

ED-HMI2020-070C

7.0-inch Industrial Panel PC Based On Raspberry Pi CM4

User Manual

EDA Technology Co., LTD

May 2024

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

Related Manuals

All kinds of product documents contained in the product are shown in the following table, and users can choose to view the corresponding documents according to their needs.

Documents	Instruction
	This document introduces the product features, software and
ED-HMI2020-070C Datasheet	hardware specifications, dimensions and ordering code of ED-
ED-HIMI2020-070C Datasheet	HMI2020-070C to help users understand the overall system
	parameters of the products.
	This document introduces the appearance, installation, startup and
ED-HMI2020-070C User Manual	configuration of ED-HMI2020-070C to help users use the product
	better.
	This document introduces the OS downloading, flashing to eMMC
ED-HMI2020-070C Application Guide	and partial configuration of ED-HMI2020-070C to help users use the
	product better.

Users can visit the following website for more information:

https://www.edatec.cn

Reader Scope

This manual is applicable to the following readers:

- ♦ Mechanical Engineer
- ♦ Electrical Engineer
- Software Engineer
- ♦ System Engineer

Related Agreement

Terminology Convention

Terminology	Meaning
CM4	Raspberry Pi Compute Module 4

Symbolic Convention

Symbolic	Instruction	
(ar	Prompt symbols, indicating important features or operations.	
	Notice symbols, which may cause personal injury, system damage, or signal interruption/loss.	
4	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 Product Description

This chapter introduces the product overview, packing list, appearance, button, indicator and interfaces.

- ✓ Overview
- ✓ Packing List
- ✓ Appearance
- ✓ Button
- ✓ Indicator
- ✓ Interface

1.1 Overview

ED-HMI2020-070C is a 7-inch industrial panel PC based on Raspberry Pi CM4. According to different application scenarios and user needs, different specifications of RAM and eMMC computer systems can be selected.

- Options for 1GB, 2GB, 4GB and 8GB RAM
- ◆ Options for 8GB, 16GB and 32GB eMMC storage

ED-HMI2020-070C provides common interfaces such as HDMI, USB 2.0, USB 3.0, audio and Ethernet, and supports access to the network through Wi-Fi and Ethernet. ED-HMI2020-070C integrates RTC, EEPROM and encryption chip, improving the ease of use and reliability of the product. It is mainly used in industrial control and IOT.



1.2 Packing List

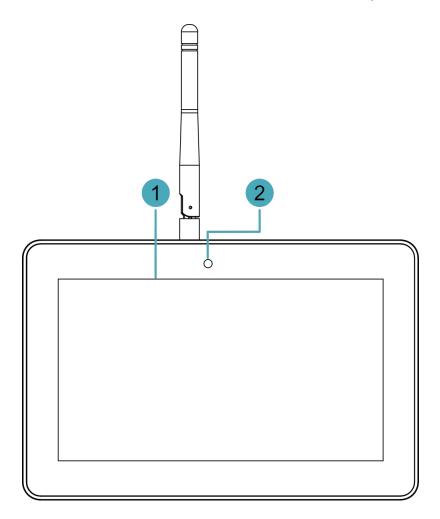
- ◆ 1x ED-HMI2020-070C Unit
- ◆ 4 x buckles (including 4xM4*8 screws and 4xM4*16 screws)
- ♦ [Optional Wi-Fi/BT version] 1x 2.4GHz/5GHz Wi-Fi/BT Antenna

1.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

1.3.1 Front Panel

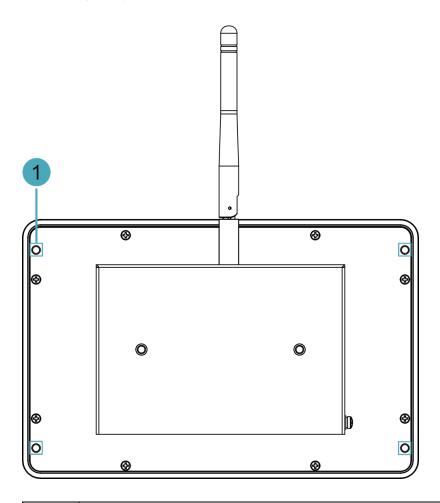
This section introduces functions and definitions of front panel.



NO.	Function Definition	
1	1 x LCD display, 7-inch LCD touch screen, which supports up to 1024x600 resolution and	
	multi-point capacitive touchscreen.	
2	1 x camera (optional), 8 Megapixel front camera.	

1.3.2 Rear Panel

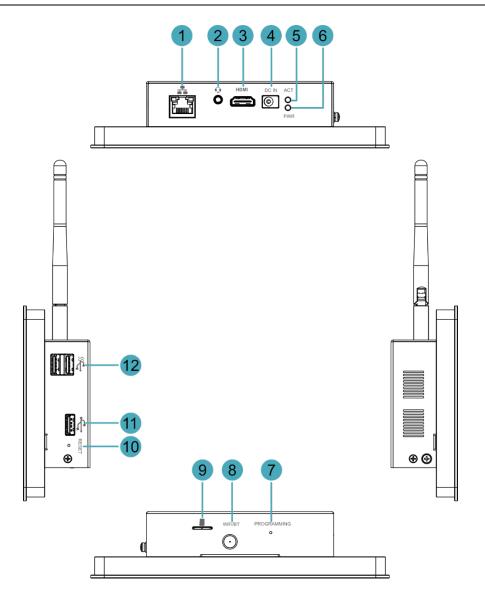
Introducing the types and definitions of rear panel interfaces.



NO.	Function Definition	
1	4 x installation holes of buckle, which are used to fix the buckles to the device for installation.	

1.3.3 Side Panel

Introducing the types and definitions of side panel interfaces.



NO.	Function Definition		
1	1 x 10/100/1000M adaptive ethernet port, RJ45 connector, with led indicator. It can		
1	be used to access the network. PoE can be supported through expansion module.		
	1 x Audio input/Stereo output, 3.5mm audio jack connector. It can be used as MIC		
	IN and LINE OUT.		
2	When a headphone is connected, the audio output is switched to the		
2	headphone.		
	When a headphone is not connected, the audio output is switched to the		
	speaker.		
3	1 x HDMI port, type A connector, which is compatible with HDMI 2.1 standard and		
3	supports 4K 60Hz. It supports to connect a displayer.		
4	1 x DC input, DC Jack connector. It supports 9V~28V input.		
5	1 x green system status indicator, which is used to check the working status of device.		
6	1 x red power indicator, which is used to check the status of device power-on and		
6	power-off.		

NO.	Function Definition	
7	1 x PROGRAMING button, which is used to flash to eMMC for the system.	
8	1 x Wi-Fi/BT antenna port, SMA connector, which can connect to Wi-Fi/BT antenna.	
9	1 x Micro-SD card slot, which is used to install SD card for storing user data.	
10	1 x Reset button, pressing the button will reset the device.	
11	1 x USB 2.0 port, type A connector, supporting up to 480Mbps transmission rate.	
12	2 x USB 3.0 ports, type A connector, each channel supports up to 5Gbps	
12	transmission rate.	

