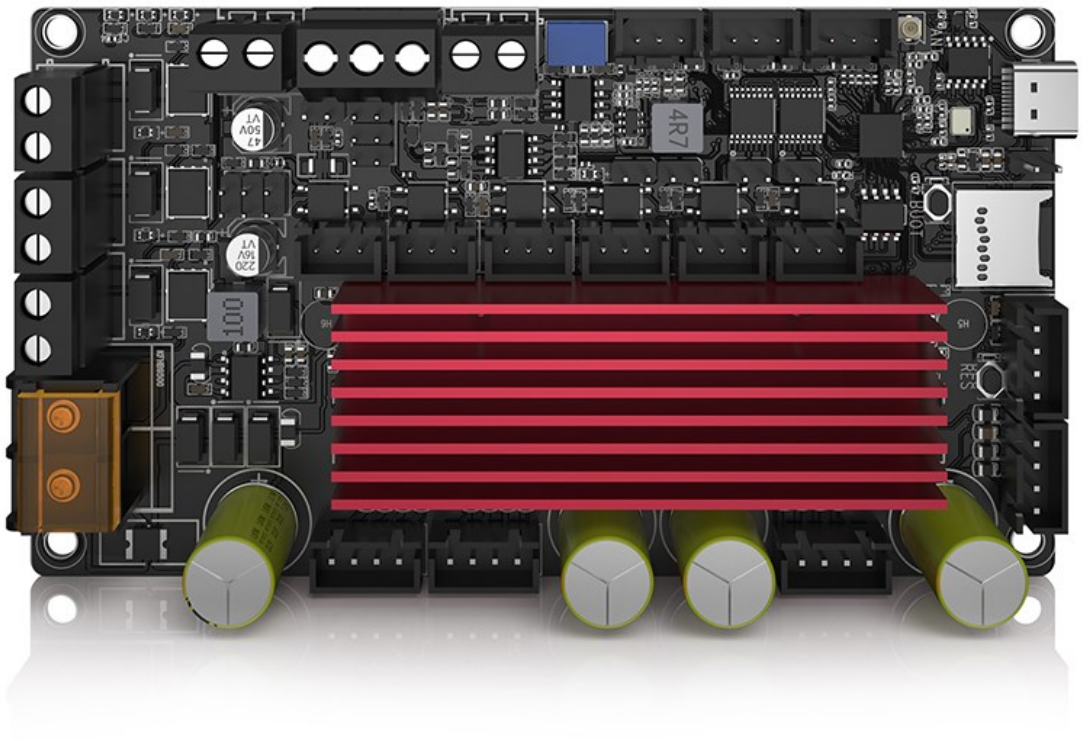
BIGTREETECH

Rodent V1.0

User Manual



Revision Log

Version	Date	Revisions
v1.00	May 29th, 2024	Initial Version
v1.01	December 6th, 2024	Added instructions regarding the proper usage of jumpers.
v1.02	May 6th, 2025	Add relevant information about V1.1 version

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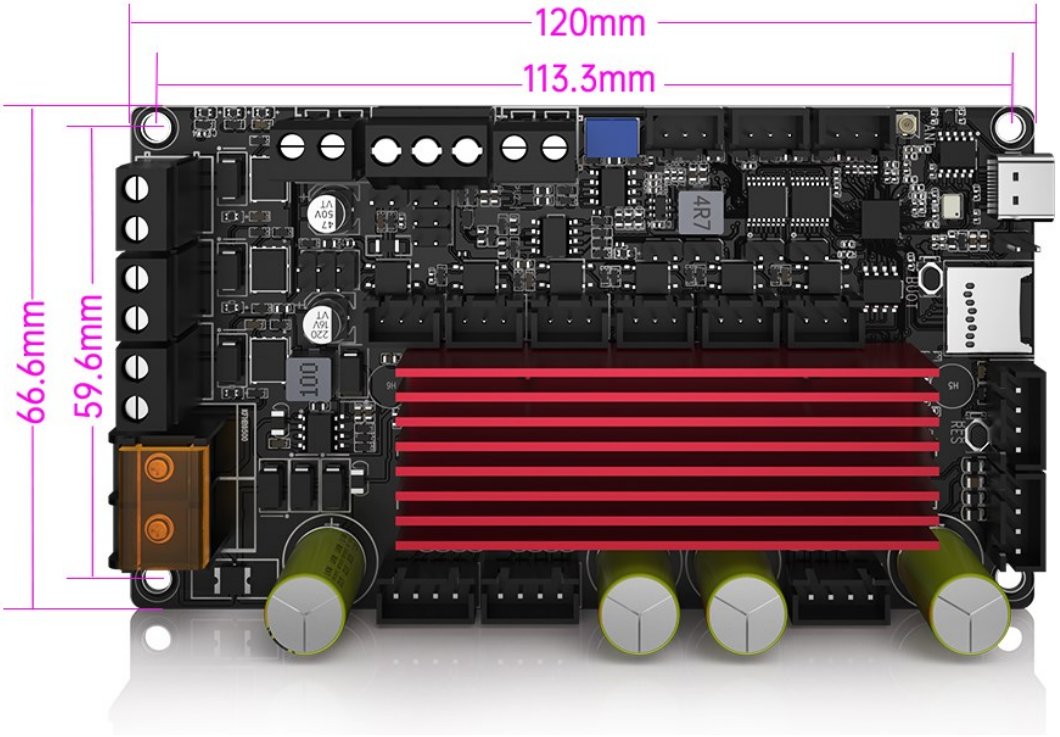
1. Product Profile

The BIGTREETECH Rodent is our very first control board designed specifically in collaboration with RatRig for CNC machines. It supports USB and RS-485 communication, greatly simplifying the wiring process and providing smooth operation.

