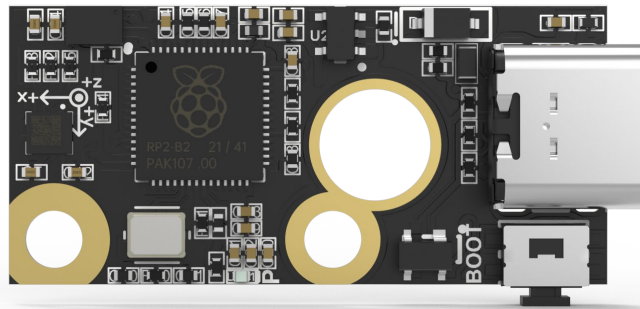


**BIGTREE TECH**

# **S2DW V1.0**

## User Manual



## Revision Log

Version	Date	Revisions
v1.00	23rd August 2023	Initial Version

## CONTENTS

<b>Revision Log</b> .....	2
<b>Product Profile</b> .....	4
<b>Feature Highlights</b> .....	4
<b>Specifications</b> .....	4
<b>Firmware Support</b> .....	4
<b>Dimensions</b> .....	5
<b>Peripheral Interfaces</b> .....	6
<b>Pin Description</b> .....	6
<b>Interface Introduction</b> .....	6
<b>Connecting to BTT Pi V1.2 (Type-C)</b> .....	6
<b>Connecting to Manta M8P (Type-C)</b> .....	7
<b>Connecting to Manta M8P (Soldering Wires)</b> .....	7
<b>Klipper Firmware</b> .....	8
<b>Compiling Klipper Firmware</b> .....	8
<b>Firmware Update via DFU</b> .....	9
<b>Configuring Klipper</b> .....	9
<b>Assembly</b> .....	12

## Product Profile

BIGTREETECH S2DW V1.0 is a module for printer resonance compensation. It can communicate through USB, greatly simplifying wiring.

## Feature Highlights

- The board has a reserved BOOT button for easy firmware updates.
- Reserved solder points enable users to customize wiring easily.
- The USB port has an added ESD protection chip to prevent the MCU from being damaged by static electricity through the USB.

