ED-CM4NANO

User Manual

by EDA Technology Co., Ltd

built: 2025-10-17

1 Product Overview

ED-CM4NANO is a compact industrial computer based on Raspberry Pi CM4. Depending on different application scenarios and user requirements, computer systems with varying RAM and eMMC specifications are available.

RAM options include 1GB, 2GB, 4GB, and 8GB. eMMC options include 8GB, 16GB, and 32GB. ED-CM4NANO provides commonly used interfaces such as HDMI, USB, and Ethernet, while also reserving expansion interfaces including DSI, CSI, and a 40-PIN connector. It supports network connectivity via both Wi-Fi and Ethernet, primarily targeting industrial control and IoT applications.

1.1 Target Application

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

1.2 Specifications

Specification	Description
CPU	Broadcom BCM2711 Quad-core Cortex-A72 (ARM v8) 64-bit 1.5GHz SoC
RAM	1GB/2GB/4GB/8GB LPDDR4-3200 SDRAM optional

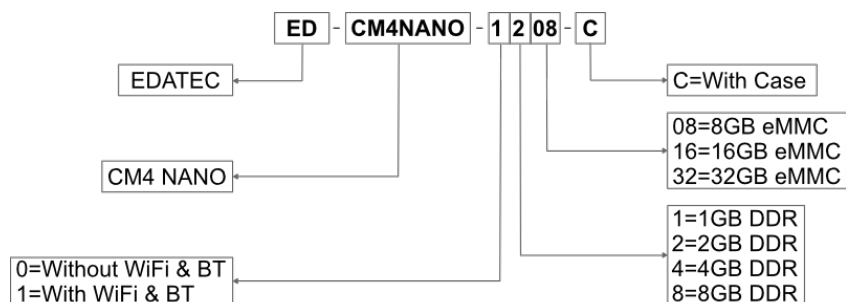| Specification	Description
Storage	8GB/16GB/32GB eMMC optional Micro SD card slot (for expanded user data storage)
Wi-Fi/Bluetooth (Optional)	Supports 2.4GHz & 5GHz dual-band Wi-Fi and Bluetooth 5.0 with antenna • 2.4GHz Wi-Fi: IEEE 802.11 b/g/n compatible • 5GHz Wi-Fi: IEEE 802.11 a/n/ac compatible • Bluetooth: 2402MHz ~ 2480MHz band compatible
1000M Ethernet Interface	1 × Ethernet port (10/100/1000M auto-negotiation), RJ45 connector
SD Card Slot	1 × Micro SD card slot for user data storage
HDMI Interface	1 × HDMI Type-A port, HDMI 2.0 compliant, supports 4K@60Hz resolution
USB 3.0 Interface	2 × USB 3.0 Type-A ports, each supporting up to 5Gbps data transfer
USB 2.0 Interface	1 × USB 2.0 Type-A port, supporting up to 480Mbps data transfer
Reserved Interfaces	• DSI interface: Supports LCD display expansion • CSI interface: Supports camera module expansion • 40-PIN connector: Raspberry Pi standard 40-PIN GPIO • 4-Pin PoE connector: Supports PoE module expansion • 2-Pin DC 5V: 5V power output expansion
Extended Features	• Built-in RTC function • Built-in buzzer
LED Indicators	• Green: System status indicator • Red: Power indicator
Power Input	7V~18V DC
Dimensions	103mm(W) x 62mm(D) x 32mm(H)
Enclosure	Heat-dissipating aluminum alloy
Antenna	External antenna
Operating Temperature	-25°C ~60°C
Operating System	• Raspberry Pi OS (Desktop) 32-bit • Raspberry Pi OS (Lite) 32-bit • Raspberry Pi OS (Desktop) 64-bit • Raspberry Pi OS (Lite) 64-bit

