



Application Guide

Using Standard Raspberry Pi OS on ED-HMI2120 Series

EDA Technology Co., LTD

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Contact Us

Thank you very much for purchasing and using our products, and we will serve you wholeheartedly.

As one of the global design partners of Raspberry Pi, we are committed to providing hardware solutions for IOT, industrial control, automation, green energy and artificial intelligence based on Raspberry Pi technology platform.

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Foreword

Reader Scope

This manual is applicable to the following readers:

- ◆ Mechanical Engineer
- ◆ Electrical Engineer
- ◆ Software Engineer
- ◆ System Engineer

Related Agreement

Symbolic Convention

Symbolic	Instruction
	Prompt symbols, indicating important features or operations.
	Notice symbols, which may cause personal injury, system damage, or signal interruption/loss.
	Warning symbols, which may cause great harm to people.

Safety Instructions

- ◆ This product should be used in an environment that meets the requirements of design specifications, otherwise it may cause failure, and functional abnormality or component damage caused by non-compliance with relevant regulations are not within the product quality assurance scope.
- ◆ Our company will not bear any legal responsibility for personal safety accidents and property losses caused by illegal operation of products.
- ◆ Please do not modify the equipment without permission, which may cause equipment failure.
- ◆ When installing equipment, it is necessary to fix the equipment to prevent it from falling.
- ◆ If the equipment is equipped with an antenna, please keep a distance of at least 20cm from the equipment during use.
- ◆ Do not use liquid cleaning equipment, and keep away from liquids and flammable materials.
- ◆ This product is only supported for indoor use.

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1 Overview

This chapter introduces the background information and application range of using standard Raspberry Pi OS on the ED-HMI2120 series.

- ✓ Background
- ✓ Application Range

1.1 Background

ED-HMI2120 series products have an operating system with BSP installed by default when leaving the factory. It has added supporting for BSP, created users, enabled SSH and supports BSP online upgrade. It is safe and reliable, and users can use the operating system.



NOTE:

If the user has no special needs, it is recommended to use the default operating system. The download paths are [ED-HMI2120-070C/raspios](#) and [ED-HMI2120-101C/raspios](#).

If the user wants to use the standard Raspberry Pi OS after receiving the product, some functions will be unavailable (For example, LCD screen is not available) after changing the operating system to the standard Raspberry Pi OS. In order to solve this problem, ED-HMI2120 supports online installation for Firmware packages to make the product better compatibles with the standard Raspberry Pi OS and ensure that all functions can be used.

ED-HMI2120 supports the standard Raspberry Pi OS by installing firmware package online on the standard Raspberry Pi OS (bookworm and bullseye). The operations for bookworm system and bullseye system are different. Since the bookworm system is newer, so it is recommended to install firmware package on bullseye system to support this application.

1.2 Application Range

The products involved in this application include ED-HMI2120-070C and ED-HMI2120-101C.

Since using a 64-bit operating system can better utilize the hardware performance of the product, it is recommended to use the 64-bit standard Raspberry Pi OS (bookworm and bullseye). The details are as follows:

Product Model	Supported OS
ED-HMI2120-070C	Raspberry Pi OS(Desktop) 64-bit-bookworm (Debian 12) Raspberry Pi OS(Desktop) 64-bit-bullseye (Debian 11)
ED-HMI2120-101C	Raspberry Pi OS(Lite) 64-bit-bookworm (Debian 12) Raspberry Pi OS(Lite) 64-bit-bullseye (Debian 11)

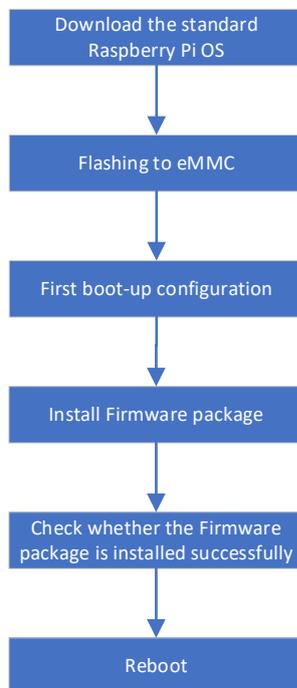
2 Application Guidance

This chapter introduces the operation steps of using standard Raspberry Pi OS on ED-HMI2120 series.

- ✓ Operating Process
- ✓ Downloading OS File
- ✓ Flashing to eMMC
- ✓ First boot-up Configuration
- ✓ Installing Firmware Package

2.1 Operating Process

The main operation process of the application configuration is as shown below.



2.2 Downloading OS File

You can download the required Raspberry Pi OS file according to actual needs. The download paths are as follows:

OS	Download Path
Raspberry Pi OS(Desktop) 64-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_arm64/images/raspios_arm64-2023-12-06/2023-12-05-raspios-bookworm-arm64.img.xz
Raspberry Pi OS(Desktop) 64-bit-bullseye (Debian 11)	https://downloads.raspberrypi.com/raspios_oldstable_arm64/images/raspios_oldstable_arm64-2023-12-06/2023-12-05-raspios-bullseye-arm64.img.xz
Raspberry Pi OS(Lite) 64-bit-bookworm (Debian 12)	https://downloads.raspberrypi.com/raspios_lite_arm64/images/raspios_lite_arm64-2023-12-11/2023-12-11-raspios-bookworm-arm64-lite.img.xz
Raspberry Pi OS(Lite) 64-bit-bullseye (Debian 11)	https://downloads.raspberrypi.com/raspios_lite_arm64/images/raspios_lite_arm64-2023-12-11/2023-12-11-raspios-bookworm-arm64-lite.img.xz

2.3 Flashing to eMMC

It is recommended to use the official Raspberry Pi flashing tool, and the download paths are as follows:

- ◆ Raspberry Pi Imager : https://downloads.raspberrypi.org/imager/imager_latest.exe
- ◆ SD Card Formatter : <https://www.sdcardformatter.com/download/>
- ◆ Rpiboot : https://github.com/raspberrypi/usbboot/raw/master/win32/rpiboot_setup.exe

Preparation:

- ◆ The downloading and installation of the flashing tool to the computer has been completed.
- ◆ A Micro USB to USB-A cable has been prepared.
- ◆ The OS file has been obtained.