1.1. Feature Highlights

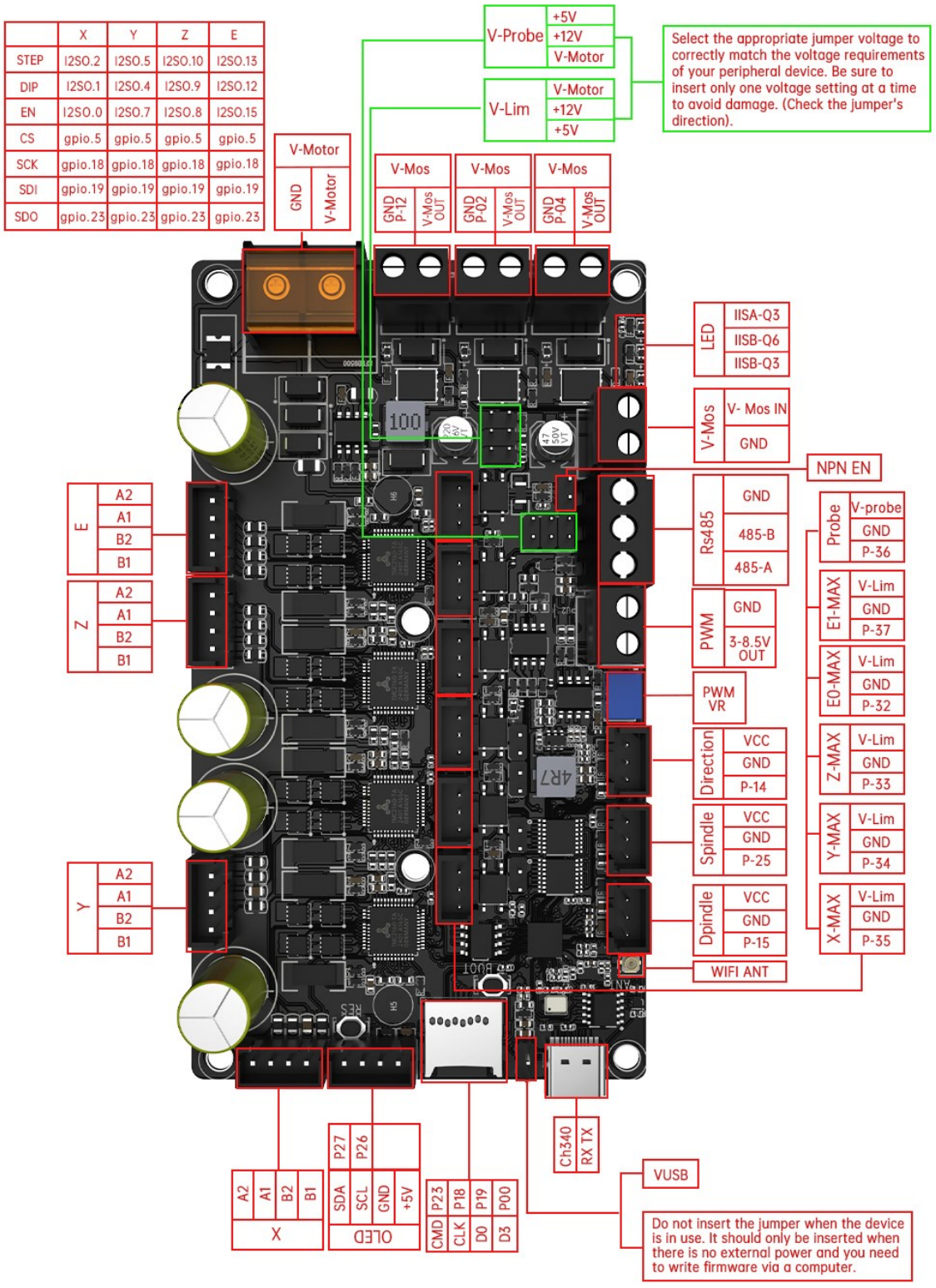
- MCU: ESP32-D0WD-V3（V1.0），WIFI module ESP32-WROOM-32URA-N4 (V1.1).
- Wi-Fi Capability: Supports 802.11 b/g/n, 802.11 n (2.4 GHz) with maximum speeds of 150 Mbps.
- Integrated Motor Drivers: Onboard four TMC2160 drivers, capable of handling high voltage and current, making them ideal for more powerful motors.
- Power Input Range: DC24V to DC56V at 10A.
- V-MOS Power Input: Accepts DC12V to DC36V with three externally controllable voltage output ports, supporting up to 5A; output voltage depends on the V-MOS input.
- 5 Endstop Switch Interfaces: Support voltage selection of 5V, 12V, and VCC (When the VCC input voltage exceeds 24V, it is prohibited to use this voltage selection), featuring optocoupler isolation to improve motherboard stability and reduce interference.
- VProbe Control Switch Interface: Support voltage selection of 5V, 12V, and VCC(When the VCC input voltage exceeds 24V, it is prohibited to use this voltage selection), featuring optocoupler isolation to improve motherboard stability and reduce interference.
- Spindle control interface.
- One PWM output interface (3-10V).
- One TF card interface.
- Firmware Management: Features TYPE-C automatic firmware burning and onboard CH340 for easy updates without external tools. Includes BOOT and RESET buttons for entering DFU mode via USB.
- RS485 Support: Includes a built-in 130R (V1.1-150R) terminal resistor for RS485 communications.
- Expansion Interfaces: Reserved connections for an OLED display (I^2C) and Wi-Fi antenna, and supports 3-channel RGB LEDs for customization.

