

**BIGTREE TECH**

# SKSM

User Manual



# Revision Log

Version	Date	Revisions
v1.00	April 19th, 2024	Initial Version

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## 1. Product Information

The SKSM is a handy external module designed for 3D printers. Its key feature is the ability to save your printing data during a power outage. This module is specifically compatible with 3D printers that use 24V DC power supply units, such as the Ender 3.

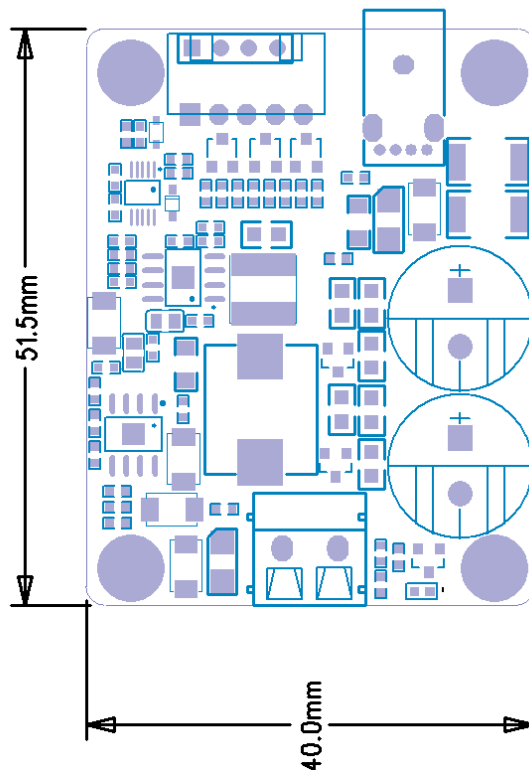
### 1.1. Feature Highlights

- **Smart Power Outage Detection:** It has a high-sensitivity MCU chip that can quickly detect power losses.
- **Backup Power:** Equipped with two 2.7V 20F supercapacitors, it ensures your printer has enough power to save your work during an outage.
- **Safe Power Input:** Comes with reverse polarity protection to safeguard against wrong connections, thus protecting your printer's circuit board.
- **Compact Design:** Its small size makes installation simple and hassle-free.
- **Power Output:** Offers a Type-C output with +5V/2A power.
- **Main Function:** Its primary role is to enable saving your print data during power outages.

### 1.2. Specifications

- **Size:** 40.8mm x 32.9mm
- **Input Power:** DC7-24V
- **Outputs:** BAT +5V/2A
- **Outputs:** USB +5V/2A
- **Charging Time:** 100 seconds (starting from power on)
- **Battery Output Power:** 5W with a discharge time of 13 seconds (please be aware of the load power)
- **Compatibility:** 3D printers powered by DC 24V using Klipper (such as the Ender3)