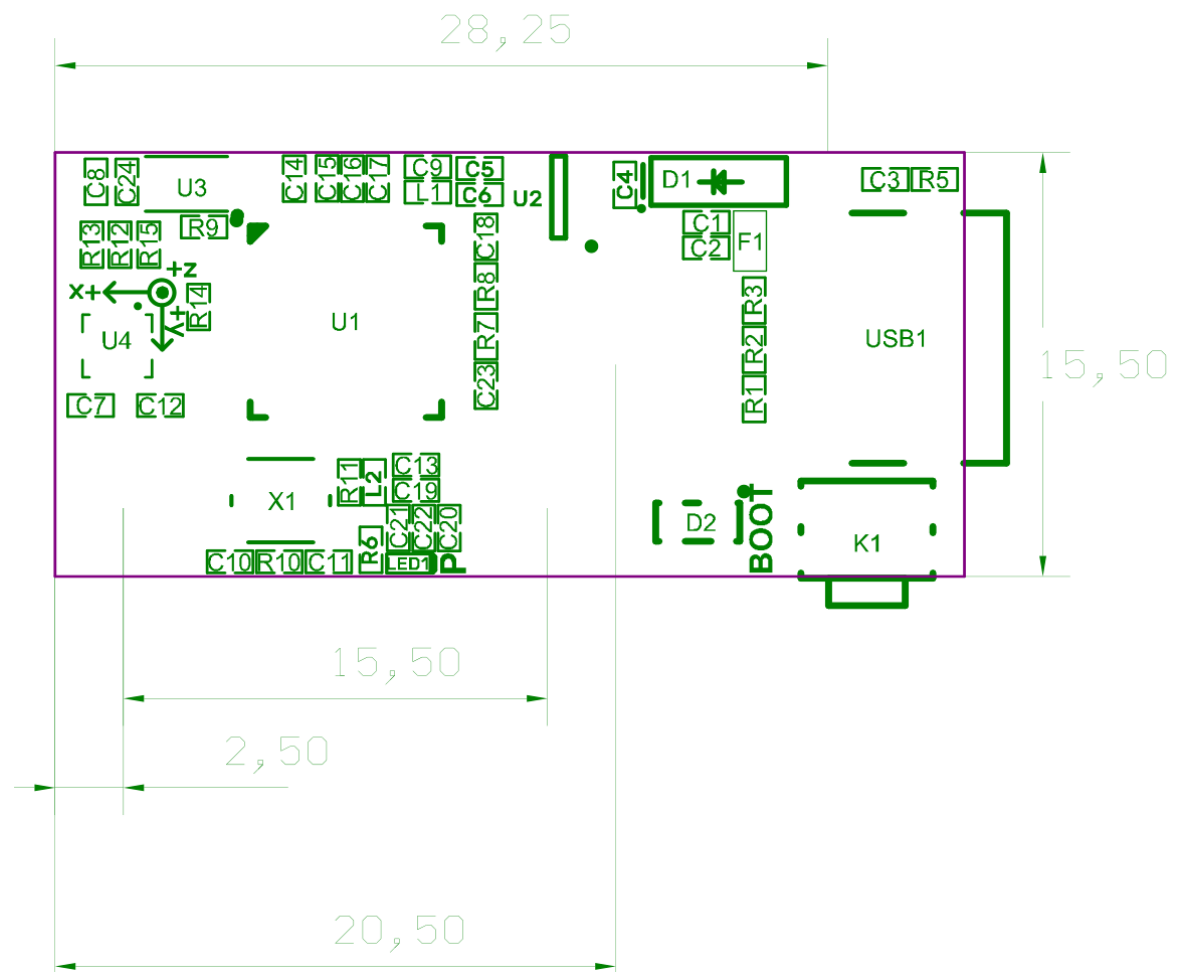
## Specifications

Dimensions	33.25 x 15.5mm
Installation Dimensions	See <b>BIGTREETECH S2DW V1.0-SIZE.pdf</b> for details.
Microprocessor	RP2040 Dual ARM Cortex-M0+ @ 133MHz
Input Voltage	DC 5V
Logic Voltage	DC 3.3V
Communication with PC	USB2.0
Sensor	LIS2DW
Output Rate	1.6Hz-1600Hz
Sensor Communication	4Line SPI
Low Noise	As low as 1.3mg RMS in low power mode.
Sensor Operating Temperature Range	-40°C to +85°C

## Firmware Support

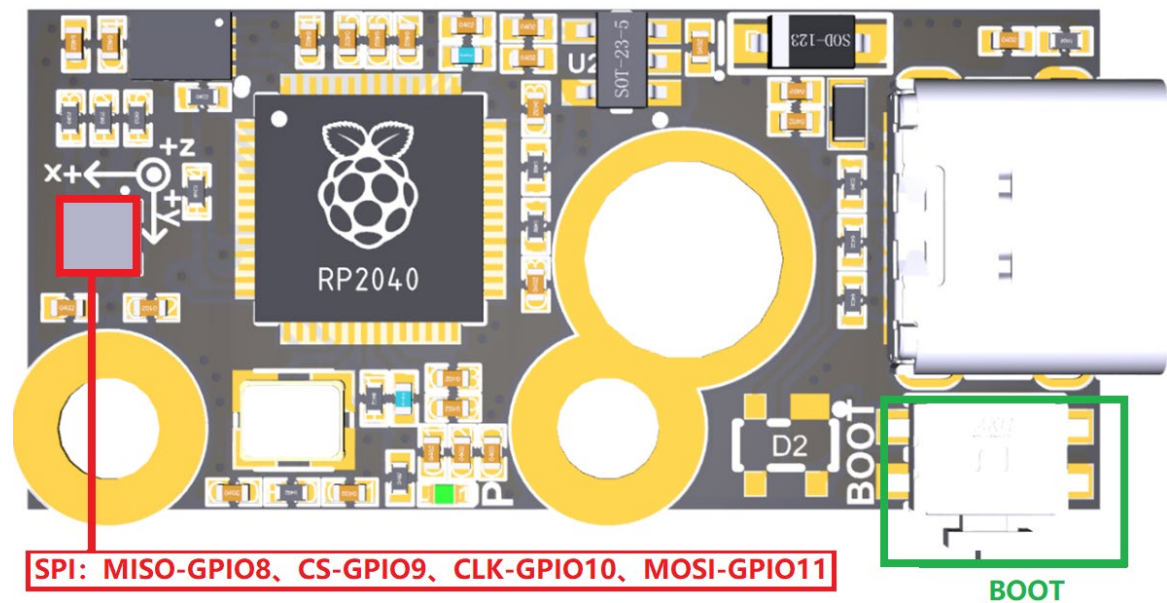
This product currently only supports Klipper firmware.

