ED-CM4IND

User Manual

by EDA Technology Co., Ltd

built: 2026-03-25

1 Product Overview

The ED-CM4IND is an industrial embedded computer based on the Raspberry Pi CM4. Depending on the application scenarios and user requirements, it offers a variety of configurations for RAM, eMMC, or SD card storage.

- The available RAM options include 1GB, 2GB, 4GB and 8GB.
- The eMMC options include 0GB, 8GB, 16GB and 32GB.
- The SD card options include 0GB and 32GB.

> TIP
>
> When purchasing the product, either an SD card or eMMC must be selected, and they cannot be chosen simultaneously.

The ED-CM4IND provides commonly used interfaces such as HDMI, USB, RS232, RS485, DI, Relay, and ADC, and supports network connectivity via Wi-Fi, Ethernet, and 4G. Integrated with RTC and Buzzer, it enhances the product's ease of use and reliability, making it primarily suitable for industrial control and IoT applications.

1.1 Target Applications

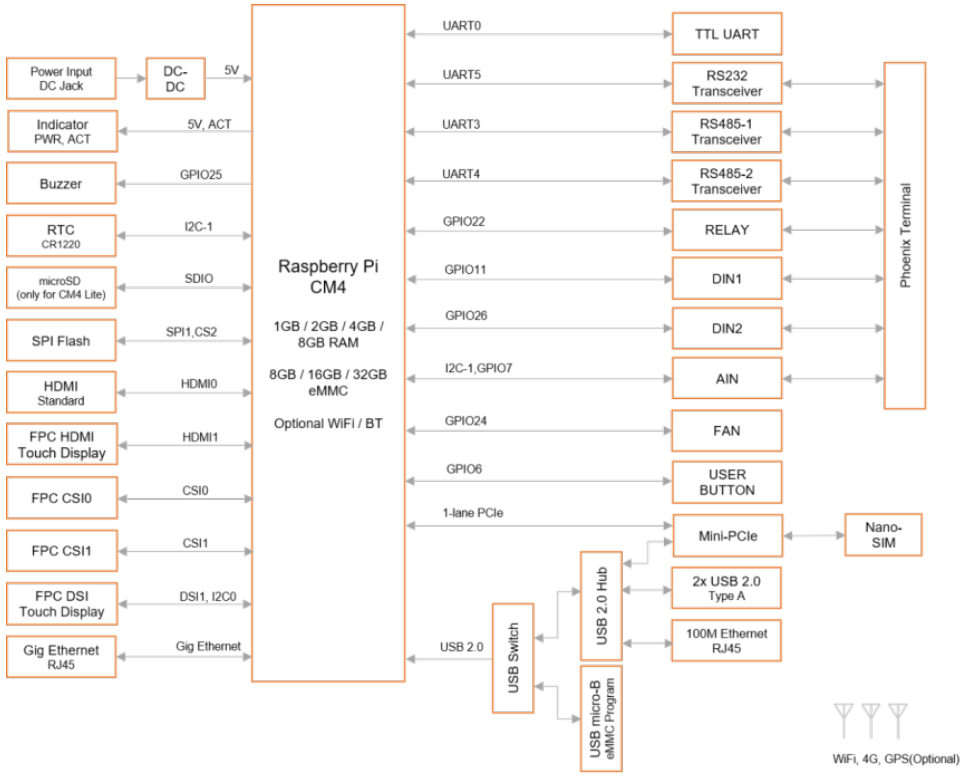
- IoT Gateways
- Industrial Control
- Display Devices
- Smart Manufacturing

1.2 Specifications

Function	Parameters
CPU	Broadcom BCM2711 quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
RAM	1GB/2GB/4GB/8GB optional
eMMC	0GB/8GB/16GB/32GB optional
Micro SD card	Supports 32GB SD card if CM4 without eMMC is selected
Extended storage	1 x 4MB Serial Flash
Ethernet Interface	Dual Ethernet ports: 1 x 1000M port, 1 x 100M port
WiFi/BT	Dual-band WiFi (2.4GHz & 5GHz), Bluetooth 5.0
4G	1 x PCIe 2.0 interface, supports optional 4G module
HDMI	1 x Standard HDMI interface
USB	2 x USB 2.0 interfaces, dual-layer Type-A connectors
RS485	2 x RS485
RS232	1 x RS232
ADC	3 x ADC interfaces, 12-bit ADC
DI	2 x DI
Relay	1 x DPDT (Double Pole Double Throw) relay interface
Internal Reserved Interfaces	1 x FPC HDMI, supports LCD screen expansion 1 x DSI, supports LCD screen expansion 2 x CSI, supports Raspberry Pi Camera expansion 2 x USB 2.0 Pin Header, supports USB 2.0 interface expansion 1 x Micro USB, for eMMC programming 1 x Serial (TTL), can be used as the default system console or configured as a standard serial port 1 x DC OUT, 5V@1A, can be used to power an expanded LCD screen 1 x Adjustable fan control interface 1 x Raspberry Pi 40-Pin GPIO 1 x RTC 1 x Buzzer
User Button	1 x User button
Reset Button	1 x Reset button
LED Indicators	Red (Power indicator), Green (System status indicator)
Operating System	Compatible with official Raspberry Pi OS, provides BSP support package, and supports APT online installation and updates

Function	Parameters
Input Power	V1.4: 9V ~ 36V DC V1.1~V1.3: 9V ~ 18V DC
Dimensions	170mm (L) x 120mm (W) x 30mm (H)
Enclosure	Full metal enclosure, supports DIN rail mounting
Antenna Accessories	Supports optional WiFi/BT antenna and 4G antenna
Operating Temperature	-25°C to 50°C
Fan	1x adjustable speed fan control interface

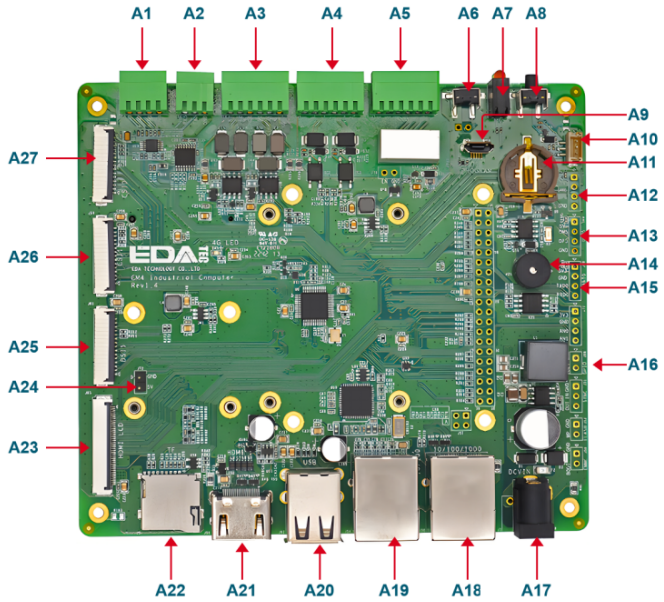
1.3 System Diagram



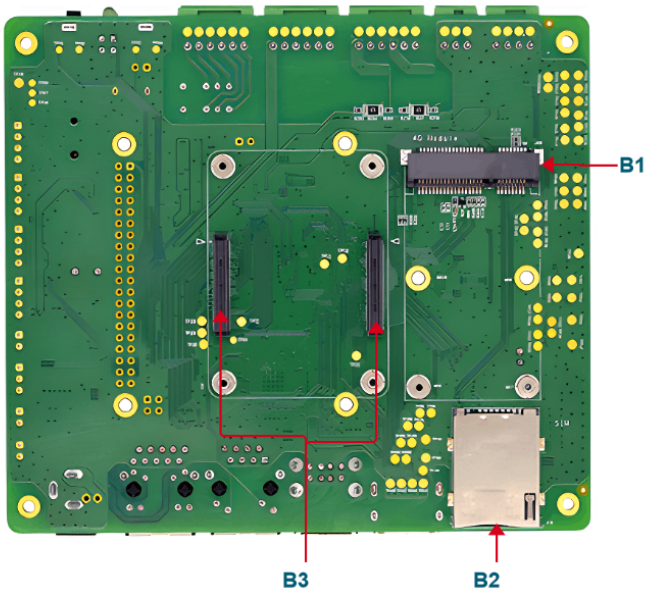
ED-CM4IND: EDATEC CM4 Industrial

> NoTE
>
> The power input range for version V1.4 is 9V ~ 36V, while for versions V1.1 to V1.3, the power input range is 9V ~ 18V.

