



ED-CM4IO COMPUTER

AN INDUSTRIAL EMBEDDED COMPUTER BASED ON RASPBERRY PI CM4

Shanghai EDA Technology Co.,Ltd
2023-02-07

Copyright Statement

ED-CM4IO Computer and its related intellectual property rights are owned by Shanghai EDA Technology Co., Ltd.

Shanghai EDA Technology Co., Ltd. owns the copyright of this document and reserves all rights. Without the written permission of Shanghai EDA Technology Co., Ltd, no part of this document may be modified, distributed or copied in any way or form.

Disclaimers

Shanghai EDA Technology Co., Ltd does not guarantee that the information in this hardware manual is up to date, correct, complete or of high quality. Shanghai EDA Technology Co., Ltd also does not guarantee the further use of this information. If the material or non-material related losses are caused by using or not using the information in this hardware manual, or by using incorrect or incomplete information, as long as it is not proved that it is the intention or negligence of Shanghai EDA Technology Co., Ltd, the liability claim for Shanghai EDA Technology Co., Ltd. can be exempted. Shanghai EDA Technology Co., Ltd expressly reserves the right to modify or supplement the contents or part of this hardware manual without special notice.

Release Note

Date	Version	Description	Note
2023-02-07	V1.0	Initial version	

Contents

1	Product Overview.....	6
1.1	Target Application.....	6
1.2	Specifications and Parameters.....	6
1.3	System Diagram.....	7
1.4	Functional Layout.....	8
1.5	Packing List.....	8
1.6	Order Code	9
2	Product Appearance and Structure.....	9
2.1	Product Appearance	9
2.2	Product Photo	10
2.3	Dimensions	11
3	Interfaces and Connectors.....	11
2.4	Front Panel.....	11
2.4.1	Power Input	12
2.4.2	Indicator Light.....	12
2.4.3	HDMI	12
2.4.4	Gigabit Ethernet	12
2.4.5	USB 2.0.....	12
2.4.6	micro-USB.....	13
2.4.7	micro-SD Card Slot	13
2.4.8	Antennas	13
2.5	Rear Panel	13
2.5.1	Power ON/OFF Button	14
2.5.2	DISP Slot.....	14
2.5.3	CAM Slot	14
3	Internal interface	14
3.1	RTC	14
3.2	MIPI DSI.....	14
3.2.1	DISP0.....	15
3.2.2	DISP1	15
3.3	MIPI CSI.....	16
3.3.1	CAM0	16
3.3.2	CAM1	17
3.4	I2C-0 Connect Pin Header.....	18
3.5	CM4 Config Pin Header	18
3.6	40-PIN Raspberry Pi HAT GPIO	19
3.7	PoE Pin Header	21
3.8	PCIe	21
3.9	USB 2.0 Pin Header.....	22
3.10	External Power Output.....	22
3.11	Fan Control Pin Header	22
4	Wireless Communication	23

4.1	WiFi	23
4.2	Bluetooth	23
4.3	Antenna	23
4.3.1	WiFi / BT antenna	24
5	Electrical Characteristics.....	24
5.1	Electrical parameters	24
6	FAQ	24
6.1	Can micro SD card be used for system startup?.....	24
7	Product Change Record	24
8	About us	24
8.1	About EDATEC	24
8.2	Contact us	25

1 Product Overview

ED-CM4IO Computer is a commercial industrial computer based on Compute Module 4 IO Board and CM4 module.

