


BPI-CM4 Introduction




BananaPi BPI-CM4 new design with Amlogic A311D Quad core ARM Cortex-A73 and dual core ARM Cortex-A53 CPU ,ARM G52 MP4(6EE) GPU,NPU for AI at 5.0 TOPS, support Camera and MIPI-CSI interface ,HDMI output,2 Gigabit port . 4G RAM and 16 GB eMMC flash.



Banana Pi BPI-CM4

- Amlogic A311D 4xARM A73+ 2xARM A53
- ARM Mali-G52 MP4 graphics
- Compatible with raspberry Pi CM4
- NPU for AI : 5.0 TOPS
- 4GB LPDDR4
- 16G eMMC flash



for A311D chip PIN limited . just support 1 HDMI ,1 CSI and 1 DSI , Raspberry Pi support 2 HDMI ,2 CSI and 2 DSI , Other is Pin2Pin . you can use Raspberry Pi CM4 baseboard.

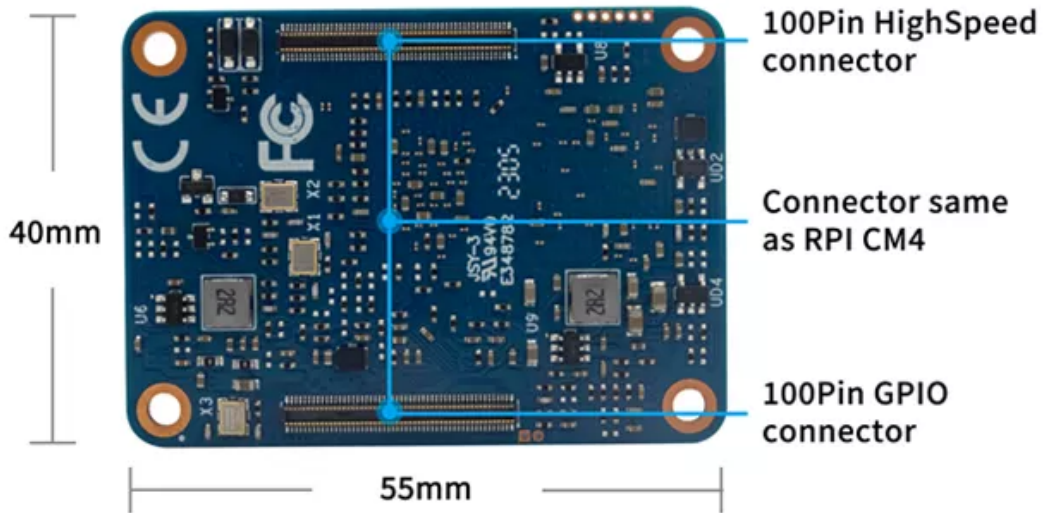
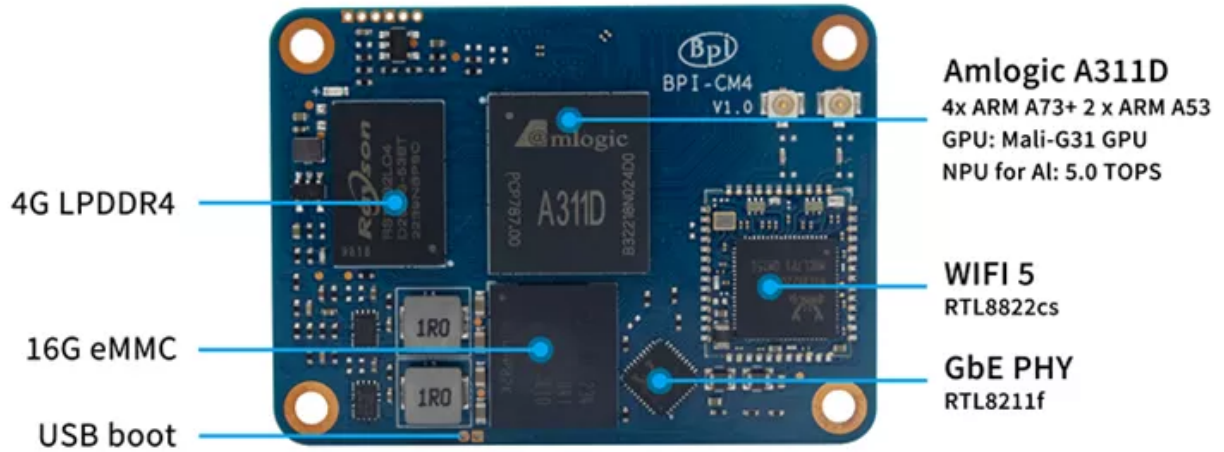
Key Features