### 1.3. Dimensions



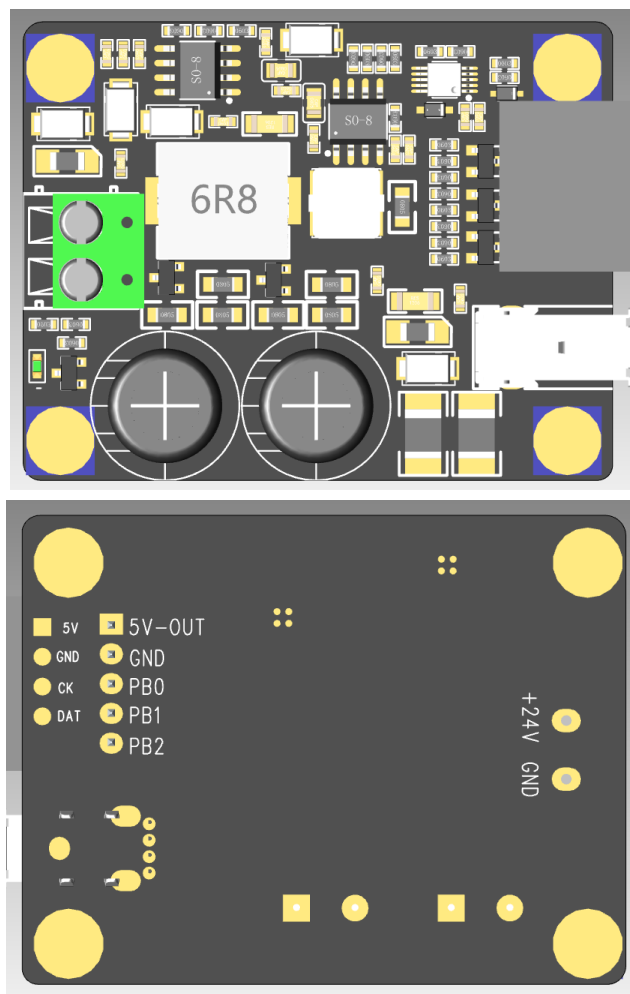
## 2. Powering Up

When the SKSM is powered on, the red LED in the upper left corner (which flashes for 15 seconds when the capacitors are completely discharged) indicates its status. The red light flashes during charging, and once the BAT+5V begins to discharge normally, the red light stays on continuously.

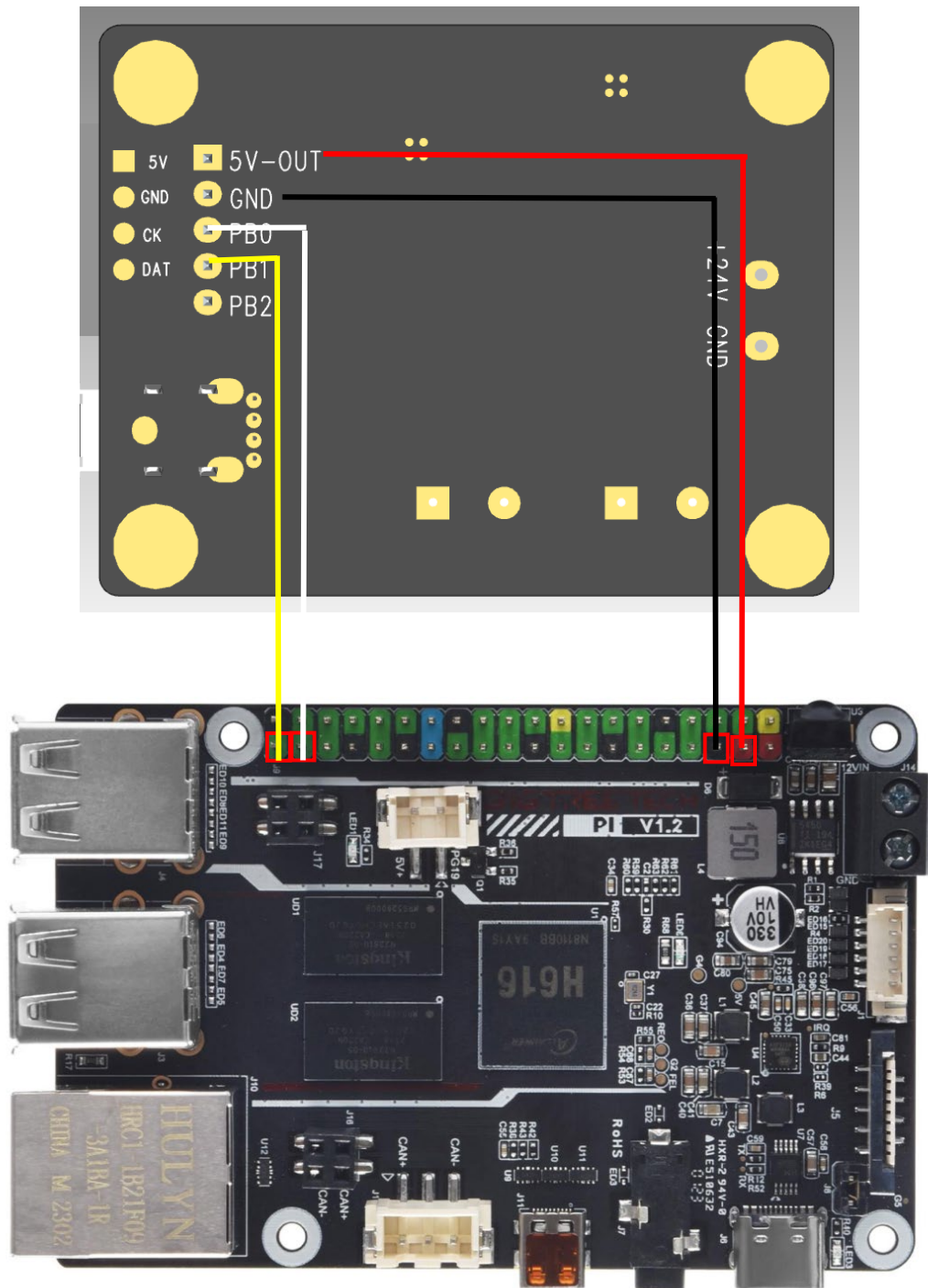
**Note:** It's designed for 24V DC input only. Always check the polarity before connecting, and connect only when the power is off. Incorrect connections are not covered under warranty.