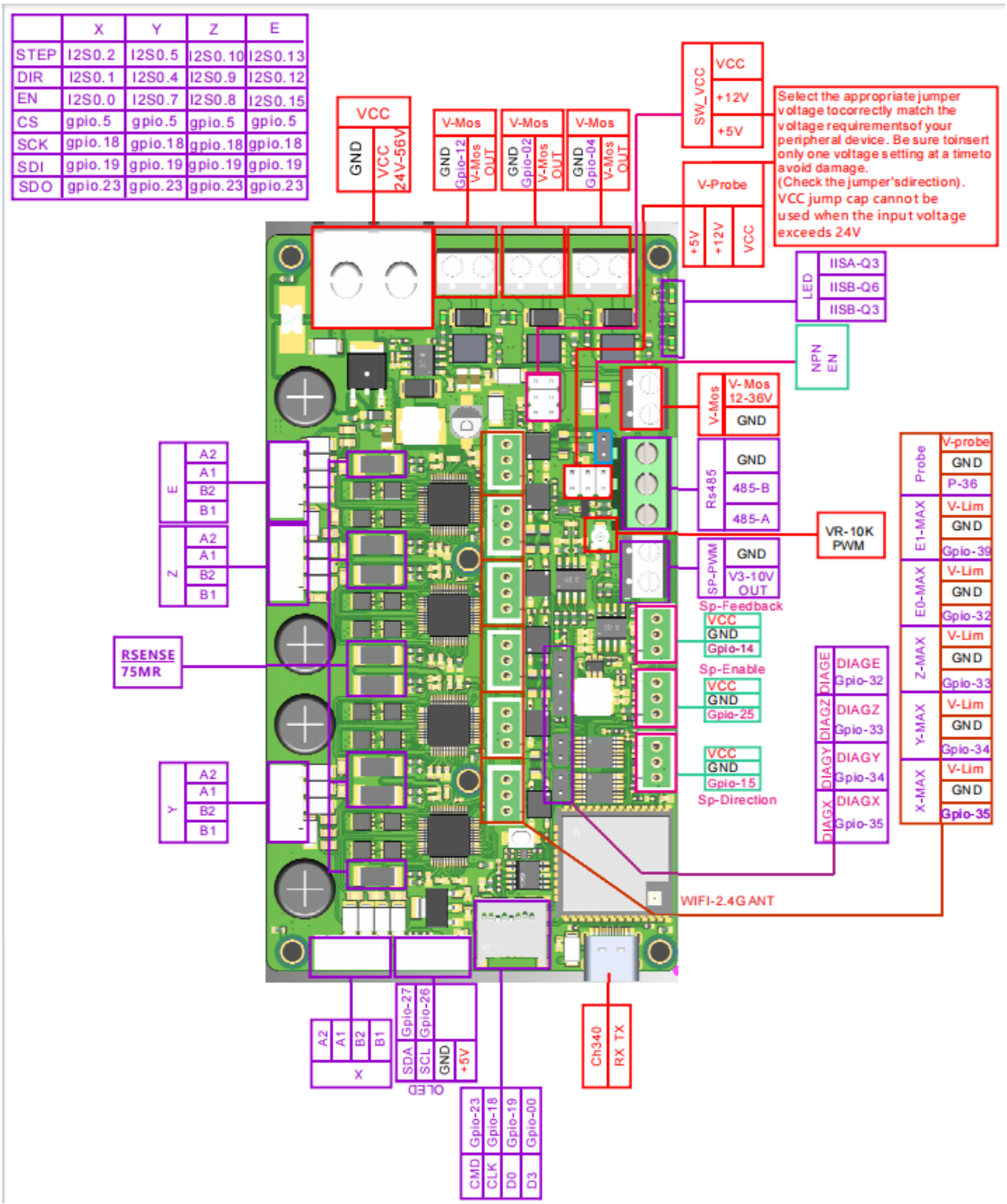
1.2. Dimensions



2. Peripheral Interface

2.2. Pin Description

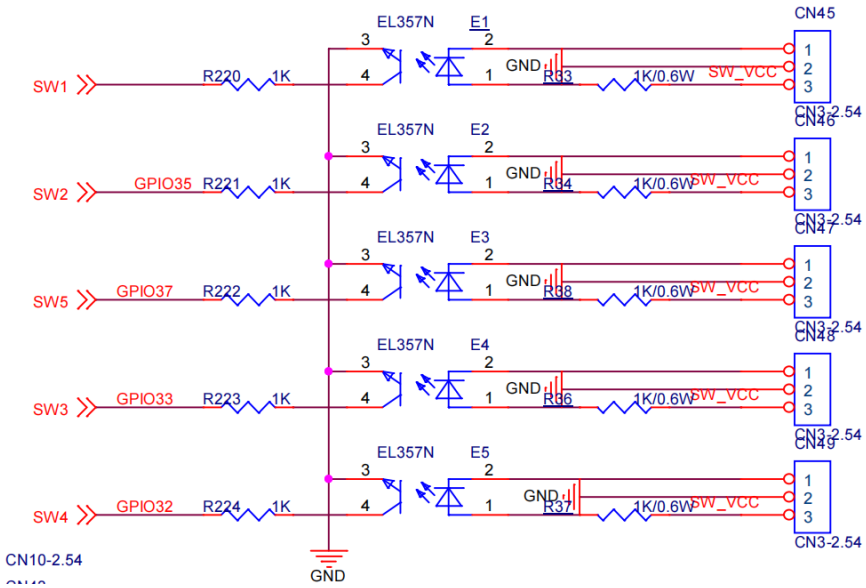


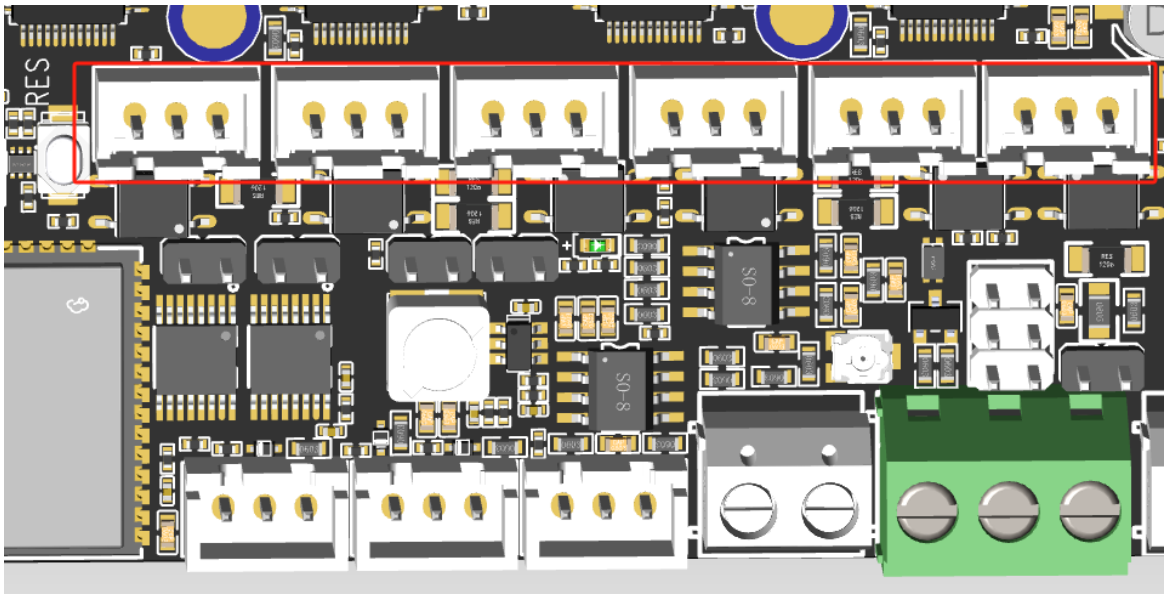

X Y Z E
STEP I2S0.2 I2S0.5 I2S0.10 I2S0.13
DIR I2S0.1 I2S0.4 I2S0.9 I2S0.12
EN I2S0.0 I2S0.7 I2S0.8 I2S0.15
CS gpio.5 gpio.5 gpio.5 gpio.5
SCK gpio.18 gpio.18 gpio.18 gpio.18
SDI gpio.19 gpio.19 gpio.19 gpio.19
SDO gpio.23 gpio.23 gpio.23 gpio.23
VCC
GND
VCC 24V-56V
V-Mos
GND
Gpio-12
V-Mos OUT
Gpio-02
Gpio-04
SW_VCC
VCC
+12V
+5V
V-Probe
Select the appropriate jumper voltage tocorrectly match the voltage requirementsof your peripheral device. Be sure toinsert only one voltage setting at a timeto avoid damage.
(Check the jumper'sdirection).
VCC jump cap cannot be used when the input voltage exceeds 24V
LED
IISA-Q3
IISB-Q6
IISB-Q3
NPN
EN
V-Mos
V- Mos 12-36V
GND
Rs485
485-B
485-A
VR-10K PWM
SP-PWM
V3-10V OUT
Sp-Feedback
Sp-Enable
Sp-Direction
Probe
V-probe
P-36
E1-MAX
E0-MAX
Z-MAX
Y-MAX
X-MAX
V-Lim
Gpio-39
Gpio-32
Gpio-33
Gpio-34
Gpio-35
DIAGE
DIAGZ
DIAGY
DIAGX
E
Z
Y
A2
A1
B2
B1
RSENSE 75MR
WIFI-2.4G ANT
OLED
SDA
SCL
+5V
Gpio-27
Gpio-26
Ch340
RX TX
CMD
CLK
D0
D3
Gpio-23
Gpio-18
Gpio-19
Gpio-00

