Makerbase

Guangzhou Qianhui Information technology Co., Ltd

Duet2 WiFi Mainboard Datasheet

Makerbase

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Version Update

version	modified time	modification	Remark
V1.0	Feb 2th,2019	original version	

Catalogue

Ⅰ Overview

Duet2 WiFi is a motherboard for market demand. It adopts ARM Cortex-M4 ATSAM4E8E as main chip and runs at up to 120 MHz. With Reprap firmware, configuration files are directly configured on the web page for easier operation. Support for connecting to the Panel Due touch screen. WiFi module is integrated to motherboard that can be controlled and printed via a web page. It adopts TMC2660 driver to support high subdivision current. It is suitable for large machines that require large current. Reserve external ports to connected the stepper driver and sd card, which is convenient for expansion.

Ⅱ Features

1. Adopt ARM Cortex-M4 ATSAM4E8E as main chip, running frequency is up to 120 MHz, and bring own FPU floating-point arithmetic unit.

2. Support TMC2660 stepper drivers, up to 256 micro stepping, Stepper driver current up to 4A.

3.Directly set the stepper driver current on the firmware, don’t need to adjust the current by hands.

4.Dedicated WIFI module on board

5. Open sourced Reprap firmware, it can be updated through the web interface.

6. Support for the Panel Due touch screen, simple interface and easy operation.

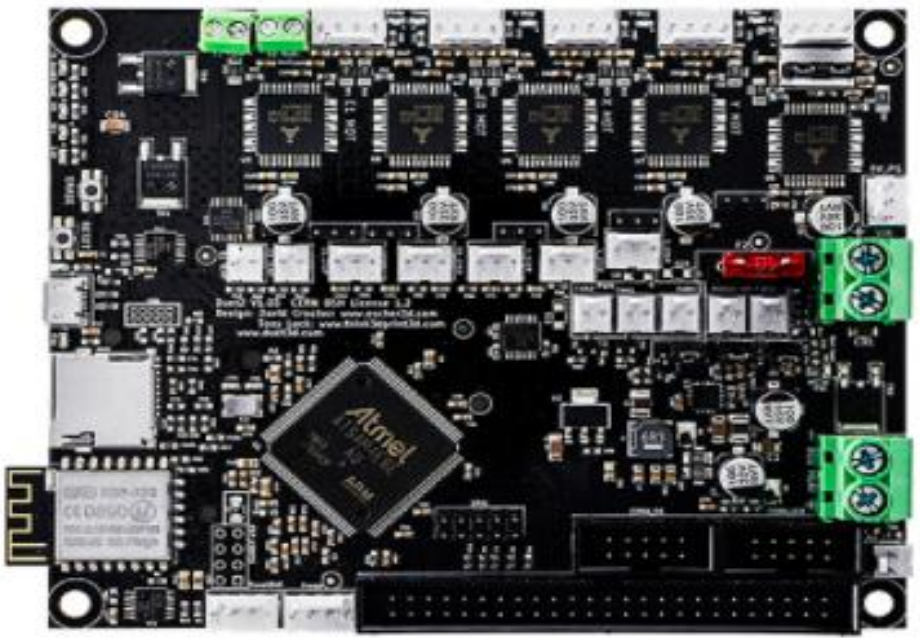
7. Support double Z on the hardware, don’t need to separately set on the firmware. Each axis has a reserved port for external stepper driver, which is convenient for expansion.

8. High speed SD card and support for a second SD external card if required.

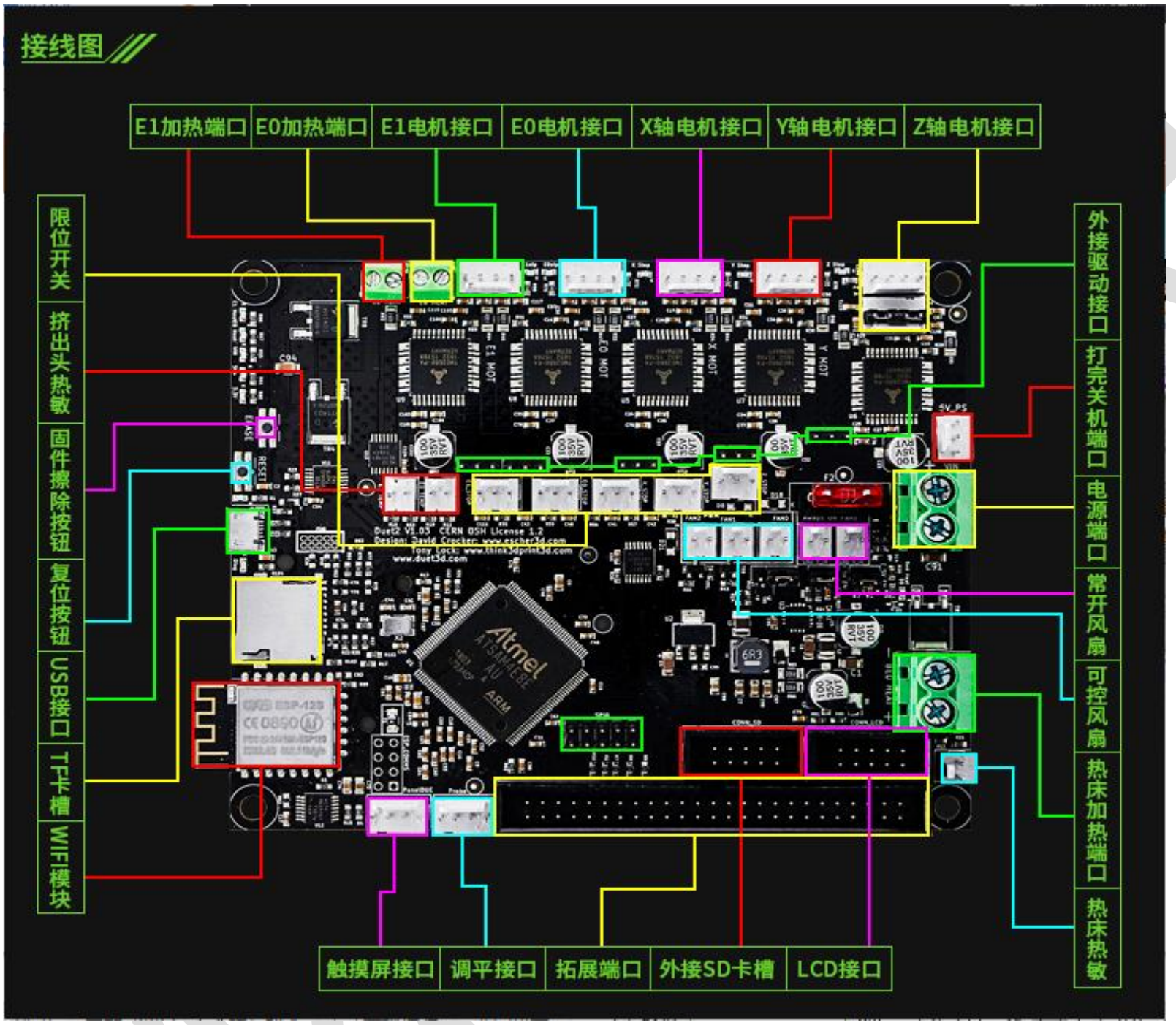
9. High quality 4-layer PCB and special designed for cooling.

Ⅲ The Connection Description and Size Chart

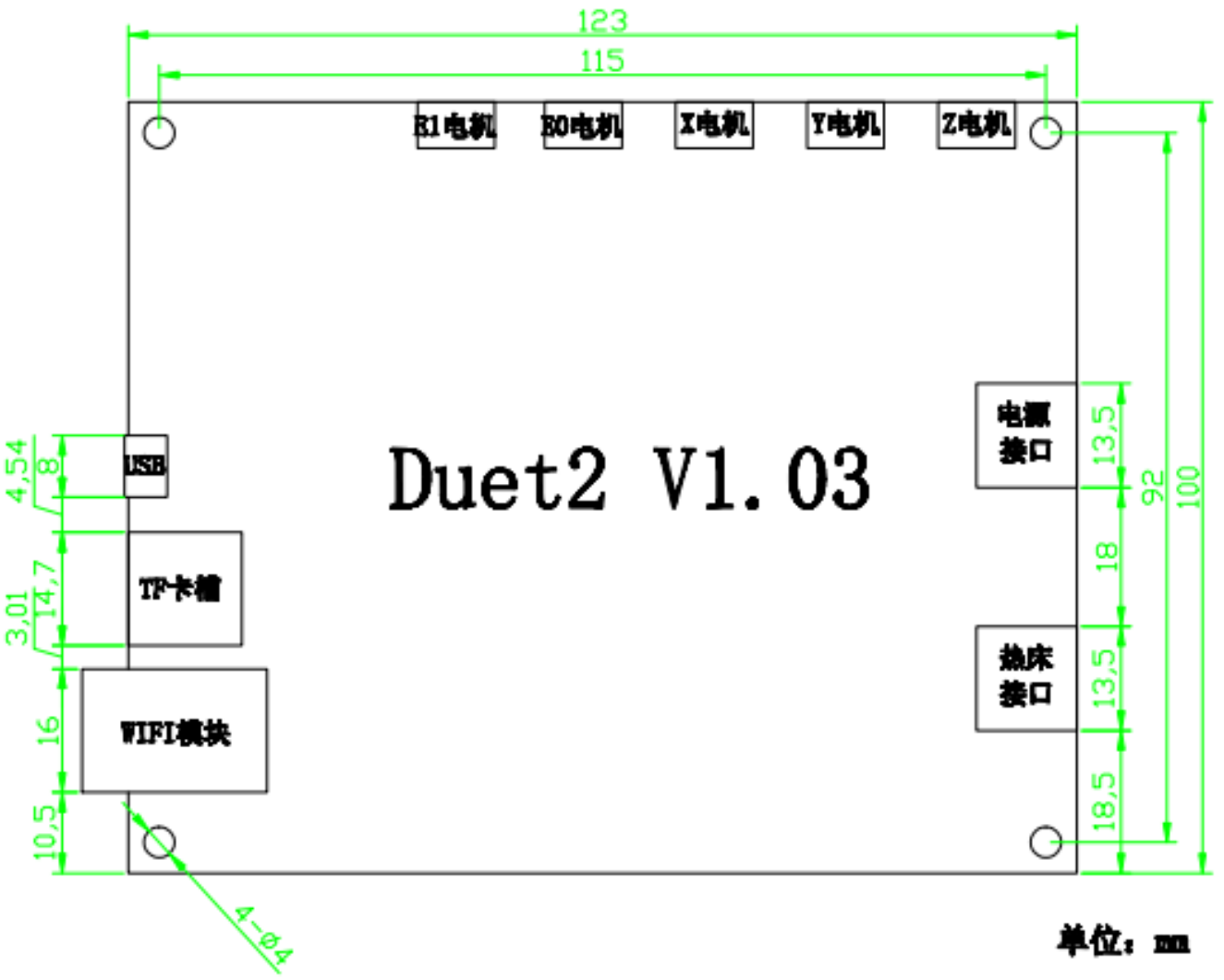
1. Duet2 WiFi Motherboard



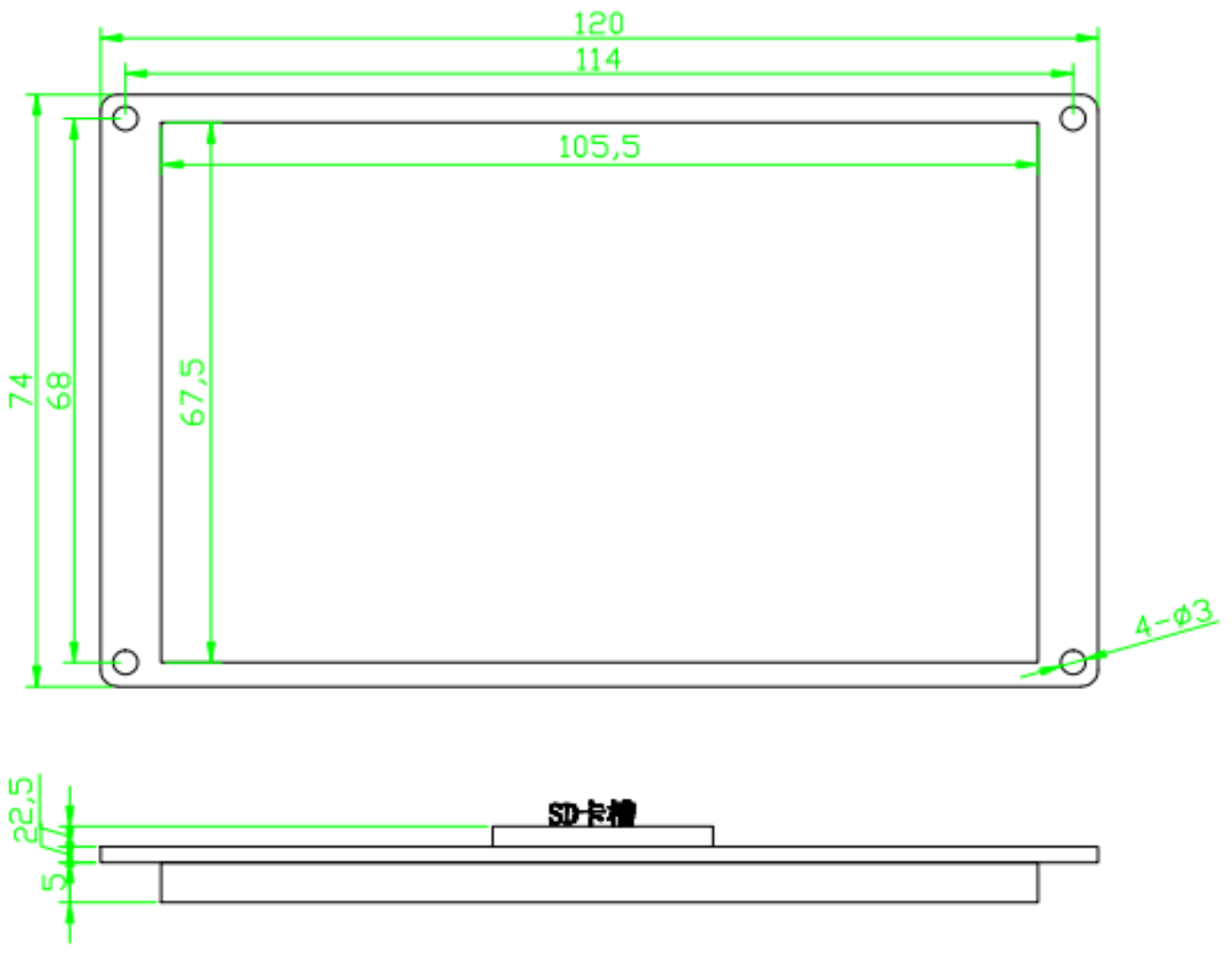
2. System Connection Diagram



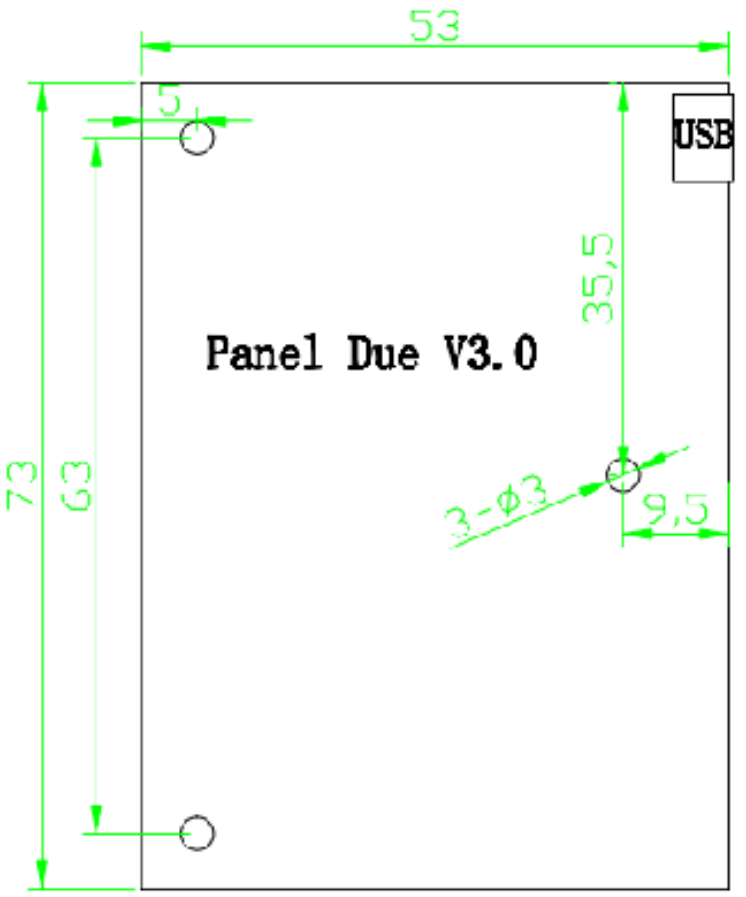
3. Duet2 Wifi Installation Dimensional Drawing



