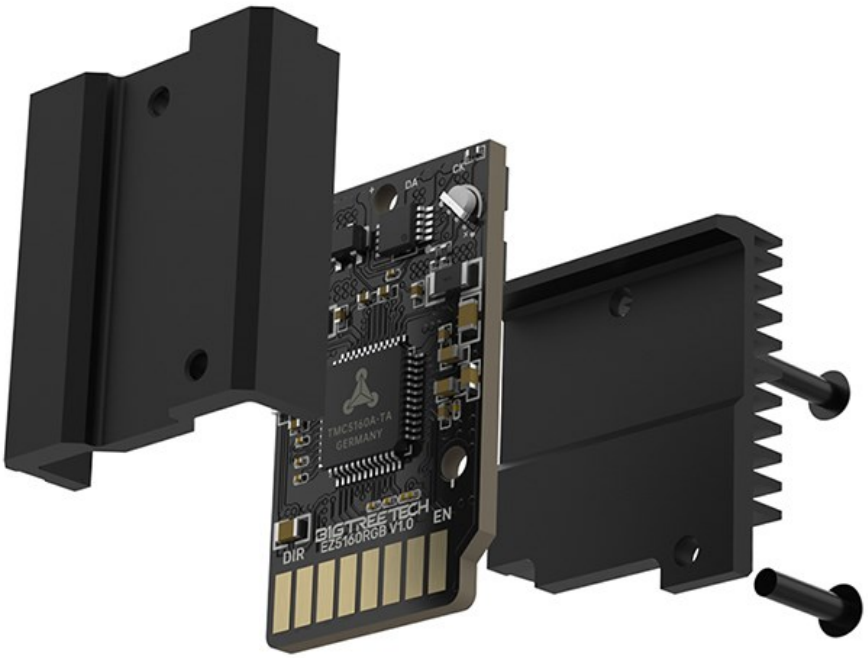
BIGTREETECH

EZ5160RGB V1.0

User Manual



CONTENTS

Revision History

Version	Revisions	Date
01.00	Original	2023/04/15

Product Profile

The EZ5160 RGB is a high-power stepper motor drive control module with 8 external power MOSFETs. The maximum voltage can reach 56V, supporting a wider range of stepper motors with higher adaptability.