1.4 Functional Layout



No.	Function	No.	Function
A1	3 × ADC	A15	Debug serial port
A2	1 × RS232	A16	Custom GPIO Pin Header
A3	2 × RS485	A17	DC Power Socket
A4	2 × DI	A18	1000M Ethernet Port
A5	2 × Relay	A19	100M Ethernet Port
A6	Reset Button	A20	2 × USB 2.0
A7	Power and Status Indicators	A21	Standard HDMI Interface
A8	User Button	A22	Micro SD Card Slot
A9	Micro USB Interface	A23	HDMI FPC Interface
A10	Fan Interface	A24	5V Power Output Interface
A11	RTC Battery Base	A25	DSI FPC Interface
A12	USB6 Pin Header	A26	CSI1 Interface
A13	USB5 Pin Header	A27	CSI0 Interface
A14	Buzzer	-	-

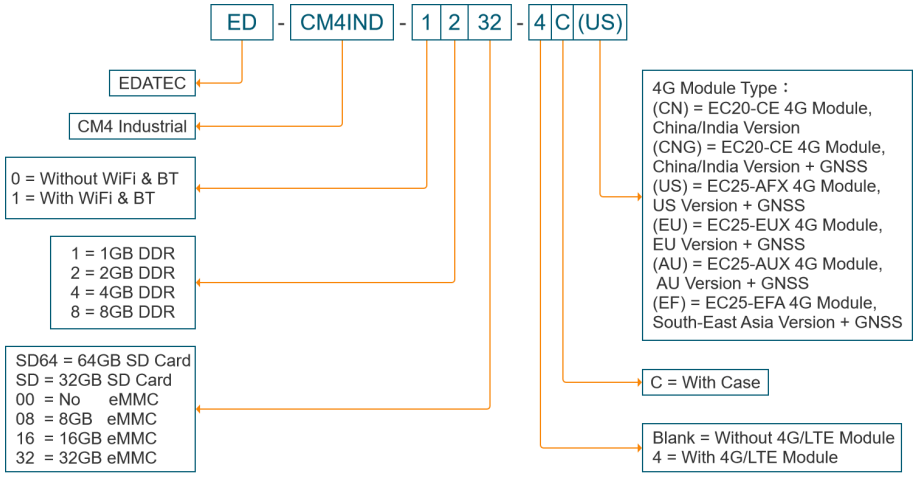


No.	Function	No.	Function
B1	Mini PCIe interface	B3	CM4 Socket
B2	Standard SIM Card Slot	--	--

1.5 Packing List

- 1 x ED-CM4IND Unit
- [WiFi/BT Version - optional] 1 x 2.4GHz/5GHz WiFi/BT Antenna
- [4G Version - optional] 1 x 4G/LTE Antenna

1.6 Ordering Code



Example

Part# : ED-CM4IND-1232-4C(US)

Configration : Industrial Computer Based on Raspberry Pi CM4, with Wi-Fi & Bluetooth, 2GB DDR, 32GB eMMC, 4G (EC25-AFX Module) and metal case.

2 Quick Start

This chapter describes the startup and some of the power-up settings of the ED-CM4IND.

2.1 Equipment List

- 1 x ED-CM4IND Unit
- 1 x 2.4GHz/5GHz WiFi/BT antenna
- 1 x 4G antenna
- 1 x 12V 2A power adapter
- 1 x CR1220 button battery (RTC power supply)

2.2 Hardware Connection

As an example, the ED-CM4IND that includes eMMC, WiFi/BT and 4G functions is used to introduce the specific operation of the connection.

Tools and wires preparation:

- 1 x Network cable
- 1 x 4G SIM card
- 1 x HDMI Monitor
- 1 x standard HDMI to HDMI cable
- 1 x keyboard
- 1 x mouse

1. Install the WiFi/BT and 4G external antenna.
2. Insert the 4G SIM card.
3. Use a network cable to connect the device to Ethernet through the 1000M port.
4. Connect the mouse and keyboard through the USB port.
5. Insert HDMI cable to connect the monitor.
6. Connect the 12V 2A power adapter.

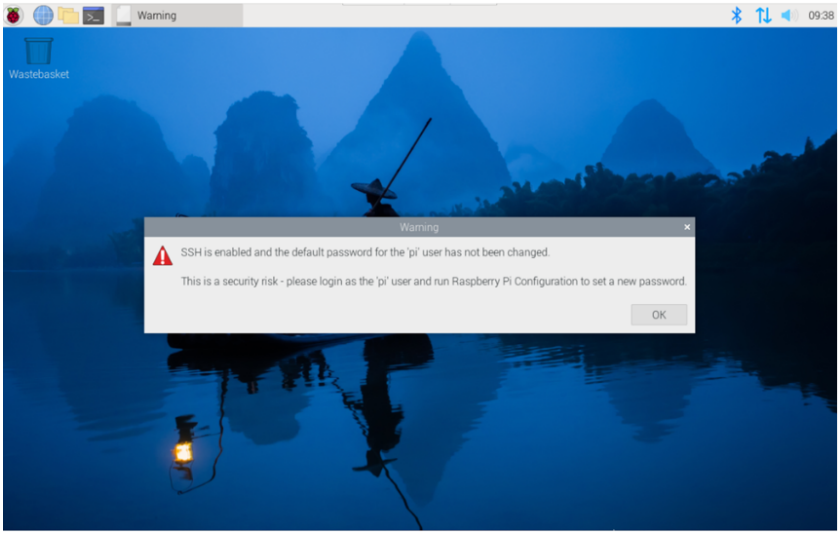
2.3 Booting The System For The First Time

ED-CM4IND device has no switching power supply. After the power supply is connected, the system will start.

- The red Power indicator is on, indicating that the device has been powered normally.
- The green Status indicator is blinking, indicating that the system is started normally, and then the logo of Raspberry Pi will appear in the upper left corner of the screen.

2.3.1 Raspberry Pi OS (Desktop)

After the Desktop version of the system is started, directly enter the desktop.

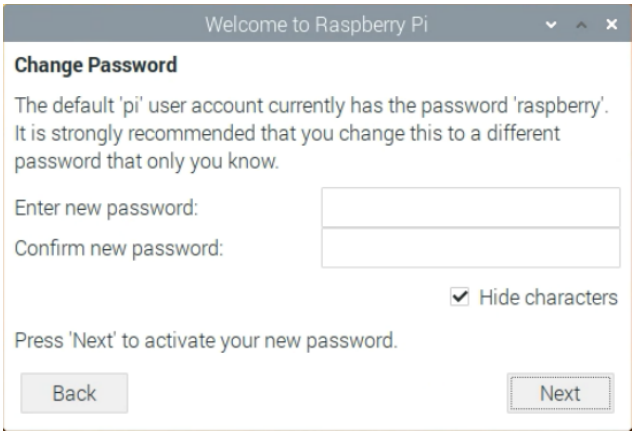


If you use the standard Raspberry Pi OS, and the OS is not configured before flasing to eMMC, the Welcome to Raspberry Pi application will pop up and guide you to complete the initialization setting when you start it for the first time.

