

# Embedded Computer User Manual



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## Safety maintenance:

- It should avoid the humidity and extreme temperature when being used.
- Please maintain your system properly to make sure its service life and reduce the damage risk.
- Avoid prolonged exposure of the unit to direct sunlight or strong ultraviolet light.
- Do not drop the unit or let it be in any place with severe shock / vibration.
- Please avoid the collision as the LCD screen is very easy to be scratched. Do not use any sharp object to touch the screen.
- To clean the outside fuselage, please turn off the power, unplug the power cord, scrub / wipe with slightly damp soft cloth. When cleaning the screen, please wipe with the lint free soft cloth.
- Never attempt to disassemble or repair the machine, otherwise the unit may be damaged.
- Do not place your unit or accessories together with other flammable liquids, gases, or other explosive materials, to avoid danger.
- Please unplug the power plug and remove the built-in battery if long-term no-use, or thunder weat

# 1. Product Description

## 1.1 Brief Introduction

- 7" 16:10 five point capacitive touch screen , 1280×800 physical resolution;
- IMX8M mini, Arm Cortex-A53 Quad-Core 1.6GHz, 2G RAM , 16G ROM;
- Android 9.0 OS;
- RS232/RS485/GPIO/CAN BUS/WLAN/BT/4G/LAN/USB/POE;
- Micro SD (TF) card storage, SIM card slot.

## 1.2 Optional Functions

- 3G/4G (built-in);
- GNSS serial port, 5V reserved for power(external built)
- Wi-Fi 2.4GHz&5GHz& Bluetooth 5.0 (built-in);
- RS485
- RS422
- CAN BUS\*2, standard\*1
- POE (LAN 2 for optional);

## 1.3. Basic Parameters

Configuration	Parameters	
Display	7" IPS	
Touch Panel	Capacitive	
Physical Resolution	1280×800	
Brightness	400cd/m <sup>2</sup>	
Contrast	800:1	
Viewing Angle	170°/170°(H/V)	
System Hardware	CPU:NXP IMX 8M mini, Arm Cortex-A53 Quad-Core 1.6GHz processor ROM: 16GB FLASH RAM: 2GB (LPDDR4) GPU: 2D and 3D Graphics OS: Android 9.0	
Interfaces	SIM card	1.8V/2.95V, SIM

	TF card	1.8V/2.95V, up to 512G
	USB	USB host 2.0×2 USB Device 2.0×1
	CAN	CAN2.0B×2
	GPIO	8 (Input and output can be customized by software, see section 3. Extended Cable Definition for details.)
	LAN	100M×1, 1000M*1 ( Note: LAN1 port is for Intranet, LAN 2 port is for Internet, both of them are defaulted)
	Serial Port	RS232×4, or RS232×3 and RS485×1, or RS232×3 and RS422×1, or RS232×2 and RS485×2 (COM fails when Bluetooth is available)
	Ear Jack	1(Doesn't support microphone)
Optional Function	Wi-Fi	802.11a/b/g/n/ac 2.4GHZ/5GHZ
	Bluetooth	Bluetooth 5.0 2402MHz~2480MHz
	3G/4G	(See section 1.4 for details)
	POE	25W(Only 1000M LAN support POE)
Multimedia	Audio	MP3/AAC/AAC+/WAV/FLAC/APE/AMR/MP4/MOV/F4V...
	Video	Encode: 1080p60 H.264, VP8 encoding Decode: 1080p60 H265, VP9, 1080p60 H264, VP8 decoding
Input Voltage	DC 8~36V	
Power Consumption	Overall ≤ 15.5W Standby ≤ 2.5W	
Working Temperature	-20°C ~60°C	
Storage Temperature	-30°C ~70°C	
Dimension (LWD)	206×144×30.9mm	
Weight	790g	

#### 1.4. 3G / 4G Support Parameter & Switch

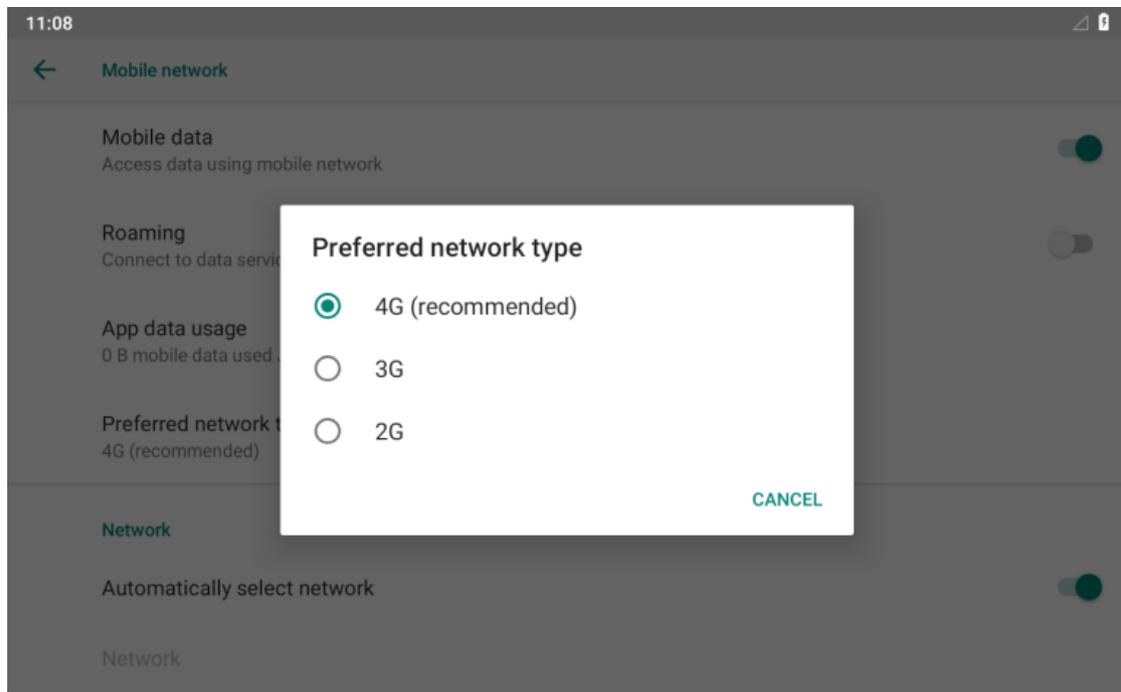
Band (Different versions support different bands)	<b>Version 1:</b> China/India/South east Asia	FDD LTE: Band 1 / Band 3 / Band 8 TDD LTE: Band 38 / Band 39 / Band 40 / Band 41 DC-HSPA+ / HSPA+ / HSPA / UMTS: Band1 / Band 5 / Band 8 / Band 9 TD-SCDMA: Band 34 / Band 39 GSM/GPRS/EDGE: 1800 / 900
	<b>Version 2:</b>	FDD LTE: Band 1 / Band 2 / Band 3 / Band 4