4. Screen Installation Size Diagram



5. Panel Due Installation Size Diagram



单位：mm

Ⅳ Instruction

4.1 The ways to get the Firmware and driver:

★ Get firmware from customer service or technician

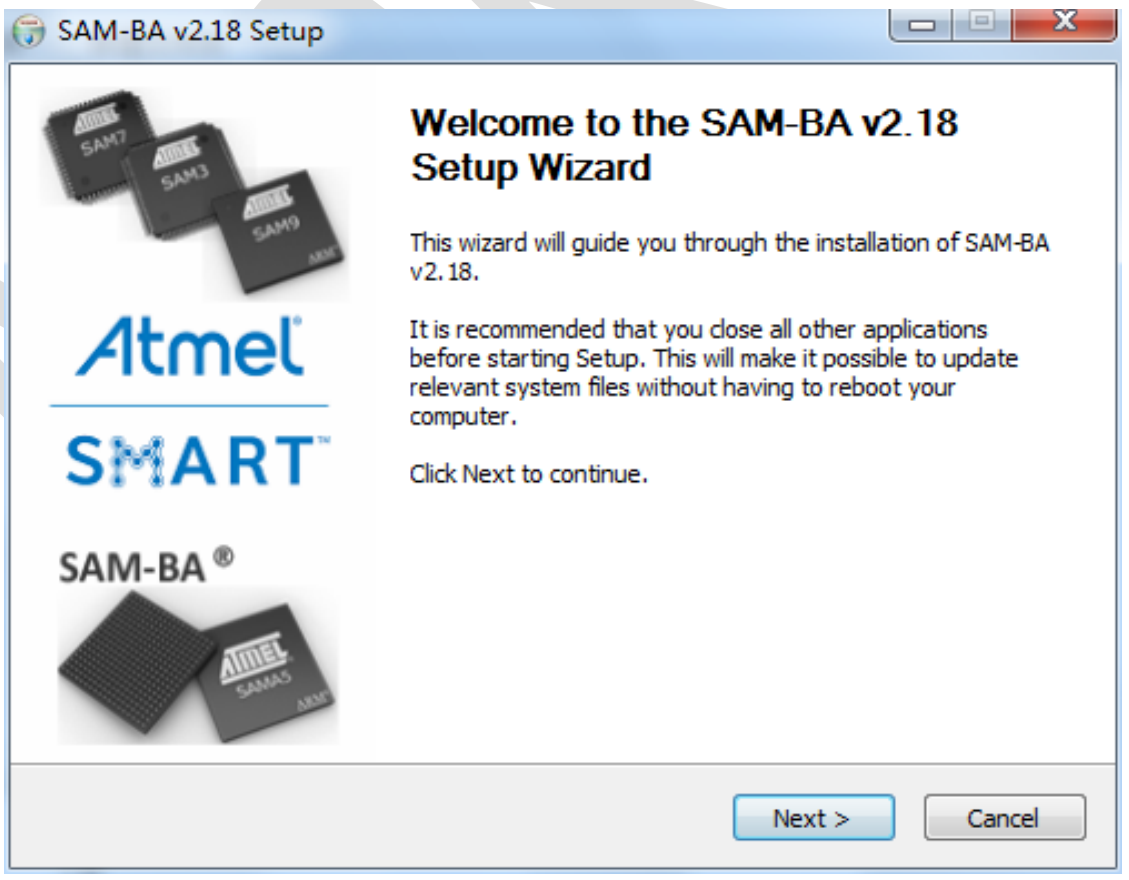
★ Download on web：https://github.com/makerbase-mks?tab=repositories

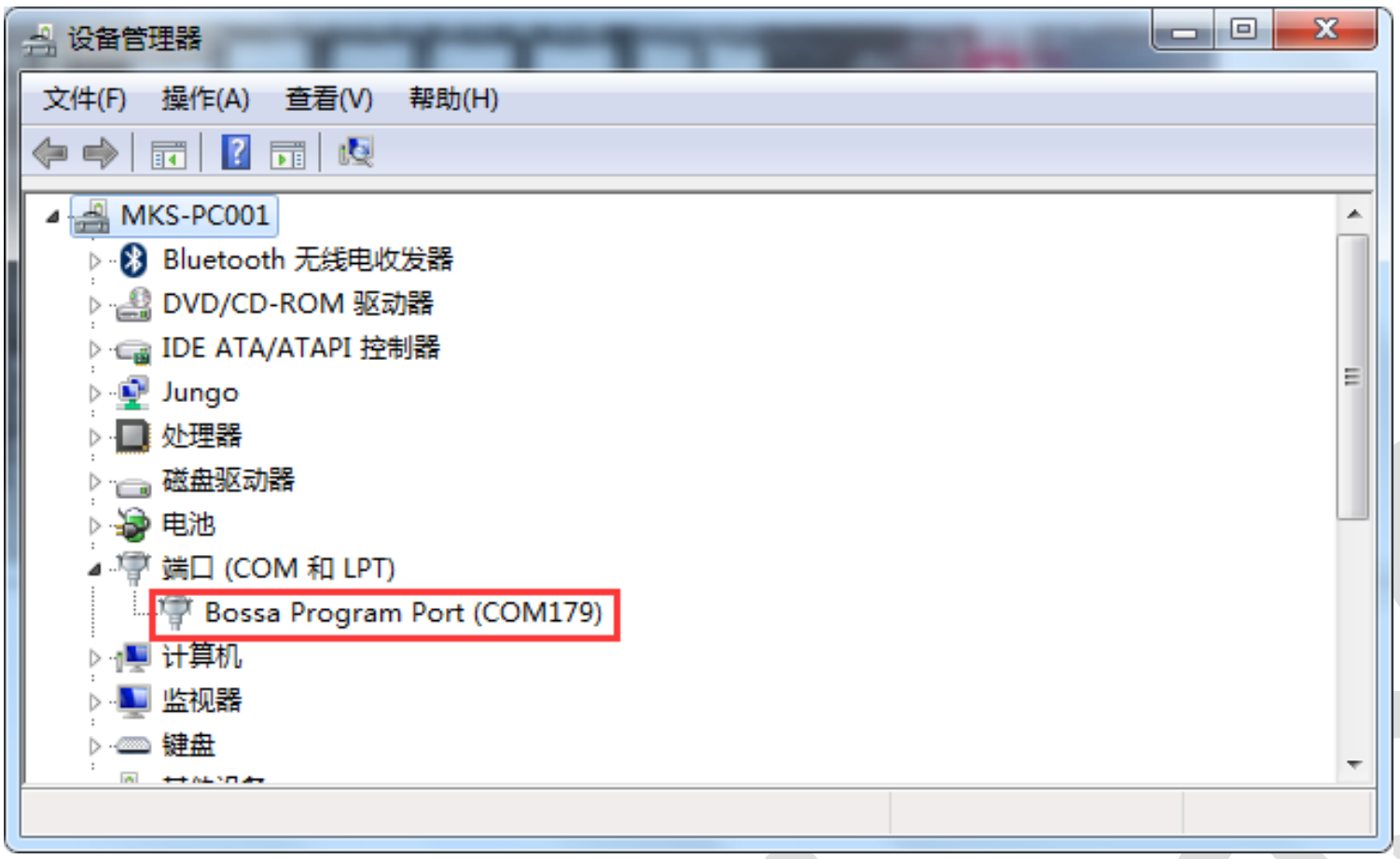
Panel screen：https://github.com/dc42/PanelDueFirmware/releases

Mainboard：https://github.com/dc42/RepRapFirmware/releases

4.2 Firmware update and driver installation

4.2.1 Install SAM-BA v2.18，





Connect the motherboard through the USB serial port, the computer can recognize the serial port (if the COM port is not recognized, press the motherboard “ERASE” button for more than 1S, and power on again)

4.2.2 Firmware update by software

1. Before we use Duet Board and Panel Screen, firmware needs to be updated by SAM-BA software.

Attention: different sizes of screen matches different firmwares. The firmware we provide by default is 4.3-inch firmware.

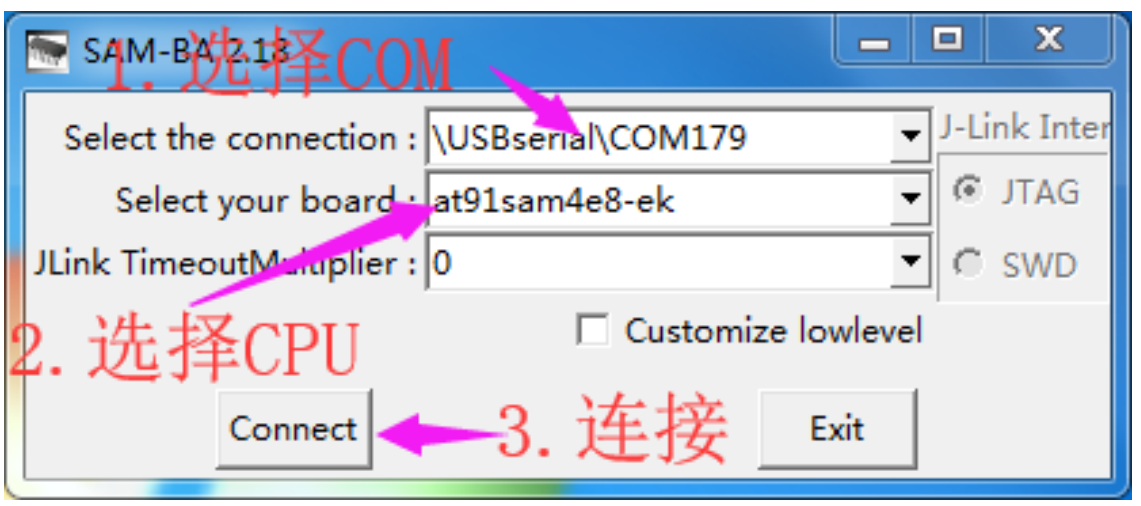
It is important to note that the firmware must be matched to the screen you are using.

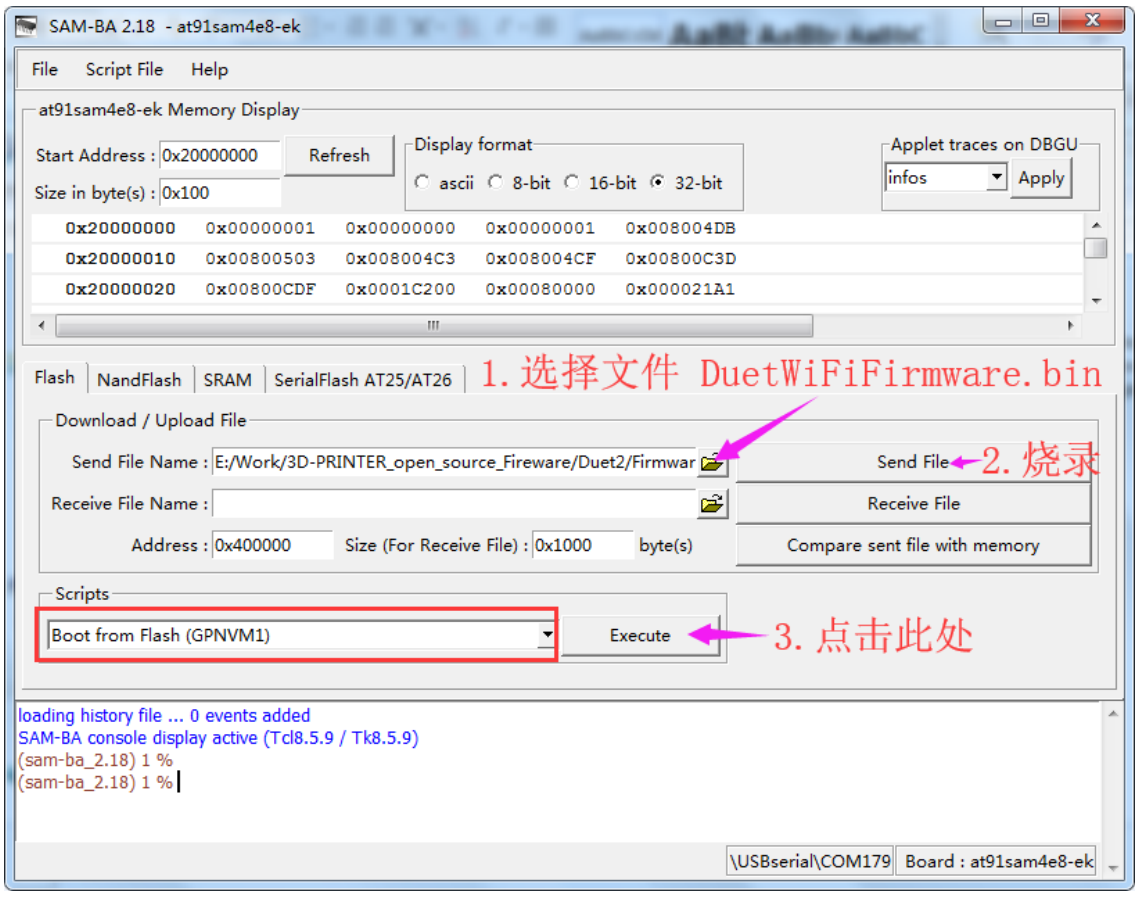
Motherboard and screen flashing steps: Pay attention to firmware and CPU type selection

Duet motherboard: firmware: Duet WiFi Firmware.bin motherboard CPU type: at91sam4e8-ek

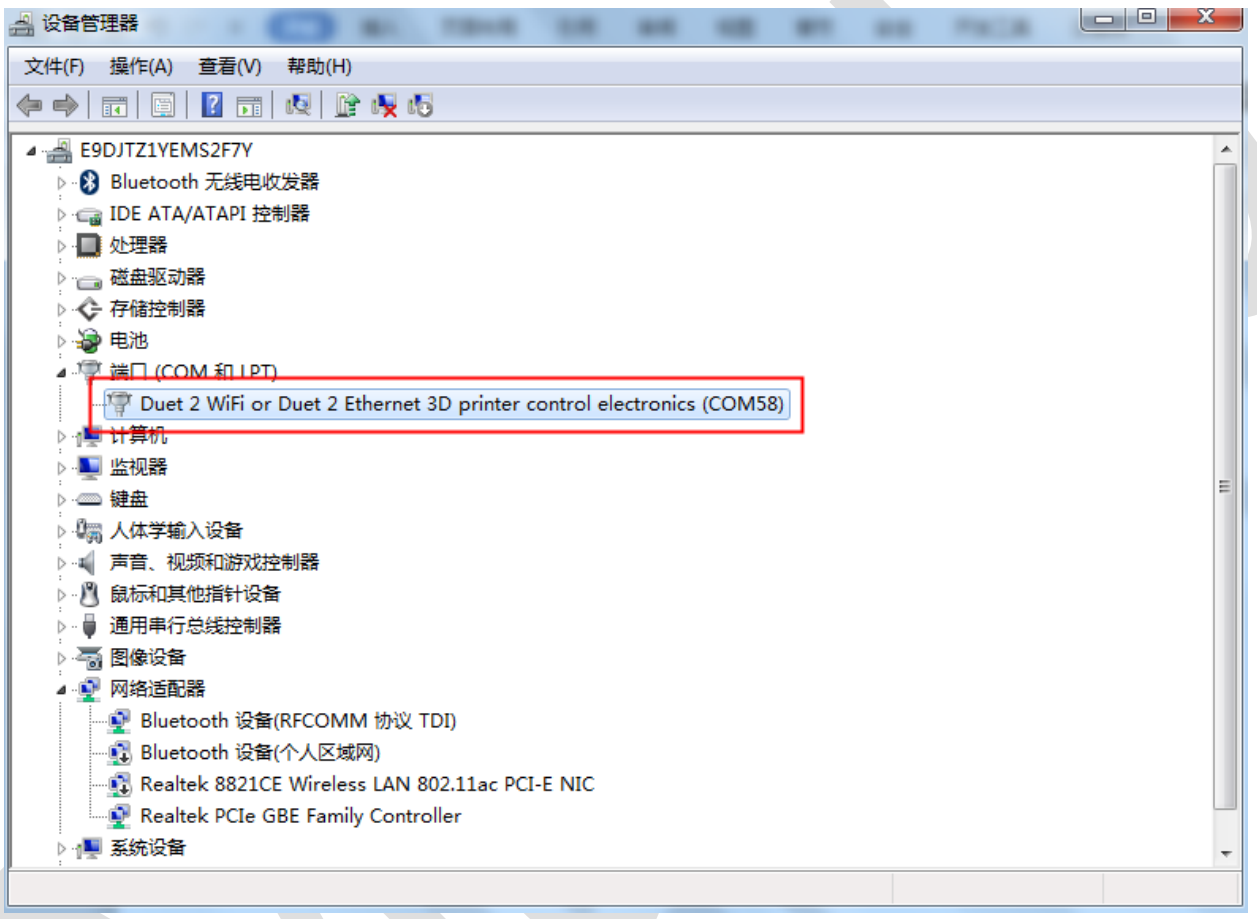
Panel screen: Firmware: PanelDue-v3-4.3 Motherboard CPU type: at91sam4s4-ek

