



ED-IPC2000 Series

Computer for industrial application scenarios based on
Raspberry Pi CM4

EDA Technology Co.,Ltd
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1 Product Overview

ED-IPC2000 series are computers based on Raspberry Pi CM4 for industrial application scenarios. ED-IPC2000 series are compatible with the hardware and software of Raspberry Pi, and its overall size is slightly larger than that of Pi4. It has made a lot of enhancements to industrial applications, adding an aluminum alloy shell outside to greatly improve the heat dissipation performance, and adding additional encryption chips and RTC and other common modules on the board.

1.1 Target Application

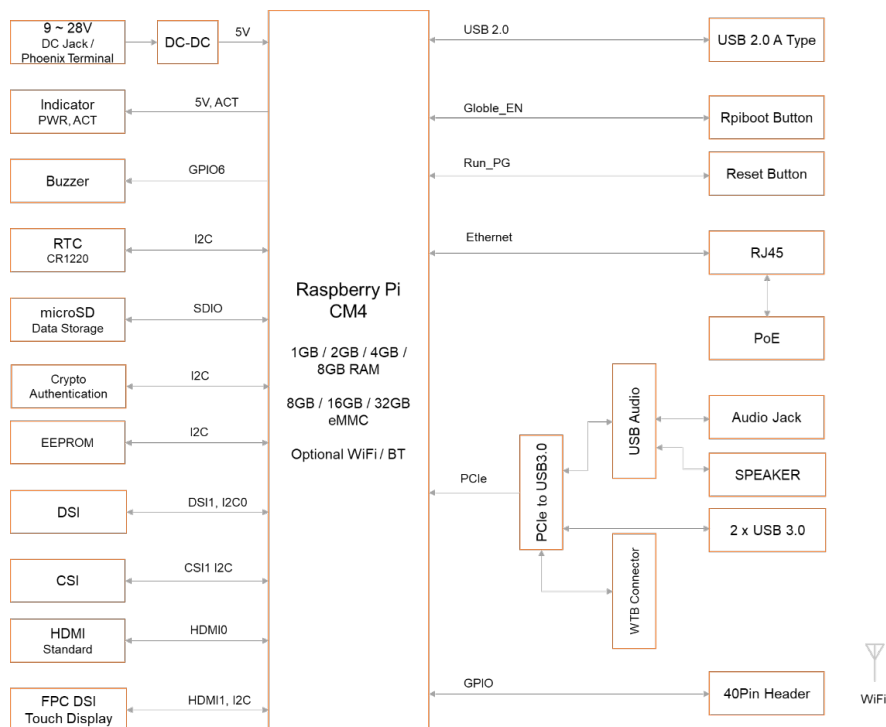
- Multimedia entertainment
- AI development
- Intelligent instrument
- Panoramic display
- Intelligent life

