BIGTREETECH

CB2

User Manual

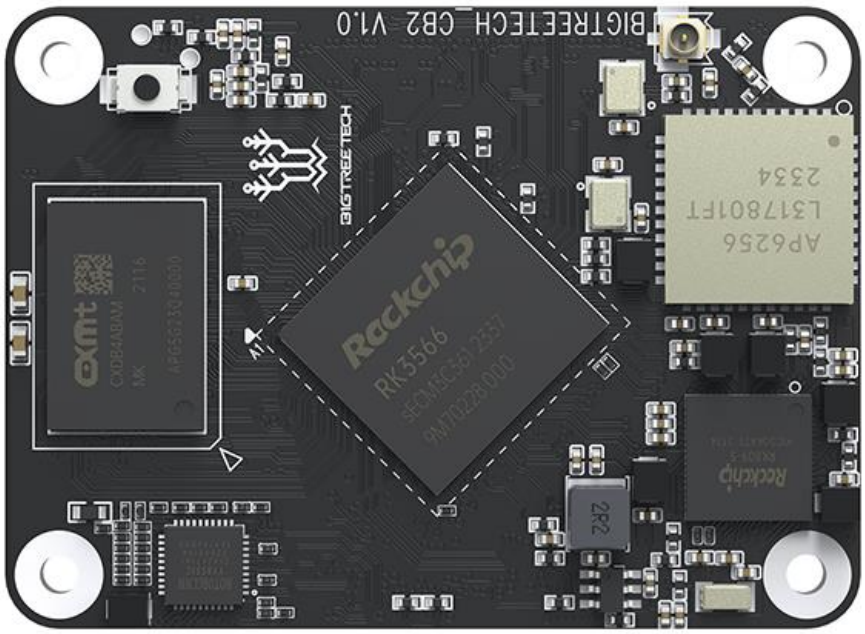


Table of Contents

Revision Log

Version	Date	Revision
v1.00	April 24th, 2024	Initial Version
v1.01	May 28th, 2024	Added account information for minimal version system
v1.02	Jun 5th, 2024	Added 40 pin GPIO spread sheet and new calculation method
v1.03	March 26th, 2025	Add 40 Pin GPIO Alternate functions description
v1.04	April 14th, 2025	V3.0.1 version system, u-boot Loader mode changed to UMS mode

1. Product Profile

The BIGTREETECH CB2, compatible with the Raspberry Pi CM4 form factor, uses two 100-pin high-speed board-to-board (BTB) connectors for easy and quick connection with external expansion baseboards. It offers an alternative with similar IO capabilities, including Micro HDMI, USB, Gigabit Ethernet, DSI, and CSI outputs. Additionally, it features 2.4G and 5G WiFi, Bluetooth 5.2, the Rockchip RK3566 SoC, 2GB LPDDR4 RAM, and 32GB eMMC storage.

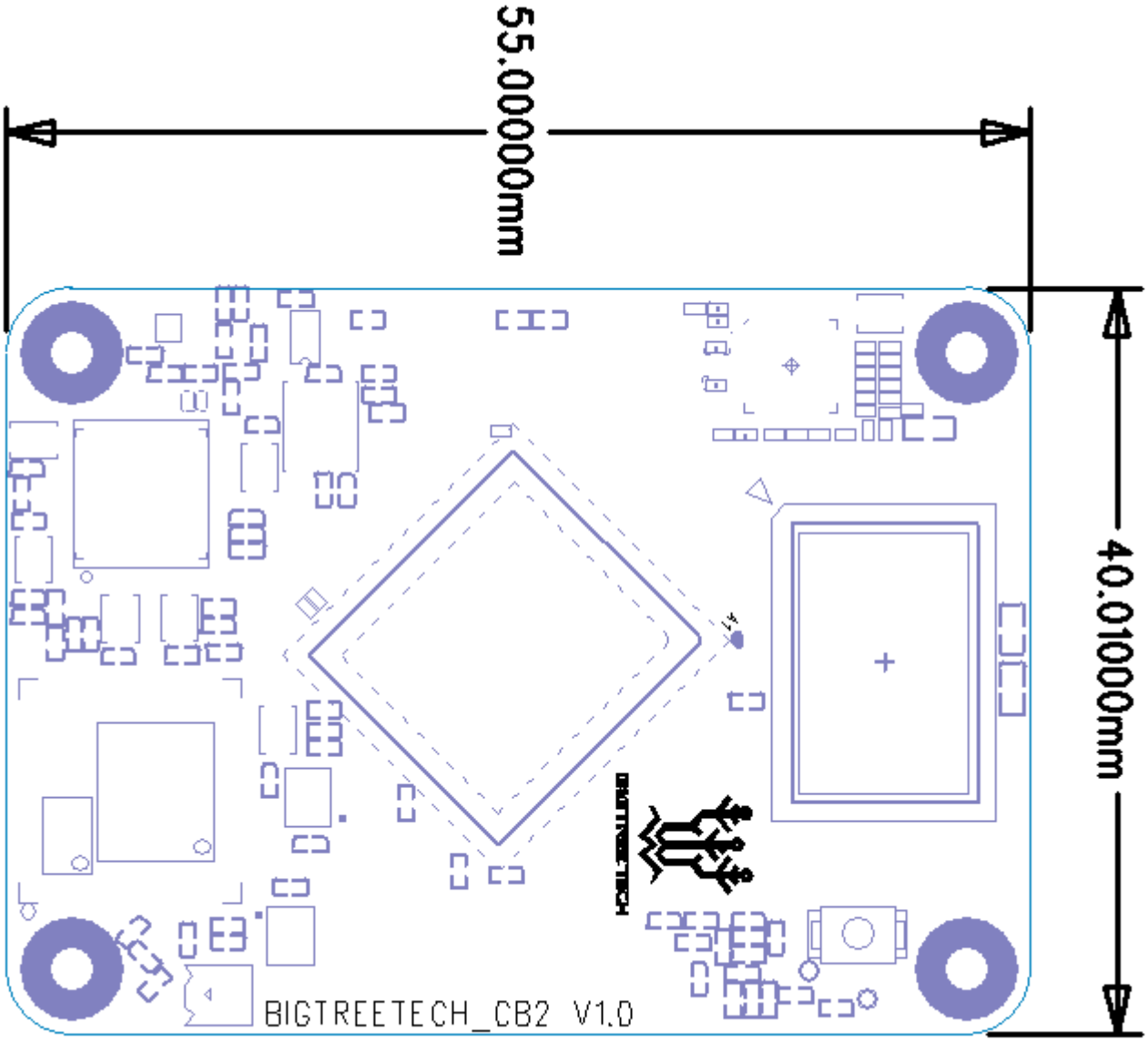
1.1. Feature Highlights

- CPU: Rockchip RK3566, quad-core Cortex-A55 @1.8GHz
- GPU: Mali-G52 1-Core-2EE
- NPU: 0.8 TOPS NPU
- RAM: 2GB/4GB LPDDR4
- Onboard EMMC
- MIPI DSI display support
- Dual-lane MIPI CSI-2 Camera Interface
- 3x USB 2.0 ports, 1x USB 3.0 port
- PCIe 2.1 1x1 Lane
- Gigabit Ethernet +433Mbps WiFi+BT5.0
- 40-pin GPIO
- BTB socket that is completely identical to the one on the Raspberry Pi CM4

1.2. Specifications

- Dimensions: 40mm x 55mm
- Mounting Dimensions: 33mm x 48mm
- Input Voltage: 5V±5%/2A
- Output Voltage: 3.3V±2%/100mA
- Output Voltage: 1.8V±2%/100mA
- WIFI: 2.4G/5G, 802.11 ac/a/b/g/n/ wireless standards

1.3. Dimensions



2. Peripheral Interface

2.1. Pin Description

PIN	Connector	Signal	Description
1	A connector_01	GND	
2	A connector_02	GND	
3	A connector_03	GBIT_MDI3_P	
4	A connector_04	GBIT_MDI1_P	
5	A connector_05	GBIT_MDI3_N	
6	A connector_06	GBIT_MDI1_N	
7	A connector_07	GND	
8	A connector_08	GND	
9	A connector_09	GBIT_MDI2_N	
10	A connector_10	GBIT_MDI0_N	
11	A connector_11	GBIT_MDI2_P	
12	A connector_12	GBIT_MDI0_P	
13	A connector_13	GND	
14	A connector_14	GND	
15	A connector_15	1000M_LED	
16	A connector_16	CAMERAB_PDN_L	
17	A connector_17	100M_LED	
18	A connector_18	SPDIF_TX_M2	
19	A connector_19	PWM3_IR	
20	A connector_20	NC	
21	A connector_21	WORKING_LEDEN_H	
22	A connector_22	GND	
23	A connector_23	GND	
24	A connector_24	GPIO0_C3	
25	A connector_25	GPIO4_C2	
26	A connector_26	GPIO4_C5	
27	A connector_27	GPIO4_C3	
28	A connector_28	GPIO0_C0	
29	A connector_29	GPIO0_A0	
30	A connector_30	GPIO3_D7	
31	A connector_31	GPIO0_C1	
32	A connector_32	GND	
33	A connector_33	GND	
34	A connector_34	NC	
35	A connector_35	GPIO0_B3	
36	A connector_36	GPIO0_B4	
37	A connector_37	GPIO0_A6	
38	A connector_38	GPIO3_C3	
39	A connector_39	GPIO4_A2	
40	A connector_40	GPIO3_C2	