Steps:

The steps are described using Windows OS as an example.

1. Connect the power cable and USB cable.
 - Connect USB cable to Micro-USB port on ED-HMI2120



- Connect power cable to Power port on ED-HMI2120



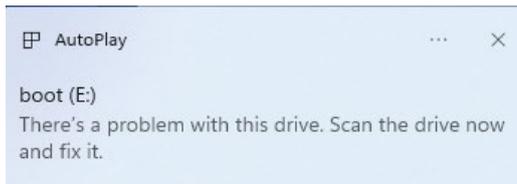
2. Disconnect the power supply of ED-HMI2120, and then power it on again.
3. Open **rpiboot tool** to automatically convert the drive to a letter.

```

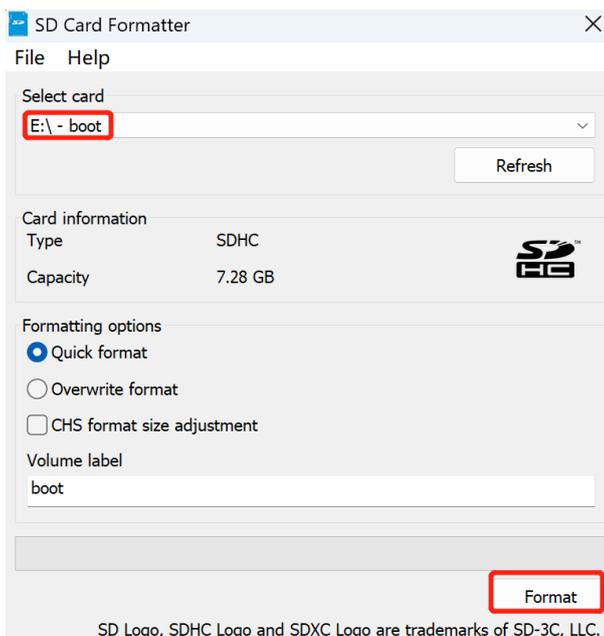
rpiboot
RPiBOOT: build-date Dec 16 2022 version 20221215-105525 1afa26c5
Waiting for BCM2835/6/7/2711...
Loading embedded: bootcode4.bin
Sending bootcode.bin
Successful read 4 bytes
Waiting for BCM2835/6/7/2711...

```

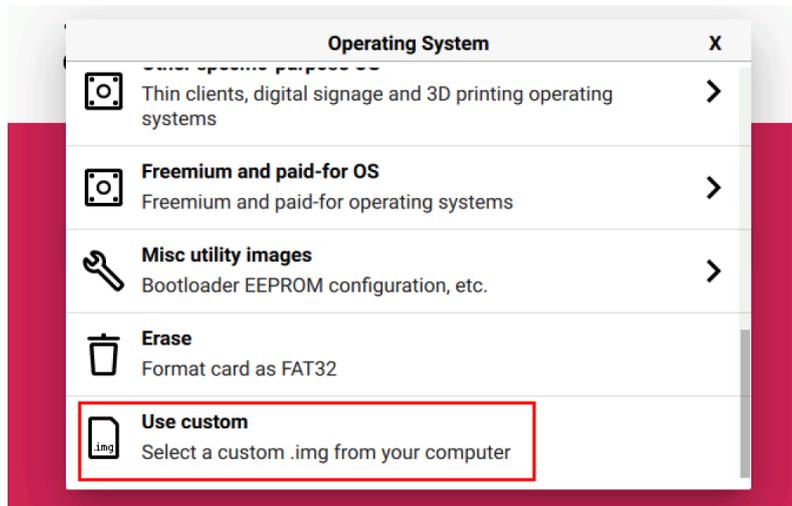
4. After the completion of the drive letter, the drive letter will pop up in the lower right corner of the computer, as shown in the figure below E drive.



5. Open **SD Card Formatter**, select the formatted drive letter, and click "Format" at the lower right to format.



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



10. According to the prompt, select the downloaded OS file under the user-defined path and return to the main page.
11. Click "WRITE" and select "Yes" in the pop-up prompt box to start writing the OS.

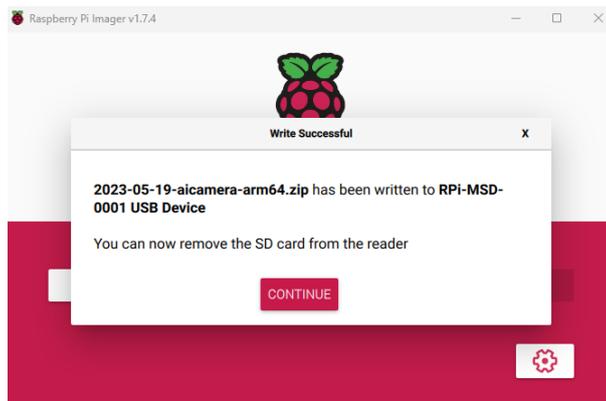


12. After the OS writing is completed, the file will be verified.



13. After the file verification is completed, the prompt box "Write Successful" pops up, and click

"CONTINUE" to finish flashing to eMMC.



