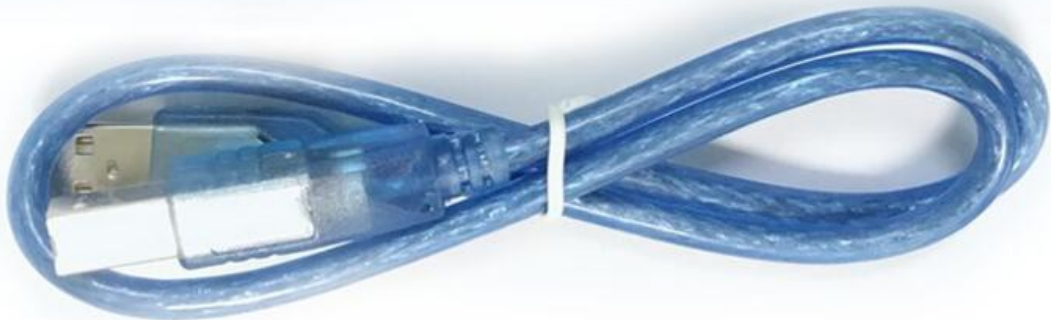
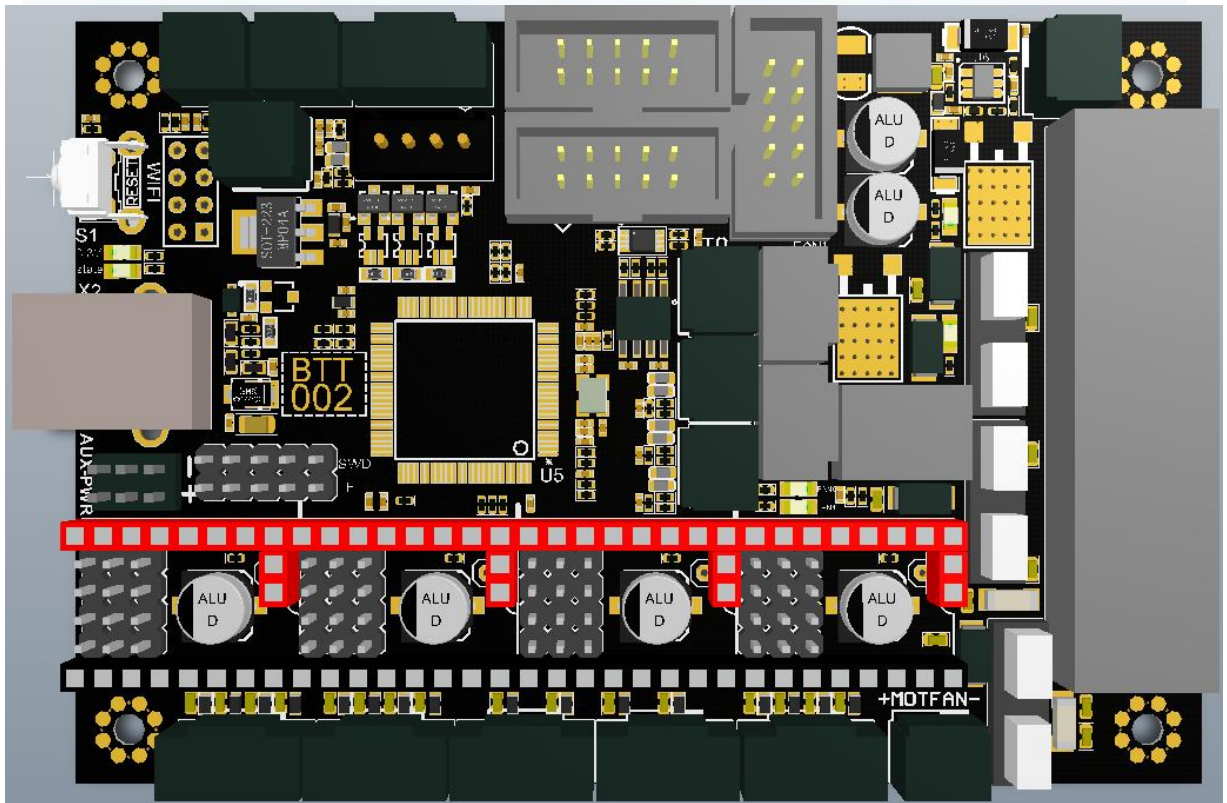


BIGTREETECH

BTT002 V1.0

Manual



I. Preface

BigTree Technology Co., Ltd. developed BIGTREETECH BTT002 V1.0 to provide a direct replacement for the Prusa i3 MK3S which has more options.