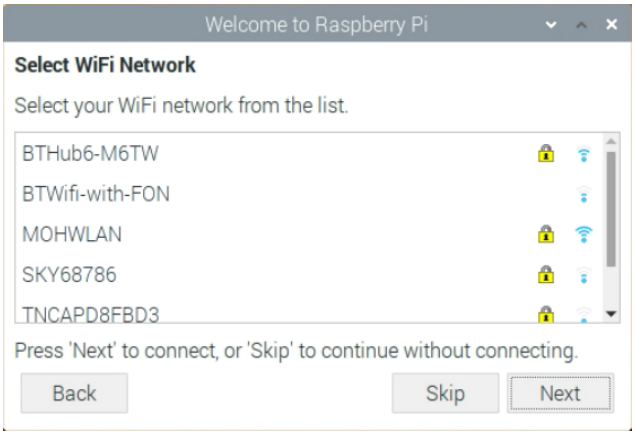
1. Click `Next` to start the setup.
2. Setting `Country` , `Language` and `Timezone` , click `Next` 。

> TIP
>
> You need to select a country region, otherwise the default keyboard layout of the system is the English keyboard layout.

3. Input a new password for the default account `pi`, and click `Next` and default password is `raspberry`.

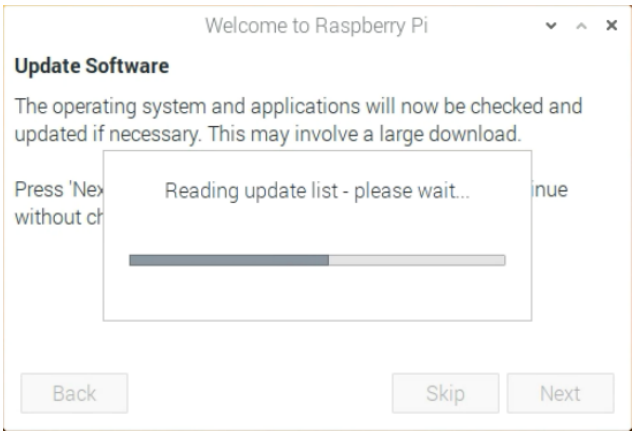


4. Select the wireless network you need to connect to, enter the password, and then click `Next`.



> TIP
>
> If the device does not support WiFi function, there will be no this step. Before upgrading the system, you need to wait for the wifi connection to work (wifi icon appears in the top right corner).

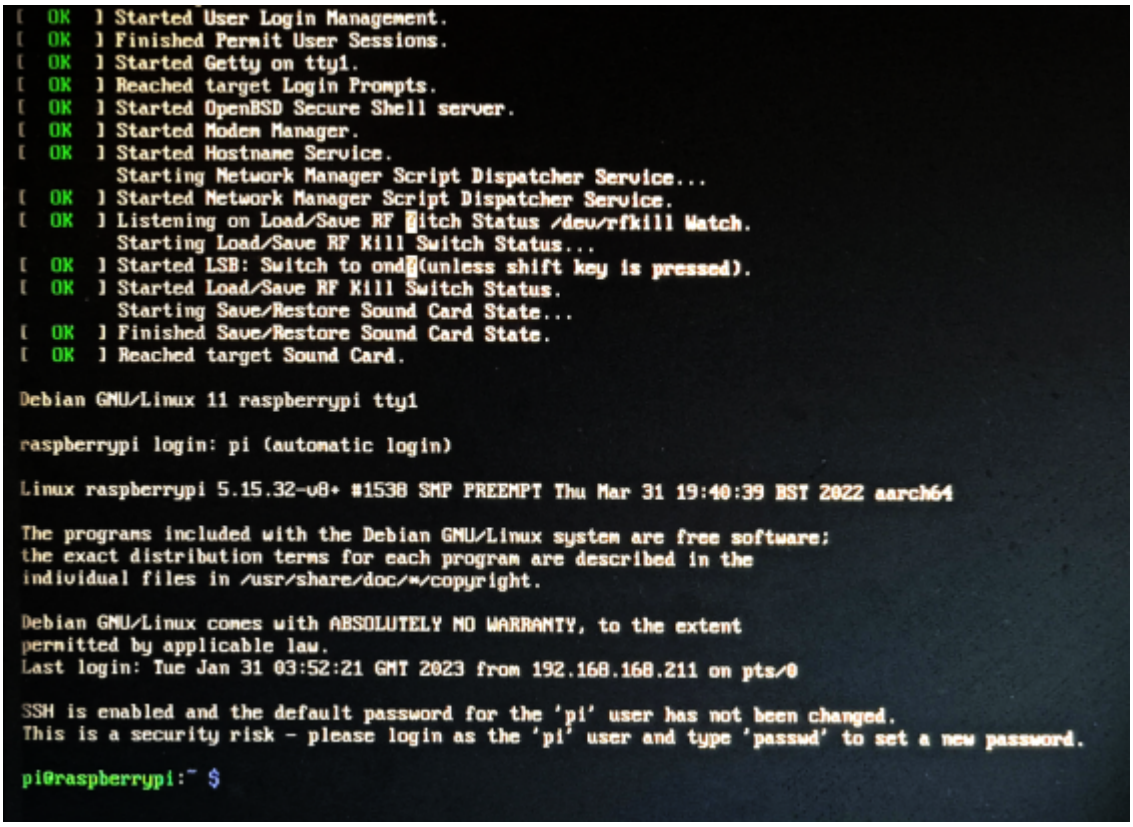
5. Click `Next`, and the wizard will automatically check and update Raspberry Pi OS.



6. Click `Restart` to complete the system update.

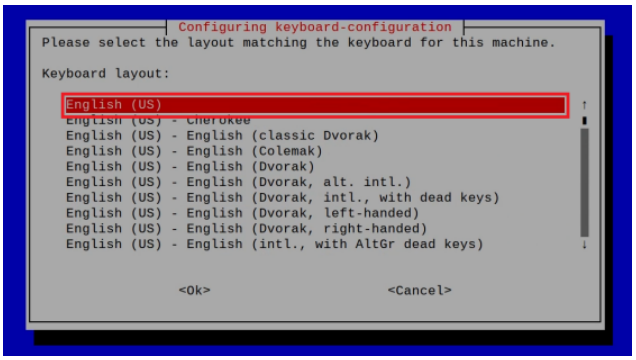
2.3.2 Raspberry Pi OS(Lite)

If you are using the default OS, the system boots up and automatically logs you in using the username pi, with a default password of raspberry.

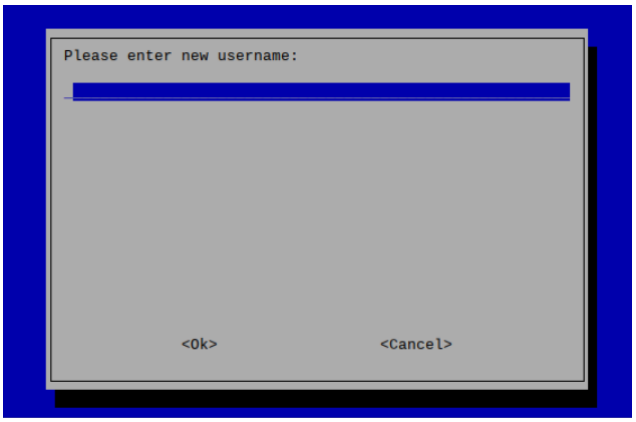


If you use the standard Raspberry Pi OS (lite), and the OS is not configured before flasing to eMMC, the configuration window will appear when you start it for the first time. You need to configure the keyboard layout, set the user name and the corresponding password.

1. Set the configuration keyboard layout.



2. Creat new username.



3. Then set the password corresponding to the user according to the prompt, and enter the password again for confirmation. At this point, you can log in with the user name and password you just set.

2.3.3 Enable SSH

If you use the standard Raspberry Pi OS, you need to enable the SSH function.

