





Banana Pi Open-Source Router Board

The Banana Pi Router Board is a 300Mbps Wireless N Router with both wired and wireless network connections designed specifically for smart home networking use. With 2T2R MIMO Technology and two detachable antennas, the R1 is the dual core Android 4.2 product which more better than Linux product. It can run with Android 4.2.2 smoothly and with Gigabit ethernet port, SATA Socket, it can easily run with the game and support 1080P high definition video output.

Art.-Nr. 114153





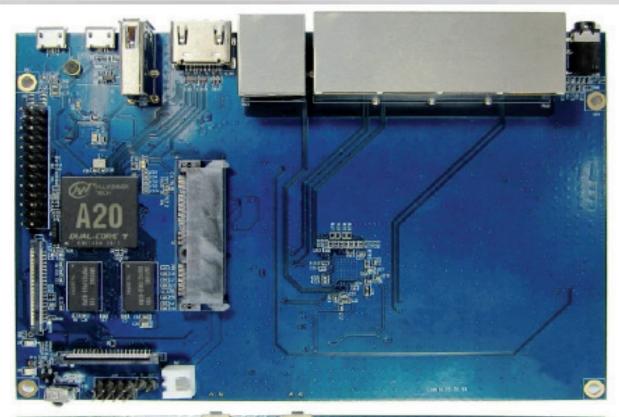
Hardware	Specification	
CPU	A20 ARM Cortex™-A7 Dual-Core	
GPU	ARM Mali400MP2Complies with OpenGL ES 2.0/1.1	
Memory (SDRAM)	1GB DDR3 (shared with GPU)	
Onboard Storage	Micro SD (Max. 64GB) card slot UP to 2T on 2.5 SATA disk	
Onboard Network	10/100/1000 Ethernet RJ45, WLAN @802.11b/g/n	
Video Input	A CSI input connector allows for the connection of a designed camera module	
Video Outputs	HDMI, LVDS/RGB	
Audio Output	3.5 mm Jack and HDMI	
Audio Input	Microphone	
Power Source	5 volt via Micro USB(DC In Only)	
USB 2.0 Ports	USB Host and Micro USB (OTG)	
Buttons	Reset button: Next to Power button Power button: Next to Battery connector	
GPIO(2X13) pin	GPIO,UART,I2C bus ,SPI bus with two chip selects, CAN bus,ADC,PWM,+3.3v,+5v,ground.	
LED	Power Key & RJ45	
Remote	IR	
OS	Android 4.2, Linux	
Interface definition		
Product size	148 mm × 100mm	
Weight	83g	





Hardware

Front:



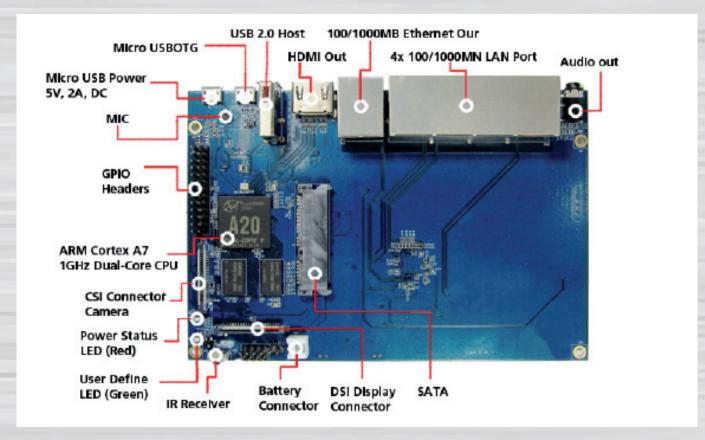
Back:



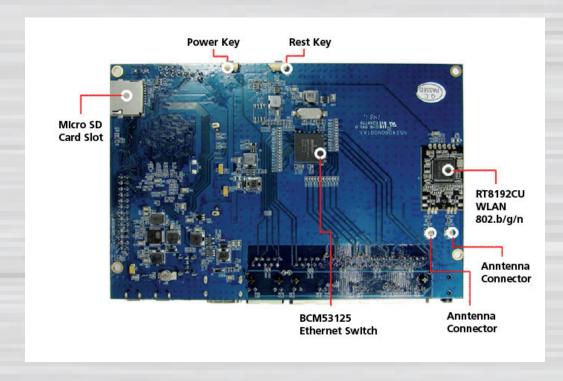




Interface:



Front:

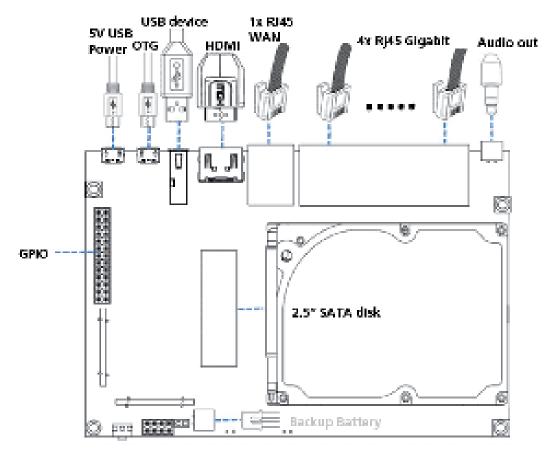




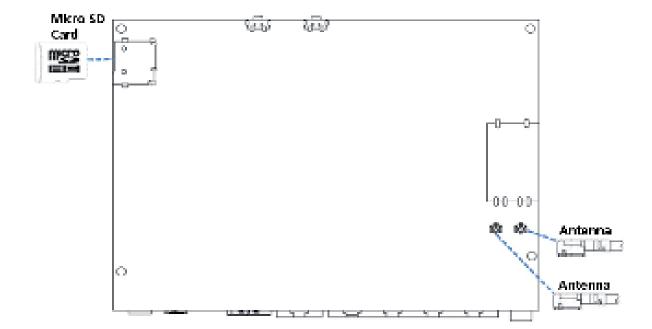


Hardware connect sketch map:





Front:







Use method

Step 1: Get what you need

First time to enjoy your R1, you need at least the accessories in the table below.

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No.	Item	Minimum recommended specification & notes
1	Micro SD card	 Minimum size 8Gb; class 10 (the class indicateshow fast the card is). We recommend using branded SD cards as they are more reliable.
2	HDMI(Full sized) to HDMI / DVI lead	- HDMI to HDMI lead (for HD TVs and monitors with HDMI input) ORHDMI to DVI lead (for monitors with DVI input).
3	Mouse	- Any standard USB keyboard and mouse should work.
		 Mice or Keyboards 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	- Networking is must of router.
5	Micro USB power adapter	- A good quality, micro USB power supply that can provide at least 2A at 5V is essential.
6	Audio lead (Optional)	- You can choose a 3.5mm jack audio lead toconnect to audio port to get stereo audio.
7	Mobile Hard disk (Optional)	- You can choose to connect a mobile hard disk to SATA port to store more files.
8	Antenna	- You can choose two 2.4GHz WIFI antennas to connect to antenna ports to get advanced wireless performance.

HDMI to HDMI lead



HDMI to DVI lead



Micro SD card



Micro USB power adapter



WiFi antenna



Step 2:Download the relevant Image file:

Please visit our website: http://www.bananapi.com to download image, R1 all image can be downlad form this web.

Step3: Prepare your Micro SD card for the R1

In order to enjoy your R1, you will need to install an Operating System (OS) onto an micro SD card. Instructions below will teach you how to write an OS image to your SD card under Windows.



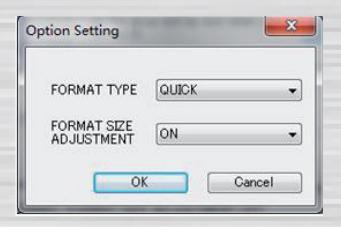


- 1. Insert your micro SD card into your computer. The size of micro SD should be larger than the OS image size, generally 8GB or greater.
- 2. Format the micro SD card.

Windows:

- i. Download the a micro SD card format tool such as SD Formatter from https://www.sdcard.org/downloads/formatter_4/eula_windows/
- ii. Unzip the download file and run the setup.exe to install the tool on your machine.
- iii. In the "Options" menu, set "FORMAT TYPE" option to QUICK, "FORMAT SIZE ADJUSTMENT" option to "ON".