	EMEA/South America	/ Band 5 / Band 7/ Band 8 / Band 20 WCDMA / HSDPA / HSUPA / HSPA+: Band 1 / Band 2 / Band 5 / Band 8 GSM / GPRS / EDGE: 850 / 900 / 1800 / 1900
	<b>Version 3:</b> North America	LTE: FDD Band 2 / Band 4 / Band 5 / Band 12/ Band 13 / Band 17 WCDMA / HSDPA / HSUPA / HSPA+: Band2 / Band 4 / Band 5
Data Transmission	LTE	LTE-FDD Max 150Mbps(DL)/Max 50Mbps(UL) LTE-FDD Max 130Mbps(DL)/Max 35Mbps(UL)
	DC-HSPA+	Max 42 Mbps(DL)/Max 5.76Mbps(UL)
	WCDMA	Max 384Kbps(DL)/Max 384Kbps(UL)
	TD-SCDMA	Max 4.2 Mbps(DL)/Max2.2Mbps(UL)
	EDGE	Max 236.8Kbps(DL)/Max 236.8Kbps(UL)
	GPRS	Max 85.6Kbps(DL)/Max 85.6Kbps(UL)

### 3G/4G Switch

Settings→Network&internet→Mobile network→Advanced→Preferred network type;

Default as 4G.



## 2. Structure Function Explanation



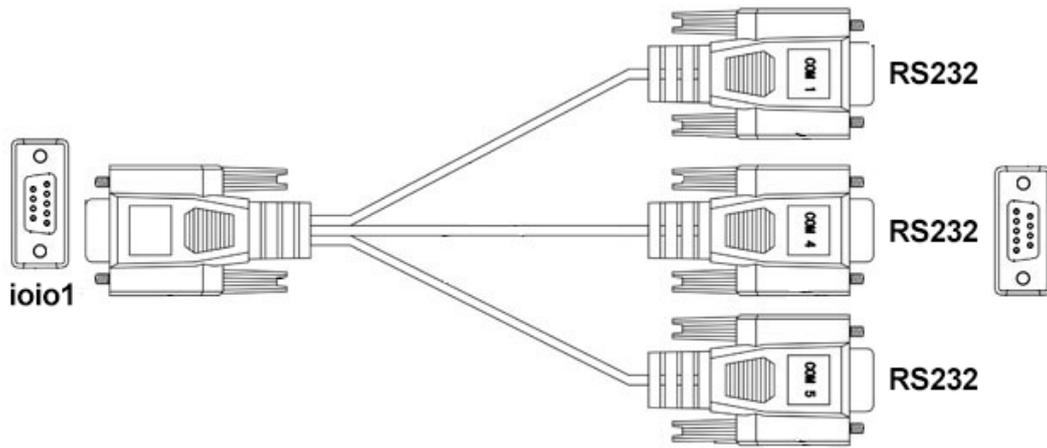
- a. Reset & burn button.
- b. User-definable button 1 (Default as return).
- c. User-definable button 2 (Default as home).
- d. Power on/off button.



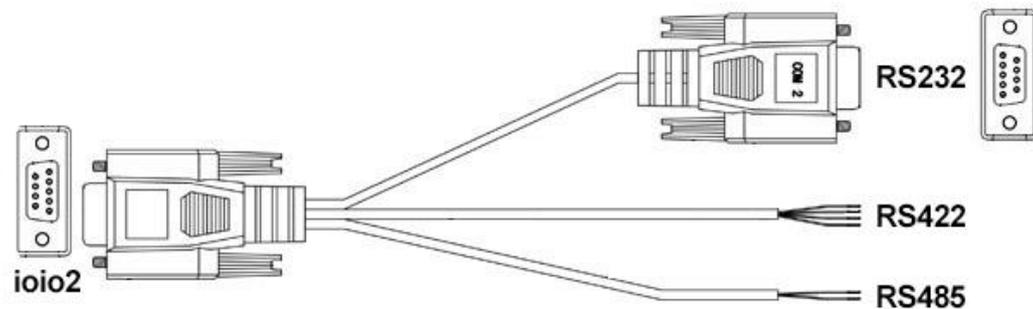
- a. SIM card slot.
- b. (TF) card slot.
- c. USB Device (TYPE-C)
- d. IOIO 2: (RS232 standard interface, connecting with DB9 optional cable to convert to RS232×1 and RS422×1 ports or RS232×1 and RS485×2 ).  
IOIO 1: (RS232 standard interface, connecting with DB9 standard cable to convert to RS232×3 port).  
Y and Z in the RS422 can be optioned as second way.
- e. CAN/GPIO (For extended cable definition, please refer to "3 Extended Cable Definition").
- f. USB Host×2.