1.3 System Diagram
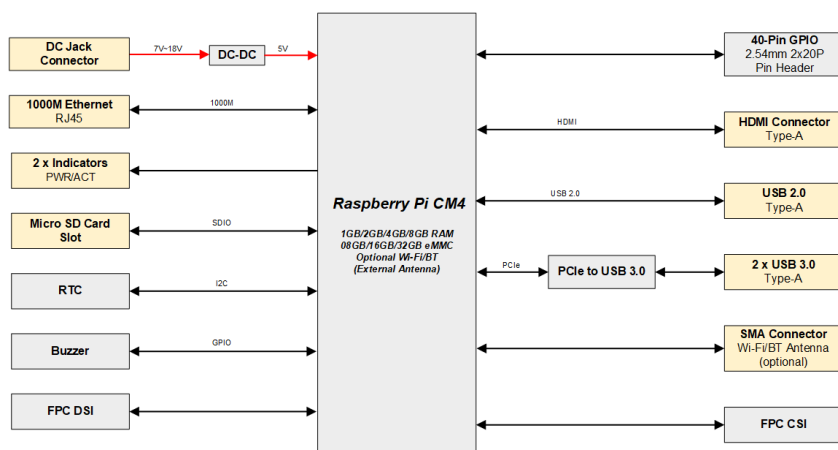
1.4 Functional Layout
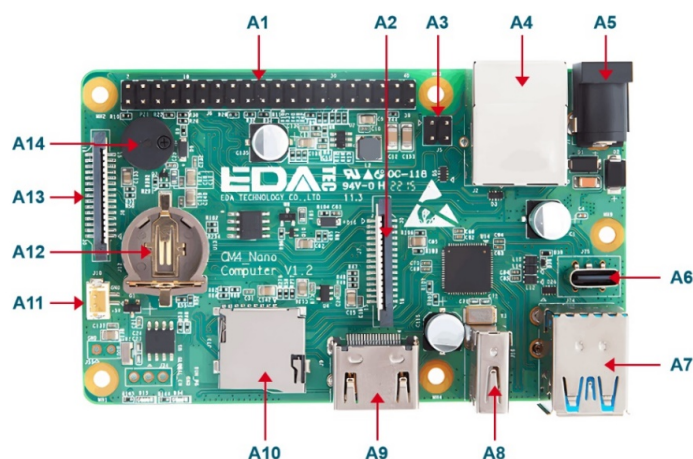
No.	Function	No.	Function
A1	40-PIN Pin Header	A2	CSI Interface
A3	PoE Pin Header	A4	1000M Ethernet Port
A5	DC Power Interface	A6	Type-C USB Port
A7	USB 3.0 Port	A8	USB 2.0 Port
A9	Standard HDMI Type-A Port	A10	Micro SD Card Slot
A11	5V DC Output Terminal	A12	RTC Battery Base
A13	DSI Interface	A14	Buzzer

1.5 Packing List

• 1 x ED-CM4NANO
• [WiFi/BT Version - optional] 1 x WiFi/BT Antenna

1.6 Ordering code

ED - CM4NANO - 1 2 08 - C

EDATEC

CM4 NANO

C=With Case

08=8GB eMMC
16=16GB eMMC
32=32GB eMMC

1=1GB DDR
2=2GB DDR
4=4GB DDR
8=8GB DDR

0=Without WiFi & BT
1=With WiFi & BT

Example

P/N: **ED-CM4NANO-1208-C**
Configuration: CM4 NANO Computer Based on Raspberry Pi CM4,
with Wi-Fi & Bluetooth, 2GB DDR, 8GB eMMC and a metal case.

Optional Accessory

Users can optionally install the rail bracket as needed for DIN rail mounting.

Model	Description	Picture
ED-ACC-DRBNANO	Mounting Bracket for 35mm DIN Rail	

2 Quick Start

This chapter explains the boot process and initial setup for ED-CM4NANO.