1.4 Button

The section introduces the function of buttons contained in ED-HMI2020-070C.

1.4.1 RESET Button

ED-HMI2020-070C includes a RESET button, which is a hidden button, and the silkscreen on the case is "RESET". Pressing the RESET button will reset the device.

1.4.2 PROGRAMMING Button

ED-HMI2020-101C includes a PROGRAMING button, the silkscreen on the case is "PROGRAMMING".

Press the PROGRAMMING button before the device is powered on (keep pressing it for a long time), and then power on the device (release the PROGRAMMING button after powering on), the system will enter the programming mode. The user can flash to eMMC through the USB 2.0 port on the device and the programming tool.

1.5 Indicator

Introducing the various statuses and meanings of indicators contained in ED-HMI2020-070C.

Indicator	Status	Description
	On	The device has been powered on.
PWR	Blink	Power supply of the device is abnormal, please stop the power supply immediately.
	Off	The device is not powered on.
ACT	Blink	The system started successfully and is reading/writing data.
ACT	Off	The device is not powered on or does not read/write data.
Vallauria dia atau	On	The data transmission is abnormal.
Yellow indicator	Blink	Data is being transmitted over the Ethernet port.
of Ethernet port	Off	The Ethernet connection is not set up.
	On	The Ethernet connection is in the normal state.
Green indicator	Blink	The Ethernet connection is abnormal.
of Ethernet port	Off	The Ethernet connection is not set up.

1.6 Interface

Introducing the definition and function of each interface on ED-HMI2020-070C.

1.6.1 Card Slot

ED-HMI2020-070C includes a micro-SD card slot. The silkscreen on the case of micro-SD card slot is "-", which is used to install SD card. It supports storing user data.

1.6.2 Power Supply

The ED-HMI2020-070C includes one power input, DC Jack connector. The silkscreen on the case is "DC IN", which supports 9V~28V input.

1.6.3 **Audio**

ED-HMI2020-070C includes one audio port, the connector is a 3.5mm 4-pole headphone jack. The silkscreen is "", which supports OMTP stereo headphone output and mono microphone recording.

- When the headphone is connected, the audio output is switched to the headphone.
- ♦ When the headphone is not connected, the audio output is switched to the speaker.

1.6.4 Speaker

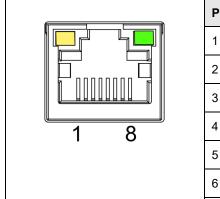
The ED-HMI2020-070C contains a power amplifier output, built-in a 4Ω 3W speaker, supporting single-channel stereo output. When playing audio, if the headphone is connected to the Audio interface, the speaker will have no audio output.

1.6.5 1000M Ethernet

ED-HMI2020-070C includes one adaptive 10/100/1000M Ethernet port, and the silkscreen is ""-".



The connector is RJ45, which can support PoE through the expansion module. When accessing to network, it is recommended to use the network cable of Cat6 and above. The pins corresponding to the terminal are defined as follows:



Pin	ID	Pin Name
1		TX4-
2		TX4+
3		TX3-
4		TX3+
5		TX2-
6		TX2+
7		TX1-
8		TX1+

1.6.6 HDMI

ED-HMI2020-070C includes one HDMI port, the silkscreen is "**HDMI**". The connector is type-A HDMI, which can connect to an HDMI display and supports up to 4Kp60.

1.6.7 USB 2.0

ED-HMI2020-070C includes one USB 2.0 port, the silkscreen is "". The connector is type-A USB, which can connect to standard USB 2.0 peripherals and supports up to 480Mbps transmission rate.

1.6.8 USB 3.0

ED-HMI2020-070C includes two USB 3.0 ports, the silkscreen is "5555". The connector is type-A USB, which can connect to standard USB 3.0 peripherals and supports up to 5Gbps transmission rate.

1.6.9 Antenna (optional)

The ED-HMI2020-070C device includes one SMA antenna port. The silkscreens is "WiFi/BT" and it can be connected to the Wi-Fi/BT antenna.



Only the Wi-Fi/BT version of ED-HMI2020-101C includes an antenna port.

2 Installing Components (optional)

This chapter describes how to install components.

- ✓ Install Antenna
- ✓ Install Micro SD Card
- ✓ Pull Out SD Card

2.1 Install Antenna

If the purchasing ED-HMI2020-070C includes Wi-Fi functions, the antenna need to be installed before using the device.

Preparation:

The antenna have been obtained from the packaging box.

Steps:

1. Find the location of antenna port, as shown in the red mark of figure below.



2. Align the ports on both sides of the device and the antenna and tighten them clockwise to ensure that they will not fall off.

2.2 Install Micro SD Card

If you need to install the SD card while using the product, you can refer to the following instructions.

Preparation:

SD card is ready.

Steps:

1. Find the location of SD card slot, as shown in the red mark of figure below.



2. Insert the Micro SD card into the corresponding card slot with the contact side facing down, and hear a sound to indicate that the installation is completed.



2.3 Pull Out SD Card

If you need to remove the SD card while using the product, you can refer to the following instructions.

Steps:

1. Find the location of SD card, as shown in the red mark of figure below.



Press the SD card into the card slot with your hand to pop it out, and then pull out the SD card.



3 Installing Device

This chapter introduces how to install the device.

✓ Embedded Installation

3.1 Embedded Installation

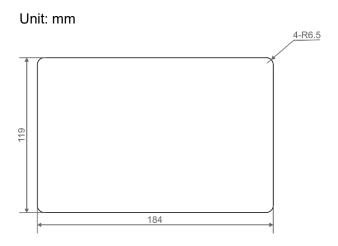
ED-HMI2020-070C supports embedded front installation, which is equipped with 4 buckles (including 4xM4*8 screws and 4xM4*16 screws).

Preparation:

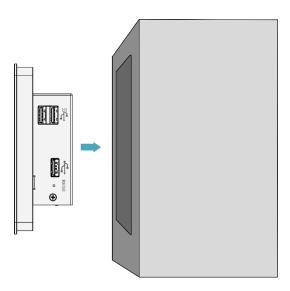
- ◆ The buckles (including 4xM4*8 screws and 4xM4*16 screws) have been obtained from the packaging box.
- A cross screwdriver has been prepared.

Steps:

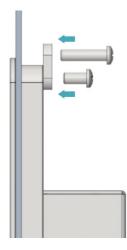
1. You need ensure the opening size of the cabinet according to the size of ED-HMI2020-070C, as shown in the figure below.



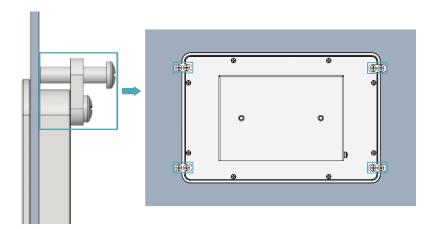
- 2. Drill a hole on the cabinet according to the hole size of step1.
- 3. Insert the ED-HMI2020-070C into the cabinet from the outside.