1.2 Specifications and Parameters

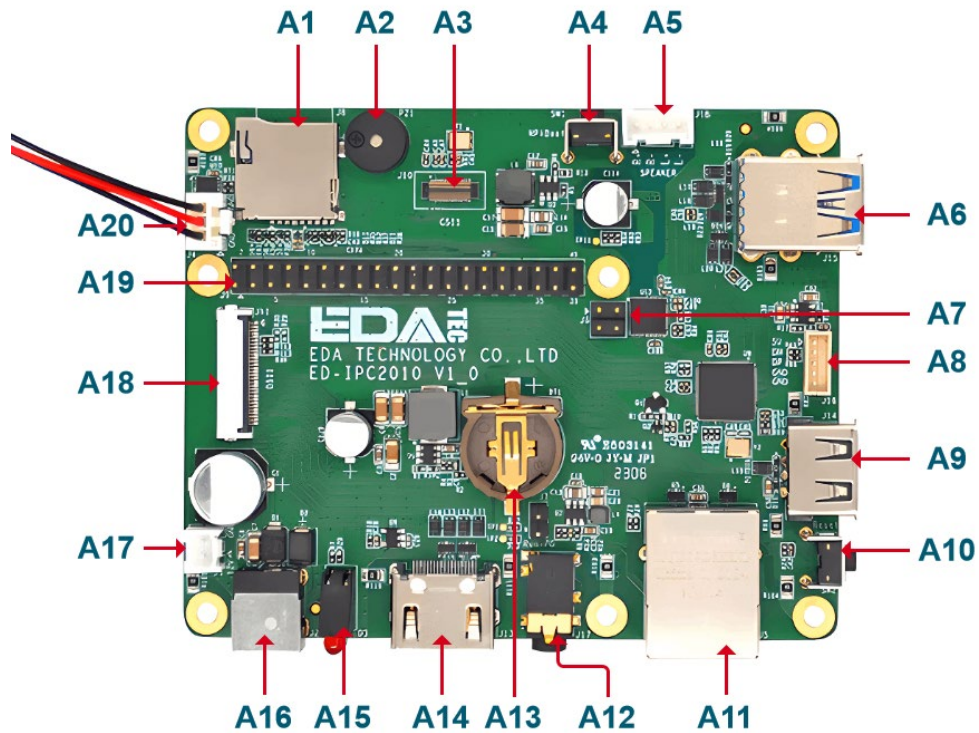
Function	Parameters
CPU	Broadcom BCM2711 4 core Cortex A72 1.5GHz (ARM v8) 64-bit CPU
RAM	1GB/2GB/4GB/8GB option
eMMC	8GB/16GB/32GB option
WiFi/BT	2.4G/5.8G WiFi, Bluetooth BLE5.0
Ethernet	10/100/1000M support POE
SD card	Support micro SD card as extended storage
HDMI	1x standard HDMI Type A
HDMI FPC port (optional)	1x HDMI + 1x USB touch support 12-inch, 15-inch and 19-inch touch screens Note: Only ED-IPC2020 includes this interface.
USB	2x standard USB 3.0 port 1x standard USB 2.0 port
DSI (optional)	1x DSI port, support 7-inch and 10-inch touch screens Note: Only ED-IPC2020 includes this interface.
CSI (optional)	1x CSI port, support camera function Note: Only ED-IPC2020 includes this interface.
Real Time Clock	Support RTC
Encryption Chip	Have onboard encryption chip ATECC608.
Buzzer	1x buzzer
Power Output	5V@1A line-to-board connector output 12V@1A Line-to-Board Connector Output

Function	Parameters
Audio (optional)	3.5mm headphone jack, supporting stereo playback, headphone microphone recording. Note: Only ED-IPC2020 includes this interface.
Speaker (optional)	Speaker interface of two pairs of wire-to-board connectors Note: Only ED-IPC2020 includes this interface.
40Pin Connector	Raspberry Pi standard 40PIN interface
4Pin POE Connector	Support PoE
Rpiboot Button	Set CM4 to enter the burning mode.
Reset Button	CM4 Reset button
LED	Green (system status), red (power supply)
Power Input	9 ~ 28V supports DC interface, with optional Phoenix terminal interface
Dimension	103(L) x 80(W) x 35(H)
Case	Aluminum alloy heat dissipation
Antenna	PCB antenna/external antenna
Working environment temperature	-25~60°C
OS	Compatible with official standard system

