SinoVoip CO.,LTD

Banana PI BPI-M2
User Manual
<Version: V2.0 >

Banana PI BPI-M2 is the open source hardware platform,Banana PI BPI-M2 is an quad core version of Banana Pi ,Banana PI BPI-M2 is the quad core more better than the Banana Pi BPI-M1,it support WIFI on board.

Banana Pi BPI-M2 series run Android,Debian linux,Ubuntu linux, Raspberry Pi image and others image.

Banana PI PBI-M2 hardware: 1Ghz ARM7 quad-core processor, 1GB DDR3 SDRAM,

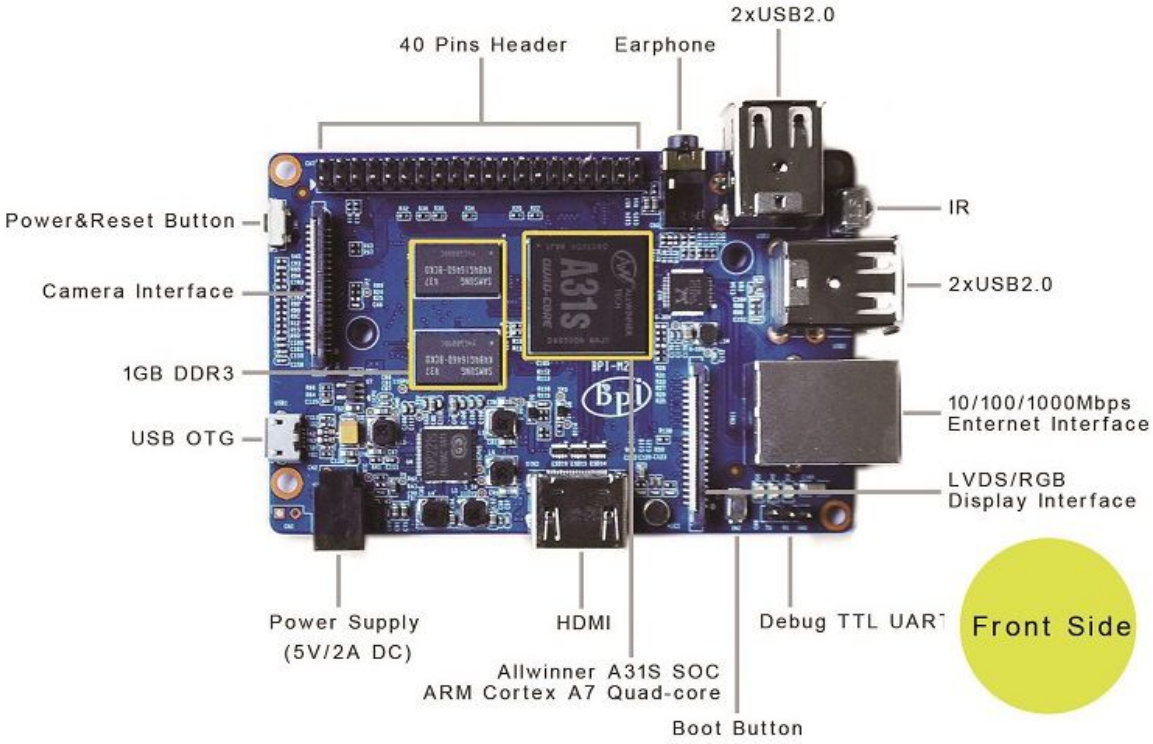
Banana PI BPI-M2with Gigabit ethernet port, It can run with Android 4.4 smoothly. The size of Banana PI BPI-M2 same as banana pi M1, it can easily run with the game it support 1080P high definition video output, the GPIO compatible with Raspberry Pi B+ and can run the ROM Image