Main features

- 1) The board is controlled by a STMicroelectronics ARM Cortex M4 32-bit STM32F407VGT6 MCU. This chip has a Maximum Clock Frequency of 168 MHz.
- 2) use a powerful integrated development environment of Visual Studio Code: support online debugging, which is more helpful for product development and performance optimization, and adopt C language for development with low development difficulty.
- 3) The firmware is upgraded with a SD card, which is very convenient and efficient!
- 4) The layout of the PCB is optimized for heat dissipation.
- 5) Support 24V power input, High voltage input means heated bed current draw can be reduced to 1/4, without power loss.
- 6) Support BIGTREETECH TFT24 V1.1、TFT28、TFT3.5 V2.0、TFT35 V3.0 and LCD12864/2004;
- 7) Firmware is adopted to set the driving current to avoid manual adjustment of current resulting in burnt out drive, which is convenient, safe and reliable.
- 8) Reserve WIFI expansion port, support ESP3D wireless printing;
- 9) Support TMC2130/5160/5161 SPI mode.
- 10) Support TMC2208/2209 UART mode.
- 11) Support RGB LED strips;
- 12) Support parallel dual Z axis;
- 13) Reserve 5V and VMOT cooling fans for improving heat dissipation;
- 14) Automobile fuses are used for easy replacement after blown out;
- 15) Reserve EXP3 expansion port, including I2C and UART expansion port.

Board specifications

Appearance size: 105*71mm
Install size: Perfect replacement of Prusa i3 MK3S motherboard, see file “BTT002 V1.0 SIZE” for details
MCU: ARM Cortex-M4 CPU
Power Input: 12/24V
Logic Voltage: 3.3V
Stepper motors: 5 ways motor ports (including dual-z motors)
Motor drives: XM、YM、ZM、EM
Thermistors: 4 ways: TH0、TH1、TH2 and onboard NTC100K
Display: TFT and EXP1、EXP2 for LCD
Endstops: 3 ways: X-MIN、Y-MIN、Z-Probe
Fans: two 5V CNC fans, one 5V fan (always on), one VMOT fan (always on)
Other ports: Nozzle, heat bed, RGB LED strips and WIFI module
Default firmware: Marlin 2.0
PC communicating port: USB-B, baudrate 115200
Support file format: G-code
Recommend printing software: Cura、Simplify3D、pronterface、Repetier-host、Makerware

II. Onboard LED information

The 3.3V green LED is the power indicator light. The LED is on when the board is powered.

The yellow ‘status’ LED flashes when the firmware is updated, and stops flashing when the update is complete.

The red LED3 is the heated bed status indicator light. It is on when the heated bed is powered and off when the heated bed is not powered.

The red LED2 is the extruder status indicator light. It is on when the extruder is powered and off when the extruder is not powered.

The red LED0 is the FAN0 status indicator light. It is on when the fan is powered and off when the fan is not powered.

The red LED1 is the FAN1 status indicator light. It is on when the fan is powered and off when the fan is not powered.

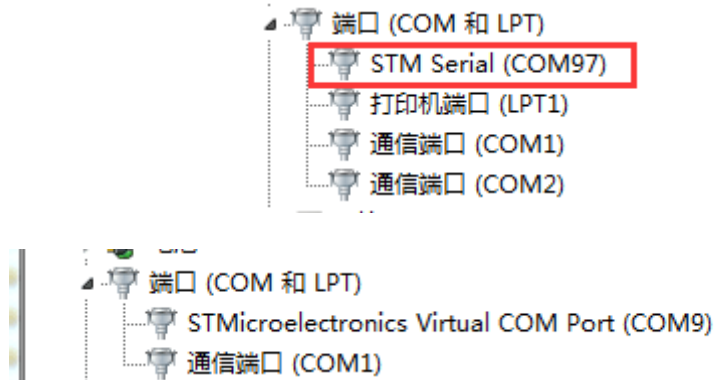
III. Communication between board and PC

After the board is connected to the computer through the USB cable, the computer will automatically install the needed driver. After the driver installation is completed, the board can be identified for data

transmission. If the installation fails, you can download the needed driver from here:

<https://github.com/bigtreetech/BIGTREETECH-SKR-MINI-V1.1/tree/master/firmware/mapleDrv-USBdriver>

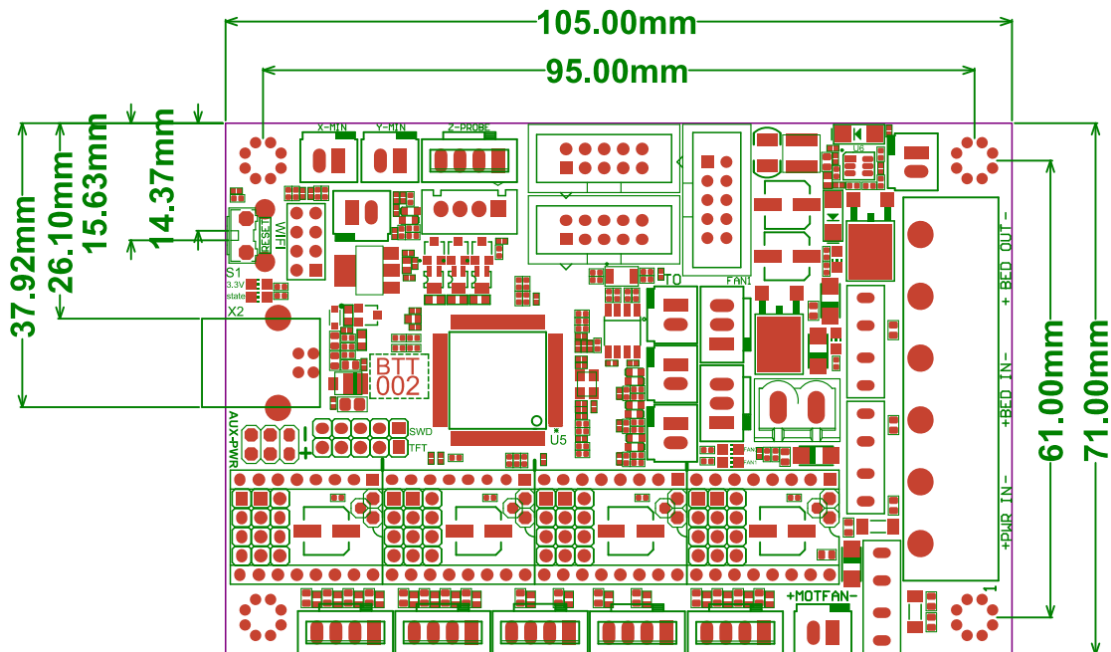
Download the file named mapleDrv for installation. After the driver installation is completed, open the "Device Manager" to see the port to which the board is connected. If you see the same as in the picture below, then the board is successfully connected.



The computer shows different COM port name with different drivers.