- Amlogic A311D Quad core ARM Cortex-A73 and dual core ARM Cortex-A53 CPU ,ARM G52 MP4(6EE) GPU
- NPU for AI :Next generation, deep-neural-network applications, at 5.0 TOPS
- 4GB LPDDR4 RAM
- 16GB eMMC flash (Max 128G)
- support MIPI DSI Display interface
- support MIPI CSI Camera interface
- Minipcie
- HDMI output
- 26 PIN GPIO
- support Android and Linux system.
- Size: 55x40mm

Getting Start

Hardware

BPI-CM4 Module Hardware interface



BPI-CM4 Module PIN Out define

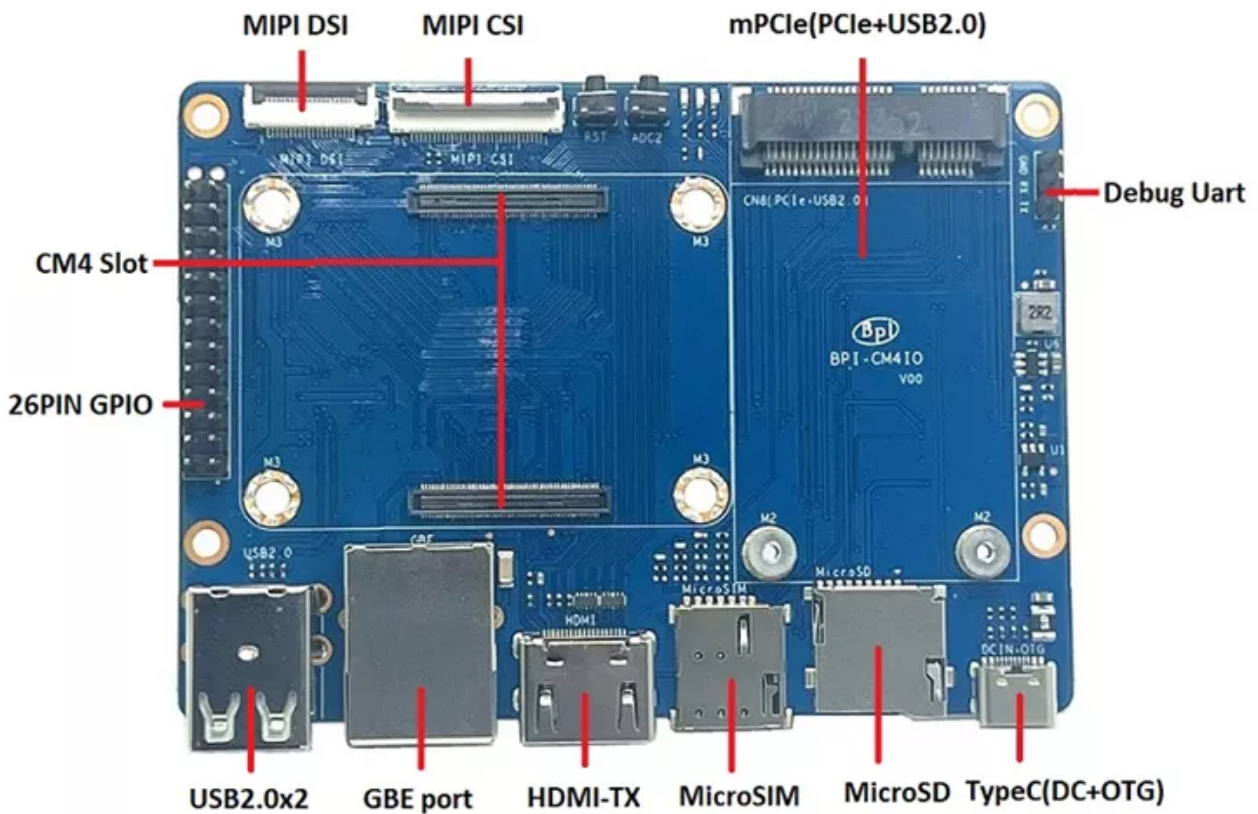
Banana pi BPI-CM4 PIN Out define VS Raspberry PI CM4