14. Close **Raspberry Pi Imager**, remove USB cable and power on the device again.

2.4 First boot-up Configuration

This section introduces the relevant configurations when users start the system for the first time.

2.4.1 Standard Raspberry Pi OS (Desktop)

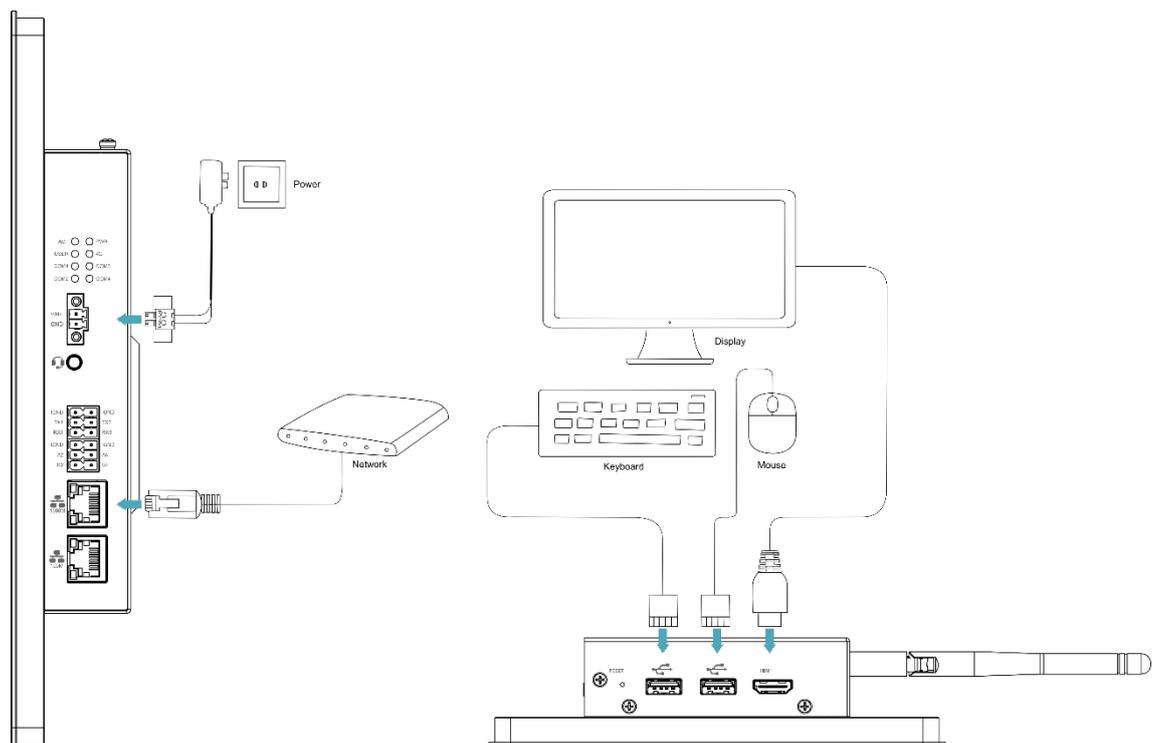
If you use the Desktop version of standard Raspberry Pi OS, and the OS is not configured in the advanced settings of **Raspberry Pi Imager** before flashing to eMMC. The initial configuration needs to be completed when the system is first started.

Preparation:

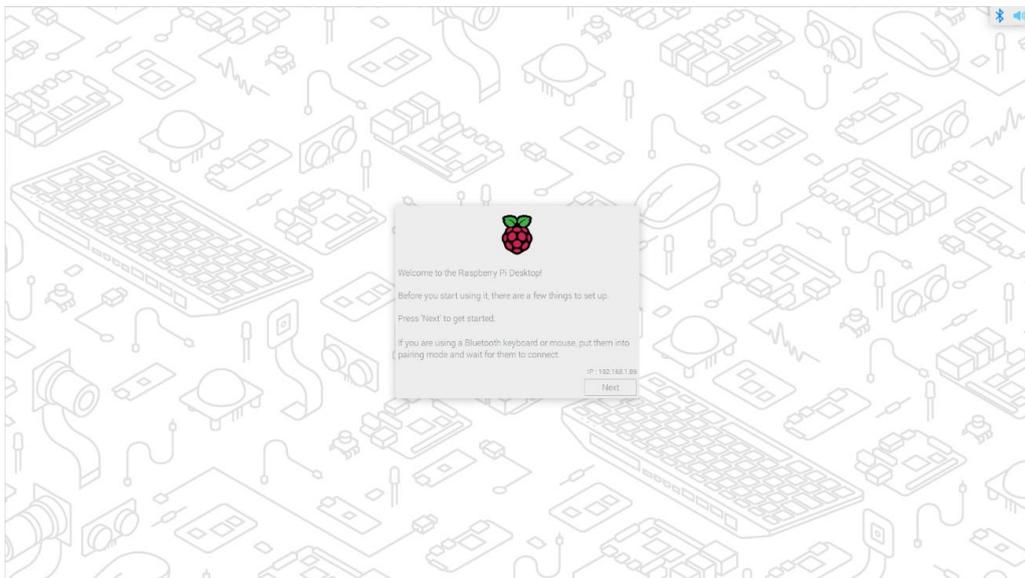
- ◆ Accessories such as display, mouse, keyboard and power adapter that can be used normally have been ready.
- ◆ A network that can be used normally.
- ◆ Get the HDMI cable and network cable that can be used normally.