1.1 Target Application

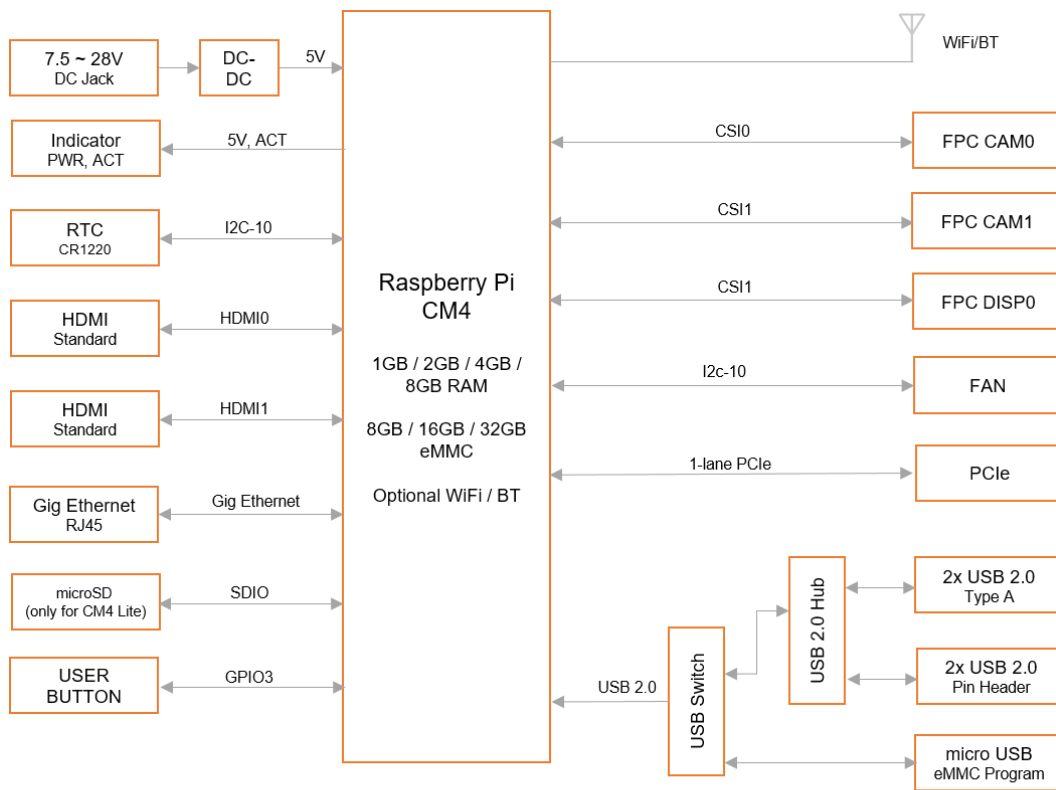
- Industrial application
- Advertising display
- Intelligent manufacture
- Maker develop

1.2 Specifications and Parameters

Function	Parameters
CPU	Broadcom BCM2711 4 core, ARM Cortex-A72(ARM v8), 1.5GHz, 64bit CPU
Memory	1GB / 2GB / 4GB / 8GB option
eMMC	0GB / 8GB / 16GB / 32GB option
SD card	micro SD card, support CM4 Lite without eMMC
Ethernet	1x Gigabit Ethernet
WiFi / Bluetooth	2.4G / 5.8G Dual band WiFi, bluetooth5.0
HDMI	2x standard HDMI
DSI	2x DSI
Camera	2x CSI
USB Host	2x USB 2.0 Type A, 2x USB 2.0 Host Pin Header extended, 1x USB micro-B for eMMC burning
PCIe	1-lane PCIe 2.0, Highest support 5Gbps
40-Pin GPIO	Raspberry Pi 40-Pin GPIO HAT extended
Real time clock	1x RTC
One-button on-off	Software on/off based on GPIO
Fan	1x adjustable speed fan control interface
DC power supply output	5V@1A, 12V@1A,
LED indicator	red(power indicator), green(system state indicator)
Power input	7.5V-28V