41	A connector_41	GPIO0_C4	
42	A connector_42	GND	
43	A connector_43	GND	
44	A connector_44	GPIO3_C1	
45	A connector_45	GPIO4_A3	
46	A connector_46	GPIO1_A1	
47	A connector_47	GPIO4_C6	
48	A connector_48	GPIO1_A0	
49	A connector_49	GPIO0_C0	
50	A connector_50	GPIO0_C7	
51	A connector_51	GPIO0_D0	DEBUG UART
52	A connector_52	GND	
53	A connector_53	GND	
54	A connector_54	GPIO3_A1	
55	A connector_55	GPIO0_D1	DEBUG UART
56	A connector_56	GPIO4_B3	
57	A connector_57	SDC0-CLK	SDCARD Clock signal
58	A connector_58	GPIO4_B2	
59	A connector_59	GND	
60	A connector_60	GND	
61	A connector_61	SDC0-D3	SDCARD Data3 signal
62	A connector_62	SDC0-CMD	SDCARD CMD signal
63	A connector_63	SDC0-D0	SDCARD Data0 signal
64	A connector_64	NC	
65	A connector_65	GND	
66	A connector_66	GND	
67	A connector_67	SDC0-D1	SDCARD Data1 signal
68	A connector_68	NC	
69	A connector_69	SDC0-D2	SDCARD Data2 signal
70	A connector_70	NC	
71	A connector_71	GND	
72	A connector_72	NC	
73	A connector_73	GPIO0_B5	
74	A connector_74	GND	
75	A connector_75	GPIO3_D2	
76	A connector_76	GPIO3_D3	SDCARD_detect
77	A connector_77	VCC_5V	5V IN /2A
78	A connector_78	NC	
79	A connector_79	VCC_5V	5V IN /2A
80	A connector_80	GPIO4_B5	
81	A connector_81	VCC_5V	5V IN /2A
82	A connector_82	GPIO4_B4	
83	A connector_83	VCC_5V	5V IN /2A
84	A connector_84	3V3	3.3v out /200mA
85	A connector_85	VCC_5V	5V IN /2A

86	A connector_86	3V3	3.3v out /200mA
87	A connector_87	VCC_5V	5V IN /2A
88	A connector_88	1V8	1.8v out /100mA
89	A connector_89	GPIO3_B4	
90	A connector_90	1V8	1.8v out /100mA
91	A connector_91	NC	
92	A connector_92	PWRON	
93	A connector_93	RECOVERY	
94	A connector_94	NC	
95	A connector_95	GPIO4_A1	
96	A connector_96	NC	
97	A connector_97	GPIO4_A5	
98	A connector_98	GND	
99	A connector_99	PMIC_PWRON	
100	A connector_100	AP-RESET	
101	B connector_1	USB_OTG0_ID	
102	B connector_2	PCIE20_CLKREQn_M2	
103	B connector_3	USB_OTG0_DM	
104	B connector_4	LINEOUTL	
105	B connector_5	USB_OTG0_DP	
106	B connector_6	LINEOUTR	
107	B connector_7	GND	
108	B connector_8	GND	
109	B connector_9	PCIE20_PERSTn_M2	
110	B connector_10	PCIE20_REFCLKP	
111	B connector_11	GPIO4_B0	
112	B connector_12	PCIE20_REFCLKN	
113	B connector_13	GND	
114	B connector_14	GND	
115	B connector_15	MIPI_CSI_RX_D0N	
116	B connector_16	PCIE20_RXP	
117	B connector_17	MIPI_CSI_RX_D0P	
118	B connector_18	PCIE20_RXN	
119	B connector_19	GND	
120	B connector_20	GND	
121	B connector_21	MIPI_CSI_RX_D1N	
122	B connector_22	PCIE20_TXP	
123	B connector_23	MIPI_CSI_RX_D1P	
124	B connector_24	PCIE20_TXN	
125	B connector_25	GND	
126	B connector_26	GND	
127	B connector_27	MIPI_CSI_RX_CLK0N	
128	B connector_28	USB3-DM	
129	B connector_29	MIPI_CSI_RX_CLK0P	

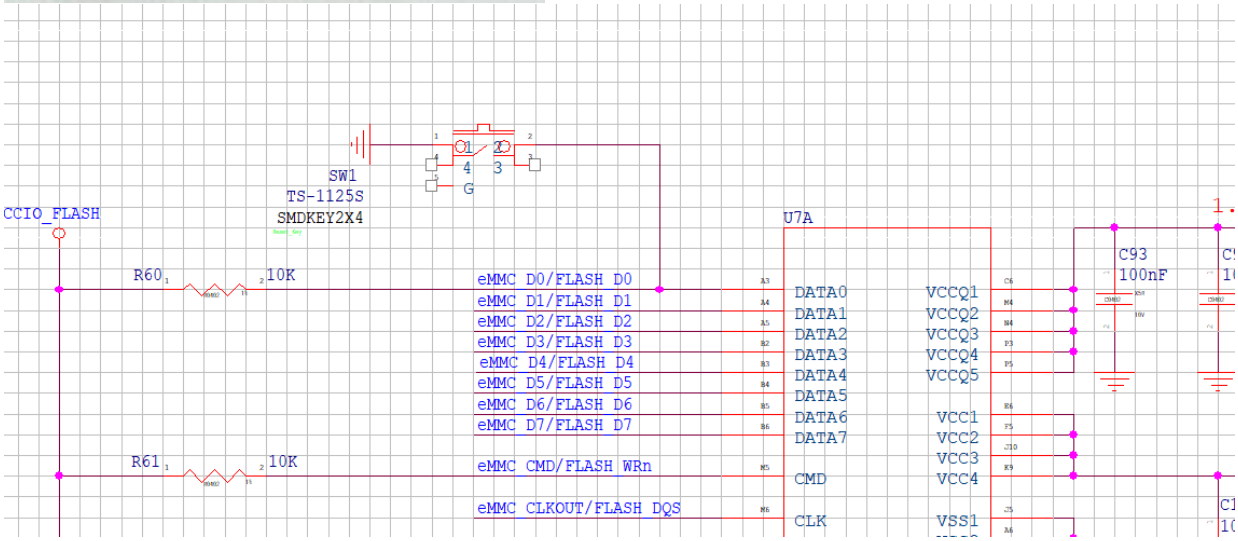
130	B connector_30	USB3-DP	
131	B connector_31	GND	
132	B connector_32	GND	
133	B connector_33	MIPI_CSI_RX_D2N	
134	B connector_34	MIC1_IN	
135	B connector_35	MIPI_CSI_RX_D2P	
136	B connector_36	MIC2_IN	
137	B connector_37	GND	
138	B connector_38	GND	
139	B connector_39	MIPI_CSI_RX_D3N	
140	B connector_40	MIPI_CSI_RX_CLK1N	
141	B connector_41	MIPI_CSI_RX_D3P	
142	B connector_42	MIPI_CSI_RX_CLK1P	
143	B connector_43	GPIO4_A7	
144	B connector_44	GND	
145	B connector_45	HP_SNS	
146	B connector_46	USB2_HOST2_DP	
147	B connector_47	HP_DET_L	
148	B connector_48	USB2_HOST2_DM	
149	B connector_49	SARADC_VIN2	
150	B connector_50	GND	
151	B connector_51	HCEC	HDMI CEC
152	B connector_52	USB3_HOST1_DP	
153	B connector_53	HHPD	HDMI Hotplug
154	B connector_54	USB3_HOST1_DM	
155	B connector_55	GND	
156	B connector_56	GND	
157	B connector_57	MIPI_DSI_TX0_D0N	
158	B connector_58	USB3_HOST1_SSTXP	
159	B connector_59	MIPI_DSI_TX0_D0P	
160	B connector_60	USB3_HOST1_SSTXN	
161	B connector_61	GND	
162	B connector_62	GND	
163	B connector_63	MIPI_DSI_TX0_D1N	
164	B connector_64	USB3_HOST1_SSRXP	
165	B connector_65	MIPI_DSI_TX0_D1P	
166	B connector_66	USB3_HOST1_SSRXN	
167	B connector_67	GND	
168	B connector_68	GND	
169	B connector_69	MIPI_DSI_TX0_CLKN	
170	B connector_70	HTX2P	HDMI TX2 Positive.
171	B connector_71	MIPI_DSI_TX0_CLKP	
172	B connector_72	HTX2N	HDMI TX2 Negative.
173	B connector_73	GND	
174	B connector_74	GND	

175	**B connector_75**	**MIPI_DSI_TX1_D0N**	
176	**B connector_76**	**HTX1P**	HDMI TX1 Positive.
177	**B connector_77**	**MIPI_DSI_TX1_D0P**	
178	**B connector_78**	**HTX1N**	HDMI TX1 Negative.
179	**B connector_79**	**GND**	
180	**B connector_80**	**GND**	
181	**B connector_81**	**MIPI_DSI_TX1_D1N**	
182	**B connector_82**	**HTX0P**	HDMI TX0 Positive.
183	**B connector_83**	**MIPI_DSI_TX1_D1P**	
184	**B connector_84**	**HTX0N**	HDMI TX0 Negative.
185	**B connector_85**	**GND**	
186	**B connector_86**	**GND**	
187	**B connector_87**	**MIPI_DSI_TX1_CLKN**	
188	**B connector_88**	**HTXCP**	HDMI CLK Positive.
189	**B connector_89**	**MIPI_DSI_TX1_CLKP**	
190	**B connector_90**	**HTXCN**	HDMI CLK Negative.
191	**B connector_91**	**GND**	
192	**B connector_92**	**GND**	
193	**B connector_93**	**MIPI_DSI_TX1_D2N**	
194	**B connector_94**	**MIPI_DSI_TX1_D3N**	
195	**B connector_95**	**MIPI_DSI_TX1_D2P**	
196	**B connector_96**	**MIPI_DSI_TX1_D3P**	
197	**B connector_97**	**GND**	
198	**B connector_98**	**GND**	
199	**B connector_99**	**HSDA**	HDMI I2C
200	**B connector_100**	**HSCL**	HDMI I2C

3. Interface Introduction

3.1. SW1 Button Explanation

Pressing and holding down SW1 will short-circuit the eMMC signal line to GND, prohibiting communication between SoC and eMMC.