The following are the steps of flashing



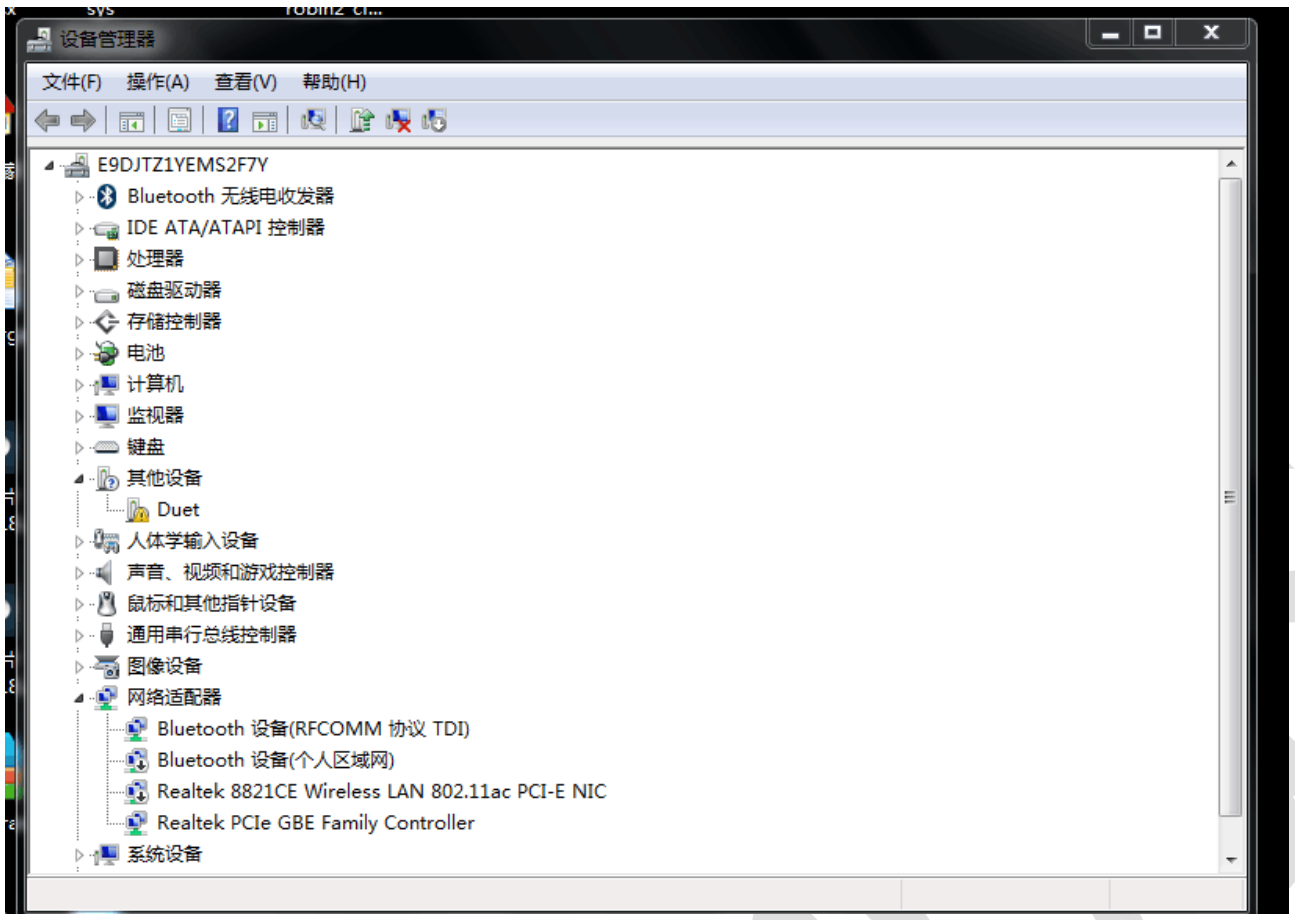


2, After flashing firmware, The USB port will change to

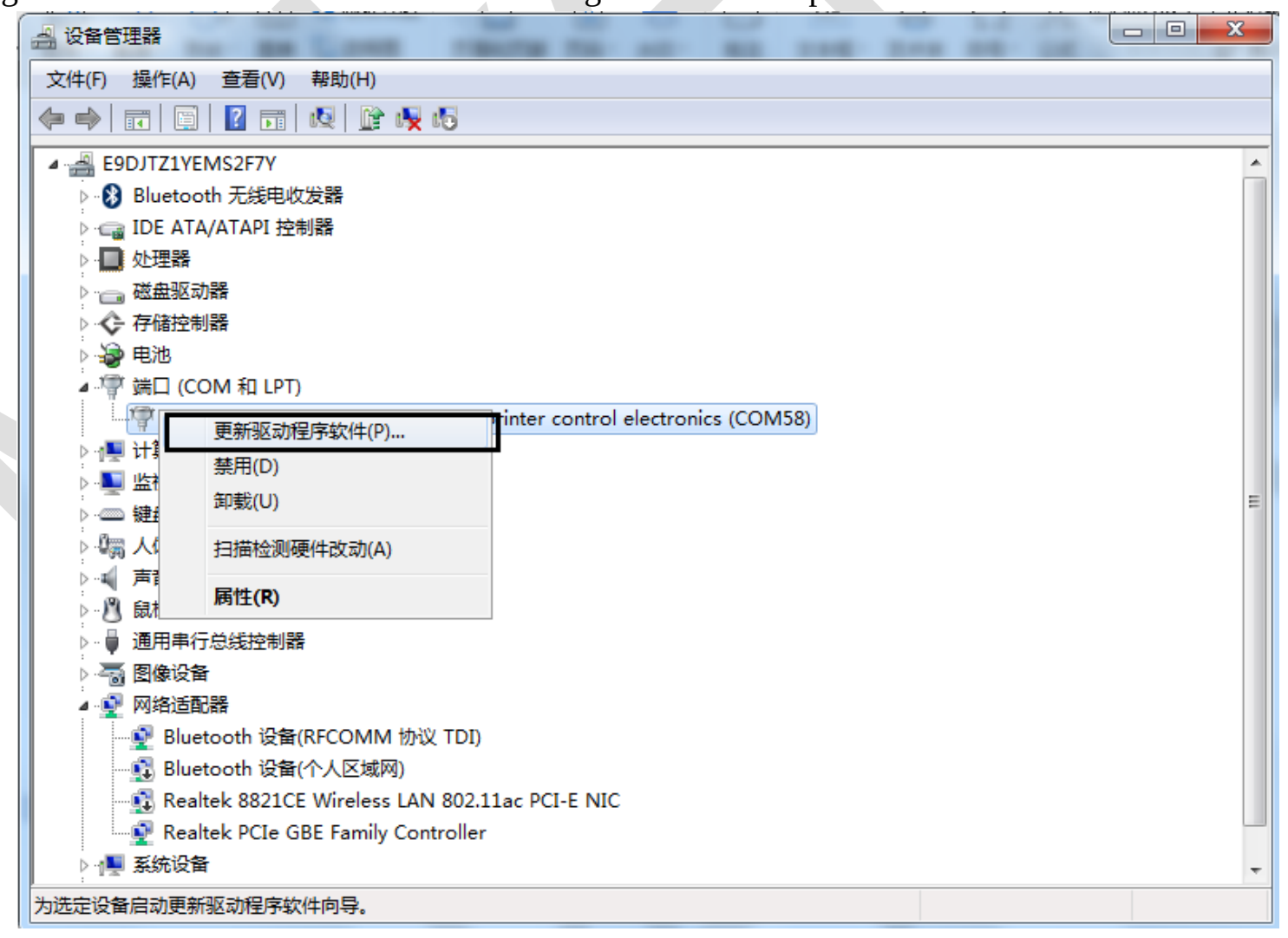


4.2.3. Driver update

If finishing firmware update, but above picture doesn't appear, you need to update the USB driver.

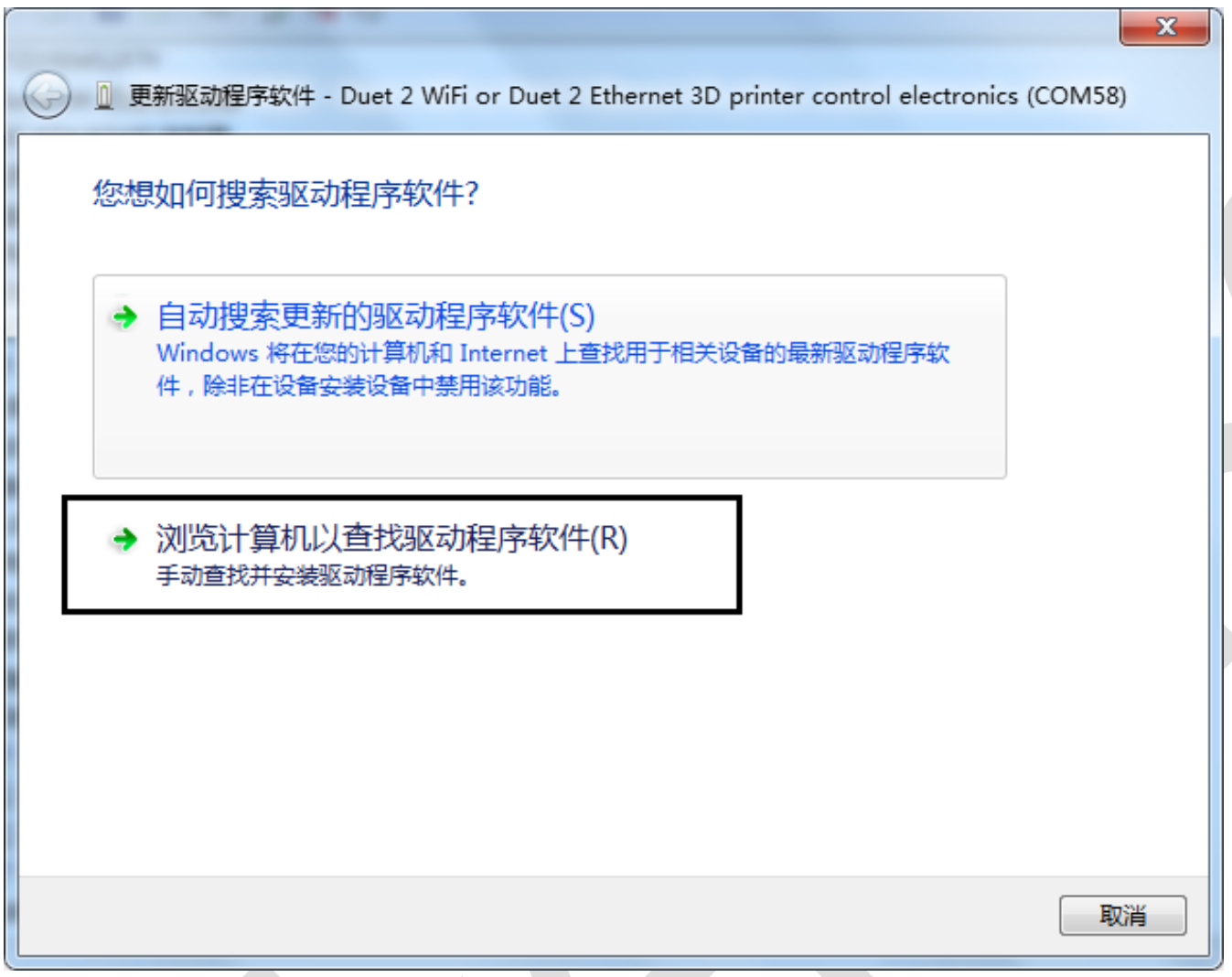


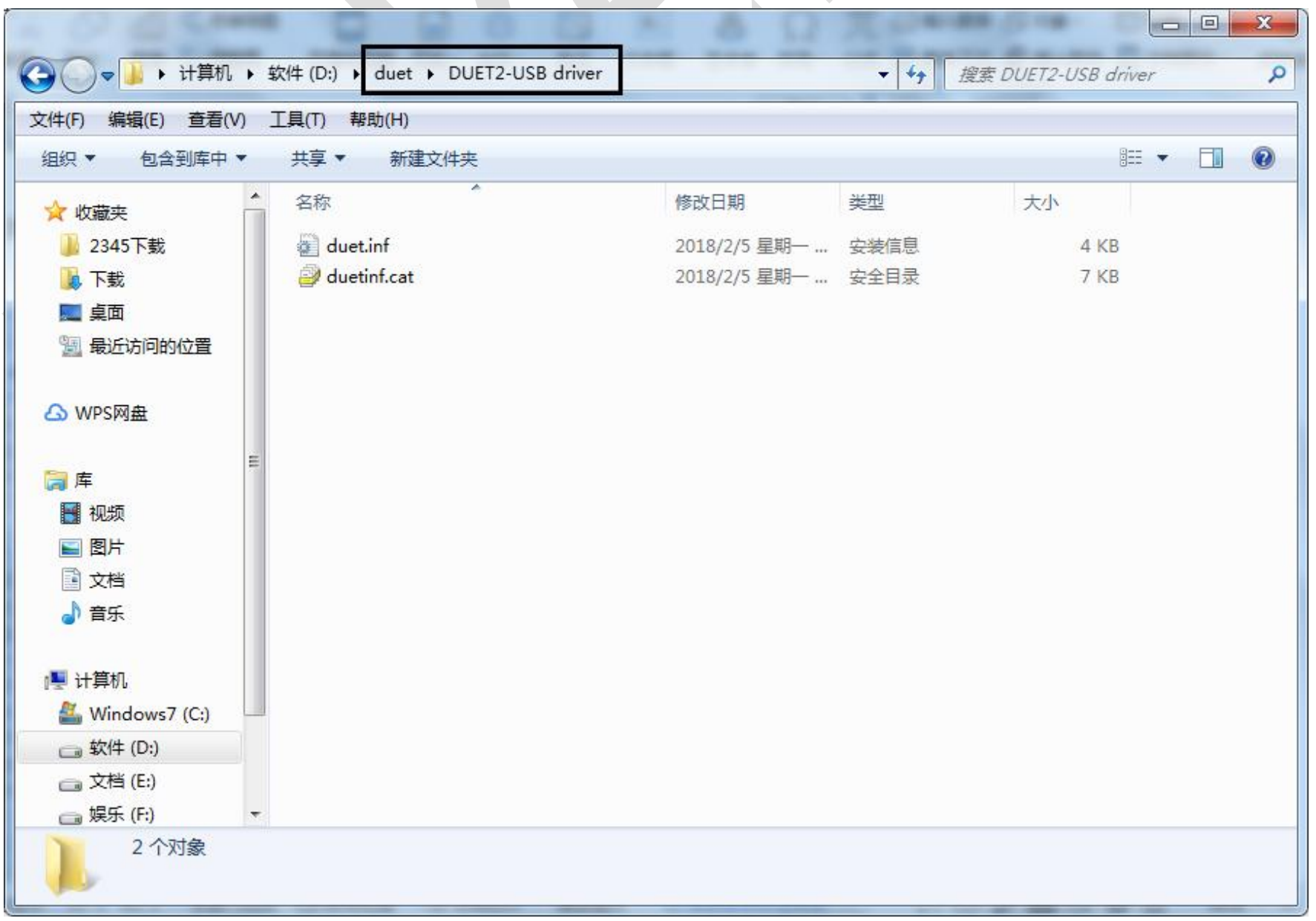
1. Right click on the device in the device manager and select Update Driver Software.