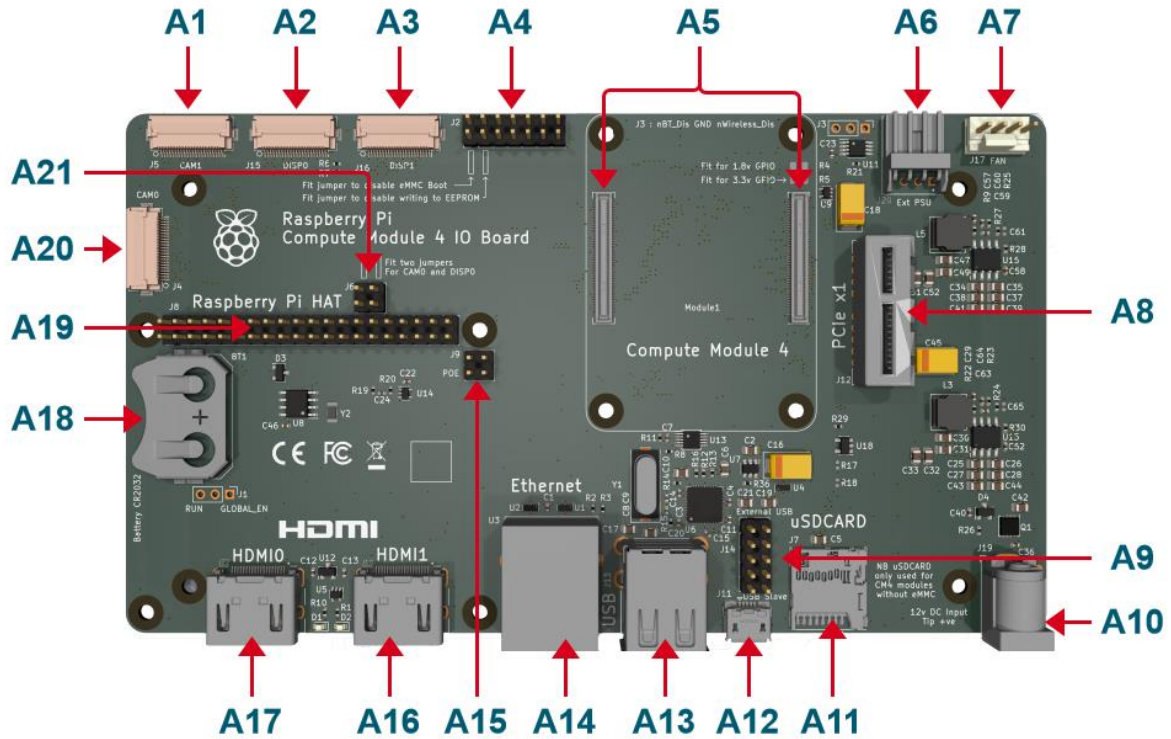
Function	Parameters
Dimensions	180(length) x 120(wide) x 36(high) mm
Case	Full Metal Shell
Antenna accessory	Support optional WiFi/BT external antenna, which has passed wireless authentication together with Raspberry Pi CM4, and optional 4G external antenna.
Operation system	Compatible with official Raspberry Pi OS, provides BSP software support package, and supports online installation and update of APT.

1.3 System Diagram



ED-CM4IO Computer

1.4 Functional Layout

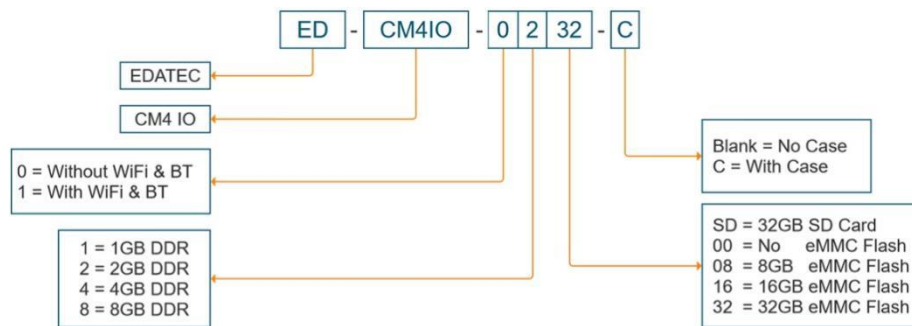


No.	Function	No.	Function
A1	CAM1 port	A13	2x USB port
A2	DISP0 port	A14	Ethernet RJ45 port
A3	DISP1 port	A15	POE port
A4	CM4 Config Pin Header	A16	HDMI1 port
A5	CM4 socket	A17	HDMI0 port
A6	External power output port	A18	RTC battery socket
A7	Fan control port	A19	40 Pin Header
A8	PCIe port	A20	CAM0 port
A9	2x USB Pin Header	A21	I2C-0 connect Pin Header
A10	DC power socket		
A11	Micro SD slot		
A12	Micro USB port		