- g. 100M LAN.
- h. 1000M WAN, POE function for optional.
- i. Ear jack.(Doesn't support microphone input)
- j. Power interface.(ACC for optional)

### 3. Extended Cable Definition



DB9 standard cable

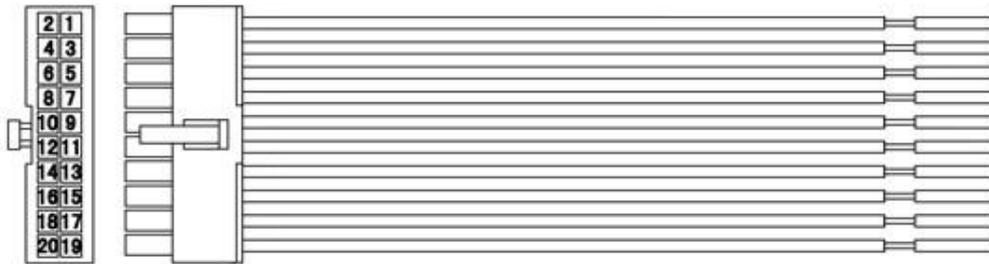


DB9 optional cable

Item	Definition
COM 1 RS232	/dev/ttymx1;

COM 2 RS232			/dev/ttymx3;
COM 4 RS232			/dev/ttymx2;
COM 5 RS232			/dev/ttymx0;
RS422	Red A	white Z	/dev/ttymx3;
	Black B	Green Y	
The first RS485	Red A		/dev/ttymx3;
	Black B		

Note: The Y(green) and Z(white) of RS422 can be configured as A and B of second RS485 port, which corresponds to the serial port /dev/ttymx2.



### CAN/GPIO

Item	Definition					
GPIO	GPIO Input	2		4	6	8
		GPIO 1		GPIO 2	GPIO 3	GPIO 4
		Yellow		Yellow	Yellow	Yellow
	GPIO Output	10	12	1	3	14
		GPIO 5	GPIO 6	GPIO 7	GPIO 8	GPIO COMMON
		Blue	Blue	Blue	Blue	Grey
GPIO GND	13					
	Black					
CAN	CAN 1/2	18	20	17	19	
		CAN1-L	CAN1-H	CAN2-L	CAN2-H	
		Green	Red	Green	Red	

### 3.1 Serial Port



Click Icon to activate ComAssistant

Serial port ID: COM1, COM2, COM4 and COM5

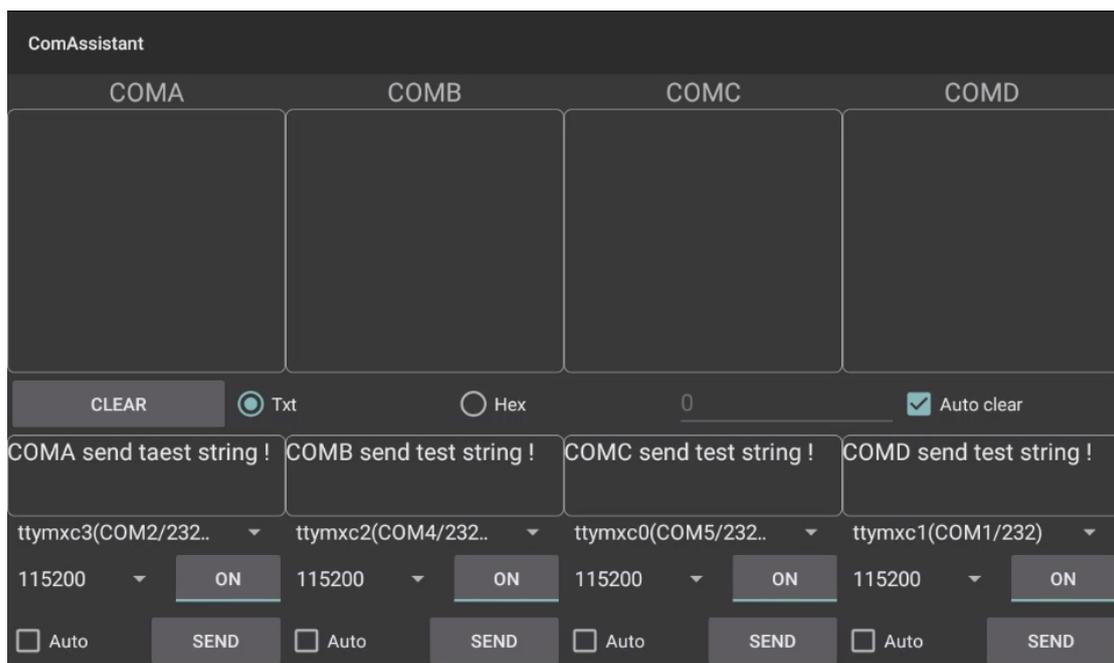
Correspondence between RS232 tail line ports and device nodes

COM1=/dev/ttymx1 (print port)

COM2=/dev/ttymx3 (RS232/RS422/The first RS485 optional)

COM4=/dev/ttymx2 (RS232/second RS485 optional)

COM5=/dev/ttymx0 (RS232/Bluetooth optional)