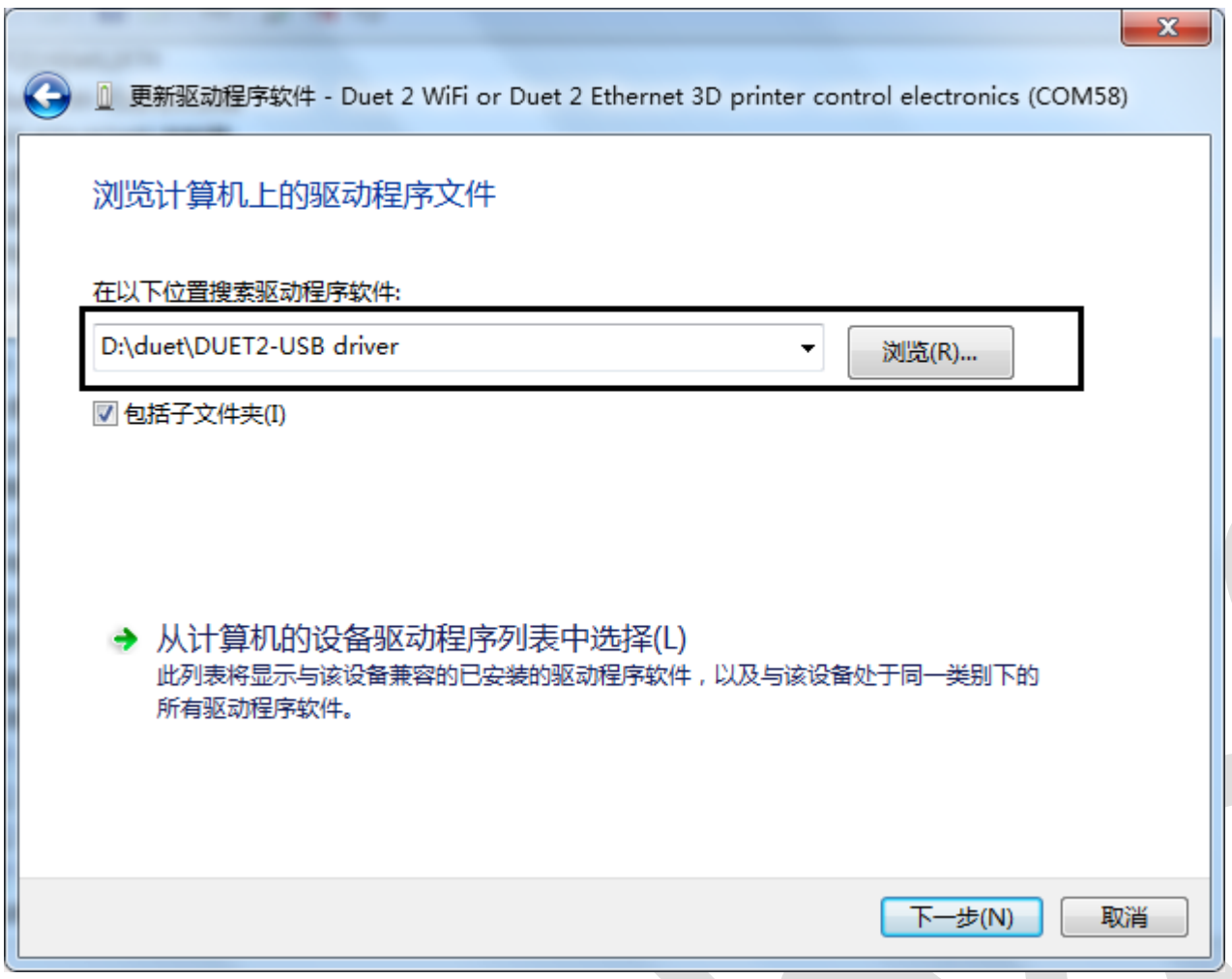


2.Browse to the folder where the usb driver is stored (the driver file can be obtained from the provided website)

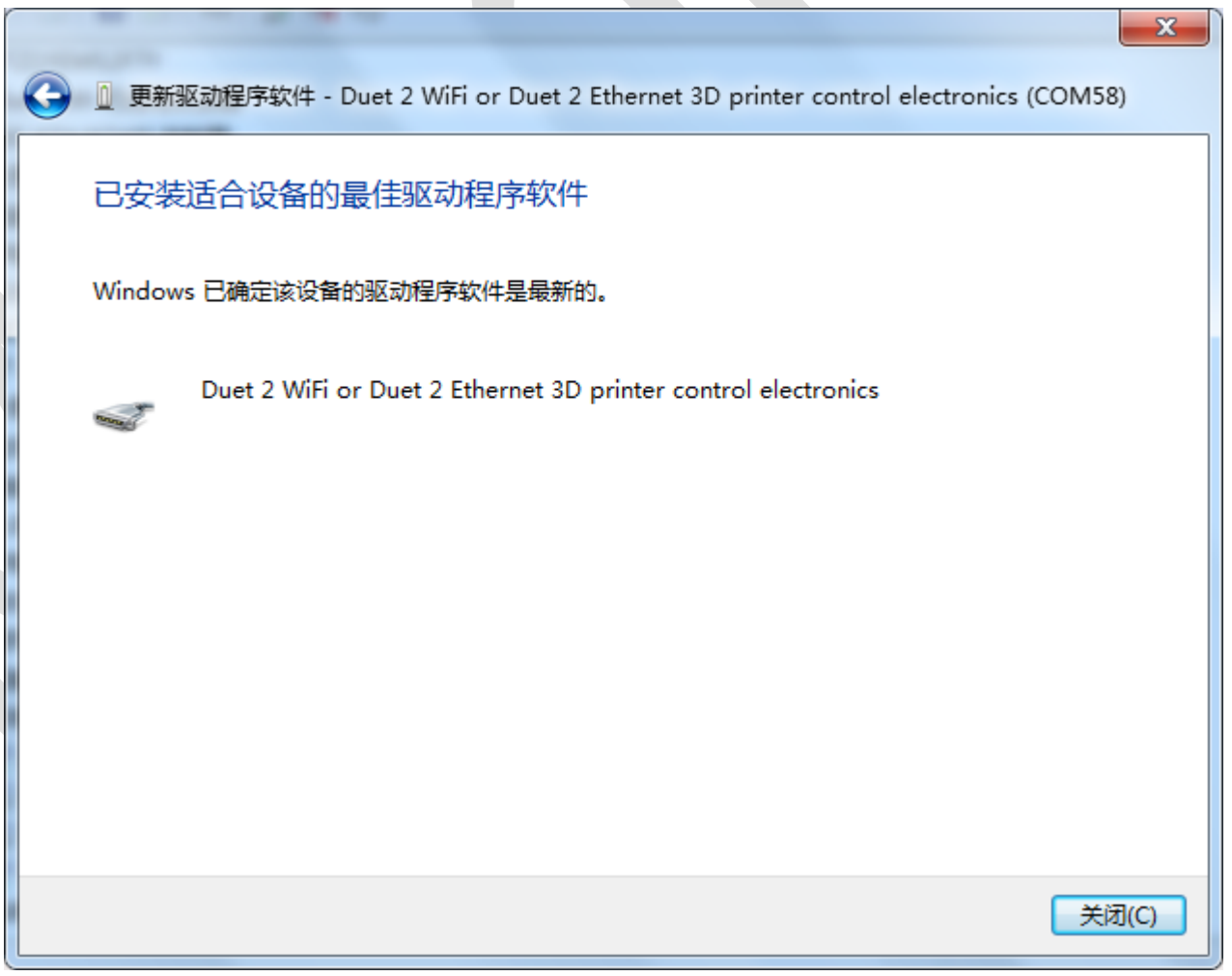
https://github.com/dc42/RepRapFirmware/blob/dev/Driver/DuetDriverFiles.zip

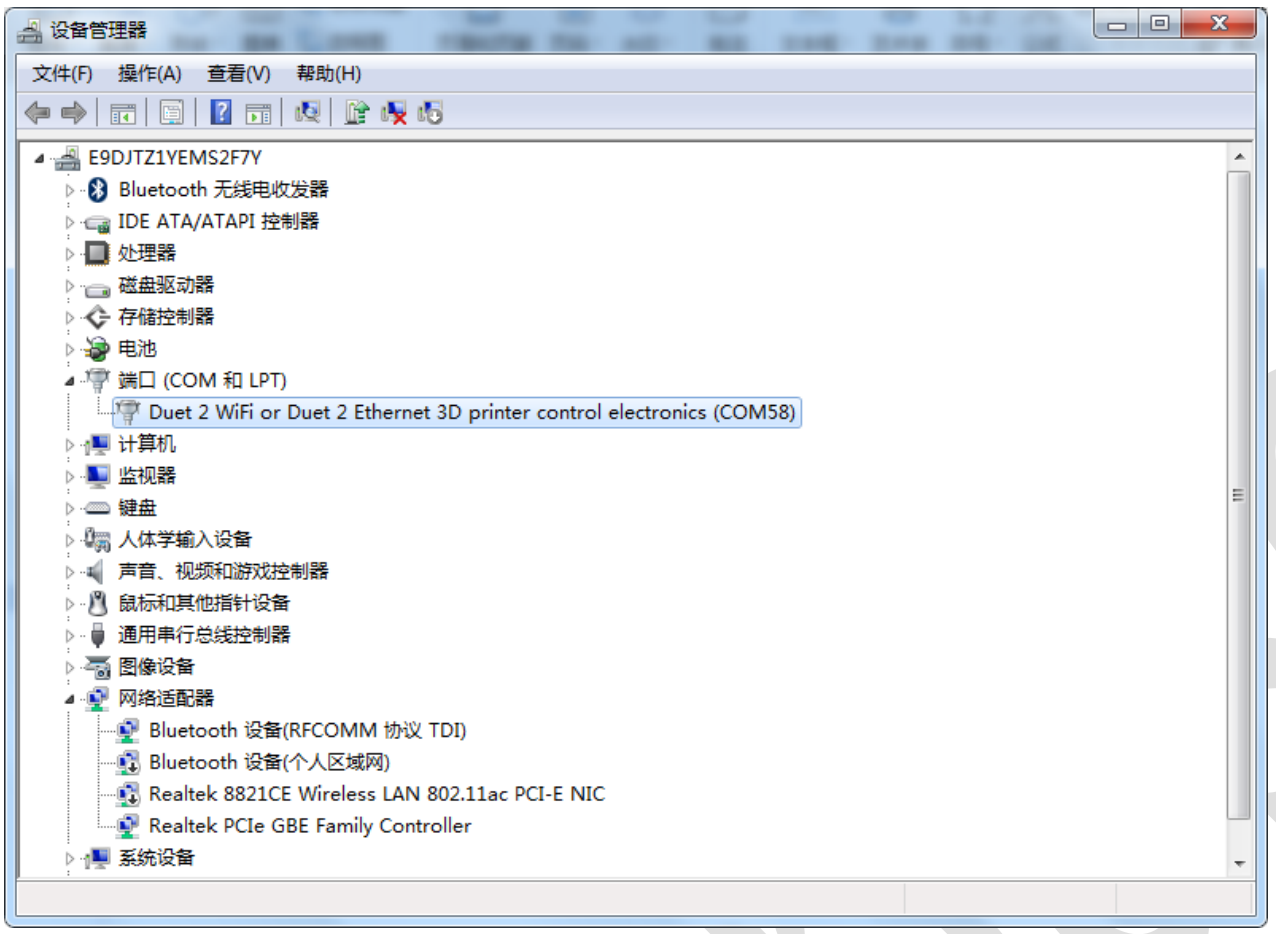






3.As shown in the figure below, the driver installation is successful.




设备管理器
文件(F) 操作(A) 查看(V) 帮助(H)
E9DJTZ1YEMS2F7Y
Bluetooth 无线电收发器
IDE ATA/ATAPI 控制器
处理器
磁盘驱动器
存储控制器
电池
端口 (COM 和 LPT)
Duet 2 WiFi or Duet 2 Ethernet 3D printer control electronics (COM58)
计算机
监视器
键盘
人体学输入设备
声音、视频和游戏控制器
鼠标和其他指针设备
通用串行总线控制器
图像设备
网络适配器
Bluetooth 设备(RFCOMM 协议 TDI)
Bluetooth 设备(个人区域网)
Realtek 8821CE Wireless LAN 802.11ac PCI-E NIC
Realtek PCIe GBE Family Controller
系统设备

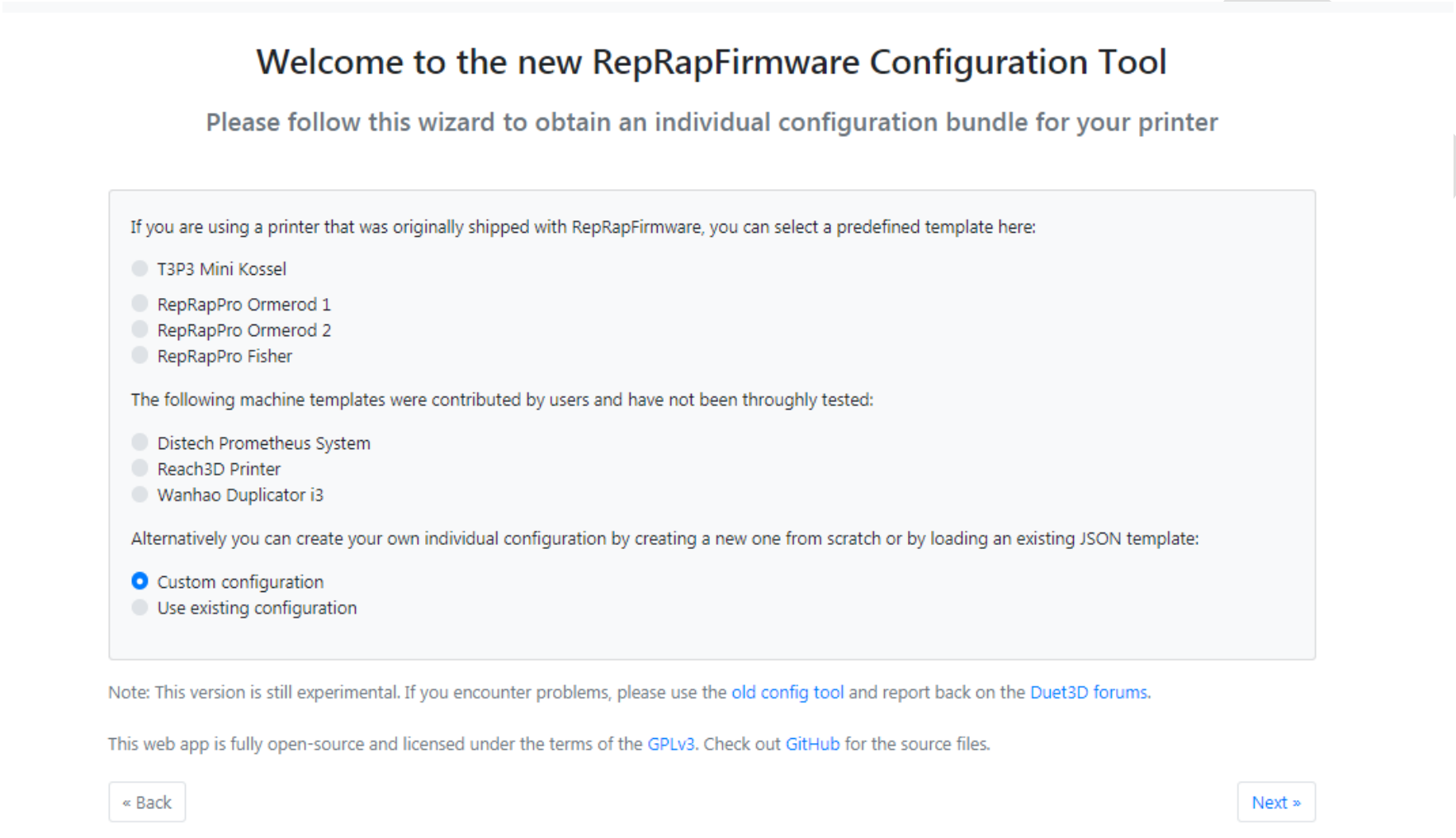
Ⅴ Configuration Profile creation and update

The configuration file of Duet2 WiFi is created directly on the web page and updated via the TF card.