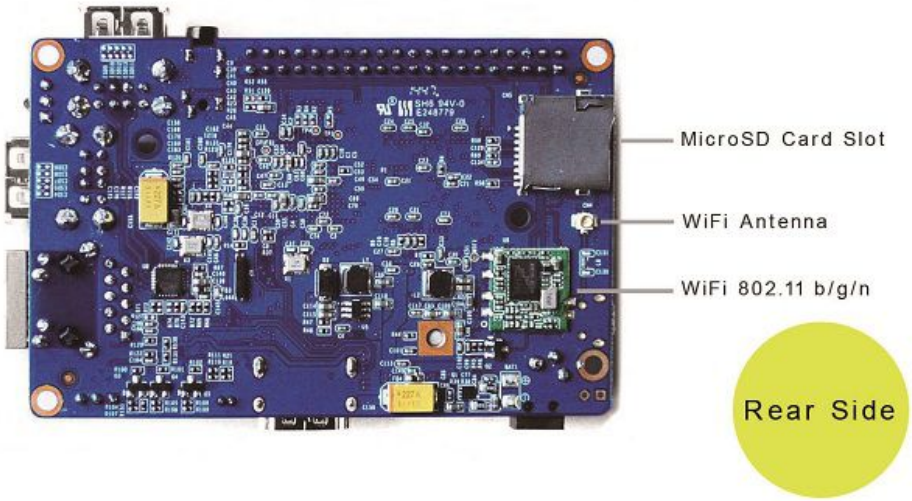
Note: Banana Pi BPI-M2 not support sata port, so you need use USB for hardisk

Hardware Specification of Banana pi BPI-M2

Soc	A31S ARM Cortex-A7
CPU	A31S ARM Cortex-A7 quad-core,256 KB L1 cache 1 MB L2 cache
GPU	PowerVR SGX544MP2 · Comply with OpenGL ES 2.0, OpenCL 1.x, DX 9_3
SDRAM	1GB DDR3 (shared with GPU)
Power	5V @ 2A via DC power and/or MicroUSB (OTG)
Features	
Low-level perpherials	40 Pins Header,28×GPIO, some of which can be used for specific functions including UART, I2C, SPI, PWM, I2S, LRADC, ADC, LINE-IN.
On board Network	10/100/1000Mbps ethernet (Realtek RTL8211E/D)
Wifi Module	WiFi 802.11 b/g/n (AP 6181 module on board)
Bluetooth	Optional
On board Storage	MicroSD (TF) card， Not SATA support
Display	Supports multi-channel HD display: HDMI 1.4 (Type A - full) LVDS/RGB/CPU display interface (DSI) for raw LCD panels 11 HDMI resolutions from 640×480 to 1920×1080 plus various PAL and NTSC standards
Video	HD H.264 2160p video decoding Mutil-format FHD video decoding, including Mpeg1/2, Mpeg4, H.263, H.264, etc H.264 high profile 1080p@30fps or 720p@60fps encoding
Audio outputs	HDMI,analog audio (via 3.5 mm TRRS jack shared with composite video out),I2S audio (also potentially for audio input)
Camera	Parallel 8-bit camera interface
Audio input	On board micphone
USB	4 USB 2.0 host, 1 USB 2.0 OTG
Buttons	Reset button Power button&U-boot button
Leds	Power status Led and RJ45 Led
Other	IR reciever
Interface definition	
Sizes	92 mm × 60mm
Weight	45g

Interface:





Use method

Step 1: Get what you need

First time to enjoy your Banana Pi, you need at least the accessories in the table below.

