# EIC-1000 USER Manual

Arm-based Edge AI Computing System

Dual Cortex-A72, Quad Cortex-A53 Processor, 9V to 55V, 0°C to 70°C Operation

Vecow

1.0.0 Edition 20211207

# Record of Revision

| Version | Date | Page | Description | Remark |
|---|---|---|---|---|
| 1.00 | 2021/12/7 | All | Official Release | |

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CE**

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# Order Information

| Part Number | Description |
|---|---|
| EIC-1000-DB | EIC-1000, Rockchip RK3399, Pre-installed with Debian 9.0, 1 GigE LAN, 1 USB 3.0, 1 USB 2.0, 1 Digital Display, 2 COM, 0°C to 70°C |
| EIC-1000-AD | EIC-1000, Rockchip RK3399, Pre-installed with Android 7.1, 1 GigE LAN, 1 USB 3.0, 1 USB 2.0, 1 Digital Display, 2 COM, 0°C to 70°C |

# Optional Accessories

| Part Number | Description |
|---|---|
| PWA-60WP3-WT | 60W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block, Wide Temperature -30°C to +70°C |
| PWA-60WP3-WT-12V | 60W, 12V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block, Wide Temperature -30°C to +70°C |
| DIN-RAIL | DIN Rail Kit for EIC-1000 |
| WiFi & Bluetooth | WiFi & Bluetooth Module with Antenna |

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# 1

# GENERAL INTRODUCTION

## 1.1 Overview

EIC-1000 is an Arm-based Edge AI Computing System. Based on Rockchip RK3399 SoC, EIC-1000 delivers high-performance, scalability and outstanding visualized functionality for industry deployments to implement AIoT applications faster.

Vecow EIC-1000 is powered by dual-core Cortex-A72 and quad-core Cortex-A53 processor and runs on Arm Mali-T860MP4 GPU. To meet the market demand for increased storage capabilities within digital signage and smart retail, EIC-1000 offers 2GB DDR3 SDRAM, 32GB eMMC and 1 external Micro SD and supports digital display at up to 4K resolution. Furthermore, the EIC-1000 supports Android and Linux operating system, which allows users to work seamlessly across industries.

With 9V to 55V wide DC-in and operating temperature range of 0°C to 70°C, the EIC-1000 provides trusted reliability to a wide range of applications including Digital Signage, Factory Automation, Smart Retail, and any AIoT/Industry 4.0 applications.

## 1.2 Features

- Rockchip Dual Cortex-A72, Quad Cortex-A53 Processor
- 2GB DDR3 SDRAM, 32GB eMMC, 1 External Micro SD Socket
- Pre-installed with Debian 9.0 or Android 7.1
- 1 Digital Display, up to 4K resolution
- 1 GigE LAN, 1 USB 3.1, 1 USB 2.0
- 2 COM RS-232/422/485, Audio Mic-in and Line-out
- 1 Half-size Mini PCIe for WiFi/Bluetooth
- DC 9V to 55V wide range power input
- Fanless, 0°C to 70°C Operating Temperature

## 1.3 Product Specification

### 1.3.1 Specifications of EIC-1000-DB

| | |
|---|---|
| **System** | |
| Processor | Rockchip RK3399 Arm Dual-core Cortex-A72 + Quad-core Cortex-A53 |
| Memory | 1 DDR3L 1066MHz SDRAM, 2GB |
| eMMC | 1 eMMC, 32GB |
| OS | • Linux Debian 9.0<br>• Supports bootup from eMMC |
| **Graphics** | |
| Interface | 1 Digital Display, up to 4Kx2K @60fps |
| Graphics Processor | ARM Mail-T860MP4, AFBC supported |
| Video Decoder | • H.264/H.265, 10bit, up to 4Kx2K@60fps<br>• VP9, 8bit, up to 4Kx2K@60fps<br>• MPEG-4/MPEG-2/VP8 up to 1080p@60fps |
| Video Encoder | H.264/MVC/VP8 encoders by 1080p@30fps |
| **I/O Interface** | |
| USB | • 1 USB 3.1 Type A<br>• 1 USB 2.0 Type A |
| Serial | 2 COM RS-232/422/485 |
| Button | • 1 Power Button<br>• 1 Reset Button |
| Antenna | 2 Antenna for WiFi/Bluetooth |
| **Expansion** | |
| Mini PCIe | 1 Half-size Mini PCIe Slot (USB 2.0) |
| USB | 2 USB 2.0 Port Wafer |
| **Storage** | |
| Storage Device | 1 Micro SD Card (External) |
| **Ethernet** | |
| LAN | 10/100/1000 Base-T Ethernet GigE LAN, RJ45 Connector |
| **Audio** | |
| Audio Codec | Realtek ALC5640 low power stereo codec |
| Audio Interface | 1 Mic-in, 1 Line-out |
| **Power** | |
| Power Input | 9V to 55V, DC-in |
| Power Interface | 3-pin Terminal Block : V+, V-, Frame Ground |

| Mechanical | |
|---|---|
| Dimensions | 136.0mm x 110.0mm x 46.8mm (5.35" x 4.33" x 1.84") |
| Weight | 0.4kg (0.9 lb) |
| Mounting | • Wallmount by mounting bracket<br>• DIN Rail Mount (Optional) |
| **Environment** | |
| Operating Temperature | 0°C to 70°C (32°F to 131°F) |
| Storage Temperature | -40°C to 85°C (-40°F to 185°F) |
| Humidity | 5% to 95% Humidity, non-condensing |
| Relative Humidity | 95% at 70°C |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-64 |
| EMC | CE, FCC, EN50155, EN50121-3-2 |

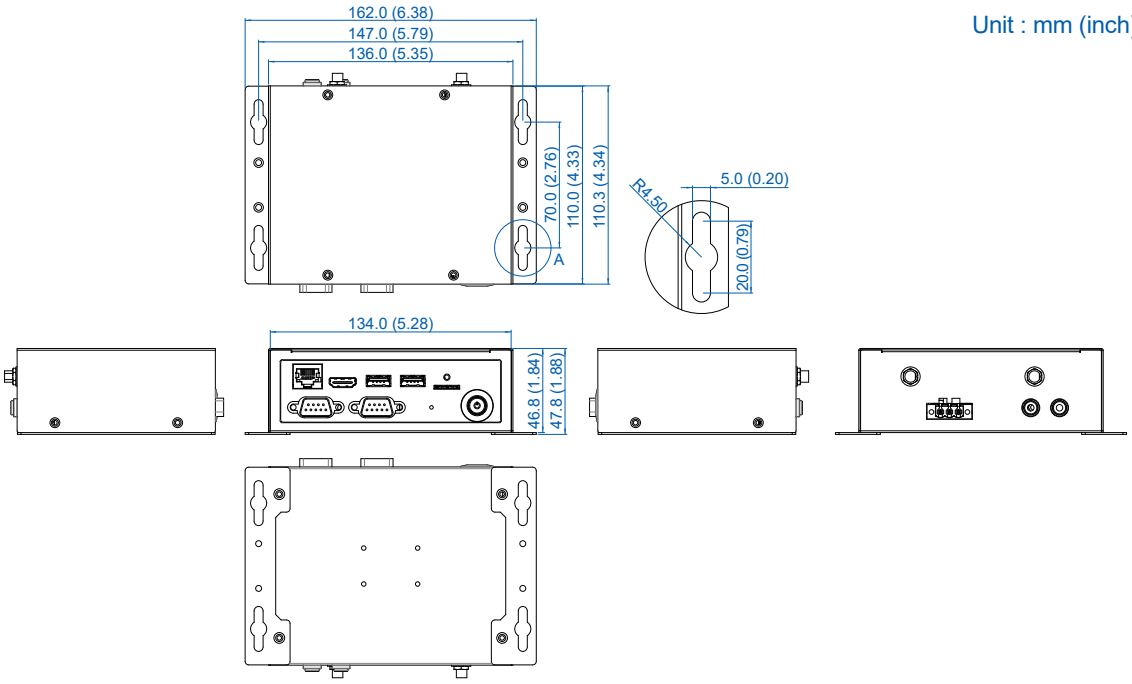
### 1.3.2 Specifications of EIC-1000-AD

| | |
|---|---|
| **System** | |
| Processor | Rockchip RK3399 Arm Dual-core Cortex-A72 + Quad-core Cortex-A53 |
| Memory | 1 DDR3L 1066MHz SDRAM, 2GB |
| eMMC | 1 eMMC, 32GB |
| OS | • Android 7.1<br>• Supports bootup from eMMC |
| **Graphics** | |
| Interface | 1 Digital Display, up to 4Kx2K @60fps |
| Graphics Processor | ARM Mail-T860MP4, AFBC supported |
| Video Decoder | • H.264/H.265, 10bit, up to 4Kx2K@60fps<br>• VP9, 8bit, up to 4Kx2K@60fps<br>• MPEG-4/MPEG-2/VP8 up to 1080p@60fps |
| Video Encoder | H.264/MVC/VP8 encoders by 1080p@30fps |
| **I/O Interface** | |
| USB | • 1 USB 3.1 Type A<br>• 1 USB 2.0 Type A |
| Serial | 2 COM RS-232/422/485 |
| Button | • 1 Power Button<br>• 1 Reset Button |
| Antenna | 2 Antenna for WiFi/Bluetooth |
| **Expansion** | |
| Mini PCIe | 1 Half-size Mini PCIe Slot (USB 2.0) |
| USB | 2 USB 2.0 Port Wafer |
| **Storage** | |
| Storage Device | 1 Micro SD Card (External) |
| **Ethernet** | |
| LAN | 10/100/1000 Base-T Ethernet GigE LAN, RJ45 Connector |
| **Audio** | |
| Audio Codec | Realtek ALC5640 low power stereo codec |
| Audio Interface | 1 Mic-in, 1 Line-out |
| **Power** | |
| Power Input | 9V to 55V, DC-in |
| Power Interface | 3-pin Terminal Block : V+, V-, Frame Ground |
| **Mechanical** | |
| Dimensions | 136.0mm x 110.0mm x 46.8mm (5.35" x 4.33" x 1.84") |
| Weight | 0.4kg (0.9 lb) |
| Mounting | • Wallmount by mounting bracket<br>• DIN Rail Mount (Optional) |

| Environment | |
|---|---|
| Operating Temperature | 0°C to 70°C (32°F to 131°F) |
| Storage Temperature | -40°C to 85°C (-40°F to 185°F) |
| Humidity | 5% to 95% Humidity, non-condensing |
| Relative Humidity | 95% at 70°C |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-64 |
| EMC | CE, FCC, EN50155, EN50121-3-2 |

# 1.4 Mechanical Dimensions of EIC-1000

Unit : mm (inch)



# 2

# GETTING TO KNOW YOUR EIC-1000

## 2.1 Packing List

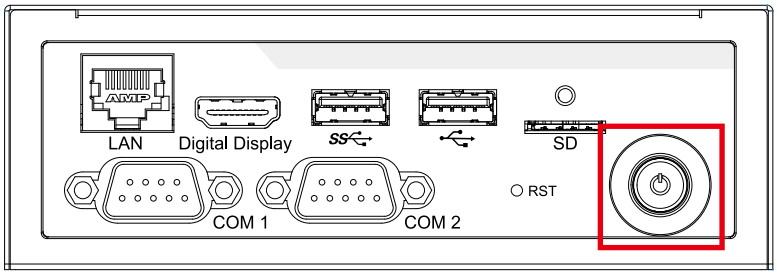
| Item | Description | Qty |
|---|---|---|
| 1 | EIC-1000 Arm-based Edge AI Computing System<br>(According to the configuration of you order, EIC-1000 series may contain Micro SD and M.2 module. Please verify these items if necessary.) | 1 |

| Item | Description | Outlook | Usage | P/N | Qty |
|---|---|---|---|---|---|
| 1 | Terminal block 3-pin (5.0mm) | | DC-IN | 51-2411R03-S1K | 1 |
| 2 | SD Cover | | Micro SD Protection | 62-00P0911-0AA | 1 |
| 3 | Wall Mount Bracket | | Wall Mount Bracket | 62-03P0834-000 | 2 |
| 4 | Flat M3x4L | | Fasten wall mount bracket to EIC-1000 series | 53-M000450-301 | 4 |
| 5 | PHILLPIS M2 x 4L, Ni | | Mini PCIe | 53-M013010-000 | 2 |

## 2.2 Front Panel I/O & Functions

In Vecow EIC-1000 series, all of the I/O connectors are located on the front and rear panels. Most of the general connections to computer devices, such as USB, LAN, Digital Display and COM port are placed on the front panel.

### 2.2.1 Power Button and LED



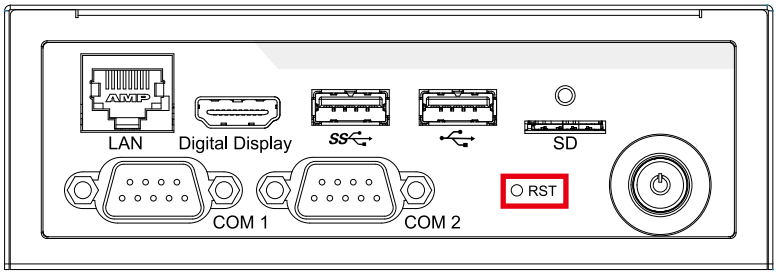

The Power Button is a latched switch with LED indication.

To power on the system, press the power button and then the blue power LED is lightened.

To power off the system, push to release the power button. For Debian OS, you can also command shutdown by OS operation.