Website for your reference：https://configurator.reprapfirmware.org/Start

1. If your machine meets its provided model, you can enter the preset template for configuration.

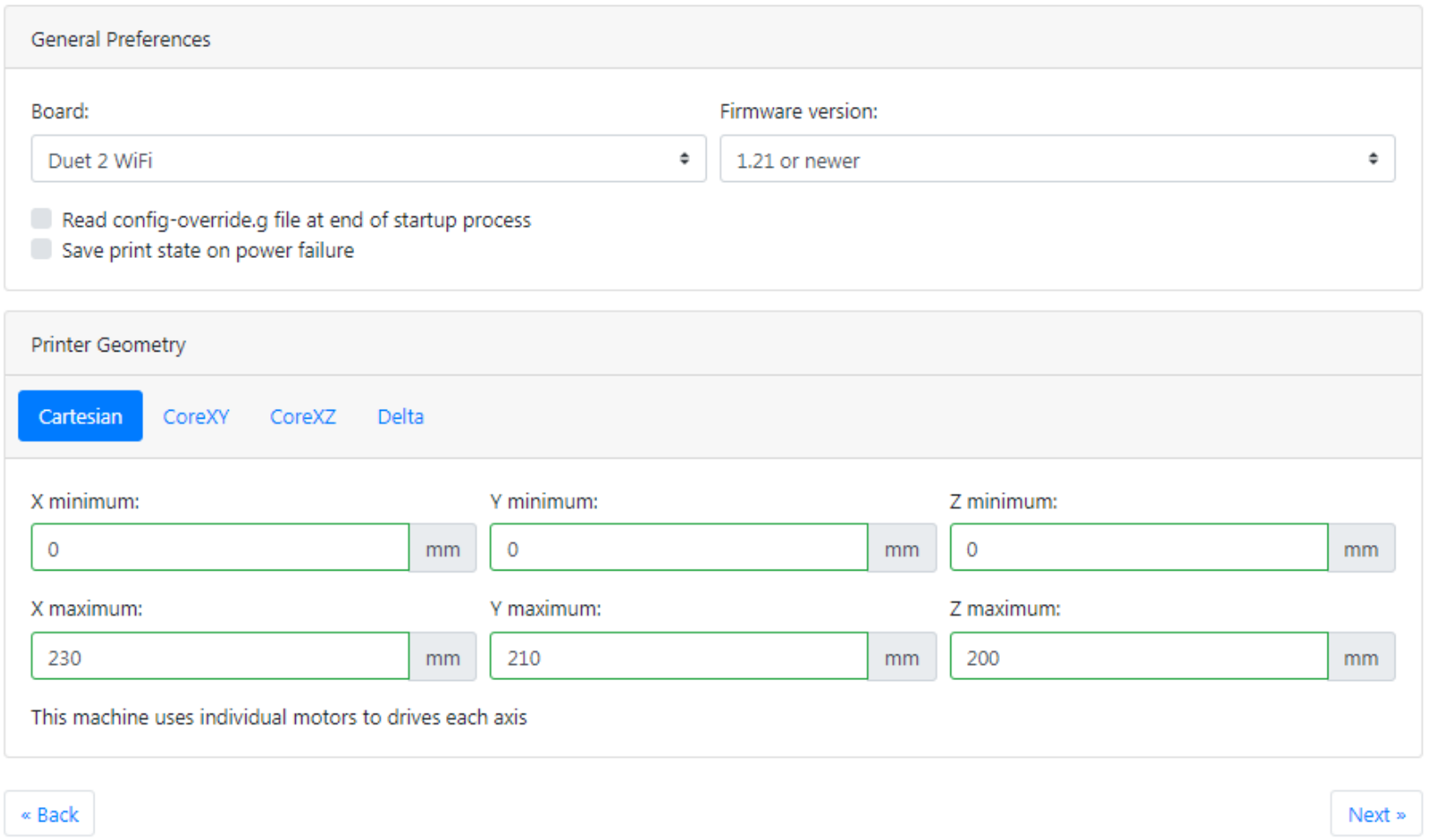
The following is a custom configuration.



2. Motherboard parameter and machine parameter setting

The motherboard type selects Duet2 WiFi, and the firmware version generally selects default (if the version is too old, there is a drop-down option to select the corresponding version)

Select the the model you are using and set the maximum and minimum value for each axis.



3.Motor parameter setting

The direction of the motor, the maximum speed and acceleration are adjusted according to the actual situation.

Microstepping (interpolation): Support TMC2660 stepper drivers, up to 256 microstepping, according to actual needs.

Steps per: You can click on the pulse setting box to set the corresponding parameters of the motor, belt and screw, and it will generate a corresponding pulse value. You can also calculate the settings yourself by formula

Formula of the number of pulses of the synchronous wheel motor / mm: (360 ÷ step angle) × subdivision 直径 (diameter × 3.14)

Formula of the number of pulses of the screw motor / mm: (360 ÷ step angle) × subdivision ÷ lead

If the pulse is not accurate, it will cause the print size to be abnormal.

Motor current: The maximum current of the driver chip is 4000mA, and the setting should not exceed or be too close to the maximum current.

Also note the maximum current of the motor used and make the settings. (Overload or full load may cause the motor or the chip to overheat, affecting the operation)

Extruders: If you are using a double extrusion head or multiple extrusion heads, you can increase or decrease here (ADD Extruders, Remove Extruders)

Motor idle setting: Idle Current Percentage: In the current case of the motor, the current will decrease to the percentage you set.

Idle Timeout: When the motor does not move for more than the time you set, the current will be turned off (M84).

Drive	Direction	Microstepping (interpolation)	Steps per mm	Max. Speed Change (mm/s)	Max. Speed (mm/s)	Accele-ration (mm/s^2)	Motor Current (mA)	Motor Driver
X	Forwards	x16 (on) interpolated to x256	80	15	100	500	800	0 (X)
Y	Forwards	x16 (on) interpolated to x256	80	15	100	500	800	1 (Y)
Z	Forwards	x16 (on) interpolated to x256	4000	0.2	3	20	800	2 (Z)

Extruders — + Add Extruder — − Remove Extruder

Drive	Direction	Microstepping (interpolation)	Steps per mm	Max. Speed Change (mm/s)	Max. Speed (mm/s)	Accele-ration (mm/s^2)	Motor Current (mA)	Motor Driver
E0	Forwards	x16 (on) interpolated to x256	420	2	20	250	800	3 (E0)

Motor Current Reduction

Reduce motor currents when idle

Idle Current Percentage: 30 %

Idle Timeout: 30 s

« Back Next »

4. Automatic leveling and limit setting

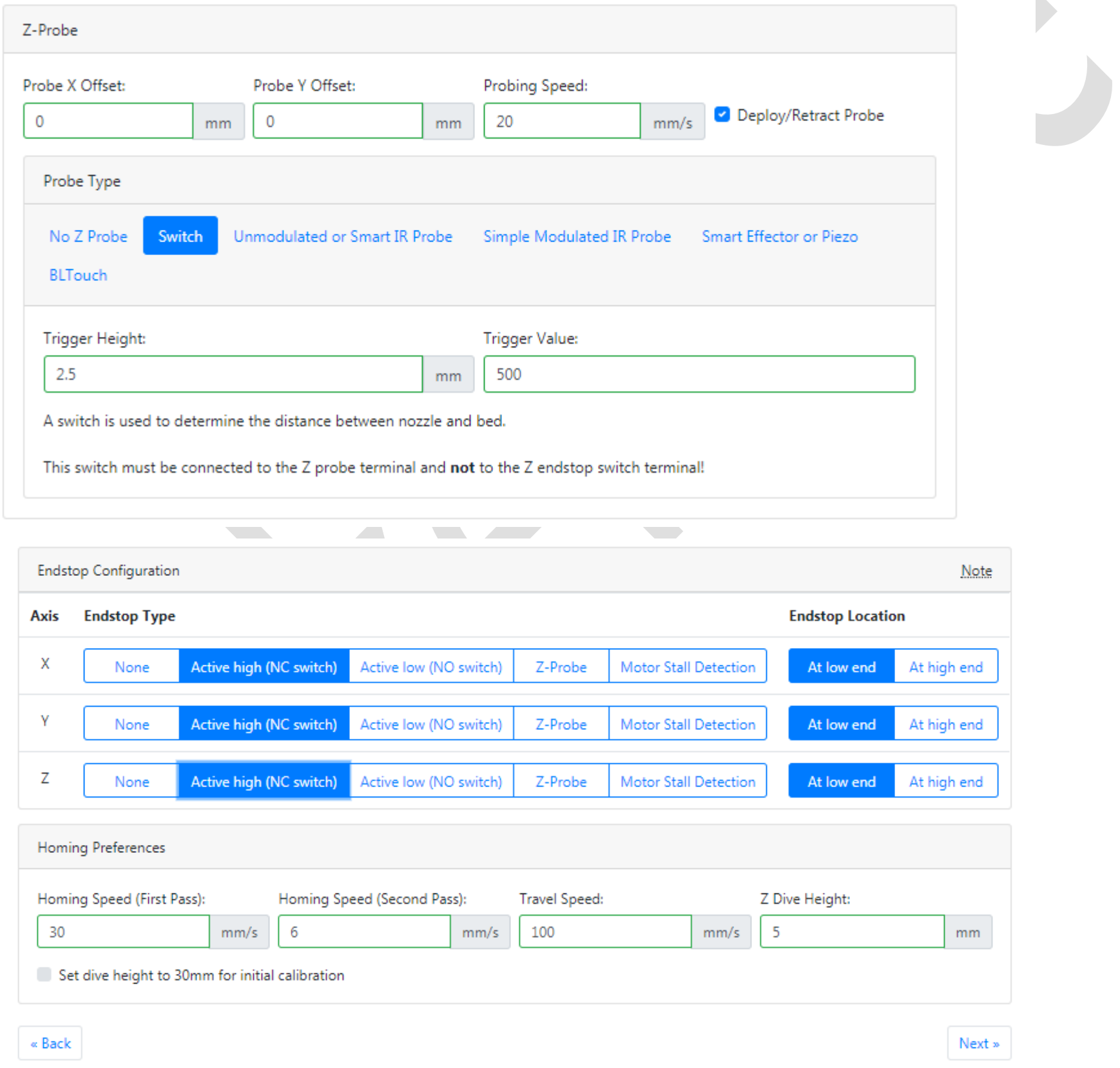
Offset value setting: The leveling switch is cheated compared to the extrusion head (X Offset, Y Offset)

Leveling switch: Set the type of switch (Probe type), select NO Z probe if you are not using automatic leveling. Use the automatic leveling to set the corresponding parameters.

Limit setting: NC is normally closed and NO is normally open. NONE is not enabling the limit.

Endstop Location: The direction of zero return.

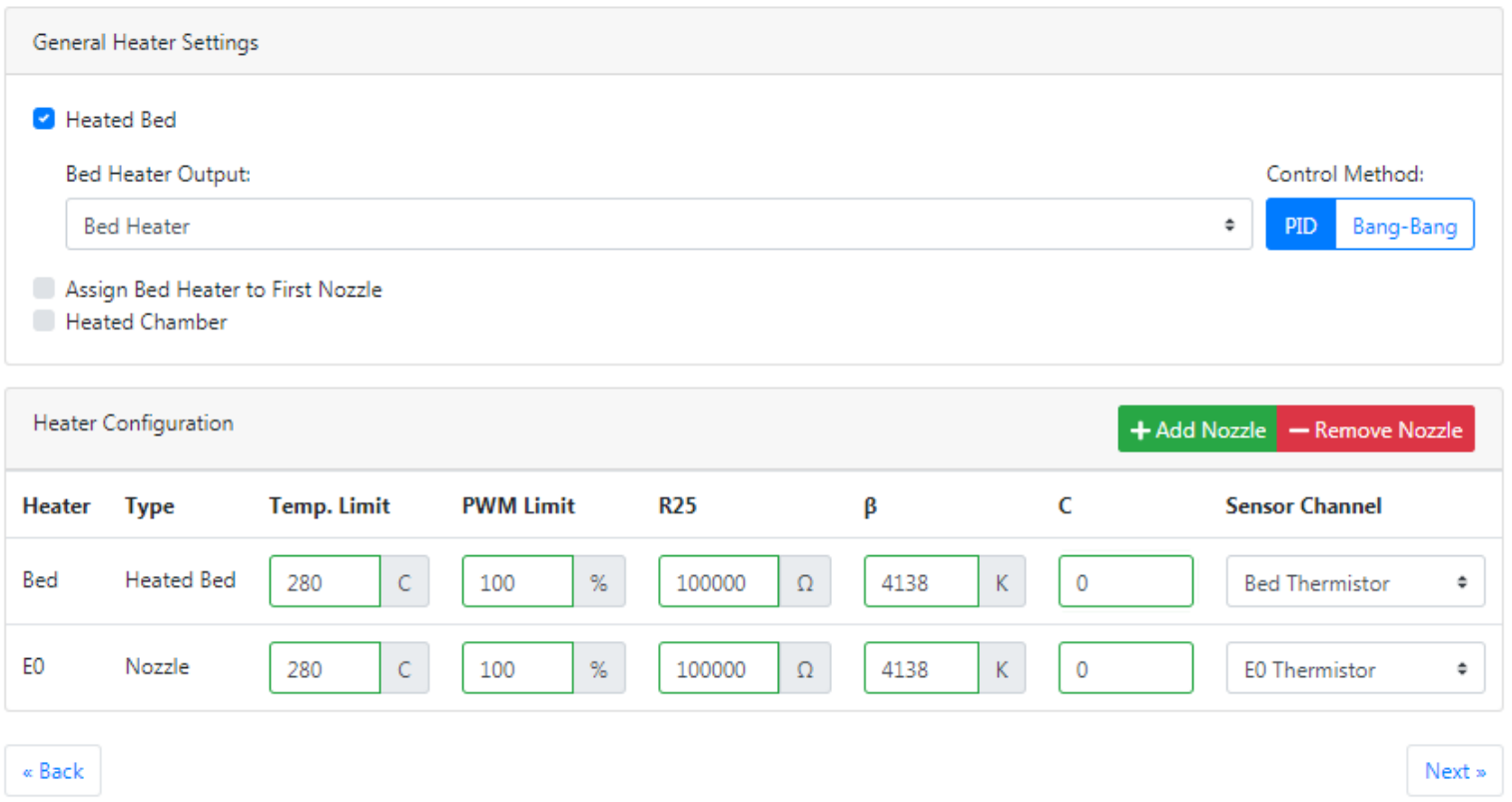
Zero setting: Homing speed



5. Temperature function setting

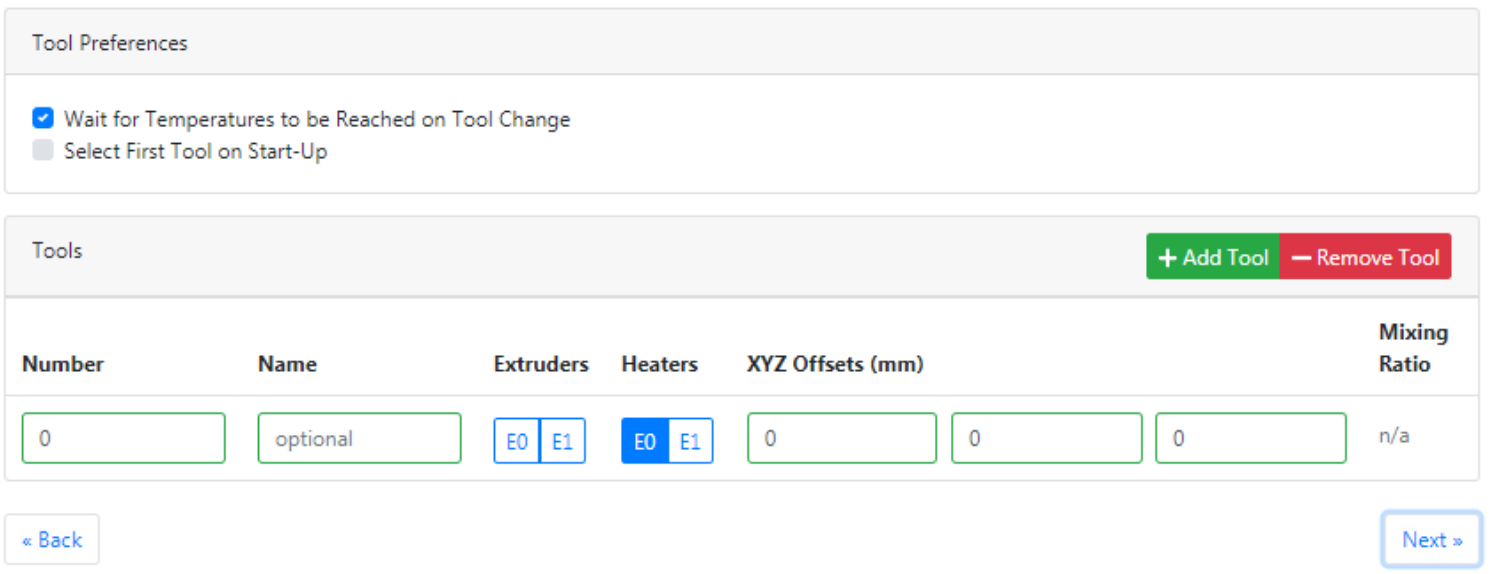
Heated bed setting: Output port, temperature control (generally by default)

Heating setting: Set the maximum temperature value and select the type of thermal sensor.