V1.1

3. Interface Details

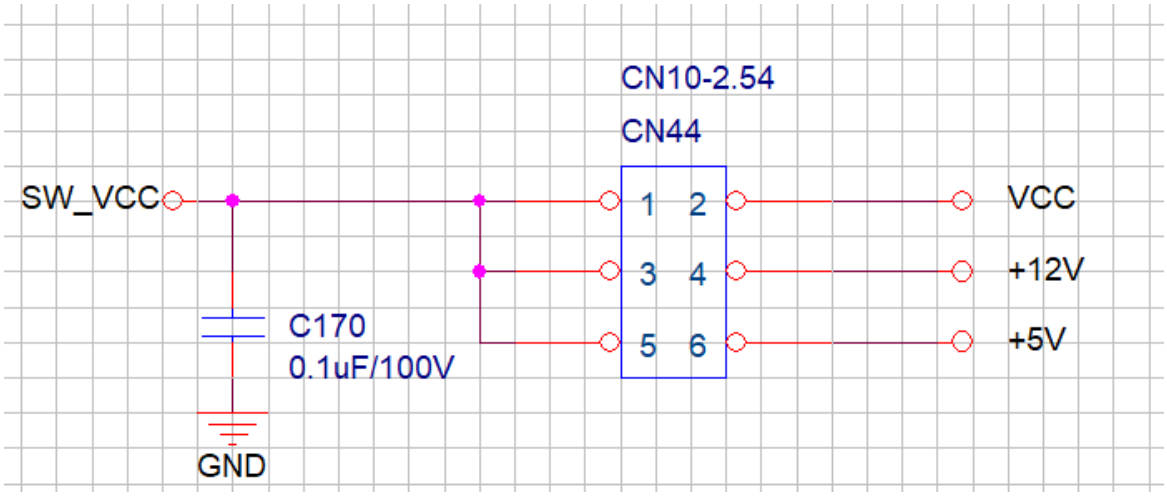
3.1. Endstop Switch

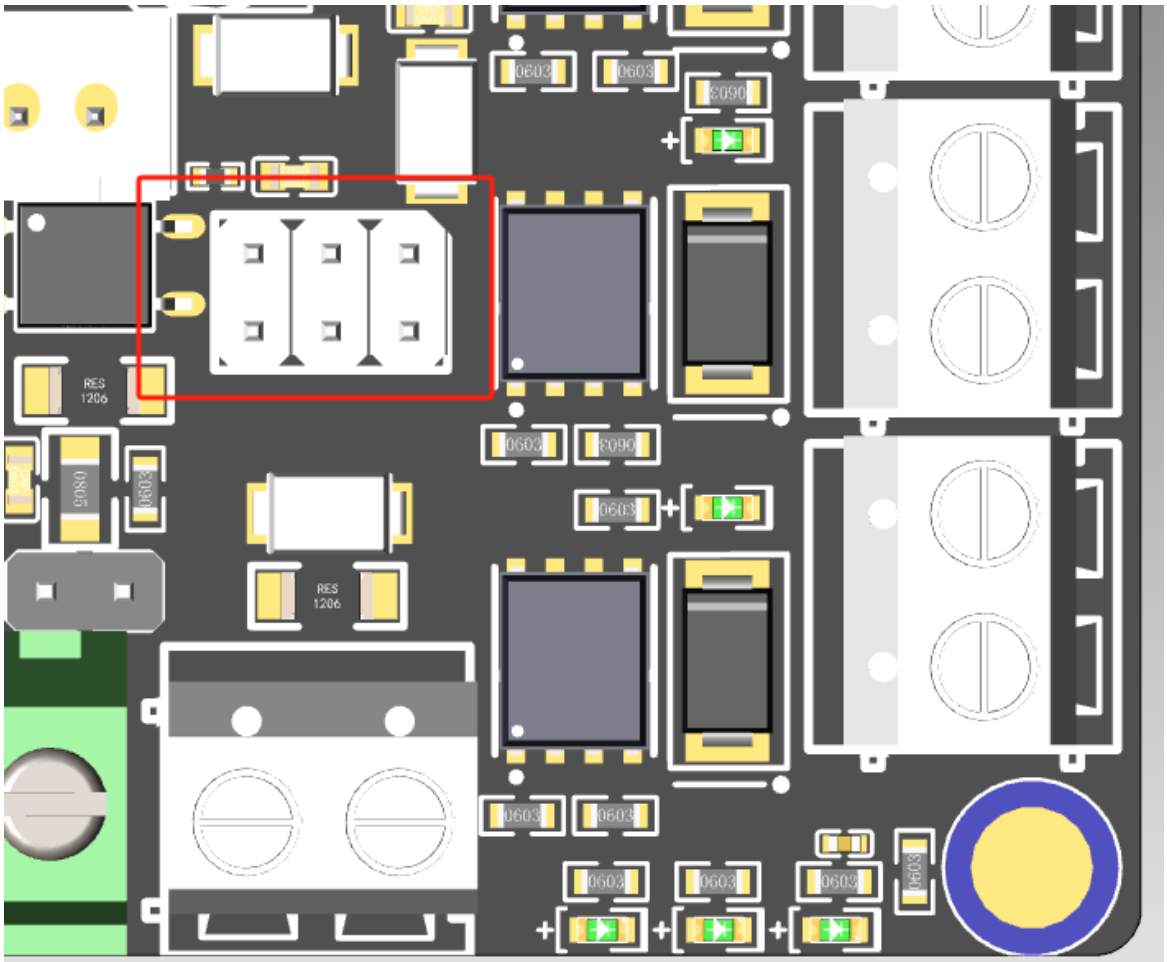




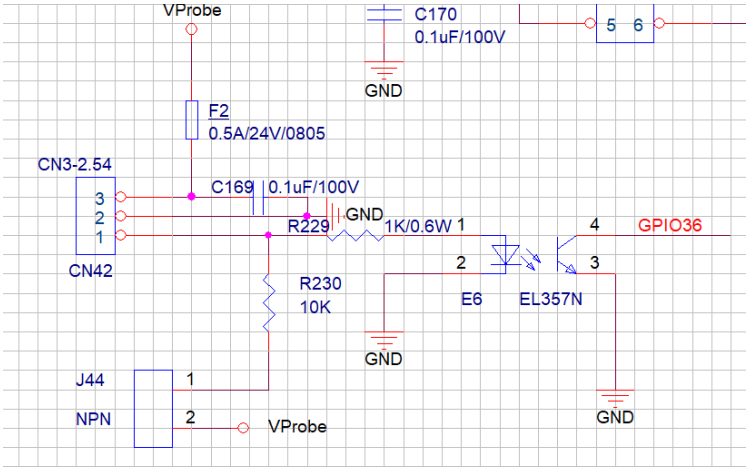
SW_VCC voltage selection, only one type of jump cap can be selected, and it is prohibited to plug in all jump caps.

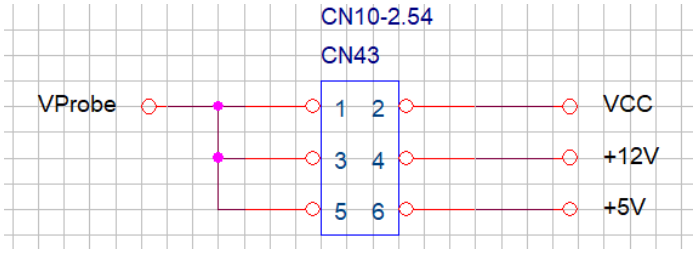
(Note: When the VCC input is greater than 24V, the use of VCC jump caps is prohibited)

