Banana Pi BPI-M2 Berry

Contents

Introduction

Banana Pi BPI-M2 Berry is a quad-core mini single board computer
built with Allwinner A40i SoC. It features 1GB of RAM . It also has
onboard WiFi and BT. On the ports side, the BPI-M2 Ultra has 4 USB
A 2.0 ports, 1 USB OTG port, 1 HDMI port, 1 audio jack, and last but
not least, a SATA port..

Banana Pi BPI-M2 Berry with Allwinner A40i

Banana Pi BPI-M2U with Allwinner A40i

Banana Pi BPI-M1 with Allwinner A20 chip

Banana Pi BPI-M1+ with Allwinner A20 chip

Banana Pi BPI-M2 ZERO with Allwinner H3 chip

Banana Pi BPI-P2 Zero with Allwinner H3 chip

Banana Pi BPI-M2+ with Allwinner H3 chip

Banana Pi BPI-M2M with Allwinner R16 chip design

Banana Pi BPI-M64 with Allwinner A64 chip design
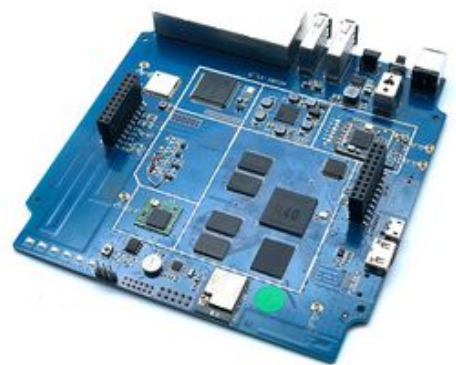

Banana Pi BPI-M3 with Allwinner A83T chip design

BPI-6202 Embedded single board industrial computer PCBA design

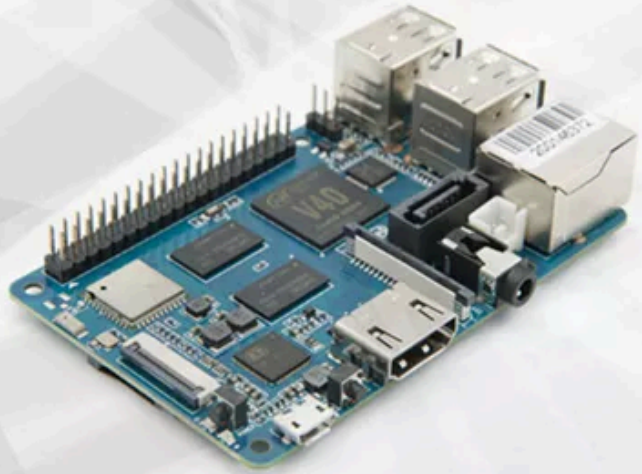BPI-M2 Berry for BPI 4.0 Successful case ：R40 for vehicle license plate recognition

BPI-M2 Berry for BPI 4.0 Successful case ：R40 for IoT gateway with Z-wave, zigbee,WiFI

BPI-M2 Berry case

Also being a member of the Banana Pi family, the M2 Berry is a direct upgrade from the Banana Pi M1/M1+ that support SATA from the SoC. The SATA performance on the V40 is fitting for media related projects such as storage servers. Backed by our community, starting a project and building servers is fun and rewarding. We welcome all companies, DIYers, and tech loving people within our community! Together, we can make a difference, we can discover our passions, inspire others, and build a practical project.

all size is same as raspberry pi 3,so you can use raspberry pi 3 case for BPI-M2 Berry.