Steps:

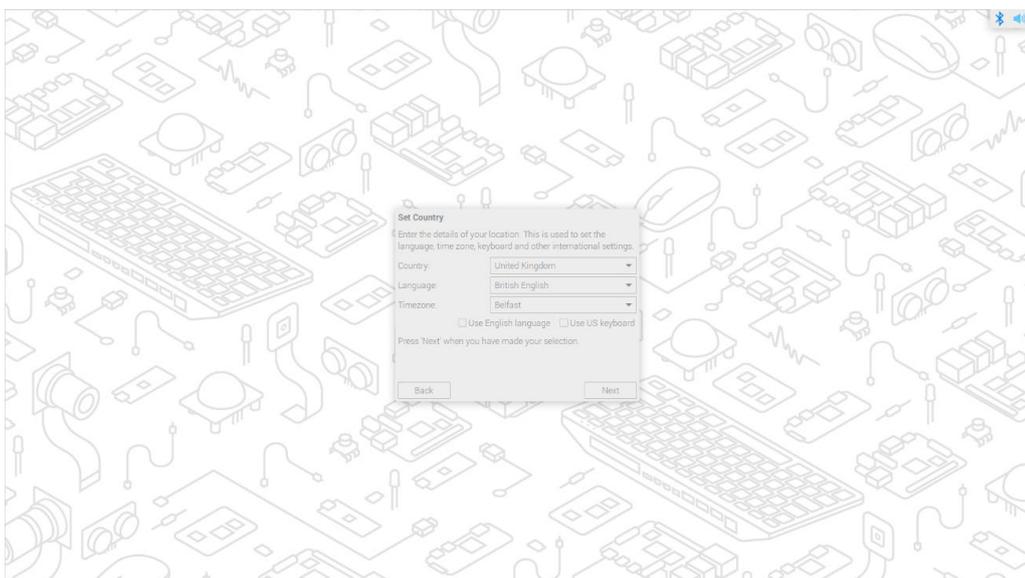
1. Connect the device to the network through a network cable, connect the display through an HDMI cable, and connect the mouse, keyboard, and power adapter.



2. Power on the device and the system will start. After the system starts normally, the "Welcome to Raspberry Pi Desktop" pane will pop up.



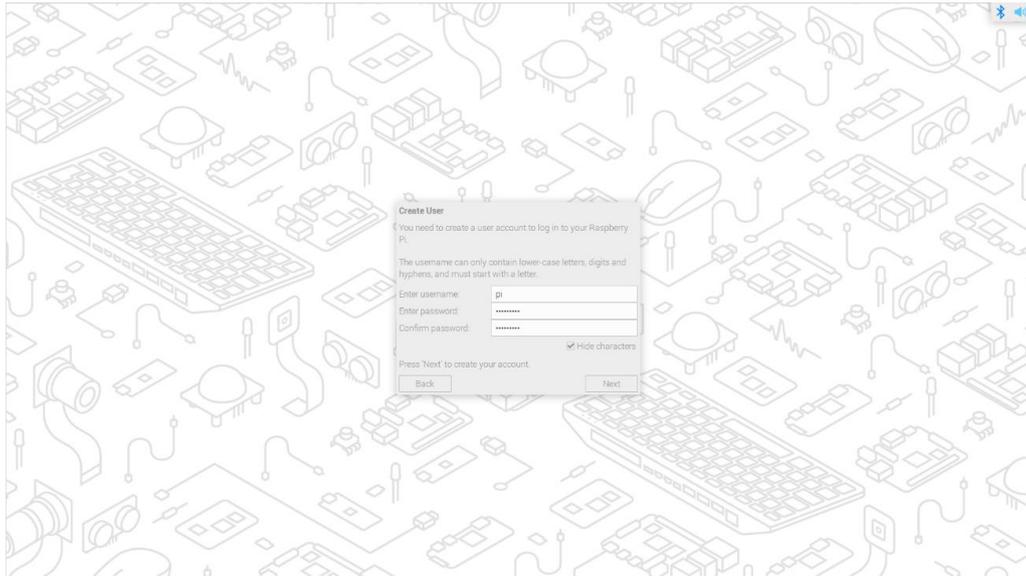
3. Click "Next" and set parameters such as "Country", "Language" and "Timezone" in the pop-up "Set Country" pane according to actual needs.



TIP:

The default keyboard layout of the system is the British keyboard layout, or you can check "Use US keyboard" as needed.

4. Click "Next" to customize and create "username" and "password" for logging in to the system in the pop-up "Create User" pane.

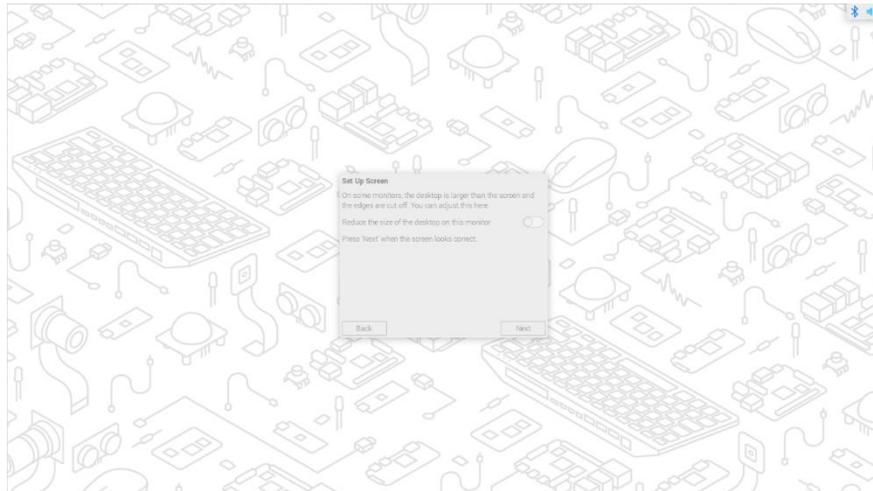


5. Click "Next":

- ◆ If you use the old version of the default username **pi** and default password **raspberry** when creating the username and password, the following prompt box will pop up and click "OK".