4. Align the screw hole (unthreaded hole) of the buckle with the buckle mounting hole on the side of the device.



5. Use 4 M4x8 screws to pass through the buckle and tighten it clockwise to fix the buckle to the device; then use 4 M4x16 screws to pass through the screw hole (threaded hole) of the buckle and tighten clockwise to the end through the buckles.



4 Booting The Device

This chapter introduces how to connect cables and boot the device.

- ✓ Connecting Cables
- ✓ Booting The System For The First Time

4.1 Connecting Cables

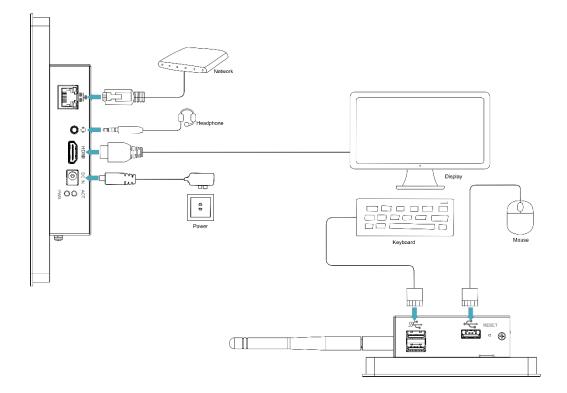
This section describes how to connect cables.

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.

Schematic diagram of connecting cables:

Please refer to 1.6 Interfaces for the pin definition of each interface and the specific method of wiring.



4.2 Booting The System For The First Time

ED-HMI2020-070C device does not have a power switch. After the power supply is connected, the system will start.

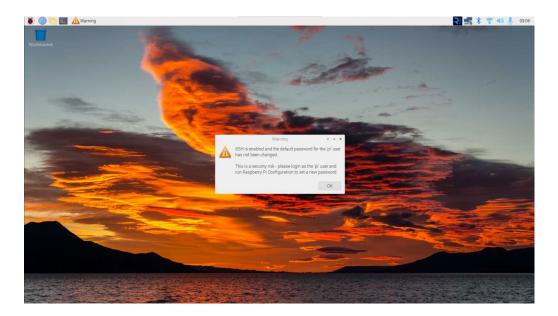
- The red PWR indicator is on, indicating that the device has been powered normally.
- ◆ The green ACT indicator is blinking, indicating that the system is started normally, and then the logo of Raspberry Pi will appear in the upper left corner of the screen.



Default username is pi, Default password is raspberry.

4.2.1 Raspberry Pi OS (Desktop)

If the Desktop version of the system is installed when the product leaves the factory, after the device is started, it will directly enter the desktop, as shown in the following figure.



4.2.2 Raspberry Pi OS (Lite)

If the Lite version of the system is installed when the product leaves the factory, the default username pi will be used to automatically log in after the device is started, and the default password is raspberry. The following figure shows that the system has been started normally.

5 Configuring System

This chapter introduces how to configure system.

- ✓ Finding Device IP
- ✓ Remote Login
- ✓ Configuring Storage Devices
- ✓ Configuring Wi-Fi (Optional)
- ✓ Configuring Ethernet IP
- ✓ Configuring Bluetooth (Optional)
- ✓ Configuring Buzzer
- ✓ Configuring RTC
- ✓ Configuring Audio

5.1 Finding Device IP

In some application scenarios, it is necessary to remotely log in or manage devices, so it is necessary to obtain the device IP.

5.1.1 View IP address at the Network icon of Desktop

After the device starting normally and the display is connected, you can view the current device IP address at the Network icon.



Only supported by Desktop version system.

Preparation:

ED-HMI2020-070C has been connected to the network through the router.

Steps:

Hover over the network icon in the system tray, and a tooltip will appear. This tooltip displays the name of the network you're currently connected to and your IP address.



5.1.2 Hostname command to query

After the device starting normally and the display is connected, you can query the current device IP address by using hostname command.

Preparation:

ED-HMI2020-070C has been connected to the network through the router.

Steps:

Run the following command in the command pane to obtain IP address.

hostname -I

```
pi@raspberrypi:~ $ hostname -I
192.168.168.219
```

5.1.3 Query IP by Using ifconfig Command

After the device is started normally and the display is connected, you can use the ifconfig command to view the current device IP.

Preparation:

ED-HMI2020-070C device has been connected to the network through the router.

Steps:

Run the following command in the command pane to view the detailed information of each port of the device, where the inet value in the eth1 interface is the device IP, as shown in the following figure.

ifconfig

```
pi@raspberrypi:~ $ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.168.252    netmask 255.255.255.0    broadcast 192.168.168.255
    inet6 fe80::db33:ac79:e1ce:176    prefixlen 64    scopeid 0x20<link>
    ether d8:3a:dd:04:7e:78    txqueuelen 1000 (Ethernet)
    RX packets 44    bytes 5126 (5.0 KiB)
    RX errors 0    dropped 0    overruns 0    frame 0
    TX packets 63    bytes 9340 (9.1 KiB)
    TX errors 0    dropped 0    overruns 0    carrier 0    collisions 0
```

5.1.4 Query IP by Using Network Manager CLI

After the device is started normally and the display is connected, you can use the built-in Network Manager CLI (nmcli) to view details about your network.

Preparation:

ED-HMI2020-070C has been connected to the network through the router.

Steps:

Run the following command in the command pane to view the detailed network information.

nmcli device show

```
pi@raspberrypi:~ $ nmcli device show
GENERAL.DEVICE:
                                          eth0
GENERAL.TYPE:
GENERAL.HWADDR:
GENERAL.MTU:
                                          1500
GENERAL.STATE:
GENERAL.CONNECTION:
                                          Wired connection 1
GENERAL.CON-PATH:
                                          /org/freedesktop/NetworkManager/ActiveConnection/3
WIRED-PROPERTIES.CARRIER:
IP4.ADDRESS[1]:
                                          192.168.168.219/24
IP4.GATEWAY:
                                          192.168.168.1
IP4.ROUTE[1]:
                                          dst = 192.168.168.0/24, nh = 0.0.0.0, mt = 100
IP4.ROUTE[2]:
                                          dst = 0.0.0.0/0, nh = 192.168.168.1, mt = 100
IP4.DNS[1]:
                                          192.168.168.1
IP6.ADDRESS[1]:
                                          fe80::382a:b964:5832:e59a/64
IP6.GATEWAY:
IP6.ROUTE[1]:
                                          dst = fe80::/64, nh = ::, mt = 1024
```

5.1.5 Login Router to Query IP

When the device starts normally but the display is not connected, you can log in to the router to check the current device IP.

Preparation:

- ◆ ED-HMI2020-070C has been connected to the network through the router.
- ◆ The IP and network password of the router in the network have been obtained, and the IP address is 192.168.X.X.

Steps:

1. Open a browser, Enter the router IP(192.168.x.x) of the network where ED-HMI2020-070C

is located in the address bar, and press Enter to enter the router login interface.