No.	Item	Minimum recommended specification & notes
1	TF card	• Minimum size 4Gb; class 4 (the class indicates how fast the card is). • We recommend using branded SD cards as they are more reliable.
2a	HDMI(Full sized) to HDMI / DVI lead	• HDMI to HDMI lead (for HD TVs and monitors with HDMI input). OR HDMI to DVI lead (for monitors with DVI input).
2b	AV video lead	• A standard AV video lead to connect to your analogue display if you are not using the HDMI output.
3	Keyboard and mouse	• Any standard USB keyboard and mouse should work. • Keyboards or mice that take a lot of power from the USB ports, however, may need a powered USB hub. This may include some wireless devices.
4	Ethernet cable/USB WiFi(Optional)	• Networking is optional, although it makes updating and getting new software for your Banana Pi much easier.
5	Micro USB power adapter	• A good quality, micro USB power supply that can provide at least 700mA at 5Vis essential. • Many mobile phone chargers are suitable—check the label on the plug.
6	Audio lead (Optional)	• You can choose a 3.5mm jack audio led to connect to audio port to get stereo audio.
7	Mobile Hard disk (Optional)	• You can choose to connect a mobile hard disk to usb port to store more files.

HDMI to HDMI lead

HDMI to DVI lead

AV video lead

SD card

Micro USB power adapter

Step 2: Download the relevant Image file:

Please visit our webmaster: www.bananapi.com to download image, banana pi all image can be download form this web.

Step3: Prepare your SD card for the Banana Pi M2

In order to enjoy your Banana Pi M2, you will need to install an Operating System (OS) onto an SD card. Instructions below will teach you how to write an OS image to your SD card under Windows and Linux.

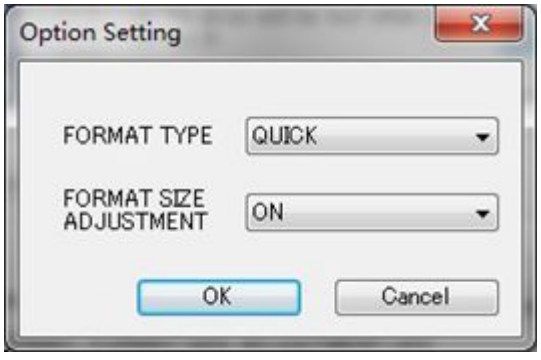
1. Insert your SD card into your computer. The size of SD should be larger than the OS image size, generally 4GB or greater.
2. Format the SD card.

Windows:

Download the a SD card format tool such as **SD Formatter** from https://www.sdcard.org/downloads/formatter_4/eula_windows/

i. Unzip the download file and run the setup.exe to install the tool on your machine.

ii. In the "Options" menu, set "FORMAT TYPE" option to QUICK, "FORMAT SIZE ADJUSTMENT" option to "ON".



iii. Check that the SD card you inserted matches the one selected by the Tool.

iv. Click the “Format” button.

Linux:

v. Run ***fdisk –l*** command to check the SD card node.

vi. Run ***sudo fdisk /dev/sdx*** command to delete all partition of SD card.

vii. Run ***mkfs –t vfat /dev/sdx*** command to format the entire SD card as FAT.

(x should be replaced according to your SD card node)

3. Download the OS image from Download district.
4. Unzip the download file to get the OS image.

Windows: Right click on the file and choose "Extract all".

Linux: Run ***unzip [downloaded filename]*** command.

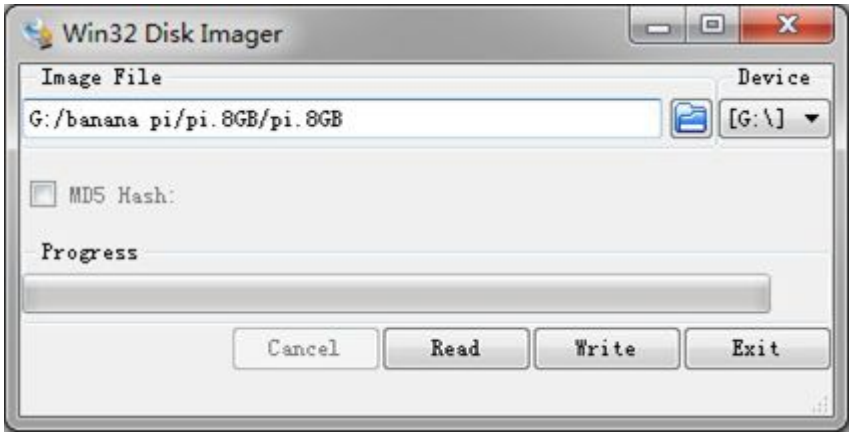
5. Write the image file to the SD card.