2.1 Equipment List

- 1 × ED-CM4NANO
- 1 x Wi-Fi/BT antenna
- 1 x mouse
- 1 x keyboard
- 1 x HDMI display
- 1 × Ethernet cable
- 1 × DC 12V/2A power adapter

2.2 Hardware Connection

1. Install the antenna to the antenna connector.
2. Connect the Ethernet cable, keyboard, and mouse.
3. Use an HDMI cable to connect the device's HDMI output to your display.
4. Plug in the ED-CM4NANO power adapter.
5. Power on the display.
6. Power the ED-CM4NANO adapter to initiate boot:
    ◦ Red LED illuminates indicating power supply.
    ◦ Green LED blinks during boot; Raspberry Pi logo appears on-screen.
7. Upon successful boot:
    ◦ Desktop environment loads automatically
    ◦ If prompted for login:
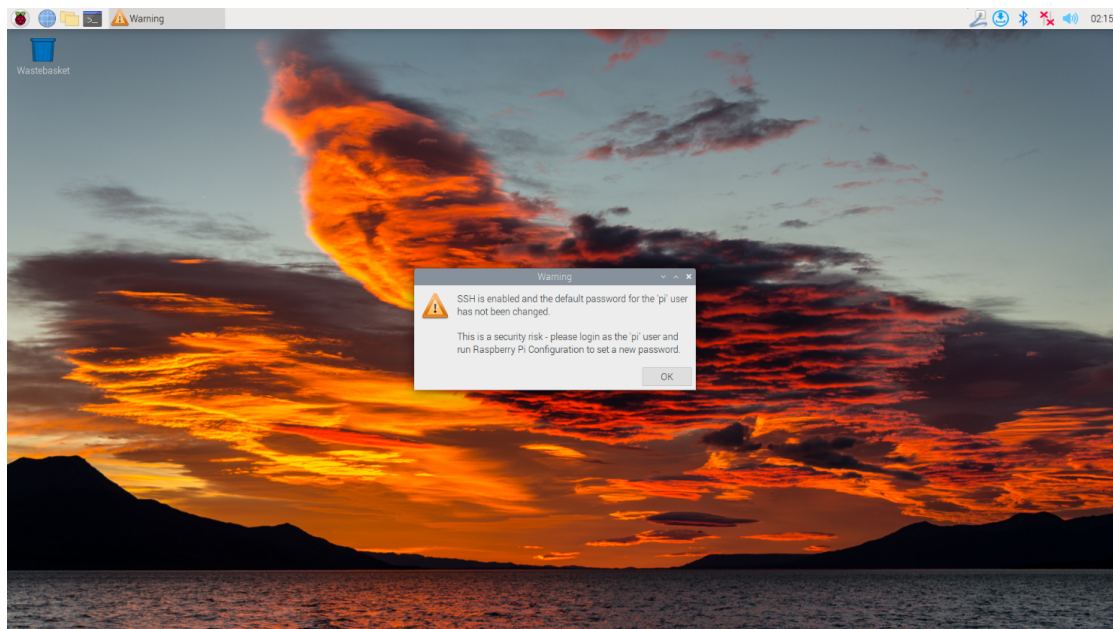   Username: pi
       Password: raspberry

2.3 First Boot

ED-CM4NANO boots automatically when powered (no physical power switch).

- Red LED illuminates indicating power supply.
- Green LED blinks during boot; Raspberry Pi logo appears on-screen.

2.3.1 Raspberry Pi OS (Desktop)

After boot, the desktop interface launches immediately.

For official Raspberry Pi OS images:

1. Click "Next" to begin configuration.
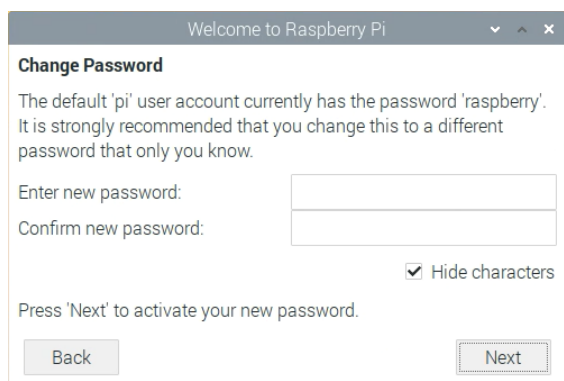2. Set Country, Language, and Timezone, then Click "Next".