1.3 System Diagram

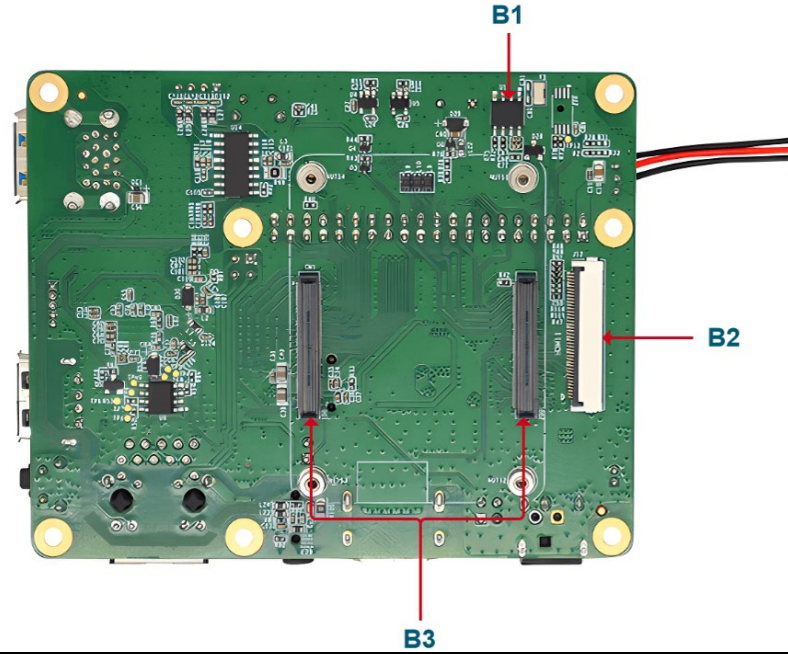


1.4 Functional layout



Item ^{note}	Function Description	Item	Function Description
A1	Micro SD Card	A11	Lan port
A2	Buzzer	A12	3.5mm headphone jack
A3	CSI	A13	CR1220
A4	Rpiboot button	A14	HDMI
A5	Speaker	A15	Indicator light
A6	USB 3.0	A16	Power Supply
A7	PoE	A17	12V output
A8	USB 2.0	A18	DSI
A9	USB 2.0	A19	40PIN
A10	Reset button	A20	5V output

Note: Only ED-IPC2000 include A3、A5、A12 and A18 interface.

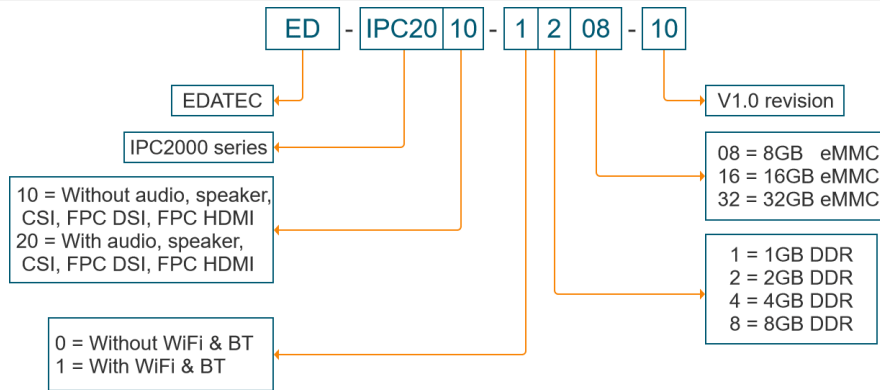


Item ^{note}	Function Description	Item	Function Description
B1	RTC	B3	CM4
B2	FPC HDMI		
Note: Only ED-IPC2020 include B2 interface.			

1.5 Packing List

- 1x ED-IPC2000 Series Unit
- [Optional WIFI/BT Version] 1x WIFI/BT antenna

1.6 Order Code



Example

Part# : ED-IPC2010-1208-10

Configuration : CM4 Industrial Computer V1.0 version
ED-IPC2010-1208-10 Module with Wireless, 2GB DDR & 8GB eMMC
1pcs Raspberry Pi certified WiFi/Bluetooth Antenna
Assembled by a metal case