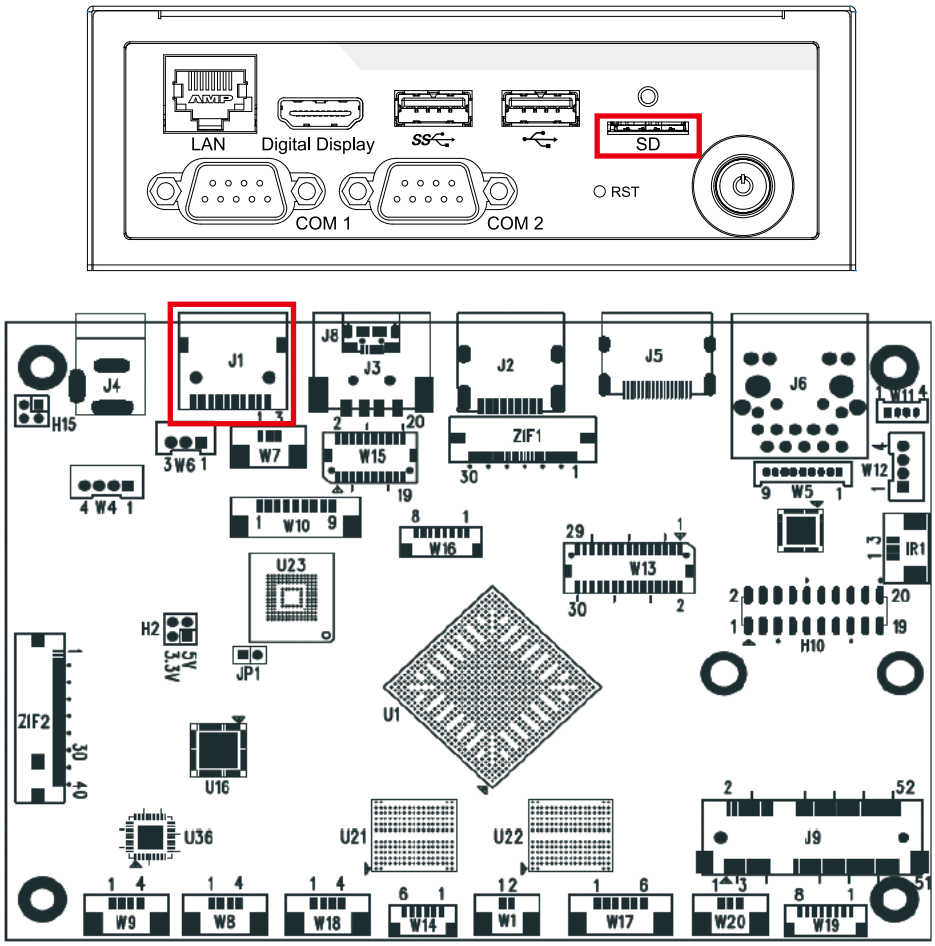
To boot on the system, please press the Power button. To shut down the system, please press the button again. The blue power LED indicates the system's power is plugged.

### 2.2.2 Reset Button



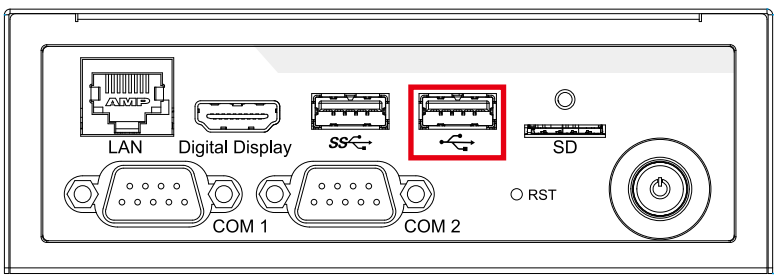

The Reset Button is used to reset the system without powering off the system. Press the Reset Button for a few seconds, then reset will be enabled.

### 2.2.3 Micro SD



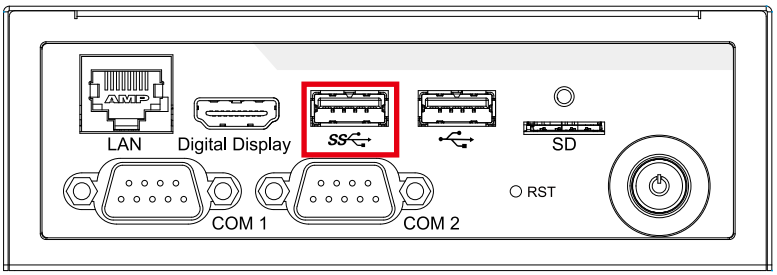

The external Micro SD card provides additional storage expansion. The Micro SD card slot supports SD card capacity up to 256GB. If you would like to replace or insert the card, **it MUST be ensured that the system is powered off**.

### 2.2.4 USB 2.0




The USB interface supports 480Mbps transfer rate complied with high speed USB specification Rev. 2.0.

### 2.2.5 USB 3.0

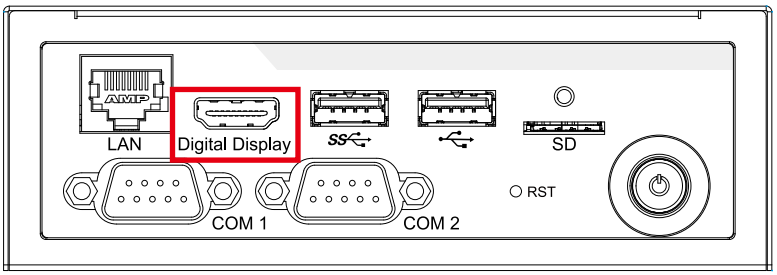



The USB 3.0 port supports up to 5GB per second data rate in the front side of EIC-1000.

Under Linux OS environment, the USB 3.0 port is in host mode.

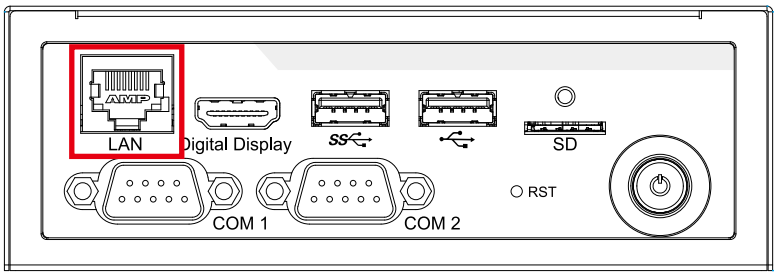
Under Android OS environment, the USB 3.0 port can be set to host or device mode. Please refer to Section 4.2 for details.

### 2.2.6 Digital Display Port




Onboard Digital Display Port supports DDC channel mode. The connection supports up to 3840 x 2160 resolution at 60Hz.

### 2.2.7 Ethernet Port



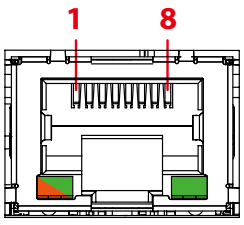

There is one 8-pin RJ-45 jack supporting 10/100/1000 Mbps Ethernet connections in the front side. Plugged in suitable RJ-45 cable, this port can create Ethernet connection from the system to any other devices, such as a computer, a hub or a switch. The pin-outs of LAN 1 and LAN 2 are listed as follows :

| Pin No. | 10/100 Mbps | 1000Mbps |
|---|---|---|
| 1 | E_TX+ | MDI0_P |
| 2 | E_TX- | MDI0_N |
| 3 | E_RX+ | MDI1_P |
| 4 | ----- | MDI2_P |
| 5 | ----- | MDI2_N |
| 6 | E_RX- | MDI1_N |
| 7 | ----- | MDI3_P |
| 8 | ----- | MDI3_N |

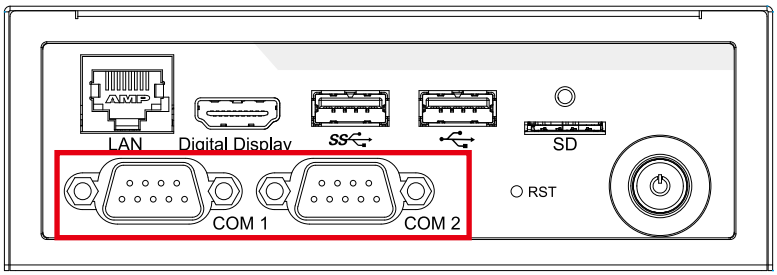
The LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

The LED indicator on the left bottom corner lightens in solid red when the cable is properly connected to a 10/100 Mbps Ethernet network; The LED indicator on the left bottom corner lightens in solid green when the cable is properly connected to a 1000Mbps Ethernet network; The right LED will keep twinkling/ off when Ethernet data packets are being transmitted/received.

| LED Location | LED Color | 10/100 Mbps | 1000Mbps |
|---|---|---|---|
| Left | Red/Green | Solid Red | Solid Green |
| Right | Green | Twinkling Green | Twinkling Green |



### 2.2.8 Serial Port (J12, J13)




COM1 and COM2 can be configured for RS-232, RS-422, or RS-485. The default definition of COM 1 and COM 2 is RS-232. To change to RS-422 or RS-485, please refer to Section 4.4.

For RS-232, the data rate is 1.5Mbps with maximum load of 150pF. For RS-422/ RS-485, the data rate is 10Mbps with maximum load of 47pF.

The operation modes can be selected by software configuration :

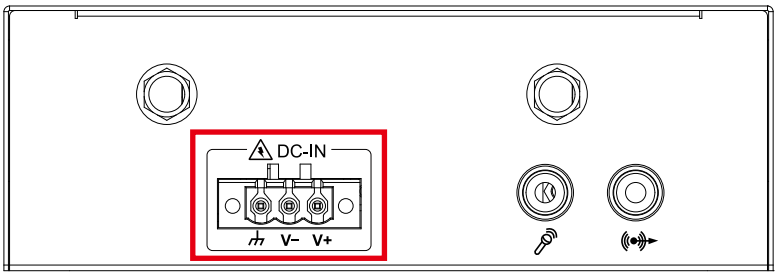
| Mode | Description | Status |
|---|---|---|
| 0 | RS-422 Full Duplex | 1T/1R RS-422 |
| 1 | Pure RS-232 | 3T/5R RS-232. |
| 2 | RS-485 Half Duplex | 1T/1R RS-485, TX ENABLE Low Active |
| 3 | RS-485 Half Duplex | 1T/1R RS-485, TX ENABLE High Active |
| 4 | RS-422 Full Duplex | 1T/1R RS-422 with termination resistor (120 ohm) and bias Resistor (1K ohm) |
| 5 | Reserved | Reserved |
| 6 | RS-485 Half Duplex | 1T/1R RS-485 with termination resistor and bias resistor. TX ENABLE Low Active |
| 7 | Low Power Shutdown | All I/O pins are High Impedance |

The pin assignments are listed in the following table :

| Serial Port | Pin No. | RS-232 | RS-422 | RS-485 |
|---|---|---|---|---|
| 1 to 2 | 1 | DCD | TXD- | DATA- |
| | 2 | RXD | TXD+ | DATA+ |
| | 3 | TXD | RXD+ | ----- |
| | 4 | DTR | RXD- | ----- |
| | 5 | GND | GND | GND |
| | 6 | DSR | ----- | ----- |
| | 7 | RTS | ----- | ----- |
| | 8 | CTS | ----- | ----- |
| | 9 | RI | ----- | ----- |

## 2.3 Rear Panel I/O Functions

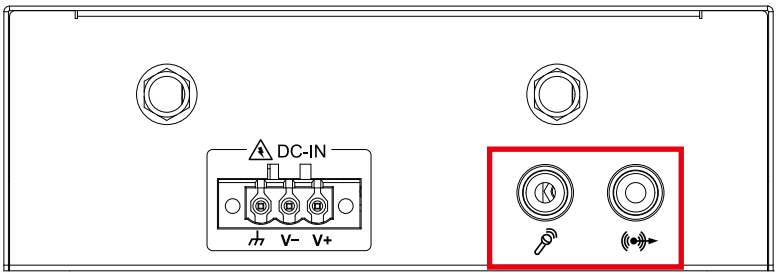
### 2.3.1 Power Terminal Block




EIC-1000 supports 9V to 55V DC wide range power input by terminal block.

| Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|
| 1 | V+ | 2 | V- |
| 3 | Chassis Ground | | |

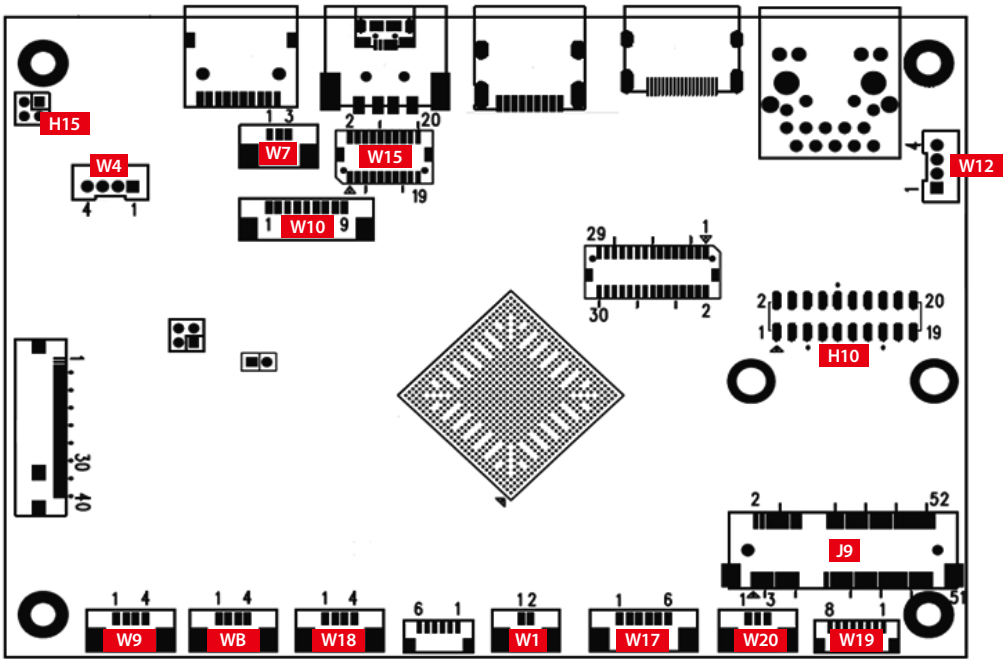
### 2.3.2 Audio Codec Interface (H10)