Key Features

- Allwinner A40i/R40/V40 Quad Core ARM Cortex A7 CPU
- 1GB DDR3 SDRAM.
- WiFi & BT onboard
- SATA Interface
- 4*USB 2.0
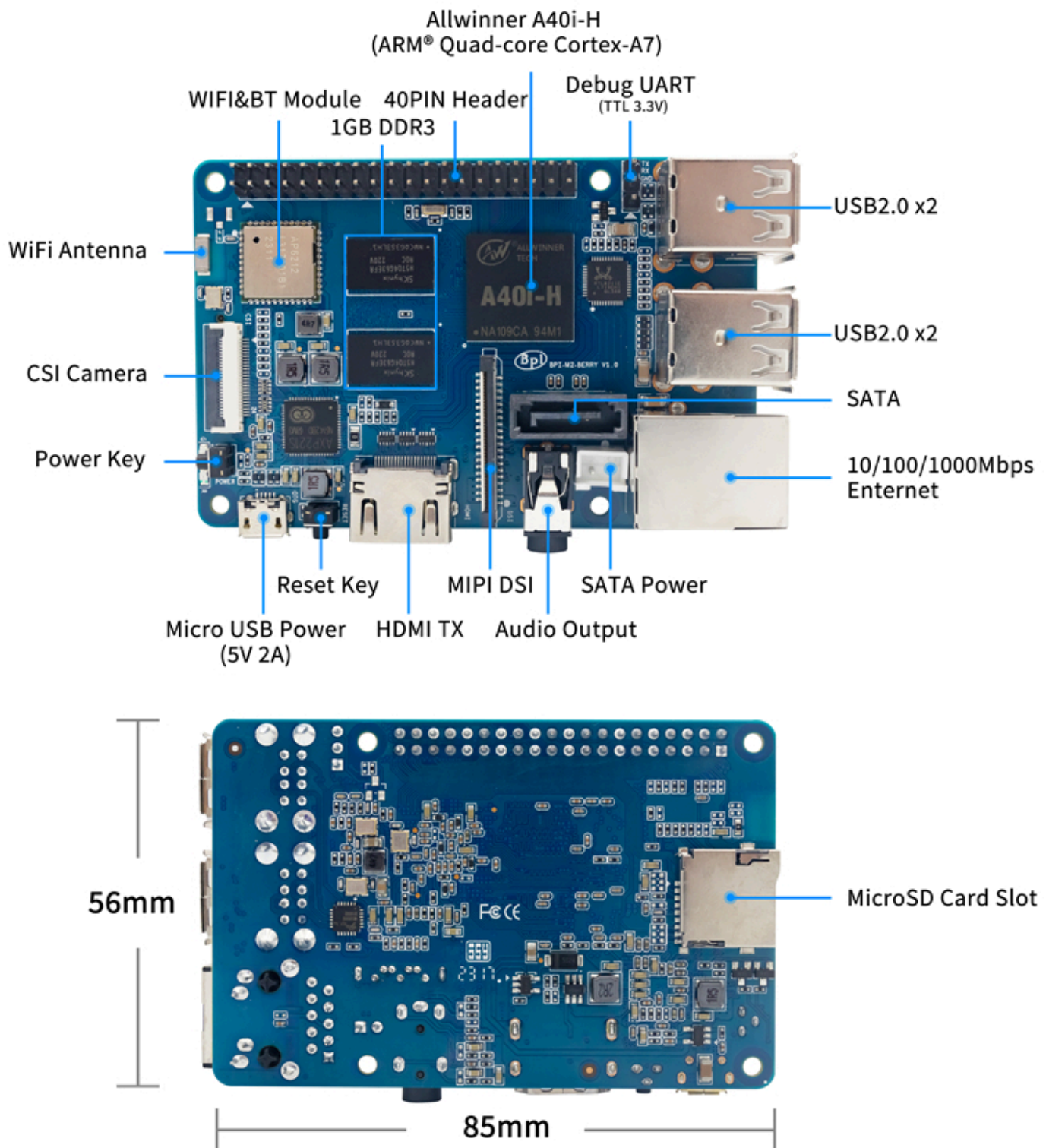- MIPI DSI interface
- CSI camera interface