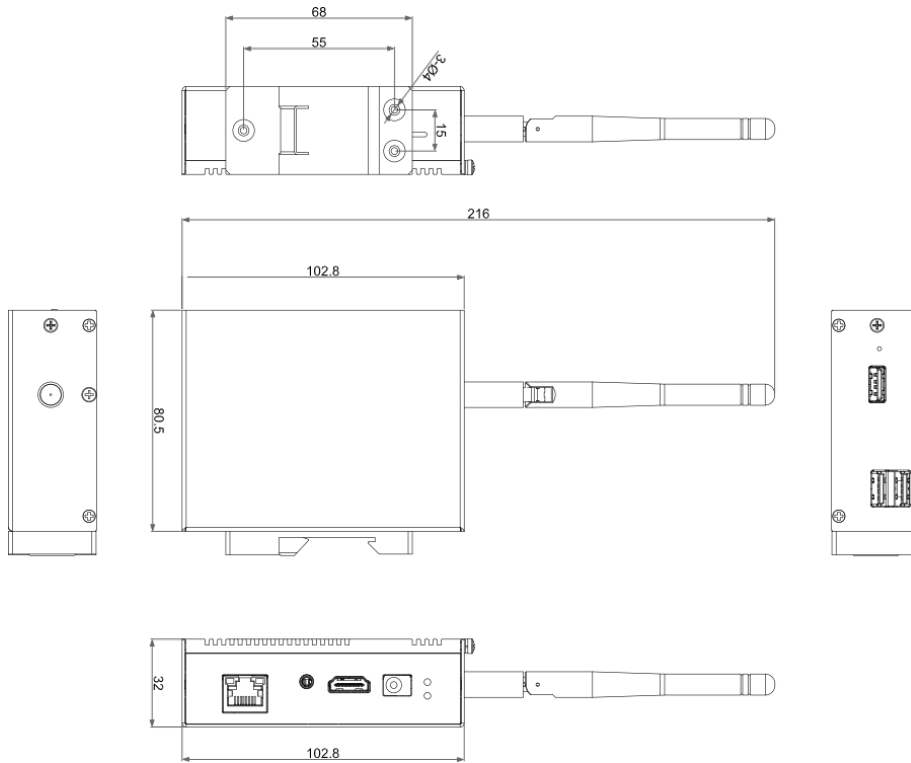
2 Product appearance and structure

2.1 Product appearance



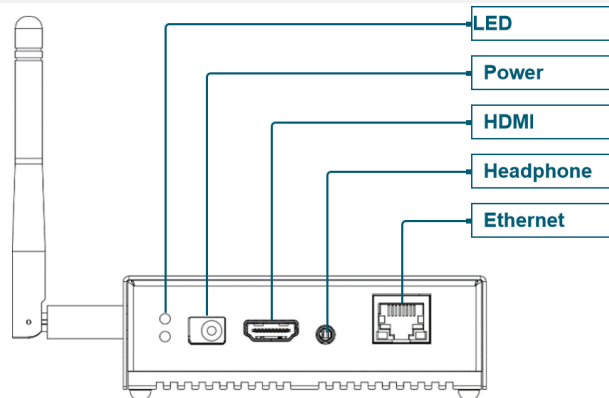
2.2 Dimensions

unit: mm, tolerance: $\pm 0.1\text{mm}$



3 Interfaces and Connectors

3.1 Front Panel



Note: Only ED-IPC2000 includes Headphone interface.

3.1.1 Power Input

The power interface is on the right panel, using standard 5.5 * 2.0 DC power socket, supporting 8 ~ 28V DC power supply, positive inside and negative outside $\ominus \text{---} \text{---} \oplus$. Recommend to use a 12V power adapter.

3.1.2 Indicator Light

IPC2000 series have 2 indicators:

Indicator	Description
Red LED	Power indicator
Green LED	Status indicator, used to indicate the reading and writing of eMMC, and can also be used to judge the cause of startup failure.

tip: Green LED can also be used to analyze and judge the cause of system startup failure. Please refer to the user manual for details.

3.1.3 HDMI

IPC2000 series have a standard HDMI Type A (full-size) interface, which uses CM4 HDMI0 signals and supports HDMI2.1 video output with a maximum resolution of 4Kp60.

3.1.4 Headphone Interface (optional)

IPC2000 series have a 3.5mm CTIA headphone jack, which supports headphone microphone recording.

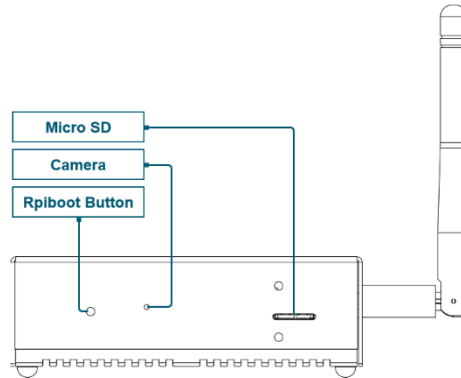
Note: Only ED-IPC2020 includes this interface.