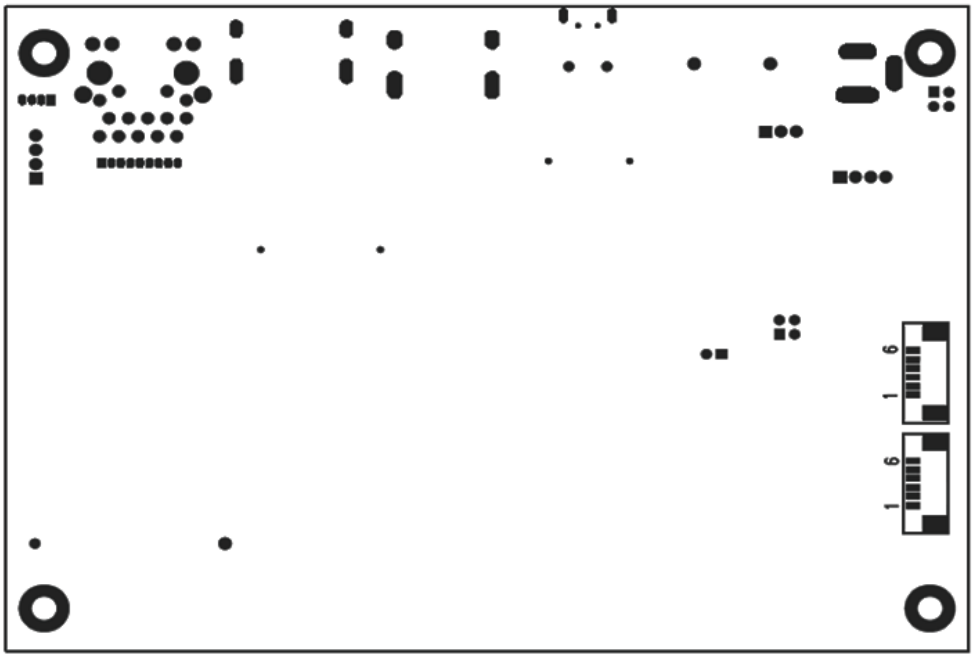

There are 2 audio connectors, Mic-in and Line-out, in the rear side of EIC-1000. Onboard Realtek ALC5640 low power stereo codec supports speaker amplifiers 1.5W per channel into 8Ω or 2W per channel into 4Ω.

## 2.4 Main Board Connectors & Jumper Locations

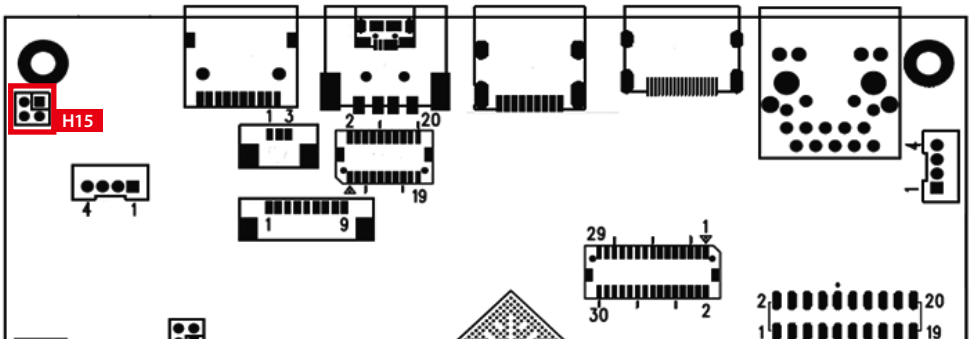
### 2.4.1 Top View (Component Side) of EIC-1000 Main Board with Connector Location




### 2.4.2 Bottom View (Solder Side) of EIC-1000 Main Board with Connector Location



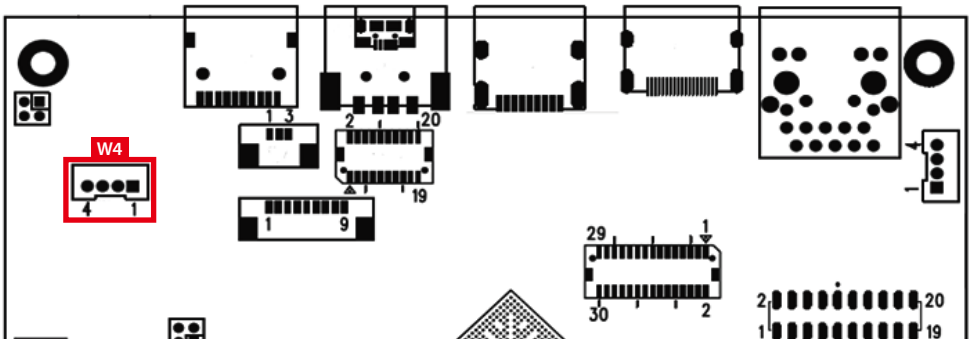
### 2.4.3 H15 : Power Switch




Short pin 1 and pin 2 of H15 to power up EIC-1000.
Pin Assignments of H15 are listed in the following table :

| Pin No. | Status | Description |
|---|---|---|
| 1-2 | Open | Power off |
| | Close | Power on |
| 3-4 | Leave Open | For factory use only |

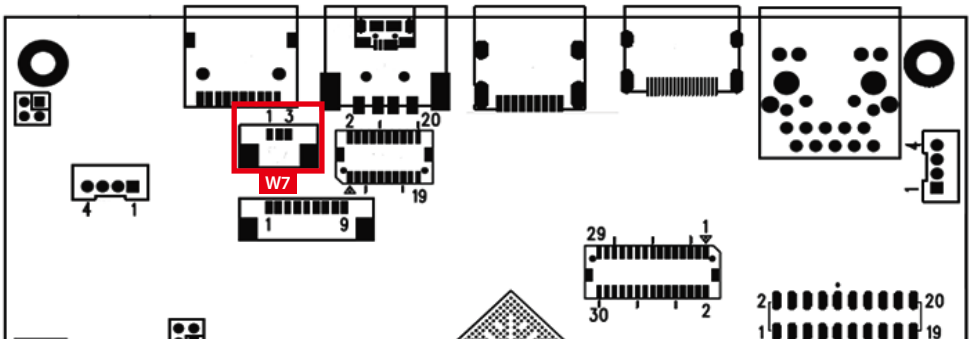
### 2.4.4 W4 : Power Input




EIC-1000 MB supports 12V DC power input by wire-to-board connector in the top side. It is connected to the power board through W4 by cable.
Pin Assignments of W4 are listed in the following table :

| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | DC12V |

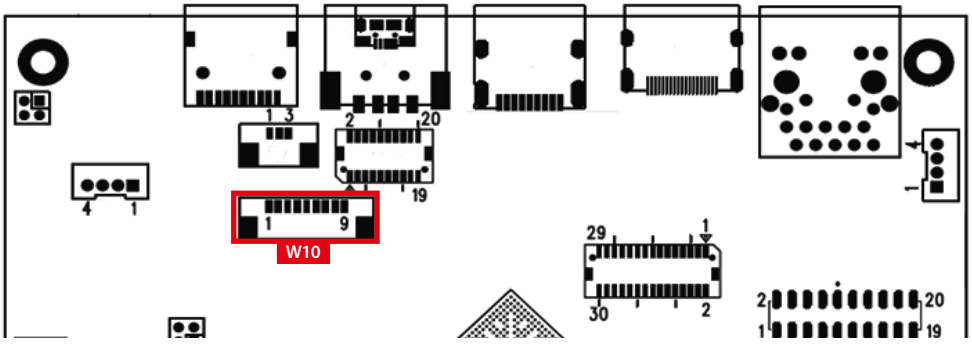
### 2.4.5 W7 : Power Input




The blue LED indicates the system's power is plugged.
Pin Assignments of W7 are listed in the following table :

| Pin No. | Definition |
|---|---|
| 1 | Blue LED |
| 2 | GND |
| 3 | Reserved |

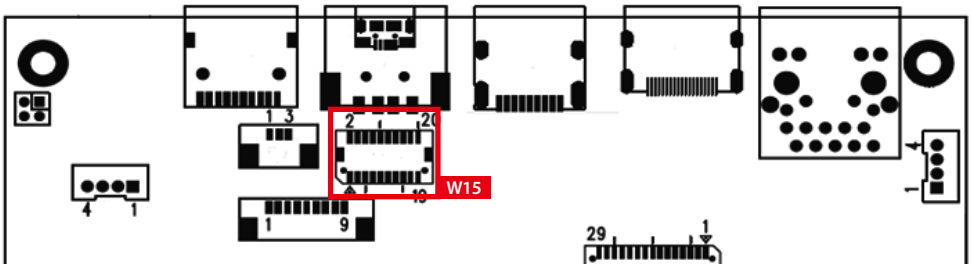
### 2.4.6 W10 : USB Host, MEMS signals Connector




W10 supports USB 2.0 host or USB-MEMS application.
Pin Assignments are listed in the following table :

| Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|
| 1 | LIGHT_INT_L (3.3V), Low active | 2 | GPIO (3.3V) Reserved |
| 3 | COMP_INT_L (3.3V), Low active | 4 | GSENSOR_INT_L (3.3V), Low active |
| 5 | GYR_INT_L (3.3V), Low active | 6 | USB_GND |
| 7* | USB Data + | 8 | USB Data - |
| 9 | VBUS (+5V) | | |

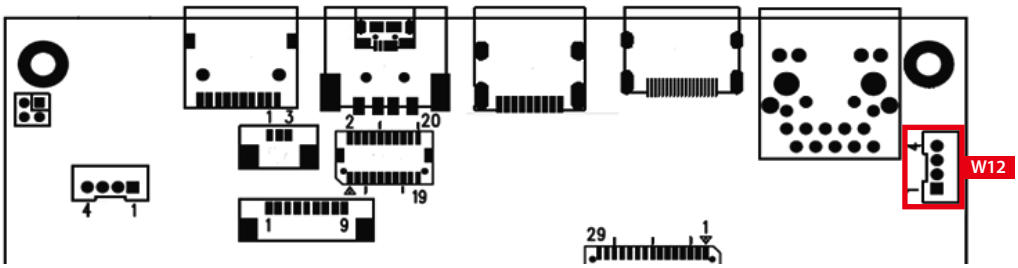
### 2.4.7 W15 : I2C, SPI, ADC, GPIOs Connector




W15 provides non-isolated GPIOs with 4 GPI and 4 GPO signals, 2 I2C signals, 4 SPI signals, and 2 ADC signals.
For ADC signals, the maximum input voltage is 1.8V, 10-bit resolution, tCLK=75ns, conversion time= 13tCLK, setup time=0.5tCLK.
Pin Assignments of W15 are listed in the following table :

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | DIN0, logical high level (3.3V) | 2 | DOUT0, logical high level (3.3V) |
| 3 | DIN1, logical high level (3.3V) | 4 | DOUT1, logical high level (3.3V) |
| 5 | DIN2, logical high level (3.3V) | 6 | DOUT2, logical high level (3.3V) |
| 7 | DIN3, logical high level (3.3V) | 8 | DOUT3, logical high level (3.3V) |
| 9 | GND | 10 | 3.3V |
| 11 | SPI-3.3V-TXD | 12 | 3.3V |
| 13 | SPI-3.3V-RXD | 14 | I2C4-3.3V-SDA |
| 15 | SPI-3.3V-CS | 16 | I2C4-3.3V-SCL |
| 17 | SPI-3.3V-CLK | 18 | ADC1-IN-1.8V |
| 19 | GND | 20 | ADC0-IN-1.8V |

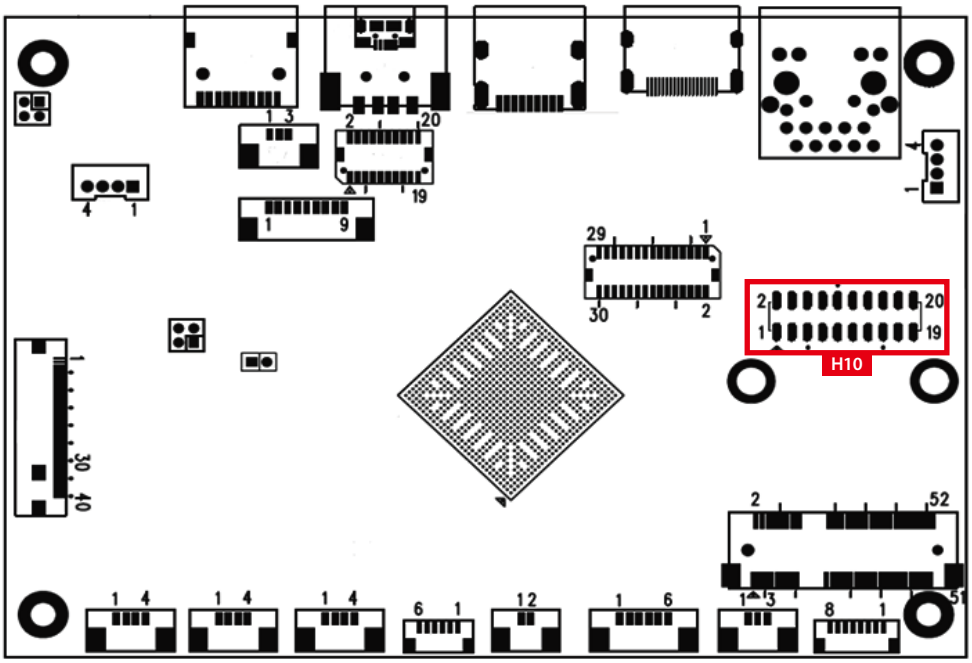
### 2.4.8 W12 : PoE Power Connector




EIC-1000 supports optional PoE function for the Gigabit Ethernet on the front with Mode A and B. Mode A delivers power on the data pairs of Pin 1, 2, 3, 6. Mode B delivers power on the Pin 4, 5, 7, 8.
Pin Assignments of W12 are listed in the following table :