1.5 Packing List

- 1x CM4 IO Computer host
- 1x 2.4GHz/5GHz WiFi/BT antenna

1.6 Order Code

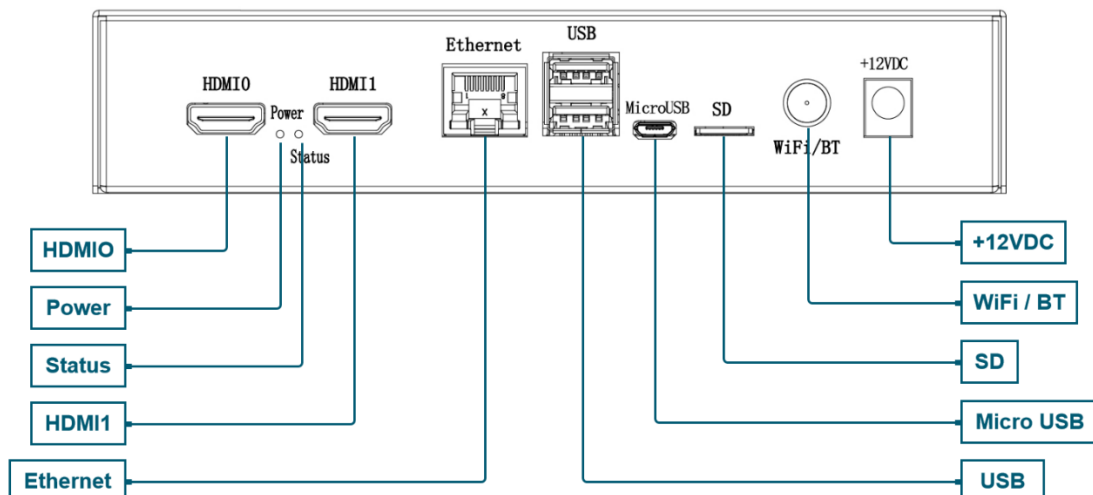


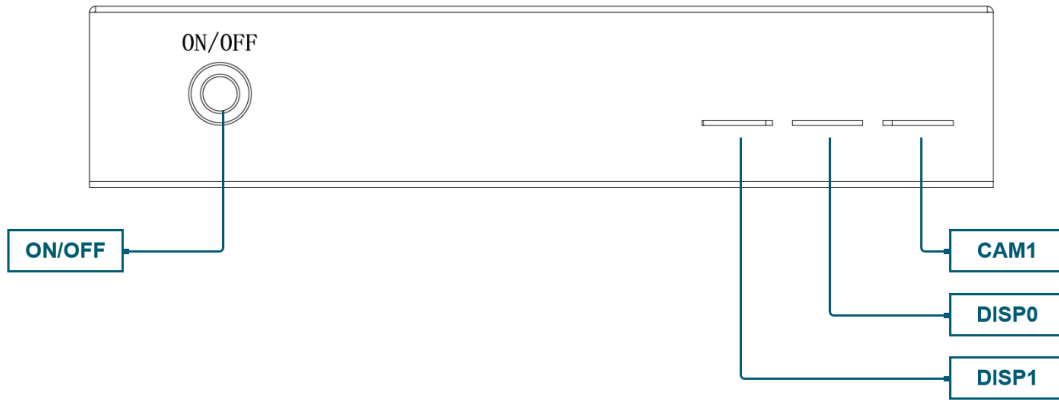
Example

Part#: ED-CM4IO-1232-C
Configuration: ED-CM4IO-Computer
 CM4102032 Computer Module with Wireless, 2GB DDR & 32GB eMMC
 1pcs Raspberry Pi certified WiFi/Bluetooth Antenna
 Metal Case