BPI-CM4	RPI CM4	PIN	PIN	RPI CM4	BPI-CM4
GND	GND	1	2	GND	GND
NAT0_MDI3p	Ethernet_Pair3_P	3	4	Ethernet_Pair1_P	NAT0_MDI1p
NAT0_MDI3n	Ethernet_Pair3_N	5	6	Ethernet_Pair1_N	NAT0_MDI1n
GND	GND	7	8	GND	GND
NAT0_MDI2n	Ethernet_Pair2_N	9	10	Ethernet_Pair0_N	NAT0_MDI0n
NAT0_MDI2p	Ethernet_Pair2_P	11	12	Ethernet_Pair0_P	NAT0_MDI0p
GND	GND	13	14	GND	GND
Ethernet_LED2/1G_Active	Ethernet_nLED3_1G-Active	15	16	Ethernet_SYNC_IN	LINUX_Debug_RX

Ethernet_LED1/Link	Ethernet_nLED2_1G-Link	17	18	Ethernet_SYNC_OUT	LINUX_Debug_TX
Ethernet_0_LED0/CFG_EXT	Ethernet_nLED1_Y	19	20	EEPROM_nWP	NC
SYS_LED2	Pi_nLED_Activity	21	22	GND	GND
GND	GND	23	24	I2S_MCLK/GPIO26	GPIOA_0
GPIOA_3	GPIO21/I2S_DO	25	26	I2S_LRCLK/GPIO19	GPIOA_2
GPIOA_4	GPIO20/I2S_DI	27	28	GPIO13	GPIOA_7
GPIOAO_11	GPIO16	29	30	GPIO6	GPIOAO_10
GPIOH_5	GPIO12	31	32	GND	GND
GND	GND	33	34	GPO5	GPIOH_4
GPIOA_15	ID_SC	35	36	ID_SD	GPIOA_14
GPIOAO_5	GPIO7/SPI-CE1	37	38	SPI-CLK/GPIO11	GPIOX_11
GPIOX_10	GPIO8/SPI-CE0	39	40	SPI-MISO/GPIO9	GPIOX_9
GPIOA_11	GPIO25	41	42	GND	GND
GND	GND	43	44	SPI-MOSI/GPIO10	GPIOX_8
GPIOA_12	GPIO24/UART0-CTS	45	46	GPIO22	GPIOA_5
GPIOA_13	GPIO23/UART0-RTS	47	48	UART1-RXD/GPIO27	GPIOA_6
GPIOA_1	GPIO18/I2S_SCLK	49	50	UART1-TXD/GPIO17	GPIOA_9
GPIOX_7	GPIO15/UART0-RXD	51	52	GND	GND
GND	GND	53	54	PWM/GPIO4	GPIOA_10
GPIOX_6	GPIO14/UART0-TXD	55	56	SCL/GPIO3	GPIOX_18
SD_CLK_B	SD_CLK	57	58	SDA/GPIO2	GPIOX_17
GND	GND	59	60	GND	GND
SD_D3_B	SD_DAT3	61	62	SD_CMD	SD_CMD_B
SD_D0_B	SD_DAT0	63	64	SD_DAT5	NC
GND	GND	65	66	GND	GND
SD_D1_B	SD_DAT1	67	68	SD_DAT4	NC
SD_D2_B	SD_DAT2	69	70	SD_DAT7	NC
GND	GND	71	72	SD_DAT6	NC
NC	SD_VDD_Override	73	74	GND	GND
TF_VDD_EN	SD_PWR_ON	75	76	Reserved/SD_DET	CARD_DET
+5V_Input	+5V_Input	77	78	GPIO_VREF	NC
+5V_Input	+5V_Input	79	80	SCL0_Camera_3V3	GPIOH_7
+5V_Input	+5V_Input	81	82	SDA0_Camera_3V3	GPIOH_6
+5V_Input	+5V_Input	83	84	CM4_3V3_OUTPUT	CM4_3V3_OUTPUT
+5V_Input	+5V_Input	85	86	CM4_3V3_OUTPUT	CM4_3V3_OUTPUT
+5V_Input	+5V_Input	87	88	CM4_1V8_OUTPUT	CM4_1V8_OUTPUT
NC	WL_nDisable_3V3	89	90	CM4_1V8_OUTPUT	CM4_1V8_OUTPUT
NC	BT_nDisable_3V3	91	92	RUN_PG/Reset_3V3	CPU_RST
NC	nRPIBOOT_3V3	93	94	AnalogIP1/USBC_CC2	SARADC_CH3
SYS_LED	PI_LED_nPWR	95	96	AnalogIP0/USBC_CC1	ADC_KEY
NC	Camera_PWD_GPIO	97	98	GND	GND
NC	GLOBAL_EN_5V	99	100	nEXTRST	GPIOH_8
USBOTG_B_ID	USB_OTG_ID_3V3	101	102	PCIe_CLK_nREQ_3V3	PCIECK_REQN
USBOTG_B_DM	USB_N	103	104	Reserved	USB_A_DP
USBOTG_B_DP	USB_P	105	106	Reserved	USB_A_DM
GND	GND	107	108	GND	GND
PERST0_N	PCIe_nRST_3V3	109	110	PCIe_CLK_P	PCIE_CLKP
NC	VDAC_COMP_TV	111	112	PCIe_CLK_N	PCIE_CLKN
GND	GND	113	114	GND	GND
MIPI_CSI_D0N	CAM1_D0_N	115	116	PCIe_RX_P	PCIE_SOC_RXP
MIPI_CSI_D0P	CAM1_D0_P	117	118	PCIe_RX_N	PCIE_SOC_RXN
GND	GND	119	120	GND	GND