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | V+ (Mode A) | 2 | V-(Mode A) |
| 3 | V+ (Mode B) | 4 | V-(Mode B) |

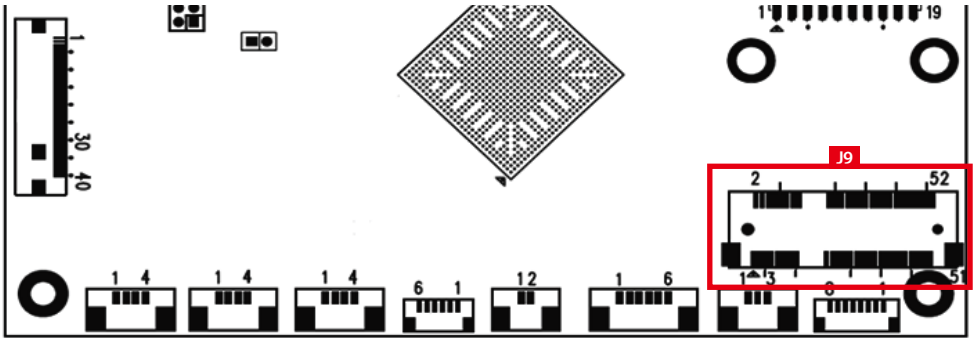
### 2.4.9 H10 : Audio Header




Onboard Realtek ALC5640 low power stereo codec supports speaker amplifiers 1.5W per channel into 8Ω or 2W per channel into 4Ω.
Pin Assignments of H10 are listed in the following table :

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | GND | 2 | HP_R |
| 3 | MIC_IN | 4 | HP_L |
| 5 | HP_GND | 6 | HP_detect |
| 7 | SPK_R- | 8 | SPK_R+ |
| 9 | SPK_L- | 10 | SPK_L+ |
| 11 | GND | 12 | GND |
| 13 | Stereo_MIC_R | 14 | Stereo_MIC_L |
| 15 | LINE_OUT_L | 16 | LINE_OUT_R |
| 17 | Reserved | 18 | GND |
| 19 | Reserved | 20 | Reserved |

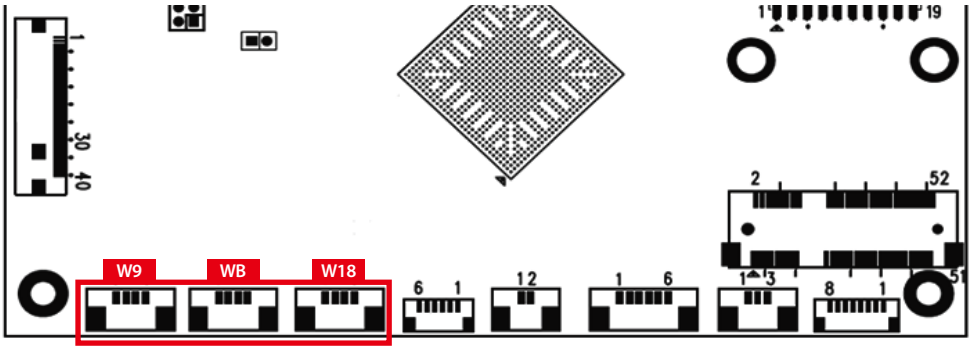
### 2.4.10 J9 : Mini PCIe




EIC-1000 has 1 standard half-size mini PCIe slot.
Pin Assignments of J9 are listed in the following table :

| Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|
| 1 | PCIe_Wake# | 2 | 3.3V |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | 1.5V |
| 7 | NC | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | PCIe_CREFCLKM | 12 | NC |
| 13 | PCIe_CREFCLKP | 14 | NC |
| 15 | GND | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | PCIe_DIS# |
| 21 | GND | 22 | PCIe_RST# |
| 23 | PCIe_CRXM | 24 | 3.3V |
| 25 | PCIe_CRXP | 26 | GND |
| 27 | GND | 28 | 1.5V |
| 29 | GND | 30 | PCIe_SMB_CLK |
| 31 | PCIe_CTXM | 32 | PCIe_SMB_DATA |
| 33 | PCIe_CTXP | 34 | GND |
| 35 | GND | 36 | PCIe_USB_DN |
| 37 | GND | 38 | PCIe_USB_DP |
| 39 | 3.3V | 40 | GND |
| 41 | 3.3V | 42 | LED_WWAN# |
| 43 | GND | 44 | LED_WLAN# |
| 45 | NC | 46 | LED_WPAN# |
| 47 | NC | 48 | 1.5V |
| 49 | NC | 50 | GND |
| 51 | NC | 52 | 3.3V |

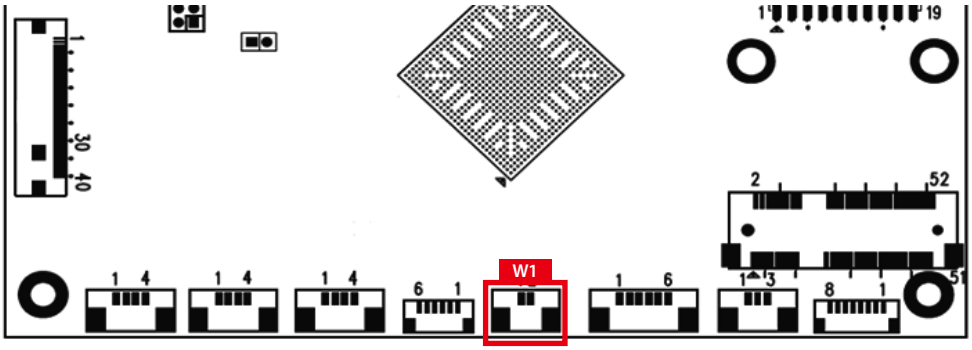
### 2.4.11 W8, W9, W18 : Internal USB 2.0 Connector




The internal USB 2.0 connectors provide extension to 3 more individual USB 2.0 ports. In addition, all of them feature hot plug capability.
Pin Assignments of W8, W9, W18 are listed in the following table :

| Pin No. | Description | Pin No. | Definition |
|---|---|---|---|
| 1 | VBUS3 (+5V) | 2 | USB3 Data - |
| 3 | USB3 Data + | 4 | USB3_GND |

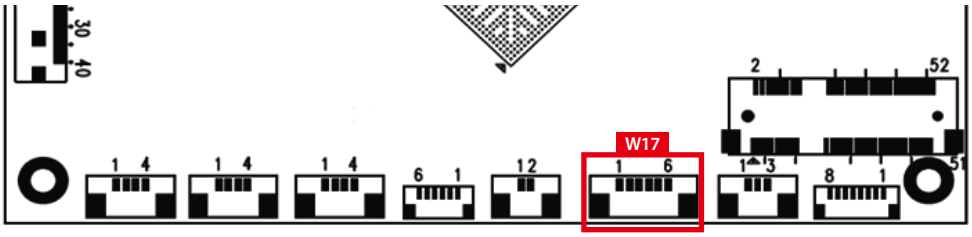
### 2.4.12 W1 : RTC Battery




The system's real-time clock is powered by a lithium battery. It is equipped with Panasonic CR2032 190mAh lithium battery. It is not recommended that you replaced the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.
Pin Assignments of W1 are listed in the following table :

| Pin No. | Definition |
|---|---|
| 1 | BAT+ |
| 2 | BAT- |

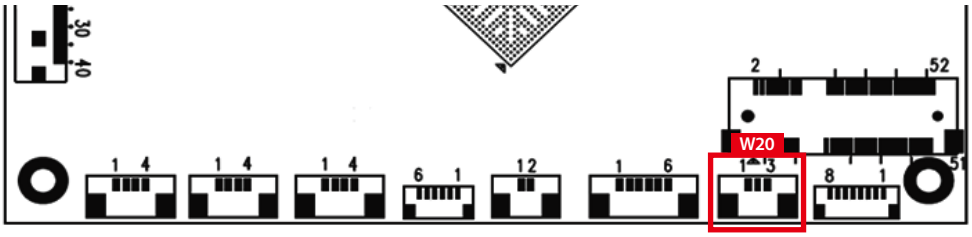
### 2.4.13 W17 : UART Connector




Pin Assignments of W17 are listed in the following table :

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | DC3.3V/60mA-Out | 2 | GND |
| 3 | UART-3.3V-RTS | 4 | UART-3.3V-CTS |
| 5 | UART-3.3V-TX (SOUT) | 6 | UART-3.3V-RX (SIN) |

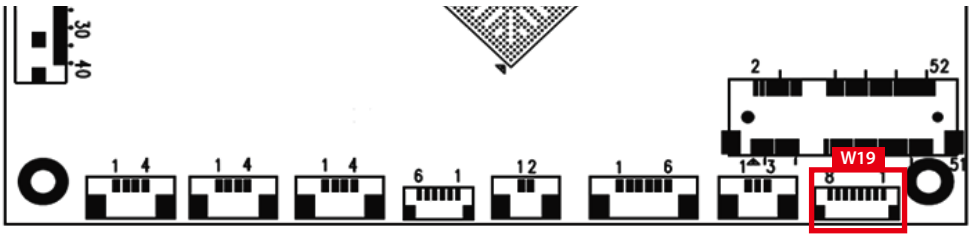
### 2.4.14 W20 : RS-232 Debug Connector




The debug port supports TX/RX with RS-232 level and it is only used for debugging purpose.
Pin Assignments of W20 are listed in the following table :

| Pin No. | Description |
|---|---|
| 1 | Debug-RS232-RX (SIN) |
| 2 | Debug-RS232-TX (SOUT) |
| 3 | COM_GND |

### 2.4.15 W19 : Reset, Wifi LEDs, Buzzer Combo Connector

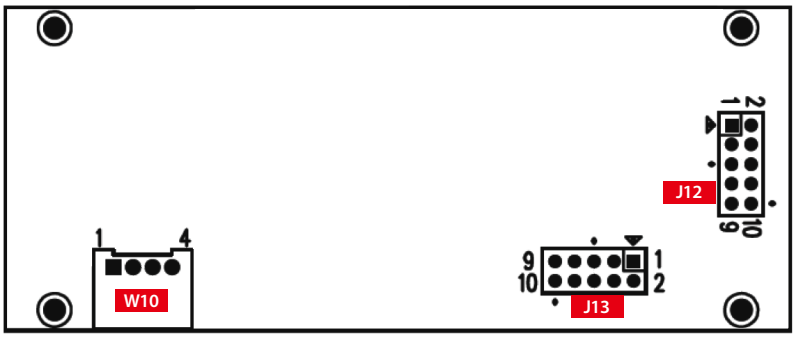



Pin Assignments of W19 are listed in the following table :

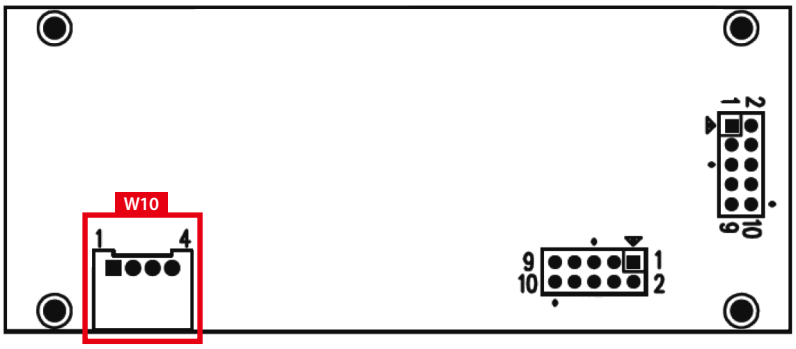
| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | DC3.3V/25mA-Out | 2 | GND |
| 3 | Wifi LED: Out, Low active | 4 | BT LED: Out, Low active |
| 5 | Reset: In, Low active | 6 | GND |
| 7 | Buzzer- | 8 | Buzzer+ |

## 2.5 Expansion Board Connectors and Jumpers

### 2.5.1 Top View (Component Side) of SMX-300 with Connector Location



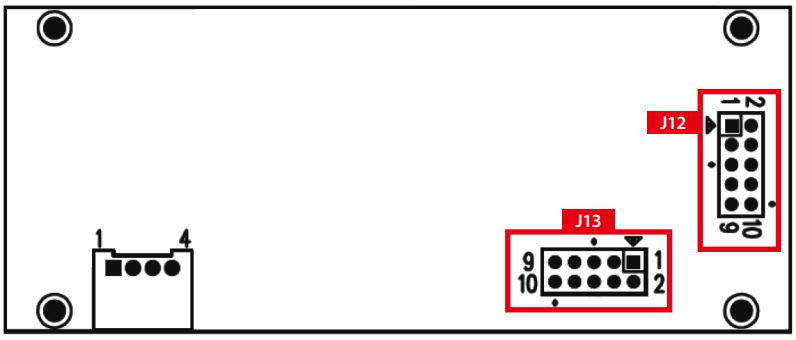

### 2.5.2 W10 : USB Input




Pin Assignments of W10 are listed in the following table :

| Pin No. | Definition | Pin No. | Description |
|---|---|---|---|
| 1 | USB-5V | 2 | USB-DM |
| 3 | USB-DP | 4 | GND |

### 2.5.3 J12, J13 : RS-232/422/485 Serial Port




COM1 and COM2 can be configured for RS-232, RS-422, or RS-485. The default definition of COM 1 and COM 2 is RS-232. To change to RS-422 or RS-485, please refer to Section 4.4.