- 2. According to the interface prompts, enter the network password and enter the router management interface.
- 3. Find the IP address of ED-HMI2020-070C in the terminal device of the management interface.

5.1.6 Scan For Using NMAP Tool

When the device starts normally but the display is not connected, you can use nmap tool to scan the IP under the current network to obtain the IP information of the device. Nmap supports Linux, macOS, Windows and other platforms.

Preparation:

- ♦ ED-HMI2020-070C has been connected to the network through the router.
- ◆ The IP segment and mask of the router in the network have been obtained, for example, 192.168.X.X/24, where 24 is the subnet mask.

Steps:

For example, using nmap to scan the network segments from 192.168.3.0 to 255, you can use the following steps:

1. Open the nmap tool and scan the hosts in the 192.168.X.X/24 network segment.



The nmap tool operates differently in different operating systems, so please follow the actual interface or command prompts.

2. According to the scanned results, get the device IP of ED-HMI2020-070C.

5.2 Remote Login

There are many remote login methods, and users can choose according to their actual needs. This chapter only introduces SSH and VNC.

5.2.1 Connect To The Device Via SSH

After the device starts normally, you can choose to connect to the device remotely through SSH to configure or debug it.

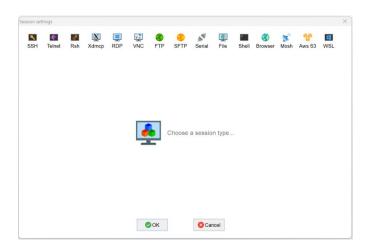
The tools for remote login are selected by users themselves, and the following is an example of logging in through MobaXterm.

Preparation:

- ◆ The MobaXterm tool has been installed on the PC.
- ◆ ED-HMI2020-070C has been connected to the network through the router.
- IP address of ED-HMI2020-070C has been get.

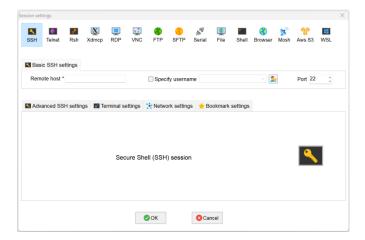
Steps:

1. Open MobaXterm, click Session, and open the window for creating connection, as shown in the figure below.

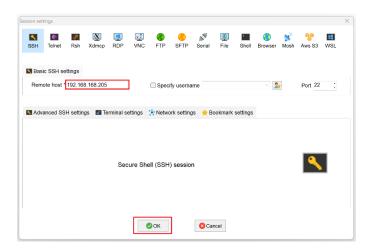




2. Click SSH in the upper left corner to open the SSH connection interface.



After entering the IP address of the obtained ED-HMI2020-070C, click "OK".



- 4. Click "Accept" in the pop-up prompt box to enter the system login interface.
- 5. Enter the username and password according to the prompt, and enter the system after logging in.



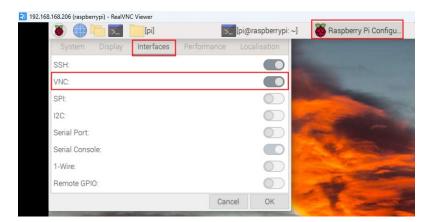
Default username is pi, Default password is raspberry.

5.2.2 Connect To The Device Desktop Through VNC

After the device starts normally, you can choose to connect to the device remotely through VNC to configure or debug it.

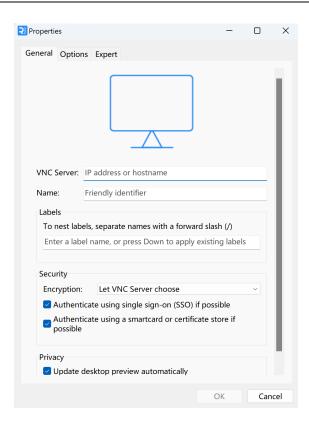
Preparation:

- ◆ The RealVNC Viewer tool has been installed on PC.
- ♦ ED-HMI2020-070C has been connected to the network through the router.
- ◆ IP address of ED-HMI2020-070C has been get.
- ◆ The VNC function in the ED-HMI2020-070C system has been turned on, as shown in the following figure.

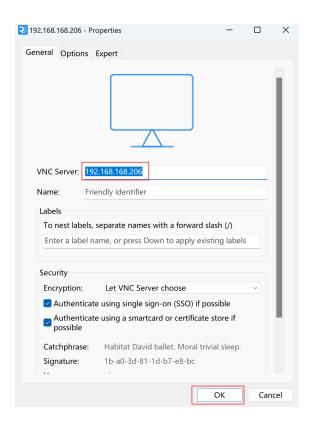


Steps:

1. Open RealVNC Viewer and select "New connection···" in the File in the menu bar to open the window for creating a connection, as shown in the following figure.



2. After entering the IP address of ED-HMI2020-070C, click "OK".

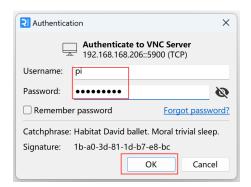


3. Enter the username and password in the Authentication prompt box that pops up.

5-10



Default username is pi, Default password is raspberry.



4. Select "OK" to log in and connect to the remote desktop.



5.3 Configuring Storage Devices

You can connect your external SSD or USB disk to the corresponding port on the ED-HMI2020-070C and mount the file system to access the data stored on it. When the ED-HMI2020-070C device is turned off, it is necessary to unmount the storage device so that it can be safely pulled out.

The connectable storage devices of ED-HMI2020-070C include USB storage devices and SD card. This chapter introduces how to configure the mounting and unmounting of storage devices.

5.3.1 Mounting a Storage Device

If the Lite version of the operating system is used (the Desktop version of the system supports automatic mounting), after the storage device is connected to the corresponding port on the ED-HMI2020-070C, it is necessary to mount the storage device in a specific folder location through configuration, usually in the /mnt folder, such as /mnt/mydisk.



The "/mnt" folder must be empty.

Preparation:

The storage device is ready to be mounted.

Steps:

- Connect the storage device to be mounted to the corresponding port on the ED-HMI2020-070C (USB storage device is inserted into USB port).
- 2. Run the following command to view all disk partitions on the ED-HMI2020-070C.

sudo Isblk -o UUID,NAME,FSTYPE,SIZE,MOUNTPOINT,LABEL,MODEL

After running the command, the information displayed is as follows:

```
pi@raspberrypi:~ $ sudo lsblk
                                                              SIZE MOUNTPOINT
                                                     FSTYPE
                                                                                             Flash_Disk
                                       sda
7C9E-4F13
                                                                                     ADMESY
                                                              3.8G /media/pi/ADMESY
                                        mmcblk0
                                                              7.3G
                                                              256M /boot
                                                                                      bootfs
                                        -mmcblk0p1
aaa4faa-eab6-400c-950f-dc96ae4e0400
                                         -mmcblk0p2
                                                                                      rootfs
                                       mmcblk0boot0
```

• UUID\NAME\FSTYPE\SIZE\MOUNTPOINT\LABEL and MODEL are disk parameters

that need to be listed.

