch screen is defined by any one of them)

1. Select the baud rate, generally 115200 and 250,000, the baud rate should be consistent with the baud rate selected by the host computer to communicate.

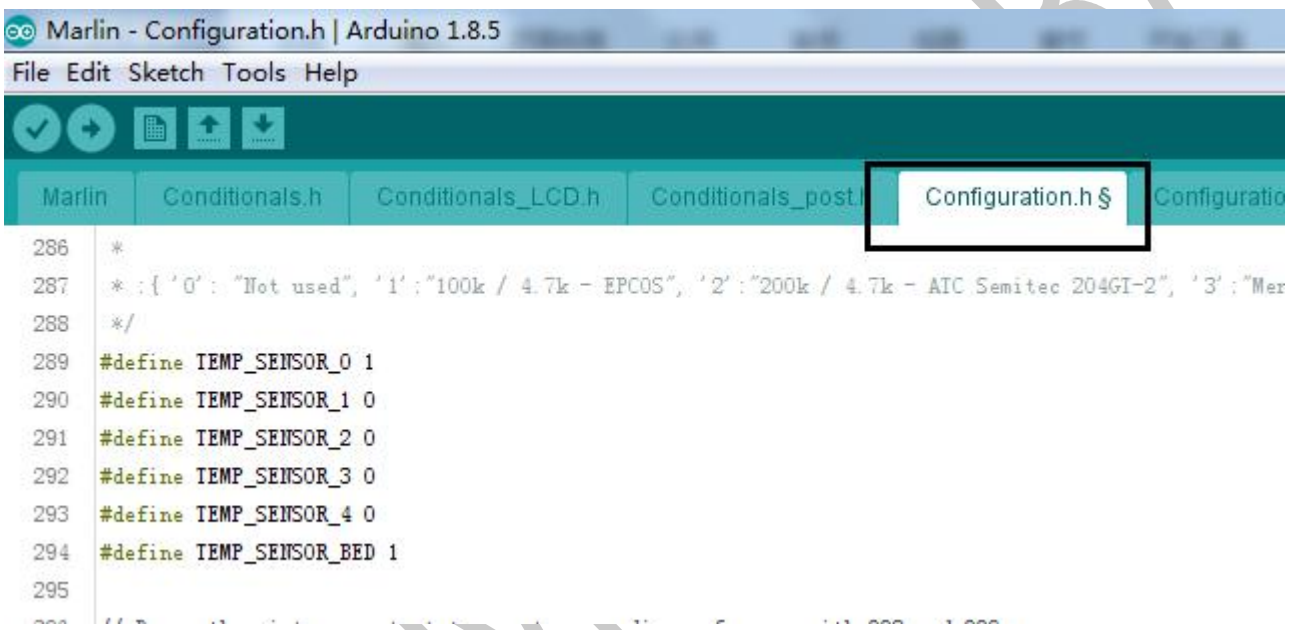


2. Motherboard type, the motherboard of the maker base selects BOARD_RAMPS_14_EFB.