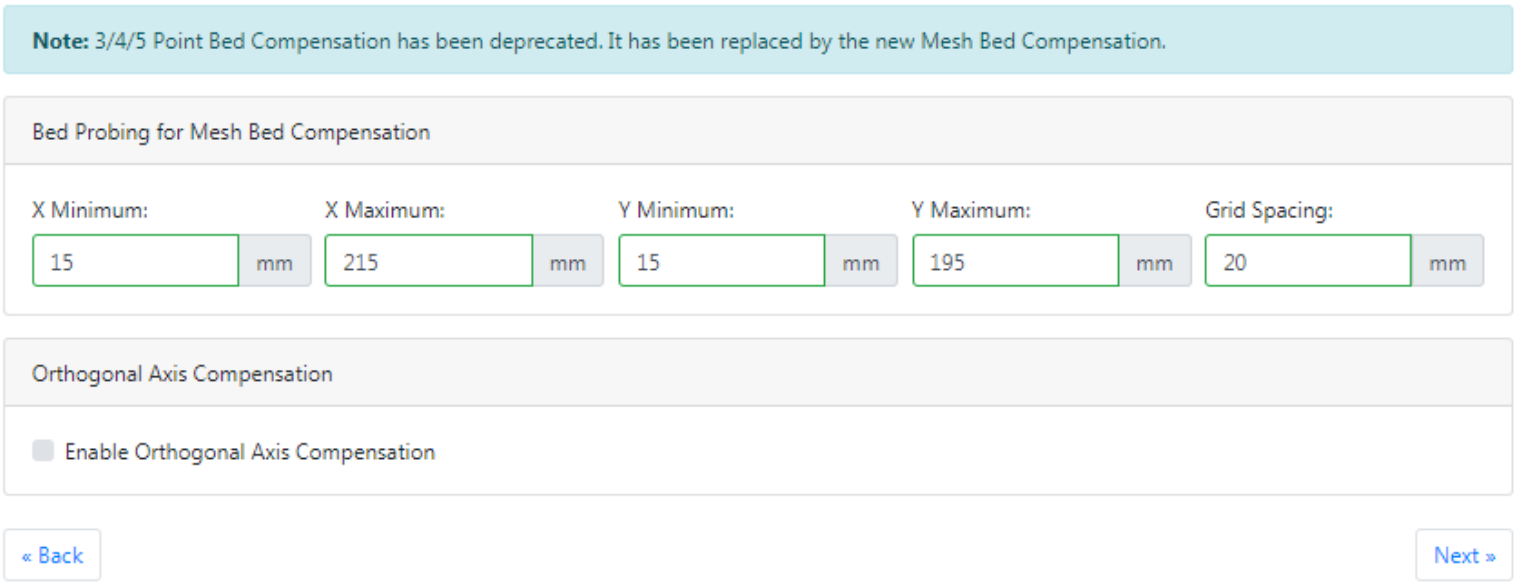


6. Double nozzle setting

Set the offset value of the dual nozzle. If single nozzle is used, ignore this setting.

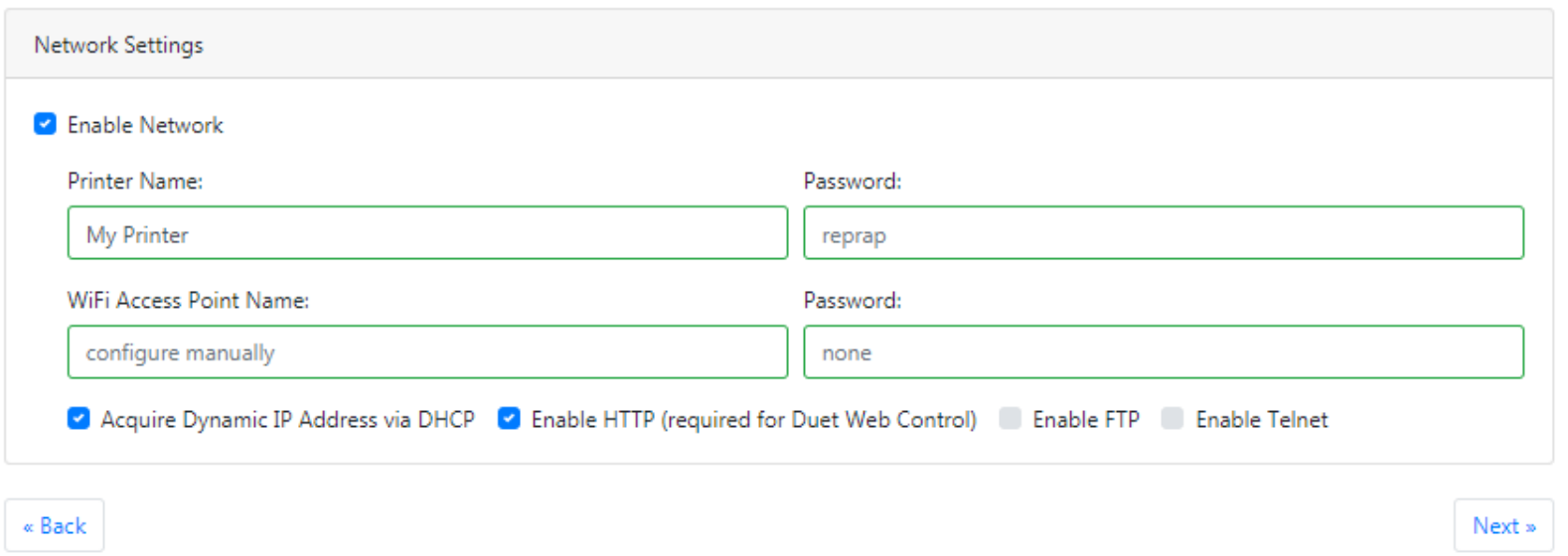


7. Leveling range and dot pitch



8. Network setting

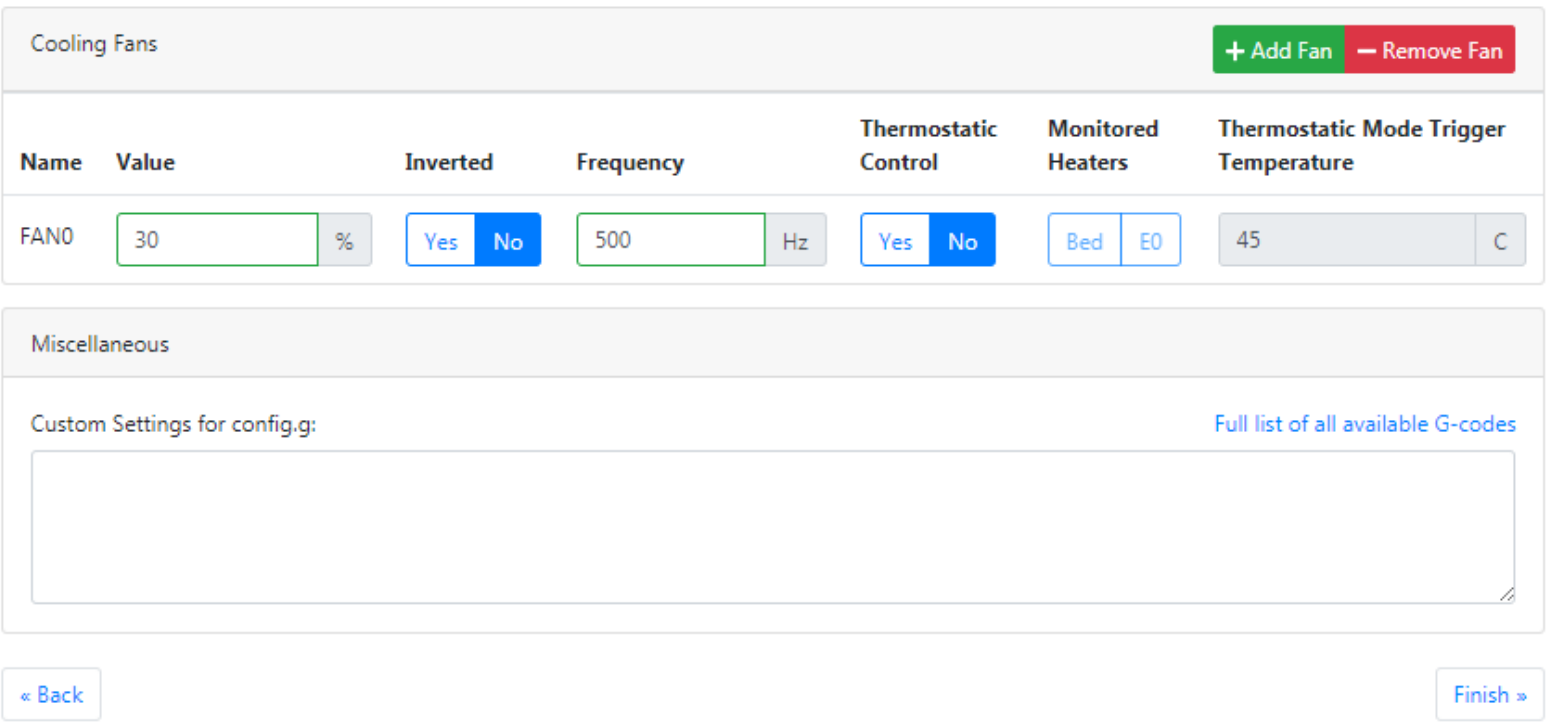
Set the name and password of the WIFI connected to the printer.



9. Configuration fan parameter and custom instruction

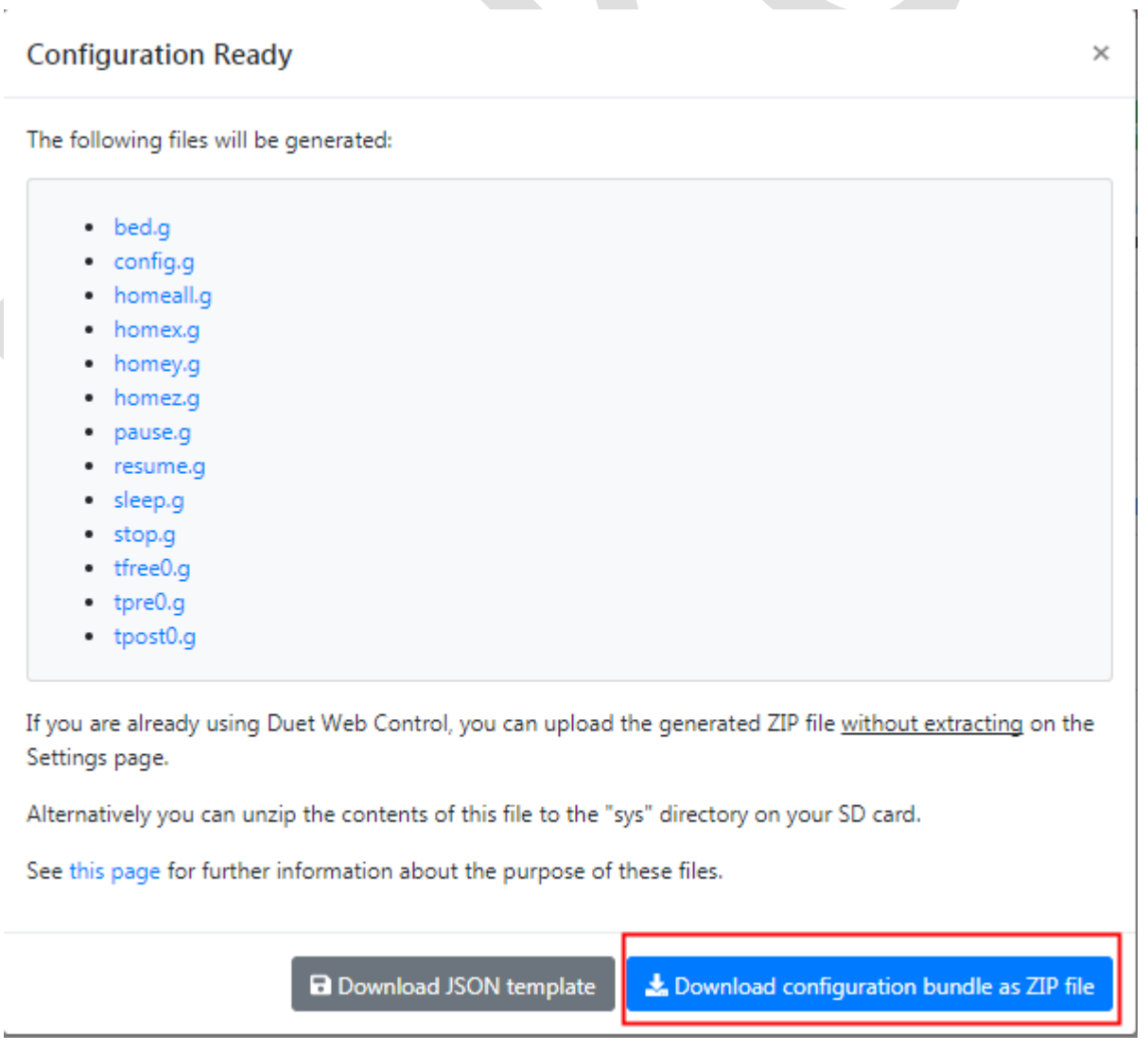
Select the fan output value and trigger temperature

Custom Settings for config.g: If you need to add a custom feature, you can add code dicectly to define it here.