2.3.3.1 raspi-config

```sh
sudo raspi-config
```

1. Choose `3 Interface Options`
2. Choose `I2 SSH`
3. Would you like the SSH server to be enabled? Select `Yes`
4. Choose `Finish`

2.3.3.2 Add Empty File To Enable SSH

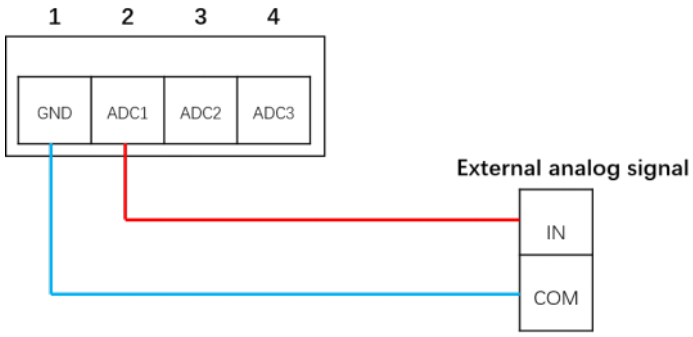
Put an empty file named ssh in the boot partition, and the SSH function will be automatically enabled after the device is powered on.

3 Wiring Guide

3.1 Panel I/O

3.1.1 ADC

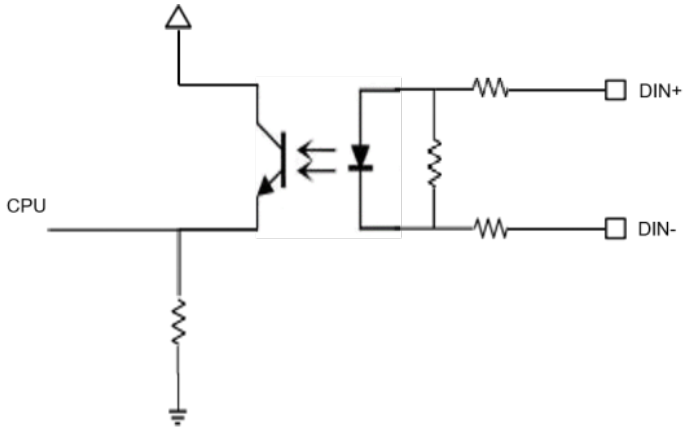
Taking ADC1 as an example, the wiring diagram of analog signal input is as follows:



3.1.2 DI

The ED-CM4IND contains 2 isolated DI interfaces. There are two wiring methods for the digital input signals, dry contact (passive) wiring and wet contact (active) wiring.

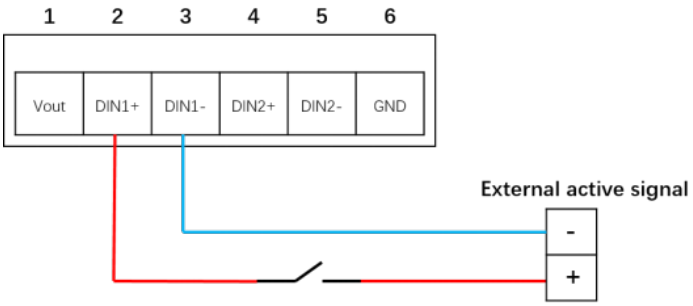
The digital signal input equivalent circuit is shown below:



3.1.2.1 Wet Contact

Wet contact wiring requires external power supply, the input is an active signal, the positive pole is connected to the device `DIN+` port, the negative pole is connected to the device `DIN-` port.

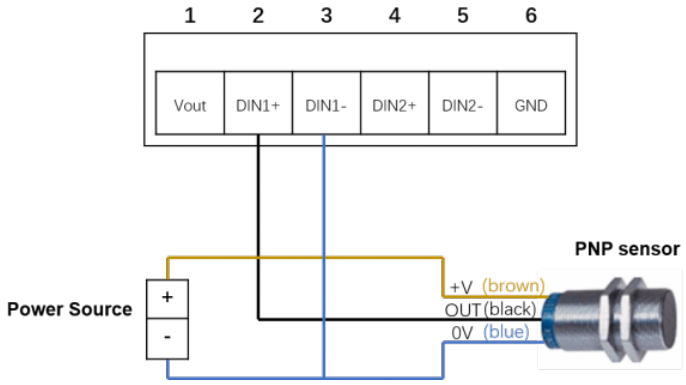
- When the input `DIN+` and `DIN-` are on and the level signal is greater than 3V, the internal optocoupler of the DI port is on, i.e., the module considers the input signal to be low.
- When `DIN+` and `DIN-` are disconnected, the internal optocoupler of DI port conducts, i.e. the module considers the input signal as high level.



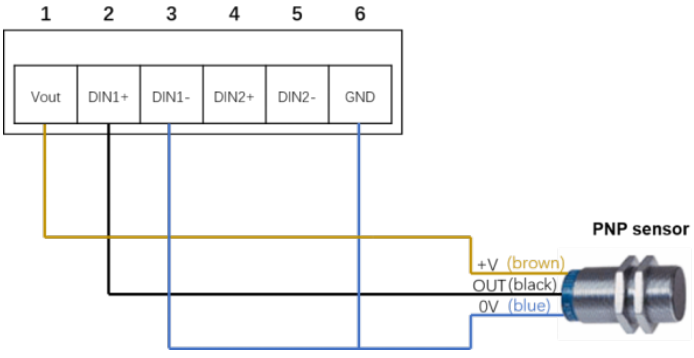
In the field of industrial control, three wire PNP type and NPN type sensors are the most common. Among the three wires, usually brown represents the positive electrode (VCC), blue represents the negative electrode (GND), and black represents the signal output terminal (OUT).

PNP type sensors are also known as source input mode sensors. When a signal is triggered, the OUT signal terminal outputs a high level.

The connection diagram of PNP type sensor is as follows.



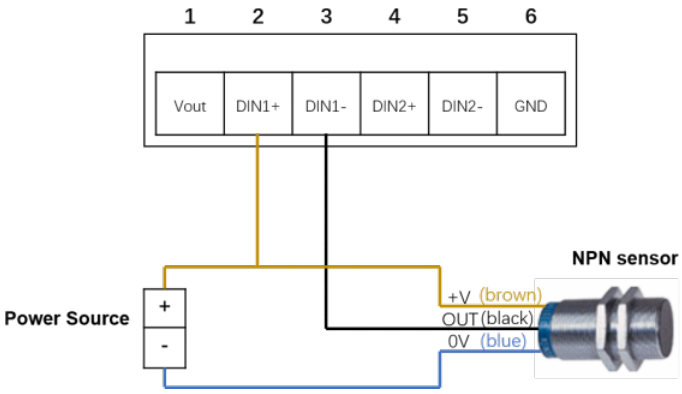
If you do not use an external power supply to power the sensor, you can use the `Vout` provided by ED-CM4IND for power supply. The connection diagram for PNP type sensors using `Vout` power supply is as follows:



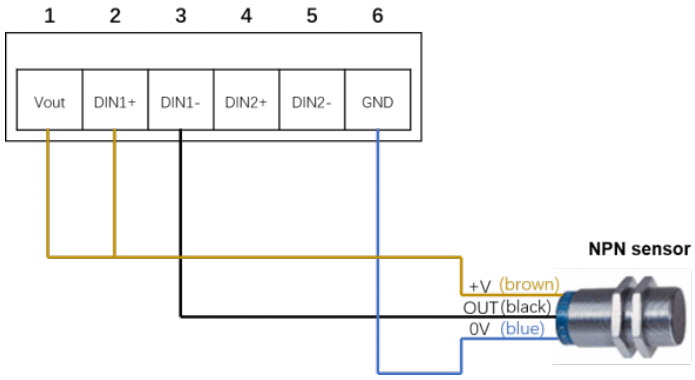
> TIP
>
> `Vout` can only provide 12V power output.

NPN type sensors are also known as sinking input mode sensors. When a signal is triggered, the OUT signal terminal outputs a low level.

The connection diagram of NPN type sensor is as follows.