MIPI_CSI_D1N	CAM1_D1_N	121 122	PCIe_TX_P	PCIE_TX0_P
MIPI_CSI_D1P	CAM1_D1_P	123 124	PCIe_TX_N	PCIE_TX0_N
GND	GND	125 126	GND	GND
MIPI_CSI_CLKAN	CAM1_C_N	127 128	CAM0_D0_N	NC
MIPI_CSI_CLKAP	CAM1_C_P	129 130	CAM0_D0_P	NC
GND	GND	131 132	GND	GND
MIPI_CSI_D2N	CAM1_D2_N	133 134	CAM0_D1_N	NC
MIPI_CSI_D2P	CAM1_D2_P	135 136	CAM0_D1_P	NC
GND	GND	137 138	GND	GND
MIPI_CSI_D3N	CAM1_D3_N	139 140	CAM0_C_N	MIPI_CSI_CLKBN
MIPI_CSI_D3P	CAM1_D3_P	141 142	CAM0_C_P	MIPI_CSI_CLKBP
NC	HDMI1_HOTPLUG_5V	143 144	GND	GND
NC	HDMI1_SDA_5V	145 146	HDMI1_TX2_P	NC
NC	HDMI1_SCL_5V	147 148	HDMI1_TX2_N	NC
NC	HDMI1_CEC_5V	149 150	GND	GND
HDMI_TXCEC	HDMI0_CEC_5V	151 152	HDMI1_TX1_P	NC
HDMI_HPDC	HDMI0_HOTPLUG_5V	153 154	HDMI1_TX1_N	NC
GND	GND	155 156	GND	GND
NC	DSI0_D0_N	157 158	HDMI1_TX0_P	NC
NC	DSI0_D0_P	159 160	HDMI1_TX0_N	NC
GND	GND	161 162	GND	GND
NC	DSI0_D1_N	163 164	HDMI1_CLK_P	NC
NC	DSI0_D1_P	165 166	HDMI1_CLK_N	NC
GND	GND	167 168	GND	GND
NC	DSI0_C_N	169 170	HDMI0_TX2_P	HDMI_TX2P
NC	DSI0_C_P	171 172	HDMI0_TX2_N	HDMI_TX2N
GND	GND	173 174	GNF	GND
MIPI_D0_N	DSI1_D0_N	175 176	HDMI0_TX1_P	HDMI_TX1P
MIPI_D0_P	DSI1_D0_P	177 178	HDMI0_TX1_N	HDMI_TX1N
GND	GND	179 180	GND	GND
MIPI_D1_N	DSI1_D1_N	181 182	HDMI0_TX0_P	HDMI_TX0P
MIPI_D1_P	DSI1_D1_P	183 184	HDMI0_TX0_N	HDMI_TX0N
GND	GND	185 186	GND	GND
MIPI_CLK_N	DSI1_C_N	187 188	HDMI0_CLK_P	HDMI_TXCP
MIPI_CLK_P	DSI1_C_P	189 190	HDMI0_CLK_N	HDMI_TXCN
GND	GND	191 192	GND	GND
MIPI_D2_N	DSI1_D2_N	193 194	DSI1_D3_N	MIPI_D3_N
MIPI_D2_P	DSI1_D2_P	195 196	DSI1_D3_P	MIPI_D3_P
GND	GND	197 198	GND	GND
HDMI_SDA	HDMI0_SDA_5V	199 200	HDMI0_SCL_5V	HDMI_SCL