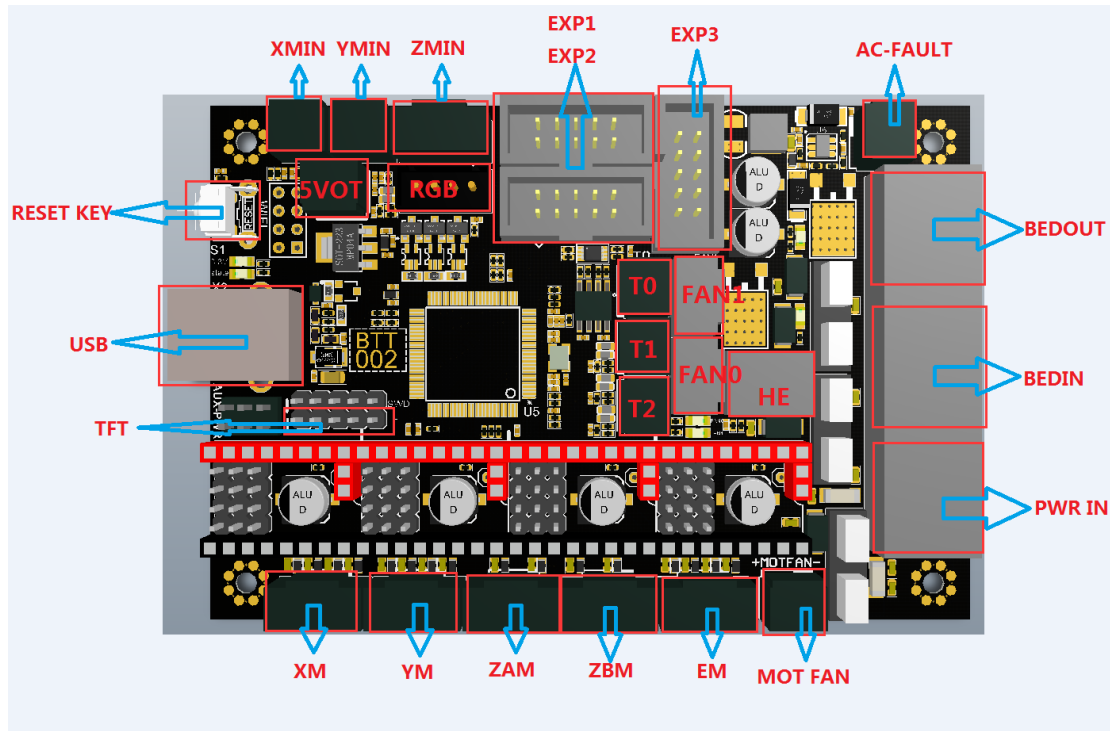
IV. Board ports

Pin diagram

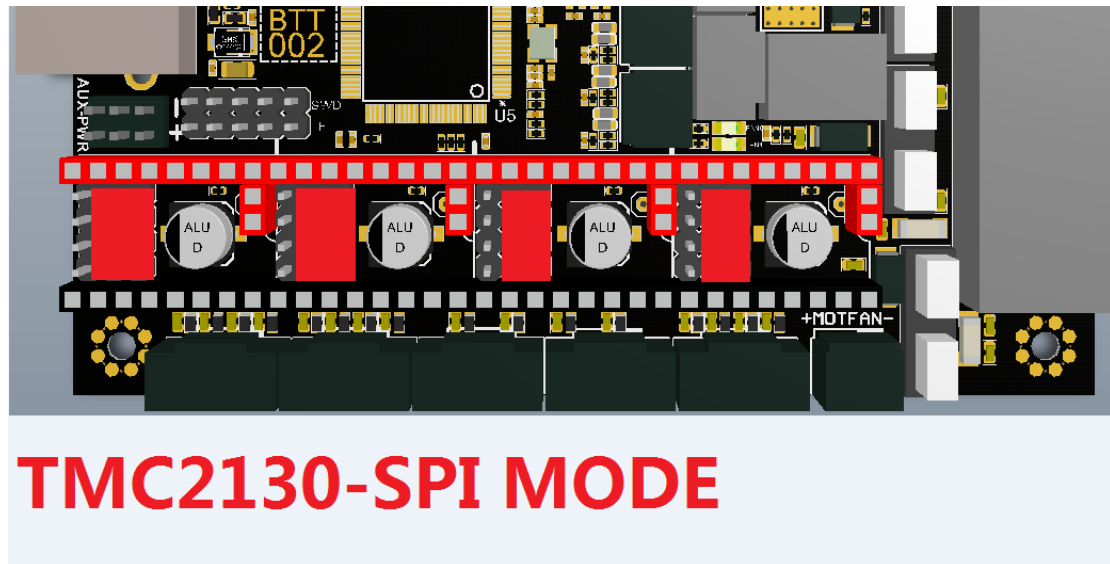


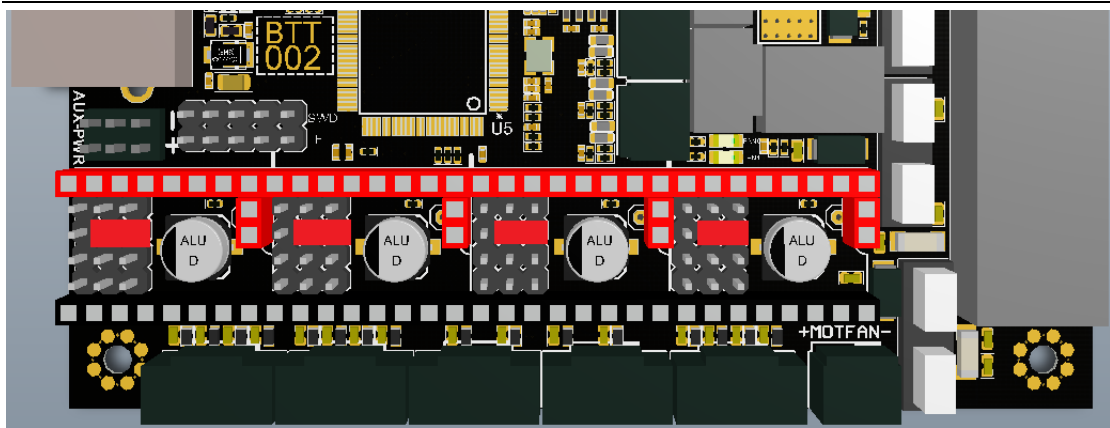
Shenzhen BIGTREE technology co., LTD.
BIG TREE TECH