## 3. Connecting to Your Printer

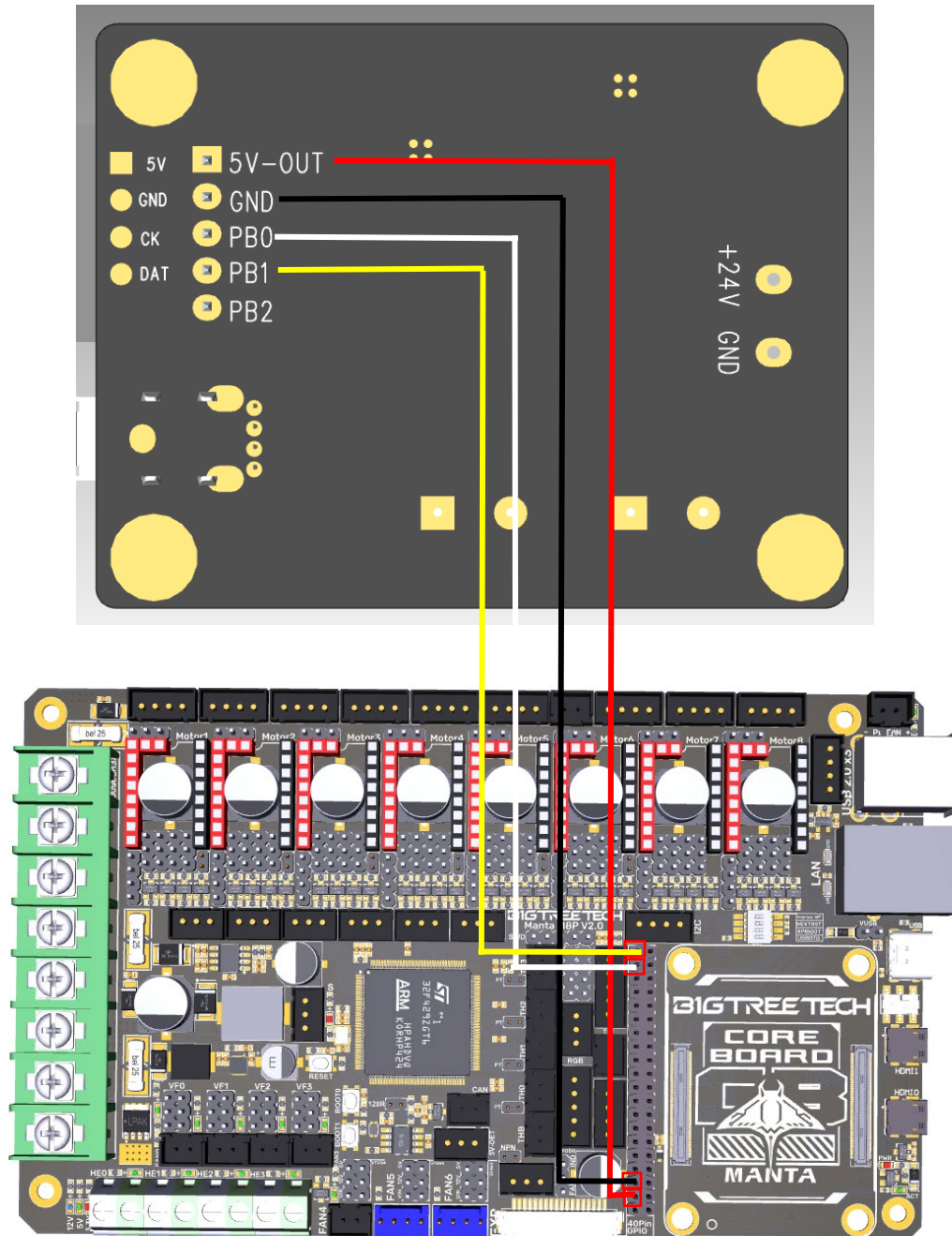
The SKSM uses a XH2.54mm 5P cable for communication with the printer's mainboard. Make sure the "PB0 PB1 PB2" signal lines are correctly connected; otherwise, the power outage save feature won't work.