Feature Highlights

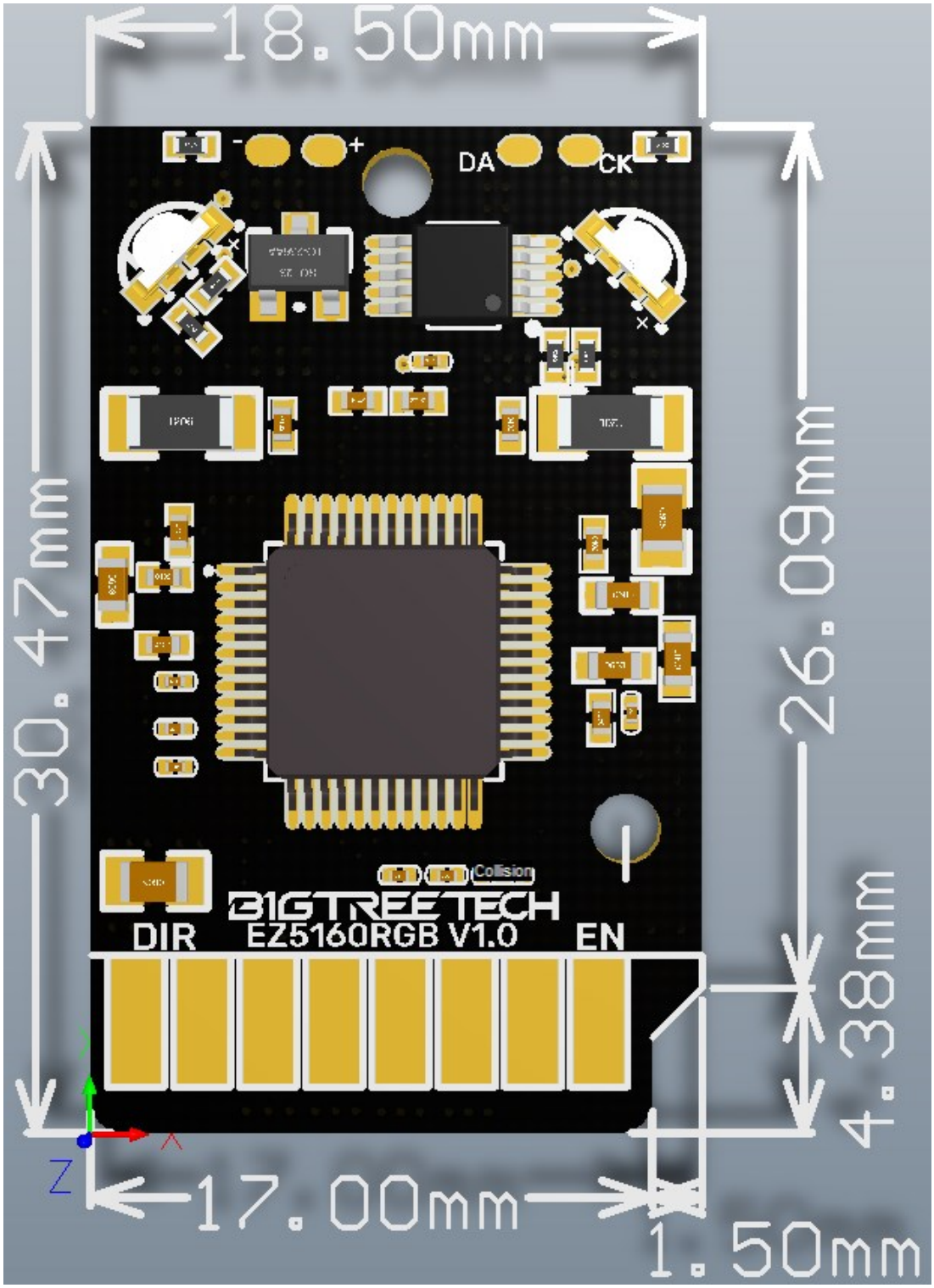
- Incorporates 8 external power MOSFETs, supports maximum voltage VM=56V, maximum current IRMS=4.7A, sine wave peak current: 6.6A;
- Ultra-quiet mode;
- Significantly less heat generation compared to 2100 and 2130 drivers;
- Helps to prevent motor jitter;
- Less prone to missed steps;
- Capable of driving 57 stepper motors;
- Utilizes a newly developed board frame and pinless connector to improve user experience and prevent injuries from old driver pins;
- Customized heat sink for enhanced heat dissipation and protection of driver chips from external damage;
- Onboard RGB lights and thermistor temperature sensing for real-time module temperature monitoring, with RGB light status indicating temperature information.