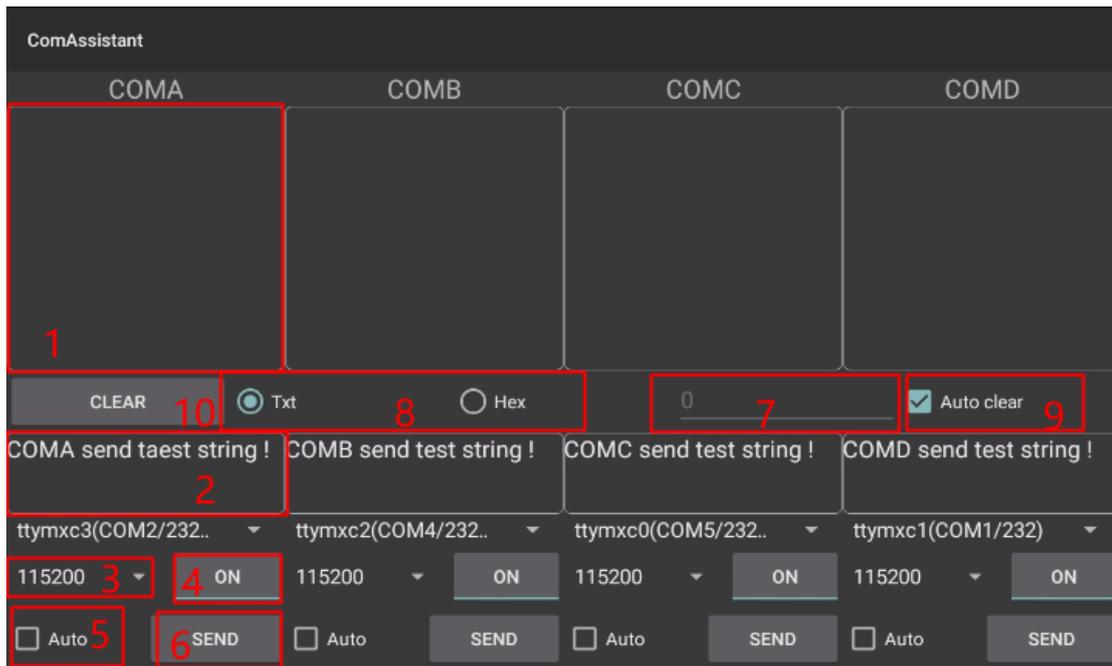
RS232x4: Bluetooth is invalid, RS485, RS422 is invalid

RS232x3 and RS485x1: Bluetooth is invalid, COM2 is invalid

RS232x3 and RS422x1: Bluetooth is invalid, COM2 is invalid

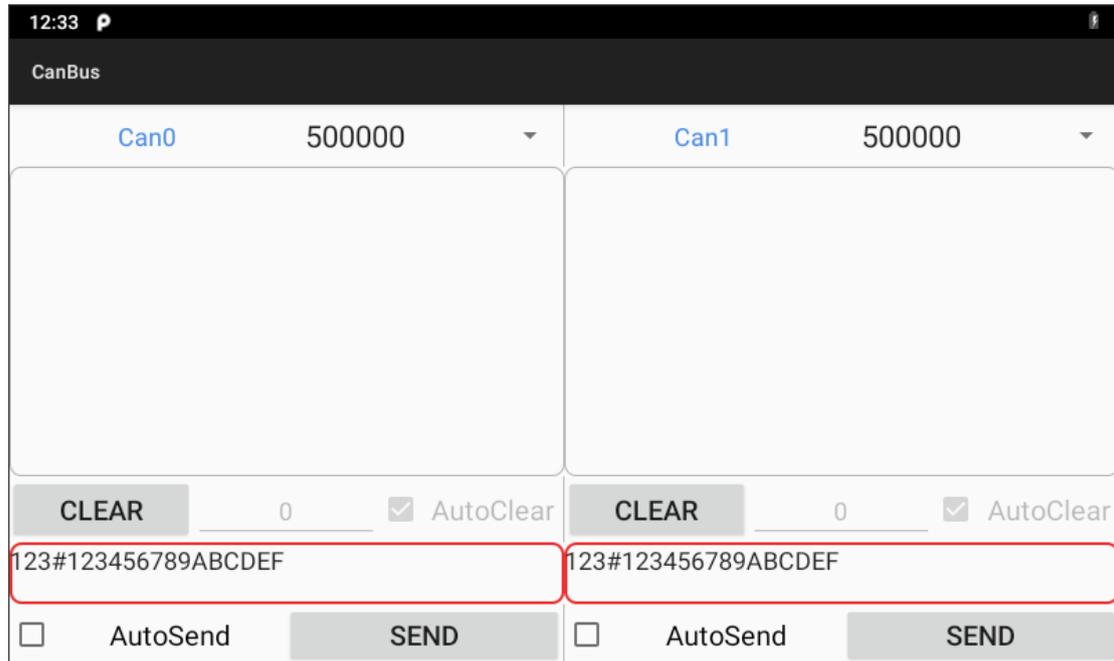
RS232x2 and RS485x2: Bluetooth is invalid, COM2 and COM4 is invalid

When machine with bluetooth, COM5 is invalid.



1. The boxes in red means the text box for the COM port information received, to display information received by corresponding COM port.
2. The boxes in red means the text input box for the COM port information sent, to edit information sent by corresponding COM port.
3. The left box in red means Baud rate Drop-down selection box, to select corresponding COM port Baud rate.
4. The right box in red means COM port switch, to switch on/off corresponding COM port.
5. The boxes in red means auto send mode selection.
6. COM port info. sending button.
7. The boxes in red means text rows counting in the information receiving text box
8. The boxes in red means send/receive information codec format option button, select "Txt" to send info. with String code, select Hex to send info. with Hexadecimal format code.
9. The boxes in red means manual clear button, click to clear both info. in the COM port info. receiving boxes.
10. The boxes in red means clear symbol of the receiving text box, default as auto clear once text up to 500 rows

## 3.2 CAN BUS Interface



adb command:

Set the bitrate ( baud rate ) before all operations

Example: Set the bitrate of the can0 interface to 125kbps:

```
# ip link set can0 up type can bitrate 125000
```

Quick test

Once the driver is installed and the bitrate is set, the CAN interface has to be started like a standard net interface:

```
# ifconfig can0 up
```

and can be stopped like that:

```
# ifconfig can0 down
```

The socketCAN version can be retrieved this way:

```
# cat /proc/net/can/version
```

The socketCAN statistics can be retrieved this way:

```
# cat /proc/net/can/stats
```

## 3.3 GPIO Interface

1. GPIO interface as shown below,

name	direction	state	operation
GPIO 0	IN	HIGH	READ
GPIO 1	OUT	HIGH	READ
GPIO 2	IN	HIGH	READ
GPIO 3	IN	HIGH	READ
GPIO 4	IN	HIGH	READ
GPIO 5	IN	HIGH	READ
GPIO 6	IN	HIGH	READ
GPIO 7	IN	HIGH	READ

At the bottom of the interface, there are two buttons: **READ\_ALL** and **SET\_ALL\_LOW**.