Getting Start

- Quick Start Banana pi SBC

- Getting Start with M2 Ultra / Berry

Hardware

Hardware interface

Hardware spec

HardWare Specification of Banana pi BPI-M2 Berry

Soc	Allwinner A40i/R40/V40
CPU	quad-core cortex -A7,the most power efficient CPU core ARM's ever development
GPU	dual-core MALI-400 MP2 and runs at 500MHz, capable of 1.1 Gpixel/s throughput. Graphics capabilities are slightly higher than the original Xbox's level of performance. The GPU provides OpenGL ES 2.0, hardware-accelerated OpenVG, 1080p45 H.264 high-profile encode and decode.
SDRAM	1GB DDR3 with 733MHz\(shared with GPU\)
SATA	suppoort SATA interface
GPIO	40 Pins Header, 28×GPIO, some of which can be used for specific functions including UART, I2C, SPI, PWM, I2S.
On board Network	10/100/1000Mbps Ethernet \(Realtek RTL8211E/D\)
Wifi Module	WiFi 802.11 b/g/n \(AP 6212 module on board\)
Bluetooth	BT4.0
On board Storage	MicroSD \(TF\) card,No eMMC onboard
Display	4-lane MIPI DSI display,or RGB panel or LVDS panel,TV-out on HDMI V1.4
Video	Multi-format FHD video decoding, including Mpeg1/2, Mpeg4, H.263, H.264, etc H.264 decode up to 1080P60,support video encodeing:High-deinition\(HD\)H.264 video encoder is up to 1080P@45fps
Audio outputs	HDMI, analog audio \(via 3.5 mm TRRS jack\), I2S audio \(also potentially for audio input\)
Camera	A CSI input connector Camera:Supports 8-bit YUV422 CMOS sensor interface,Supports CCIR656 protocol for NTSC and PAL,Supports 5M pixel camera sensor ,Supports video capture solution up to 1080p@30fps
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
IR	No onboard IR receiver
DC Power	5V/2A with micro USB port
battery	No 3.7V lithium battery power support
Sizes	85mmX56mm,same size as raspberry pi 3
Weight	40g

GPIO PIN define

Banana Pi BPI-M2 Berry has a 40-pin GPIO header that matches that of the Model Raspberry Pi 3. Following is the Banana Pi GPIO Pinout:

40 PIN GPIO of Banana pi BPI-M2 Ultra			
GPIO Pin Name	Default Function	Function2：GPIO	Function3
CON1-P01	VCC-3V3		
CON1-P02	DCIN		
CON1-P03	TWI2-SDA	PB21	PWM5
CON1-P04	DCIN		
CON1-P05	TWI2-SCK	PB20	PWM4
CON1-P06	GND		
CON1-P07	PB3	PB3	PWM1
CON1-P08	UART2-TX	PI18	SPI1_MOSI
CON1-P09	GND		
CON1-P10	UART2-RX	PI19	SPI1_MISO
CON1-P11	UART7-TX	PI20	
CON1-P12	UART2-CTS	PI17	SPI1_CLK
CON1-P13	UART7-RX	PI21	PWM3
CON1-P14	GND		
CON1-P15	PH25	PH25	CSI1-FIELD
CON1-P16	UART2-RTS	PI16	SPI1_CS0
CON1-P17	VCC-3V3		
CON1-P18	PH26	PH26	CSI1-HSYNC
CON1-P19	SPI0_MOSI	PC0	
CON1-P20	GND		
CON1-P21	SPI0_MISO	PC1	
CON1-P22	PH27	PH27	CSI1-VSYNC
CON1-P23	SPI0_CLK	PC2	
CON1-P24	SPI0_CS	PC23	
CON1-P25	GND		
CON1-P26	PH24	PH24	CSI1-PCLK
CON1-P27	TWI3-SDA	PI1	
CON1-P28	TWI3-SCK	PI0	
CON1-P29	PH0	PH0	CSI1-D0
CON1-P30	GND		
CON1-P31	PH1	PH1	CSI1-D1
CON1-P32	PD20	PD20	CSI1-MCLK
CON1-P33	PH2	PH2	CSI1-D2
CON1-P34	GND		
CON1-P35	PH3	PH3	CSI1-D3
CON1-P36	UART5-RX	PH7	CSI1-D7
CON1-P37	UART4-TX	PH4	CSI1-D4
CON1-P38	UART5-TX	PH6	CSI1-D6
ON1-P39	GND		

| CON1-P40 | UART4-RX | PH5 | CSI1-D5 |

CSI Camera Connector specification:

The CSI Camera Connector is a 24-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 "Camera".

CSi Camera connector GPIO of Banana pi BPI-M2 Ultra		
CSI Pin Name	Default Function	Function2：GPIO
CN5-P01	NC	
CN5-P02	GND	
CN5-P03	CSI0-SDA	PI3
CN5-P04	CSI0-AVDD	
CN5-P05	CSI0-SCK	PI2
CN5-P06	CSI0-Reset	PI7
CN5-P07	CSI0-VSYNC	PE3
CN5-P08	CSI0-PWDN	PI6
CN5-P09	CSI0-HSYNC	PE2
CN5-P10	CSI0-DVDD	
CN5-P11	CSI0-DOVDD	
CN5-P12	CSI0-D7	PE11
CN5-P13	CSI0-MCLK	PE1
CN5-P14	CSI0-D6	PE10
CN5-P15	GND	
CN5-P16	CSI0-D5	PE9
CN5-P17	CSI0-PCLK	PE0
CN5-P18	CSI0-D4	PE8
CN5-P19	CSI0-D0	PE4
CN5-P20	CSI0-D3	PE7
CN5-P21	CSI0-D1	PE5
CN5-P22	CSI0-D2	PE6
CN5-P23	GND	
CN5-P24	CSI0-AFVCC	

Display specification

MIPI DSI \(Display Serial Interface\)

The display Connector is a 40-pin FPC connector which can connect external LCD panel \(MIPI DSI\) 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 "DSI".