Specifications

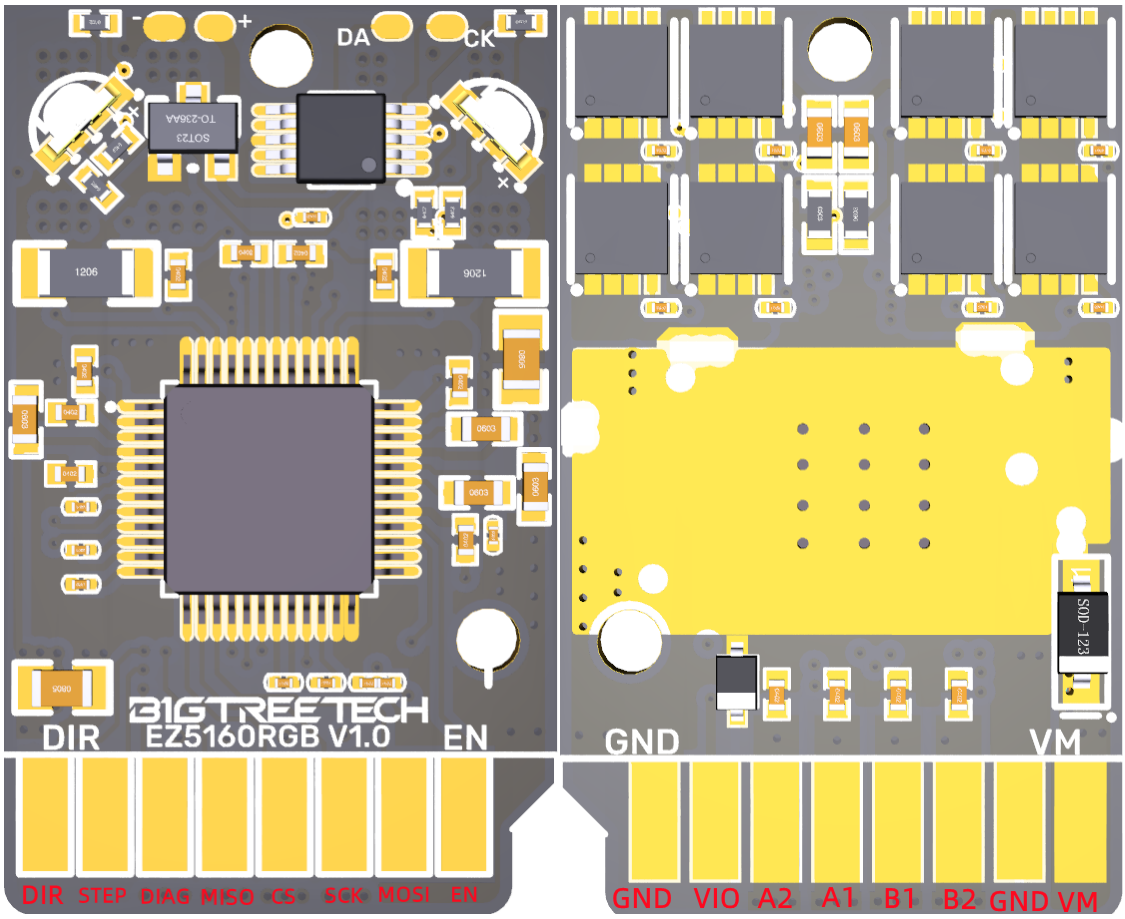
- Dimensions: 18.5 x 30.47mm
- Driver Chip: TMC5160-TA
- Input Voltage (VM): 8V-56V
- Maximum Current: 4.7A, sine wave peak current: 6.6A
- Maximum Microsteps: 256
- Operating Mode: SPI
- R Sensor: 50mΩ