## 2. How to read or set the value of the gpio

GPIO0~7 (IO number)

a)When the software configures the IO port as input, (Negative trigger).

Configuration command: `gpiocontrol read [gpio number]`

For example: Setting gpio 0 as the input state, and read the input level

```
diamond:/ # gpiocontrol read 0
```

```
diamond:/ #
```

Trigger voltage: The logic level is '0', 0~1.5V.

Non-trigger voltage: The logic level is '1', the input IO is floating, or beyond 2.5V, but the maximum input voltage must be less than 50V.

b)When the software configures the IO port as output, it is an open-drain output.

Configuration command: `gpiocontrol [gpio number] set [output state]`

For example: Set gpio 0 as output state and output high level

```
diamond:/ # gpiocontrol 0 set 1
```

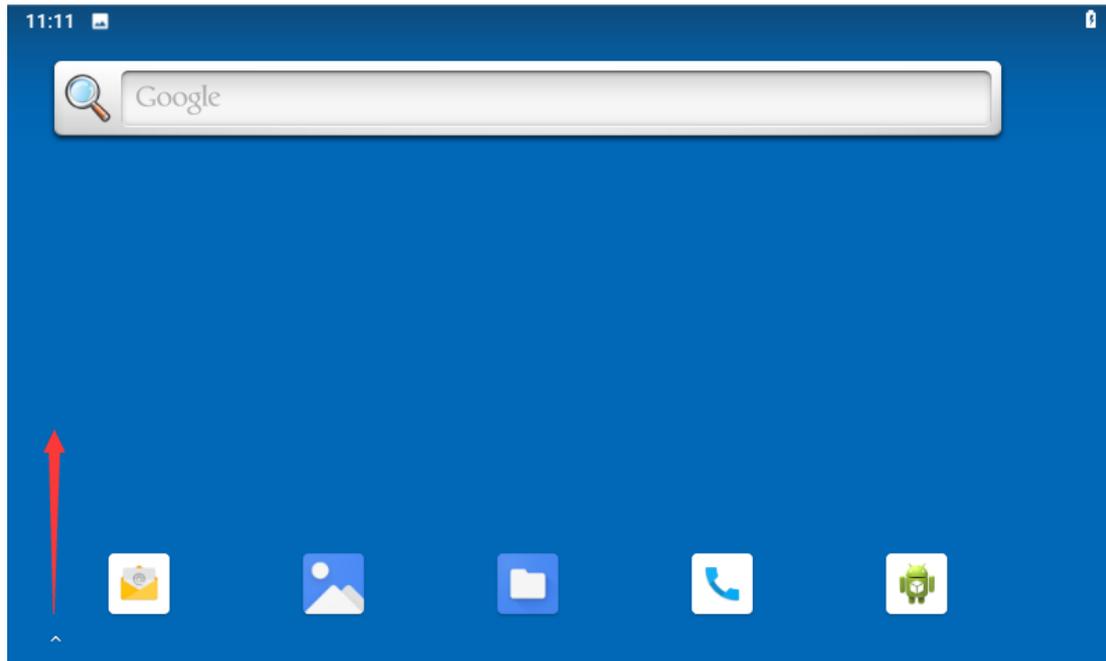
```
diamond:/ #
```

When the output IO is enabled, the logic level is '0', and the IO voltage is less than 1.5V.

When the output IO is disabled, the logic level is '1', and the rated voltage of the IO must be less than 50V.

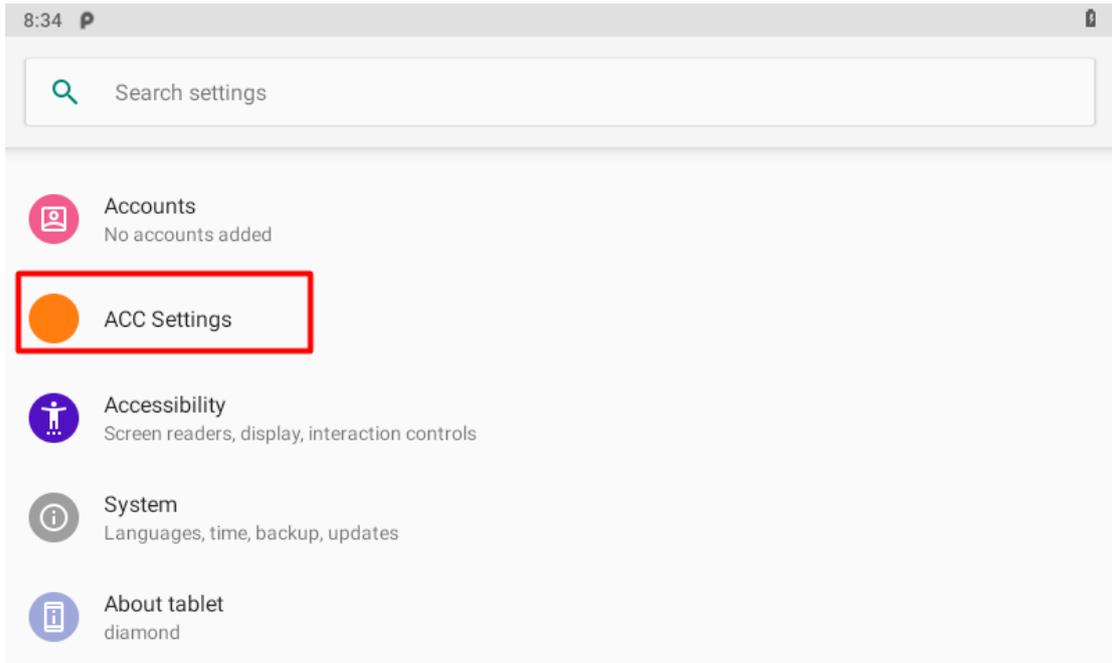
### 3.4 ACC Setting Path

ACC settings located in ACC Settings under the category of System in the Settings of Android OS. Please refer to Figure 3-1, 3-2 and 3-3:

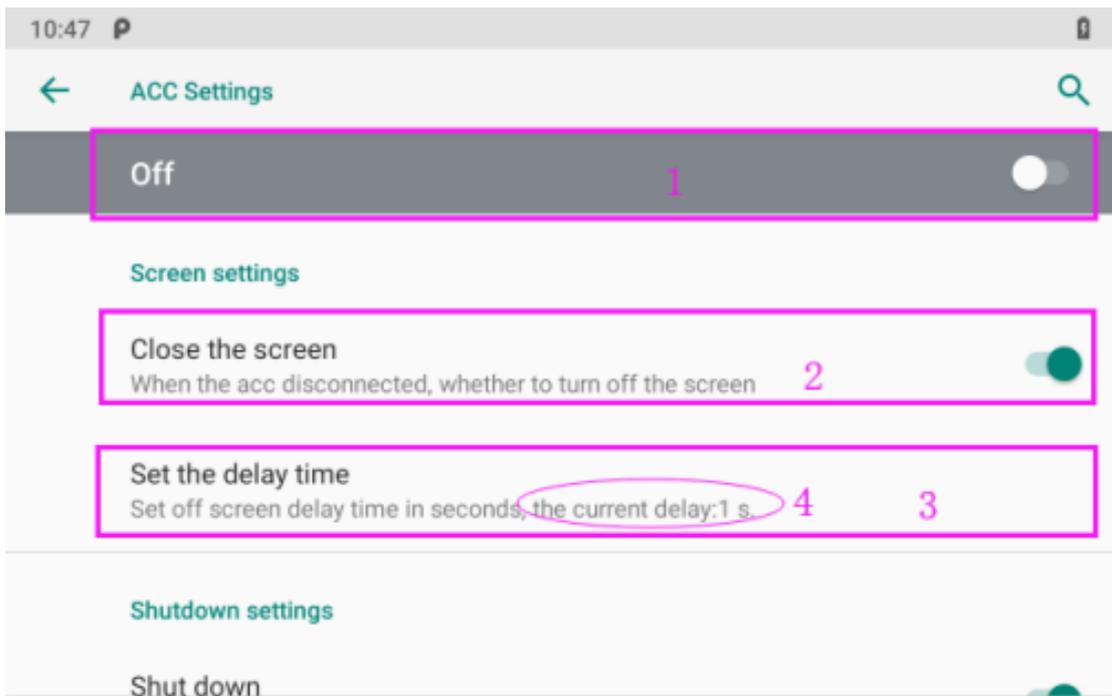


3-1

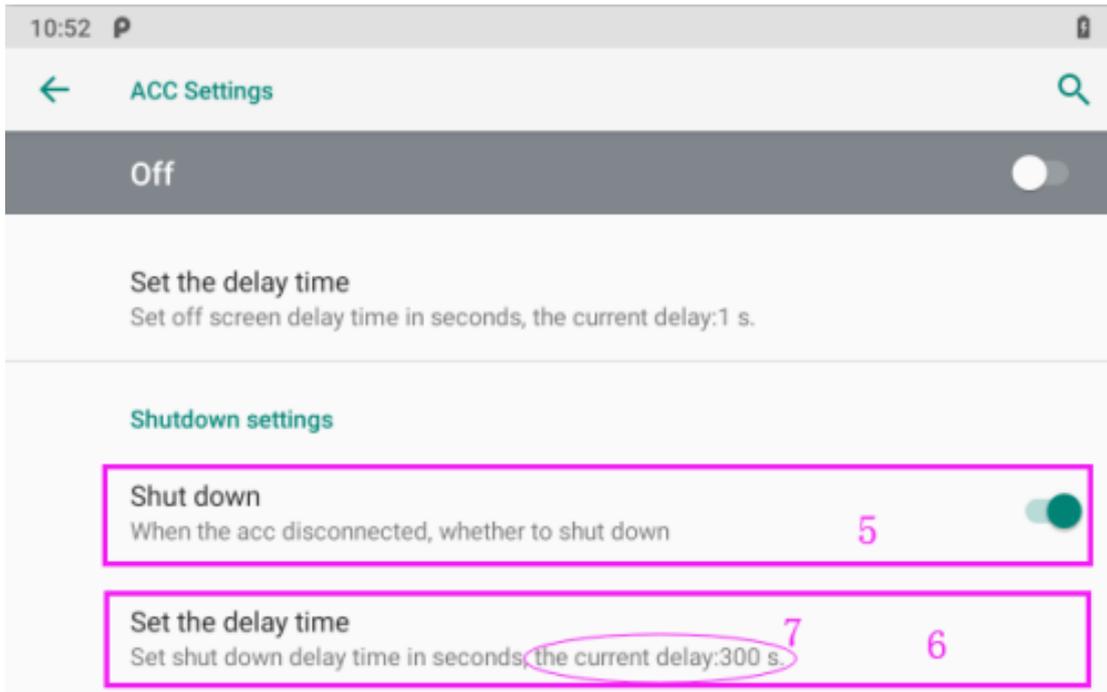
Click  go to Settings and select "ACC Settings" as shown.



3-2



3-3



3-4

ACC settings as shown in Figure 3-4 & Figure 3-5.

Mark 1: The main switch of the three functions controlled by ACC, namely, light up the screen, close the screen and shut down.

Mark 2: The switch of close screen function controlled by ACC.