> TIP
>
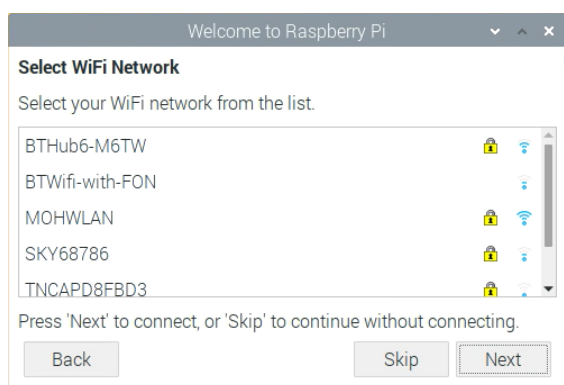> Regional settings are required – default keyboard layout is UK English.

3. Set password for default account "pi", then Click "Next".

> **TIP**
>
> The default username is `pi` , and the default password is `raspberry` .

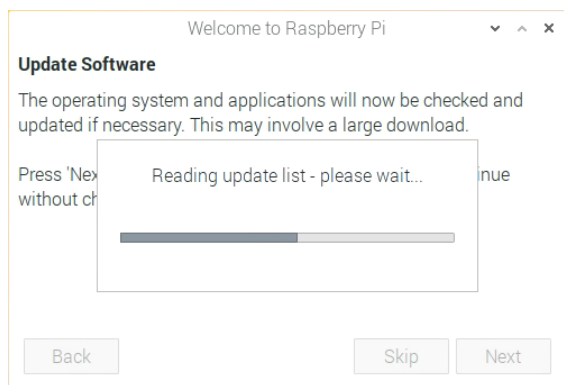4. Select the wireless network you need to connect to, enter the password, and then click "Next".

> **TIP**
>
> Skip this step if your ED-CM4NANO model doesn't include Wi-Fi.

5. Click "Next" to check for system updates.

> **TIP**
>
> Ensure Wi-Fi icon appears top-right before updating.

6. Click "Restart" to complete setup.

2.3.2 Raspberry Pi OS (Lite)

Automatically logs in as user `pi` with default password `raspberry` .

For official Raspberry Pi OS Lite

1. Set the keyboard layout.
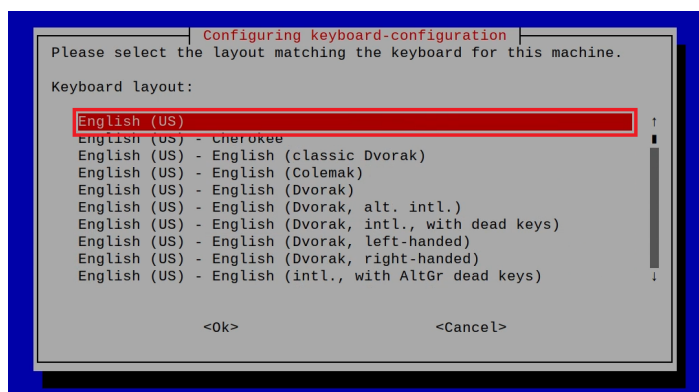
2. Creat username.

3. Set/confirm password.
4. Log in with new credentials.

2.3.3 Enabling SSH

SSH is pre-enabled in all our provided system images. For official Raspberry Pi OS images, manual configuration is required using either method below:

- Via the `raspi-config` tool;
- By creating an empty file named ssh.

2.3.3.1 raspi-config

1. Execute `sudo raspi-config` command.
2. Choose 3 Interface Options
3. Choose I2 SSH
4. Would you like the SSH server to be enabled? Select Yes
5. Choose Finish

2.3.3.2 Add Empty File To Enable SSH

Create an empty file named ssh in the boot partition. The SSH function will be automatically enabled upon system boot.