## Dimensions



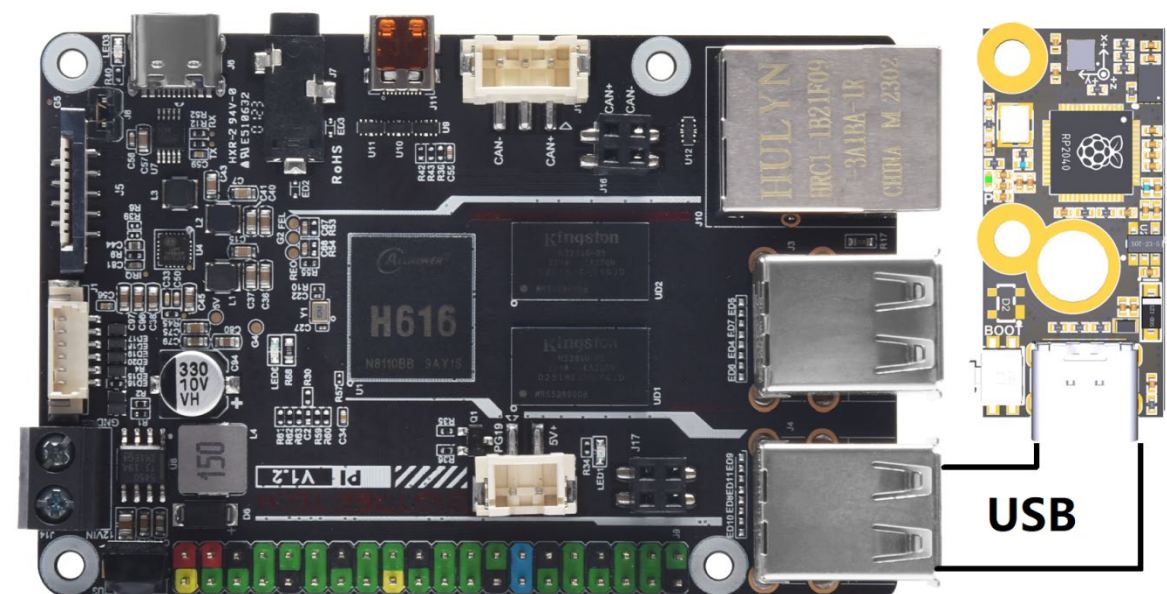
## Peripheral Interfaces

### Pin Description

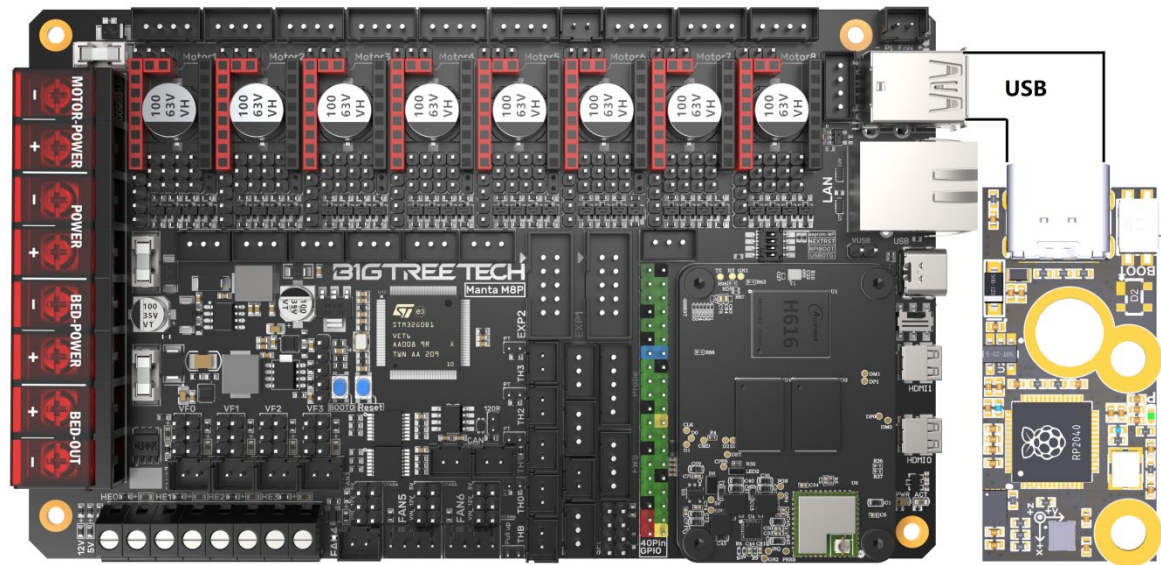