Pin Assignments of J12 and J13 are listed in the following table :

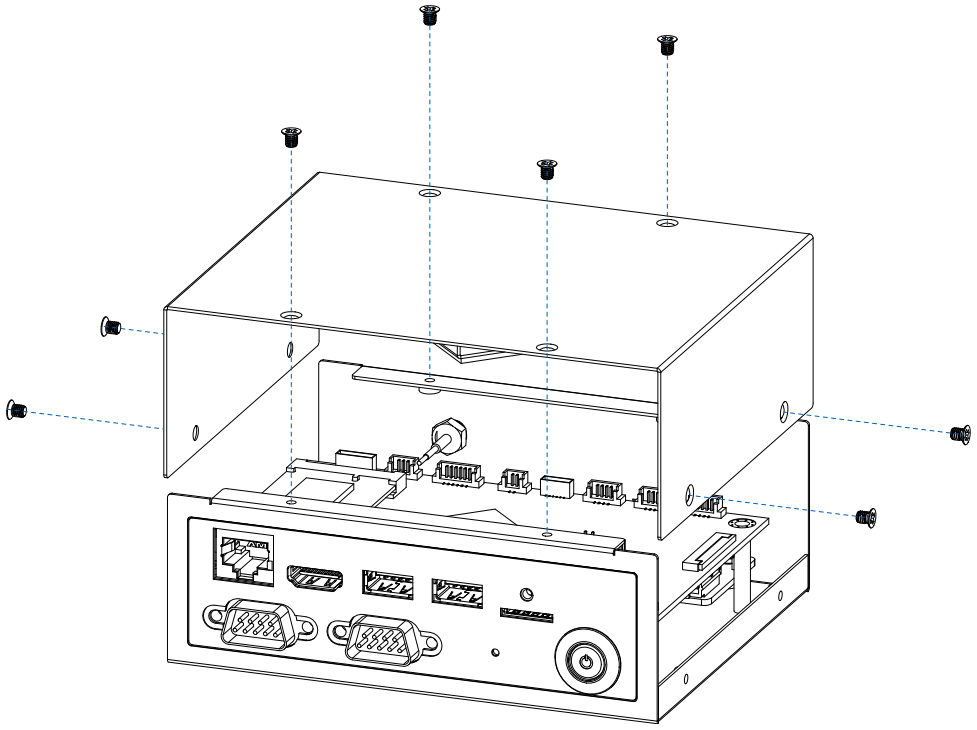
| Serial Port | Pin No. | RS-232 | RS-422 | RS-485 |
|---|---|---|---|---|
| 1 to 2 | 1 | DCD | TXD- | DATA- |
| | 2 | RXD | TXD+ | DATA+ |
| | 3 | TXD | RXD+ | ----- |
| | 4 | DTR | RXD- | ----- |
| | 5 | GND | GND | GND |
| | 6 | DSR | ----- | ----- |
| | 7 | RTS | ----- | ----- |
| | 8 | CTS | ----- | ----- |
| | 9 | RI | ----- | ----- |

# 3

# SYSTEM SETUP

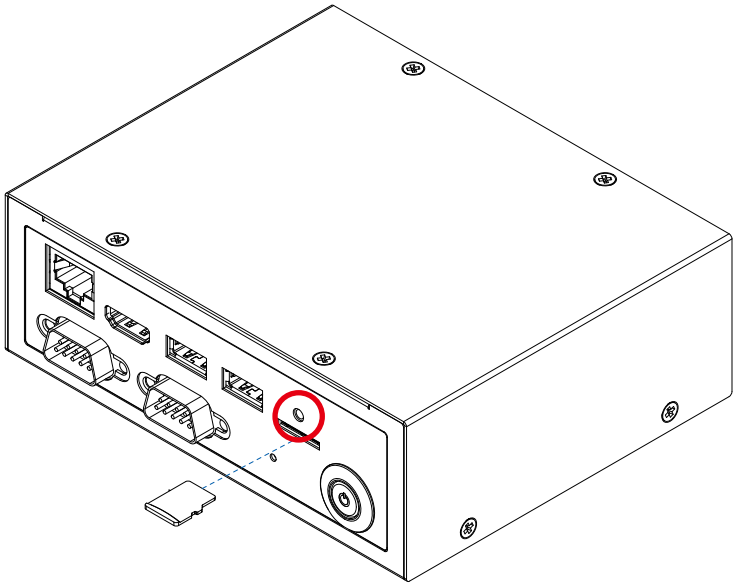
## 3.1 How to Open Your EIC-1000

Remove eight pcs F-M3x4L screws and pick up top cover.

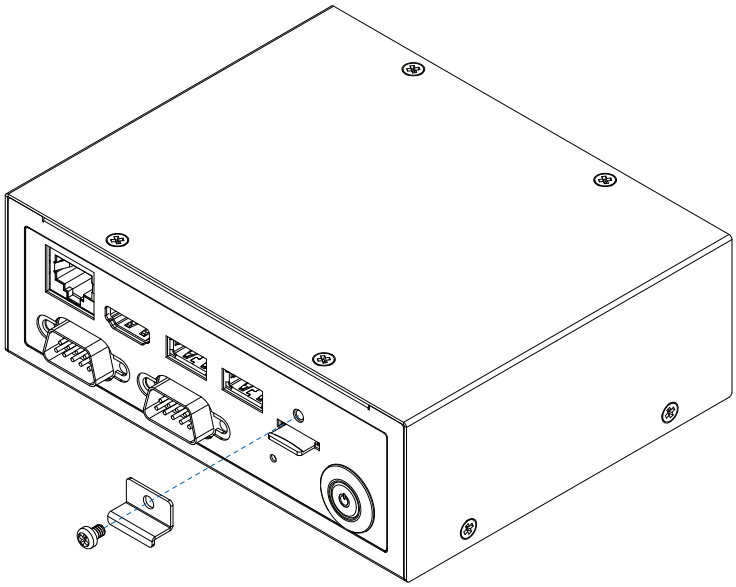


## 3.2 Installing SD Card

**Step 1** Remove one pcs PH-M3x4L screw and install SD Card.

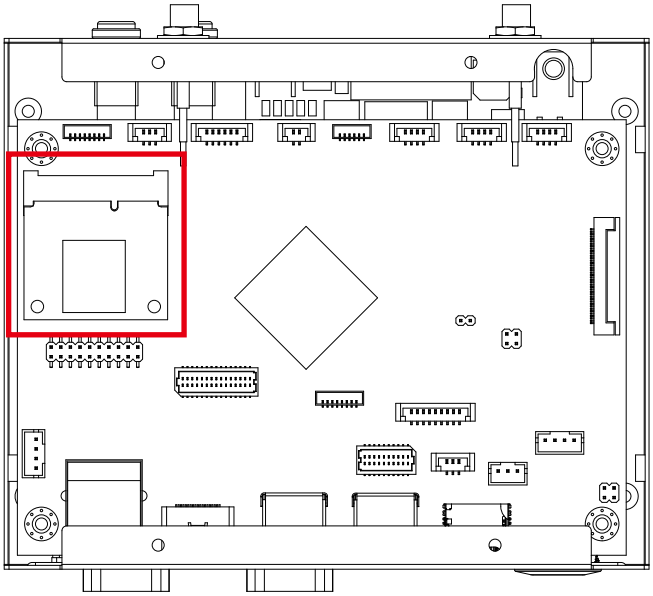


**Step 2** Install SD Cover on front panel.



## 3.3 Installing Mini PCIe

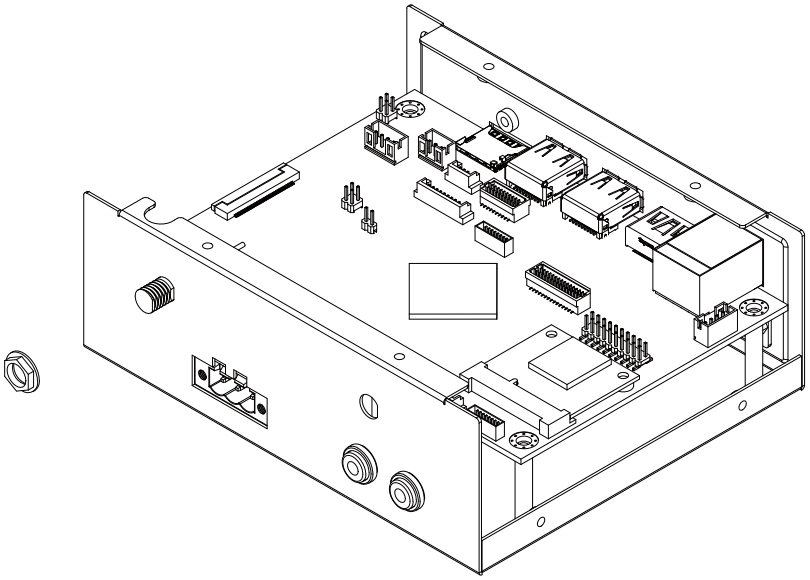
Install MiniPCIe card into the Mini PCIe slot and fasten two PHILLPIS M2x4L screws.



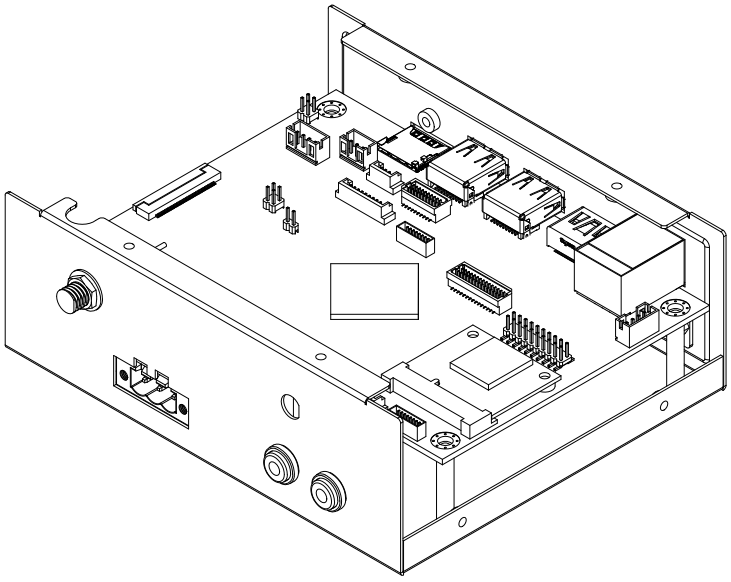
## 3.4 Installing Antenna Cable

**Step 1** Remove the rubber corks on the rear panel.

**Step 2** Put antenna cable connector into the hole on panel.



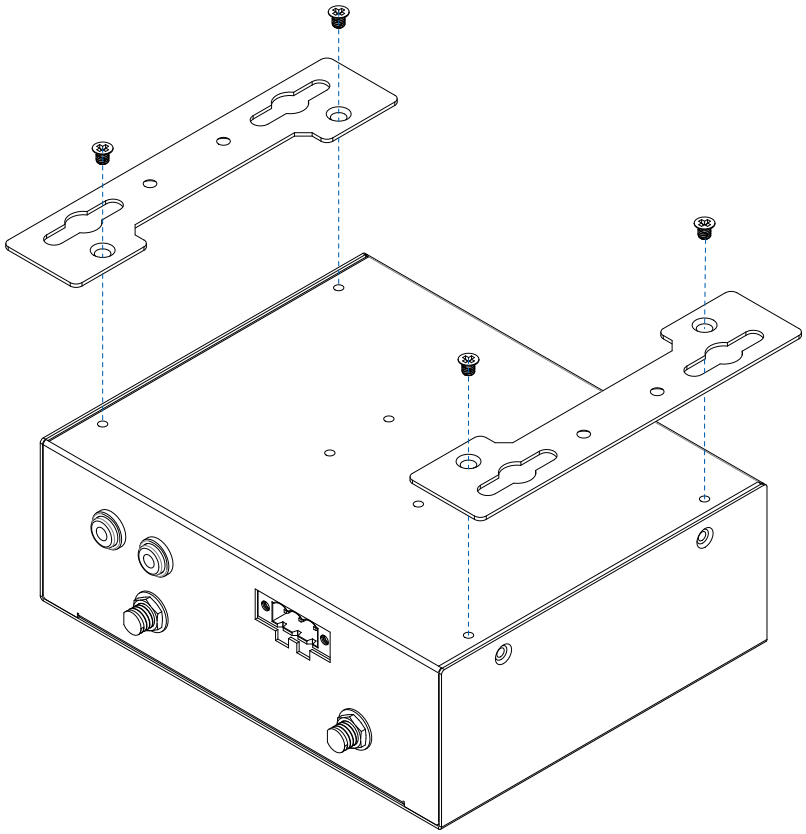
**Step 3** Fasten washer on the antenna cable connector.



## 3.5 Mount Your EIC-1000

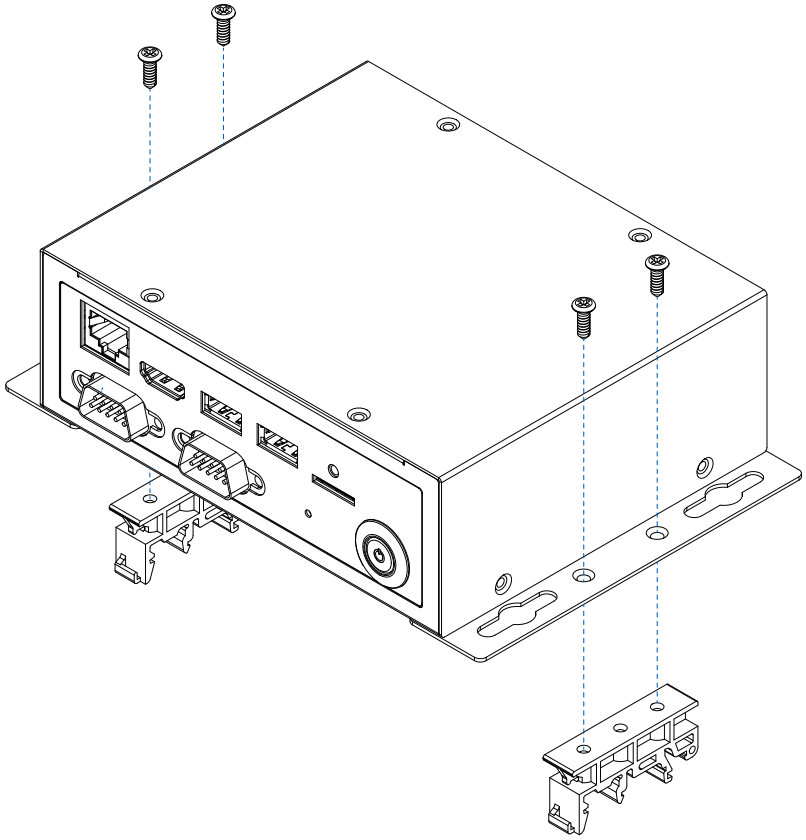
### Wall Mount

Install wall mount bracket then fasten four pcs F-M3x4L screws.