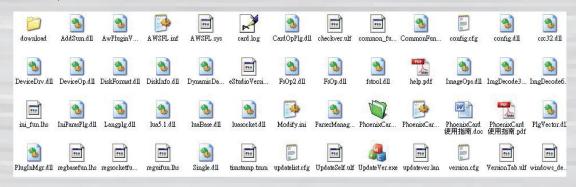


- iv. Check that the SD card you inserted matches the one selected by the Tool.
- v. Click the "Format" button.
- 3. Download the OS image from Download district.
- 4. Unzip the download file to get the OS image.

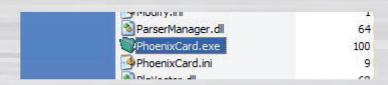


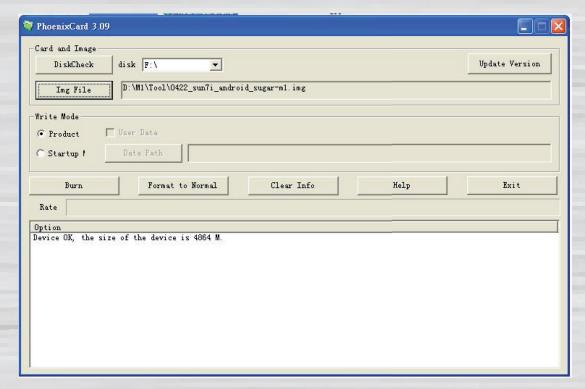


- 5. Write the image file to the micro SD card.
 - 5.1 Preparing
 - 5.1.1 Insert the SD card to PC.
 - 5.1.2 Unpack PhoenixCard_V309.rar you received.
 - 5.1.3 Open it:



5.2 Run PhoenixCard.exe

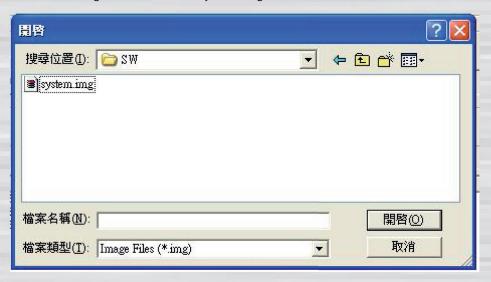




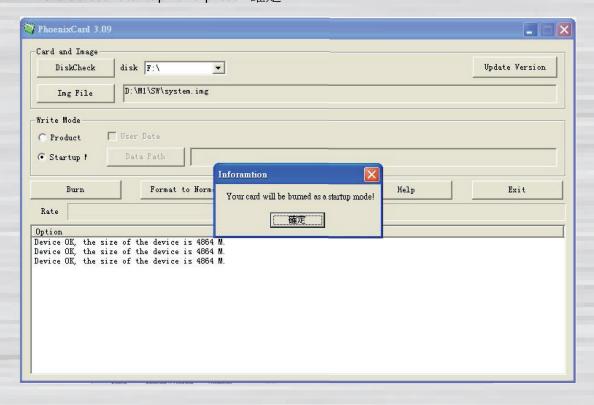




- 5.3 Press "DiskCheck" and select disk of SD Card.
- 5.4 Press "Img File" and Select system.img



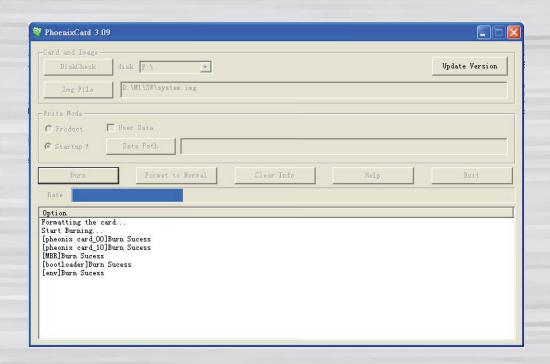
5.5 Select "Startup" and press "確定"



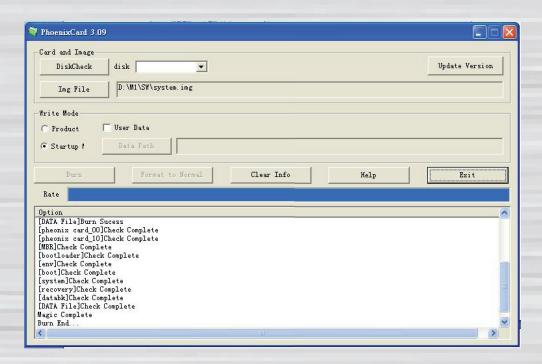
5.6 Press "Burn" start upgrading







5.7 Upgraded complete.



5.8 Press "Exit"

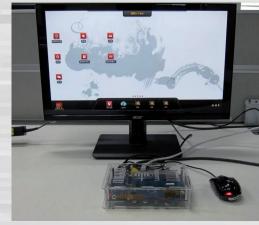




Step4: Set up your R1

According to the set up diagram below, you can easily set up your R1.