Peripheral Interface

Dimensions



Connector Diagram

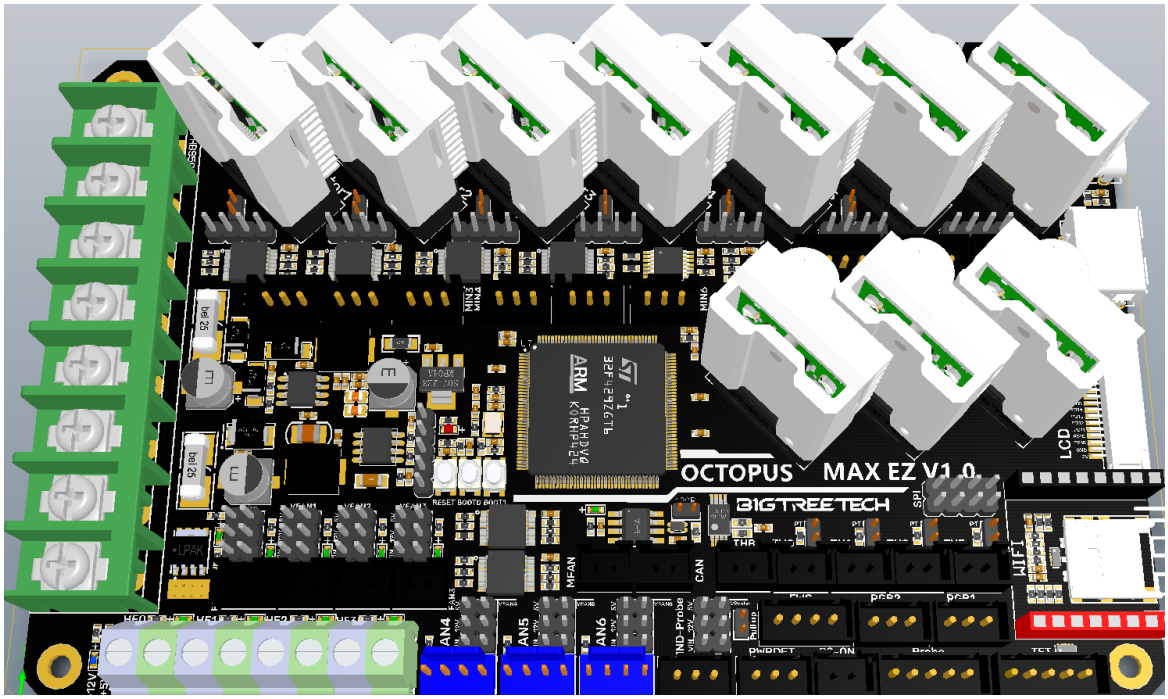


Features	Features
(EN) Enable	(VM) Motor Power Supply Voltage
(SDI/CFG1) Data	(GND) Ground
(SCK/CFG2) Clock	(B2) B Phase
(CSN/CFG3) Chip Select	(B1) B Phase
(SDO/CFG0) Data	(A1) A Phase
(DIAG) Stall Detection	(A2) A Phase
(STEP) Pulse Input	(VIO) Logic Voltage
(DIR) Direction Input	(GND) Ground

Interface Introduction

Installation

To install the EZ driver into the EZ driver slot, follow the direction as shown in the figure below. (e.g.: Octopus MAX EZ + EZ5160RGB)



RGB Light Status

Blue: When the temperature is below 40°C.

As the temperature rises from 40°C to 75°C, the RGB blue brightness decreases while the red brightness increases. The hue transitions from blue to purple, and subsequently shifts to magenta.

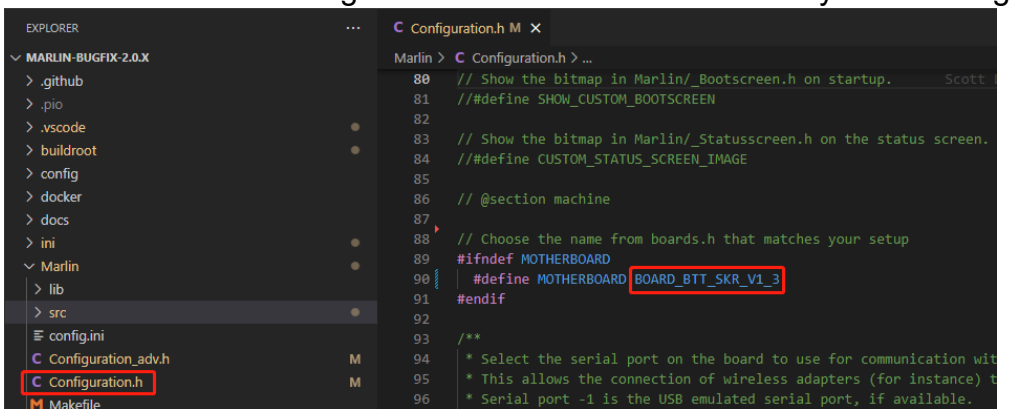
Red: When the temperature is above 75°C.