- ◆ The "Set Up Screen" pane pops up, and related parameters of screen are set as required.



6. **(Optional)** Click "Next" and select the wireless network to be connected in the pop-up "Select WiFi Network" pane.



TIP:

If you buy a product without Wi-Fi function, there is no such step.

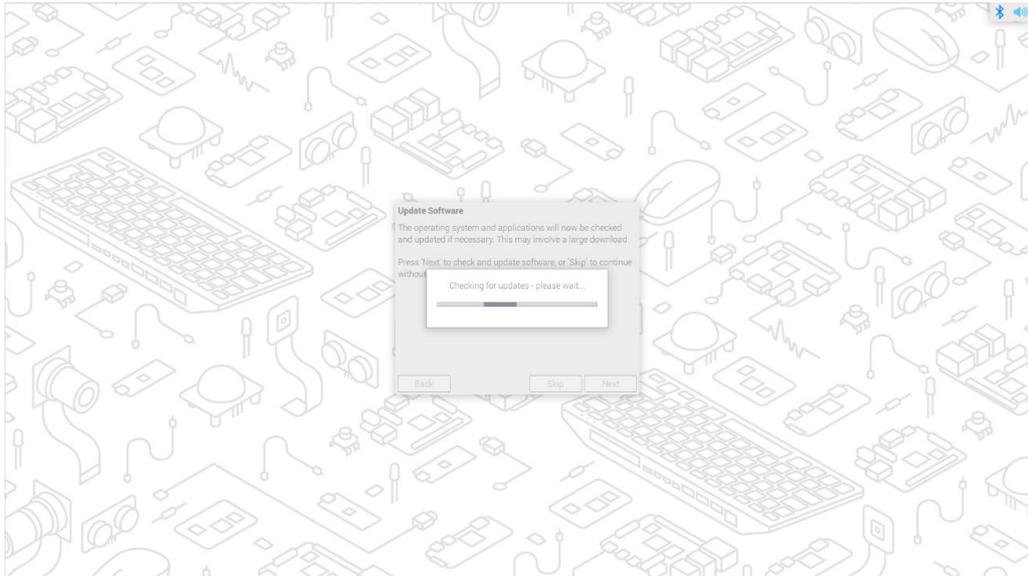
7. **(Optional)** Click "Next" and enter the password of wireless network in the pop-up "Enter WiFi Password" pane.



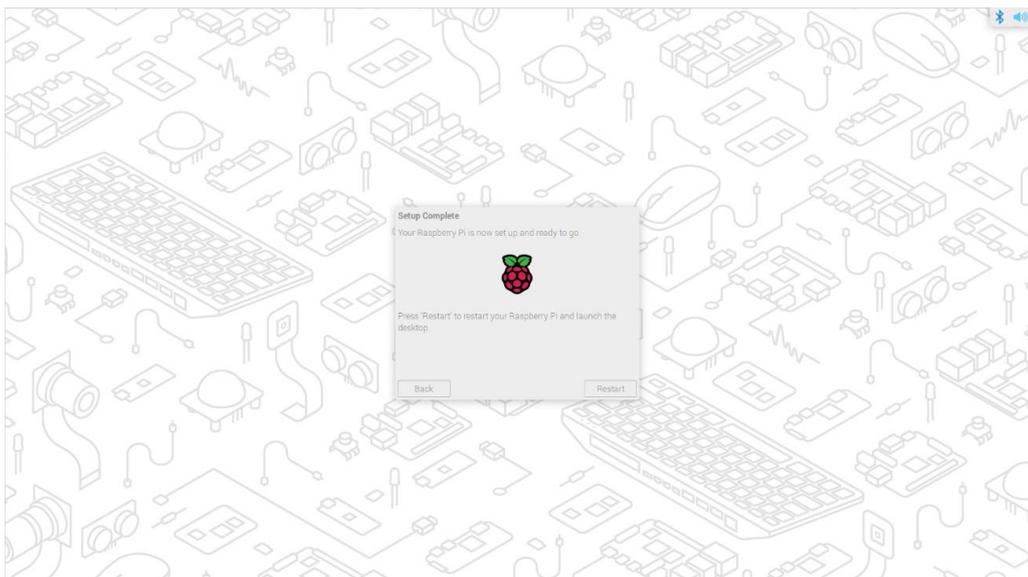
TIP:

If you buy a product without Wi-Fi function, there is no such step.

8. Click "Next", then click "Next" in the pop-up "Update Software" interface to automatically check and update the software.



9. After checking and updating the software, click "OK", then click "Restart" in the pop-up "Setup Complete" pane to complete the initial configuration and start the system.



10. After startup, enter the OS desktop.

**NOTE:**

There may be slight differences in the initial configuration of different versions of Raspberry Pi OS, please refer to the actual interface. For related operations, please refer to <https://www.raspberrypi.com/documentation/computers/getting-started.html#getting-started-with-your-raspberry-pi>.