### 3.1. SKSM+PI Wiring

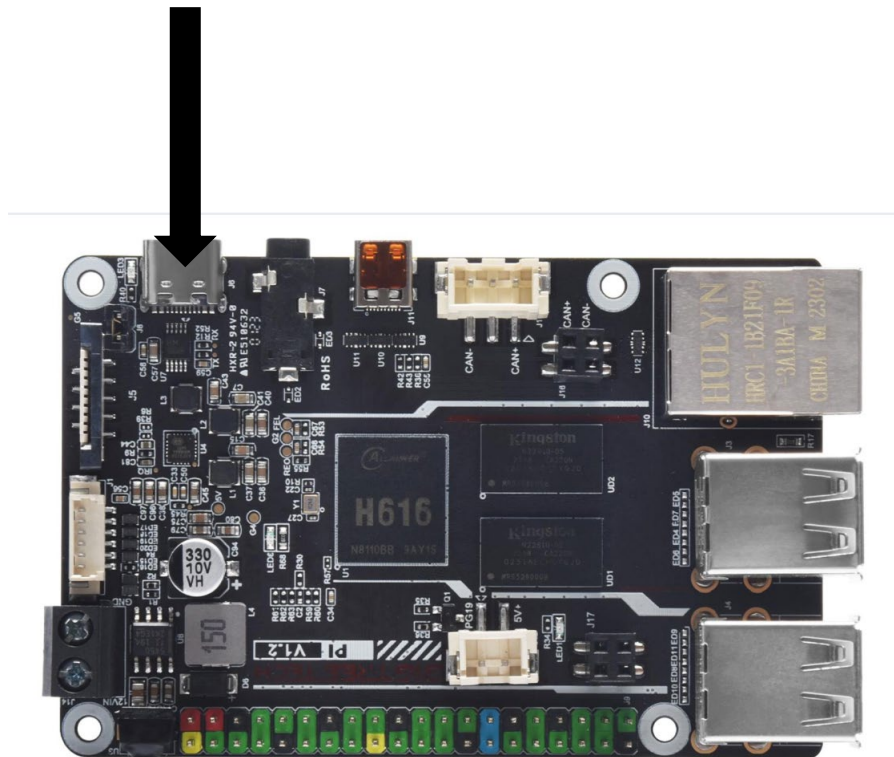
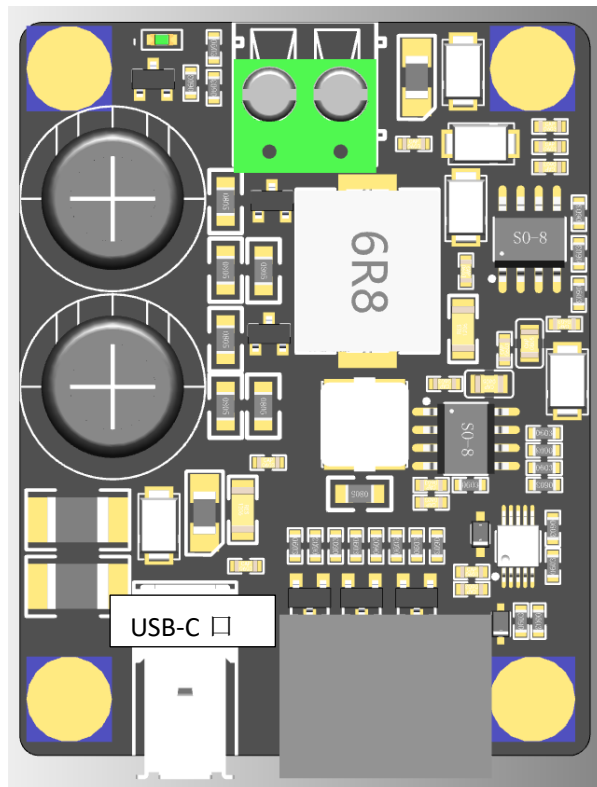