2 Product Appearance and Structure

2.1 Product Appearance



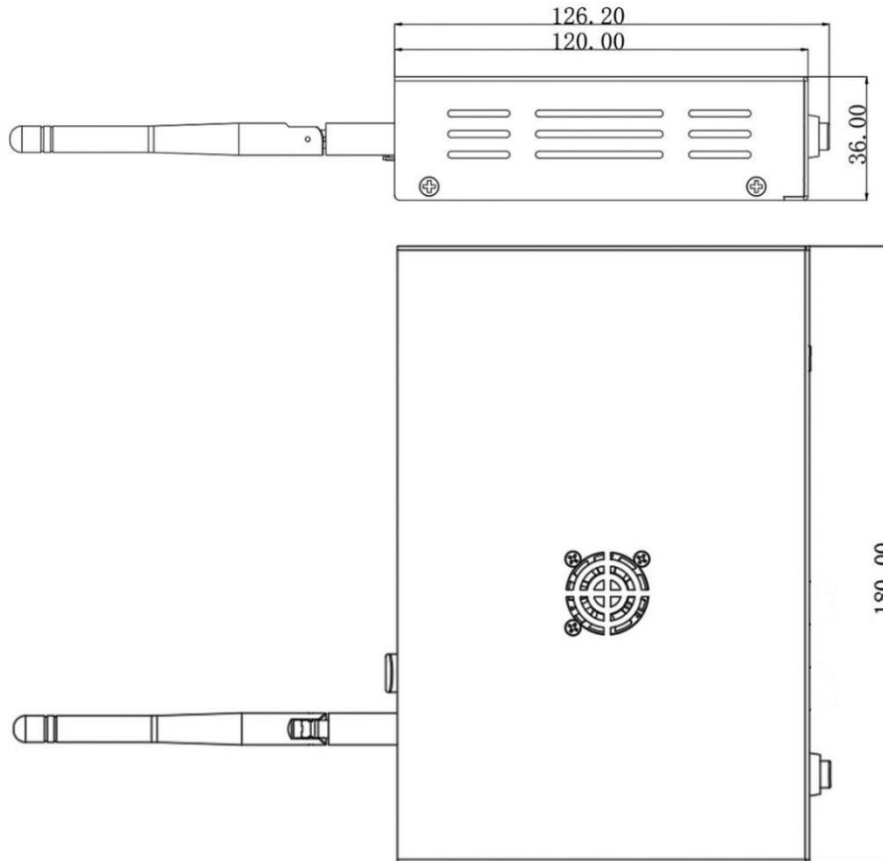


2.2 Product Photo



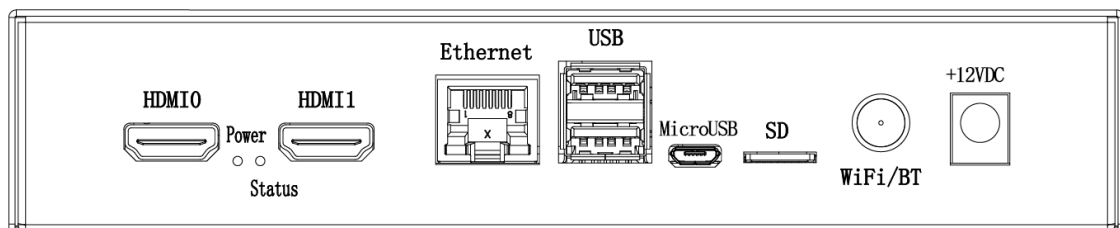
2.3 Dimensions

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



3 Interfaces and Connectors

2.4 Front Panel



2.4.1 Power Input

The standard input power supply of ED-CM4IO Computer is 12V, the maximum power input range is +7.5V~28V, and the screen printing of the shell is +12VDC, which is a standard 5.5*2.0 DC Jack power socket.

2.4.2 Indicator Light

ED-CM4IO Computer has two lights, the red LED is the power indicator and the green LED is the status indicator.

2.4.3 HDMI

ED-CM4IO Computer has two standard HDMI Type A interfaces, the screen names are HDMI0 and HDMI1 respectively, and the two HDMI interfaces are identical, so it can work by directly connecting the HDMI display screen.