3.2. 40 pin GPIO

PI2/CB2 40-Pin GPIO										
function5	function4	function3	function2	function1	Pin		function1	function2	function3	function4	function5
				3.3V	1	2	5V				
			I2C4_SDA_M0	GPIO4_B2(gpiochip4/gpio10)	3	4	5V				
			I2C4_SCL_M0	GPIO4_B3(gpiochip4/gpio11)	5	6	GND				
				GPIO3_A1(gpiochip3/gpio1) SPI1_CS1	7	8	GPIO0_D1(gpiochip0/gpio25)	UART2_TX_M0			
				GND	9	10	GPIO0_D0(gpiochip0/gpio24)	UART2_RX_M0			
	UART0_CTSn	PWM0_M1		GPIO0_C7(gpiochip0/gpio23)	11	12	GPIO0_B0(gpiochip0/gpio8) SPI1_CS2				
		UART3_RX_M0	I2C3_SDA_M0	GPIO1_A0(gpiochip1/gpio0)	13	14	GND				
		UART3_TX_M0	I2C3_SCL_M0	GPIO1_A1(gpiochip1/gpio1)	15	16	GPIO4_C6(gpiochip4/gpio22) SPI1_CS0	PWM13_M1			UART9_RX_M1
				3.3V	17	18	GPIO4_A3(gpiochip4/gpio3)				UART7_RX_M2
	SPI1_MOSI_M1			GPIO3_C1(gpiochip3/gpio17)	19	20	GND				
UART5_TX_M1	SPI1_MISO_M1			GPIO3_C2(gpiochip3/gpio18)	21	22	GPIO0_C4(gpiochip0/gpio20)	PWM5		UART0_RTSn	
UART5_RX_M1	SPI1_CLK_M1			GPIO3_C3(gpiochip3/gpio19)	23	24	GPIO4_A2(gpiochip4/gpio2)				UART7_TX_M2
				GND	25	26	GPIO0_A6(gpiochip0/gpio6)				
			I2C1_SDA	GPIO0_B4(gpiochip0/gpio12)	27	28	GPIO0_B3(gpiochip0/gpio11)	I2C1_SCL			
				GPIO3_D6(gpiochip3/gpio30)	29	30	GND				
				GPIO3_D7(gpiochip3/gpio31)	31	32	GPIO0_C0(gpiochip0/gpio16)	PWM1_M0		UART0_RX	
	UART0_TX		PWM2_M0	GPIO0_C1(gpiochip0/gpio17)	33	34	GND				
UART9_TX_M1		SPI3_MISO_M1	PWM12_M1	GPIO4_C5(gpiochip4/gpio21)	35	36	GPIO0_A0(gpiochip0/gpio0) SPI3_CS0				
			PWM4	GPIO0_C3(gpiochip0/gpio19)	37	38	GPIO4_C3(gpiochip4/gpio19)	PWM15_IR_M1	SPI3_MOSI_M1		
				GND	39	40	GPIO4_C2(gpiochip4/gpio18)	PWM14_M1	SPI3_CLK_M1		

The calculation method for GPIO pins is as follows:

GPIO4_B2 = (‘B’ - ‘A’) * 8 + 2 = 1 * 8 + 2 = gpiochip4/gpio10

GPIO3_D7 = (‘D’ - ‘A’) * 8 + 7 = 3 * 8 + 7 = gpiochip3/gpio31

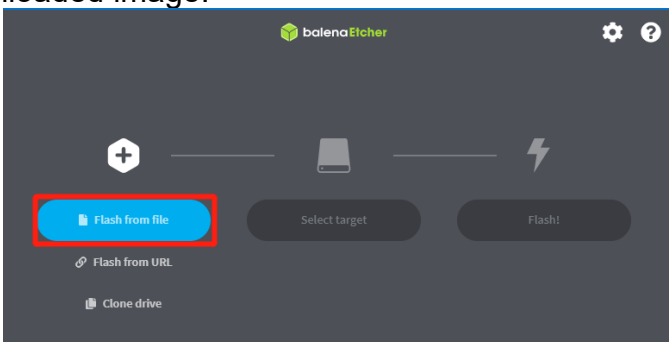
4. Flashing the System

4.1. Download the System Image

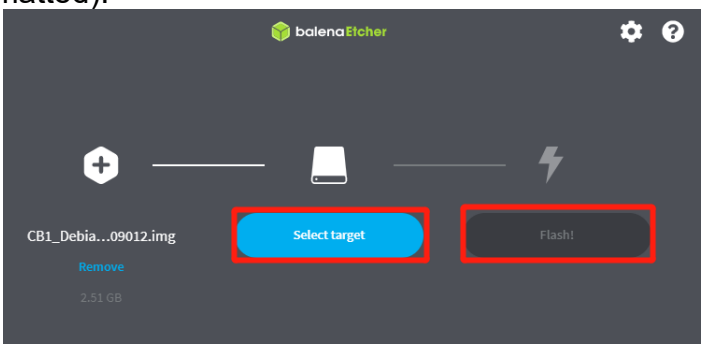
Only use the image provided in the link: https://github.com/bigtreetech/CB2/releases

4.2. Write System to MicroSD Card

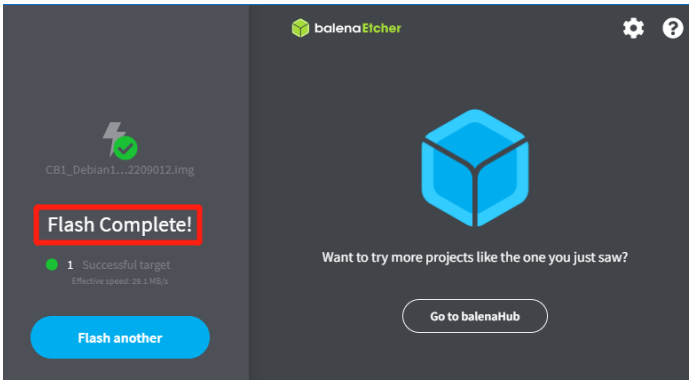
1. Download the balenaEtcher software from [https://www.balena.io/etcher/], install, and run it.
2. Insert the MicroSD card via a card reader.
3. Select your downloaded image.



4. Select the MicroSD card and click "Flash" (WRITE the image will format the MicroSD card. Be careful not to select the wrong storage device, otherwise the data will be formatted).



5. Wait for the process to complete.

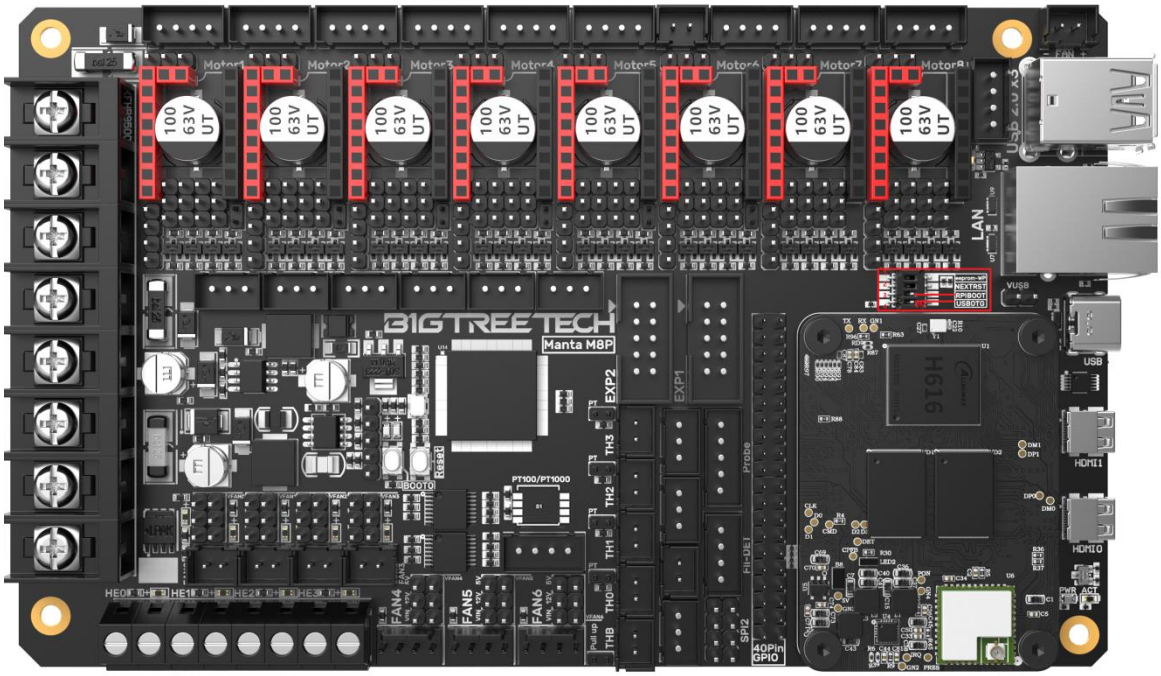


4.3. Writing System onto eMMC

4.3.1. Using RKDevTool to Write the eMMC (Windows)

Download and unzip RKDevTool from the GitHub repository (https://github.com/bigtreetech/CB2) to your computer. DO NOT insert a MicroSD card.