Windows:

i. Download a tool that can wirte image to SD card, such as **Win32 Diskimager** from:

http://sourceforge.net/projects/win32diskimager/files/Archive/

ii. Open the unzipped image file.



iii. Click Write button. Wait patiently to successfully complete writing.

Linux:

iv. Run ***fdisk –l*** command to check the SD card node.

v. Run ***dd if=[imagename] of=/dev/sdx*** command to write image file to SD card. Wait patiently to successfully complete writing.

Step4: Set up your Banana Pi M2

According to the set up diagram below, you can easily set up your Banana Pi.

1. Insert the written-image SD card that to the SD card spot on the left side edge of the underside of the board.
2. On the bottom "edge" in the middle of the board is the HDMI Type A (Full sized) port. Just connect any HDMI cable from the board to your TV or HDMI Monitor.

   If you don't have an TV/Monitor with a HDMI or DVI-D port you can use the yellow AV jack located in the middle of the "top" edge and the 3.5 mm stereo headphone jack to the right of it.
3. Plug a USB keyboard and mouse into the USB slots located on the right edge.
4. Just under the USB ports on the right edge is the ethernet connector for anyone who wants to plug the Banana Pi into a wired network.
5. Finally, at the very left of the bottom edge is the micro-usb power connector. Plug in a regulated power supply that is rated at 5V ±5% and at least 700mA (or 0.7A). Any number bigger than 700 mA (like 1000mA) will also work. Avoid using the smaller chargers used for small GSM phones, as these are often unregulated, even if they claim "5V 1A", they may do "5V" and may do "1A", but not at the same time!

   The mini-USB (on the left) is the wrong one. It’s thicker and looks like a trapezoid with its sides pinched in. The micro-USB (on the right) is the correct one. It is thinner and also looks like a trapezoid except it’s sides are rounded outward.

If all goes well, the Banana Pi will boot in a few minutes. The screen will display the OS GUI.

Step5: Shut down your Banana Pi M2

You can use the GUI to shut down the Banana Pi safely.

Also you can run the command in the terminal:

sudo halt

or

sudo shutdown –h.

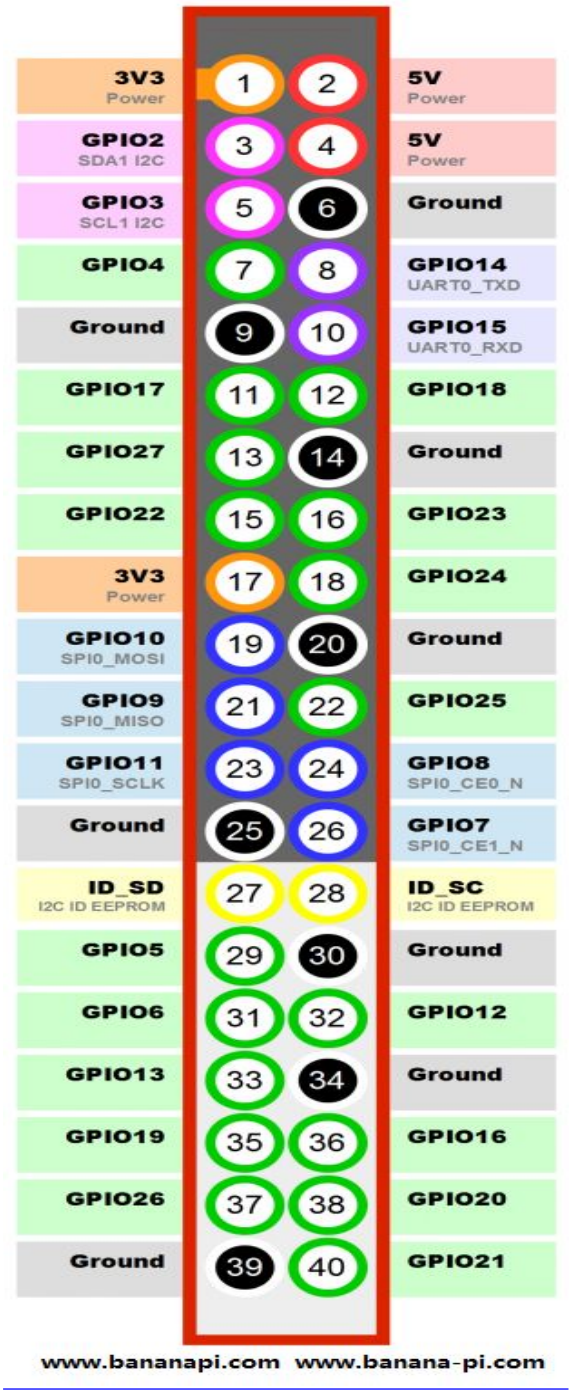
This will shut down the PI safely, (just use the power key to turn off might damage the SD-cards file system). After that you can press the power key for 5 seconds to turn it off.