BPI-CM4 moudule base board interface



Banana Pi BPI-CM4 SBC specifications

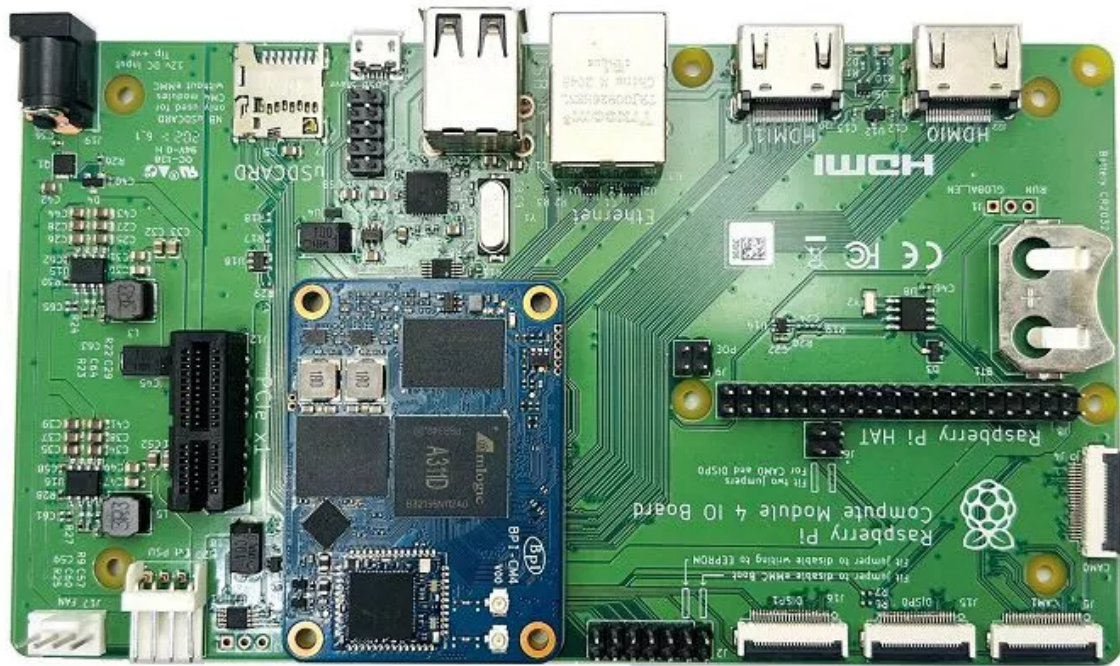
- SoC – Amlogic A311D hexa-core processor with 4x Arm Cortex-A73 cores, 2x Arm Cortex-A53 cores, Arm Mali-G52 MP4 (6EE) GPU with OpenGL ES 3.2, Vulkan 1.0 and OpenCL 2.0 support, 5 TOPS NPU
- System Memory – 4GB LPDDR4
- Storage – 16GB eMMC flash (option up to 128GB), MicroSD card slot
- Video interfaces