3.1.5 Gigabit Ethernet

There is an adaptive 10/100/1000Mbps Ethernet in IPC2000 series, which uses RJ45 interface. It is recommended to use Cat6 (Category 6) network cable to cooperate with it.

	Pin ID	Pin Name
	1	TRD0+
	2	TRD0-
	3	TRD1+
	4	TRD2+
	5	TRD2-
	6	TRD1-
	7	TRD3+
8	TRD3-	

3.2 Rear Panel



3.2.1 Rpiboot Button

Press this button before the device is powered on, and CM4 will enter the burning mode. Users can burn the device through rpiboot tool.

3.2.2 Micro SD Card

IPC2000 series support dual storage scheme, eMMC+micro SD card. eMMC is used for the main file system, and micro SD card can be used for expanding data storage. Users can choose SD cards with different capacities to store data according to application requirements. Compared with the built-in eMMC memory, SD cards have larger capacity and lower cost. Users can use eMMC on CM4 to store system code and SD card to store application data.

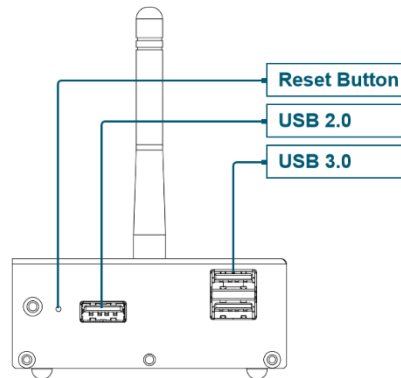
tip: Micro SD card can only be used for extended storage and cannot be boot from SD card.

3.2.3 Camera Hole

A camera hole is reserved in the middle of the rear panel, which can be used to install various official models of CSI interface cameras from Raspberry Pi.

Note: Only ED-IPC2020 has a CSI interface reserved for connecting to a camera.

3.3 Right Panel



3.3.1 Reset Button

The reset button is a hidden button, and the device will automatically restart after pressing this button. Reset button is connected with the Global_EN pin of CM4, and when this pin is pulled down, the CM4 module will be reset. Pressing the reset button will set the Global_EN pin to a low level, thereby resetting the ED-IPC2000 series device.

3.3.2 USB 2.0

IPC2000 series have 1 USB 2.0 Type-A, which is used as a burning interface when burning the system. The official Raspberry Pi OS does not enable USB for CM4 by default. If the BSP provided by our company has been installed in the system, this interface can be used as a regular USB 2.0.

	Pin ID	Pin Name
	1	5V
	2	D-
	3	D+
	4	GND

3.3.3 USB 3.0

IPC2000 series have 2 USB 3.0 type-A. Users can extend other peripherals at this interface.

	Pin ID	Pin Name
		1
2		D-
3		D+
4		GND
5		StdA_SSRX-
6		StdA_SSRX+
7		GND_DRAIN
8		StdA_SSTX-
9		StdA_SSTX+

3.4 Antennas

3.4.1 WIFI/BT (optional)

IPC2000 series have a WIFI/BT antenna, which supports 2.4 GHz and 5.0 GHz IEEE 802.11b/g/n/AC dual-band WiFi. We provide dual-band external antenna, which has passed wireless authentication together with Raspberry Pi CM4.

Note: Only WIFI/BT versions include this antenna.

4 Internal Interface

4.1 Power Output

4.1.1 5V Output

5V@1A Wire-to-Board Connector terminal output, with 5V pin in the middle and GND pins on both sides.

Pin ID	Pin Name
1	GND
2	5V
3	GND

4.1.2 12V Output

12V@1A Wire-to-Board Connector terminal output.

Pin ID	Pin Name
1	12V
2	GND

4.2 USB 2.0 Pin Header

The ED-IPC2000 series also have a 1-way USB 2.0 Host, which is exported through a 1x5 1.27mm Pin Header with an interface name of J16. Customers can expand USB Device devices based on their own applications.