2.4.4 Gigabit Ethernet

There is an adaptive 10/100/1000Mbps Ethernet interface on ED-CM4IO Computer, and the screen printing logo is Ethernet. 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-	

2.4.5 USB 2.0

There are two USB 2.0 Type A interfaces on the ED-CM4IO Computer, which can transmit data up to 480 Mbit/s. If we use our factory image, the USB Host function is available. If we use the official image, we

need to install our BSP package.

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

2.4.6 micro-USB

The ED-CM4IO Computer also has a MicroUSB, the screen name of which is micro USB, which is located on the right side of the USB socket and is mainly used to burn the eMMC of the CM4 core board.

2.4.7 micro-SD Card Slot

There is a micro SD card slot on ED-CM4IO Computer, which is used together with CM4 Lite.

Only when you choose CM4 Lite (without eMMC) core module, you need to use the micro SD card for main file system storage. If you choose CM4 module with eMMC, this micro SD card slot is not available, and it shares an MMC port with eMMC.

2.4.8 Antennas

The ED-CM4IO Computer panel has a standard SMA head antenna interface corresponding to the WiFi/BT antenna.

2.5 Rear Panel



2.5.1 Power ON/OFF Button

ED-CM4IO Computer has an on-off button, and the screen printing on the panel is "ON/OFF", which realizes the one-button on-off function.

One-key on-off is a combination of Bootloader of Raspberry Pi and GPIO of 40PIN to realize on-off by software, which is different from the traditional power on-off or on-off by hardware.

One-button power on/off uses GPIO3 on the 40-pin socket. If you want to realize the one-button power on/off function, this pin should be configured as ordinary GPIO function, and can no longer be defined as SCL1 of I2C. Please remap I2C function to other pins.

NOTE: To realize the one-button on-off function, it is necessary to install the factory image or the BSP package provided by us.

2.5.2 DISP Slot

The back panel of ED-CM4IO Computer has two DISP slots, which are used to lead out the FPC cable, and the silk-screen is DISP1 and DISP0 respectively.

2.5.3 CAM Slot

There are two CAM slots on the back panel and side of ED-CM4IO Computer, which are used to lead out the FPC cable, and the silk-screen is CAM1 and CAM0 respectively.

3 Internal interface

3.1 RTC

The ED-CM4IO Computer is integrated with RTC. For the version sold in China, CR2032 button cell (RTC backup power supply) will be installed by default. 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-10 bus, and the device address is 0x51.

3.2 MIPI DSI

The ED-CM4IO Computer has two MIPI DSI interfaces, and the screen printing name is DISP1/DISP0, both of which use 22-pin connectors with a spacing of 0.5 mm. DISP0 has 2 channels, and DISP1 has 4

channels. When using DSI0 interface, it is necessary to install two jumper caps on J6 to connect the internal I2C bus to the connector.

3.2.1 DISPO


The corresponding definition of DISPO pin is as follows.

	Pin ID	Pin Name
	1	GND
	2	DSI0_D0_N
	3	DSI0_D0_P
	4	GND
	5	DSI0_D1_N
	6	DSI0_D1_P
	7	GND
	8	DSI1_CLK_N
	9	DSI1_CLK_P
	10	GND
	11	X
	12	X
	13	GND
	14	X
	15	X
	16	GND
	17	X
	18	X
	19	GND
	20	SCL1
	21	SDA1
	22	+3.3v



3.2.2 DISP1

The corresponding definition of DISP1 pin is as follows.

	Pin ID	Pin Name
	1	GND
	2	DSI1_D0_N
	3	DSI1_D0_P
	4	GND
	5	DSI1_D1_N
	6	DSI1_D1_P
	7	GND
	8	DSI1_CLK_N
	9	DSI1_CLK_P
	10	GND
	11	DSI1_D2_N
	12	DSI1_D2_P
	13	GND
	14	DSI1_D3_N
	15	DSI1_D3_P
	16	GND
	17	×
	18	×
	19	GND
	20	SCL0
	21	SDA0
	22	+3.3v

3.3 MIPI CSI

There are two CSI camera interfaces on ED-CM4IO Computer, and the screen printing marks are CAM0 and CAM1 respectively, both of which use 22-pin connectors with a spacing of 0.5 mm. CAM0 has 2 channels, and CAM1 has 4 channels. When using the CAM0 interface, it is necessary to install two jumper caps on J6 to connect the internal I2C bus to the connector.