HDMI 2.1 output up to 4Kp60
 MIPI DSI connector for display
 MIPI CSI connector for camera

- Networking – 1x Gigabit Ethernet ports one via RTL8211F GbE transceiver
- USB – 2x USB 2.0 Type-A port, 1x USB Type-C port
- Expansion – 26-pin GPIO header
- Debugging – 3-pin header for serial console
- Misc – 2x buttons.
- Power Supply – Via USB-C port or pin header

Same size as RPI CM4

The BPI-CM4 computer module is exactly the same size as the raspberry PI CM4, and adopts the same interface, You can use the universal raspberry PI CM4 module expansion board



Development

Source code

- Linux BSP source code : <https://github.com/BPI-SINOVOIP/BPI-M2S-bsp>
- Android 9 : <https://github.com/BPI-SINOVOIP/BPI-A311D-Android9>
- geerlingguy sbc-reviews : <https://github.com/geerlingguy/sbc-reviews/issues/11>
- BPI-M2S/CM4 Android9 Source Code

Baidu Cloud: <https://pan.baidu.com/s/1rANGEB-1MLPCBXqOR5aYCg?pwd=8888> (pincode: 8888)

Google Drive: https://drive.google.com/drive/folders/1INIABp_MbB5UcwfqujTngGLOZN7YGuWp?usp=share_link

Resources

- Banana Pi BPI-M2S Amlogic A311D / S922X : <https://www.youtube.com/watch?v=9eFXiOtzFI0>
- 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](#)
- All banana pi [docement\(SCH file,DXF file,and doc\)](#)
- Amlogic A311D datasheet: https://drive.google.com/file/d/1SRAY_RDxKhW819uyo9H13zNN2wLG6LDq/view?usp=sharing
- BPI-CM4 Schematic : <https://drive.google.com/file/d/1IXXok1P2OLiW3p8tavkbfEPTGTrM3b-R/view?usp=sharing>
- BPI-CM4 Base board Schematic: <https://drive.google.com/file/d/1IErCKqfWdU7gL7kUod2-wlpG7uE9EiVZ/view?usp=sharing>
- BPI-CM4 DXF file: <https://drive.google.com/file/d/1hTLNCwmYhCuzt9rL6fP0PjK4MTIE5dK6/view?usp=sharing>
- BPI-CM4 Base board DXF file: <https://drive.google.com/file/d/1-K3ESgU63S4ynwwNbe0p3OI1ajOsufQ8/view?usp=sharing>
- UglyScale Present - Banana Pi BPI-CM4 : <https://www.youtube.com/watch?v=9qhAmpjdEfE>
- Banana Pi CM4 Review (VS Compute Raspberrypi CM4) : <https://bret.dk/banana-pi-cm4-review/>

System image

Android

[How to flash Android Image](#)

- 2023-01-12-bpi-m2s-cm4-android9.img

Baidu Cloud: <https://pan.baidu.com/s/1YVI0T9rSNqM3D0I1BRUr7A?pwd=8888> (pincode): 8888

Google Drive: https://drive.google.com/drive/folders/1u8fA6zsMOLnr75U4rvbph02z8YUKe2Y?usp=share_link

Linux

[How to flash Linux Image](#)

Ubuntu

- 2023-01-12-ubuntu-20.04-mate-desktop-bpi-cm4-aarch64-sd-emmc.img

Baidu Cloud: <https://pan.baidu.com/s/1rh55yoEjPWsHXIcna7xEhQ?pwd=8888> (pincode: 8888)