Firmware Settings

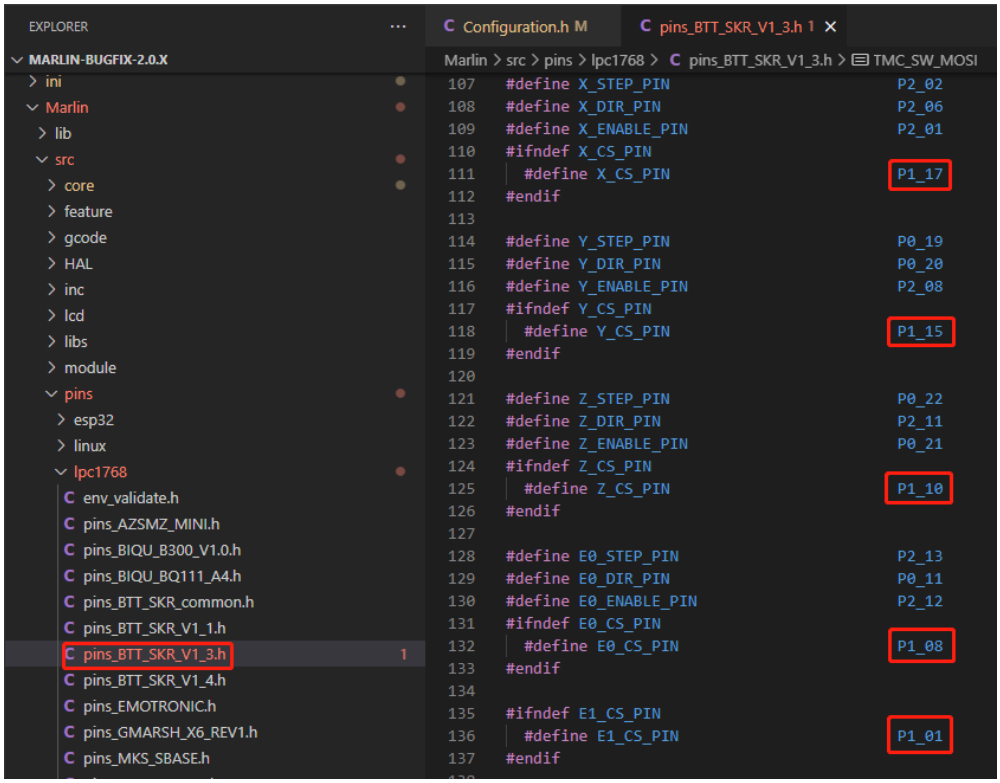
Marlin Firmware Settings

Important Note: Currently, only Marlin 2.0 and later firmware versions support TMC5160's SPI mode.

Step 1: In the Marlin 2.0 firmware, locate and open the "Configuration.h" file, then find the line "#define MOTHERBOARD XXXXXX". "XXXXXX" represents the model of the board being used. Confirm the motherboard you are using.



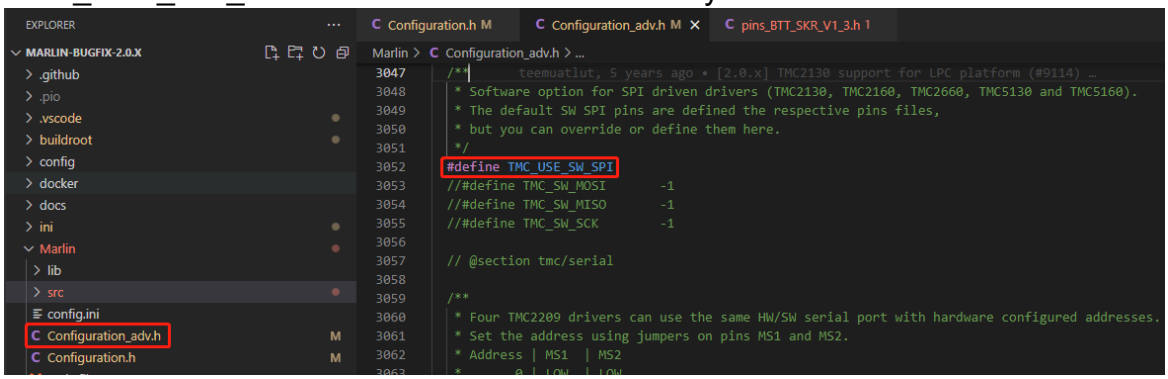
Step 2: In the Marlin\src\pins directory, find the "pins_xxxxxx.h" file corresponding to your board (xxxxxx represents the board model), and then locate "X_CS_PIN", "Y_CS_PIN", "Z_CS_PIN", and "EO_CS_PIN" within the file. Modify the pin names following these variables to the pins you are using.