3.3.1 CAM0

The corresponding definition of CAM0 pin is as follows.

	Pin ID	Pin Name
	1	GND
	2	CAM1_D0_N
	3	CAM1_D0_P
	4	GND
	5	CAM1_D1_N
	6	CAM1_D1_P
	7	GND
	8	CAM1_CLK_N
	9	CAM1_CLK_P
	10	GND
	11	CAM1_D2_N
	12	CAM1_D2_P
	13	GND
	14	CAM1_D3_N
	15	CAM1_D3_P
	16	GND
	17	CAM_GPIO
	18	X
	19	GND
	20	SCL0
	21	SDA0
22	+3.3v	

3.3.2 CAM1

The corresponding definition of CAM1 pin is as follows.

	Pin ID	Pin Name
	1	GND
	2	CAM1_D0_N
	3	CAM1_D0_P
	4	GND
	5	CAM1_D1_N
	6	CAM1_D1_P
7	GND	

	8	CAM1_CLK_N
	9	CAM1_CLK_P
	10	GND
	11	CAM1_D2_N
	12	CAM1_D2_P
	13	GND
	14	CAM1_D3_N
	15	CAM1_D3_P
	16	GND
	17	CAM_GPIO
	18	X
	19	GND
	20	SCL0
	21	SDA0
	22	+3.3v

3.4 I2C-0 Connect Pin Header

J6 Pin Header of ED-CM4IO Computer is used to connect the ID_SC pin and ID_SD pin of CM4 with I2C bus pins of CAM0 and DSI0 interfaces. When using the CAM0 or DSI0 interface, it is necessary to install two jumper caps on J6 to connect the internal I2C bus to the CAM0 or DSI0 connector.

#	Signal	CM4 Pinout
1	SCL	ID_SC
2	SDA	ID_SD

3.5 CM4 Config Pin Header

J2 Pin Header of ED-CM4IO Computer is used for the startup configuration of CM4, and pins 1 and 2 are used to configure the prohibition of starting from eMMC. When writing eMMC of CM4, pins 1 and 2 of J2 need to be shorted to prohibit starting from eMMC and enable starting from USB rpiboot. Shorting pins 3 and 4 of J2 will prohibit writing to EEPROM on board CM4.

Pin	Function
1	GND
2	nRPIBOOT
3	GND

NOTE: No need to use other pins.

3.6 40-PIN Raspberry Pi HAT GPIO

ED-CM4IO Computer has a pin arrangement with a distance of 2X20P of 2.54mm, which leads out the GPIO of CM4.

Pin	Name	I/O	Function
1	3V3	O	
2	5V	I/O	
3	PIN3	I/O	I2C1_SDA
4	5V	I/O	
5	PIN5	I/O	I2C1_SCL
6	GND		
7	PIN7	I/O	GPIO4
8	PIN8	I/O	TXD0
9	GND		
10	PIN10	I/O	RXD0
11	PIN11	I/O	GPIO17
12	PIN12	I/O	GPIO18
13	PIN13	I/O	GPIO27
14	GND		
15	PIN15	I/O	GPIO22
16	PIN16	I/O	GPIO23
17	3V3	O	
18	PIN18	I/O	GPIO24

Pin	Name	I/O	Function
19	PIN19	I/O	GPIO10
20	GND		
21	PIN21	I/O	GPIO9
22	PIN22	I/O	GPIO25
23	PIN23	I/O	GPIO11
24	PIN24	I/O	GPIO8
25	GND		
26	PIN26	I/O	GPIO7
27	PIN27	I/O	ID_SD
28	PIN28	I/O	ID_SC
29	PIN29	I/O	GPIO5
30	GND		
31	PIN31	I/O	GPIO6
32	PIN32	I/O	GPIO12
33	PIN33	I/O	GPIO13
34	GND		
35	PIN35	I/O	GPIO19
36	PIN36	I/O	GPIO16
37	PIN37	I/O	GPIO26
38	PIN38	I/O	GPIO20
39	GND		
40	PIN40	I/O	GPIO21