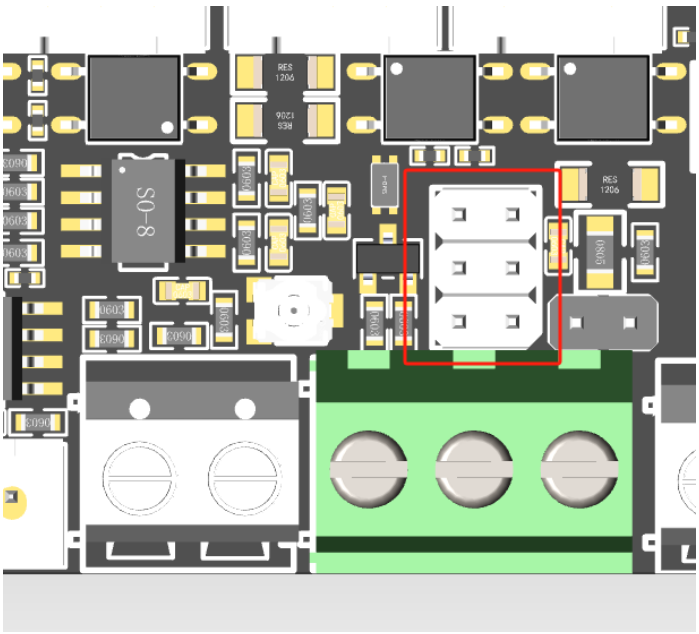


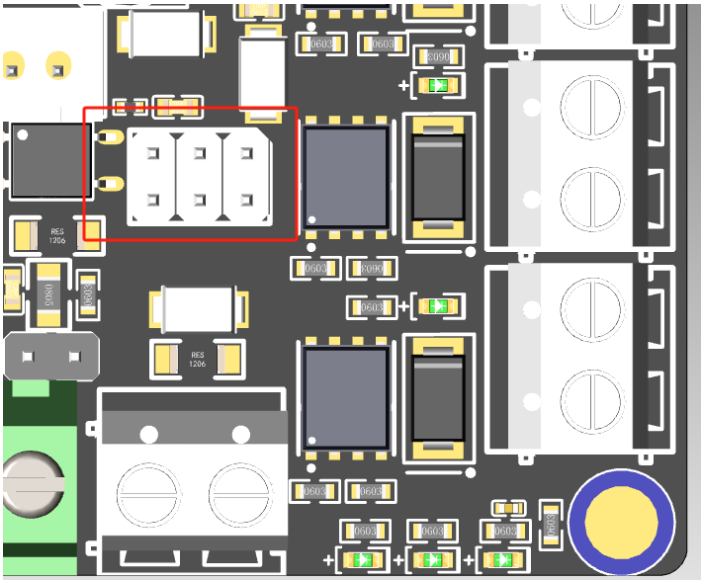

RES
1206
RES
1206
0603
0603
0603

3.2. VProbe Switch

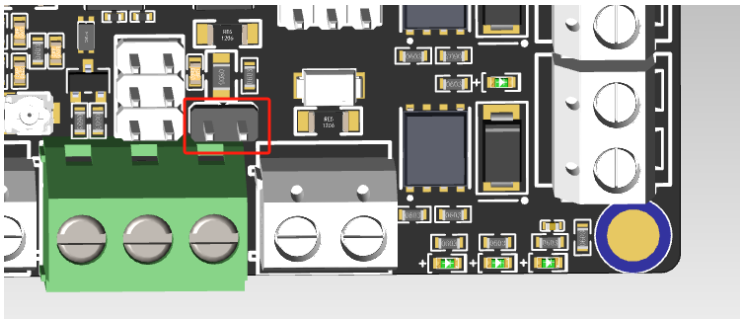






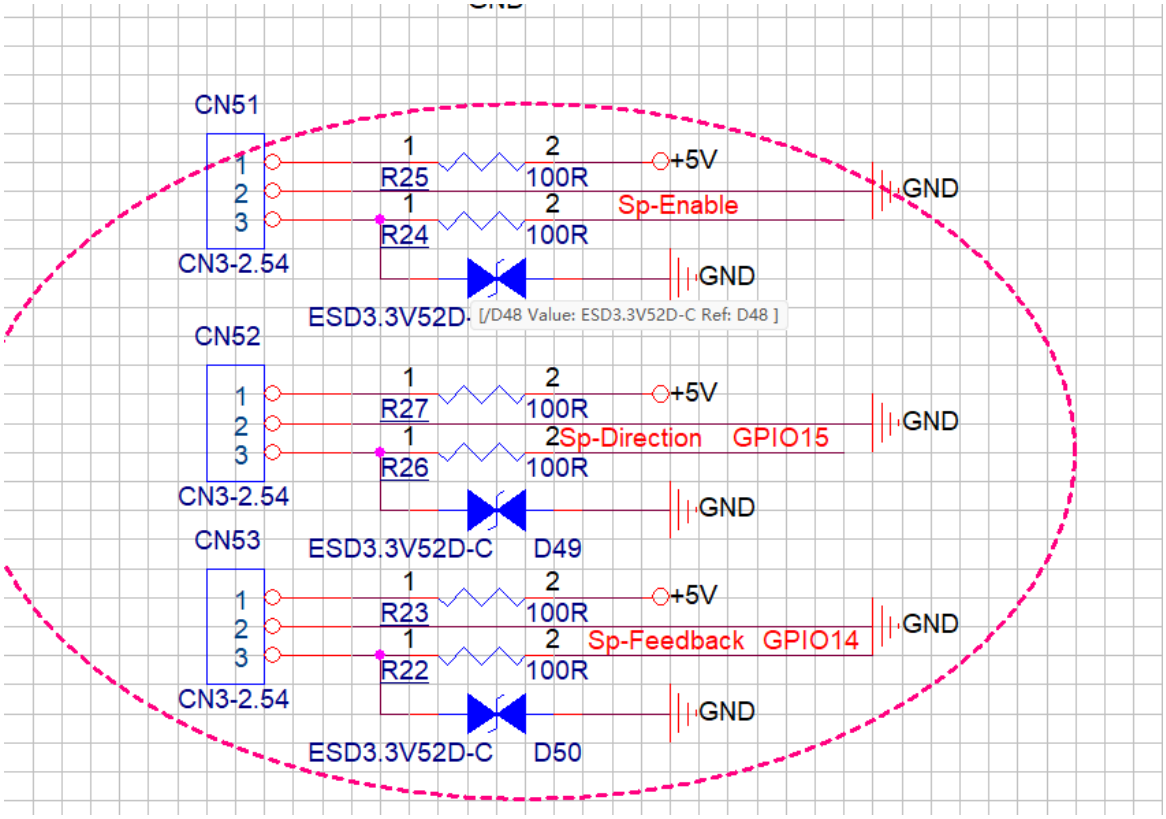


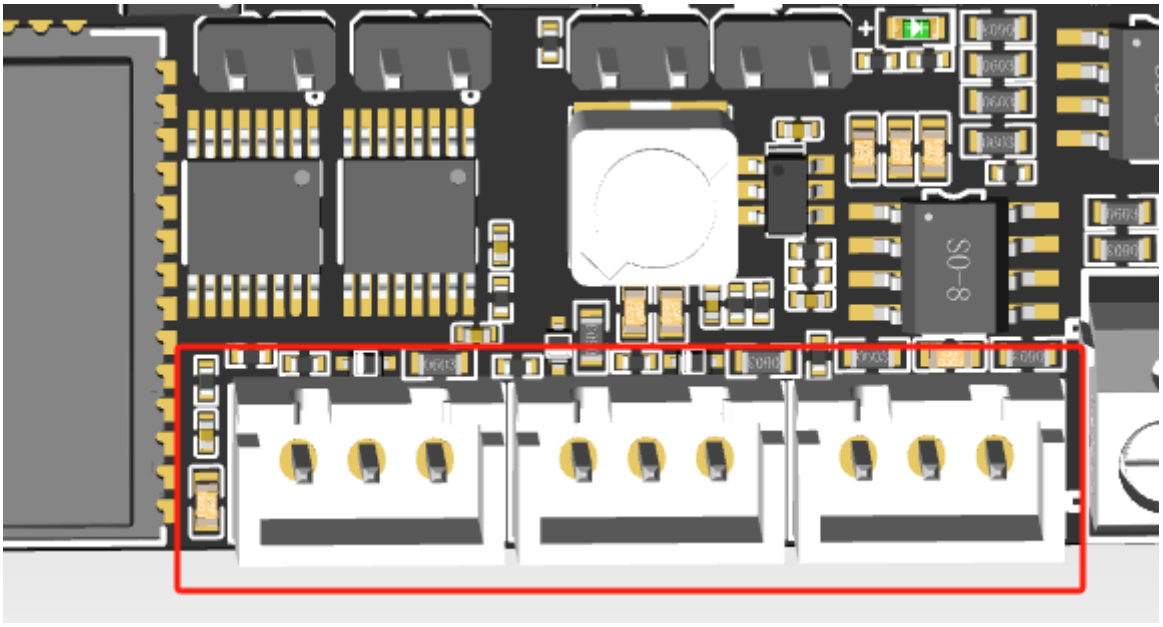
Normally closed (NPN type), short circuited through jumper cap



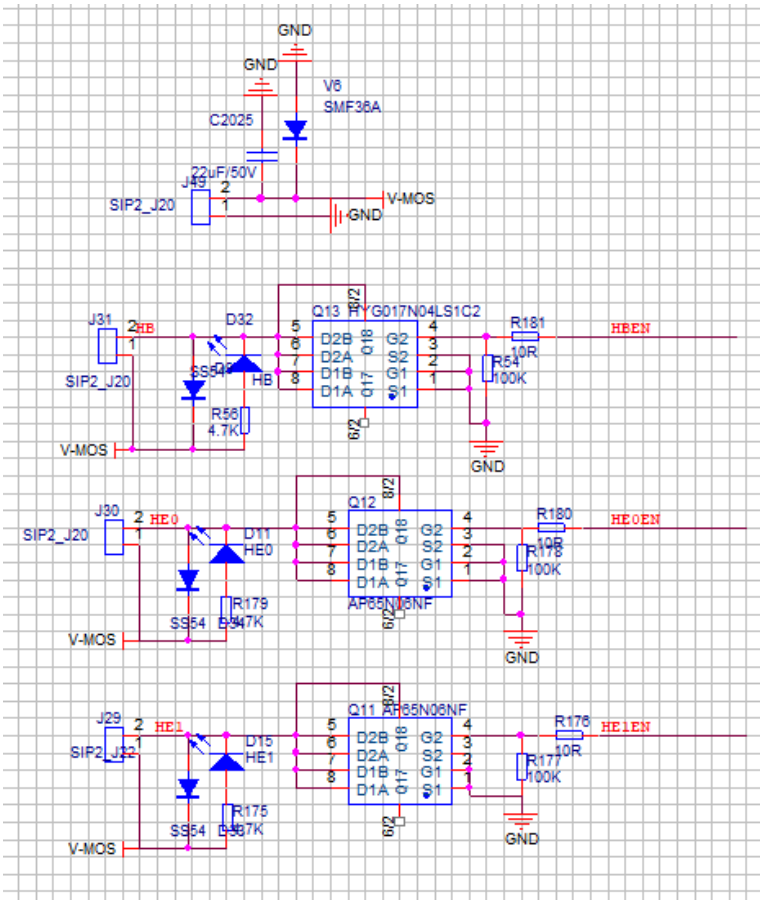
VProbe voltage selection, only one type of jump cap can be selected, and all jump caps are prohibited from being plugged in (note: VCC jump caps are prohibited when VCC input is greater than 24V)