2.4.2 Standard Raspberry Pi OS (Lite)

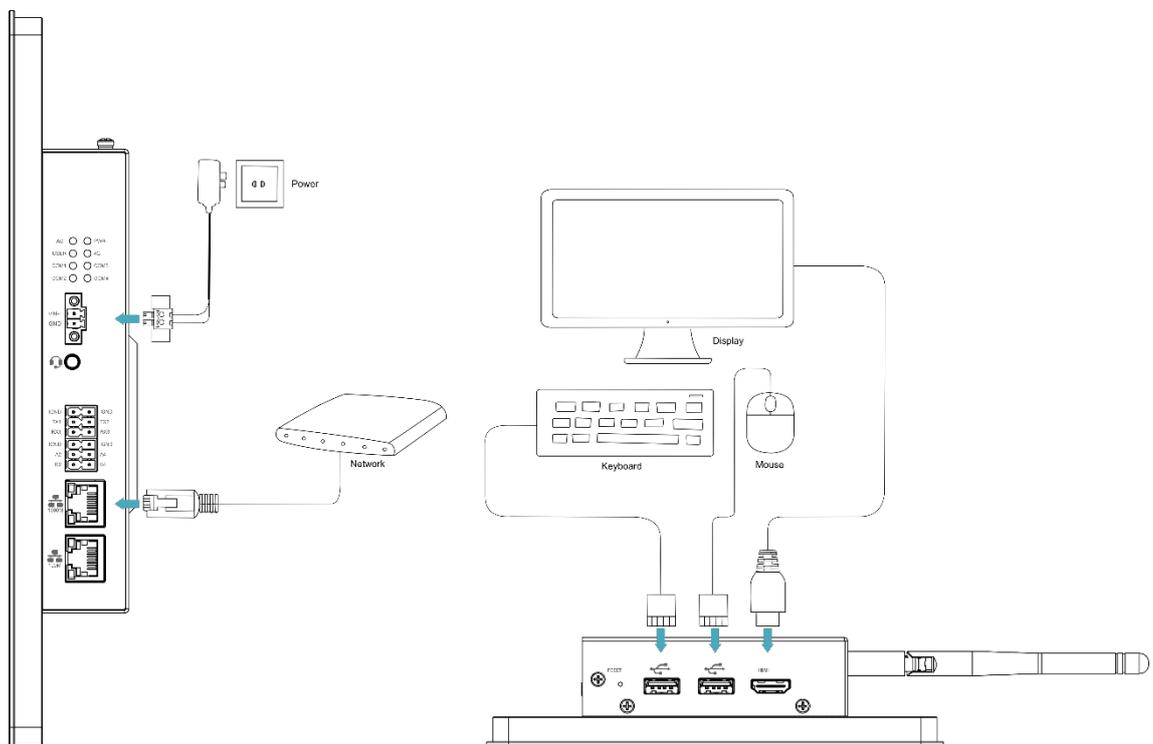
If you use the Lite version of standard Raspberry Pi OS, and the OS is not configured in the advanced settings of **Raspberry Pi Imager** before flashing to eMMC. The initial configuration needs to be completed when the system is first started.

Preparation:

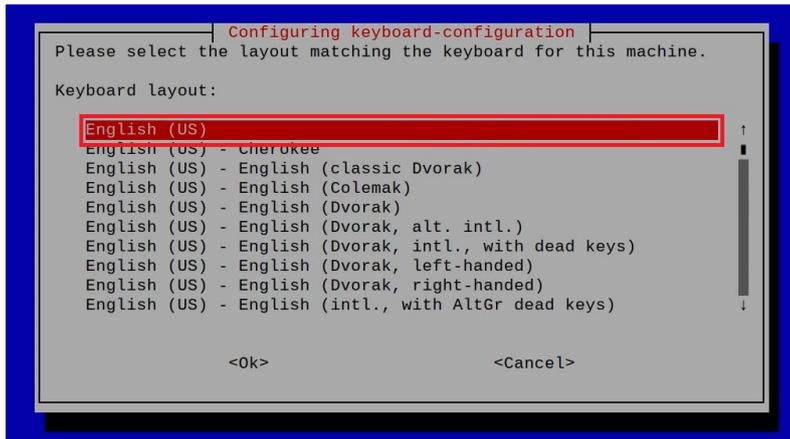
- ◆ Accessories such as display, mouse, keyboard and power adapter that can be used normally have been ready.
- ◆ A network that can be used normally.
- ◆ Get the HDMI cable and network cable that can be used normally.

Steps:

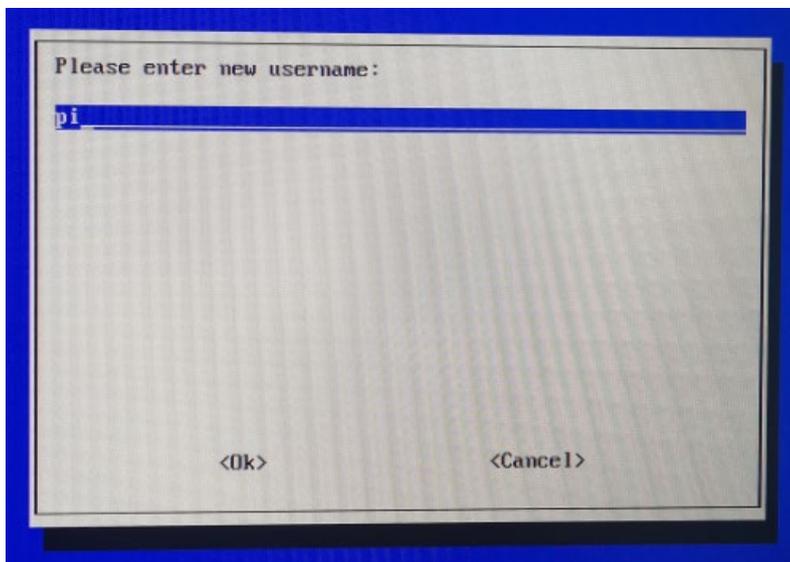
1. Connect the device to the network through a network cable, connect the display through an HDMI cable, and connect the mouse, keyboard, and power adapter.