40 PIN GPIO of Banana pi BPI-M2 Ultra		
DSI Pin Name	Default Function	Function2：GPIO
CN6-P01	VCC-3V3	
CN6-P02	IPSOUT	
CN6-P03	VCC-3V3	
CN6-P04	IPSOUT	
CN6-P05	GND	
CN6-P06	IPSOUT	
CN6-P07	GND	
CN6-P08	IPSOUT	
CN6-P09	NC	
CN6-P10	GND	
CN6-P11	NC	
CN6-P12	DSI-D0N	
CN6-P13	NC	
CN6-P14	DSI-D0P	
CN6-P15	NC	
CN6-P16	GND	
CN6-P17	TWI0-SDA	PB19
CN6-P18	DSI-D1N	
CN6-P19	TWI0-SCK	PB18
CN6-P20	DSI-D1P	
CN6-P21	CTP-INT	PI10
CN6-P22	GND	
CN6-P23	CTP-RST	PI11
CN6-P24	DSI-CKN	
CN6-P25	GND	
CN6-P26	DSI-CKP	
CN6-P27	LCD-BL-EN	PH16
CN6-P28	GND	
CN6-P29	LCD-RST	PH17
CN6-P30	DSI-D2N	
CN6-P31	LCD-PWR-EN	PH18
CN6-P32	DSI-D2P	
CN6-P33	GND	
CN6-P34	GND	
CN6-P35	LCD-PWM	PB2
CN6-P36	DSI-D3N	
CN6-P37	GND	
CN6-P38	DSI-D3P	
CN6-P39	NC	

CN6-P40	GND	

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.

CON4 Uart GPIO of Banana pi BPI-M2 Ultra		
CON2 Pin Name	Default Function	GPIO
CON2 P03	UART0-TXD	
CON2 P02	UART0-RXD	
CON2 P01	GND	

Software

TinaLinux

Allwinner Tina-IoT os for BPI-M2 Ultra/BPI-M2 Berry

Development

Basic Development

Resources

- Because of the Google security update some of the old links will not work if the images you want to use cannot be downloaded from the new link bpi-image Files (https://drive.google.com/drive/folders/0B_YnvHgh2rwjVjNyS2phe EtWQlk?resourcekey=0-U4TI84zIBdId7bHHjf2qKA)
- All banana pi docement(SCH file,DXF file,and doc) (https://drive.google.com/drive/folders/0B4PAo2nW2Kfndjh6S W9MS2xKSWs?resourcekey=0-qXGFXKmd7AVy0S81OXM1RA&usp=sharing)
- Schematics:google driver (https://drive.google.com/drive/folders/0B4PAo2nW2KfnflVqbjJGTFlFTTd1b1o1OUxD Nk5ackVDM0RNUjBpZ0FQU19SbDk1MngzZWM?resourcekey=0-ZRCiv304nGzvq-w7lwnpjg&usp=sharing)
- Dimensional diagram BPI-M2 Berry dxf file (https://drive.google.com/file/d/0B4PAo2nW2Kfnci1xaHd5eWtseEU/v iew?usp=sharing)
- Allwinner R40/V40 datasheet

    Allwinner V40 datasheet (https://drive.google.com/file/d/0B4PAo2nW2KfneE54VzVOdHpITzA/view?usp=s haring)
    Allwinner R40 datasheet (https://drive.google.com/file/d/0B4PAo2nW2KfnbVp2TmRMYUdPUGM/view?us p=sharing)
    Allwinner R40 User Manual v1.0 (https://github.com/tinalinux/docs/blob/r40-v1.y/Allwinner_R40_User_M anual_V1.0.pdf)
    axp221s PMU datasheet (https://drive.google.com/file/d/0B4PAo2nW2KfnM2pnT19zZW5qOTA/view?usp=s haring)