Pins are defined as follows:

Pin ID	Pin Name
1	5V
2	D-
3	D+
4	GND
5	GND

4.3 Buzzer

IPC2000 series have a buzzer, which is controlled by GPIO6, enabled at high level and disabled at low level.

Buzzer control pin definition:

#	Signal	CM4 Pinout
1	BEEP	GPIO6

4.4 Speaker (optional)

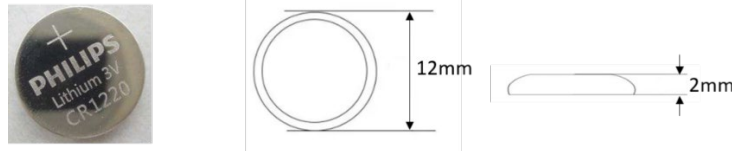
The speaker interface is led out by a 4 Pin Wire-to-Board Connector , which supports two 5W speakers and stereo playback.

Pin ID	Pin Name
1	OUT_R+
2	OUT_R-
3	OUT_L-

Pin ID	Pin Name
4	OUT_L+

Note: Only ED-IPC2020 includes this interface.

4.5 RTC



IPC2000 series are integrated with RTC. For the version sold in China, we will install CR1220 button cell (RTC backup power supply) by default when shipping. In this way, the system can be guaranteed to have an uninterrupted and reliable clock, which is not affected by factors such as equipment power down.

RTC clock chip is mounted on i2c-1 bus, and the device address is 0x51.

I2c-1 bus pin definition:

#	Signal	CM4 Pinout
1	SDA1	GPIO2
2	SCL1	GPIO3

4.6 PoE

J6 is a PoE interface, which can supply power with our PoE module.

4.7 HDMI FPC (optional)

On the back of the development board, J12 uses CM4 HDMI1 signal, in the form of FPC, with USB 2.0 touch screen signal and PWM brightness level signal reserved on it, which can be connected to HDMI touch screen.

Pin	Definition	Pin	Definition
1	NC	21	HDMI1_TX2N
2	NC	22	HDMI1_TX2P
3	NC	23	GND
4	NC	24	GND
5	NC	25	HDMI1_CEC
6	NC	26	GND
7	NC	27	HDMI1_SCL
8	GND	28	HDMI1_SDA
9	HDMI1_CLKN	29	GND
10	HDMI1_CLKP	30	HDMI1_HPDP
11	GND	31	GND
12	GND	32	TP_INT
13	HDMI1_TX0P	33	GND
14	HDMI1_TX0N	34	SDA_LCD
15	GND	35	SCL_LCD
16	GND	36	GND
17	HDMI1_TX1N	37	GND
18	HDMI1_TX1P	38	USBHP1+
19	GND	39	USBHP1-
20	GND	40	GND

Note: Only ED-IPC2020 includes this interface.

4.8 CSI (optional)

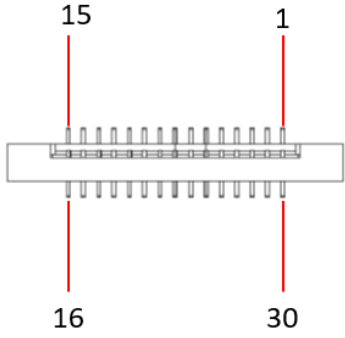
J10 is a CSI interface, which is connected to the camera and supports various official models of Raspberry Pi cameras.

Pin	Definition	Pin	Definition
1	NC	16	GND
2	NC	17	NC
3	1V8	18	NC
4	1V2	19	GND
5	1V8	20	CSI_D1_N
6	GND	21	CSI_D1_P
7	CSI_MCLK	22	GND
8	GND	23	CSI_D0_N
9	GND	24	CSI_D0_P
10	2V8	25	GND
11	NC	26	CSI_CLK_N
12	GND	27	CSI_CLK_P
13	NC	28	GND
14	NC	29	SCL_1V8
15	GND	30	SDA_1V8

Note: Only ED-IPC2000 includes this interface.