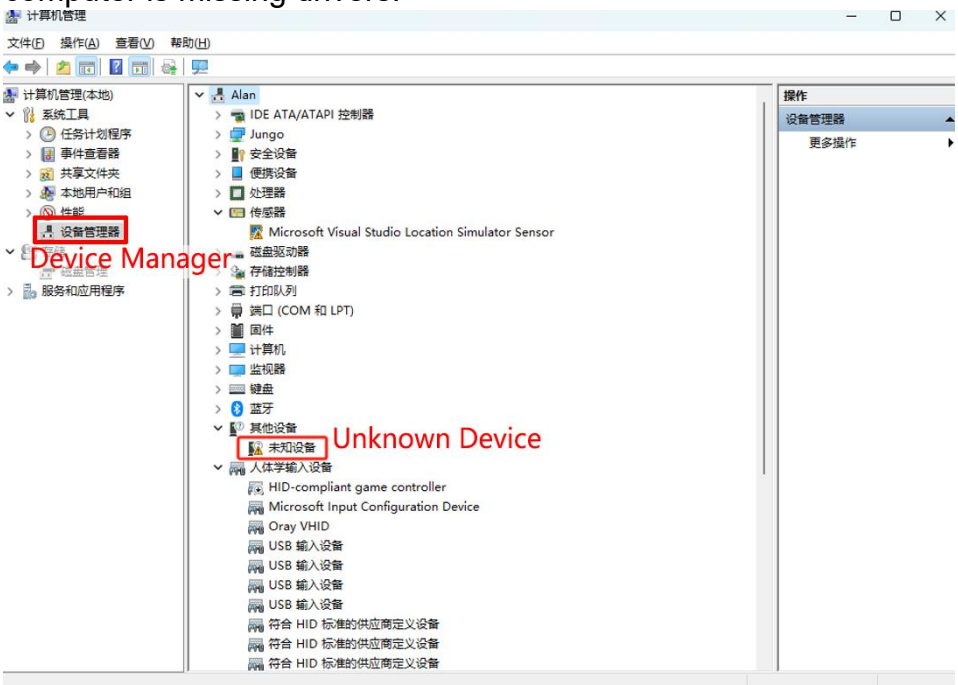
1. Turn the DIP switch 4 (USBOTG) and 3 (RPIBOOT) to the ON position to enter BOOT mode.



2. Then, connect the Type-C cable to the computer.

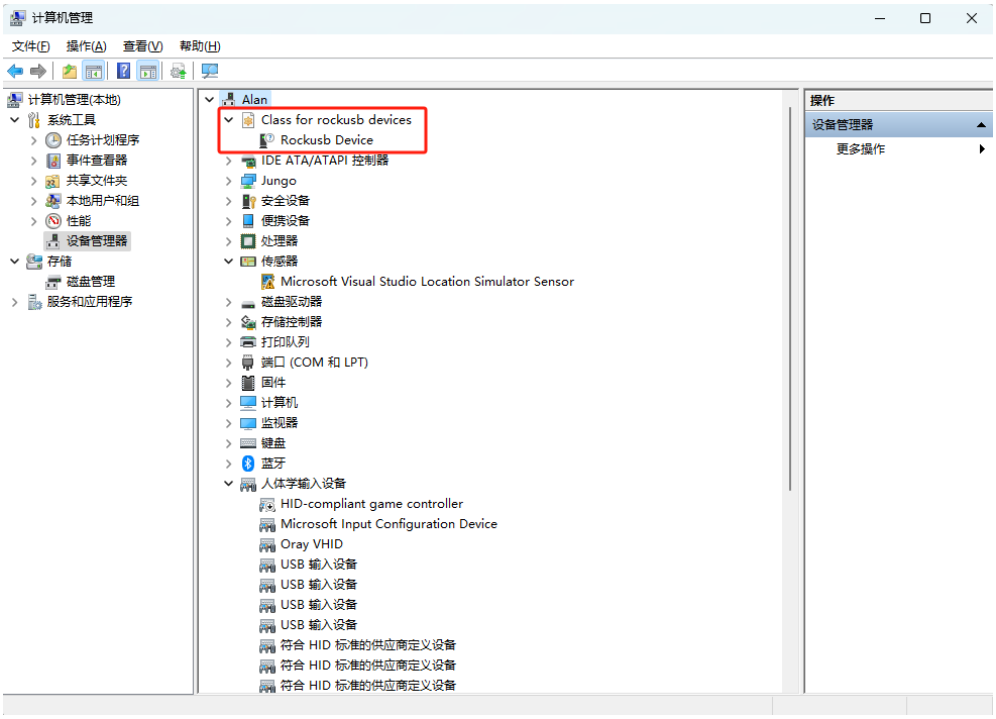
3. Install the driver:

(1) In “Device Manager”, if you see “Unknown Device”, it indicates that the computer is missing drivers.

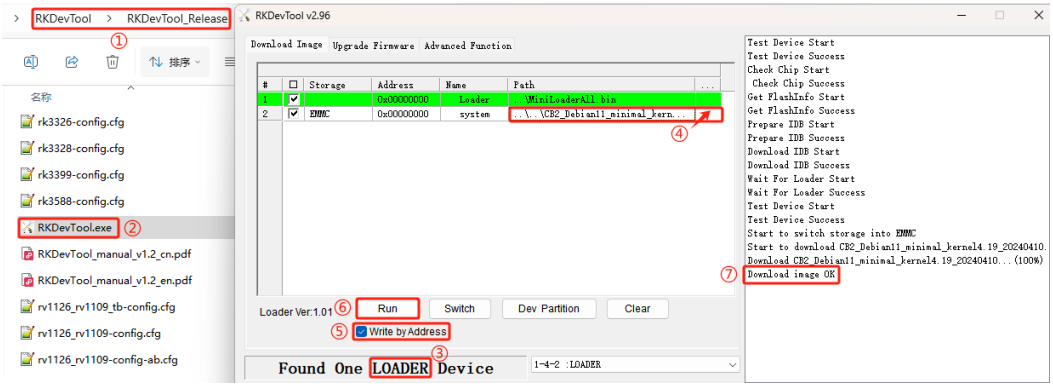


(2) Open the DriverAssistant tool in the downloaded RKDevTool folder, click “① Uninstall Driver”, then click “② Install Driver” to ensure that the latest version of the driver is installed.

(3) After the installation is complete, hold down the “Recovery” button, replug the Type-C cable. "Device Manager" should now recognize a “Rockusb Device”, indicating that the driver installation is successful.



4. Open the “RKDevTool” software:



Note: The parameters in the software are set by default as shown in the image. Normally, you only need to set the “④ actual path of the .img system”. If the parameters in your software do not match those in the image, manually adjust them to match.

#	□	Storage	Address	Name	Path
1	☑		0x00000000	Loader	..\MiniLoaderAll.bin
2	☑	EMMC	0x00000000	System	actual path of the .img system

①Find the path where the downloaded RKDevTool is located.

②Open the RKDevTool tool.

③The software will recognize a “LOADER” or “MASKROOM” device.

④Select the system to be written (the OS image must be unzipped as a .img file beforehand; RKDevTool does not support directly writing compressed .xz files).

⑤Check “Write by Address”.

⑥Click “Run” to start writting the system.

⑦“Download image OK” indicates that the system has been successfully burned.

5. After writing is complete, toggle the USB OTG switch to the OFF position to boot normally. Note: Files on the eMMC cannot be accessed by the computer like those on a MicroSD card, so you cannot modify the system.cfg configuration file to set up the WiFi network. Instead, use an Ethernet cable or USB-to-UART connection to configure the terminal.

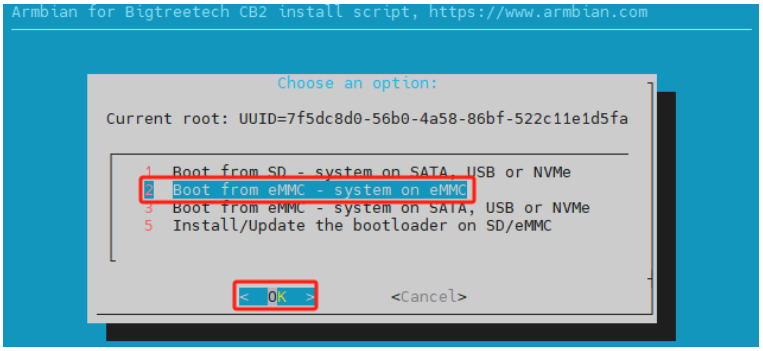
4.3.2. Writing System onto eMMC Using a MicroSD Card

1. First, write the system onto the MicroSD card. Then, insert the MicroSD card into the motherboard's card slot and wait for the system to boot.