- Banana pi BPI-M2 Berry CE,FCC,RoHS

    CE FCC RoHS (https://bananapi.gitbooks.io/bpi-m2-ultra-open-source-single-board-computer/content/bpi-m2 -berry-cefcc-rohs-certification.html)

- BPI-M2 Ultra/Berry Touch work : https://forum.banana-pi.org/t/discuss-bpi-m2-ultra-touch-doesnt-work/15980

Image Release

Android 6.0

- 2017-08-25 update
- HDMI-Version,LCD5-Version LCD7-Version,please choose which you are need:

    google Drive : https://drive.google.com/drive/folders/0B_YnvHgh2rwjNFRpVFlhcW56LUk?resourcekey=0-95UrcQ-bb0Bh-RDtLRp-0w

- forum pthread : http://forum.banana-pi.org/t/bpi-m2-ultra-bpi-m2-berry-new-image-android-6-0-version-v1-2017-08-25/3731

Ubuntu

- 2022-04-16 Banana Pi new image: Ubuntu 16.04 with Allwinner BSP, use MPV play 1080P video,Allwinner BSP kernel 3.4 , BPI-M2 Ultra/Berry use kernel 3.10

    google driver: https://drive.google.com/drive/folders/1DEO7JdMfDhHynC83K7JMxgnNxf1gV82S
    discuss on forum: https://forum.banana-pi.org/t/banana-pi-new-image-ubuntu-16-04-with-allwinner-bsp-use-mpv-play-1080p-video/13272

- 2020-04-19 update, kernel 3.10.108

    Ubuntu 16.04 mate desktop Download (https://download.banana-pi.dev/d/3ebbfa04265d4dddb81b/?p=%2FImages%2FBPI-M2U%2FUbuntu16.04&mode=list)
    Ubuntu 16.04 server Download (https://download.banana-pi.dev/d/3ebbfa04265d4dddb81b/?p=%2FImages%2FBPI-M2U%2FUbuntu16.04&mode=list)

- 2019-05-13 update banana pi M2U board which is based on A40I, R40, V40, and it is based on Ubuntu 16.04 & Raspbian 9 & Debian 9 Operation system with kernel 3.10.108

    BPI-M2U Ubuntu 16.04 Features Map:http://wiki.banana-pi.org/M2U/Berry_Image_Map#Ubuntu_16.04
    Desktop images:

        Google Drive :https://drive.google.com/file/d/1Q8MGksdugAsMhy4slj50Rp9P0eeDUQFo/view?usp=sharing
        Baidu Drive : https://pan.baidu.com/s/1Aap1emViG6Vh2ejVHPtZhg?pwd=xfd5 (PinCode:xfd5)
        MD5 : cde8fd1165b54c633bcc5288e8447c2b

    Server images:

        Google Drive : https://drive.google.com/open?id=1vcuIpQ7O2SFB3cZ4UemOqR2hQkxHy3RF
        Baidu Drive : https://pan.baidu.com/s/18Cp7zeuHxa82z5OU_tV_oQ (PinCode：qat4)
        MD5 : 07981887a7a21f5cda72ab8a1e37a834

    Forum pthread : http://forum.banana-pi.org/t/bpi-m2u-berry-new-image-release-ubuntu-16-04-raspbian-9-4-debian-9-4-2019-05-13/9225

- 2018-01-04 update BPI-M2 Ultra/Berry Ubuntu 16.04 image

    Google Drive : https://drive.google.com/file/d/1G4Ggkne63ofD51Yt2c-x5-qy9h7BgY4_/view?usp=sharing
    baidu cloud : https://pan.baidu.com/s/1cFHYGY1
    MD5: a61e6f66a5ea2288fff0c3acff12d633

- 2017-11-13 update

    Google Drive : https://drive.google.com/file/d/19PI9yuL9iFa4bU6dh7ym3tcCHhjAh-cM/view?usp=sharing

baidu cloud : http://pan.baidu.com/s/1nvccOlz
MD5: 4655b896a3c4e1958a15bb8ca45ac4fe
forum pthread : http://forum.banana-pi.org/t/bpi-m2-ultra-bpi-m2-berry-new-image-2017-11-13-ubuntu-16-04-mate-desktop-beta2-bpi-m2u-sd-emmc-img/4182