## Interface Introduction

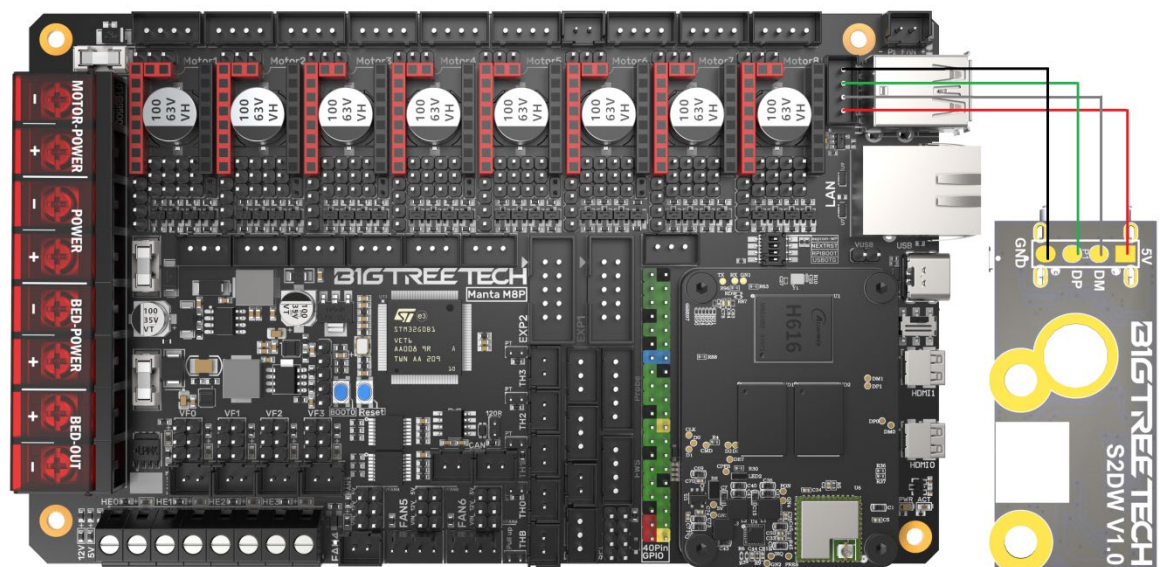
### Connecting to BTT Pi V1.2 (Type-C)