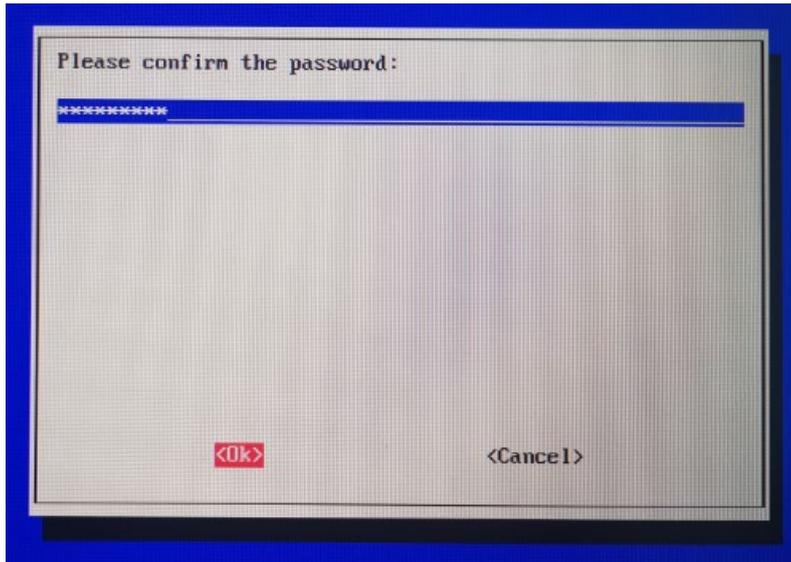
2. Power on the device and the system will start. After the system starts normally, the "Configuring keyboard-configuration" pane will pop up. You need to set up a keyboard according to the actual needs.



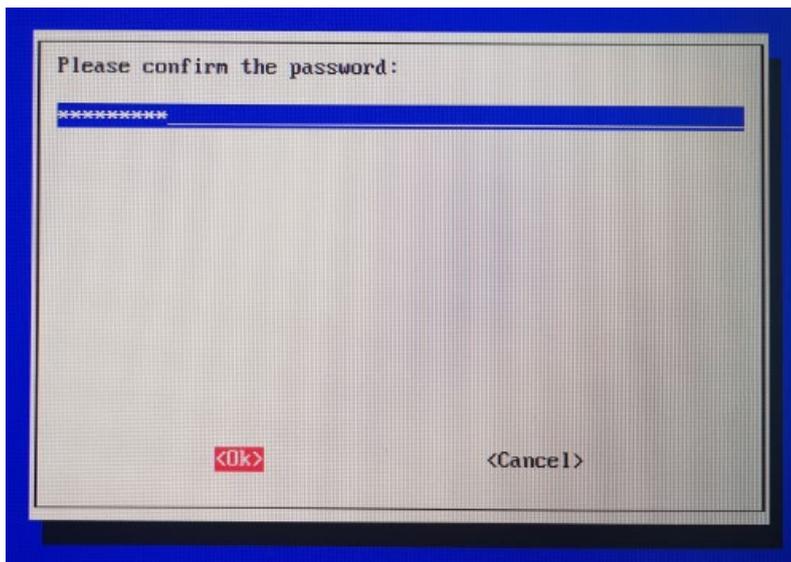
3. Select "OK", then you can start creating a new username in the pane.



4. Select "OK", then you can start setting a password for the new user in the pane.



5. Select "OK", then input the password again in the pane.



6. Select "OK" to complete the initial setup and enter the login interface.
7. According to the prompt, enter the username and password to log in the system. After the startup is completed, enter the operating system.

2.5 Installing Firmware Package

This section introduces the specific operations of installing the firmware package on the standard Raspberry Pi OS. It is compatible with the standard Raspberry Pi OS (bookworm, Debian 12) and the standard Raspberry Pi OS (bullseye, Debian 11).

2.5.1 Debian 11 (bullseye)

After flashing to eMMC of the Raspberry Pi OS (bullseye) on the ED-IPC2100 series, you can configure the system by adding the **edatec apt source**, **installing the kernel package** and **installing the firmware package**, so that the system can be used normally.

Preparation:

The flashing to eMMC and startup configuration of the Raspberry Pi standard OS (bullseye) have been completed.

Steps:

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

```
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/edatec.list  
  
sudo apt update
```

```
pi@raspberrypi:~$ curl -sS https://apt.edatec.cn/pubkey.gpg | sudo apt-key add -  
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).  
OK  
pi@raspberrypi:~$ echo "deb https://apt.edatec.cn/raspbian stable main" | sudo tee /etc/apt/sources.list.d/edatec.list  
deb https://apt.edatec.cn/raspbian stable main  
pi@raspberrypi:~$ sudo apt update  
Hit:1 http://security.debian.org/debian-security bullseye-security InRelease  
Hit:2 http://deb.debian.org/debian bullseye InRelease  
Hit:3 http://deb.debian.org/debian bullseye-updates InRelease  
Get:4 https://apt.edatec.cn/raspbian stable InRelease [3,237 B]  
Hit:5 http://archive.raspberrypi.org/debian bullseye InRelease  
Get:6 https://apt.edatec.cn/raspbian stable/main armhf Packages [2,384 B]  
Get:7 https://apt.edatec.cn/raspbian stable/main arm64 Packages [5,657 B]  
Fetched 11.3 kB in 2s (5,419 B/s)  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
42 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

2. Execute the following command to install the kernel package.