Debian

- 2020-04-19 update, kernel 3.10.108

  Debian 9 stretch mate desktop Download (https://download.banana-pi.dev/d/3ebbfa04265d4dddb81b/?p=%2FImages%2FBPI-M2U%2FDebian9&mode=list)
  Debian 9 stretch lite Download (https://download.banana-pi.dev/d/3ebbfa04265d4dddb81b/?p=%2FImages%2FBPI-M2U%2FDebian9&mode=list)

- 2019-05-13 update banana pi M2U board which is based on A40I, R40, V40, and it is based on Ubuntu 16.04 & Raspbian 9 & Debian 9 Operation system with kernel 3.10.108

  BPI-M2U Debian 9 Features Map:http://wiki.banana-pi.org/M2U/Berry_Image_Map#Debian_9
  Desktop images :

    Google Drive :
    Baidu Drive : https://pan.baidu.com/s/1ZqDZT4dOQNyvsu0nT4oMTg (PinCode:kshd)
    MD5 : 7e5d848f804bc5ffb8854a93d7488694

  Server images:

    Google Drive : https://drive.google.com/open?id=1aoB8mGwSveNztB-EO_fBKLOr-GdzcMNV
    Baidu Drive : https://pan.baidu.com/s/1V0djGvUR7QJFMeAgZV86zg (PinCode:e0t6)
    MD5 : b7314d444dc13a40e1dd7b1602436f40

  Forum pthread : http://forum.banana-pi.org/t/bpi-m2u-berry-new-image-release-ubuntu-16-04-raspbian-9-4-debian-9-4-2019-05-13/9225

- 2017-11-13 update debian-9-stretch-mate-desktop

  Google Drive : https://drive.google.com/file/d/0B_YnvHgh2rwjeTh4TmlnMGl5X3M/view?usp=sharing
  baidu cloud : http://pan.baidu.com/s/1c1LvS1y
  MD5: 0a1fad281c24902148b16276a79bac12

- 2017-11-13 update debian-9-stretch-lite

  Google Drive: https://drive.google.com/file/d/0B_YnvHgh2rwjOWg1OW9heWZsYm8/view?usp=sharing
  baidu cloud: http://pan.baidu.com/s/1c3zxCy 13
  MD5: cff677aa94ca5345fc6e26379cfe4e95

- forum pthread : http://forum.banana-pi.org/t/bpi-m2-ultra-bpi-m2-berry-new-image-2017-08-28-debian-sd-emmc-img/3745/2

Raspbian

- 2020-04-19 update, kernel 3.10.108

  https://drive.google.com/drive/folders/0B_YnvHgh2rwjR0JsaUltalFXanc?resourcekey=0-sP6nS_7yziua5nmCfFQmAw&usp=share_link

- 2019-05-13 update banana pi M2U board which is based on A40I, R40, V40, and it is based on Ubuntu 16.04 & Raspbian 9 & Debian 9 Operation system with kernel 3.10.108

  BPI-M2U Raspbian 9 Features Map:http://wiki.banana-pi.org/M2U/Berry_Image_Map#Raspbian_9.4
  Desktop image :

    Google Drive : https://drive.google.com/file/d/146--P5XiX9F_Dn8JzC3gRApGBQUUcEzH/view?usp=sharing

Baidu Drive : https://pan.baidu.com/s/1ngowiaK1q20MbQMQzXabDw?pwd=8888
(PinCode:8888)
MD5 : f7ee24ff15654724e2c7ec3bf72c8506
Forum pthread : http://forum.banana-pi.org/t/bpi-m2u-berry-new-image-release-ubuntu-16-04-raspbian-9-4-debian-9-4-2019-05-13/9225

- 2018-05-24 update Raspbian jessie 8.0 V1.1

  Google Drive : https://drive.google.com/file/d/0B_YnvHgh2rwjRGlUMUdqZk5ETDg/view?usp=sharing
  baidu cloud : https://pan.baidu.com/s/1UnMPtGBNp3-8KHDZPhVOUg
  forum pthread : http://forum.banana-pi.org/t/banana-pi-bpi-m2u-berry-new-image-release-raspbian-jessie-8-0-2018-5-24/5812

- 2017-05-25 update raspbian jessie

  Google Drive : https://drive.google.com/file/d/0B_YnvHgh2rwjRGlUMUdqZk5ETDg/view?usp=sharing
  baidu cloud : https://pan.baidu.com/s/1civq4e
  MD5: 60e19ea9138d6841fa6852ece4727b0a
  forum pthread : http://forum.banana-pi.org/t/banana-pi-bpi-m2-ultra-bpi-m2-berry-new-image-2017-05-25-raspbian-jessie-preview3-bpi-m2u-sd-emmc-img/3306