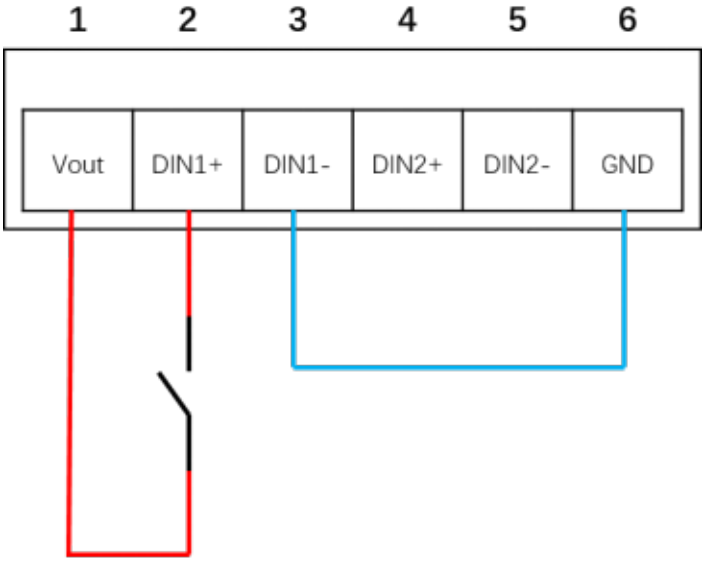
If you do not use an external power supply to power the sensor, you can use the `Vout` provided by ED-CM4IND for power supply. The connection diagram for NPN type sensors using Vout power supply is as follows:



> TIP
>
> `Vout` can only provide 12V power output.

3.1.2.2 Dry Contact

The input signal of dry contact connection mode is passive switching signal. The change of input state can be detected by disconnecting or shorting the DI and COM port.

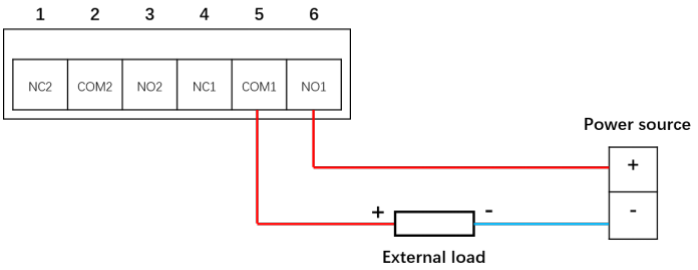


3.1.3 Realy

The relay output interfaces NC, COM, NO, correspond to the normally closed, common, and normally open of the relays respectively, and the relays of ED-CM4IND are double-knife, double-throw relays.

- When the control relay is closed, NO1 and NO2 are closed with respect to COM1 and COM2.
- When the control relay is popped open, NO1 and NO2 are both in the disconnected state relative to COM1 and COM2.

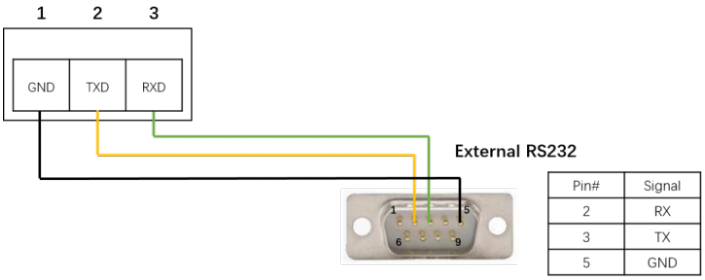
Taking an external DC load as an example, the wiring schematic of the relay is shown below:



3.1.4 RS232

ED-CM4IND includes 1 RS232 port.

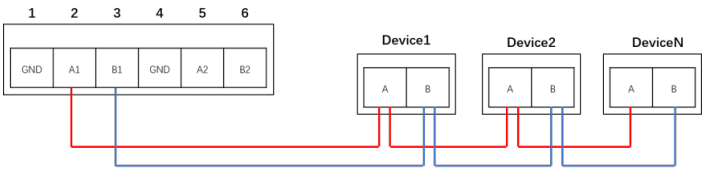
The wiring diagram of RS232 serial port is as follows:



3.1.5 RS485

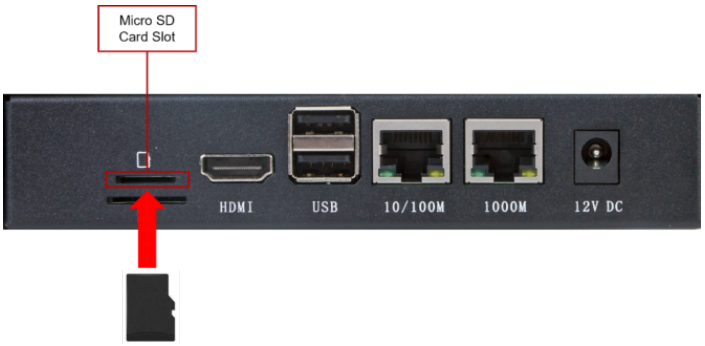
ED-CM4IND includes 2 RS485 ports.

Taking RS485-1 interface as an example, the wiring diagram is as follows:



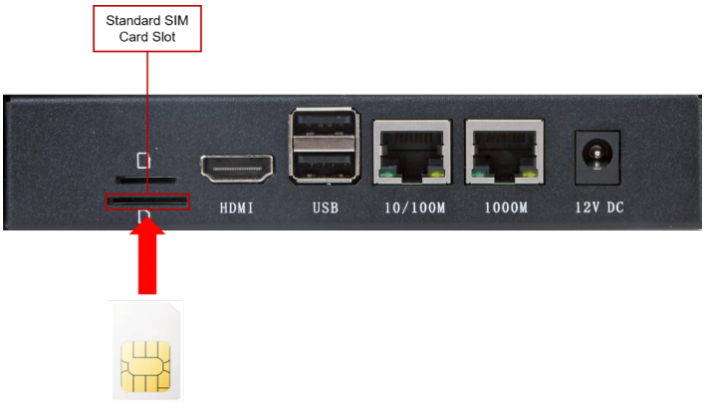
3.1.6 Micro SD Card slot

There is a Micro SD card slot on ED-CM4IND. Please insert the Micro SD card face up into the Micro SD card slot.



3.1.7 SIM Card Slot

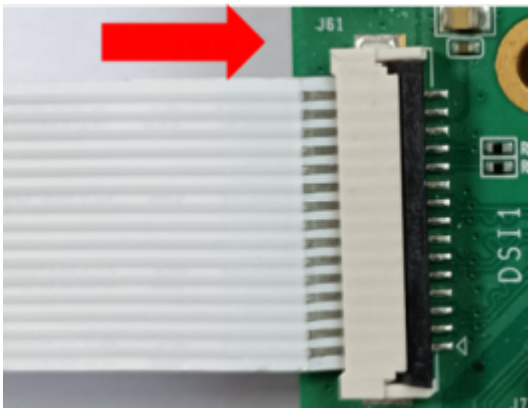
The ED-CM4IND contains 1 standard SIM card slot, insert the standard SIM card chip end upwards into the SIM card slot.



3.2 Internal I/O

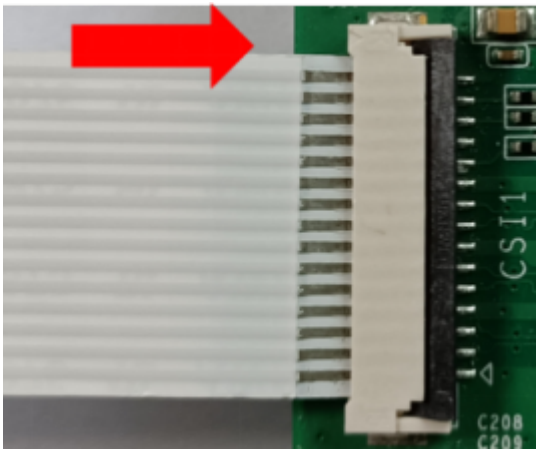
3.2.1 DSI

It is recommended that a 15-pin 1mm pitch single-sided FPC connector cable be used to connect to the DSI interface, with the metal contact side facing up and inserted in a direction perpendicular to the FPC connector, as shown in the figure below.