4.9 DSI (optional)

J11 is MIPI DSI interface, which uses DSI1 signals of 2-lane on CM4, and can be used with Raspberry Pi official 7-inch touch screen.

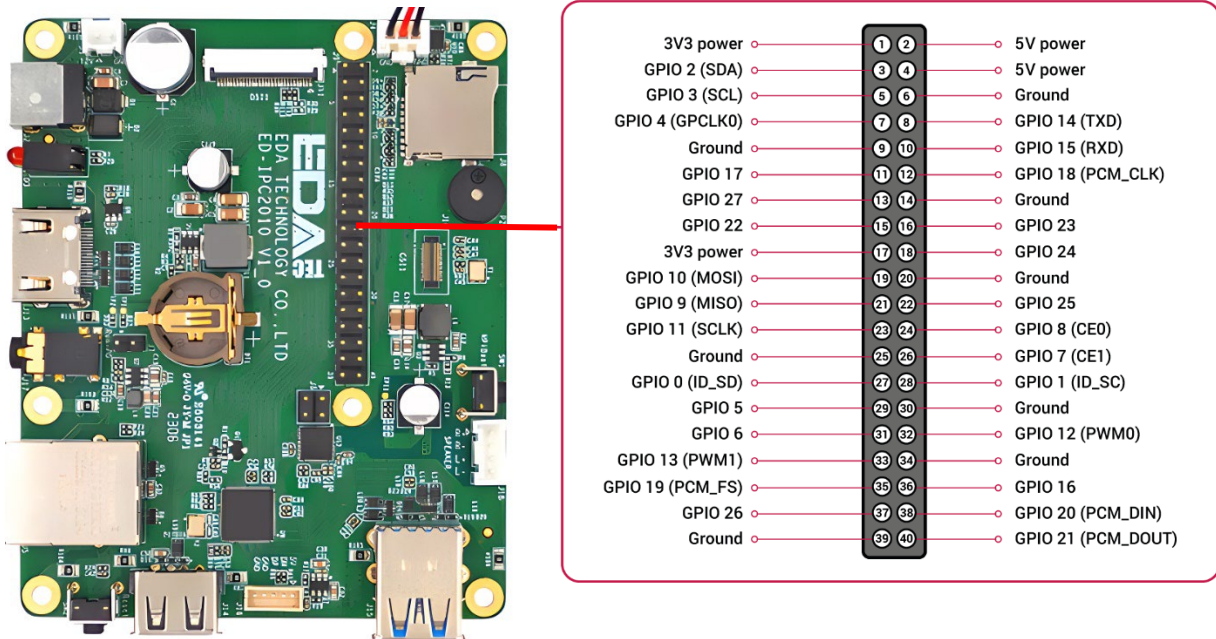


Pin	Definition	Pin	Definition
1	GND	16	DSI1_D1_N
2	USBHP1-	17	DSI1_D1_P
3	USBHP1+	18	GND
4	GND	19	GND
5	GND	20	DSI1_CLK_N
6	SCL1	21	DSI1_CLK_P
7	SDA1	22	GND
8	GND	23	GND
9	TP_INT	24	DSI1_D2_N
10	GND	25	DSI1_D2_P
11	GND	26	GND
12	DSI1_D0_N	27	GND
13	DSI1_D0_P	28	DSI1_D3_N
14	GND	29	DSI1_D3_P
15	GND	30	GND

Note: Only ED-IPC2020 includes this interface.

4.10 40PIN

IPC2000 series have a 40PIN compatible with Raspberry Pi, including two I2C, two S PI, a UART serial port and 28 GPIO pins.