Armbian

- 2023-07 BPI-M2 Berry Armbian_23.08.0 wiringpi

  Google Drive:https://drive.google.com/file/d/1RaZcDPDp6a5otU8rrbGKhBKFVJ-As426/view?usp=drivesdk
  Baidu Cloud:https://pan.baidu.com/s/1tOa_BymrKNXYTHciInmkXg?pwd=8888

- 2023-07 BPI-M2 Berry Armbian_23.08.0

  Google Drive:https://drive.google.com/drive/folders/1DBvBi5RsPWYvgw7j2Gwq8JyOoDg-TXJw?usp=sharing
  Baidu Cloud: https://pan.baidu.com/s/1qZqTYBfM2oK03RARcTEqng?pwd=8888 (pincode: 8888)

- 2023-07 BPI-M2 Berry Armbian_23.05.0

  Google Drive:https://drive.google.com/drive/folders/1mzcyy11sJyg0ZrDzdKj4JVjo9qrDjRyb?usp=sharing
  Baidu Cloud: https://pan.baidu.com/s/1XYg5KjoAaxewIpv9NT-gcA?pwd=8888 (pincode: 8888)

- Armbian_23.02.0-trunk_Bananapim2ultra_jammy_edge_6.1.11_xfce_desktop.img

  Google Drive: https://drive.google.com/drive/folders/1VpvVkYMqgmSnmfKXQSrEY2B6wRa-cggL?usp=share_link
  Baidu Cloud: https://pan.baidu.com/s/1hkkl22uVjvRct1V7N4OK2w?pwd=8888
  Disucss on forum: https://forum.banana-pi.org/t/banana-pi-bpi-m2-berry-new-armbian-image/15140

- 2022-12-06 Armbian_22.11.0-trunk_Banana Pi BPI-M2 Berry_bullseye_edge_6.0.9.img.xz

  Google Drive:https://drive.google.com/file/d/1vyK13DB2Z1OMjGE9Wd1XHYIMFPZ8UuZI/view?usp=share_link
  Baidu Cloud:https://pan.baidu.com/s/1GMUZGZcWWXPKRSW1X5fRKw?pwd=8888 (pincode: 8888)
  Discuss on forum: https://forum.banana-pi.org/t/bananapi-bpi-m2-berry-new-image-release-armbian-bullseye/14451

- Armbain have support BPI-M2 Ultra/BPI-M2 Berry，Armbian Bionic btea and Armbian Stretch beta version

  image download：https://www.armbian.com/bananapi-m2u/
  Boot logs : http://ix.io/1kVQ
  Forum pthread : http://forum.banana-pi.org/t/armbian-bionic-and-stretch/6573

Tina IoT Linux

- BPI-M2 Ultra / BPI-M2 Berry support Allwinner TinaLinux .

  more please see : Tina Linux

RPiTC v3 1.12

- 2017-11-28 updtae
- RPiTC v3 1.12 for Banana Pi (BPI-M2U/BPI-M2B/BPI-M2P/BPI-M3/BPI-M64/BPI-R2): download link (http://forum.banana-pi.org/t/rpitc-v3-1-12-for-banana-pi-bpi-m2u-bpi-m2b-bpi-m2p-bpi-m3-bpi-m64-bpi-r2/4292)

Others

- kali linux,crux linux,archlinux,centos linux for BPI-M2 Ultra & BPI-M2 Berry : kali linux,crux linux,archlinux,centos linux 2017-08-25 (http://forum.banana-pi.org/t/bpi-m2-ultra-bpi-m2-berry-new-image-2017-8-28-kali-linux-crux-linux-archlinux-centos-linux-image/3750)

- please download here: http://forum.banana-pi.org/c/Banana-pi-BPI-M2-Ultra/M2Uimage

FAQ

Easy to buy

- SINOVOIP Aliexpress Shop: https://www.aliexpress.com/store/group/BPI-M2-Berry/1100417230_40000003434388.html
- Bipai Aliexpress Shop: https://www.aliexpress.com/store/group/BPI-M2-Berry/1101951077_40000003547464.html
- Taobao Shop: https://shop108780008.taobao.com/category-1694930635.htm
- OEM&ODM, please contact: judyhuang@banana-pi.com

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