- The types of MOUNTPOINT are "/" and "/boot".
- The storage device whose LABEL is "ADMESY" is the inserted USB storage device, and the corresponding disk name is sda1.
- FSTYPE indicates the file system type contained.
 - ✓ If the file system type of the inserted storage device is exFAT, please run the following commands to install the exFAT driver.

```
sudo apt update
sudo apt install exfat-fuse
```

✓ If the file system type of the inserted storage device is NTFS (only read permission is supported), you can install ntfs-3g driver to realize write permission. Run the following commands to install ntfs-3g drivers.

```
sudo apt update
sudo apt install ntfs-3g
```

3. Run the following command to get the location of the disk partition.

sudo blkid

After running the command, the following information is displayed, which the disk partition of the connected storage device is displayed as "/dev/sda1".

```
pi@raspberrypi:~ $ sudo blkid
/dev/mmcblk0p1: LABEL_FATB00T="bootfs" LABEL="bootfs" UUID="C336-AC83" BL0CK_SIZE="512" TYPE="vfat"
    PARTUUID="7902e585-01"
/dev/mmcblk0p2: LABEL="rootfs" UUID="eaaa4faa-eab6-400c-950f-dc96ae4e0400" BL0CK_SIZE="4096" TYPE="
ext4" PARTUUID="7902e585-02"
/dev/sda1: LABEL="ADMESY" UUID="7C9E-4F13" BL0CK_SIZE="512" TYPE="vfat"
```

4. Create a target folder as the mount point of the storage device. Assuming that the mount name is mydisk and the directory to be mounted is "/mnt", the command to be executed is as follows:

```
sudo mkdir /mnt/mydisk
```

5. Mount the storage device at the created mount point, and execute the following command:

sudo mount /dev/sda1 /mnt/mydisk

6. Verify the success of mounting the storage device by executing the following command.

Is /mnt/mydisk

- ✓ After executing the command, if the displayed information lists all files in the storage device, it means that the mount is successful.
- ✓ After executing the command, if the displayed information does not list the contents of related files, it means that the mount is failed.

5.3.2 Unmount The Storage Device

When the ED-HMI2020-070C device is turned off, it is necessary to manually unmount the storage device so that it can be pulled out safely.



Both Lite and Desktop versions of the system need to manually unmount the storage device.

Preparation:

The storage device has been successfully mounted.

Steps:

If "/mnt" is the mounted directory and "mydisk" is the name of the mount point, you can execute the following command to complete the unmounting.

sudo umount /mnt/mydisk

- ✓ After executing the command, if no error message is displayed, it means that the unmounting has been completed and the storage device can be completely pulled out.
- ✓ After executing the command, if an error message is displayed, it means that the unmounting is failed.

5.3.3 Set The Storage Device To Mount Automatically

If you are using the Lite version of operating system, you can automatically mount it by modifying the fstab settings.

Preparation:

The storage device to be mounted has been connected to the corresponding port on the ED-HMI2020-070C device.

Steps:

1. Execute the following command to view all disk partitions on the ED-HMI2020-070C and get the file system type of the storage device to be mounted, as "vfat" shown in the figure below.

sudo Isbik -o UUID, NAME, FSTYPE, SIZE, MOUNTPOINT, LABEL, MODEL

```
        pi@raspberrypi:~ $ sudo lsblk -o UUID, NAME, FSTYPE, SIZE, MOUNTPOINT, LABEL, MODEL

        UUID
        NAME
        FSTYPE
        SIZE MOUNTPOINT
        LABEL
        MODEL

        sda
        3.86
        Flash_Disk

        7C9E-4F13
        "-sda1
        7.36
        Vfat
        3.86 /media/pi/ADMESY ADMESY

        C336-AC83
        |-mmcblk0|
        vfat
        256M /boot
        bootfs

        eaaa4faa-eab6-400c-950f-dc96ae4e0400
        "-mmcblk0p2
        ext4
        7G /
        rootfs

        mmcblk0boot0
        4M
        4M
```

2. Execute the following command to obtain the UUID of the storage device to be mounted, such as "7C9E-4F13" in the figure below.

sudo blkid

```
pi@raspberrypi:~ $ sudo blkid
/dev/mmcblk0p1: LABEL_FATB00T="bootfs" LABEL="bootfs" UUID="C336-AC83" BLOCK_SIZE="512" TYPE="vfat"
PARTUUID="7902e585-01"
/dev/mmcblk0p2: LABEL="rootfs" UUID="eaaa4faa-eab6-400c-950f-dc96ae4e0400" BLOCK_SIZE="4096" TYPE="
ext4" PARTUUID="7902e585-02"
/dev/sda1: LABEL="ADMESY" UUID="7C9E-4F13" BLOCK_SIZE="512" TYPE="vfat"
```

3. Execute the following command to open the fstab file.

sudo nano /etc/fstab

4. Add the following to the fstab file.

UUID=7C9E-4F13 /mnt/mydisk vfat defaults,auto,users,rw,nofail 0 0

- ✓ The value of UUID is the value found in Step 2 above.
- ✓ "/mnt" is the directory to be mounted, and mydisk is the name of the mount point.
- ✓ Vfat is the file system type queried in step 1.
- ✓ If the type of file system is FAT or NTFS, the added content is "UUID = 7C9E-4F13 /mnt/mydisk vfat defaults,auto,users,rw,no fail umask = 000 0 0", which will allow all users to "read/write" access to each file on the storage device.



More information about the fstab command can be viewed by executing the man fstab command.

5. Use Ctrl+X to save the file and exit edit mode.

5.4 Configuring Wi-Fi (Optional)

User can choose the ED-HMI2020-070C with Wi-Fi version, which needs to be configured before using Wi-Fi function.

5.4.1 Enable Wi-Fi

The Wi-Fi function is blocked by default, and you need to set the country region to enable it.

5.4.1.1 Raspberry Pi OS(Desktop)

In the Desktop version of the operating system, you can use the desktop icon to open the configuration window for setting.

Steps:

1. Left-click the icon in the upper right corner of the desktop and select "Click here to set Wi-Fi country" from the menu.



2. Set the value of Country in the pop-up "Wireless LAN Country" pane, and select it according to the actual region.



Select "OK" to complete the setting.

5.4.1.2 Raspberry Pi OS(Lite)

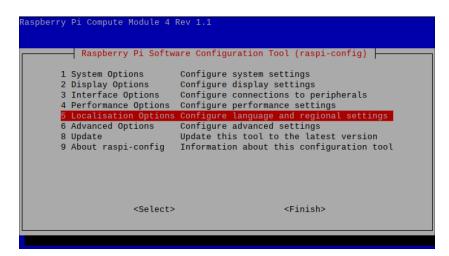
In the Lite version of the operating system, Wi-Fi can be enabled through the command line.