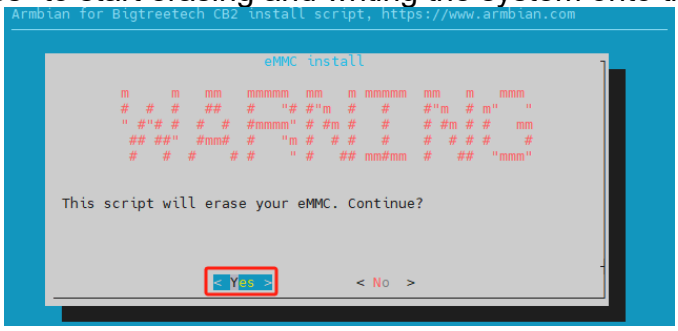
2. Connect to the system terminal via Ethernet cable, WiFi, or USB to UART, and log in to the system.

login: biqu
password: biqu

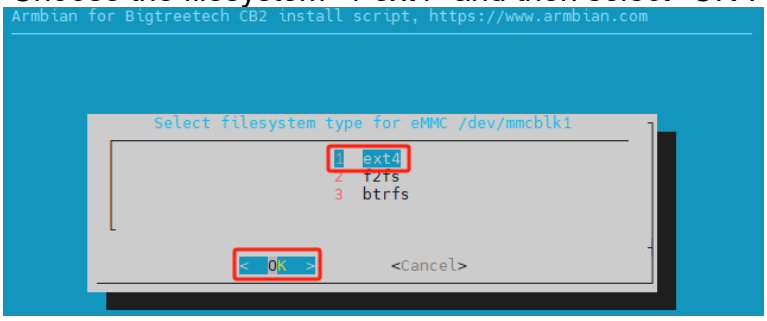
Execute the command sudo nand-sata-install. In the interface that pops up, select "2 Boot From eMMC - system on eMMC" and then select "OK"



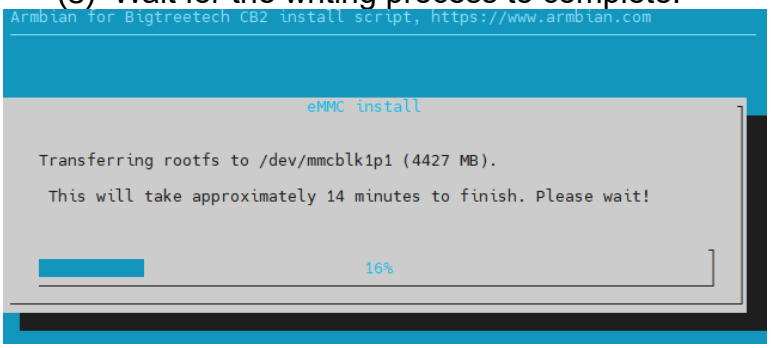
(1) Select "Yes" to start erasing and writing the system onto the eMMC.



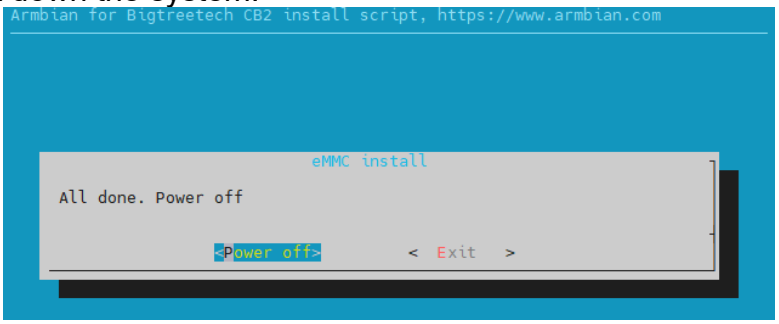
(2) Choose the filesystem "1 ext4" and then select "OK".



(3) Wait for the writing process to complete.



(4) Upon completion, you will be prompted whether to power off. Select “Power off” to shut down the system.



(5) After the system has powered down, disconnect the power supply, remove the MicroSD card, and then reconnect power. The system should now boot from the eMMC.

4.4. Erasing eMMC

When using a MicroSD card as the system card instead, it's best to erase the data on the eMMC to prevent the motherboard from booting from it by mistake.

4.4.1. Using UMS to Erase eMMC (Windows)

If a V3.0.1 or later version of the system has already been written into eMMC, the computer will recognize eMMC as a UMS device (Mass Storage device). UMS mode has the following advantages over Loader mode:

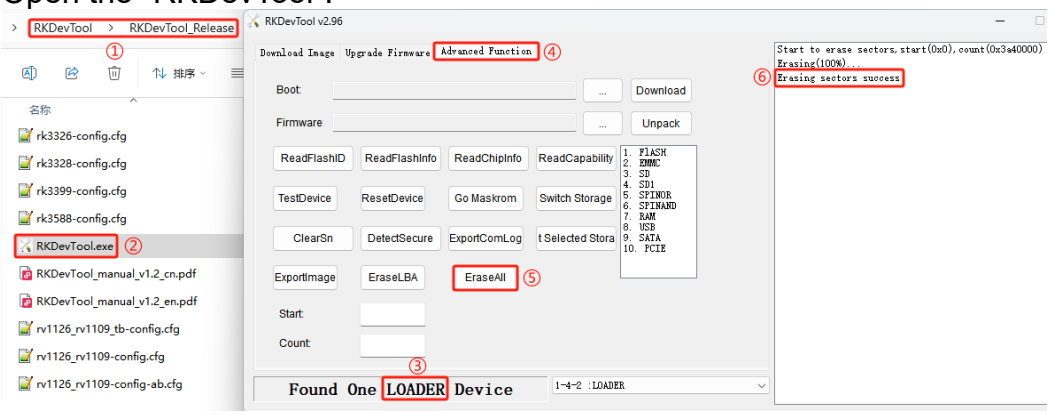
a. We can directly modify the configuration in /boot/ partition
b. We can directly write the system image to eMMC like a Micro SD card
c. All content in eMMC can be erased through software

1. Refer to the steps in "4.3.1 Using RKDevTool to Write the eMMC (Windows)" to connect the motherboard to the computer.
2. The computer will recognize eMMC as a UMS device.
3. Install SD Card Formatter software to format UMS devices for eMMC. (Please do not directly use the formatting function provided by the Windows system, as it cannot completely erase the data in eMMC)

4.4.2. Using RKDevTool to Erase eMMC (Windows)

If a system with V2.0.0 or earlier has been written into eMMC, the computer will recognize eMMC as a device in Loader mode.

1. Refer to the steps in "4.3.1 Using RKDevTool to Write the eMMC (Windows)" to connect the motherboard to the computer.
2. Open the "RKDevTool".



①Find the path where the downloaded RKDevTool is located.

②Open the RKDevTool.

③The software will recognize a "LOADER" device. If it recognizes "MASKROOM," it indicates there is no data in the eMMC, hence no erase operation is necessary.

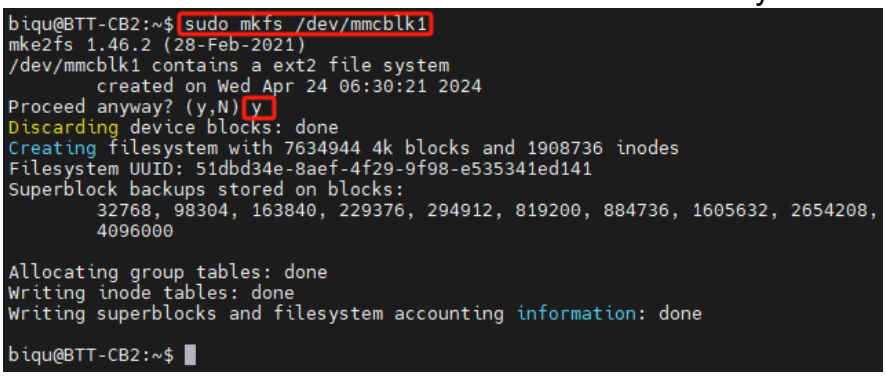
④Click "Advanced Function."

⑤Click "EraseAll" to begin erasing data from the eMMC.

⑥"Erasing sectors success" indicates the erasure is complete.

4.4.3. Erasing eMMC After Booting from MicroSD Card

1. Refer to the steps in "4.3.2 Writing System onto eMMC Using a MicroSD Card" and log into the system terminal.
2. Run the command sudo mkfs /dev/mmcblk1 and then enter "y" to confirm.