3.7 PoE Pin Header


The Gigabit network port of ED-CM4IO Computer supports POE power supply, and the POE power supply terminal is led out through 1x2 2.54mm Pin Header, which needs to be equipped with official PoE HAT module to realize POE power supply to ED-CM4IO Computer.

Pin definition of POE Pin Header is as follows

Pin	Function
1	VC1-
2	VC1+
3	VC2-
4	VC2+

3.8 PCIe

ED-CM4IO Computer has a standard PCIe Gen2 interface, supports 1 PCIe channel, and the speed is up to 5Gbps.

	Pin ID	Pin Name	Pin ID	Pin Name
	B1	+12V	A1	NC
	B2	+12V	A2	+12V
	B3	+12V	A3	+12V
	B4	GND	A4	GND
	B5	NC	A5	+3.3V
	B6	NC	A6	+3.3V
	B7	GND	A7	NC
	B8	+3.3V	A8	+3.3V
	B9	+3.3V	A9	+3.3V
	B10	+3.3V	A10	+3.3V
	B11	NC	A11	PCIE_nRST
	B12	PCIE_CLK_nREQ	A12	GND
	B13	GND	A13	PCIE_CLK_P
	B14	PCIE_TX_N	A14	PCIE_CLK_N

	B15	PCIE_TX_P	A15	GND
	B16	GND	A16	PCIE_RX_N
	B17	NC	A17	PCIE_RX_P
	B18	GND	A18	GND

3.9 USB 2.0 Pin Header

There are also two USB 2.0 Host on ED-CM4IO Computer, which are led out by 2x5 2.54mm Pin Header, and the interface is J14. Customers can expand USB Device devices according to their own applications.

USB Pin Header's pin defined as follows:

Pin	Function	Pin	Function
1	+5V	6	USB4_P
2	+5V	7	GND
3	USB3_N	8	GND
4	UBS4_N	9	NC
5	USB3_P	10	NC

3.10 External Power Output

J20 socket can provide +5V and +12V power, with one pin being +12V, four pins being +5V, and pins 2 and 3 being grounded.

J20 pin defined as follows:

Pin	Function
1	+12V
2	GND
3	GND
4	+5V

3.11 Fan Control Pin Header

J17 socket of ED-CM4IO Computer is a fan control interface, which supports PWM output and fan speed control.

J17 pin defined is as follows:

Pin	Function
1	GND
2	+12V
3	Speed input
4	PWM output

4 Wireless Communication

4.1 WiFi

ED-CM4IO Computer supports 2.4G/5G 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 5470-5725MHz 5725-5850MHz
modulation system	BPSK
Frequency step	5M

4.2 Bluetooth

ED-CM4IO Computer supports Bluetooth 5.0.

Parameter	Feature
frequency range	2402-2480MHz
modulation system	GFSK,DPSK
Frequency step	2M

4.3 Antenna

4.3.1 WiFi / BT antenna

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

5 Electrical Characteristics

5.1 Electrical parameters

Parameters	Minimum	Typical	Max	Unit
System power input	7.5	12	28	V
Working temperature	-20	25	85	°C
Storage temperature	-25	25	85	°C
Working environment humidity	20		90	%

6 FAQ

6.1 Can micro SD card be used for system startup?

The micro SD card slot is only used with CM4 Lite for primary file system storage. If you choose CM4 module with eMMC, this micro SD card slot is not available because it shares an MMC interface with eMMC.

7 Product Change Record

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

Mail - sales@edatec.cn / support@edatec.cn

Phone - +86-18621560183

Website - <https://www.edatec.cn>

Address - Room 301, Building 24, No.1661 Jialuo Highway, Jiading District, Shanghai