If all is well ,so you can use banana pi M2 now.

GPIO specification

Banana Pi 40-pin GPIO

Banana Pi has a 40-pin GPIO header that matches that of the Model B+ Raspberry Pi. Following is the Banana Pi GPIO Pinout:



GPIO Pin Name	Default Function	Function2：GPIO
CN7-P01	VCC-3V3	__
CN7-P02	VCC-DC	__
CN7-P03	TWI2-SDA	PH19
CN7-P04	VCC-DC	__
CN7-P05	TWI2-SCK	PH18
CN7-P06	GND	__
CN7-P07	PWM1-P	PH9
CN7-P08	UART5_TX	PE4
CN7-P09	GND	__
CN7-P10	UART5_RX	PE5
CN7-P11	UART2_RX	PG7
CN7-P12	PWM1-N	PH10
CN7-P13	UART2_TX	PG6
CN7-P14	GND	__
CN7-P15	UART2_CTS	PG9
CN7-P16	PWM2-P	PH11
CN7-P17	VCC-3V3	__
CN7-P18	PWM2-N	PH12
CN7-P19	SPI1_MOSI	PG15
CN7-P20	GND	__
CN7-P21	SPI1_MISO	PG16
CN7-P22	UART2_RTS	PG8
CN7-P23	SPI1_CLK	PG14
CN7-P24	SPI1_CS0	PG13
CN7-P25	GND	__
CN7-P26	SPI1_CS1	PG12
CN7-P27	TWI3-SDA	PB6
CN7-P28	TWI3-SCK	PB5
CN7-P29	I2S-MCLK	PB0
CN7-P30	GND	__
CN7-P31	I2S-BCLK	PB1
CN7-P32	I2S-DI	PB7
CN7-P33	I2S-LRCK	PB2
CN7-P34	GND	__
CN7-P35	I2S-DO0	PB3
CN7-P36	UART5_RTS	PE6
CN7-P37	I2S-DO1	PB4
CN7-P38	UART5_CTS	PE7

CN7-P39	GND	
CN7-P40	1WIRE	PM2

CSI Camera Connector specification:

CSI Camera Connector

The CSI Camera Connector is a 40-pin FPC connector which can connect external camera module with proper signal pin mappings. The pin definitions of the CSI interface are shown as below. This is marked on the Banana Pi board as "CN6".