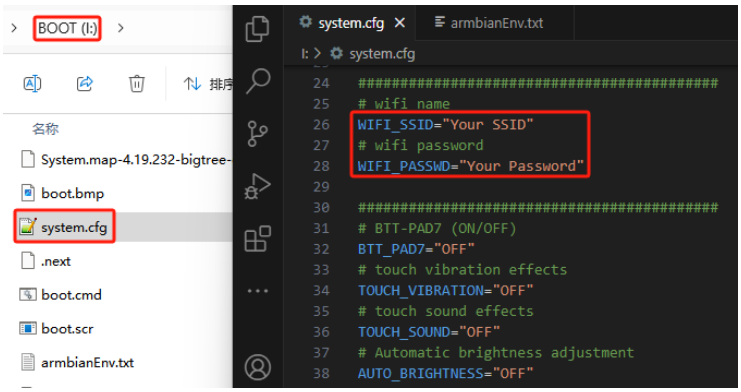
5. System Configuration

5.1. Using Ethernet

Ethernet is plug-and-play and requires no additional setup.

5.2. Setting Up WiFi

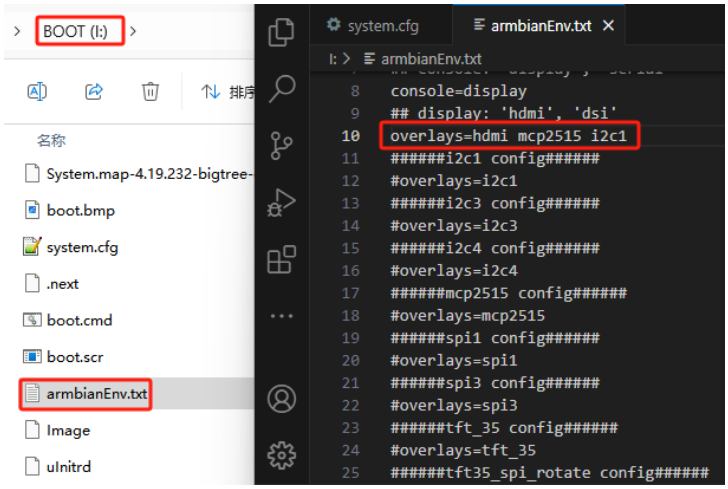
After the system image has been written, the MicroSD card will have a FAT32 partition recognized by the computer. In this partition, there is a "system.cfg" file. Open it and replace "Your SSID" with your actual WiFi name and "Your Password" with the actual password.



5.3. Configuring Overlays

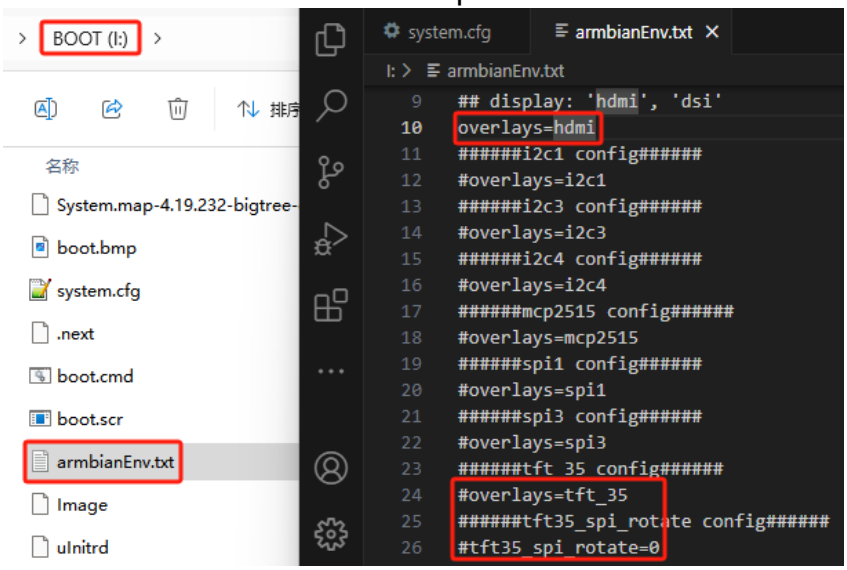
Open the "armbianEnv.txt" file in the BOOT partition and set the values for overlays. The configuration file supports only one line of overlays at a time; if multiple overlays are enabled, only the last line will take effect. If you need multiple overlays, place the contents of multiple configurations on the same line separated by a space. For example, if you need to use a DSI screen, MCP2515 SPI to CAN module, and I2C1 simultaneously:

overlays=dsi mcp2515 i2c1



5.4. Configuring the Display

1. Open the "armbianEnv.txt" file in the BOOT partition.

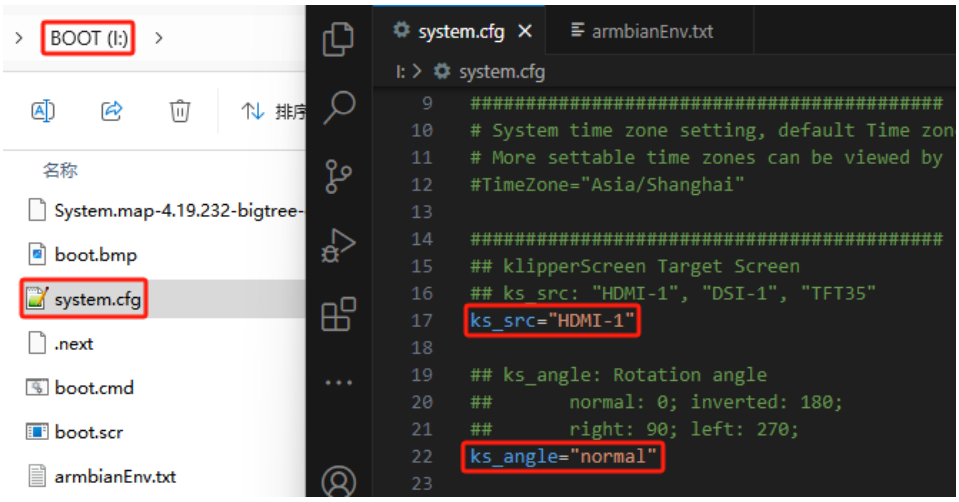


2. The default overlay is set to "hdmi," meaning the system uses an HDMI screen by default. This can be changed to match the actual screen being used, such as:
   - "hdmi": HDMI screen
   - "dsi": DSI screen
   - "tft_35": SPI Screen
   -

   For "tft_35", there is also a "tft35_spi_rotate" parameter for system-level screen rotation, with default "0" meaning no rotation, other options include "90", "180", "270".

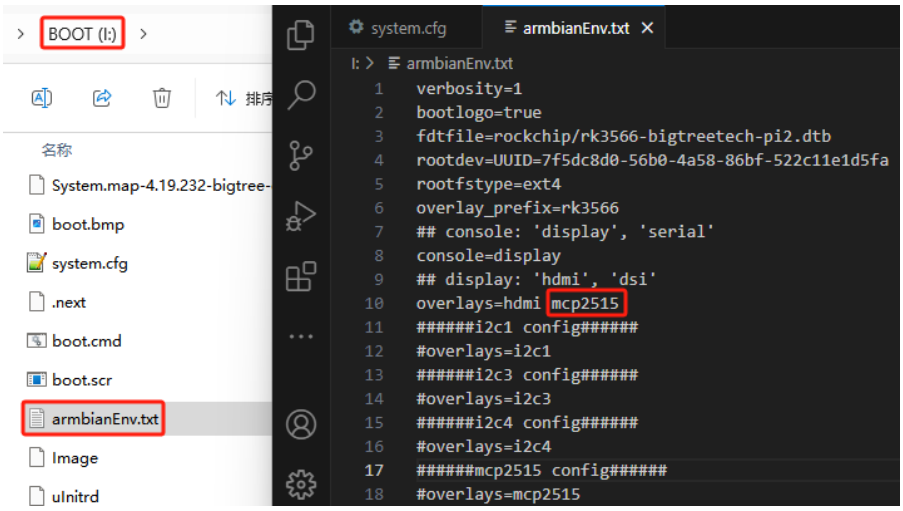
   Note: Only one screen type can be used at a time.

3. To configure KlipperScreen, open the `system.cfg` file in the BOOT partition. Set the screen type with the parameter `ks_src`, and the rotation angle with `ks_angle`.



5.5. Using SPI to CAN

Open the "armbianEnv.txt" file in the BOOT partition and add "mcp2515" to the overlays configuration.

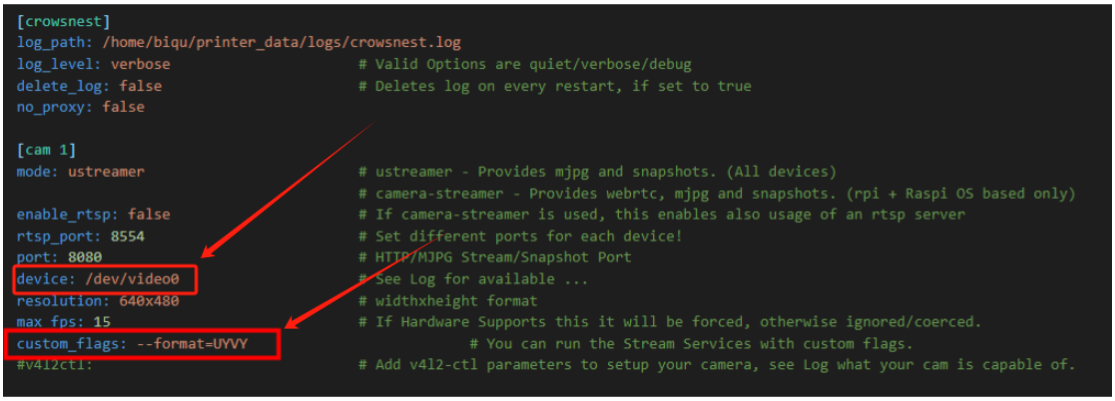


5.6. Using CSI Camera and Crowsnest Configuration

For both RPi v1.3 ov5647 and RPi v2 imx219 cameras, no specific configuration in "armbianEnv.txt" is required as they are plug-and-play. "crowsnest.conf" file configuration is as follows:

device: /dev/video0 # The CSI camera node is fixed as video0

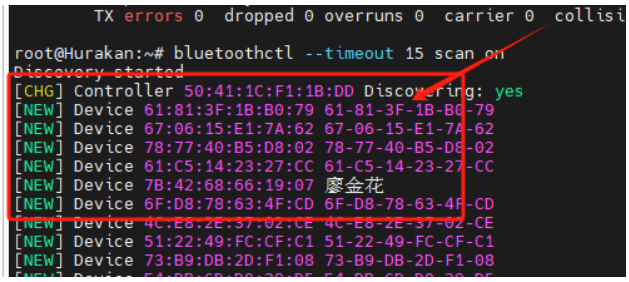
custom_flags: --format=UYVY # The current system's CSI camera does not support the default YUYV, so it needs to be set to the supported UYVY format.