## Connecting to Manta M8P (Type-C)



## Connecting to Manta M8P (Soldering Wires)





## Klipper Firmware

### Compiling Klipper Firmware

1. Connect to CB1/Raspberry Pi via SSH and enter the following commands:

```
cd ~/klipper/
```

```
make menuconfig
```

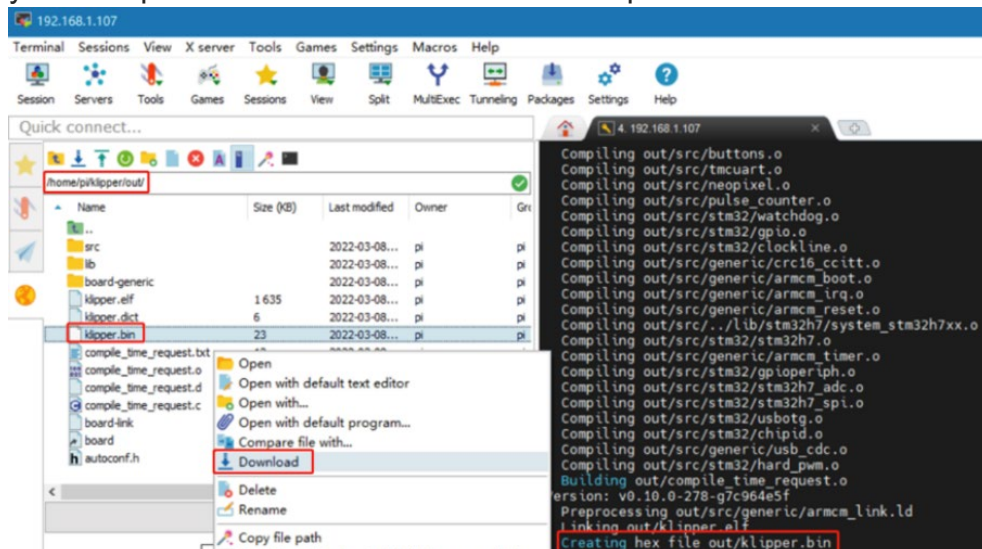
Configure the firmware as shown in the provided image (update Klipper firmware to the latest version if options are not available).

```
(Top)
Klipper Firmware Configuration
[*] Enable extra low-level configuration options
  Micro-controller Architecture (Raspberry Pi RP2040) ---->
  Bootloader offset (No bootloader) ---->
  Flash chip (W25Q080 with CLKDIV 2) ---->
  Communication interface (USB) ---->
  USB ids ---->
(C) GPIO pins to set at micro-controller startup

[Space/Enter] Toggle/enter      [?] Help      [/] Search
[Q] Quit (prompts for save)     [ESC] Leave menu
```

```
[*] Enable extra low-level configuration options
Micro-controller
Micro-controller Architecture (Raspberry Pi RP2040) ---->
Bootloader offset (No bootloader) ---->
Flash chip (W25Q080 with CLKDIV 2) ---->
Communication interface (USB) ---->
```

2. After configuration, press **q** to exit, and select **Yes** when prompted to save.
3. Enter **make** to compile the firmware. The resulting **klipper.bin** file will be in the **home/pi/klipper/out** folder. This can be directly downloaded to your computer from the SSH software's left panel.





## Firmware Update via DFU

Raspberry Pi or CB1 update via DFU.

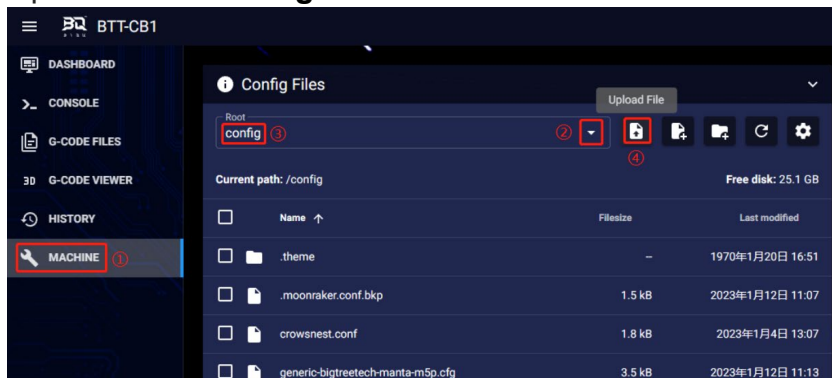
1. Hold the **Boot** button and connect the board to Raspberry Pi/CB1 via Type-C cable to enter DFU mode.
2. Enter **lsusb** in the SSH terminal to query the DFU device ID.

```
pi@fluidpi:~$ lsusb
Bus 001 Device 005: ID 2e8a:0003 Raspberry Pi RP2 Boot
Bus 001 Device 004: ID 1d50:6061 OpenMoko, Inc. Geschwister Schneider CAN adapter
Bus 001 Device 003: ID 0424:0c00 Microchip Technology, Inc. (formerly SMSC) SMC9512/9514 Fast Ethernet Adapter
Bus 001 Device 002: ID 0424:9514 Microchip Technology, Inc. (formerly SMSC) SMC9514 Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
pi@fluidpi:~$
```