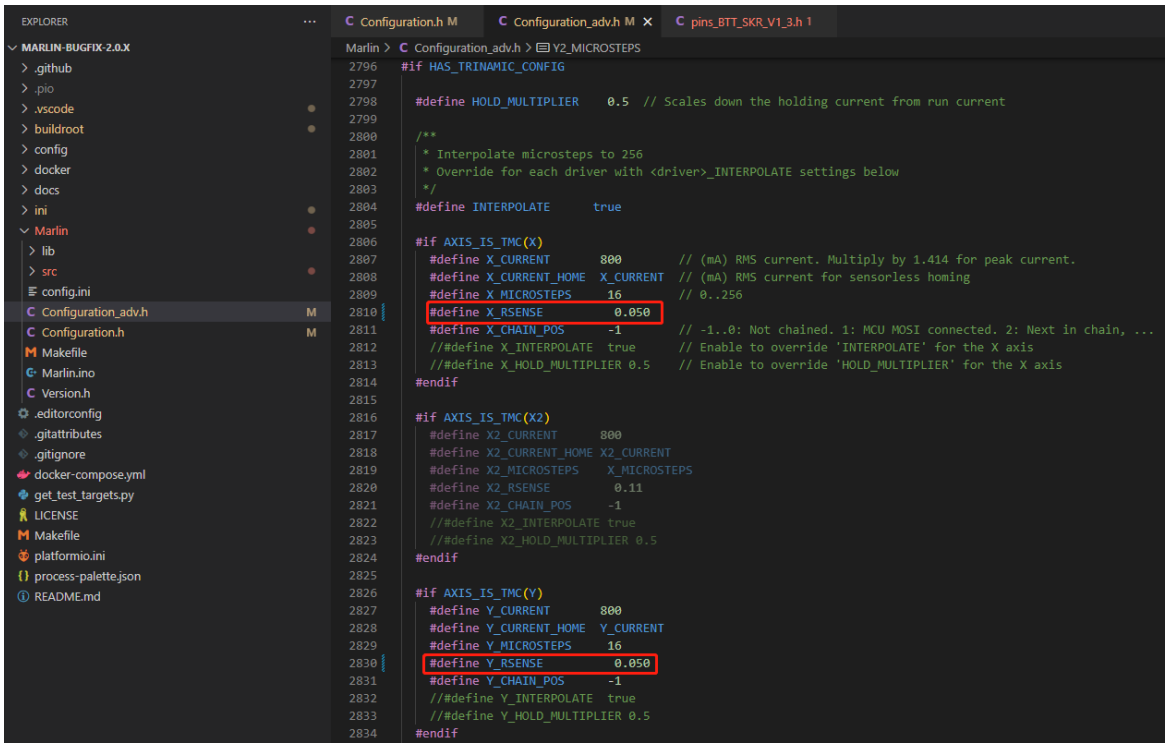
Step 3: In the file from Step 2, locate "#define TMC_SW_MOSI XXX", "#define TMC_SW_MISO XXX", and "#define TMC_SW_SCK XXX". Change "XXX" to the pins you want to use.

```
139  //
140  // Software SPI pins for TMC2130 stepper drivers
141  //
142  #if ENABLED(TMC_USE_SW_SPI)
143    #ifndef TMC_SW_MOSI
144      #define TMC_SW_MOSI                P4_28
145    #endif
146    #ifndef TMC_SW_MISO
147      #define TMC_SW_MISO                P0_05
148    #endif
149    #ifndef TMC_SW_SCK
150      #define TMC_SW_SCK                 P0_04
151    #endif
152  #endif
```