(or BOARD_MKS_BASE)

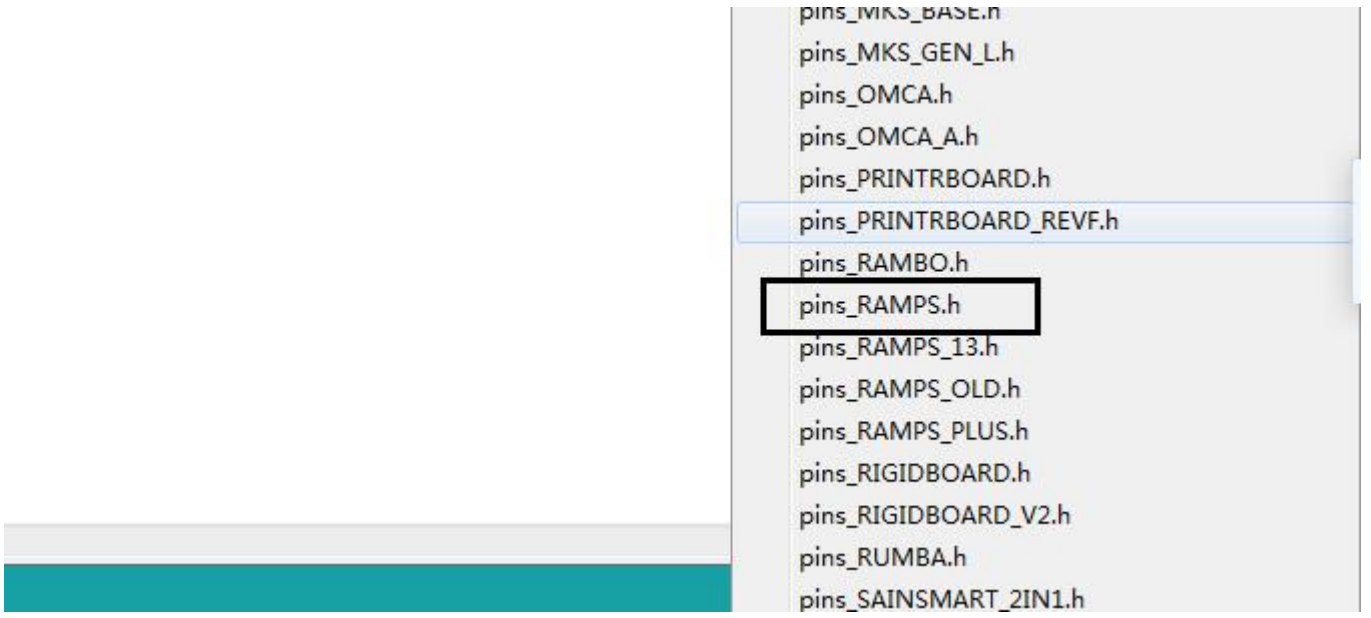


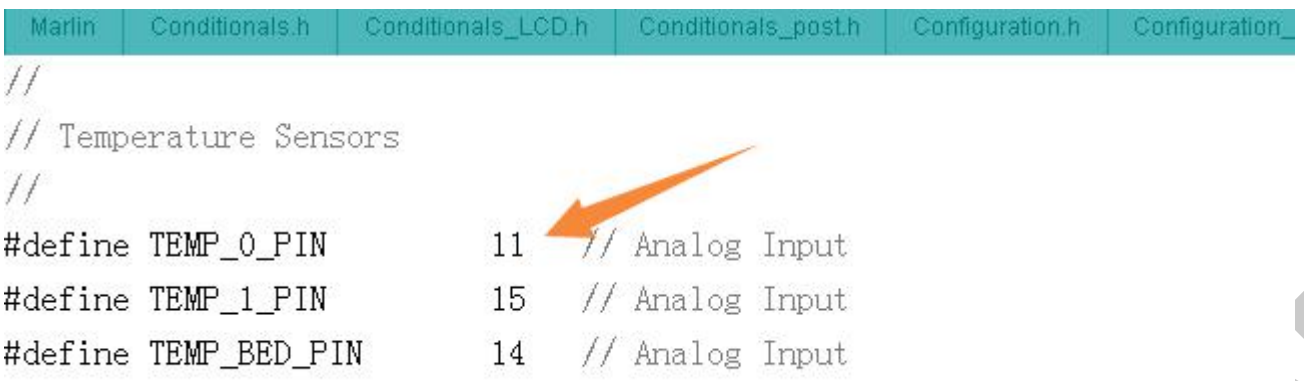
3. The sensor type is generally NTC 100K thermistor, PT100 thermocouple, AD597 thermocouple and so on.

You can choose according to your own thermal type.