Google Drive: https://drive.google.com/drive/folders/1xd2HA4Vv_U69iREiAUkOfZmmVbjw7yF?usp=share_link

- 2023-01-12-ubuntu-20.04-server-bpi-cm4-aarch64-sd-emmc.img

Baidu Cloud: <https://pan.baidu.com/s/17gu0ToxWmFi2i8VwuiqVDQ?pwd=8888> (pincode:8888)

Google Drive : https://drive.google.com/drive/folders/1i7okuijL3Jd99vf8PYuK7uH8D2t_WJZg?usp=share_link

Debian

- 2023-01-12-debian-10-buster-bpi-cm4-aarch64-sd-emmc.img

Baidu Cloud: <https://pan.baidu.com/s/19aQB16fdo2Si-is76R9LOQ?pwd=8888> (pincode: 8888)

Google Drive: https://drive.google.com/drive/folders/1_k0RYmuZoBBk4GCaDDOD112FDORcV5g2?usp=share_link

Third part image

Armbian



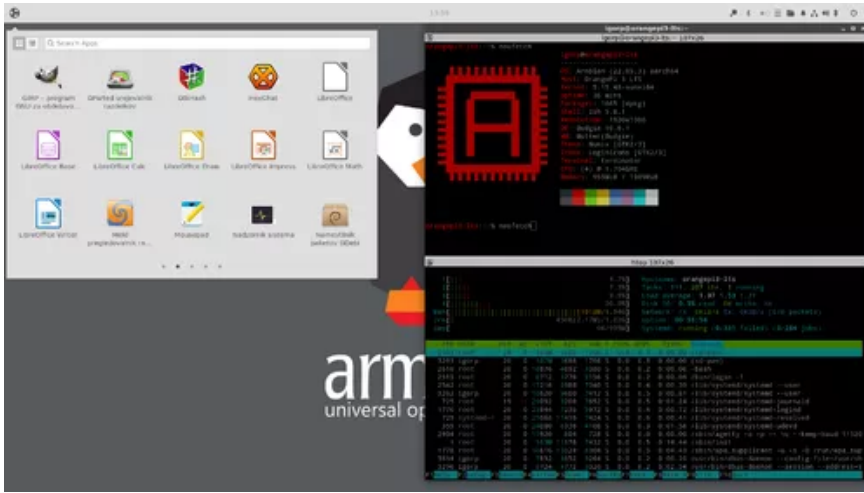
BPI-CM4 is currently on platinum support from armbian. Download the latest images from here:

<https://www.armbian.com/bananapicm4io/>

Armbian is a simple, light, and fast Linux operating system optimized for development boards, offering a user-friendly experience for newcomers and professionals.

The system is designed to minimize SD card wear. It can be accessed via serial, HDMI/VGA, or SSH, with optional special utilities available for further customization.

The system can also be built and customized via the [armbian build utility](<https://github.com/armbian/build>).



BPI-CM4 with VIM3 rootfs image

BPI-CM4 use vim3 rootfs image, you can run the npu demo from khadas wiki on this image, username/password: khadas/khadas or root/khadas

Baidu Link: https://pan.baidu.com/s/1zLQJGf4YQ_45ZLKotKWhhw?pwd=xvvc (pincode: xvvc)

Google drive: <https://drive.google.com/drive/folders/11ReyzqHyalOA010uAo-jKHBYB9E89qVBx>

Easy to buy sample

- BPI Aliexpress shop : https://www.aliexpress.us/item/3256804929238485.html?spm=5261.promotion_single_index.table.1.7d6b4edfN3JCM&gatewayAdapt=glo2usa4itemAdapt&_randl_shipto=L
- SinoVoip Aliexpress shop : <https://www.aliexpress.com/item/1005005115415086.html>
- Taobao shop : <https://item.taobao.com/item.htm?spm=a1z10.5-c-s.w4002-24708246124.11.473c3550I3PVcF&id=696638614755>
- OEM&ODM please contact : judyhuang@banana-pi.com