### 3.2. SKSM+Manta Wiring

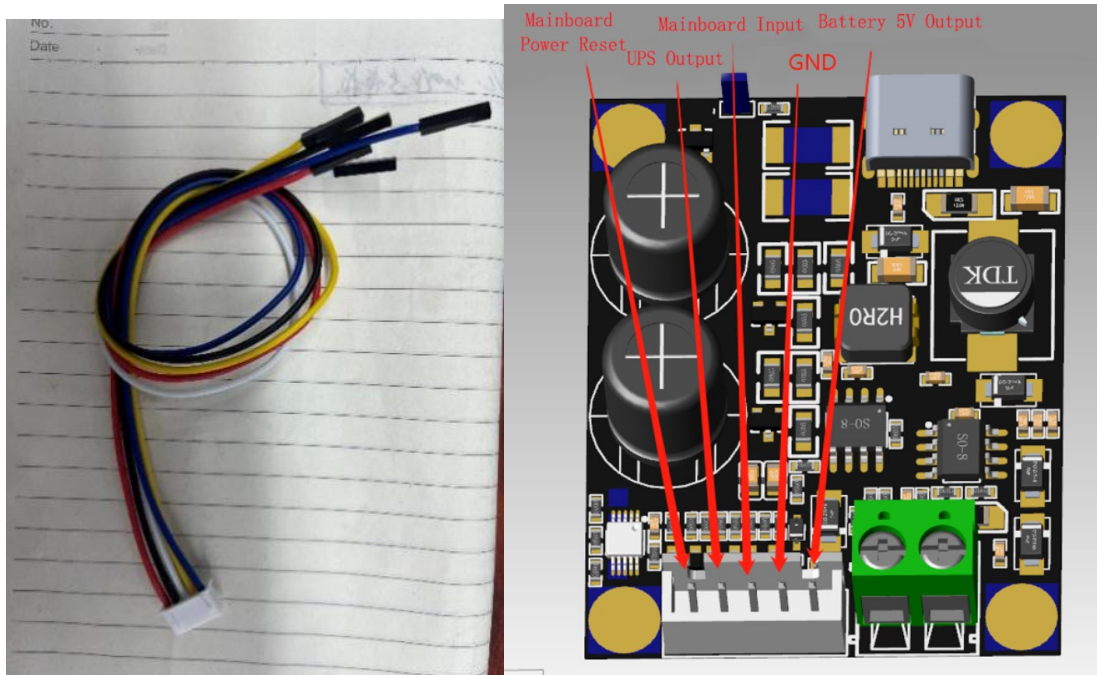
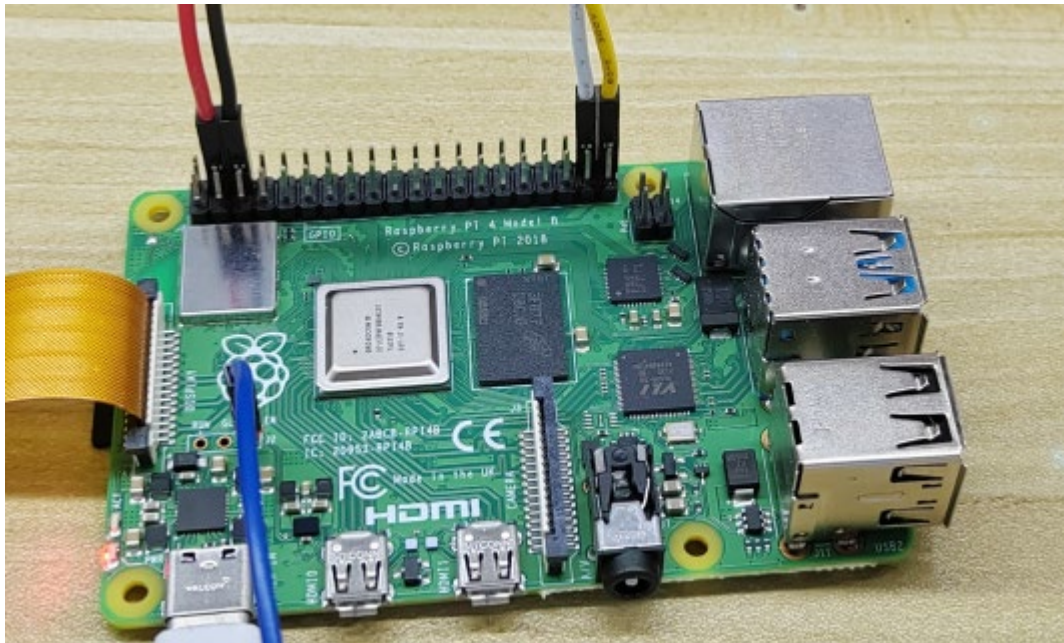




### 3.3. SKSM USB Interface +Pi Wiring



### 3.4. Raspberry Pi Wiring and Actual Wires

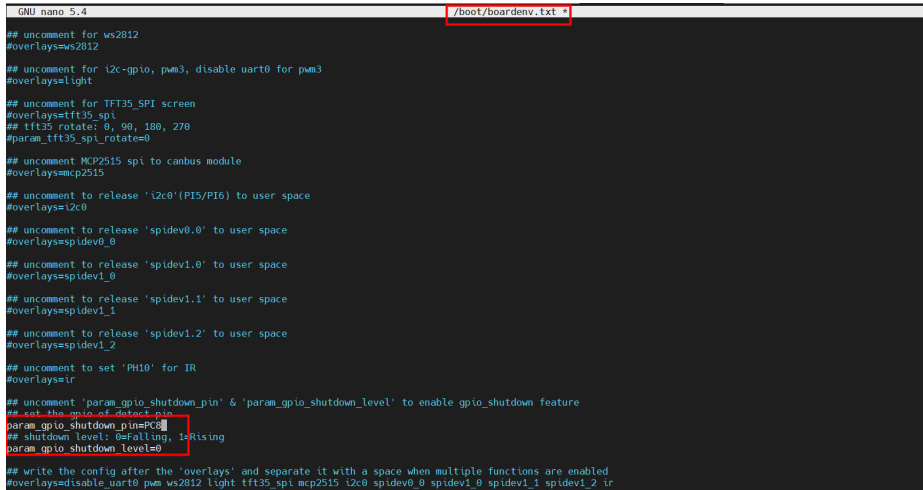


PB0 SKSM: Input detection, activated when detecting high voltage levels.  
PB1 SKSM: Outputs low level; upon detection of this level by the host, data is synchronized and the system shuts down.  
PB2 SKSM: Outputs low level to reset the host.