- 1. Insert the written-image micro SD card that to the micro SD card slot on the left side edge of the underside of the board.
- 2. The HDMI Type A (Full sized) port is between a USB port and a RJ45 port of the board. Just connect any HDMI cable from the board to your TV or HDMI Monitor.
- 3. Plug a mouse into the USB slot.
- 4. Plug a Ethernet cable into the RJ45 slot.
- 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 ±2% and at least 2A. If all goes well, the R1 will boot in a few minutes. The screen will display the OS GUI.



Step5: Shut down your R1

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, the splash screen show as below!

Android system screen



GPIO define

We can check R1 PIN definition in this thread, including CON1, CON2, CON3, J12 and J13.

J13 contains the default serial port UARTO (UARTO-RX, UARTO-TX). UATRO is configured to be used for console input/output. Whilst this is useful if you want to login using the serial port. So it is the most common used PIN.

J12 also contains serial port.

CON3 contains CAN bus, SPI bus, PWM, serial port and etc. It can be configured to be used for kinds of peripherals.

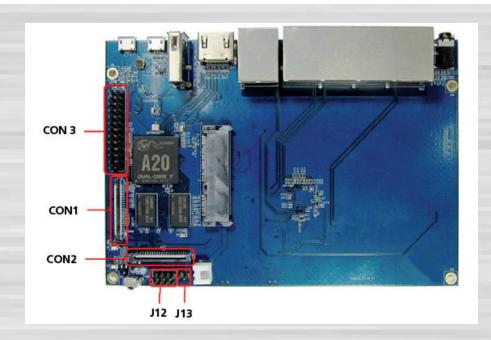
CON1 is a CSI camera connector.

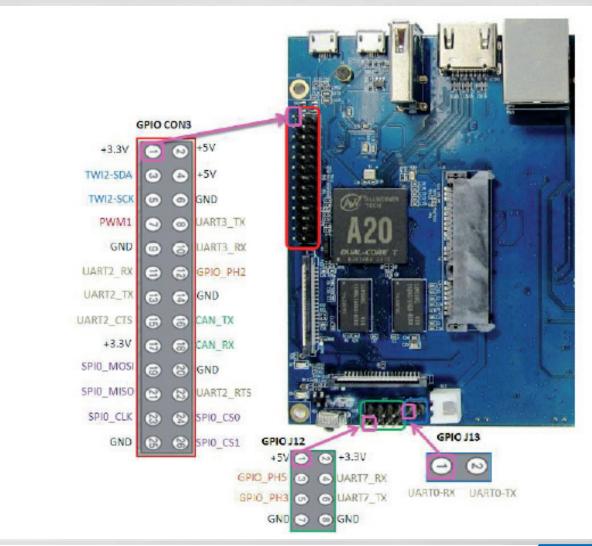
CON2 is a DSI display connector.

Pictures and tables below show the specific layout and definition of PIN.













R1 PIN define

PIN	PIN define	GPIO	
CON1-P01	LINEINL		
CON1-P02	LINEINR		
CON1-P37	HPL		
CON1-P36	HPR		
CON1-P07	FMINL		
CON1-P09	FMINR		
CON1-P04	ADC_X1		
CON1-P06	ADC_X2		
CON1-P08	ADC_Y1		
CON1-P10	A DC_Y2		
CON1-P13	LRADC0		
CON1-P15	LRADC1		
CON1-P33	RESET#		
CON1-P17	CSIO-DO	PE4	
CON1-P19	CSIO-D1	PE5	
CON1-P21	CSIO-D2	PE6	
CON1-P23	CSIO-D3	PE7	
CON1-P25	CSIO-D4	PE8	
CON1-P27	CSIO-D5	PE9	
CON1-P29	CSIO-D6	PE10	
CON1-P31	CSIO-D7	PE11	
CON1-P20	CSIO-PCLK	PEO PEO	
CON1-P24	CSIO-MCLK	PE1	
CON1-P28	CSIO-VSYNC	PE3	
CON1-P30	CSIO-HSYNC	PE2	
CON1-P18	CSIO-STBY-EN	PH19	
CON1-P26	CSIO-RESET#	PH14	
CON1-P32	CSI1-STBY-EN	PH18	
CON1-P34	CSI1-RESET#	PH13	
CON1-P14	TWI1-SDA	PB19	
CON1-P16	TWI1-SCK	PB18	
CON1-P12	CSI0-FLASH	PH17	
CON1-P22	CSIO-PWR-EN	PH16	
CON1-P35	CSI-IO0 PH11	PH11	