Wiring diagram

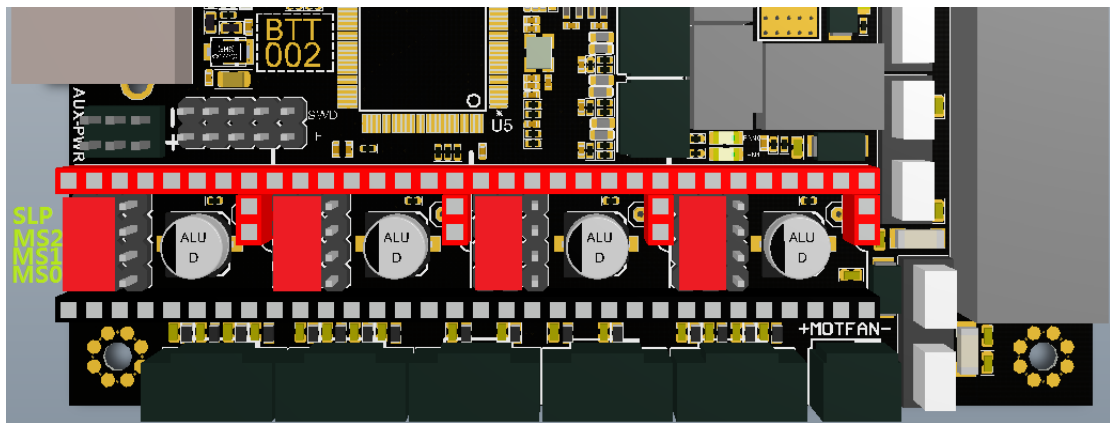


Stepper driver and peripherals configuration





TMC2208-UART MODE



STEP/DIR MODE(A4988-16MICROSTEP)

V. Firmware

By default there will be a Marlin 2.0 firmware installed on the board, which is optimized for i3 machine. It is also possible to make changes to the firmware.

You can find the needed firmware files on our Github page:

<https://github.com/bigtreotech>

You can also get the firmware from customer service or technical assistant.

Marlin2.0 firmware update method

After downloading the files, use Visual Studio Code to open the project for compilation. Customize the firmware and compile it. Check for errors. If there are no errors, find the firmware.bin file. Copy it to the SD card and plug the SD card in the board. Reboot the board, wait for about 10 seconds before doing anything else with the board.

Note: The bootloader in the main chip will be erased if user flash firmware by USB cable, the board also no longer upgrade the firmware by SD card. This way for flashing firmware also needs to change many configurations, it is not recommended that users update the firmware by USB cable!

3. Please refer to BTT002 V1.0 PIN file for motherboard firmware DIY.

VI. Notes

1. File name cannot be changed, firmware.bin must be lowercase!

2. Ensure that all wires, jumper and drivers are correctly plugged in before power-on.

3. BTT002 V1.0 is a motherboard designed specifically for the Pruse i3 MK3S printer. If you want to use another machine, please refer to the corresponding electrical parameters of Ender3 (such as heated bed power, extruder cartridge power, etc.). The electrical parameters of other machines should never exceed the electrical parameters of the Prusa i3 MK3S. Our company will not compensate for any losses caused.

4. Motor driver mode and microsteps must be consistent with the firmware, otherwise it is easy to cause the motor does not work;

5. The default firmware is Marlin 2.0 (capable of 3D model printing and functions in Marlin), not the original firmware of Prusa i3 MK3S printer. When you want to use the special functions of Prusa i3 MK3S printer, you need DIY the firmware.

If you encounter other problems while using, please contact us, we will answer you scrupulous; if you have any good comments or suggestions for our products, pls feel free to inform us, we will carefully consider your comments or suggestions, thank you for choosing BIGTREETECH products, thank you!