**Din Rail (The wall mount bracket must be installed first.)**

Install din rail kit then fasten screws.



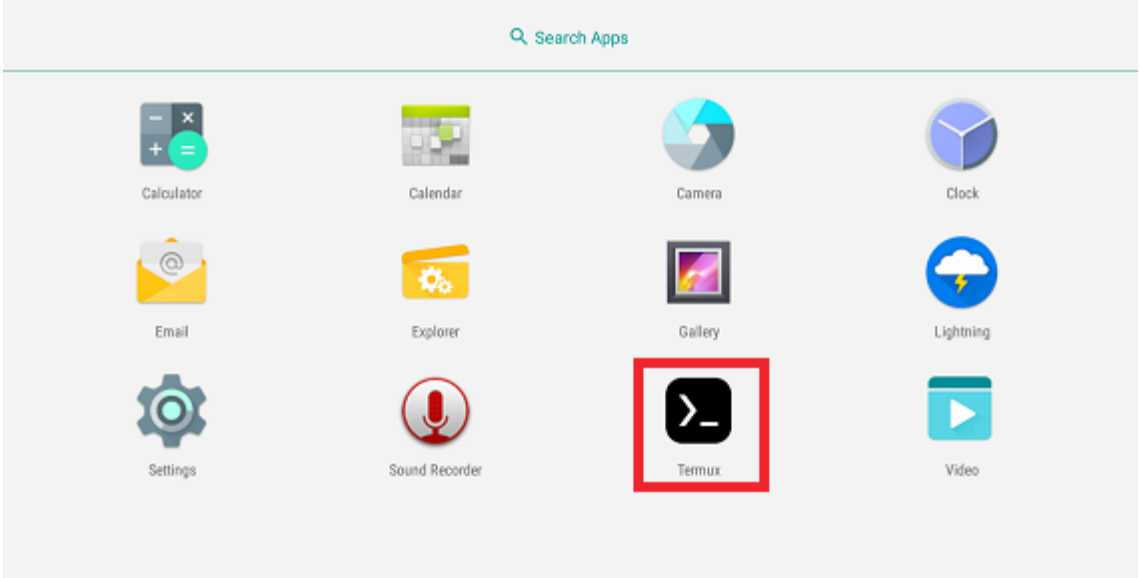
# 4

# SOFTWARE SETUP

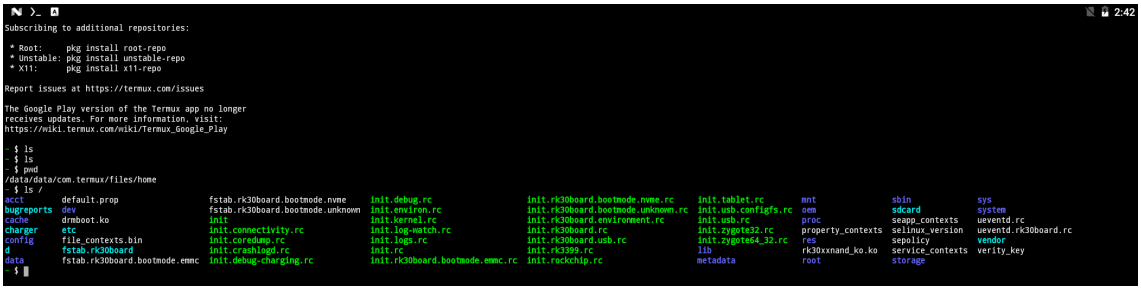
## 4.1 Prerequisites

For Android C++ developer, please install termux (com.termux_116.apk) software package (terminal). Download the package at https://f-droid.org/en/packages/com.termux/

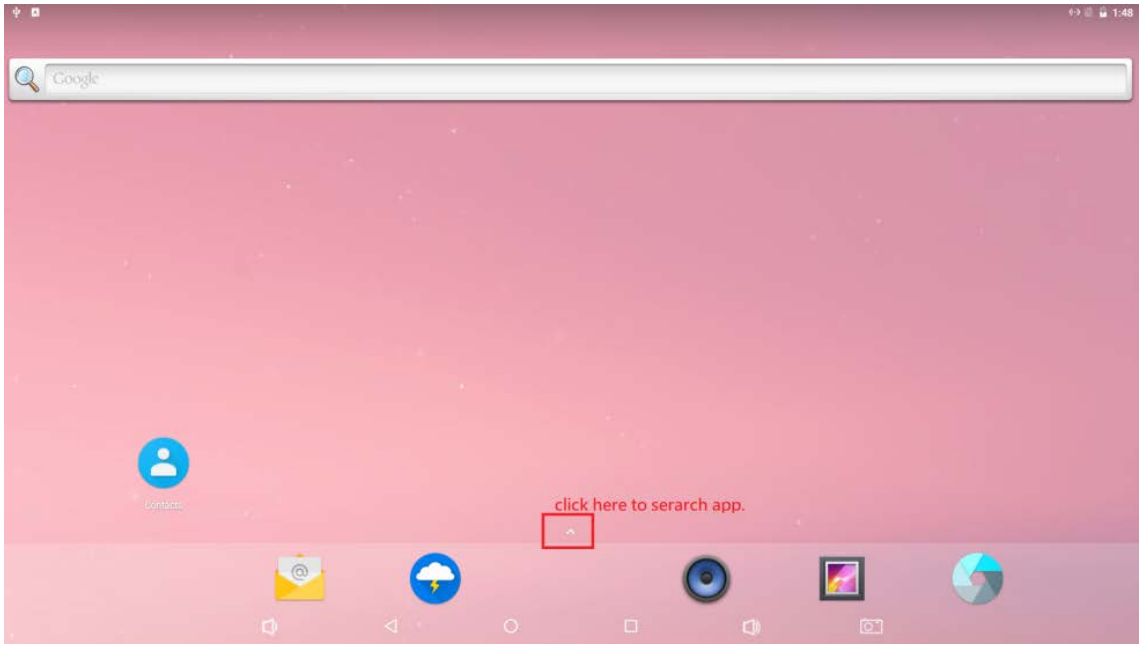
You will find the "Termux" software icon shown as below after installation.




Termux has the same function as Linux terminal.



Click the arrow to open the search app page.

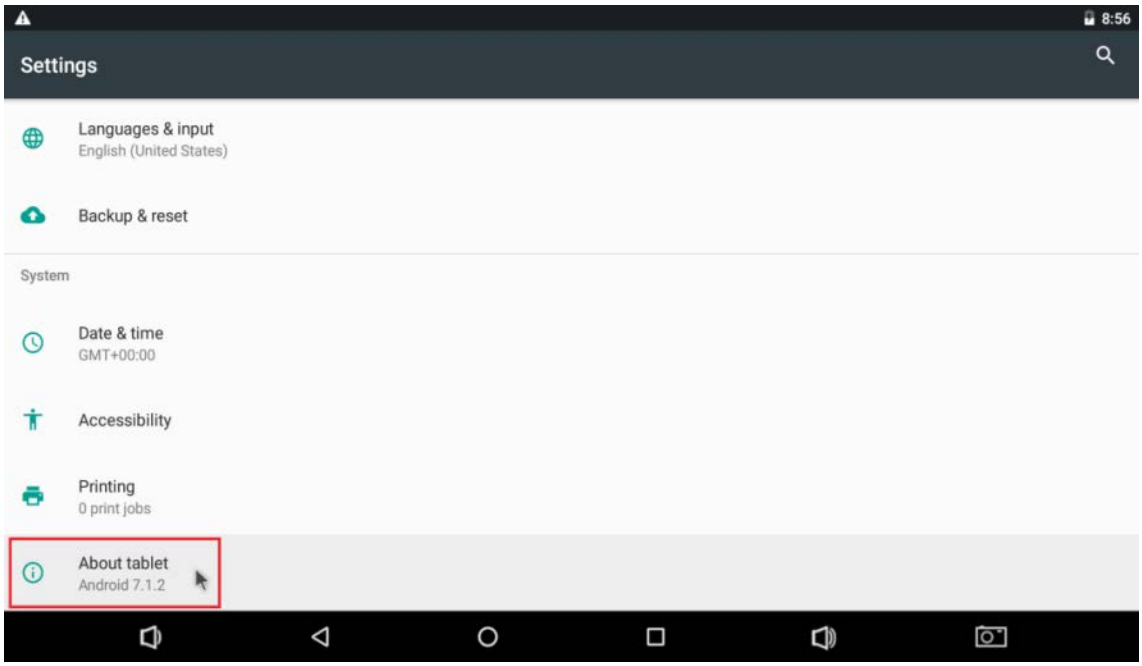


## 4.2 USB Debug Bridge

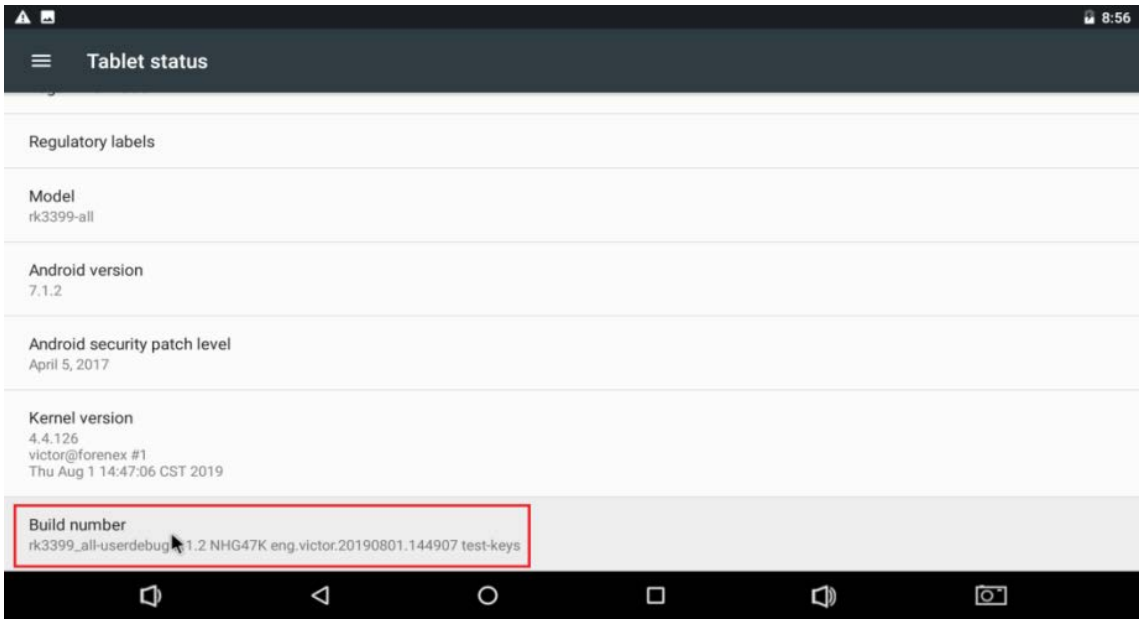
### 4.2.1 Android Debug Bridge (ADB)

The EIC-1000 USB 3.0 port is set as host mode in default. To use the ADB function, the USB 3.0 port must be set to device mode by following steps.

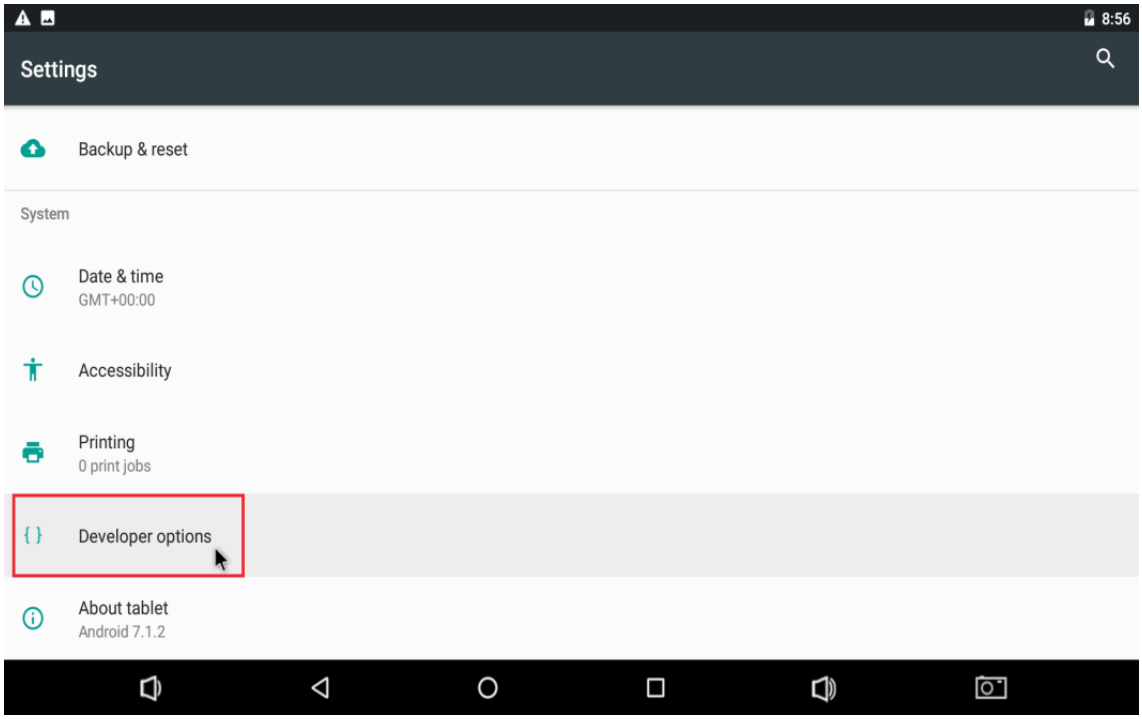
**Step 1** Enter Settings and select "About Tablet".