R1 PIN define

PIN	PIN define	GPIO	
CON1-P38	IPSOUT		
CON1-P40	IPSOUT		
CON1-P05	GND		
CON1-P11	GND		
CON1-P39	GND		
CON1-P03	VCC-CSI		
CON2-P09	LCD0-D00	PD0	
CON2-P11	LCD0-D01	PD1	
CON2-P13	LCD0-D02	PD2	
CON2-P15	LCD0-D03	PD3	
CON2-P17	LCD0-D04	PD4	
CON2-P19	LCD0-D05	PD5	
CON2-P21	LCD0-D06	PD6	
CON2-P23	LCD0-D07	PD7	
CON2-P25	LCD0-D08	PD8	
CON2-P27	LCD0-D09	PD9	
CON2-P29	LCD0-D10	PD10	
CON2-P31	LCD0-D11	PD11	
CON2-P33	LCD0-D12	PD12	
CON2-P35	LCD0-D13	PD13	
CON2-P37	LCD0-D14	PD14	
CON2-P39	LCD0-D15	PD15	
CON2-P40	LCD0-D16	PD16	
CON2-P38	LCD0-D17	PD17	
CON2-P36	LCD0-D18	PD18	
CON2-P34	LCD0-D19	PD19	
CON2-P32	LCD0-D20	PD20	
CON2-P30	LCD0-D21	PD21	
CON2-P28	LCD0-D22	PD22	
CON2-P26	LCD0-D23	PD23	
CON2-P22	LCD0-CLK	PD24	
CON2-P20	LCD0-CS	PH6	
CON2-P18	LCD0-HSYNC	PD26	





PIN	PIN define	GPIO
CON2-P16	LCD0-VSYNC	PD27
CON2-P14	LCD0-DE	PD25
CON2-P12	LCD0-I02	PH9
CON2-P10	PWM0	PB2
CON2-P08	LCD0-I01	PH8
CON2-P06	LCD0-I00	PH7
CON2-P04	TWI3-SCK	PIO
CON2-P02	TWI3-SDA	PI1
CON2-P01	IPSOUT	
CON2-P03	IPSOUT	
CON2-P05	GND	
CON2-P24	GND	
CON2-P07	VCC-3V3	
CON3-P18	CAN_RX	PH21
CON3-P16	CAN_TX	PH20
CON3-P23	SPIO_CLK	PI11
CON3-P21	SPI0_MISO	PI13
CON3-P19	SPI0_MOSI	PI12
CON3-P24	SPIO_CSO	PI10
CON3-P26	SPIO_CS1	PI14
CON3-P05	TWI2-SCK	PB20
CON3-P03	TWI2-SDA	PB21
CON3-P15	UART2_CTS	PI17
CON3-P22	UART2_RTS	PI16
CON3-P11	UART2_RX	PI19
CON3-P13	UART2_TX	PI18
CON3-P10	UART3_RX	PH1
CON3-P08	UART3_TX	PH0
CON3-P12	PH2	PH2
CON3-P07	PWM1	PI3
CON3-P01	VCC-3V3	
CON3-P17	VCC-3V3	
CON3-P02	VCC-5V	
CON3-P04	VCC-5V	
CON3-P09	GND	





PIN	PIN define	GPIO
CON3-P25	GND	
CON3-P06	GND	
CON3-P14	GND	
CON3-P20	GND	
J12-P03	PH5	PH5
J12-P05	PH3	PH3
J12-P04	UART7_RX	PI21
J12-P06	UART7_TX	PI20
J12-P01	VCC-5V	
J12-P02	VCC-3V3	
J12-P07	GND	
J12-P08	GND	
J13-P01	UARTO-RX	PB23
J13-P02	UARTO-TX	PB22

R1 UART define