Setps:

1. Open the command terminal pane and execute the following command to open the Raspberry Pi Software Configuration Tool (raspi-config) interface.

sudo raspi-config

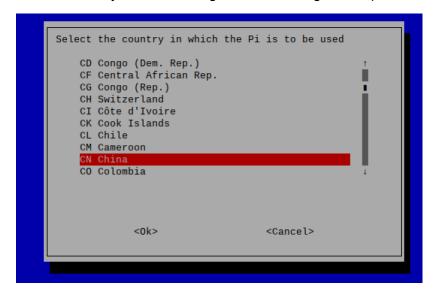
2. Choose "5 Localisation Options" and press Enter.



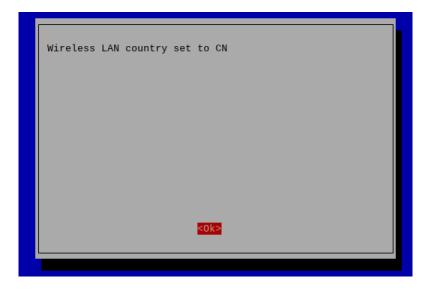
3. Select "L4 WLAN Country" and press Enter.



4. Select a country code according to the actual region and press Enter.



5. Press Enter in "Wireless LAN country set to CN" interface.



6. In the main interface of the pane, select "Finish" and press Enter to complete the setting and return to the command line.

5.4.2 Use The NetworkManager Tool To Configure Wi-Fi Connections

The operating systems of Desktop and Lite have enabled NetworkManager by default, which can be directly configured by using NetworkManager.

5.4.2.1 Raspberry Pi OS(Desktop)

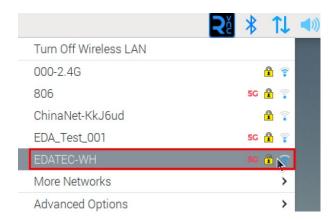
In the Desktop version of the operating system, you can connect to Wi-Fi through the desktop icon.

Preparation:

Wi-Fi function is enabled.

Steps:

1. Left-click the icon in the upper right corner of the desktop, select the Wi-Fi to be connected in the pop-up Wi-Fi list and click.



2. Enter the Wi-Fi Password in the pop-up "Wi-Fi Network Authentication Required" pane.



3. Click "Connect" to connect to the network. After the connection is completed, you can click icon to view Wi-Fi information.

5.4.2.2 Raspberry Pi OS(Lite)

In the Lite version of the operating system, it is supported to configure Wi-Fi through the command line.

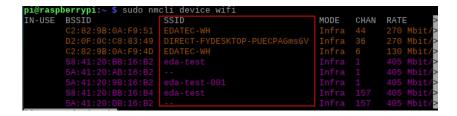
Preparation:

- Wi-Fi function is enabled.
- The Wi-Fi name and password that can be connected are prepared, for example, the Wi-Fi
 name is SSID and the password is password.

Steps:

1. Open the terminal and execute the following command to scan the list of connectable Wi-Fi name.

sudo nmcli device wifi



2. Execute the following command to connect the Wi-Fi to be accessed.

sudo nmcli device wifi connect SSID password password

Where SSID is the name of the Wi-Fi to be connected and password is the password of the Wi-Fi to be connected.

3. Execute the following command to set up automatic Wi-Fi connection.

sudo nmcli connection modify SS/D connection.autoconnet yes

Where SSID is the name of the Wi-Fi to be connected.

5.4.3 Configure Wi-Fi Connection By Using dhcpcd Tool

In both Desktop and Lite versions of the operating system, you can connect to Wi-Fi through the dhcpcd tool.

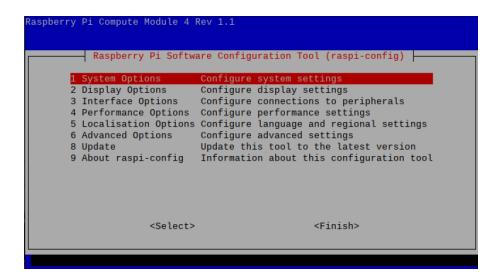
Preparation:

- Wi-Fi function is enabled.
- The Wi-Fi name and password that can be connected are prepared, for example, the Wi-Fi name is EDATEC-WH and the password is password.

Steps:

1. Open the terminal and execute the following command to open the Raspberry Pi Software Configuration Tool (raspi-config) interface.

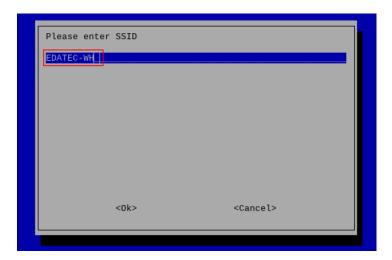
sudo raspi-config



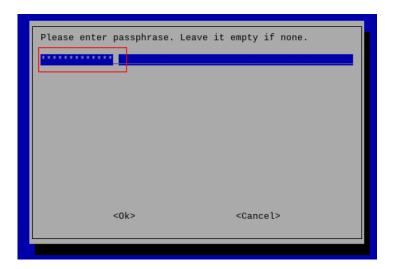
Select "1 System Options" and press Enter, and then select "S1 Wireless LAN" in the interface.



3. Press Enter, then enter the Wi-Fi name in the "Please enter SSID" interface.



4. Press Enter, then enter the Wi-Fi password in the "Please enter passphrase. Leave it empty if none" interface.



5. Press Enter to connect Wi-Fi. When the Wi-Fi is connected successfully, select "Finish" and press Enter to complete the setting and return to the command line window.

5.5 Configuring Ethernet IP

The IP address is automatically obtained by default. If you need to reconfigure the IP, you can configure it through NetworkManager and dhcpcd.

5.5.1 Configure IP by Using The NetworkManager Tool

The operating systems of Desktop and Lite have enabled NetworkManager by default, which can be directly configured by using NetworkManager.

5.5.1.1 Raspberry Pi OS(Desktop)

In the Desktop version of the operating system, it is recommended to use the graphical NetworkManager tool to configure IP.



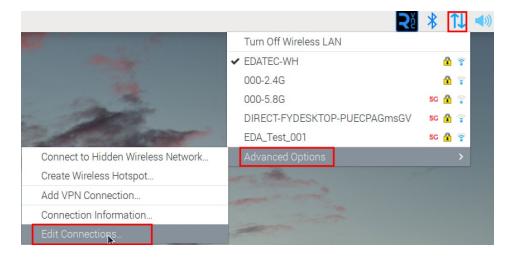
The Desktop version of the operating system has the NetworkManager graphical tool installed by default.

Preparation:

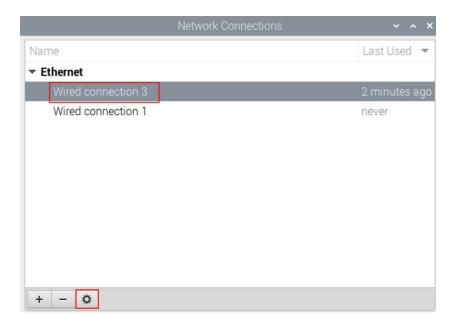
Wi-Fi is enabled.