2.3.4 Get device IP

- If the display screen is connected, you can use the ifconfig command to find the current device IP.
- If there is no display screen, you can view the assigned IP through the router.
- If there is no display screen, you can download the nmap tool to scan the IP under the current network.

Nmap supports Linux, macOS, Windows and other platforms. If you want to use nmap to scan the network segments from 192.168.3.0 to 255, you can use the following command：

```sh
nmap -sn 192.168.3.0/24
```

After waiting for a period of time, the result will be output.

```sh
Starting Nmap 7.92 ( https://nmap.org ) at 2022-12-30 21:19 中国标准时间
Nmap scan report for 192.168.3.1 (192.168.3.1)
Host is up (0.0010s latency).
MAC Address: XX:XX:XX:XX:XX:XX (Phicomm (Shanghai))
Nmap scan report for DESKTOP-FGEOUUK.lan (192.168.3.33)
Host is up (0.0029s latency).
MAC Address: XX:XX:XX:XX:XX:XX (Dell)
Nmap scan report for 192.168.3.66 (192.168.3.66)
Host is up.
Nmap done: 256 IP addresses (3 hosts up) scanned in 11.36 seconds
```

3 Wiring Guide

3.1 Panel I/O

3.1.1 BOOT
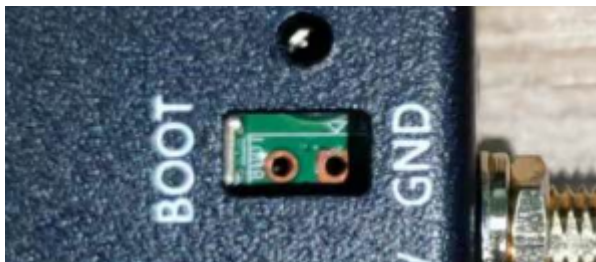
During the flashing process, short-circuit the BOOT and GND pins using jumper wires to enter flash mode. Remove the jumper wires immediately after flashing completes.

3.1.2 Micro SD Card
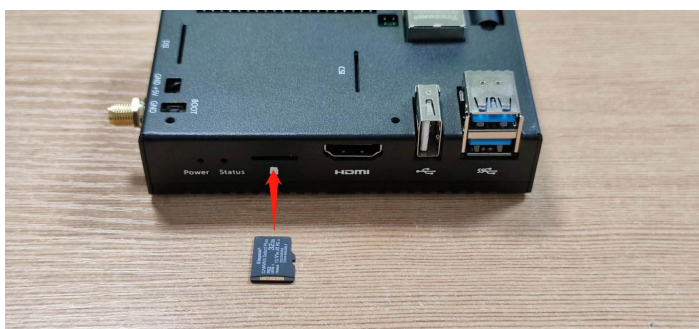
3.2 Internal I/O

3.2.1 HDMI FPC

The FPC HDMI connector resides at position J13 on the PCB assembly and supports connection to LCD displays.

Pin	Definition	Pin	Definition
1	NC	21	GND
2	NC	22	HDMI1_CLKP
3	NC	23	HDMI1_CLKN
4	NC	24	GND
5	GND	25	BACKLIGHT_PWM

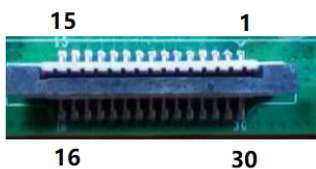|			
6	USB_DP	26	GND
7	USB_DM	27	GND
8	GND	28	GND
9	HDMI1_HPD	29	GND
10	HDMI1_SCL	30	GND
11	HDMI1_SDA	31	GND
12	GND	32	LCD_PWR_EN
13	HDMI1_TX2P	33	5V
14	HDMI1_TX2N	34	5V
15	GND	35	5V
16	HDMI1_TX1P	36	5V
17	HDMI1_TX1N	37	5V
18	GND	38	5V
19	HDMI1_TX0P	39	5V
20	HDMI1_TX0N	40	5V

3.2.2 MIPI DSI

The FPC DSI connector resides at position J8 on the PCB assembly and supports connection to LCD displays.