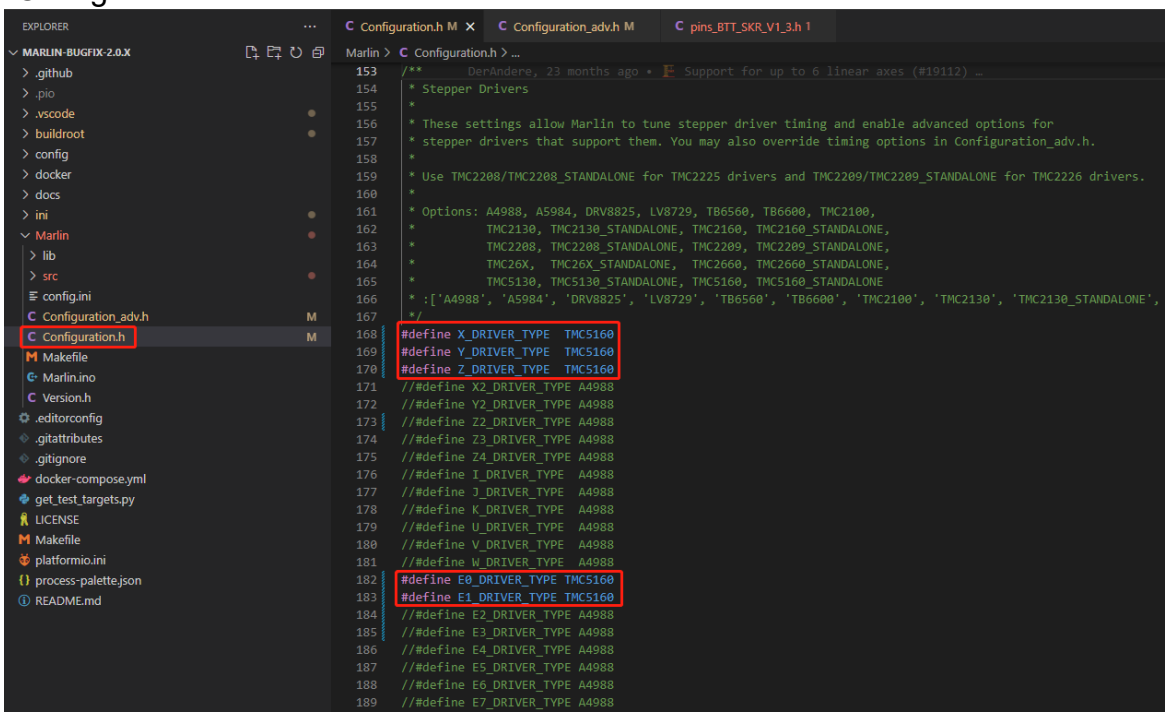
Step 4: Find and open "Configuration_adv.h", then locate "#define TMC_USE_SW_SPI" and remove the comment symbols "//".



Step 5: In the "Configuration_adv.h" file, find "#define X_CURRENT", "#define X_MICROSTEPS", and "#define X_RSENSE" and modify the parameters that follow (for each axis being used). The RSENSE value for each used axis should be changed to "0.050".



Step 6: Set the corresponding axis drive type to "TMC5160" in the "Configuration.h" file.



Klipper Firmware Settings

```
[tmc5160 stepper_x]
cs_pin: P1.17
spi_software_miso_pin: P0.5
spi_software_mosi_pin: P4.28
spi_software_sclk_pin: P0.4
sense_resistor: 0.050
#diag1_pin: P1.29
run_current: 0.800
stealthchop_threshold: 999999
```

Note: The default sense_resistor in Klipper is 0.075; it needs to be set to 0.050.

Precautions

1. Be sure to disconnect the power supply before installing the driver to prevent damage;
2. Do not plug or unplug the driver module while it is powered, as this may cause damage;
3. The heat sink has been installed at the factory. Do not remove the heat sink, otherwise the heat dissipation effect will decrease without the heat-conducting material;
4. When using high voltage (greater than 48V) or high current (greater than 2A), active cooling must be adopted to ensure that the drive can work normally.

If you require additional resources for this product, please visit https://github.com/bigtreetech/ to find them. If you cannot locate the resources you need, please contact our customer support.

If you encounter other problems during use, please feel free to contact us, and we will be more than happy to assist you. If you have any suggestions or feedback for our products, we are open to hearing them. Thank you for choosing BIGTREETECH products!