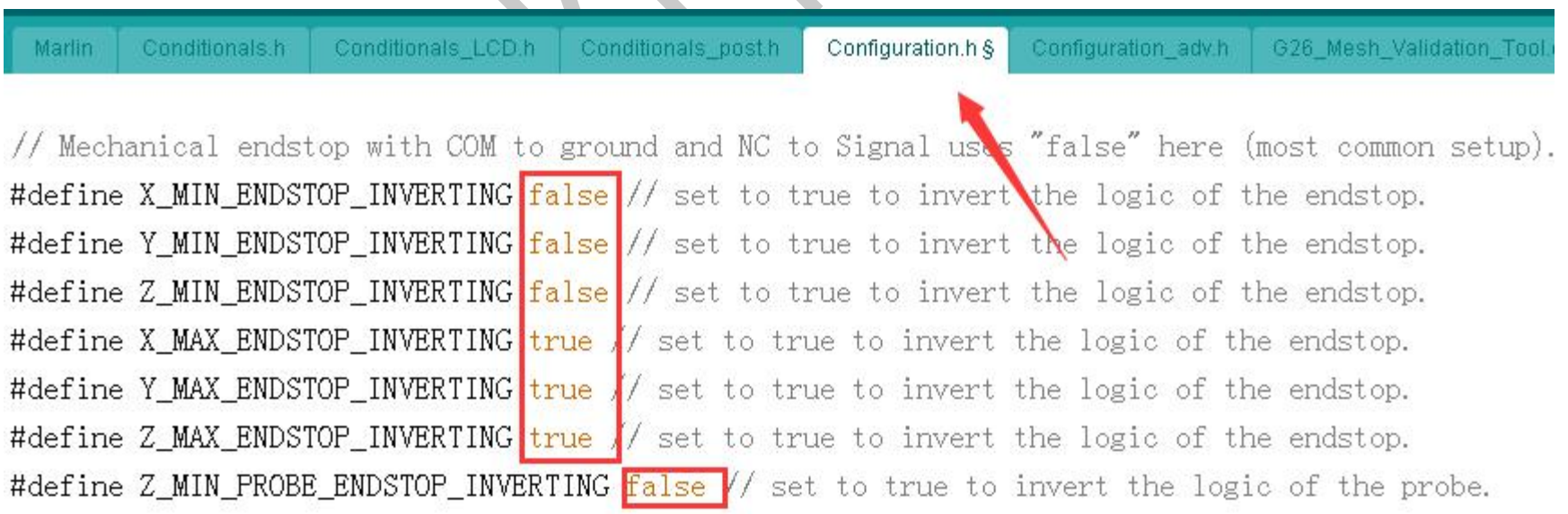


If using a PT100 thermocouple, you need to modify the PIN port to be connected in pins_RAMPS.h, for example, the A11 pin of the MKS Base motherboard. Modify as follows:



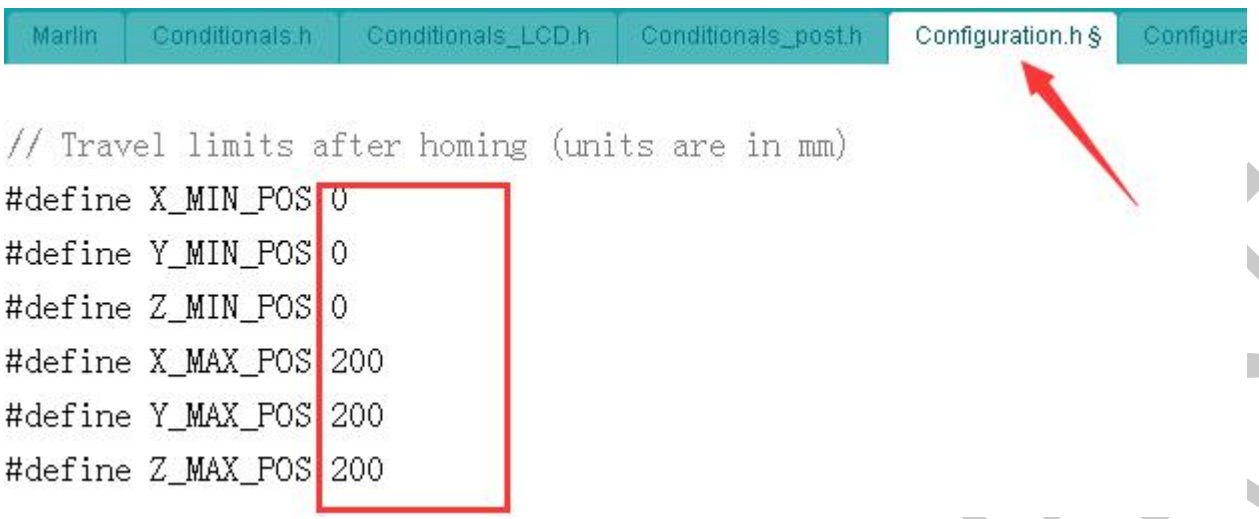


4. The endstop switch type is divided into normally open and normally closed. If the endstop switch is mechanical and normally open, it is “true” here. If it is photoelectric switch (normally closed), it is “false” here.



5. Motor movement direction control. Due to the different origin positions of each printer, the uncertainty of the motor's zero return direction. If the motor moves in the opposite direction, the following parameter values can be true or false, or the same group of stepper motors can be replaced. For example, 1A and 1B are swapped.

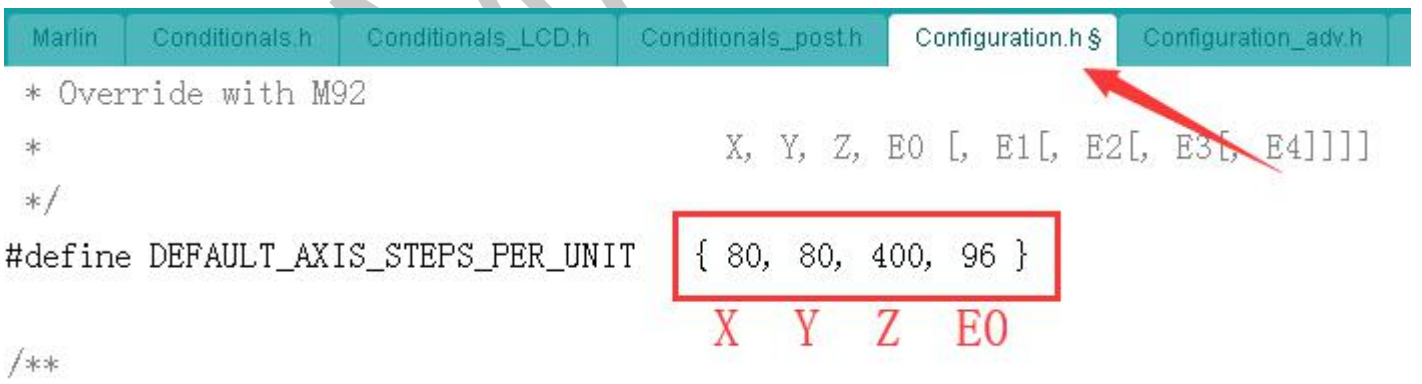
6. The maximum stroke of each axis, which is the maximum print size of the printer



7. Set the number of pulses corresponding to each axis to move 1mm, and calculate the number of pulses for each axis motor as follows:

Formula of pulse number/mm of synchronous wheel motor:（360÷step angle）×Subdivision÷（Diameter ×3.14）

The formula of the pulse number/mm of The screw rod Motor:（360÷step angle）×Subdivision÷lead