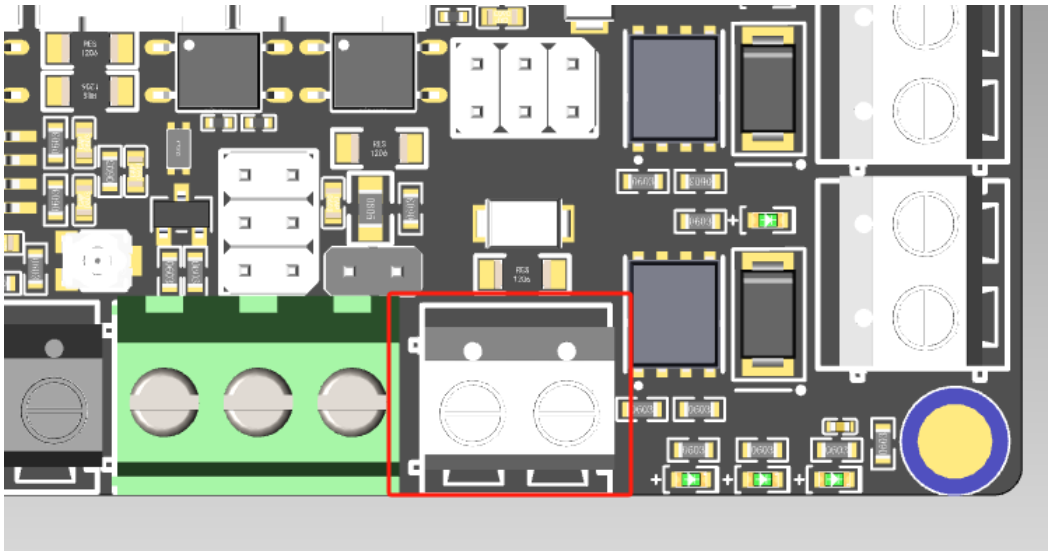
3.3. Spindle


CN51
1
2
3
CN3-2.54
R25
R24
100R
+5V
GND
Sp-Enable
ESD3.3V52D-C
[/D48 Value: ESD3.3V52D-C Ref: D48]
CN52
R27
R26
Sp-Direction
GPIO15
D49
CN53
R23
R22
Sp-Feedback
GPIO14
D50


SO-8

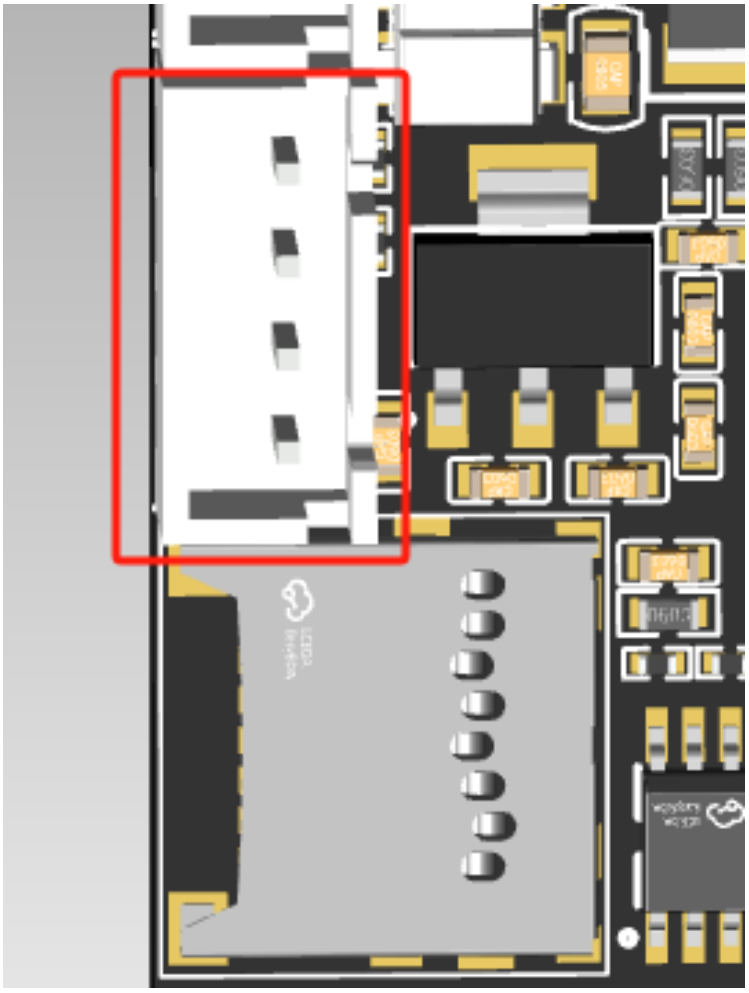
3.4. V-MOS Output Ports



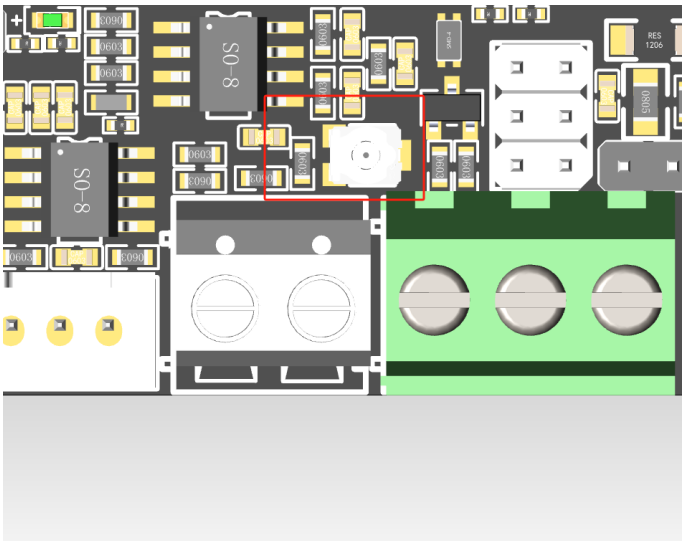


(Note: V-MOS input 12-36V, input voltage exceeding 36V is prohibited)