Pin	Definition	Pin	Definition
1	GND	9	DSI1_D0_P
2	DSI1_D1_N	10	GND
3	DSI1_D1_P	11	SCL0
4	GND	12	SDA0
5	DSI1_CLK_N	13	GND
6	DSI1_CLK_P	14	3V3
7	GND	15	3V3
8	DSI1_D0_N	-	-

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 RTC

The ED-CM4NANO 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 shipping system image 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 the CM4 Nano is powered off, the RTC is still working and timing.

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

> TIP
>
> 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 Time manually:

```sh
sudo hwclock -r
2022-11-09 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
```

4.8 Buzzer

The buzzer is controlled by GPIO6.

- open the buzzer:

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

• close the buzzer:

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

4.9 Serial Communication

4.9.1 Install The picocom Tool

Picocom serial terminal can be debugged conveniently in Linux environment.

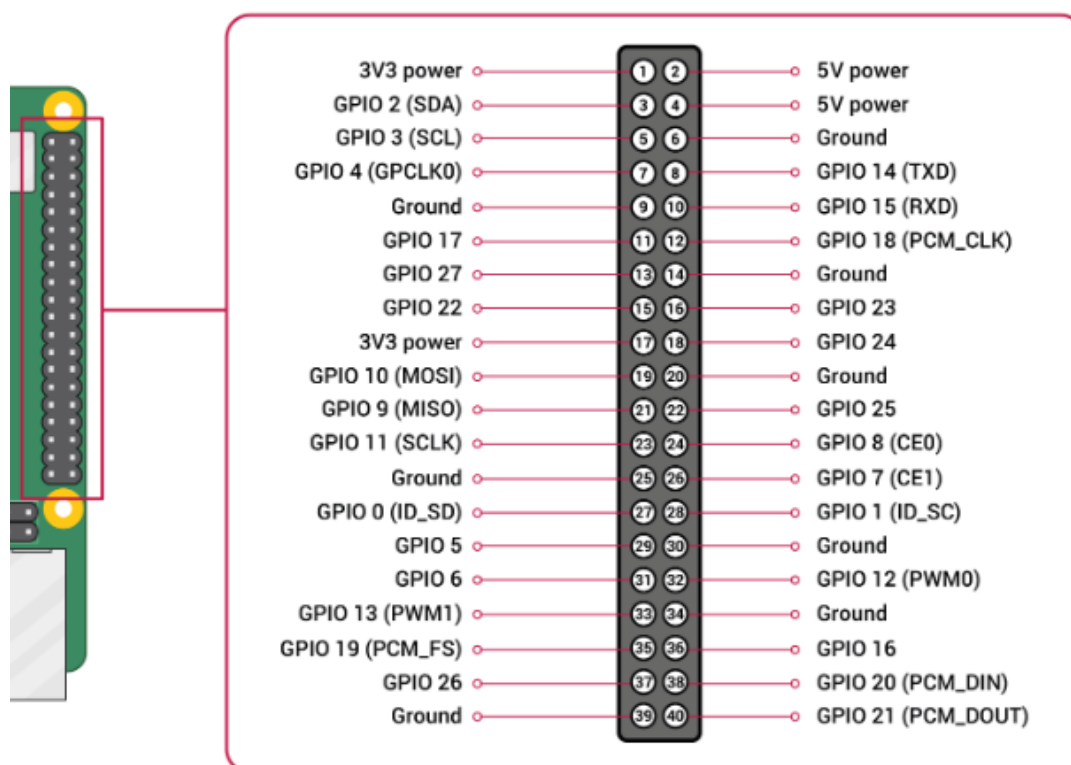1. Execute the following command to install picocom.