3. Enter **cd klipper**  
navigate to the Klipper directory, and enter **make flash FLASH\_DEVICE=2e8a:0003**  
start flashing the firmware (Note: Replace 2e8a:0003 with the actual device ID found in the previous step.)
4. After flashing, enter **ls /dev/serial/by-id/**  
to query the device's Serial ID (only applicable for USB communication, not for CANBus).
5. For USB communication, you don't need to press the Boot button for subsequent updates. Enter the following command to flash the firmware  
**make flash FLASH\_DEVICE=/dev/serial/by-id/usb-Klipper\_rp2040\_4550357128922FC8-if00**  
(Note: replacing **/dev/serial/by-id/xxx** with the actual ID found in the previous step).

## Configuring Klipper

1. Download the **sample-bigtreetech-lis2dw-v1.0.cfg** config file from:  
<https://github.com/bigtreetech/LIS2DW>
2. Upload to the **Configuration Files**.



3. In **printer.cfg**, add:

**[include sample-bigtreetech-lis2dw-v1.0.cfg]**

4. Set the correct ID number for your board.(USB serial)
5. Configure the module's functions according to the instructions in the link below:

[https://www.klipper3d.org/Config\\_Reference.html#lis2dw](https://www.klipper3d.org/Config_Reference.html#lis2dw)

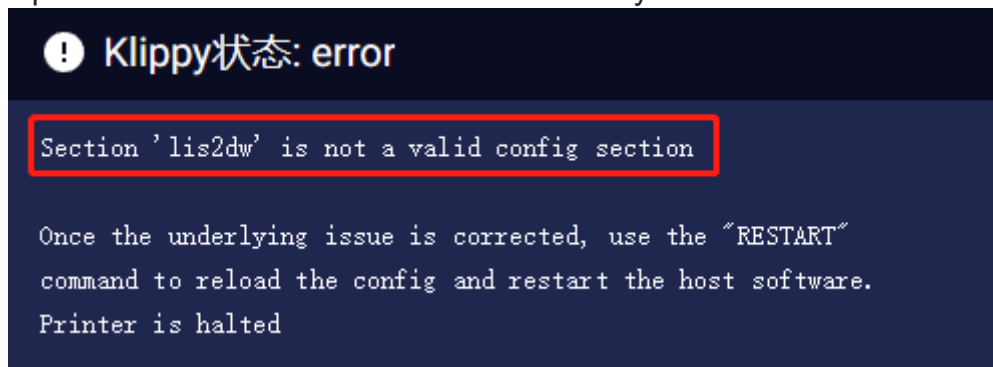
The **axes\_map** parameter needs to be set according to the direction of the module installation and the movement direction of the printer. The first parameter represents the direction of the accelerometer module corresponding to the axis when the printer's X-axis moves in the positive direction (the silk screen on the module shows the direction of each axis of the module), and the second parameter represents the direction of the accelerometer when the Y-axis moves in the positive direction.

6. Lis2dw is a function added to Klipper on August 22, 2023:

<https://github.com/Klipper3d/klipper/pull/6312>

If you encounter the error "**Section 'lis2dw' is not a valid config section**", it means that your Klipper version does not support lis2dw.