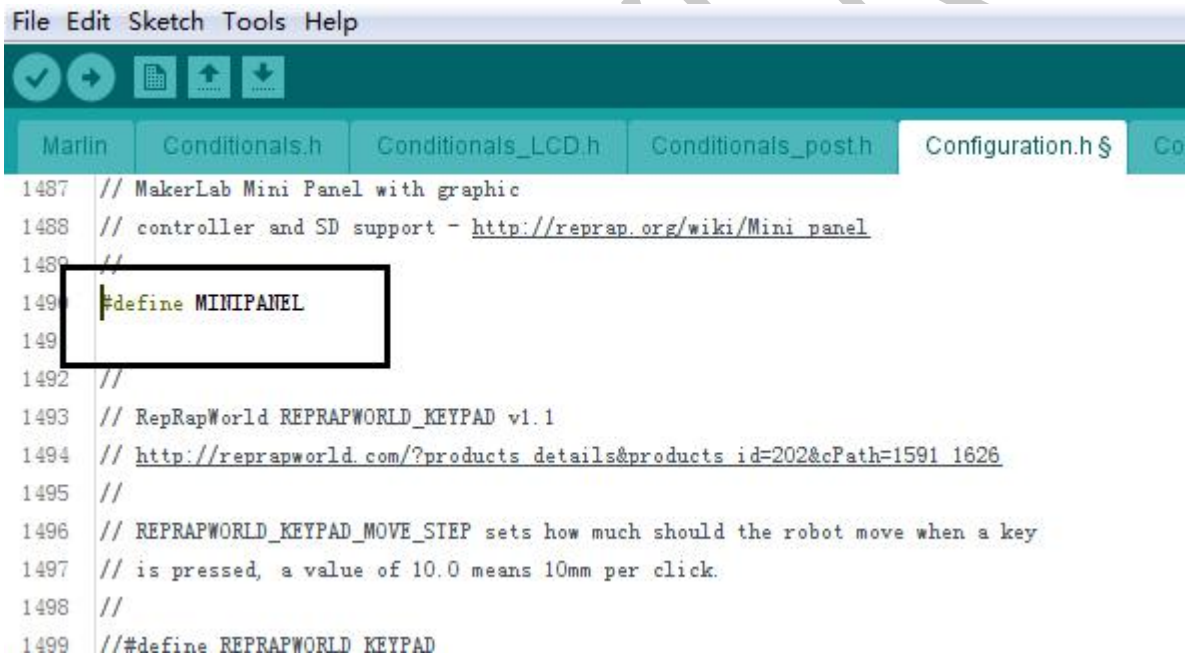
8. The type setting of the display is also relatively easy to make mistakes, so it is recommended that you download the firmware of the corresponding display directly in the group to make some basic modifications. (Cannot be defined together with two LCD screen types, otherwise it will compile, but only one LCD can be defined.

Screen type, if it is a touch screen, define any one of them)

(1) Define LCD2004 display

（2）Define LCD12864 display

（3）Define LCD mini12864 display



Define the type of display, just delete the "//" if you find the corresponding type.

Ⅵ　the main matters before loading the machine

According to the connection diagram introduced by Taobao, all the lines are connected to debug the printer and test the printing. There are a few points to note after connecting the line:

1. Never reverse the +and- of the power supply, drive and fan! ! !

2. The position of the endstop is to be inserted. Generally, the XYZ and I3 are connected to the minimum value, the delta is connected to the maximum value; the 2pin endstop switch is connected to the S and -, and the 3Pin limit switch is connected to the S, -, and + .