3.2.2 CSI

It is recommended that a 15-pin 1mm pitch single-sided FPC connector cable be used to connect to the CSI interface, with the metal contact side facing up and inserted in a direction perpendicular to the FPC connector, as shown in the figure below.



4 Software Operation Guide

4.1 Finding Device IP

Finding Device IP

4.2 Remote Login

Remote Login

4.3 Configuring Storage Devices

Configuring Storage Devices

4.4 Configuring Ethernet IP

Configuring Ethernet IP

4.5 Configuring Wi-Fi (Optional)

Configuring Wi-Fi

4.6 Configuring Bluetooth (Optional)

Configuring Bluetooth

4.7 Configuring 4G (Optional)

User can choose the device with 4G version, which needs to be configured before using 4G network.

4.7.1 Configure Using The Network Manager Tool

To connect to the 4G network, you need to create a gsm network connection first. The following connections are created according to different configuration requirements.

- There is no need to configure APN and other configurations.

```sh
sudo nmcli connection add type gsm con-name <connection_name>
```

For example, create a gsm network called mobilegsm.

```sh
sudo nmcli connection add type gsm con-name mobilegsm
```

- APN needs to be configured.

```sh
sudo nmcli connection add type gsm con-name <connection_name> ifname cdc-wdm0 gsm.apn "cmnet"
```

- configure username and password

```sh
sudo nmcli connection add type gsm con-name <connection_name> ifname cdc-wdm0 gsm.number "#777
```

- Mobile/Unicom/Telecom generally use the first method (no need to configure the APN scenario) to dial successfully, if you find the problem you can also try the following commands.

```sh
# China Mobile
sudo nmcli connection add type gsm con-name "mobile" ifname cdc-wdm0 gsm.number "*98*1#" gsm.a
#  China Unicom
sudo nmcli connection add type gsm con-name "Unicom" ifname cdc-wdm0 gsm.number "*99#" gsm.apn
# China Telecom
sudo nmcli connection add type gsm con-name "Telecom" ifname cdc-wdm0 gsm.number "#777" gsm.us
```

4.7.2 Configure Using dhcpcd

Before using 4G, we need to add our APT library first. All the images given by our company have been added with this library, so users don't need to add it manually.

```sh
sudo apt update
sudo apt install ed-ec20-qmi
```

Automatic dialing is not started by default. If users want to start automatic dialing, they need to enable LTE `lte-reconnect.service` service.

```sh
sudo systemctl enable lte-reconnect.service
sudo systemctl start lte-reconnect.service
```

After successful dialing, you can use the `ifconfig` command to see the `wwan0` network port.

If you need to set APN additionally, you need to modify the dialing command `.$BSP_HOME_PATH/quectel-CM -4 -f $LOGFILE &` in `/usr/share/ed-ec20-qmi/LTE-reconnect.sh`

The `quectel-CM` dialing configuration information is as follows:

```sh
$BSP_HOME_PATH/quectel-CM -4 -f $LOGFILE -s <APN> &
```

Restart `lte-reconnect.service` after setting.

```sh
sudo systemctl restart lte-reconnect.service
```

4.8 RTC

ED-CM4IND is 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.

The default OS will integrate the RTC automatic synchronization service we wrote, so guests can automatically synchronize the clock without setting it, and can use RTC without feeling. The general principle is:

- When the system is turned on, the service automatically reads the saved time from RTC and synchronizes it to the system time.
- If there is an Internet connection, the system will automatically synchronize the time from the NTP server and update the local system time with Internet time.
- When the system is shut down, the service automatically writes the system time into RTC and updates the RTC time.
- Because of the installation of button cell, although ED-CM4IND is powered off, RTC is still working and timing.

In this way, we can ensure that our time is accurate and reliable.

> NOTE
>
> If it is the first time to boot, because there is no effective time in RTC, synchronization may fail, so just restart it directly. When rebooting, the system time will be written into RTC for normal use.

If you don't want to use this service, you can turn it off manually:

```sh
sudo systemctl disable rtc
sudo reboot
```

Re-enable this service:

```sh
sudo systemctl enable rtc
sudo reboot
```

Read RTC manually:

```sh
sudo hwclock -r2022-11-09 07:07:30.478488+00:00
```

Manually synchronize RTC time to the system:

```sh
sudo hwclock -s
```

Write the system time into RTC.

```sh
sudo hwclock -w
```

4.9 User Button

User-defined buttons are screen-printed on the shell as user, which is connected to the GPIO6 pin of CM4 chip. By default, it is at high level, and when the button is pressed, the pin is at low level.

We use the raspi-gpio command to test, and query the GPIO6 pin when the key is not pressed.

```sh
raspi-gpio get 6
GPIO 6: level=1 fsel=0 func=INPUT pull=UP
```

A level of 1 indicates that the GPIO6 pin is high.

When the key is pressed, query the GPIO6 pin.

```sh
raspi-gpio get 6
GPIO 6: level=0 fsel=0 func=INPUT pull=UP
```

A level of 0 indicates that the GPIO6 pin is low.

4.10 Buzzer

The buzzer control pin of ED-CM4IND is GPIO25.

Open buzzer:

```sh
raspi-gpio set 6 op dh
```

Close buzzer：

```sh
raspi-gpio set 6 op dl
```

4.11 SPI Flash

The ED-CM4IND is extended with a SPI Flash via SPI with a memory capacity of 4MB for user data storage. On Linux, Serial Flash is recognized as an MTD (Memory Technology Device) device, and the device file of Flash on ED-CM4IND is `/dev/mtd0`.

> TIP
>
> MTD devices are different from our common Block devices such as hard disk, SD card, U-disk and EMMC. The typical difference is that MTD devices need to perform Erase operation, and the Sector of Erase is usually larger than the Page of the writing unit. Block devices usually have device hardware processing, and there is no difference between writing and erasing on the Host side. We usually use JFFS2 file system to manage MTD devices, not ext4.

Install `mtd-utils` tool to manage Flash devices.

```sh
sudo apt update
sudo apt install mtd-utils
```

First time to use, or you need to format, please Erase the whole Flash device.

```sh
sudo flash_erase /dev/mtd0 0 0
```

Mounting, reading and writing with `JFFS2` type.

```sh
sudo mount -t jffs2 /dev/mtd0 /mnt
```

After mounting, you can read and write the `/mnt directory` to read and write Flash devices.

4.12 Serial Communication

4.12.1 Install picocom Tool

In the Linux environment, you can use the picocom tool to debug the serial ports RS232 and RS485.

Execute the following command to install the picocom tool.

```sh
sudo apt-get install picocom
```

After opening the corresponding serial port with picocom, you can type `Ctrl+a` and then `Ctrl+h` to see the available commands.

```sh
*** Picocom commands (all prefixed by [C-a])

*** [C-x] : Exit picocom
*** [C-q] : Exit without reseting serial port
*** [C-b] : Set baudrate
*** [C-u] : Increase baudrate (baud-up)
*** [C-d] : Decrease baudrate (baud-down)
*** [C-i] : Change number of databits
*** [C-j] : Change number of stopbits
*** [C-f] : Change flow-control mode
*** [C-y] : Change parity mode
*** [C-p] : Pulse DTR
*** [C-t] : Toggle DTR
*** [C-g] : Toggle RTS
*** [C-|] : Send break
*** [C-c] : Toggle local echo
*** [C-w] : Write hex
*** [C-s] : Send file
*** [C-r] : Receive file
*** [C-v] : Show port settings
*** [C-h] : Show this message
```

Input `Ctrl+a` first, then `Ctrl+c` to switch the local echo mode.

Input `Ctrl+a` first, then `Ctrl+q` to exit picocom.

4.12.2 Configure RS232

ED-CM4IND includes 1 RS232 port, and the corresponding COM ports and device files are as follows:

RS232 Port	Corresponding Device File
RS232	/dev/ttyAMA5

Preparation:

The RS232 port of ED-CM4IND has been connected with external device.