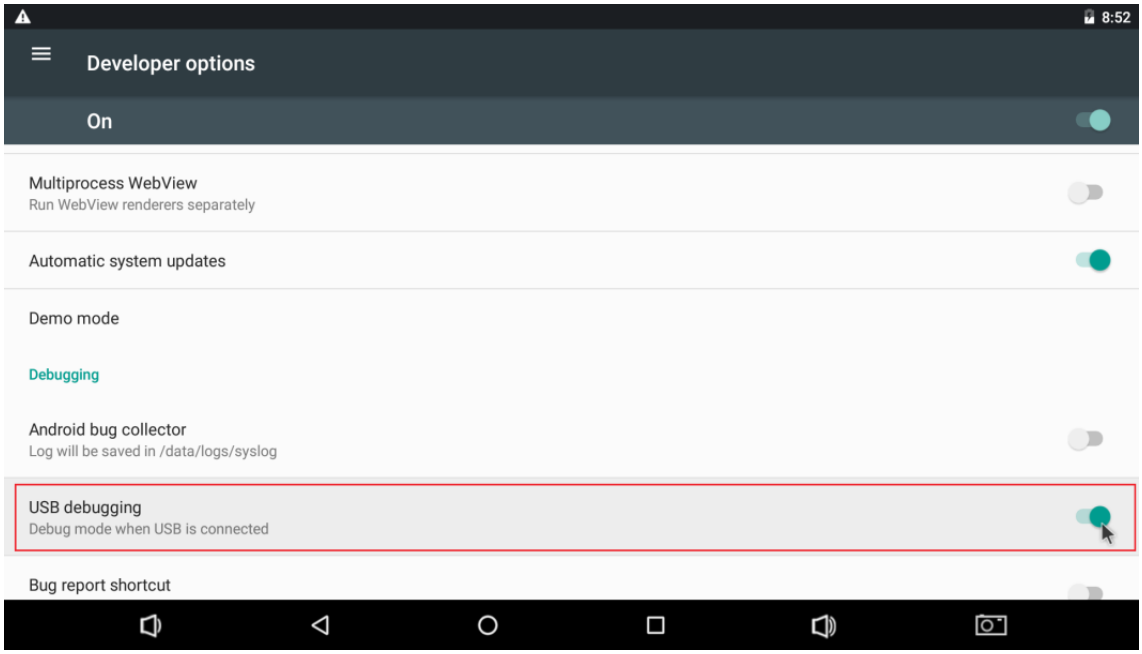

**Step 2** Click in the "Build number" in the dialog as shown. A countdown message will pop up. Keep clicking the click until the number counts to zero.



**Step 3** A new item "Developer Options" should appear in the system block.

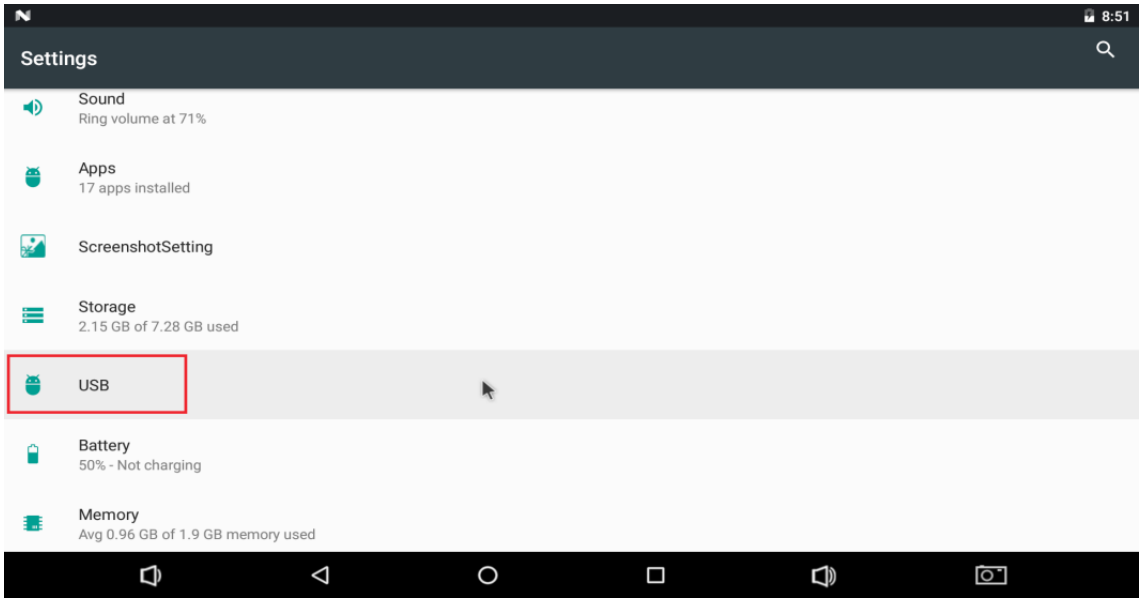



**Step 4** Select the "Developer Options" to turn on the USB debugging function.

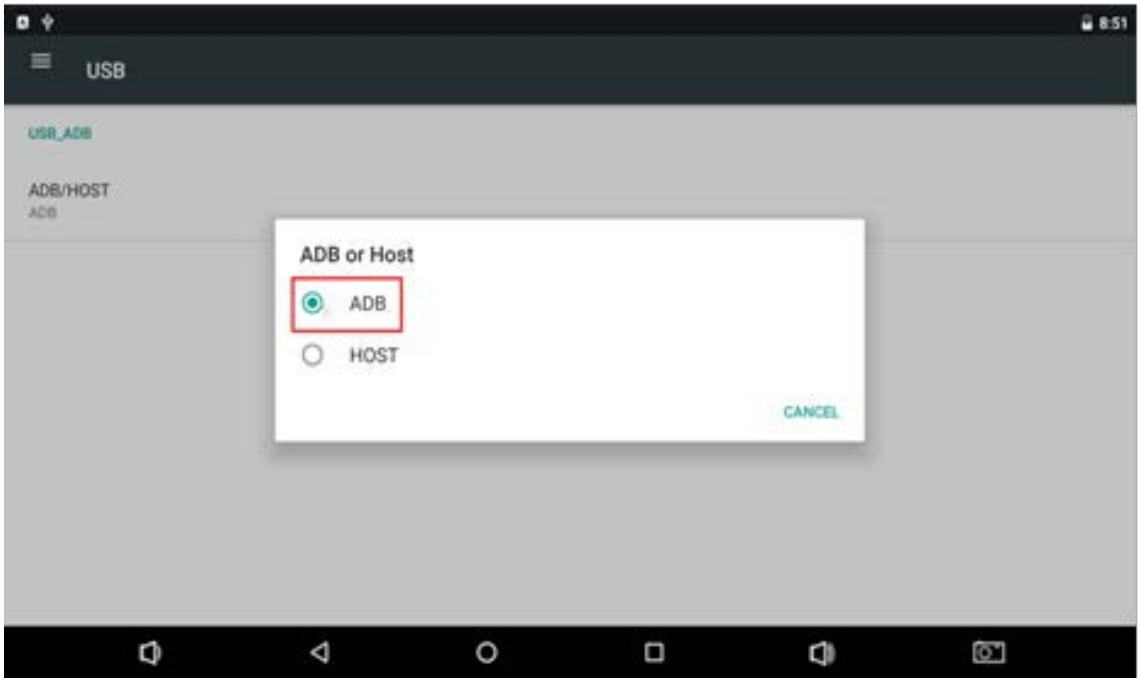



Note : Please do not change any others settings unless you know what you are doing.

**Step 5** Go back to Settings and select "USB".



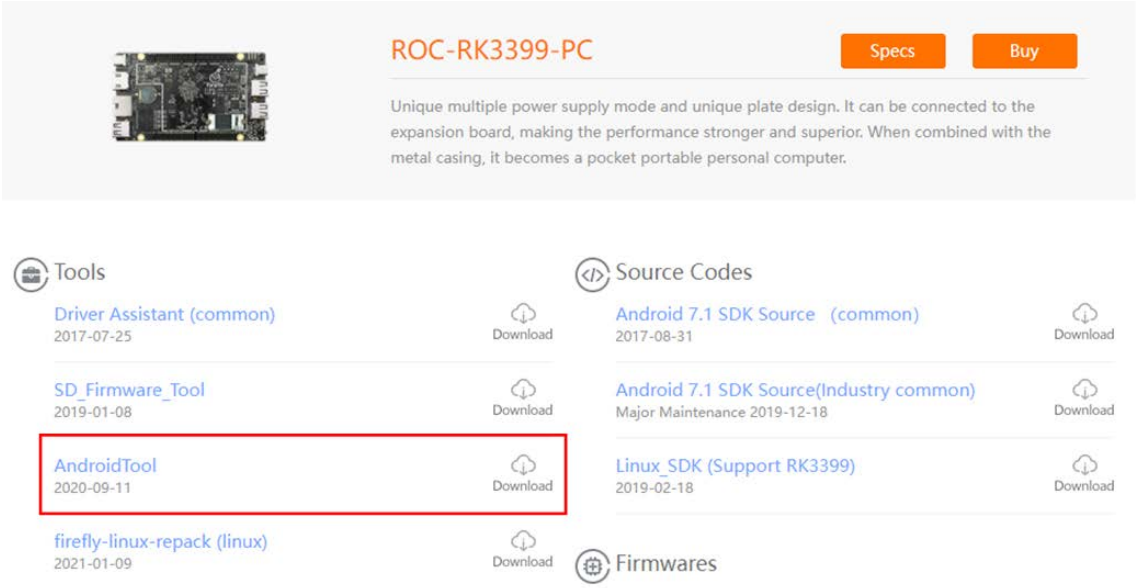

**Step 6** Select "ADB/HOST" and set USB 3.0 as ADB.



**Step 7** After the setting is complete, you can connect to a Windows PC through the USB 3.0 port and find the "Android ADB" Interface in the device manager.

### 4.2.2 Android APK Software Installation

**Step 1** To install APK software, you can use the built-in "apkinstaller" App or through USB. Please download the "Android Tool" Software Package at https://www.t-firefly.com/doc/download/53.html

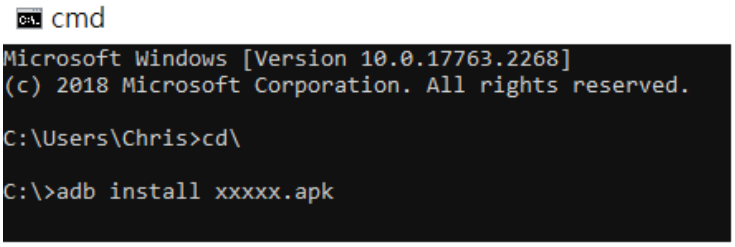


**Step 2** Connect the EIC-1000 USB 3.0 port with Windows PC.

| | | | |
|---|---|---|---|
| adb | 2014/1/17 下午 0... | 應用程式 | 800 KB |
| AdbWinApi.dll | 2014/1/17 下午 0... | 應用程式擴充 | 94 KB |
| AdbWinUsbApi.dll | 2014/1/17 下午 0... | 應用程式擴充 | 60 KB |
| AFPTool | 2013/3/20 下午 0... | 應用程式 | 172 KB |
| RKImageMaker | 2012/11/7 上午 1... | 應用程式 | 208 KB |

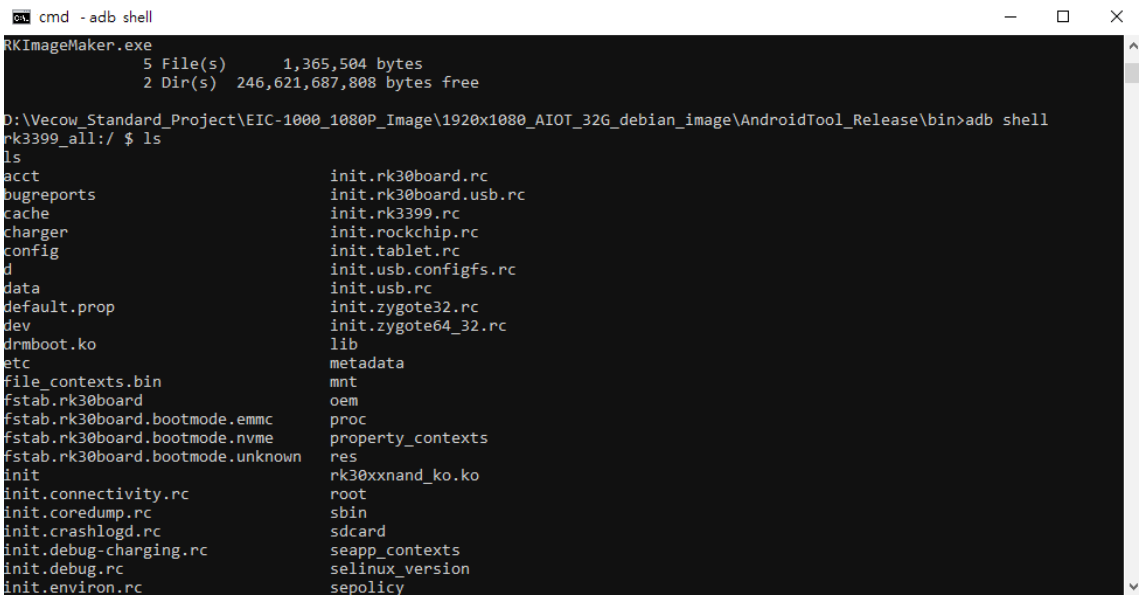
**Step 3** Begin APK software installation through Window PC command prompt.

```
adb install xxxxx.apk
```