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

2. Execute the following commands as applicable:
   ◦ input `Ctrl+a` first, and then `Ctrl+h` to see the available commands.
   *** 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.

4.9.2 Debug UART

The 40-PIN header on ED-CM4NANO includes a debug serial port (GPIO14 = RX, GPIO15 = TX). Enable it via these steps.

1. Execute the following command to launch raspi-config.

```sh
sudo raspi-config
```

2. choose option 3 - Interface Options.
3. choose option P6 - Serial Port.
4. When prompted Would you like a login shell to be accessible over serial?, answer Yes.
5. Exit raspi-config
6. Execute the following command to restart device.

```sh
sudo reboot
```

7. Edit `config.txt` and add `enable_uart=1` at the end.

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

> TIP

The default baud rate for the debug serial port is 115200. To verify the current baud rate, inspect `cmdline.txt` .

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

5 Installing OS (optional)

ED-CM4NANO ships with a pre-installed operating system. Reinstall a suitable system image if the OS becomes corrupted or if you need to replace it.

5.1 Downloading System Images

Raspberry Pi OS with desktop, 32-bit

- Release date: July 08nd 2022
- System: 32-bit
- Kernel version: 5.10
- Debian version: 11 (bullseye)
- Release notes
- Downloads: https://vip.123pan.cn/1826505135/20273097 (https://vip.123pan.cn/1826505135/20273097)

Raspberry Pi OS Lite, 32-bit

- Release date: July 08nd 2022
- System: 32-bit
- Kernel version: 5.10
- Debian version: 11 (bullseye)
- Release notes
- Downloads: https://vip.123pan.cn/1826505135/20273290 (https://vip.123pan.cn/1826505135/20273290)

Raspberry Pi OS with desktop, 64-bit

- Release date: July 08nd 2022
- System: 64-bit
- Kernel version: 5.10
- Debian version: 11 (bullseye)
- Release notes
- Downloads: https://vip.123pan.cn/1826505135/20273319 (https://vip.123pan.cn/1826505135/20273319)

Raspberry Pi OS Lite, 64-bit

- Release date: July 08nd 2022
- System: 64-bit
- Kernel version: 5.10
- Debian version: 11 (bullseye)
- Release notes
- Downloads: https://pan.baidu.com/s/1iZ0UlpqvCD-yR6hEDdOxLw?pwd=hkr0 (https://pan.baidu.com/s/1iZ0UlpqvCD-yR6hEDdOxLw?pwd=hkr0)

5.2 Flashing to eMMC

5.2.1 Downloading Tools

- Raspberry Pi Imager: Raspberry Pi Imager (https://downloads.raspberrypi.org/imager/imager_latest.exe)
- SD Card Formatter: SD Card Formatter (https://www.sdcardformatter.com/download/)
- rpiboot: rpiboot (https://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot_setup.exe)

5.2.2 Flashing to eMMC

Preparation:

- USB-A to USB-A data cable (USB flashing cable) is available.
- Windows PC with flashing tools installed is available.
- The OS file has been obtained.

Steps:

The steps are described using Windows system as an example.

1. Connect Cables & Short-circuit Pins.
   - Use jumper wires to short-circuit the BOOT and GND pins.
   - Connect the USB flashing cable:
     - Device side: USB 2.0 port (location shown below)
   - PC side: USB interface

2. Disconnect the power supply of ED-CM4NANO and then power it on again.
3. Open rpiboot tool to automatically convert the drive to a letter