CSI Pin Name	Default Function	Function2：GPIO
CN6-P01	LINEINL	
CN6-P02	LINEINR	
CN6-P03	VCC-CSI	
CN6-P04	AVDD-CSI	
CN6-P05	GND	
CN6-P06	VDD-CSI	
CN6-P07	MIC2P	
CN6-P08	VCC-CSI	
CN6-P09	MIC2N	
CN6-P10	AFVCC-CSI	
CN6-P11	GND	
CN6-P12	CSI-IO0	PM0
CN6-P13	LRADC0	
CN6-P14	TWI0-SDA	PH15
CN6-P15	MIC-MBIAS	
CN6-P16	TWI0-SCK	PH14
CN6-P17	CSI-D4	PE8
CN6-P18	CSI0-STBY-EN	PH27
CN6-P19	CSI-D5	PE9
CN6-P20	CSI-PCLK	PE0
CN6-P21	CSI-D6	PE10
CN6-P22	CSI0-PWR-EN	PG18
CN6-P23	CSI-D7	PE11
CN6-P24	CSI-MCLK	PE1
CN6-P25	CSI-D8	PE12

CN6-P26	CSI0-RESET#	PH26
CN6-P27	CSI-D9	PE13
CN6-P28	CSI-VSYNC	PE3
CN6-P29	CSI-D10	PE14
CN6-P30	CSI-HSYNC	PE2
CN6-P31	CSI-D11	PE15
CN6-P32	CSI1-STBY-EN	PH25
CN6-P33	AP-RESET#	___
CN6-P34	CSI1-RESET#	PH24
CN6-P35	CSI-IO1	PM1
CN6-P36	HPR	___
CN6-P37	HPL	___
CN6-P38	IPSOUT	___
CN6-P39	GND	___
CN6-P40	IPSOUT	___

LVDS specification

LVDS (LCD display interface)

The LVDS Connector is a 40-pin FPC connector which can connect external LCD panel (LVDS) and touch screen (I2C) module as well. The pin definitions of this connector are shown as below. This is marked on the Banana Pi board as "CN9".

DSI Pin Name	Default Function	Function2： GPIO
CN9-P01	IPSOUT	___
CN9-P02	TWI1-SDA	PH15
CN9-P03	IPSOUT	___
CN9-P04	TWI1-SCK	PH16
CN9-P05	GND	___
CN9-P06	TP-INT	PG0
CN9-P07	LCD-PWR-EN	PG4
CN9-P08	TP-RST	PG1
CN9-P09	LCD0-D00	PD0
CN9-P10	LCD0-PWM	PH13
CN9-P11	LCD0-D01	PD1
CN9-P12	LCD0-BL-EN	PG3
CN9-P13	LCD0-D02	PD2
CN9-P14	LCD0-DE	PD25
CN9-P15	LCD0-D03	PD3
CN9-P16	LCD0-VSYNC	PD27

CN9-P17	LCD0-D04	PD4
CN9-P18	LCD0-HSYNC	PD26
CN9-P19	LCD0-D05	PD5
CN9-P20	LCD0-CS	PG2
CN9-P21	LCD0-D06	PD6
CN9-P22	LCD0-CLK	PD24
CN9-P23	LCD0-D07	PD7
CN9-P24	GND	___
CN9-P25	LCD0-D08	PD8
CN9-P26	LCD0-D23	PD23
CN9-P27	LCD0-D09	PD9
CN9-P28	LCD0-D22	PD22
CN9-P29	LCD0-D10	PD10
CN9-P30	LCD0-D21	PD21
CN9-P31	LCD0-D11	PD11
CN9-P32	LCD0-D20	PD20
CN9-P33	LCD0-D12	PD12
CN9-P34	LCD0-D19	PD19
CN9-P35	LCD0-D13	PD13
CN9-P36	LCD0-D18	PD18
CN9-P37	LCD0-D14	PD14
CN9-P38	LCD0-D17	PD17
CN9-P39	LCD0-D15	PD15
CN9-P40	LCD0-D16	PD16

UART specification:

The header CON4 is the UART interface. For developers of Banana Pi, this is an easy way to get the UART console output to check the system status and log message.

CN8 Pin Name	Default Function	GPIO
CN8 P03	UART0-TXD	PH20
CN8 P02	UART0-RXD	PH21
CN8 P01	GND	__