Update to the latest version to use it normally.



7. After configuring and installing the module and successfully connecting to the printer, you can start the resonance compensation test. Follow the instructions in the link below to start testing:

[https://www.klipper3d.org/G-Codes.html#shaper\\_calibrate](https://www.klipper3d.org/G-Codes.html#shaper_calibrate)

In Mainsail's Console, enter the following command to start X axis calibration:

SHAPER\_CALIBRATE AXIS=X

Enter the following command to start Y axis calibration:

SHAPER\_CALIBRATE AXIS=Y

After calibration is complete, follow the prompts and enter SAVE\_CONFIG to save the calibration parameters.

**Note:** After the resonance compensation test, the module can be removed. The module configuration needs to be commented out in the "printer.cfg" file, otherwise the printer will fail to start if it cannot find the module. Comment out the module configuration by adding "#" in front of the config file name:

```
# [include sample-bigtreetech-lis2dw-v1.0.cfg]
```

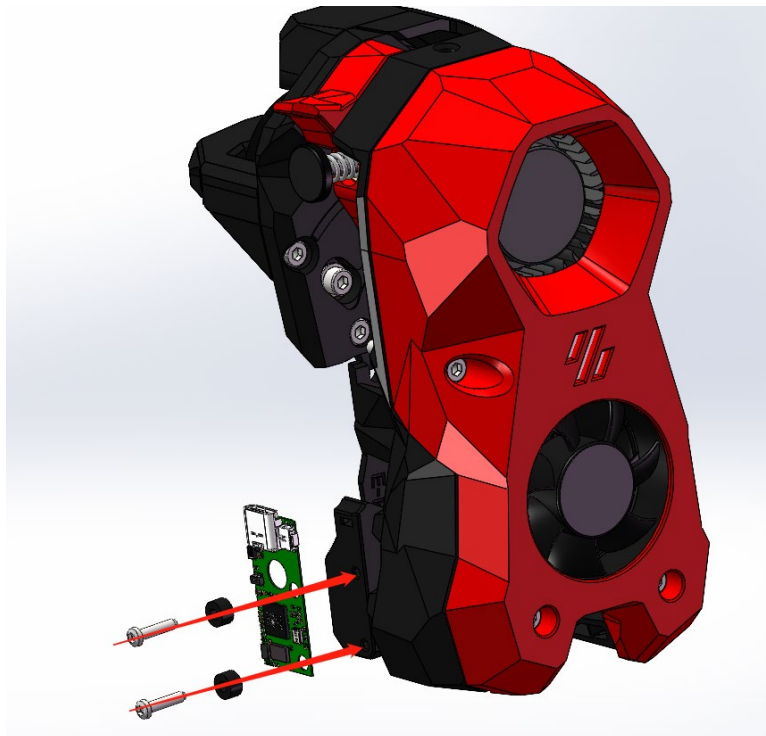
## Assembly

Note: Avoid overtightening screws during installation to prevent damage.

Example using the Voron StealthBurner:

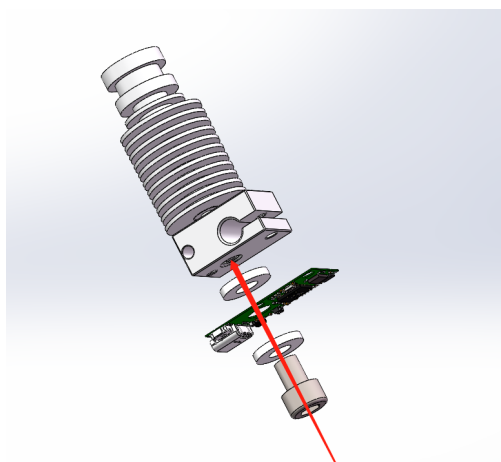
### Method 1:

Install on the side bracket with the dual holes (matches official spacing).



### Method 2:

Use screws through the PCB and rubber ring on the heater block as shown.



If you need further resources for this product, you can find them at [GitHub](https://github.com/bigtreotech/). 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.