Steps:

1. Execute the following command to open the serial port, and configure the serial port baud rate to 115200.

```sh
picocom -b 115200 /dev/ttyAMA5
```

2. Input commands as needed to control external device.

4.12.3 Configure RS485

ED-CM4IND includes 2 RS485 port, and the corresponding COM ports and device files are as follows:

RS485 Port	Corresponding Device File
RS485-1	/dev/ttyAMA4
RS485-2	/dev/ttyAMA3

Preparation:

The RS485 port of ED-CM4IND has been connected with external device.

Steps:

1. Execute the following command to open the serial port RS485-2, and configure the serial port baud rate to 115200.

```sh
picocom -b 115200 /dev/ttyAMA3
```

2. Input commands as needed to control external devices.

4.12.4 Debug UART

Debugging serial interface J58, screen printing name UART0, TTL level serial port.

To enable debugging serial port, you need to modify the `config.txt` file.

```sh
sudo nano /boot/config.txt
```

Add the following content to the end of the file.

```text
[all]
enable_uart=1
```

The default baud rate of debugging serial port is 115200. You can check the current baud rate of debugging serial port through `cmdline.txt` file.

```sh
sudo nano /boot/cmdline.txt
```

4.13 ADC

There are 3 ADC channels on ED-CM4IND. Take AIN1 as an example to demonstrate how to read them:

```sh
cd /sys/bus/iio/devices
cd iio\:device0
cat in_voltage1_raw
```

4.14 DI

The ED-CM4IND contains 2 channels of DI, which are connected to GPIO11 and GPIO26 of the CM4. The default wiring method of the device is wet contact (active) wiring, with `DIN+` connected to the positive terminal of the external power supply and `DIN-` connected to the negative terminal of the external power supply.

`DIN1` corresponds to GPIO11, and use `raspi-gpio` command to check the pin status of GPIO11.

```sh
raspi-gpio get 11
```

- When `DIN1+` and `DIN1-` are disconnected:

```sh
GPIO 11: level=1 fsel=0 func=INPUT pull=DOWN
```

- When `DIN1+` and `DIN1-` are connected:

```text
GPIO 11: level=0 fsel=0 func=INPUT pull=DOWN
```

`DIN2` corresponds to GPIO26, and use `raspi-gpio` command to check the pin status of GPIO26.

```text
raspi-gpio get 26
```

- When `DIN2+` and `DIN2-` are disconnected:

```text
GPIO 26: level=1 fsel=0 func=INPUT pull=DOWN
```

- When `DIN1+` and `DIN1-` are connected:

```text
GPIO 26: level=0 fsel=0 func=INPUT pull=DOWN
```

4.15 Relay

The ED-CM4IND features an onboard double-pole double-throw (DPDT) relay, controlled by the GPIO22 pin's high or low level. By default, the relay is in the normally closed (NC) state, where COM1 is connected to NC1 and COM2 is connected to NC2. When GPIO22 is set to a high level, the relay switches to the open state, connecting COM1 to NO1 and COM2 to NO2.

- Open relay

```text
sudo raspi-gpio set 22 op dh
```

`Op` means set to output, `dh` means pin is high.

- Close relay

```text
sudo raspi-gpio set 22 op dl
```

`Op` means set to output, and `dl` means pin is low.

5 Installing OS (optional)

The device is shipped with an operating system by default. If the OS is corrupted during use or the user needs to replace the OS, it is necessary to re-download the appropriate system image and install it. Our company supports to install the OS by installing the standard Raspberry Pi OS first, and then install the Firmware package.

The following section describes the specific operations of image download, eMMC flashing and installation of Firmware packages.

5.1 Downloading OS File

You can download the corresponding official Raspberry Pi OS file according to your actual needs, the download path is listed below:

OS	Download Path
Raspberry Pi OS(Desktop) 64-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_arm64/images/raspios_arm64-2024-07-04/2024-07-04-raspios-bookworm-arm64.img.xz (https://downloads.raspberrypi.com/raspios_arm64/images/raspios_arm64-2024-07-04/2024-07-04-raspios-bookworm-arm64.img.xz)
Raspberry Pi OS(Lite) 64-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_lite_arm64/images/raspios_lite_arm64-2024-07-04/2024-07-04-raspios-bookworm-arm64-lite.img.xz (https://downloads.raspberrypi.com/raspios_lite_arm64/images/raspios_lite_arm64-2024-07-04/2024-07-04-raspios-bookworm-arm64-lite.img.xz)
Raspberry Pi OS(Desktop) 32-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_armhf/images/raspios_armhf-2024-07-04/2024-07-04-raspios-bookworm-armhf.img.xz (https://downloads.raspberrypi.com/raspios_armhf/images/raspios_armhf-2024-07-04/2024-07-04-raspios-bookworm-armhf.img.xz)
Raspberry Pi OS(Lite) 32-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_lite_armhf/images/raspios_lite_armhf-2024-07-04/2024-07-04-raspios-bookworm-armhf-lite.img.xz (https://downloads.raspberrypi.com/raspios_lite_armhf/images/raspios_lite_armhf-2024-07-04/2024-07-04-raspios-bookworm-armhf-lite.img.xz)

5.2 Flashing to eMMC

It is recommended to use the Raspberry Pi official tools. The download paths are as follows:

- Raspberry Pi Imager: https://downloads.raspberrypi.org/imager/imager_latest.exe (https://downloads.raspberrypi.org/imager/imager_latest.exe)

- SD Card Formatter: https://www.sdcardformatter.com/download/ (https://www.sdcardformatter.com/download/)
- Rpiboot: https://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot_setup.exe (https://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot_setup.exe)

Preparation:

- The downloading and installation of the official tools to the computer have been completed.
- A Micro USB to USB-A cable (USB flashing cable) has been prepared.
- The OS file has been obtained.

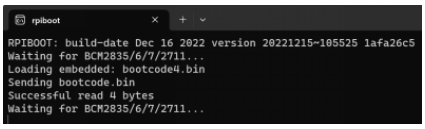
Steps:

The steps are described using Windows system as an example.

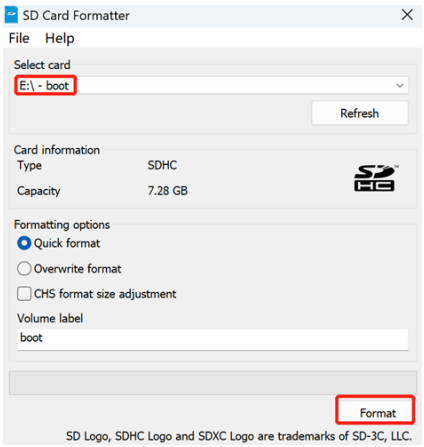
1. Open the top cover of the ED-CM4IND device, determine the location of the Micro USB port, and then connect USB flashing cable and power cables.

   - Connecting to USB flashing cable: One end is connected to the Micro USB port on ED-CM4IND, and the other end is connected to the USB port on the PC.
   - Connecting Power Cord: One end connects to the DC Jack terminal on the side of the device and the other end connects to the external power supply.