Pin	Name	I/O	Pin Definition	Pin configuration function
1	3V3	O	3.3V	/
2	5V	I/O	5V	/
3	PIN3	I/O	GPIO2	I2C1_SDA
4	5V	I/O	5V	/
5	PIN5	I/O	GPIO3	I2C1_SCL
6	GND	/	GND	/
7	PIN7	I/O	GPIO4	GPIO4
8	PIN8	I/O	GPIO14	TXD0
9	GND	/	GND	/
10	PIN10	I/O	GPIO15	RXD0
11	PIN11	I/O	GPIO17	GPIO17
12	PIN12	I/O	GPIO18	GPIO18
13	PIN13	I/O	GPIO27	SD_D3
14	GND	/	GND	/
15	PIN15	I/O	GPIO22	SD_CLK
16	PIN16	I/O	GPIO23	SD_CMD
17	3V3	O	3.3V	/
18	PIN18	I/O	GPIO24	SD_D0
19	PIN19	I/O	GPIO10	GPIO10
20	GND	/	GND	/
21	PIN21	I/O	GPIO9	GPIO9
22	PIN22	I/O	GPIO25	SD_D1

Pin	Name	I/O	Pin Definition	Pin configuration function
23	PIN23	I/O	GPIO11	GPIO11
24	PIN24	I/O	GPIO8	GPIO8
25	GND	/	GND	/
26	PIN26	I/O	GPIO7	GPIO7
27	PIN27	I/O	GPIO0	GPIO0
28	PIN28	I/O	GPIO1	GPIO1
29	PIN29	I/O	GPIO5	GPIO5
30	GND	/	GND	/
31	PIN31	I/O	GPIO6	Buzzer_EN
32	PIN32	I/O	GPIO12	GPIO12
33	PIN33	I/O	GPIO13	GPIO13
34	GND	/	GND	/
35	PIN35	I/O	GPIO19	SPI_MISO
36	PIN36	I/O	GPIO16	TP_INT
37	PIN37	I/O	GPIO26	SD_D2
38	PIN38	I/O	GPIO20	GPIO20
39	GND	/	GND	/
40	PIN40	I/O	GPIO21	GPIO21

5 Wireless Communication

5.1 WiFi (optional)

Customers can choose IPC2000 series with WiFi version, which supports 2.4 GHz and 5.0 GHz IEEE 802.11b/G/N/AC dual-band WiFi.

2.4G band

Parameter	Feature
Frequency range	802.11b/g/n(HT20): 2412-2472MHz 802.11n(HT40): 2422-2462MHz
Modulation system	802.11b:DSSS 802.11g/n:OFDM
Frequency Step	5M

5G band

Parameter	Feature
Frequency range	802.11a/n/ac: 5150-5350MHz

Parameter	Feature
	5470-5725MHz 5725-5850MHz
Modulation system	BPSK
Frequency Step	5M

5.2 Bluetooth (optional)

IPC2000 series support bluetooth5.0.

Parameter	Feature
Frequency range	2402-2480MHz
Modulation system	GFSK,DPSK
Frequency Step	2M

5.3 Antennas

5.3.1 WiFi / BT Antenna (optional)

Parameter	Feature
Antenna type	External antenna
frequency band	2400-2500MHz, 5150-5850 MHz
antenna gain	2 dBi
impedance	50 OHM

Note: Only WIFI/BT versions include this antenna.

6 Electrical Characteristics

6.1 Electrical Parameters

Parameters	Minimum	Typical	Max	Unit
System power input	9	12	28	V
Working temperature	-25	25	60	°C
Storage temperature	-25	25	60	°C
Working environment humidity	20		90	%

7 FAQ

1. Why do some functions fail after installing the official system in CM4 products?

We recommend that customers install the system image provided by us. Otherwise, please download our BSP to make some external interfaces work.

2. Can IPC2000 series be started in micro SD card?

No, the micro SD card is only used for data storage. The os should be installed in eMMC.

3. How to install a image?

You can refer to the instructions by reading the software manual.

4. How to solve the problem of "config failed, hub doesn't have any ports!" when opening IPC2000 series? (err -19) "error?"

Delete "otg_mode=1" in config.txt , [cm4], and then add "dtoverlay=dwc2,dr_mode=host".

8 About Us

8.1 About EDATEC

EDATEC, located in Shanghai, is one of Raspberry Pi's global design partners. Our vision is to provide hardware solutions for Internet of Things, industrial control, automation, green energy and artificial intelligence based on Raspberry Pi technology platform.

We provide standard hardware solutions, customized design and manufacturing services to speed up the development and time to market of electronic products.

8.2 Contact Us

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