Steps:

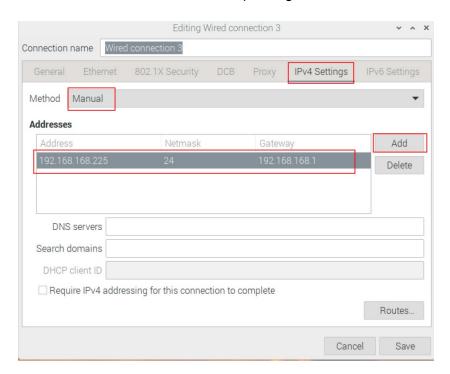
1. Left-click the icon and select "Edit Connections..." from the menu.



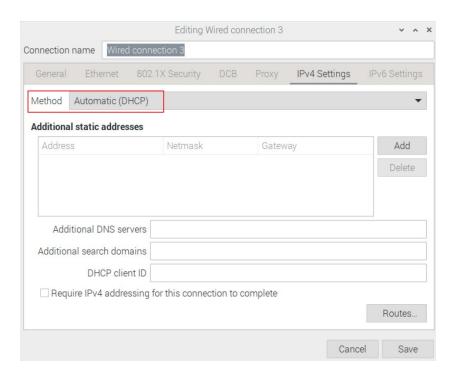
2. In the pop-up "Network Connections" pane, select the connection name to be modified, and then click the Settings button below.



- 3. In the pop-up "Editing Wired connection" pane, select the "IPv4 Settings" page, and then set the IP address as required.
 - If you want to set the IP as a static IP, set the "Method" as "Manual", add an entry in Addresses and enter the corresponding IP address information.



 If you want to set the IP to automatic mode, you only need to set the "Method" as "Automatic(DHCP)".



- 4. Click "save" to return to "Network Connections" pane and close the page.
- 5. Execute the **sudo reboot** command to restart the device.

5.5.1.2 Raspberry Pi OS(Lite)

In the Lite version of operating system, it is recommended to use the command to configure IP.

Preparation:

NetworkManager is enabled.

Steps:

Set a static IP address

- Get the assigned IP address, subnet mask and gateway address, for example, the IP address is 192.168.1.101/24 and the gateway IP is 192.168.1.1.
- 2. Obtain the connection name to be modified, for example e167c45f-efed-3f8d-89a5-f2430f92fae8. In the command pane, run the following command to query the connection name.

nmcli c

```
        pi@raspberrypi:~ $ nmcli c

        NAME
        UUTD
        TYPE
        DEVICE

        Wired connection 1
        e167c45f-efed-3f8d-89a5-f2430f92fae8
        ethernet
        ethernet

        EDATEC-WH
        0e6ae3ef-d53d-447d-9da7-79f72293c3f3
        wifi
        wlan0

        Wired connection 2
        2699e0b9-277b-36d4-b145-8bd29ad924c2
        ethernet
        --

        wired connection 3
        c0d88cab-714c-3dd1-acd4-595787994af4
        ethernet
        --
```

Execute the following command to set the IP address to the obtained IP address.

 $\textbf{sudo nmcli connection modify} \ e 167c 45f-e fed-3f8d-89a 5-f24 30f92 fae 8 \ \textbf{ipv4.addresses} \ 192.168.1.101/24 \\ \textbf{ipv4.method manual}$

4. Execute the following command to set the gateway IP to the obtained gateway IP.

sudo nmcli connection modify e167c45f-efed-3f8d-89a5-f2430f92fae8 ipv4.gateway 192.168.1.1

Set the IP to automatic mode

 Obtain the connection name to be modified, for example e167c45f-efed-3f8d-89a5f2430f92fae8. In the command pane, run the following command to query the connection name.

nmcli c

```
        pi@raspberrypi:~ $ nmcli c

        NAME
        UUTD
        TYPE
        DEVICE

        Wired connection 1
        e167c45f-efed-3f8d-89a5-f2430f92fae8
        ethernet
        ethernet
        ethernet
        wifi
        wlan0

        Wired connection 2
        2699e0b9-277b-36d4-b145-8bd29ad924c2
        ethernet
        --
        ethernet
        --

        Wired connection 3
        c0d88cab-714c-3dd1-acd4-595787994af4
        ethernet
        --
```

2. Execute the following command to set the way of obtaining IP address to automatic mode.

sudo nmcli connection modify e167c45f-efed-3f8d-89a5-f2430f92fae8 ipv4.method auto

5.5.2 Configure IP by Using The dhcpcd Tool

Since NetworkManager is enabled on the Desktop and Lite of operating systems by default. If you need to switch to using the dhcpcd tool for configuration, you need to stop and disable the NetworkManager service and enable the dhcpcd service before configuration.

Steps:

1. Execute the following command to stop the NetworkManager service.

sudo systemcti stop NetworkManager

2. Execute the following command to disable the NetworkManager service.

sudo systemctl disable NetworkManager

3. Execute the following command to enable the dhcpcd service.

sudo systemctl enable dhcpcd

4. Execute the following command to restart the device.

sudo reboot

5. Execute the following command to open the /etc/dhcpcd.conf file.

sudo nano /etc/dhcpcd.conf

6. Add the following content at the end of the /etc/dhcpcd.conf file.

```
interface eth0
static ip_address=192.168.168.210/24
static routers=192.168.168.1
static domain_name_servers=192.168.168.1 8.8.8.8 fd51:42f8:caae:d92e::1
```

- ✓ eth0 is the Ethernet port of the IP to be configured;
- ✓ 192.168.0.10/24 indicates the IP address and subnet mask to be configured;
- √ 192.168.0.1 indicates the gateway IP to be configured;
- √ 8.8.8.8 represents the DNS server address, which should be configured according to the actual needs.
- √ fd51:42f8:caae:d92e::1 indicates the IPV6 address, which should be configured according to the actual needs.

- 7. Use Ctrl+S to save the file, then enter Ctrl+X to exit edit mode.
- 8. Execute the following command to reboot the device.

sudo reboot

5.6 Configuring Bluetooth (Optional)

User can choose ED-HMI2020-070C with Bluetooth version, and the Bluetooth function is enabled by default, you need to finish related configurations such as adding devices, scanning devices and device pairing before using Bluetooth.

5.6.1 Raspberry Pi OS(Desktop)

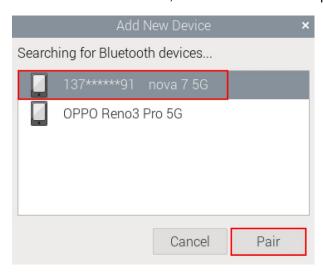
In the Desktop version of the operating system, you can use the desktop icon to configure Bluetooth.

Steps:

 Left-click the icon in the upper right corner of the desktop and select "Add Device" in the pop-up menu.



2. In the pop-up "Add New Device" pane, view the scanned Bluetooth devices. Then you can select a Bluetooth device, and click "Pair" to start pairing.