## 4. System Configuration

### 4.1. Usage for Pi V1.2

1. Access Pi V1.2 by entering its IP address in remote login software.
2. Send the command: `sudo nano /boot/boardEnv.txt`
3. Modify according to the diagram shown.



```
GNU nano 5.4 /boot/boardenv.txt
## uncomment for ws2812
#overlays=ws2812

## uncomment for i2c-gpio, pwm3, disable uart0 for pwm3
#overlays=i2c-gpio

## uncomment for TF135 SPI screen
#overlays=tft35_spi
# tft35 rotate: 0, 90, 180, 270
#param_tft35_spi_rotate=0

## uncomment MCP2515 spi to canbus module
#overlays=mcp2515

## uncomment to release 'i2c0'(PI5/PI6) to user space
#overlays=i2c0

## uncomment to release 'spidev0.0' to user space
#overlays=spidev0_0

## uncomment to release 'spidev1.0' to user space
#overlays=spidev1_0

## uncomment to release 'spidev1.1' to user space
#overlays=spidev1_1

## uncomment to release 'spidev1.2' to user space
#overlays=spidev1_2

## uncomment to set 'PH10' for IR
#overlays=ir

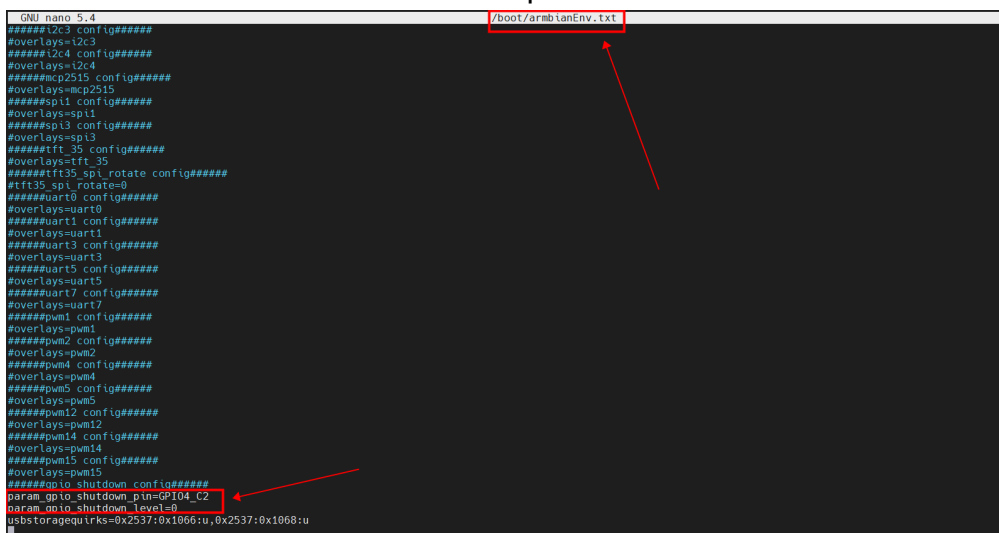
## uncomment 'param_gpio_shutdown_pin' & 'param_gpio_shutdown_level' to enable gpio_shutdown feature
#set the gpio_shutdown_pin & gpio_shutdown_level
param_gpio_shutdown_pin=PC8
# shutdown level: 0=falling, 1=Rising
param_gpio_shutdown_level=0

## write the config after the 'overlays' and separate it with a space when multiple functions are enabled
#overlays=i2c0 pwm3 ws2812 light tft35_spi mcp2515 i2c0 spidev0_0 spidev1_0 spidev1_1 spidev1_2 ir
```