10. Configuration file creation and download

As shown in the figure below



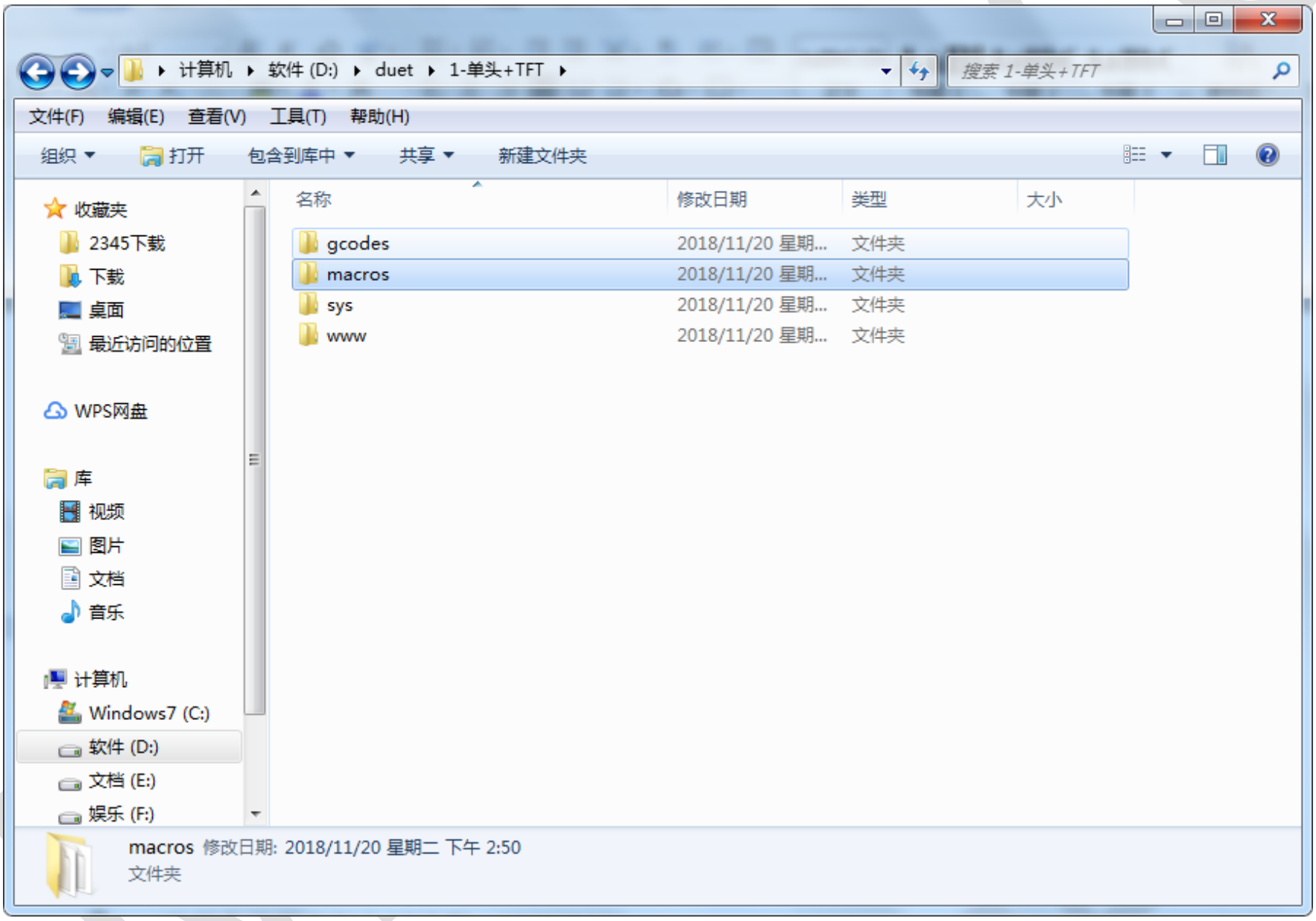
Ⅵ. Configuration Profile update and web operation

The configuration file is updated via the sd card, the motherboard will be readable the configuration file when it is on power, so be ensure that there is a configuration file on each sd card. File directory needs to be set as required

6.1 SD card file directory

File directory, save different types of files as required (you can directly download the directory, then replace sys (configuration file))

download link:



The folder should be set as required.

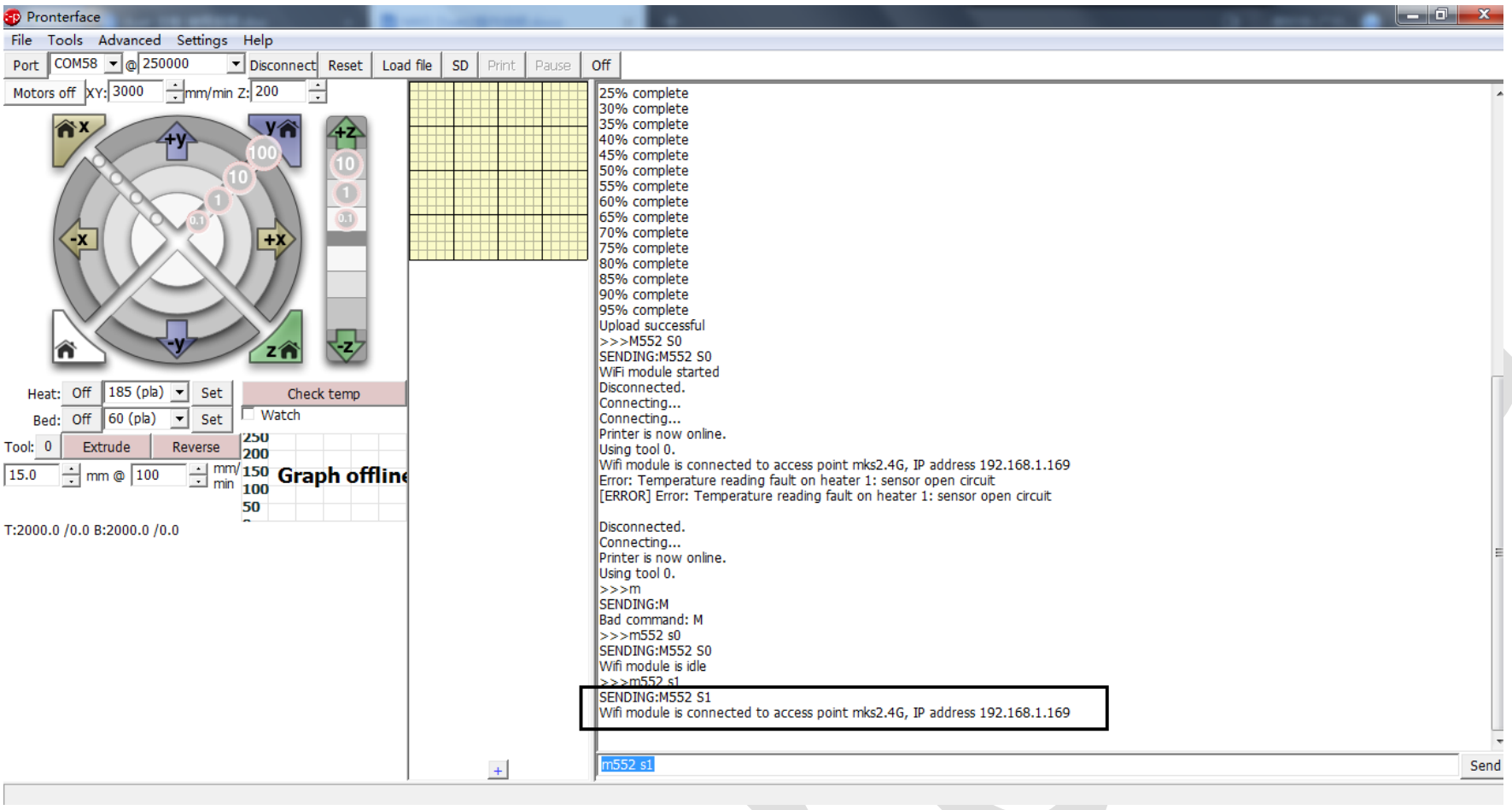
Gcode is a folder for placing gcode print files.

Macros: some macro files of touch screen and firmware (usually by default)

Sys:sys is the configuration file generated by the above web page (can be directly replaced after the web page is generated)

Www: web interface file (generally by default)

6.2 Host computer connection and setting



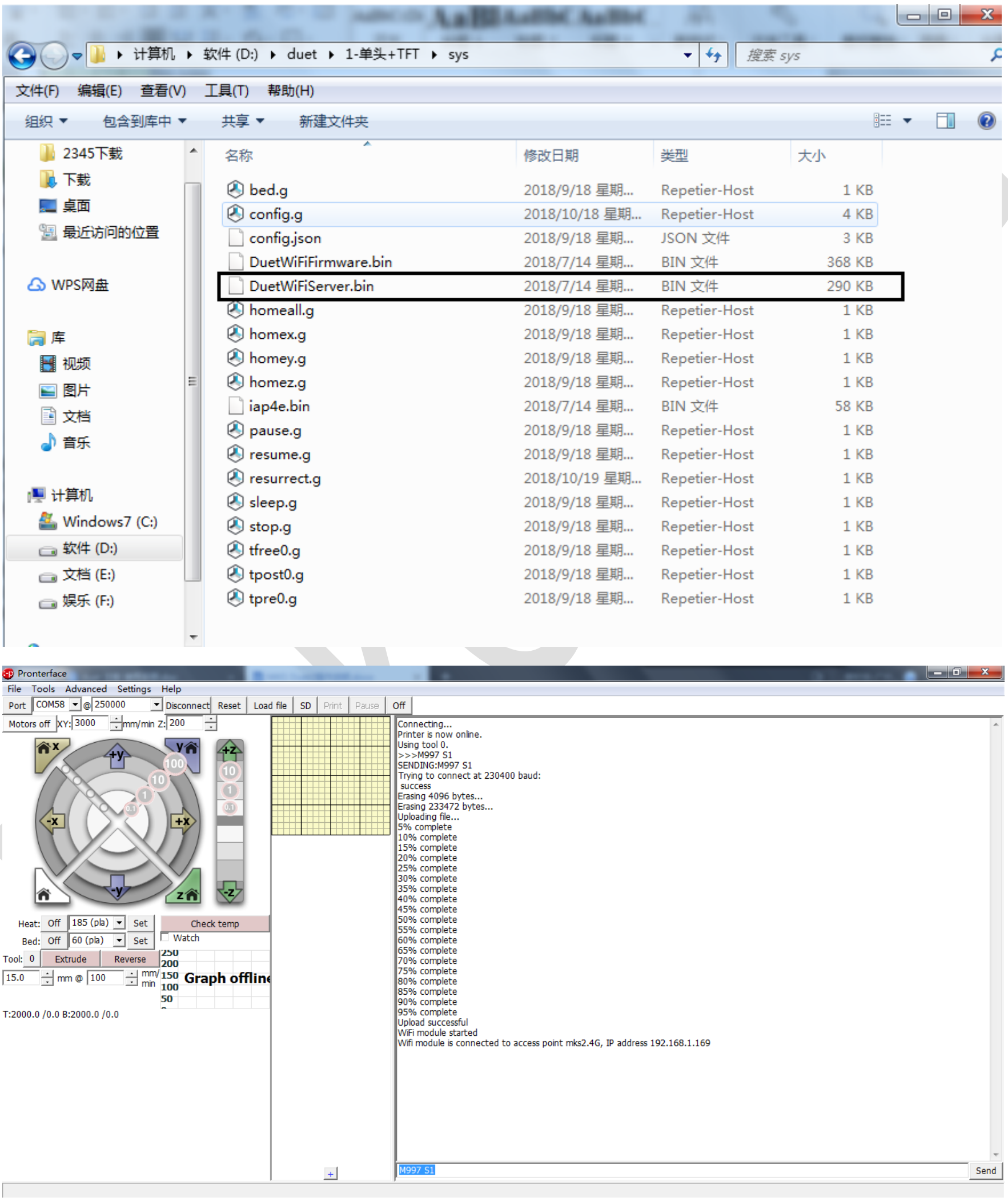
Generally, when the wifi account and password are set correctly, and within the use range of wifi, after connecting to the host computer, or returning an IP, it is the IP of the motherboard wifi.

It is also possible to send commands through the host computer to modify the wifi.

6.3 WIFI command setting

M997 S1　　Update WIFI firmware (the firmware of wifi needs to be placed in the sys folder of the sd card)

If the IP is not returned after connecting to the host computer, the wifi setting may not be normal, or it may not be within the range.



M552 S1　　turns on WIFI (the LED on the module is lit. If the IP is not returned after connecting to the

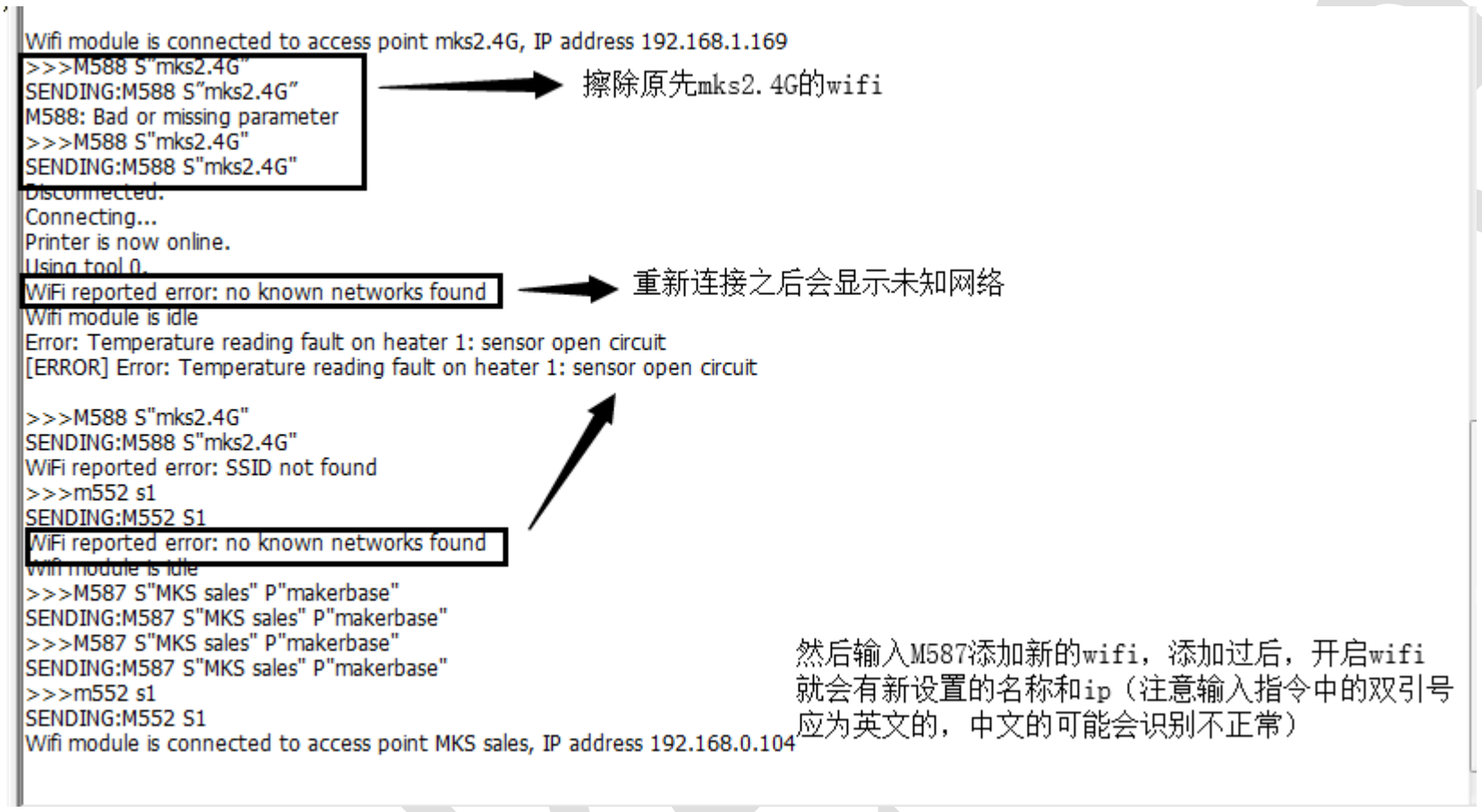
host computer, the wifi setting may not be normal, or it is not within the range)

M552 S0　　Turns off WIFI (LED on the module is off)

M587 S”WIFI name “P” password” Add WIFI network to module example: M587 S”mks2.4G” P” 12345678”