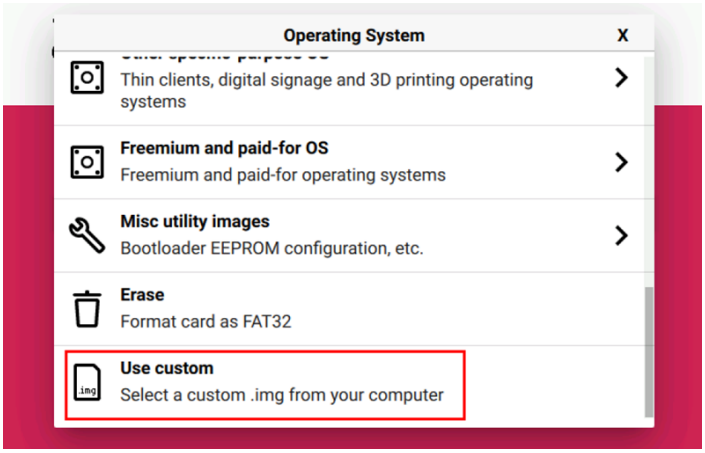
2. Open rpiboot tool to automatically convert the drive to a letter



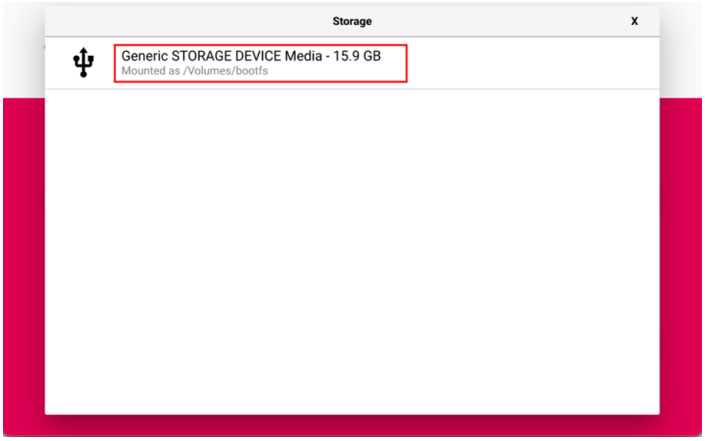
3. After the completion of the drive letter, the drive letter will pop up in the lower right corner of the computer.
4. Open SD Card Formatter, select the formatted drive letter, and click "Format" at the lower right to format.



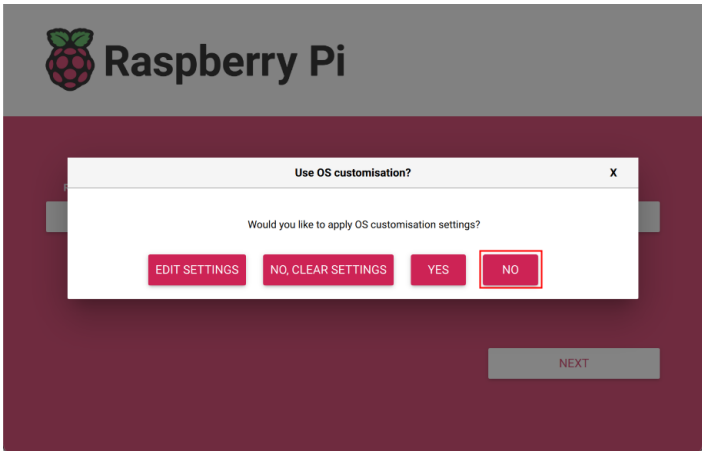
5. In the pop-up prompt box, select "Yes".
6. When the formatting is completed, click "OK" in the prompt box.
7. Close SD Card Formatter.
8. Open Raspberry Pi Imager, select "CHOOSE OS" and select "Use Custom " in the pop-up pane.



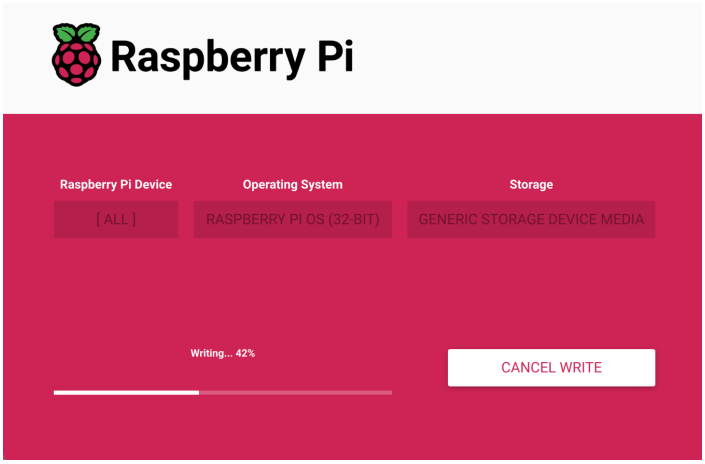
9. According to the prompt, select the OS file under the user-defined path and return to the main page.
10. Click "CHOOSE STORAGE", select the default device in the "Storage" interface, and return to the main page.



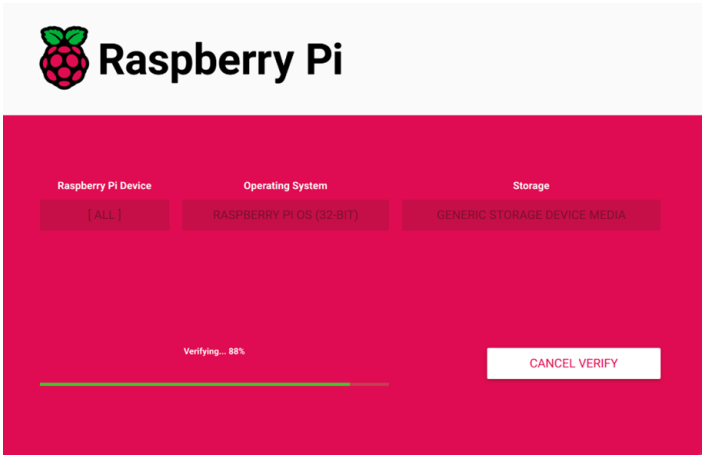
11. Click “NEXT”, select "NO " in the pop-up “Use OS customization?” pane.



12. Select “YES” in the pop-up “Warning” pane to start writing the image.



13. After the OS writing is completed, the file will be verified.



14. After the verification is completed, click “CONTINUE” in the pop-up “Write Successful” box.
15. Close Raspberry Pi Imager, remove USB cable and power on the device again.

5.3 Installing Firmware Package

After you have finished flashing to eMMC on ED-IPC2000 Series, you need to configure the system by adding edatec apt source and installing firmware package to make the system work. The following is an example of Debian 12 (bookworm) desktop version. Preparation:

- The flashing to eMMC of the Raspberry Pi standard OS (bookworm) has been completed.
- The device has booted normally and the relevant boot configuration has been completed.

Steps: :

1. After the device starts normally, execute the following commands in the command pane to add the edatec apt source and installing firmware package.

```sh
curl -s https://apt.edatec.cn/bsp/ed-install.sh | sudo bash -s ind
```

```
pi@raspberry:~ $ curl -s https://apt.edatec.cn/bsp/ed-install.sh | sudo bash -s ind
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   141  100   141    0     0   1285      0 --:--:-- --:--:-- --:--:--  1293
--2024-12-20 18:53:35--  https://apt.edatec.cn/bsp/splash.png
Resolving apt.edatec.cn (apt.edatec.cn)... 47.242.199.148
Connecting to apt.edatec.cn (apt.edatec.cn)|47.242.199.148|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 36009 (35K) [image/png]
Saving to: '/tmp/eda-common/eda/splash.png'

/tmp/eda-common/eda/splash 100%[===================================>]  35.17K  --.-KB/s    in 0.03s
```

2. After the installation is complete, the system automatically reboots.
3. Execute the following command to check whether the firmware package is installed successfully.

```sh
dpkg -l | grep ed-
```

The result in the picture below indicates that the firmware package has been installed successfully.

```
pi@raspberry:~ $ dpkg -l |grep ed-
ii  ed-cm4ind-rev1p3-bsp          1.20240708              arm64        EDATEC CM4 Industial BSP Package
ii  ed-rtc                        1.20210805-1            arm64        RTC auto load and sync service for EDATEC products powered by
Raspberry Pi
ii  libparted-fs-resize0:arm64    3.5-3                   arm64        disk partition manipulator - shared FS resizing library
ii  libshine3:arm64               3.1.1-2                 arm64        Fixed-point MP3 encoding library - runtime files
ii  shared-mime-info              2.2-1                   arm64        FreeDesktop.org shared MIME database and spec
ii  usr-is-merged                 37~deb12u1              all          Transitional package to assert a merged-/usr system
```

> TIP
>
> If you have installed the wrong firmware package, you can execute `sudo apt-get --purge remove package` to delete it, where “package” is the package name.