4. After making changes, save (Ctrl + S) and exit (Ctrl + X), then type `sudo reboot` to restart the host machine.

### 4.2. Usage for Pi 2:

1. Access Pi 2 by entering its IP address in remote login software.
2. Send the command: `sudo nano /boot/armbianEnv.txt`
3. Enable the content shown in the picture.



```
GNU nano 5.4 /boot/armbianEnv.txt
#####i2c3 config#####
#overlays=i2c3
#####i2c4 config#####
#overlays=i2c4
#####mcp2515 config#####
#overlays=mcp2515
#####spi1 config#####
#overlays=spi1
#####spi3 config#####
#overlays=spi3
#####tft_35 config#####
#overlays=tft_35
#####tft35_spi_rotate config#####
#tft35_spi_rotate=0
#####uart0 config#####
#overlays=uart0
#####uart1 config#####
#overlays=uart1
#####uart3 config#####
#overlays=uart3
#####uart5 config#####
#overlays=uart5
#####uart7 config#####
#overlays=uart7
#####pwm1 config#####
#overlays=pwm1
#####pwm2 config#####
#overlays=pwm2
#####pwm4 config#####
#overlays=pwm4
#####pwm5 config#####
#overlays=pwm5
#####pwm12 config#####
#overlays=pwm12
#####pwm14 config#####
#overlays=pwm14
#####pwm15 config#####
#overlays=pwm15
#####gpio_shutdown config#####
param_gpio_shutdown_pin=GPIO104_C2
param_gpio_shutdown_level=0
usbstoragequirks=0x2537:0x1066:u,0x2537:0x1068:u
```

4. After making changes, save (Ctrl + S) and exit (Ctrl + X), then type `sudo reboot`

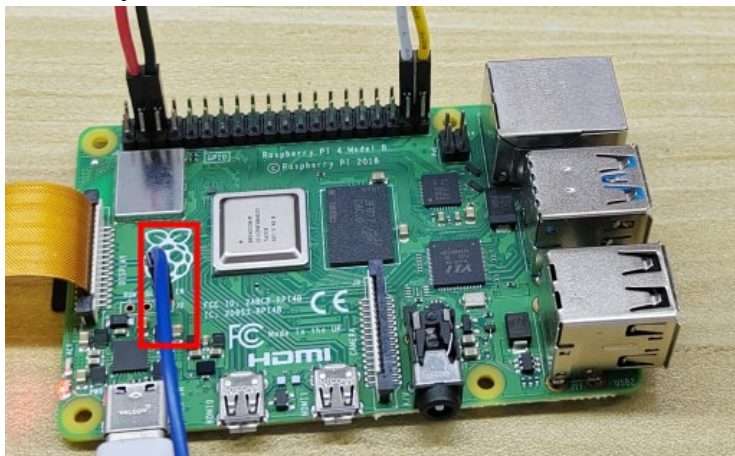
to restart the host machine.

### 4.3. Usage for Raspberry Pi

The process for Raspberry Pi differs from the above. It involves inserting an SD card with the system image into a computer, then adding the line `dtoverlay=gpio-shutdown,gpio_pin=21` to the `config.txt` file, and saving the changes.

## 5. Precautions

1. Upon detecting a drop in 24V power, the module will maintain a 5V output for up to 15 seconds.
2. Pi2 requires a 24V power supply and cannot be powered by TYPE-C 5V (to ensure normal operation of the module, the 5V output voltage within the SKSM must not fall below 4.9V, otherwise, SKSM will draw power from an internal boost converter, continuously charging the capacitors and causing the module to heat up continuously).
3. The reset pin on SKSM can be connected to a host machine that includes a power reset feature, such as the Pi4B.( If the reset wire is not connected, and the host computer experiences a power loss followed immediately by power resumption, the host will enter standby mode instead of restarting automatically. In such cases, a manual restart of the host is required.)



Should you require 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](mailto: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.