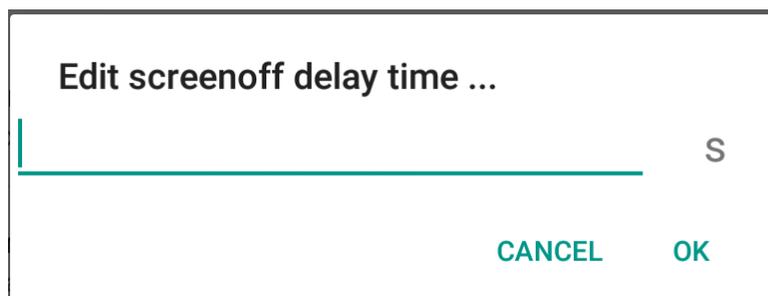
Mark 3: Click to pop-up dialog box as shown in Figure 3-5, to edit the screen off delay time after ACC outage.

Mark 4: The current screen off delay time after ACC outage.

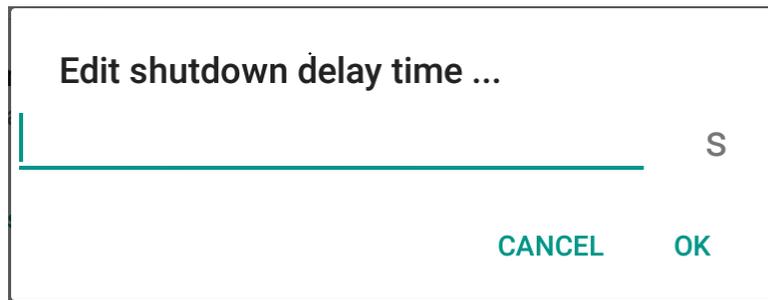
Mark 5: The switch of Trigger to shut down function by ACC outage.

Mark 6: Click to pop-up dialog box as shown in Figure 3-6, to edit the shut down delay time after ACC outage.

Mark 7: The current shut down delay time after ACC outage.



3-5



3-6

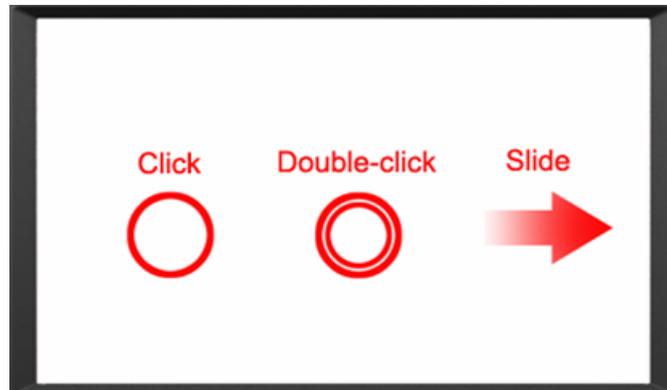
#### 4. Memory Card Instructions

- The memory card and the card slot on the device are precision electronic components. Please align to the position accurately when inserting the memory card into the card slot to avoid of damage. Please slightly push the upper edge of the card to loosen it when removing the memory card, then pull it out.
- It is normal when the memory card getting hot after long time working.
- The data stored on the memory card may be damaged if the card is not used correctly, even the power is cut off or the card is pulled out when reading data.
- Please store the memory card in packing box or bag if not used for a long time.
- Do NOT insert the memory card by force to avoid of damage.

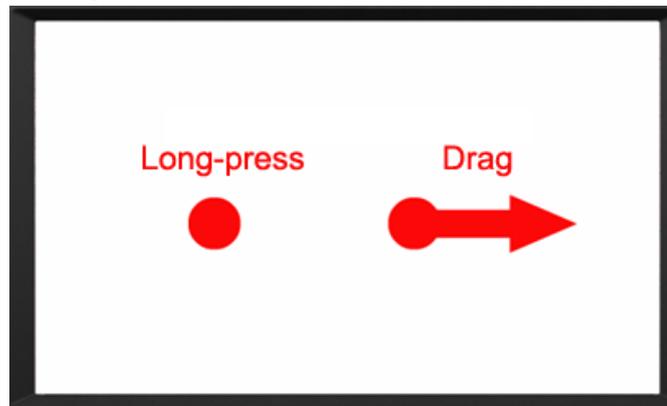
## 5. Operation Guide

### 5.1 Basic Operation

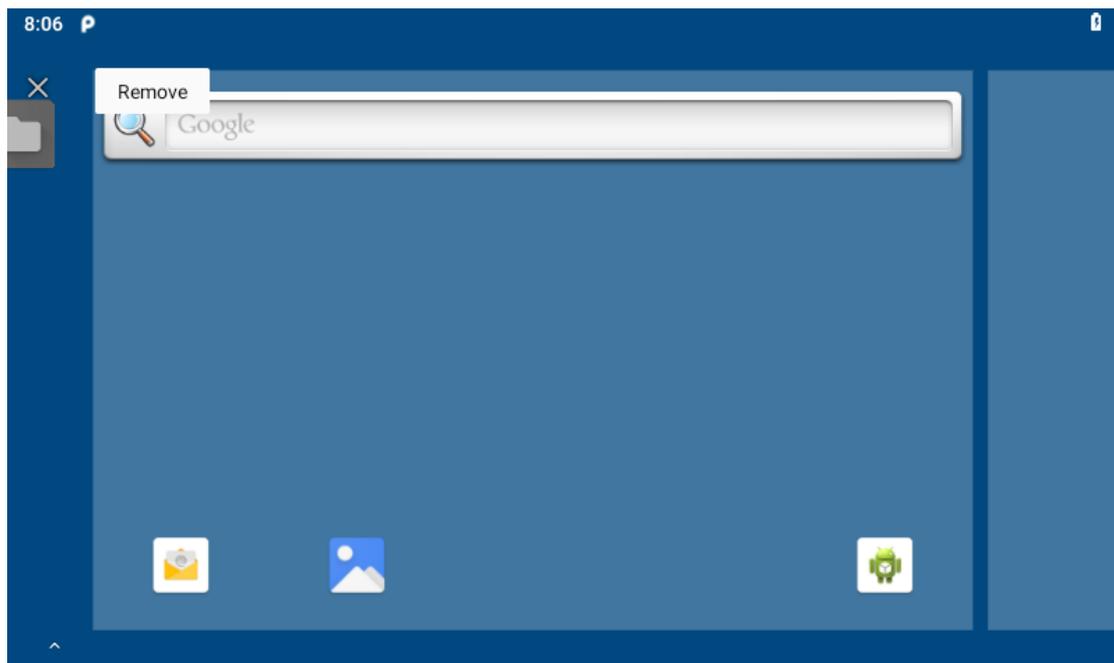
#### 5.1.1 Click, Double-click and Slide



#### 5.1.2 Long-press and Drag



#### 5.1.3 Delete



Long-press the application icon, and drag it to the recycle bin on the top left corner of screen, then press OK to uninstall this app.