3. Select "OK" in the pop-up prompt box to confirm the pairing request.





You need confirm the pairing request on connected Bluetooth device, otherwise the pairing will fail.

- 4. After successful Bluetooth pairing, click "OK" in the pop-up prompt to close the page.
- 5. Left-click the icon ³ in the upper right corner of the desktop to view the connected Bluetooth device.



5.6.2 Raspberry Pi OS(Lite)

In the Lite version of the operating system, you can use the command line to configure Bluetooth.

5.6.2.1 Basic Configuration Command

Command	Function Description
bluetoothctl scan on	Enable Bluetooth scanning
bluetoothctl scan off	Disable Bluetooth scanning
bluetoothctl discoverable on	Enable Bluetooth discovery (which can be discovered by the other
	party)
bluetoothctl discoverable off	Disable Bluetooth discovery
bluetoothctl trust device_MAC	Trust device
bluetoothctl connect device_MAC	Connect device
bluetoothctl disconnect device_MAC	Disconnect device

5.6.2.2 Configuration Example

This chapter introduces how to configure Bluetooth through a configuration example.

Preparation:

The Bluetooth to be paired has been enabled and its name has been determined.

Steps:

1. Enter the Bluetooth view.

sudo bluetoothctl

2. Enable bluetooth.

power on

3. Scan Bluetooth device.

scan on

Returned display information:

Discovery started

[CHG] Controller B8:27:EB:85:04:8B Discovering: yes

[NEW] Device 4A:39:CF:30:B3:11 4A-39-CF-30-B3-11

4. Find the name of the turned-on Bluetooth device.

devices

Returned display information:

Device 6A:7F:60:69:8B:79 6A-7F-60-69-8B-79

Device 67:64:5A:A3:2C:A2 67-64-5A-A3-2C-A2

Device 56:6A:59:B0:1C:D1 Lefun

Device 34:12:F9:91:FF:68 test

5. Pairing target devices.

pair 34:12:F9:91:FF:68

34:12:F9:91:FF:68 is target device's device_MAC

Returned display information:

Attempting to pair with 34:12:F9:91:FF:68

[CHG] Device 34:12:F9:91:FF:68 ServicesResolved: yes

[CHG] Device 34:12:F9:91:FF:68 Paired: yes

Pairing successful



The Bluetooth device to be connected also needs to confirm the pairing request, otherwise the pairing will fail.

6. Add as trusted device.

trust 34:12:F9:91:FF:68

34:12:F9:91:FF:68 is target device's device_MAC

Returned display information:

[CHG] Device 34:12:F9:91:FF:68 Trusted: yes

Changing 34:12:F9:91:FF:68 trust succeeded

5.7 Configuring Buzzer

The ED-HMI2020-070C contains a buzzer, which supports manually configure the buzzer to turn on and off.

Execute the following command to turn on the buzzer.

raspi-gpio set 6 op dh

- ✓ op means set to output; dh means that pin is high level.
- ◆ Execute the following command to turn off the buzzer.

raspi-gpio set 6 op dl

✓ op means set to output; dI means that pin is low level.

5.8 Configuring RTC

ED-HMI2020-070C contains an integrated RTC, which automatically reads the system time synchronously by default, and can manually read and write the system time into RTC.

Execute the following command to read the RTC time manually.

sudo hwclock -r

◆ Execute the following command to write the system time into RTC.

sudo hwclock -w

5.9 Configuring Audio

ED-HMI2020-070C contains one audio (supports access to MIC) and one extended speaker output. The volume of Master, MIC and Speaker can be adjusted, and support recording for MIC.

5.9.1 Adjust The Volume

It supports manual adjustment of MIC, Speaker and Master volume.

◆ If you are using the Desktop version of the operation system, you can adjust the volume of the MIC and Master directly through the desktop icon.

Steps:

1. Click the icon or in the upper right corner of the desktop to open the volume adjustment column.



- 2. Drag the button of the volume adjustment column up and down to adjust the volume, check or uncheck the Mute check box to mute and unmute the audio.
- ♦ Both Desktop and Lite versions of the operation system support opening the volume adjustment interface through the command line to adjust the volume.

Steps:

1. Execute the following command to open the volume adjustment interface.

alsamixer

```
Card: PulseAudio
Chip: PulseAudio
View: F3:[Playback] F4: Capture F5: All
Item: Master

F1: Help
F2: System information
F6: Select sound card
Esc: Exit
```

2. View the volume value of the current Master in the opened interface. You can adjust the volume through the 1 key and 1 key on the keyboard, and press the M key to mute and unmute the audio.

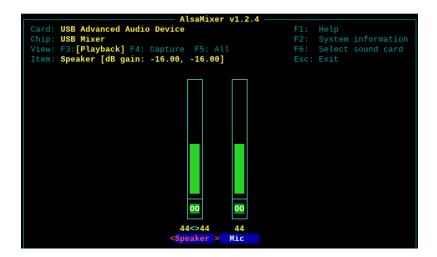
Keyboard Key	Function
1	Volume+
1	Volume-
М	Mute or Unmute

3. Press F6 to open "Sound Card" interface, select "1 USB Advanced Audio Device".



4. Press Enter to open the volume interface of MIC and Speaker, and you can adjust the volume of MIC and Speaker respectively through the **1** key and **↓** key on the keyboard, and press M to mute and unmute MIC/Speaker.

Keyboard Key	Function
1	Volume+
1	Volume-
М	Mute or Unmute



5.9.2 Configure Recording

It supports the audio recording of MIC input.

Preparation:

The audio interface has been connected to MIC.

Steps:

1. Execute the following command to open the volume adjustment interface.

alsamixer

- Press F6 to open the "Sound Card" interface, select "1 USB Advanced Audio Device", and press Enter to open the volume adjustment interface of MIC and Speaker to ensure that MIC is not muted.
- 3. Press Esc to exit to the command pane, execute the following command to start recording audio named audio1, as shown in the figure below.

arecord -fcd -Dhw:1 -c 1 --vumeter=mono audio1 | aplay -fcd -Dhw:1

```
pi@raspberrypi:~ $ arecord -fcd -Dhw:1 -c 1 --vumeter=mono audio1 | aplay -fcd -Dhw:1
Recording WAVE 'audio1' : Signed 16 bit Little Endian, Rate 44100 Hz, Mono
##+
```

Parameters	Description
cd	Indicates the audio format, which can be set to cd, cdr, dat and other formats, and can be
	set as needed.
11	Indicates the sound card for recording, it needs to be obtained by executing arecord -I
	before recording, as shown in the following figure:
	<pre>pi@raspberrypi:~ \$ arecord -l ***** List of CAPTURE Hardware Devices **** card 1: Device [USB Advanced Audio Device], device 0: USB Audio [USB Audio] Subdevices: 1/1 Subdevice #0: subdevice #0</pre>
audio1	Indicates the recorded file name, which can be customized by the user.

- 4. Use Ctrl+C to close recording.
- 5. Execute the following command to obtain the storage path of the recording file.

pwd

```
pi@raspberrypi:~ $ pwd
/home/pi
```