3.5. OLED Display Interface

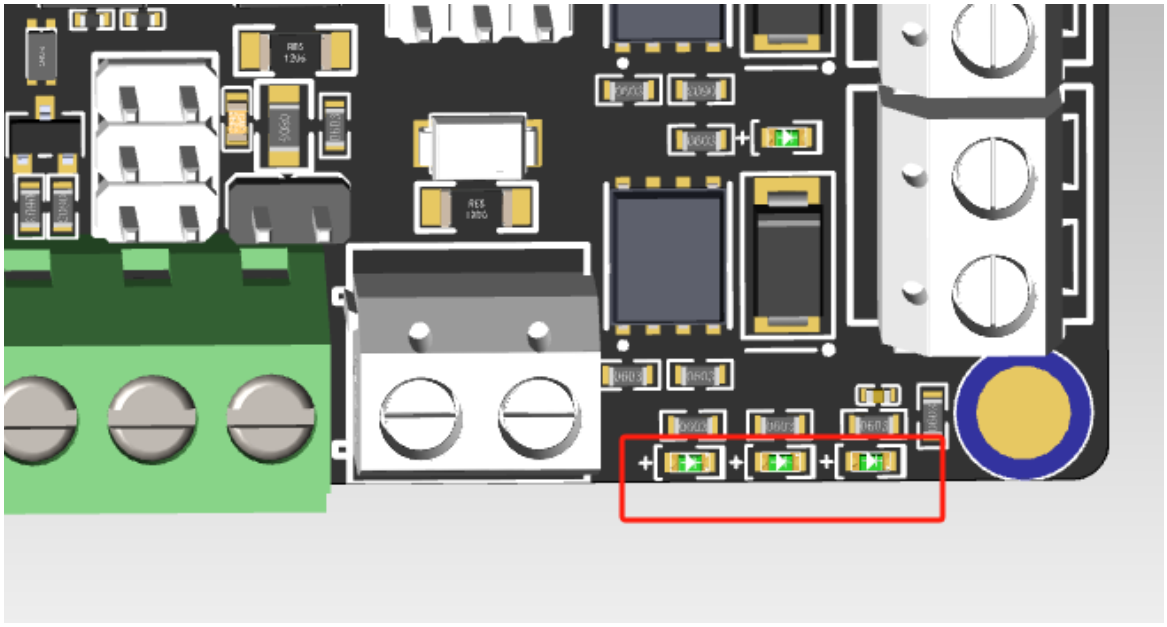


3.6. SP-PWM potentiometer

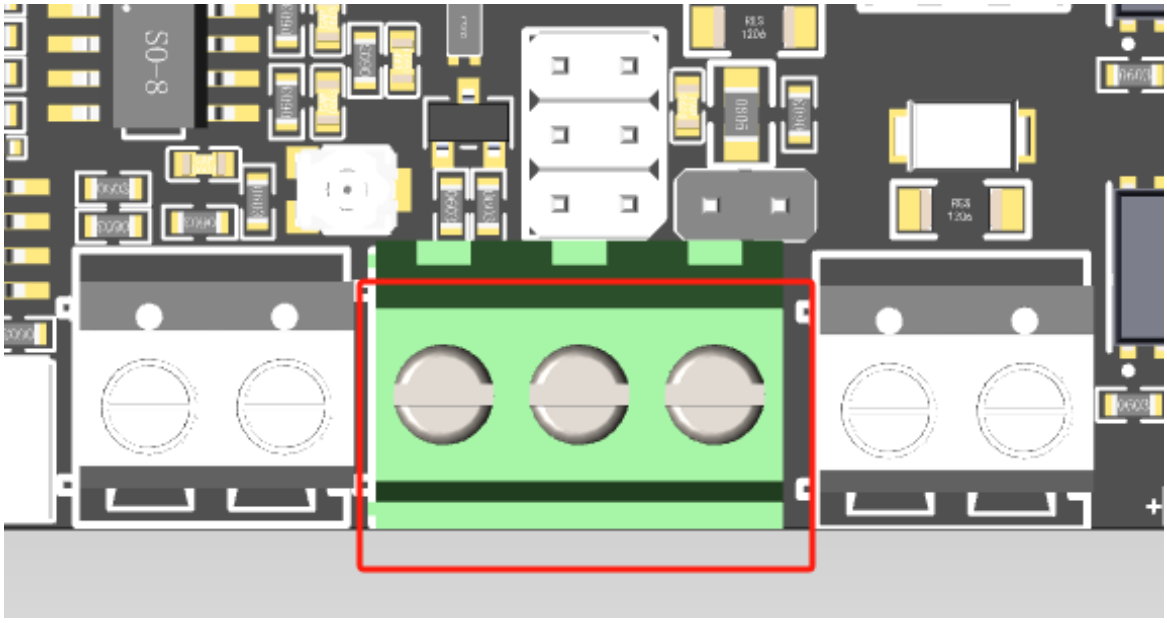


(Adjustable potentiometer 10K, SP-PWM 10V requires adjusting the potentiometer to maximum output)

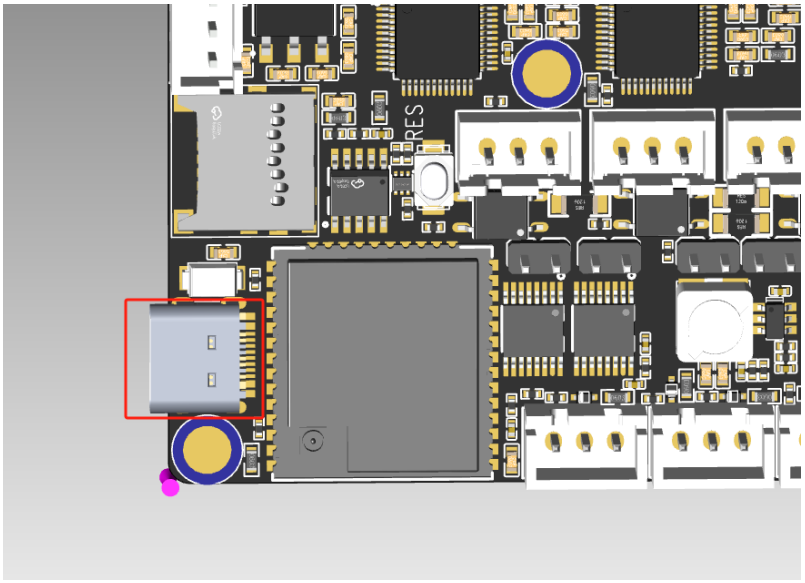
3.7. LED



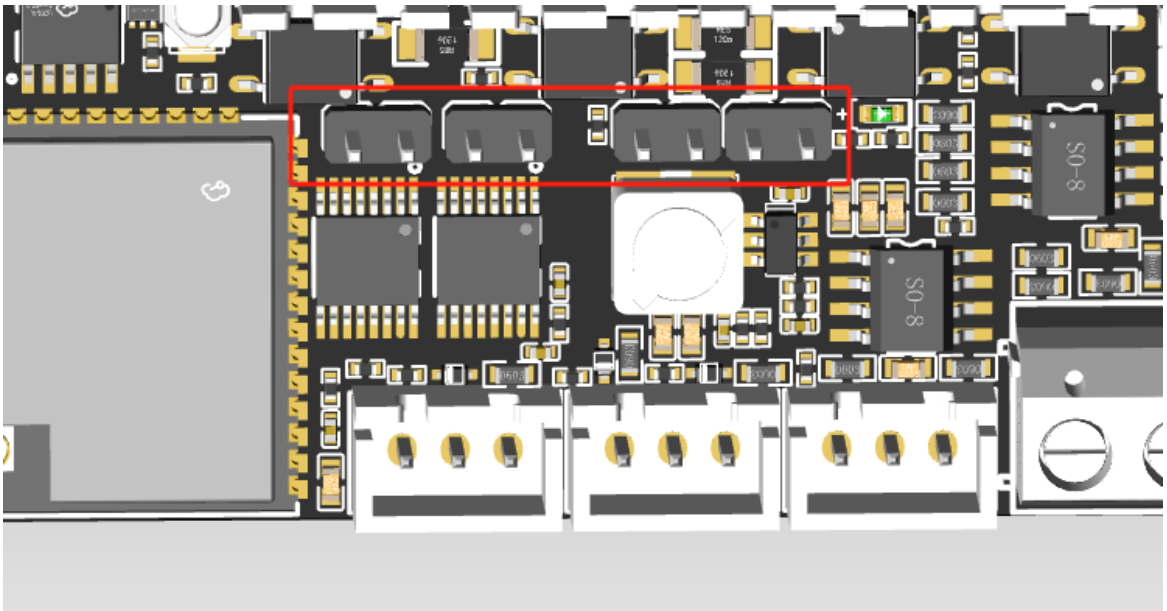
3.8. 485 interface



3.8. Firmware burning interface



3.8. DIAG



(Note: When using the DIAG function, the limit switch interface should not be used to trip the cap, and the DIAG sensitivity should be adjusted on the software)

4. Software Setup

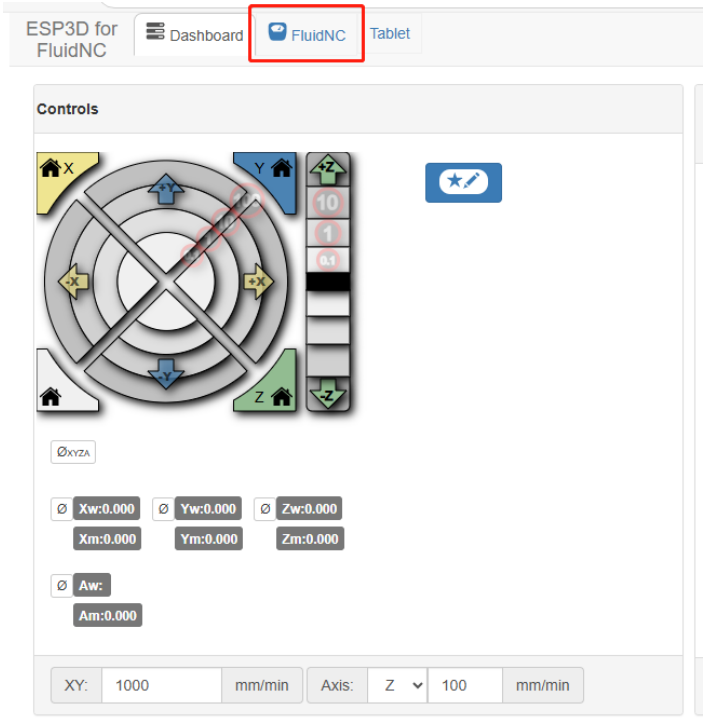
4.1. Firmware Installation

Firmware available at: https://github.com/bdring/FluidNC

4.2. Wi-Fi Configuration Steps

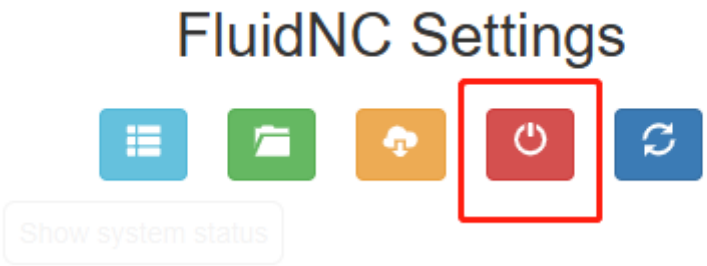
1. Connect to the FluidNC hotspot to access the configuration interface.