4. After the completion of the drive letter, the drive letter will pop up in the lower right corner of the computer.
5. Open `SD Card Formatter` , select the formatted drive letter, and click "Format" at the lower right to format.
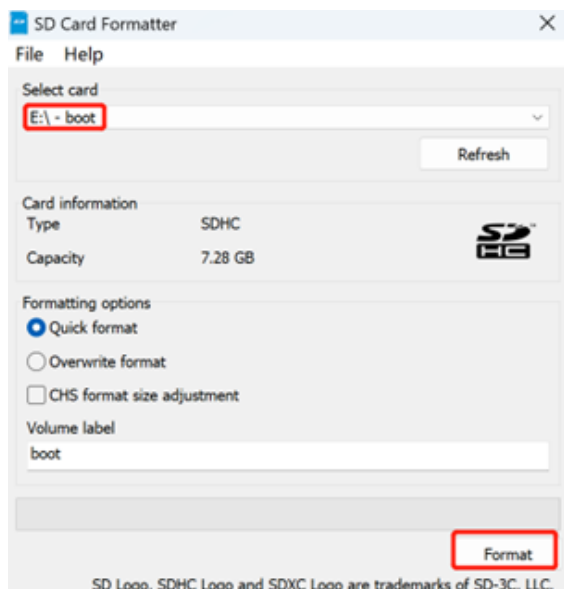
6. Complete the formatting as prompted, then close `SD Card Formatter` .
7. Open `Raspberry Pi Imager` , select "CHOOSE OS" and select "Use Custom " in the pop-up pane.
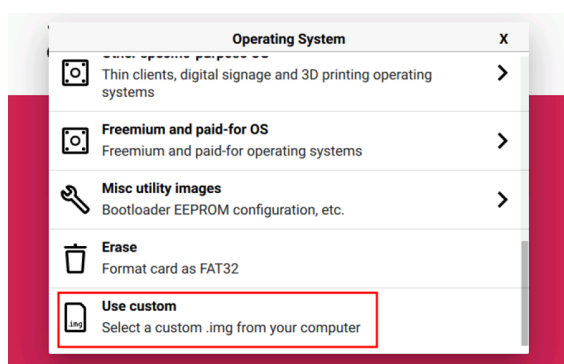
8. According to the prompt, select the OS file under the user-defined path and return to the main page.
9. Click "CHOOSE STORAGE", select the default device in the "Storage" interface, and return to the main page.
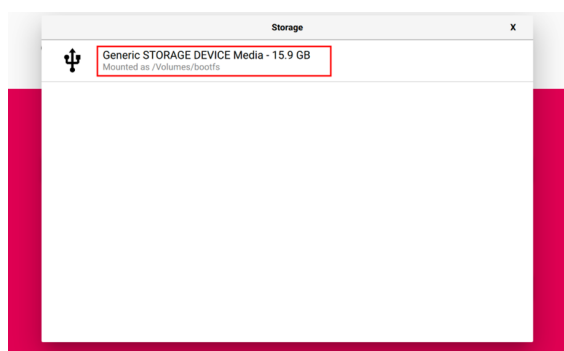
10. Click "NEXT", select "NO " in the pop-up "Use OS customization?" pane.
11. After the OS writing is completed, the file will be verified.
12. After the verification is completed, click "CONTINUE" in the pop-up "Write Successful" box.
13. Close `Raspberry Pi Imager` , remove the USB flashing cable and jumper wires, and then power on the device again.

5.3 Install BSP Based On The Offical Raspberry Pi OS

When using the official Raspberry Pi OS image, you must install our Board Support Package (BSP) to enable device-specific functionalities.

1. Execute the following commands sequentially to add the repository and BSP.

```sh
curl -sS https://apt.edatec.cn/pubkey.gpg | sudo apt-key add -
echo "deb https://apt.edatec.cn/raspbian stable main" | sudo tee /etc/apt/sources.list.d/edate
```

2. Install BSP :

```sh
sudo apt update
sudo apt install ed-cm4nano-bsp ed-rtc
```

5.4 Install the NetworkManager network management tool

The NetworkManager tool makes it easier to configure routing rules and set priorities.

• Raspberry Pi OS (Lite)

```sh
sudo apt install ed-networkmanager
```

• Raspberry Pi OS (Desktop)

```sh
sudo apt install ed-networkmanager-gnome
```