```
sudo apt install -y raspberrypi-kernel
```

3. Execute the following command to install the firmware package.

- ED-HMI2120-070C

```
sudo apt install -y ed-hmi2120-070c-firmware
```

- ED-HMI2120-101C

```
sudo apt install -y ed-hmi2120-101c-firmware
```



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.

4. After the installation is completed, execute the following command to check whether the firmware package is installed successfully.

- ED-HMI2120-070C

```
dpkg -l | grep ed-hmi2120-070c-firmware
```

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

```
pi@raspberrypi:~$ dpkg -l | grep ed-hmi2120-070c-firmware
ii  ed-hmi2120-070c-firmware  1.20240204.1      arm64      Firmware of EDATEC Software Package
```

- ED-HMI2120-101C

```
dpkg -l | grep ed-hmi2120-101c-firmware
```

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

```
pi@raspberrypi:~$ dpkg -l | grep ed-hmi2120-101c-firmware
ii  ed-hmi2120-101c-firmware  1.20240204.1      arm64      Firmware of EDATEC Software Package
```

5. Execute the following command to restart the device.

```
sudo reboot
```

6. **(Optional)** Disconnect the connection between the display and ED-HMI2120, and power off ED-HMI2120. Then power on ED-HMI2120 again and restart it.



TIP:

This step is only required for Lite version systems. Since the Lite version of the operating system

does not support multi-screen display, when the display that connected to the HDMI port on the ED-HMI2120 is not disconnected, after rebooting the device, only the connected display is available and the LCD screen is not available. So you need disconnect the connection between the display and ED-HMI2120 first, and Power off ED-HMI2120. Then power on ED-HMI2120 again and restart it.

2.5.2 Debian 12 (bookworm)

After flashing to eMMC of the Raspberry Pi OS (bookworm) on the ED-HMI2120 series, you can configure the system by adding the **edatec apt source**, **installing the kernel package**, **installing the firmware package**, and **disabling raspberry kernel upgrade**, so that the system can be used normally.

Preparation:

The flashing to eMMC and startup configuration of the Raspberry Pi standard OS (bookworm) have been completed.

Steps:

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

```
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/edatec.list

sudo apt update
```

```
pi@raspberrypi:~$ curl -sS https://apt.edatec.cn/pubkey.gpg | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
pi@raspberrypi:~$ echo "deb https://apt.edatec.cn/raspbian stable main" | sudo tee /etc/apt/sources.list.d/edatec.list
deb https://apt.edatec.cn/raspbian stable main
pi@raspberrypi:~$ sudo apt update
Hit:1 http://security.debian.org/debian-security bullseye-security InRelease
Hit:2 http://deb.debian.org/debian bullseye InRelease
Hit:3 http://deb.debian.org/debian bullseye-updates InRelease
Get:4 https://apt.edatec.cn/raspbian stable InRelease [3,237 B]
Hit:5 http://archive.raspberrypi.org/debian bullseye InRelease
Get:6 https://apt.edatec.cn/raspbian stable/main armhf Packages [2,384 B]
Get:7 https://apt.edatec.cn/raspbian stable/main arm64 Packages [5,657 B]
Fetched 11.3 kB in 2s (5,419 B/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
42 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

2. Execute the following command to install and update the kernel package.

```
sudo apt install -y ed-linux-image-6.1.58-v8
```

```
curl -s 'https://apt.edatec.cn/downloads/202403/kernel-change.sh' | sudo bash -s
6.1.58-rpi7-rpi-v8
```

3. Execute the following command to install the firmware package.

- ED-HMI2120-070C

```
sudo apt install -y ed-hmi2120-070c-firmware
```

- ED-HMI2120-101C

```
sudo apt install -y ed-hmi2120-101c-firmware
```



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.

4. Execute the following command to disable raspberry kernel upgrade.

```
dpkg -l | grep linux-image | awk '{print $2}' | grep ^linux | while read
line; do sudo apt-mark hold $line; done
```

5. After the installation is completed, execute the following command to check whether the firmware package is installed successfully.

- ED-HMI2120-070C

```
dpkg -l | grep ed-hmi2120-070c-firmware
```

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

```
pi@raspberrypi:~$ dpkg -l | grep ed-hmi2120-070c-firmware
ii  ed-hmi2120-070c-firmware  1.20240204.1      arm64      Firmware of EDATEC Software Package
```

- ED-HMI2120-101C

```
dpkg -l | grep ed-hmi2120-101c-firmware
```

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

```
pi@raspberrypi:~$ dpkg -l | grep ed-hmi2120-101c-firmware
ii  ed-hmi2120-101c-firmware  1.20240204.1      arm64      Firmware of EDATEC Software Package
```

6. Execute the following command to restart the device.

```
sudo reboot
```

7. **(Optional)** Disconnect the connection between the display and ED-HMI2120, and power off ED-HMI2120. Then power on ED-HMI2120 again and restart it.

**TIP:**

This step is only required for Lite version systems. Since the Lite version of the operating system does not support multi-screen display, when the display that connected to the HDMI port on the ED-HMI2120 is not disconnected, after rebooting the device, only the connected display is available and the LCD screen is not available. So you need disconnect the connection between the display and ED-HMI2120 first, and Power off ED-HMI2120. Then power on ED-HMI2120 again and restart it.

3 Firmware Update (Optional)

After the system starting normally, you can execute the following commands in the command pane to upgrade the system firmware and optimize the software functions.



TIP:

If you have a software problem when using ED-HMI2120 series, you can try to upgrade the system Firmware.

```
sudo apt update
```

```
sudo apt upgrade
```