2. Navigate to the FluidNC configuration interface.



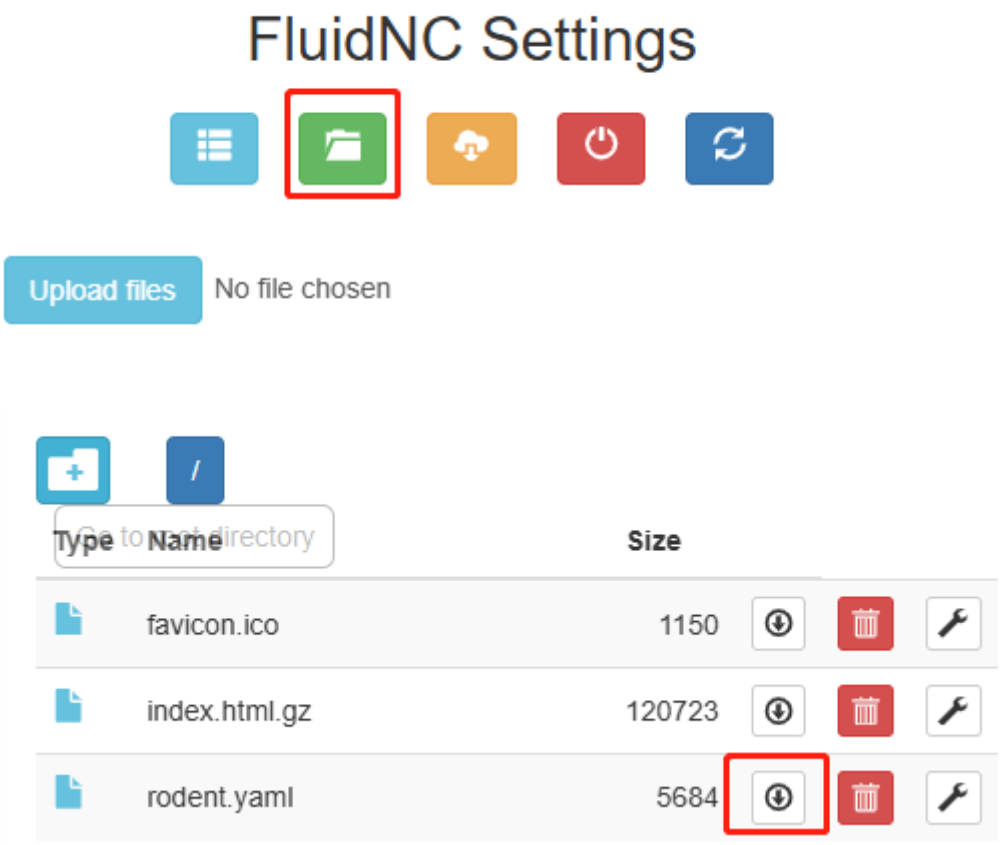
3. Modify Sta/SSID (Wi-Fi name) and Sta/Password (Wi-Fi password), then click "Set" to apply changes.

4. Restart the FluidNC system to finalize the setup.



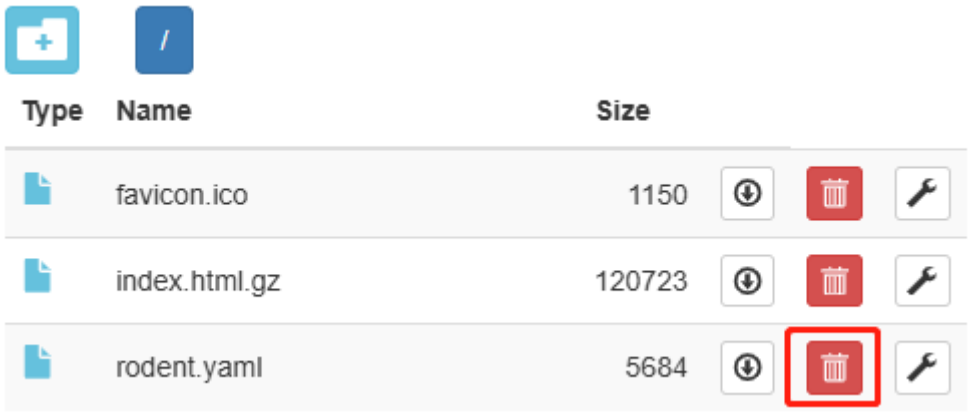
4.3. Configuring the Machine

1. Download rodent.yaml from the file icon.

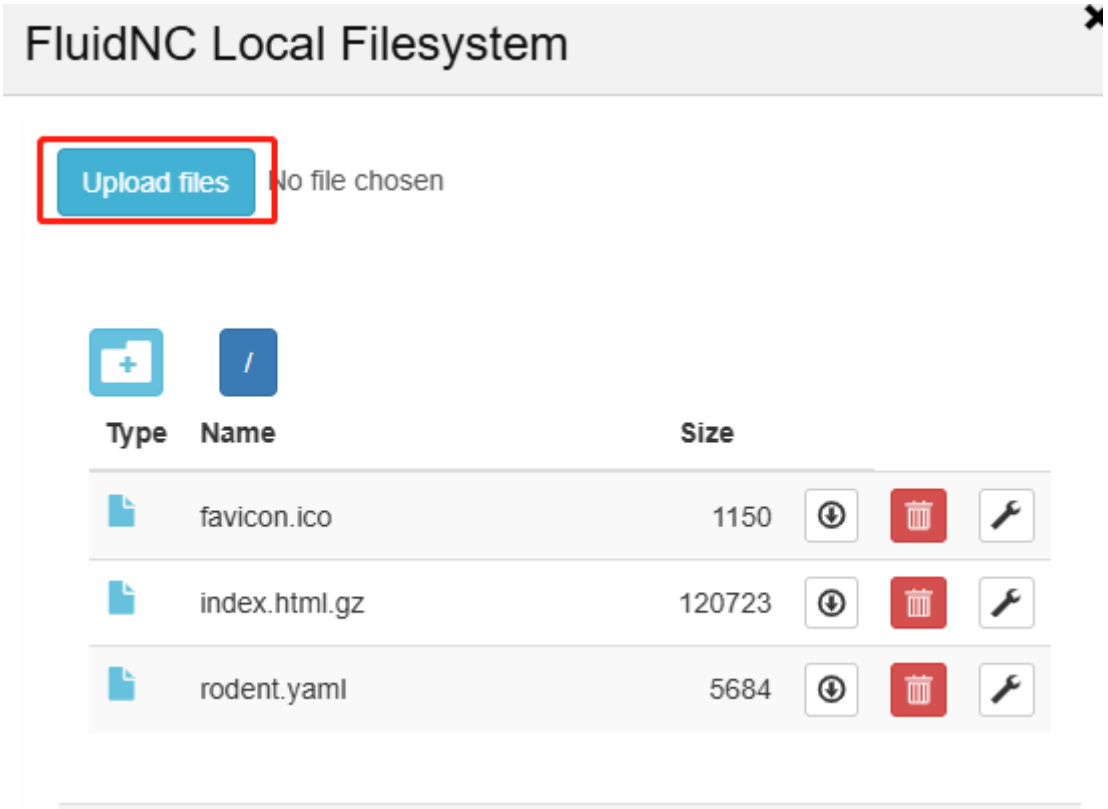


2. Customize your settings by referencing the FluidNC Wiki:
http://wiki.fluidnc.com/

3.Click the "Delete icon".



4.Click "Upload files" to upload rodent.yaml.



5.Click "Restart Rodent".

If you need further resources for this product, you can find them at [GitHub](https://github.com/bigtreetech/). If you cannot find what you need, you may contact our after-sales support(service005@biqu3d.com).

If you encounter any other problems during use or have suggestions or feedback, please contact us. Thank you for choosing BIGTREETECH products.