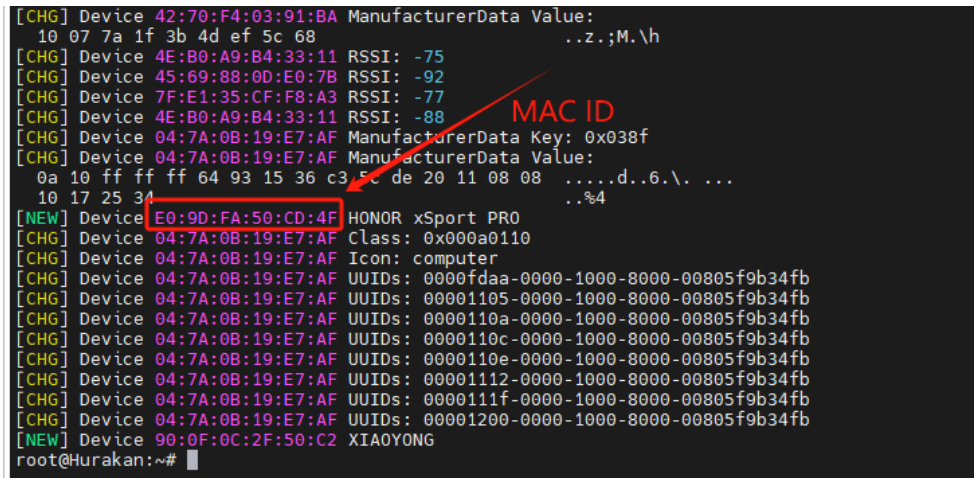
5.7. Using Bluetooth

1. To scan for Bluetooth devices, enter the following command, and a list of Bluetooth devices will appear as shown below:

bluetoothctl --timeout 15 scan on

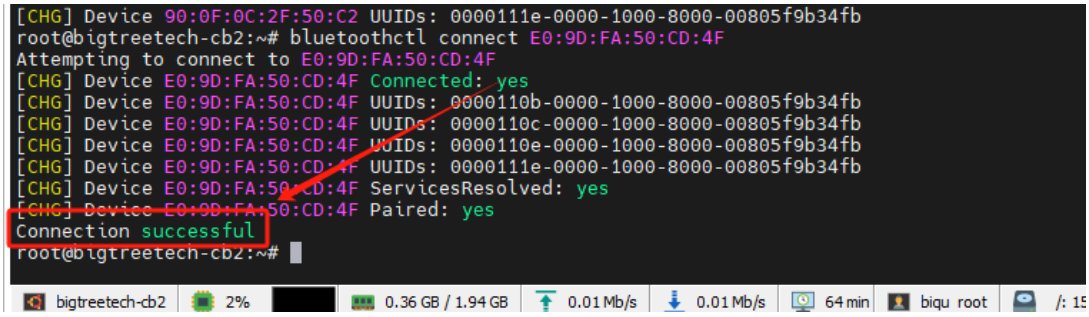


2. Find your Bluetooth device, for example, if your device name is "HONOR xSport PRO", locate the corresponding Bluetooth MAC ID as shown below.

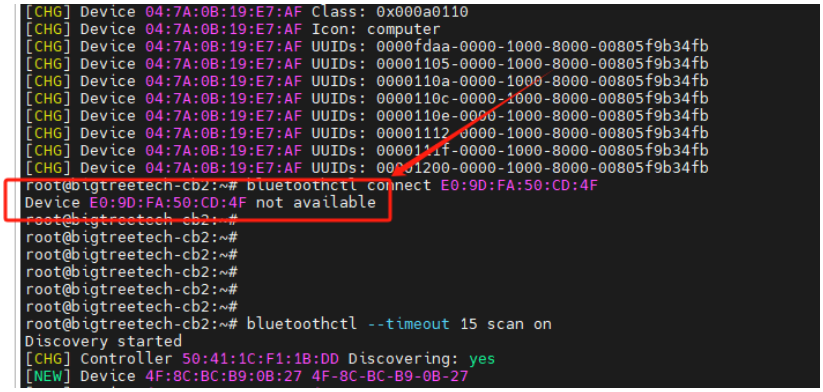


3. To connect to a Bluetooth device, enter the following command, connection success is shown as below

bluetoothctl connect E0:9D:FA:50:CD:4F



(1) If there's an issue while connecting, as shown below, please restart the Bluetooth device and repeat steps 1 and 2 to connect.



(2) If there's an issue while connecting, as shown below, please enter the following commands and then repeat steps 1 and 2:

bluetoothctl remove E0:9D:FA:50:CD:4F (Your Bluetooth device's corresponding MAC ID)

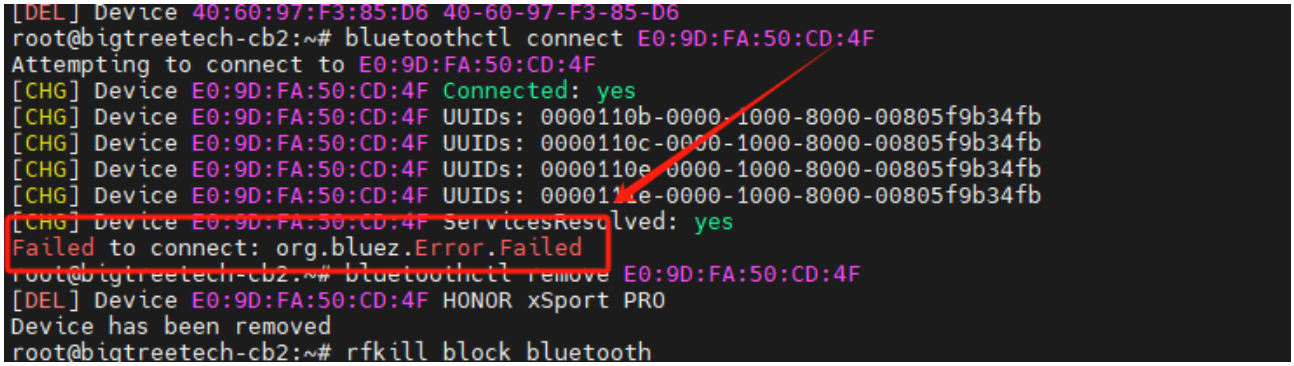
rfkill block bluetooth

sleep 3s

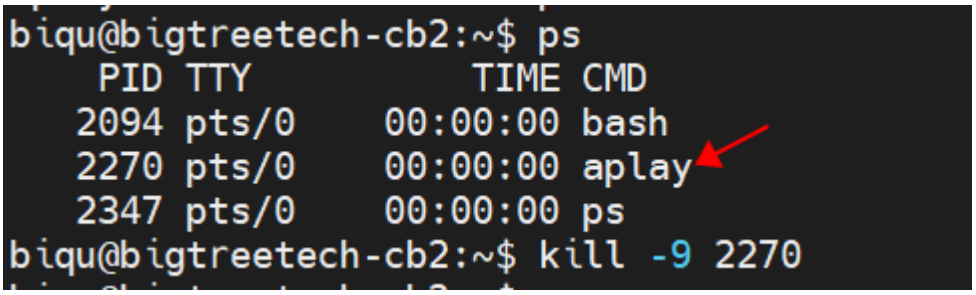
rfkill unblock bluetooth

pulseaudio -k

pulseaudio –start



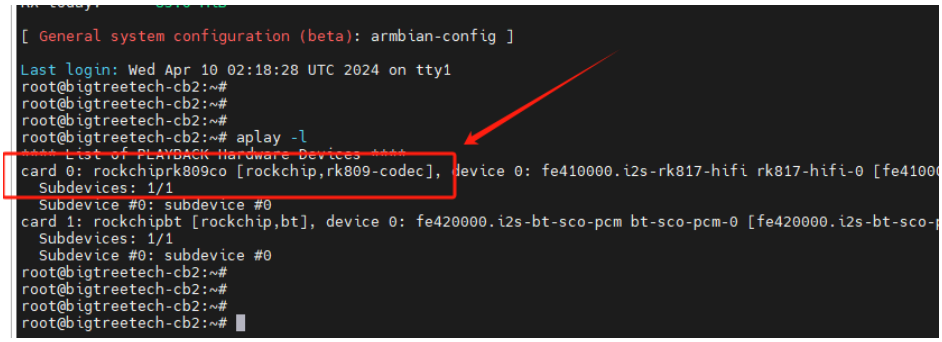
4. If you exit voice playback during the use of Bluetooth and cannot reuse it, manually delete the corresponding playback process. Use the ps command to view the process number, then use kill -9 process_number to delete the corresponding playback process.