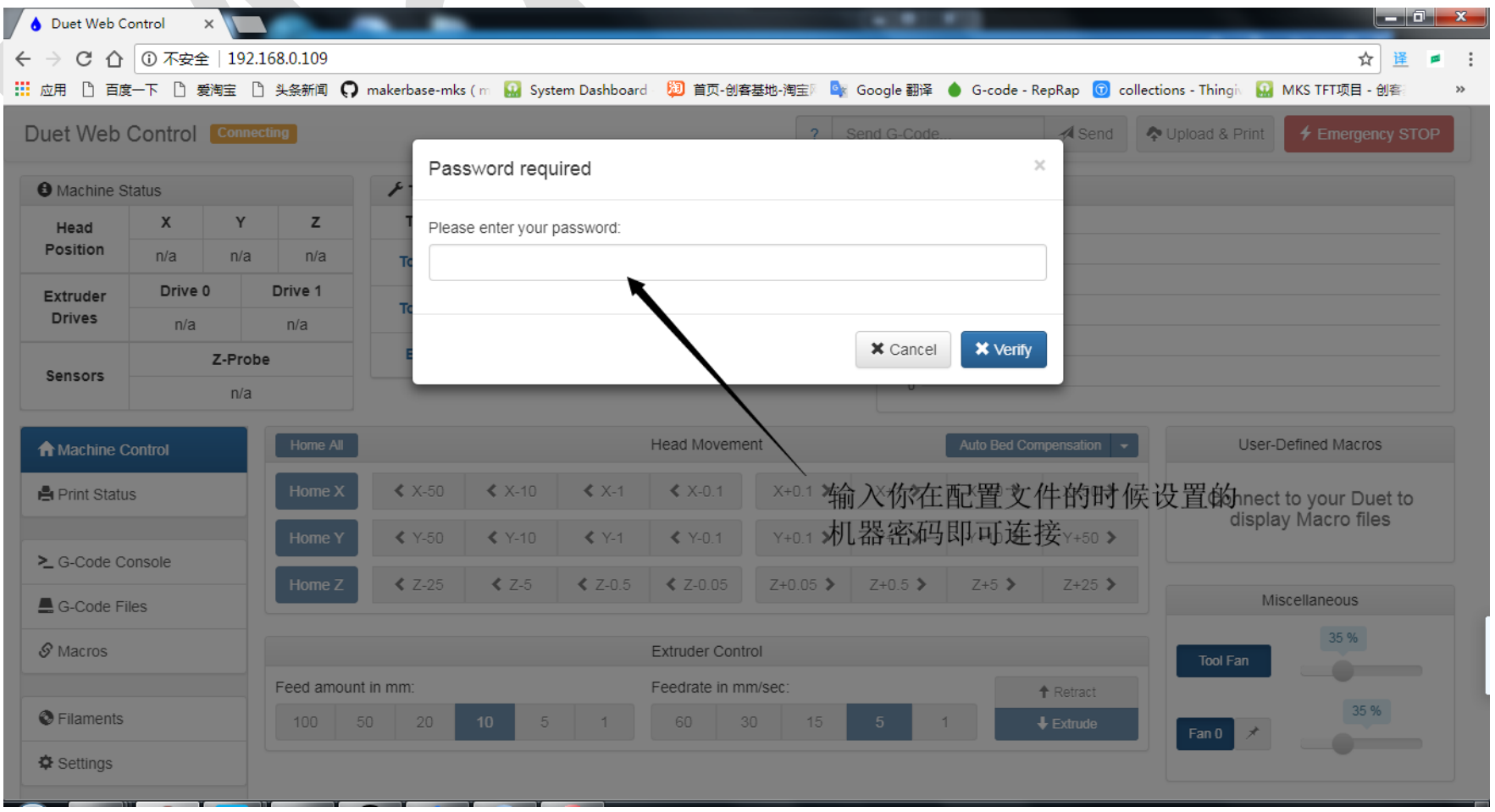
(M587 command must first execute M552 S0 to turn off WIFI, remove the original wifi by M588 command, and then set a new wifi name and password)

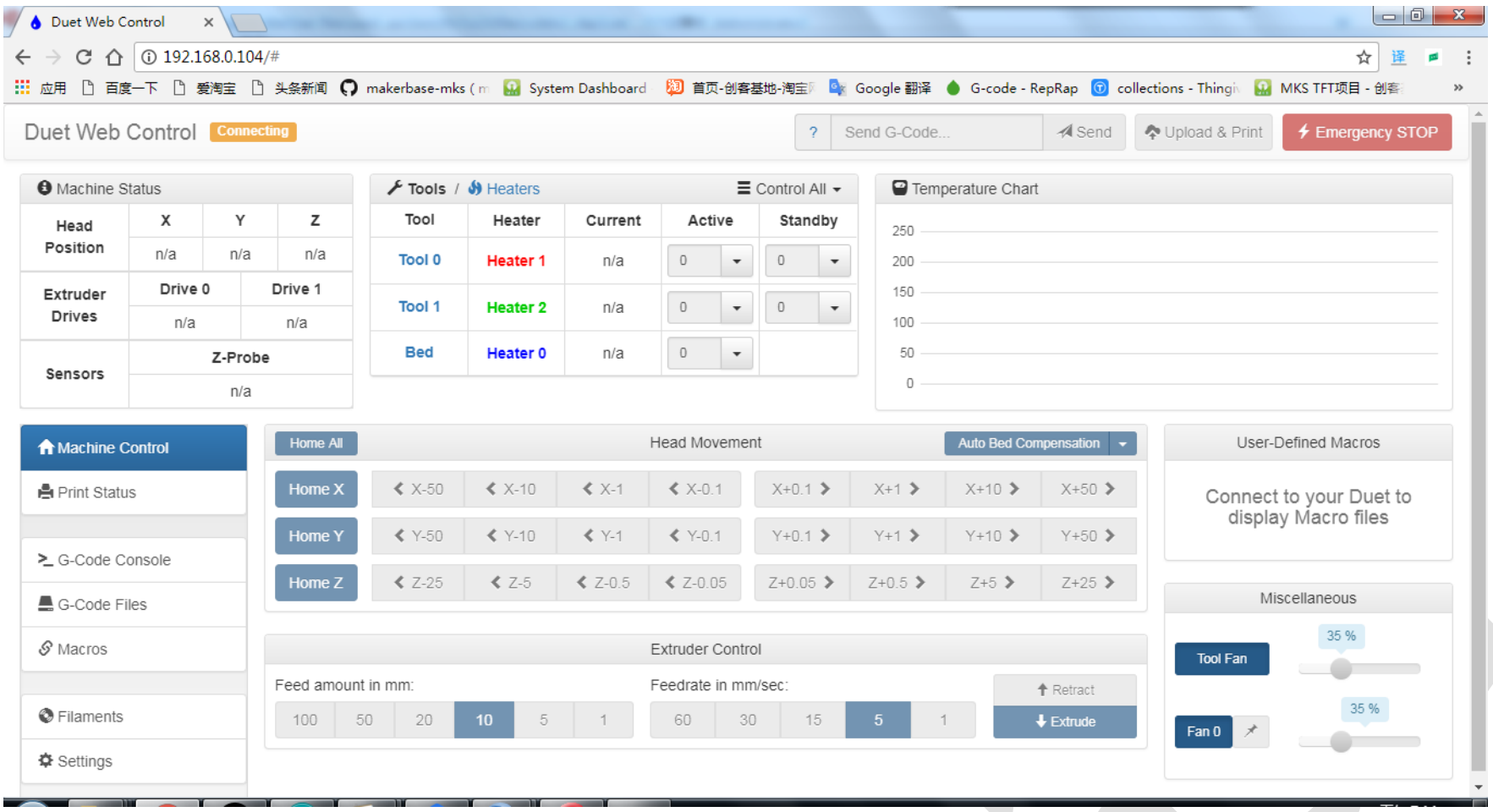
M588 S "WIFI Name" Remove the WIFI from the list, including password, SSID



6.4 Web page connection

You can enter the corresponding ip through the browser to enter the control interface. You also need to enter the machine password set in the configuration file to control it.



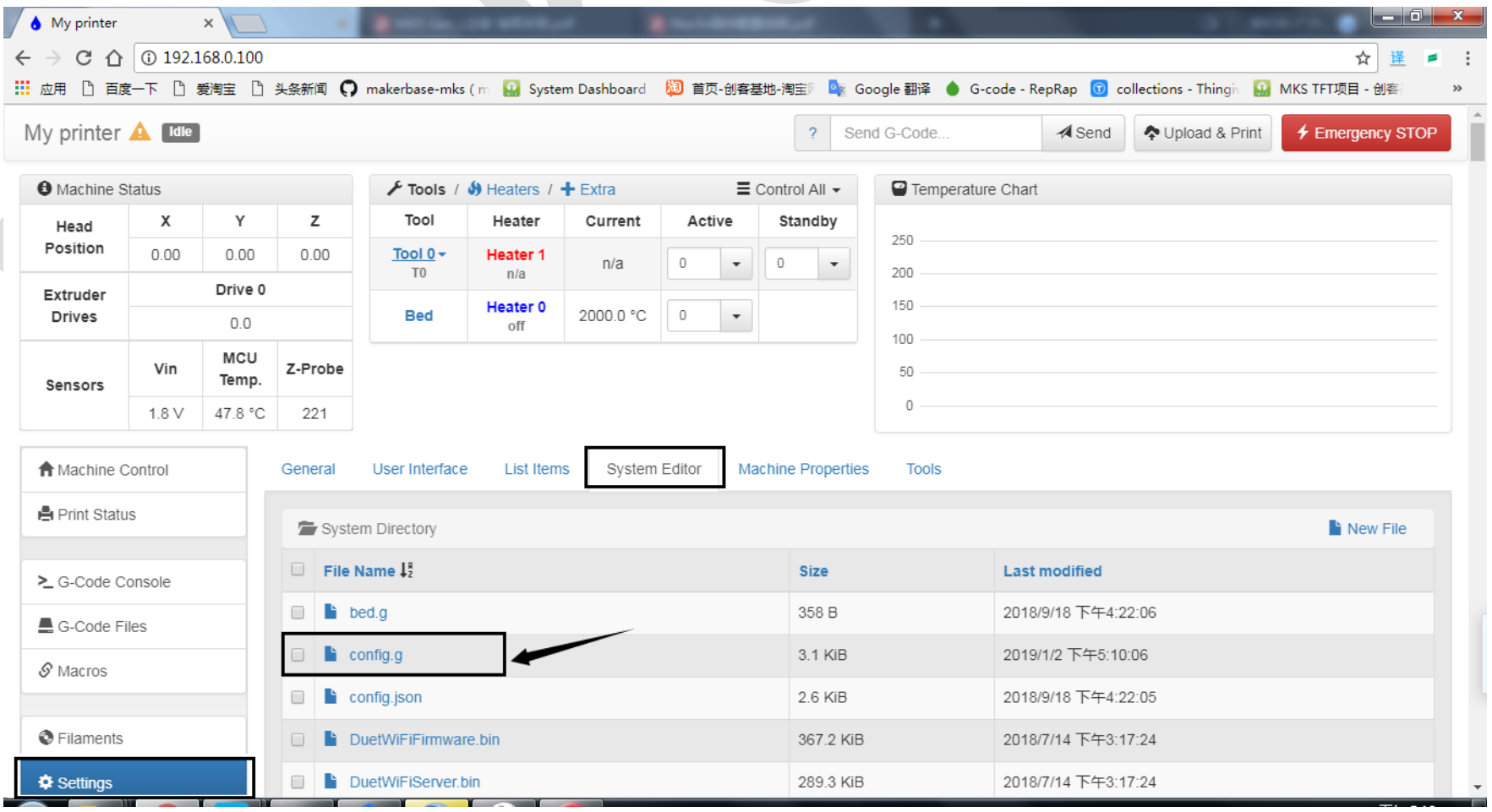


6.5 Configuration File Modification

If you need to re-adjust the parameter after updating the firmware and configuration files,It can be modified through a web page or a document editor. (If you are not familiar with the configuration file or G code, you can re-set the configuration file on the web page, you can not do it).

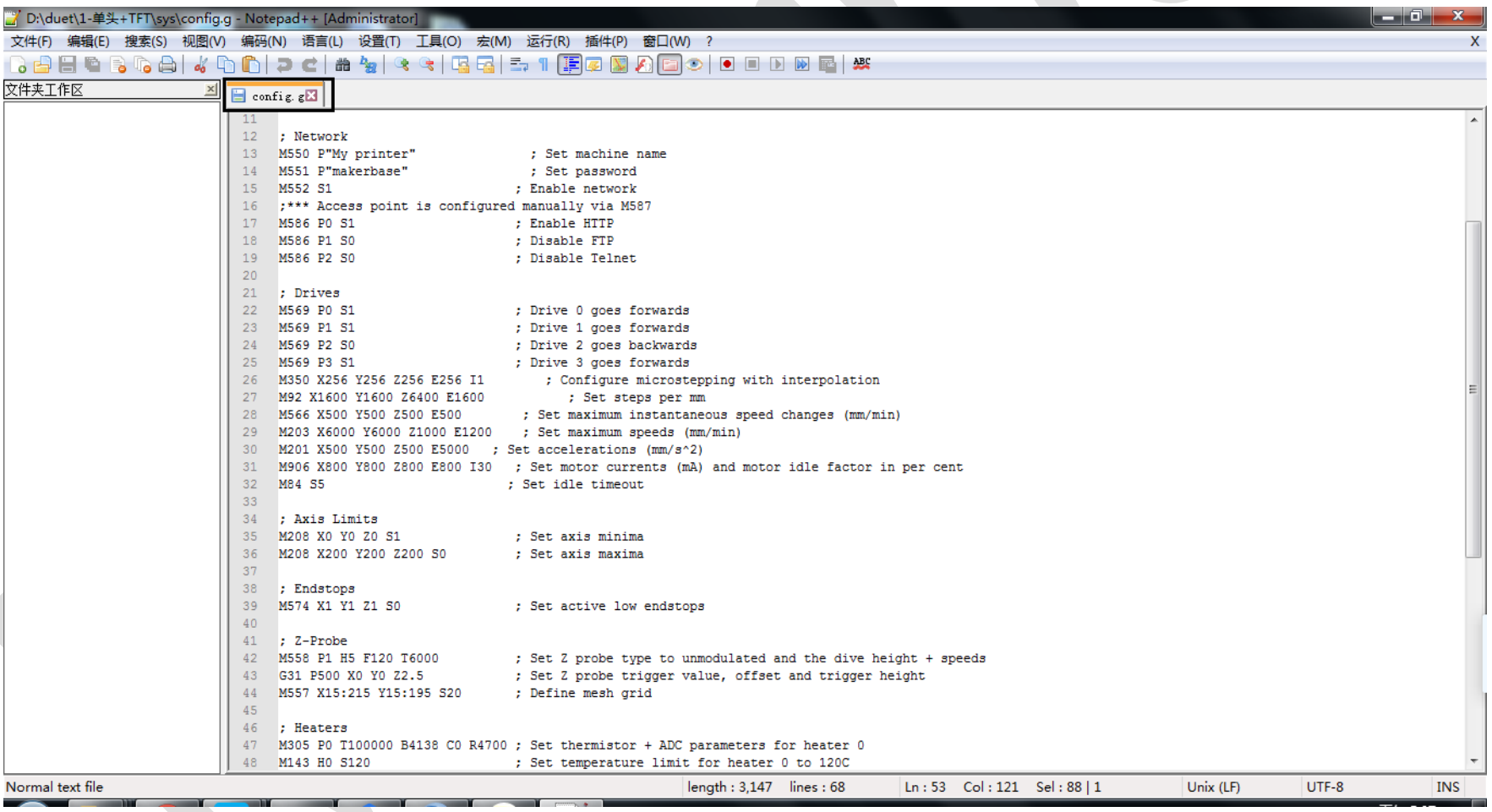
1. Modify configuration file on web page.

When the web page is connected to the printer, the configuration file that can be read and modified



2.Notepad++

It can also be edited by the editor Notepad++, then save it to the sd card and insert it into the motherboard to update.



Suitable for people who are familiar with the code to modify, edit and save

Detailed correspondence can refer to the URL:

Configuration instruction

https://duet3d.dozuki.com/Wiki/ConfiguringRepRapFirmwareCartesianPrinter

Hardware instyruction

https://duet3d.dozuki.com/Wiki/Hardware_Overview

Ⅶ Technical support and guarantee

1. Power test will be done before shipping to ensure normal use of the product.

2. Welcome friends to join the QQ discussion group: 232237692

3. Welcome to blog exchange: http://flyway97.blog.163.com

4.3D printer motherboard contact

Huang Sheng: 13148923315

Tan Sheng: 15521190023

Peng Sheng: 13427958535

5. If you have any questions, contact our customer service or technical support staff in the group. We will be happy to help you.

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