## 5.2 Applied

Scroll up to the “” icon in the lower side to see all the apps on the device

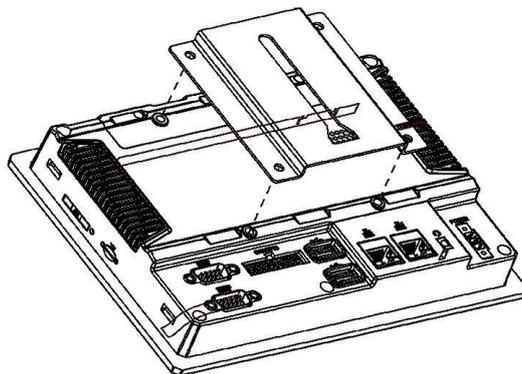
Icon	Name	Description
	Phone	Open the dial interface.
	E-mail	After you set up your e-mail account, you will be reminded when there are new e-mails.
	Calculator	Turn on the calculator.
	Calendar	In the calendar you can view the date, or you can add the schedule.
	Setting	It can be set up according to individual requirements
	Clock	Check the time and set the alarm, timer and stopwatch.
	Address book	View the address book and add new contacts.
	Picture	The gallery program supports viewing by folder path.
	File	Open to manage files.
	Ethernet	Ethernet can be managed Modify static or dynamic IP and proxy Settings
	Search	Click to go to Google Search
	Browser	Android Web browser

## 5.3 Icon bar

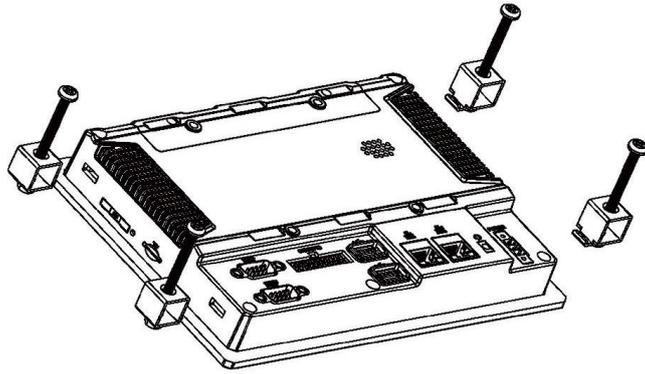
Icon bar shown on the top right corner of screen, as well as the notice bar; Slide the top bar down to launch the notice bar.

Icon	Name	Description
	Wi-Fi	Wi-Fi signal connection and status
	SIM card	No SIM card
	Mobile Network	Network available but not surf the Internet via 2G/3G/4G
		Signal connection and status
	Time	Current time
	Wi-F Hotspot	Wi-Fi Hotspot available
	Bluetooth	Bluetooth available
	Flight Mode	Flight mode status

## 6. Mounting Methods



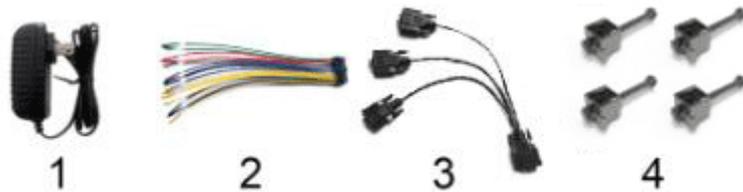
VESA 75mm rail slot



Embedded mount

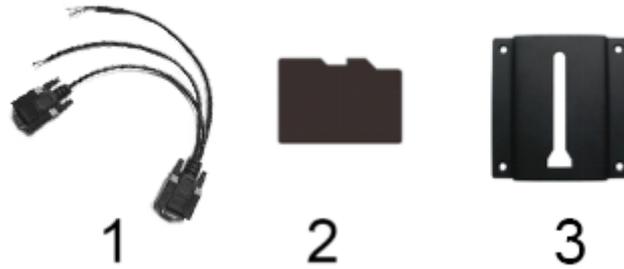
## 7. Accessories

Standard accessories:



- |                       |          |
|-----------------------|----------|
| 1. DC 12V adapter     | 1 piece  |
| 2. CAN/GPIO cable     | 1 piece  |
| 3. DB9 cable(RS232x3) | 1 piece  |
| 4. Fixed screw        | 4 pieces |

## Optional accessories:



- |                                      |         |
|--------------------------------------|---------|
| 1. DB9 cable (RS232x1, RS485, RS422) | 1 piece |
| 2. Micro SD card                     | 1 piece |
| 3. 75mm VESA rail slot               | 1 piece |

## 8. Trouble Shootings

### ·Power Problem

#### 1. Cannot boot up

Wrong cable connection

- Connect Extended cable with device first, and connect the AC end of DC adapter with DC input port of Extended cable, then the other end of DC adapter connect with power plug socket.

#### 2. Bad connection

- Check every connection and socket of power source.

### ·Screen Problem

- No picture on screen.
- The application reaction time is too long and cannot be activated when clicked.
- The image appears delay or still when switching.

**Please restart your system if the device has any problem as described above.**

4. Incorrect responding to the touch click on screen

a) Please calibrate the touch screen.

5. Display screen is misty

a) Please check whether the display screen surface has dust filth or not. Please simply wipe with clean and soft cloth.

**Note: Due to constant effort to improve products and product features, specifications may change without notice.**