5.8. Setting up 3.5mm Headphones Port

1. Enter the command: aplay -l

Check for the corresponding sound card, as shown in the image (the sound card for the headphone port shown in the image corresponds to card 0).



2. Enter the command:

amixer -c 0 contents (0 represents the card 0 found in the previous aplay -l command)

Check the settings for playback and recording channels, as shown in the image.

```
root@bigtreetech-cb2:~#
root@bigtreetech-cb2:~#
root@bigtreetech-cb2:~# amixer -c 0 contents
numid=3,iface=MIXER,name='PCM'
  ; type=INTEGER,access=rw---R--,values=2,min=0,max=252,step=0
  : values=255,255
  | dBscale-min=-95.00dB,step=0.37dB,mute=0
numid=2,iface=MIXER,name='Capture MIC Path'
  ; type=ENUMERATED,access=rw------,values=1,items=2
  ; Item #0 'MIC OFF'
  ; Item #1 'Main Mic'
  : values=0
numid=4,iface=MIXER,name='Capture Volume'
  ; type=INTEGER,access=rw---R--,values=2,min=0,max=255,step=0
  : values=255,255
  | dBscale-min=-95.00dB,step=0.37dB,mute=0
numid=1,iface=MIXER,name='Playback Path'
  ; type=ENUMERATED,access=rw------,values=1,items=11
  ; Item #0 'OFF'
  ; Item #1 'RCV'
  ; Item #2 'SPK'
  ; Item #3 'HP'
  ; Item #4 'HP_NO_MIC'
  ; Item #5 'BT'
  ; Item #6 'SPK_HP'
  ; Item #7 'RING_SPK'
  ; Item #8 'RING_HP'
  ; Item #9 'RING_HP_NO_MIC'
  ; Item #10 'RING_SPK_HP'
  : values=0
root@bigtreetech-cb2:~#
```

3. Enter the command:

amixer -c 0 cset numid=1 3

Set the playback channel, as shown in the image.

```
root@bigtreetech-cb2:~#
root@bigtreetech-cb2:~#
root@bigtreetech-cb2:~# amixer -c 0 cset numid=1 3
numid=1,iface=MIXER,name='Playback Path'
  ; type=ENUMERATED,access=rw------,values=1,items=11
  ; Item #0 'OFF'
  ; Item #1 'RCV'
  ; Item #2 'SPK'
  ; Item #3 'HP'
  ; Item #4 'HP_NO_MIC'
  ; Item #5 'BT'
  ; Item #6 'SPK_HP'
  ; Item #7 'RING_SPK'
  ; Item #8 'RING_HP'
  ; Item #9 'RING_HP_NO_MIC'
  ; Item #10 'RING_SPK_HP'
  : values=3
root@bigtreetech-cb2:~#
```

4. Enter the command:

amixer -c 0 cset numid=2 1

Set the recording channel, as shown in the image.

```
  : values=3
root@bigtreetech-cb2:~#
root@bigtreetech-cb2:~# amixer -c 0 cset numid=2 1
numid=2,iface=MIXER,name='Capture MIC Path'
  ; type=ENUMERATED,access=rw------,values=1,items=2
  ; Item #0 'MIC OFF'
  ; Item #1 'Main Mic'
  : values=1
root@bigtreetech-cb2:~#
```

5. Enter the following command to play audio, with the audio file directory xxx and the audio file name xxxxx.wav:

aplay -D plughw:0,0 /xxx/xxxxx.wav

6. Enter the following command to record (where 10 represents recording for 10 seconds), storing the recording in directory xxx, file name xxxx.wav:

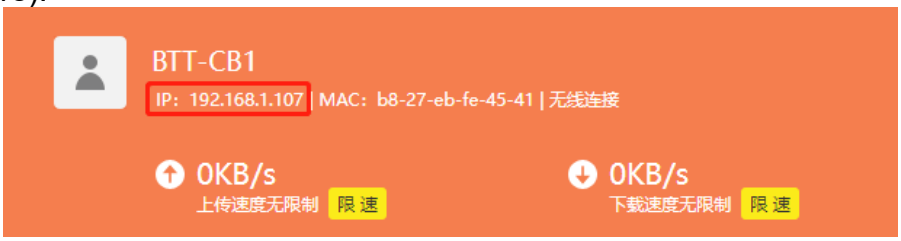
sudo arecord -Dhw:0,0 -d 10 -f cd -r 44100 -c 2 -t wav /xxx/xxxx.wav

7. Enter the following command to play the recording:

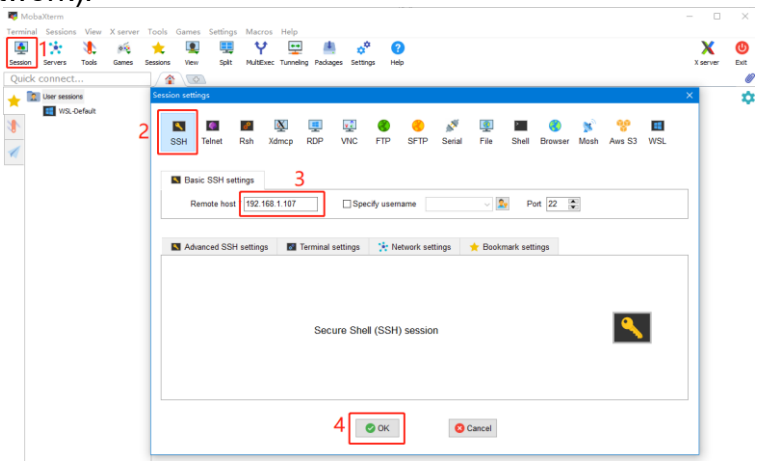
aplay -D plughw:0,0 /xxx/xxxx.wav

6. SSH Connect to Device

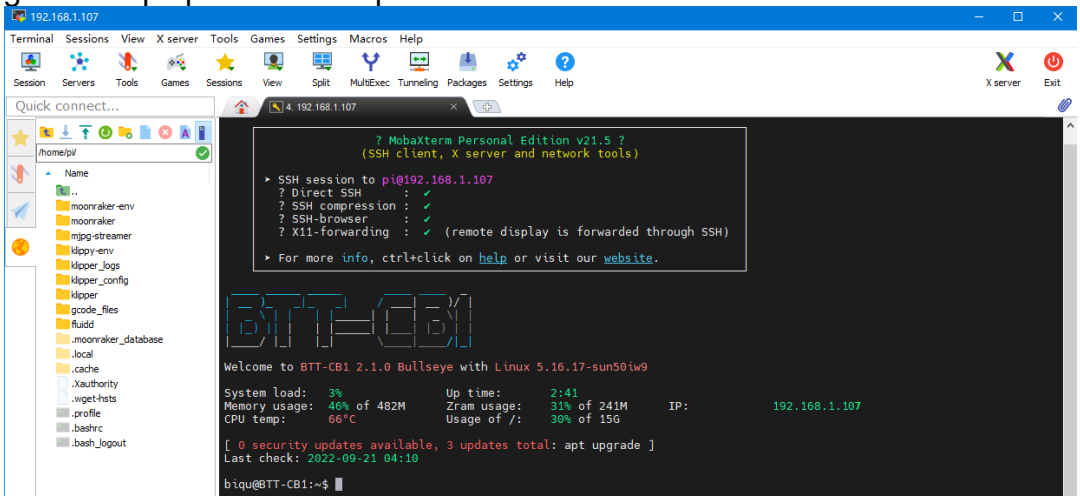
1. Install the SSH software Mobaxterm: https://mobaxterm.mobatek.net/download-home-edition.html
2. After powering on, wait for the system to boot, which typically takes about 1 to 2 minutes.
3. Once the device is connected to WiFi or an Ethernet cable is plugged in, it will automatically be assigned an IP address.
4. Access the router management interface to find the device's IP (it should be BTT-CB2 here).



5. Open Mobaxterm and click "Session", and click "SSH", inset the device IP into Remote host and click "OK" (Note: your computer and the device needs to be in the same network).



6. Login as: biqu password: biqu



7. Precautions

1. About 10 seconds after powering on, the system enters the kernel phase. At this time, the blue light stays on, and the green light flashes continuously, indicating that the system is running normally.

2. Klipper OS:
   Root administrator:
   Login: root
   Password: root

   BIQU user:
   Login: biqu
   Password: biqu

   Minimal OS:
   Root administrator:
   Login: root
   Password: root

   Minimal OS is a standard Armbian startup process, It only has the administrator account `root`. After the first boot, the system will guide the user to create their own ordinary account in the terminal.

3. The PCIe M.2 interface does not support hot-plugging; the solid-state drive must be connected in advance for the device to be recognized.

4. When booting from eMMC, do not insert a MicroSD card. When booting from a MicroSD card, it is necessary to erase the data in the eMMC.

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.