3. Must be connected to the thermal to operate, otherwise "Err: MINITEMP" will appear;

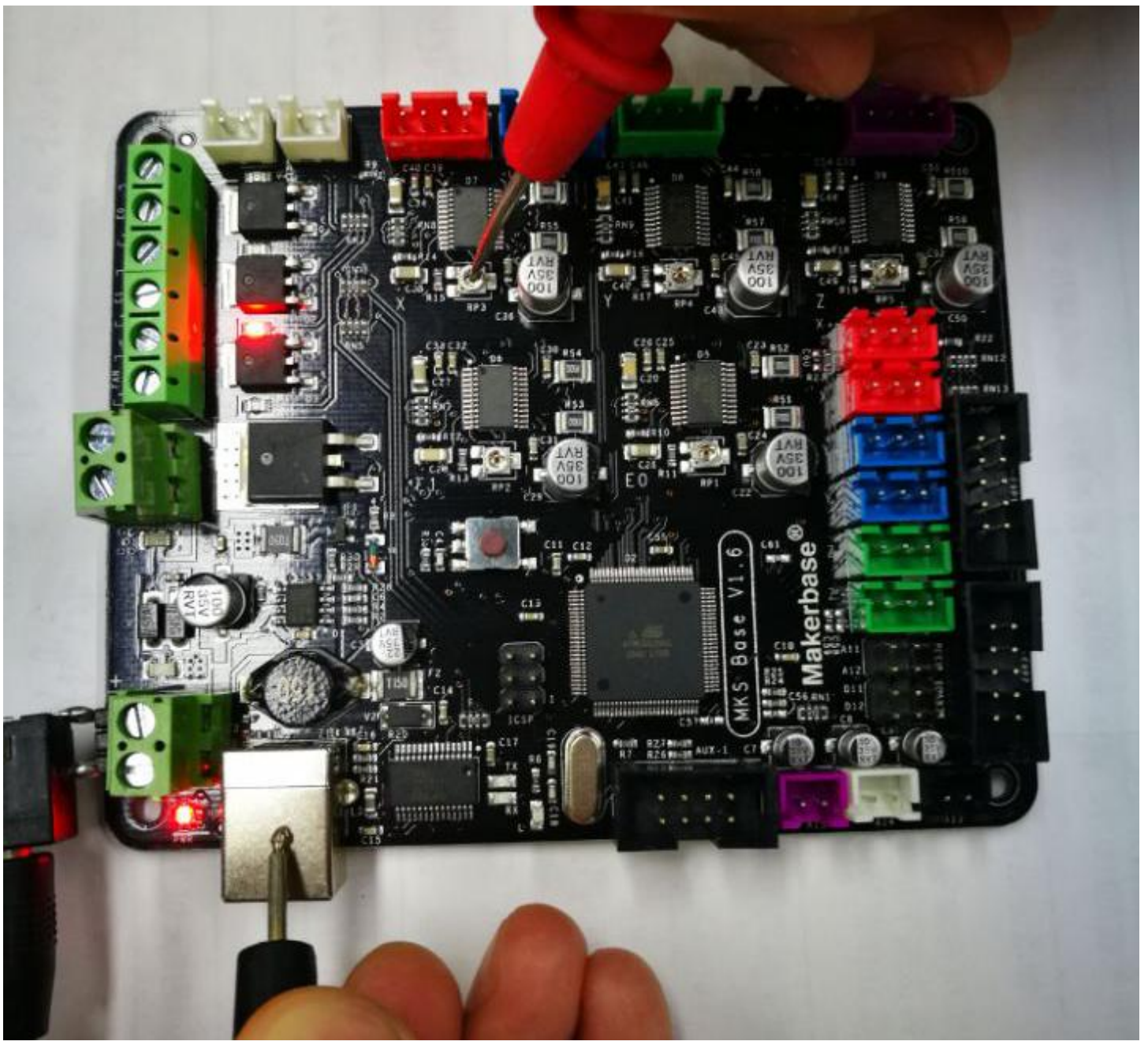
4. Before moving each axis, you must first return to zero.

Ⅶ Adjust the drive current

The motor driver chip on the MKS Base board is A4982, connected to 12V power supply, and the voltage of the intermediate foot of the potentiometer is measured with a multimeter.

The maximum load current formula is:I=V_REF/(8×RS)， RS=0.1

The V_REF measurement method is shown below. Do not connect the motor to regulate the current, burn the driver easily!!! The default driving current is 1A, and the maximum current is 2A. It is recommended not to exceed 1.5A.



Note: Please do not plug or unplug the motor when the power is on, it is easy to cause the drive to burn out; do not adjust the current during the running of the motor. The correct way is to disconnect the power supply, unplug the motor, re-power it, adjust the potentiometer, and test the voltage of the potentiometer until the measured voltage is the same as expected! ! !

Ⅷ. Technical support and protection

1. Power test will be done prior to shipment to ensure normal use of the product
2. Welcome friends to join the discussion group: 232237692.
3. Welcome to Blog Exchange ：http://flyway97.blog.163.com.
4. 3D printer motherboard contact

Miss Zhong：15521638375 Mr. Huang： 13148932315 Mr. Tan：13640262556.

Mr.Peng：13427595835

5. If you have any questions you can contact our customer service or find technical support staff in the group, we will be happy to serve you.

MKS official website

MKS Taobao website