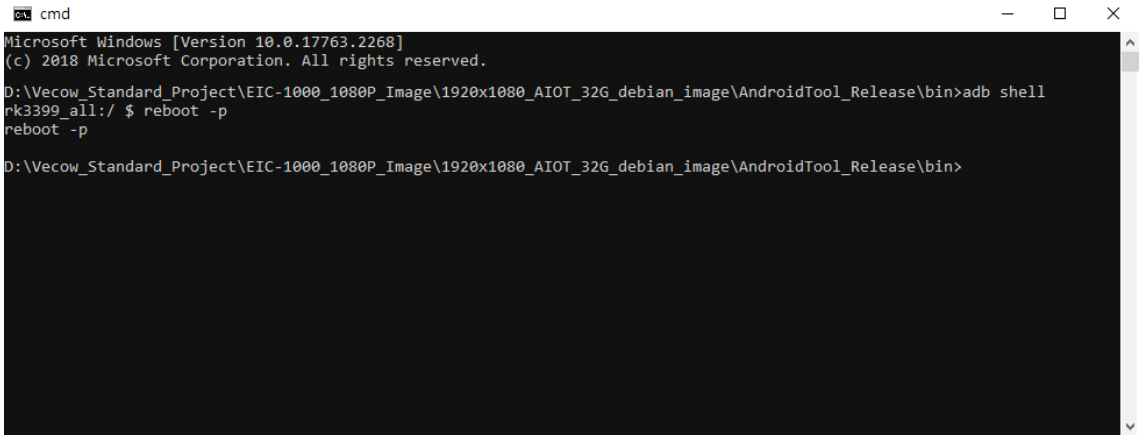

Enter Terminal Mode: `$adb shell`

Exit Terminal Mode: `$exit`




Shutdown System: `$reboot -p`

Reboot System: `$reboot`




### 4.2.3 Linux Debug Console

**Step 1** Install SSH service.

```
$sudo apt-get install sshd
```

**Step 2** Active SSH service.

```
sudo service sshd start
```

**Step 3** Check SSH service status.

```
sudo service sshd status
```

**Step 4** If installed successfully, the systems will response as below.

```
Active: active (running) since Sun 20xx-xx-xx xx:xx:xx CST; 15s ago
```

## 4.3 GPIO

### 4.3.1 GPIO List

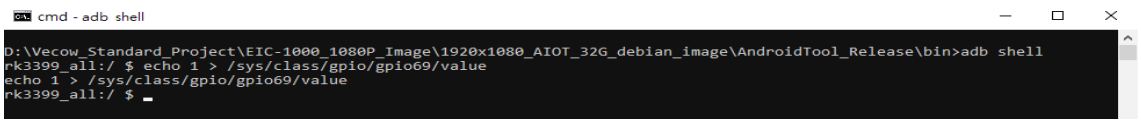
| Position | PIN name | Linux node/Note | Direction |
|---|---|---|---|
| PIN 1 | DIN2 | /sys/class/gpio/gpio76/value | In |
| PIN 2 | DOUT2 | /sys/class/gpio/gpio69/value | Out |
| PIN 3 | DIN0 | /sys/class/gpio/gpio74/value | In |
| PIN 4 | DOUT1 | /sys/class/gpio/gpio68/value | Out |
| PIN 5 | DIN1 | /sys/class/gpio/gpio73/value | In |
| PIN 6 | DOUT3 | /sys/class/gpio/gpio67/value | Out |
| PIN 7 | DIN3 | /sys/class/gpio/gpio70/value | In |
| PIN 8 | DOUT0 | /sys/class/gpio/gpio66/value | Out |
| PIN 9 | Ground | | |
| PIN 10 | 3.3V | Power supply | Out |

### 4.3.2 GPIOs control method

You can write or read value by The GPIOs with the Linux command echo/cat by debug port.

```
linaro@linaro-alip:~$ sudo -s
root@linaro-alip:/home/linaro# echo 1 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
1
root@linaro-alip:/home/linaro# echo 0 > /sys/class/gpio/gpio69/value
root@linaro-alip:/home/linaro# cat /sys/class/gpio/gpio69/value
0
root@linaro-alip:/home/linaro#
```

For Android, please use the following adb.exe command.



## 4.4 Serial Port

### 4.4.1 Linux Serial Port

The serial port is set to RS-232 mode in default. To switch to RS-422 or RS-485 mode, please follow the following steps.

**Step 1** Install gcc compiler

```
$ sudo apt-get install gcc
```

**Step 2** Enter command for compiler

```
$gcc -fPIC -static main.c FR2ur2_comport.c -o set_mode
```

**Step 3** Switch to RS-232

```
$./set_mode /ttyUSB0 1
```

**Step 4-1** Switch to RS-485

```
$./set_mode /ttyUSB0 2 (sender)
```

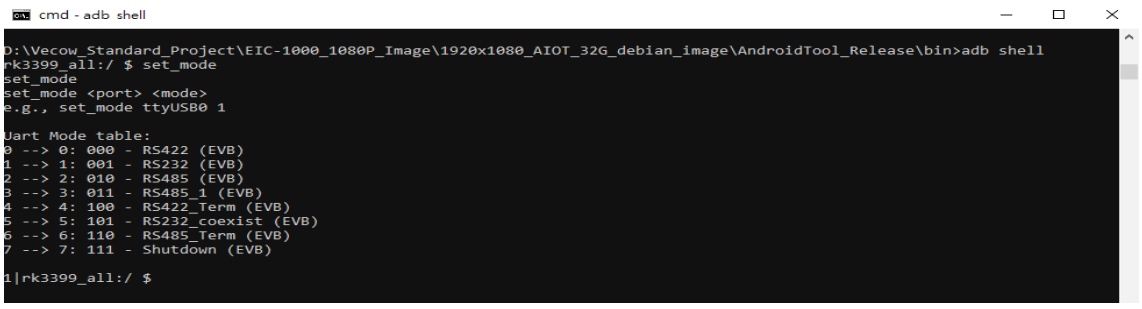
```
$./set_mode /ttyUSB0 3 (receiver)
```

**Step 4-2** Switch to RS-422

```
$./set_mode /ttyUSB0 0
```

### 4.4.2 Android Serial Port

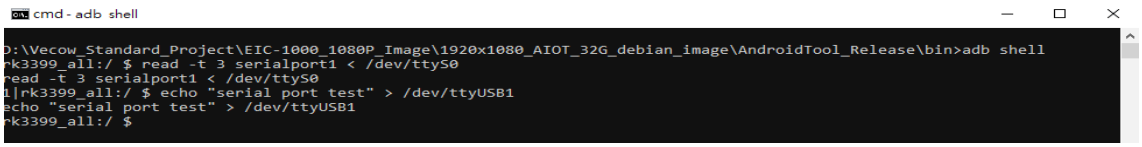
**Step 1** Enter the following adb.exe command.




**Step 2** Enter serial port read/write test command.

```
$ read -t 3 serialport1 < /dev/ttyUSB1
```

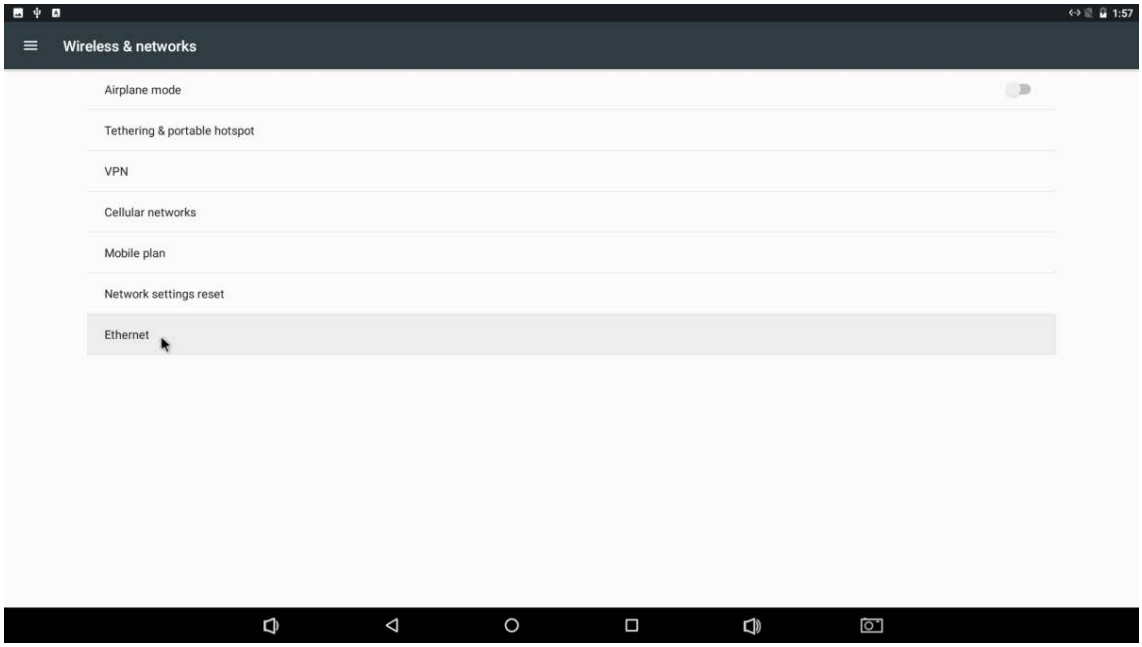
```
$ echo "serial port test" > /dev/ttyUSB1
```



## 4.5 Ethernet

**Step 1** Enter setting and select "More" in the wireless & networks section.

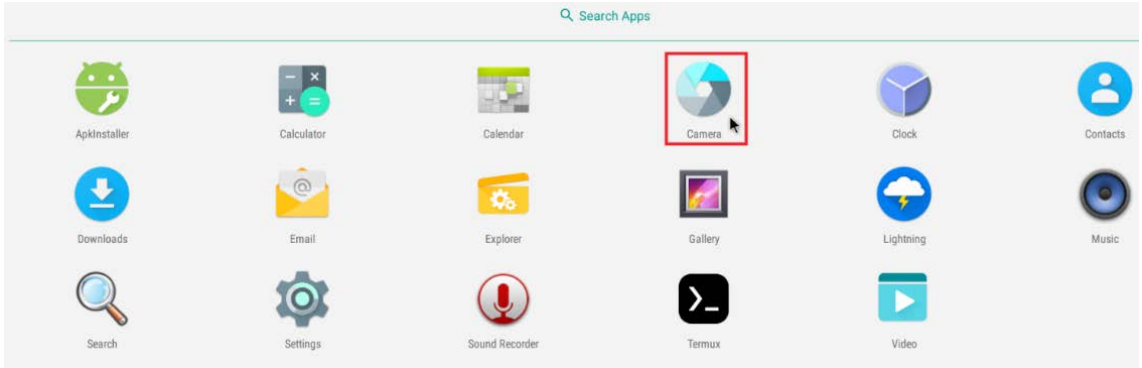
**Step 2** Select Ethernet.



**Step 3** Edit Ethernet settings.

## 4.6 Camera

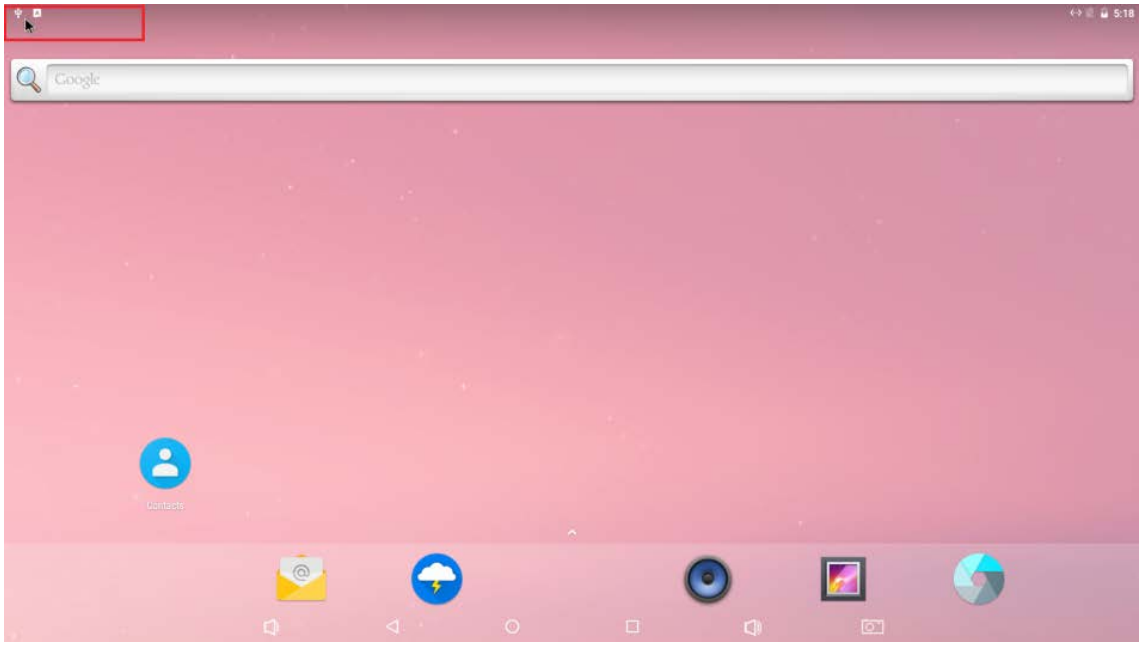
EIC-1000 supports USB Web CAM, you can use the built-in camera software for the camera functions.



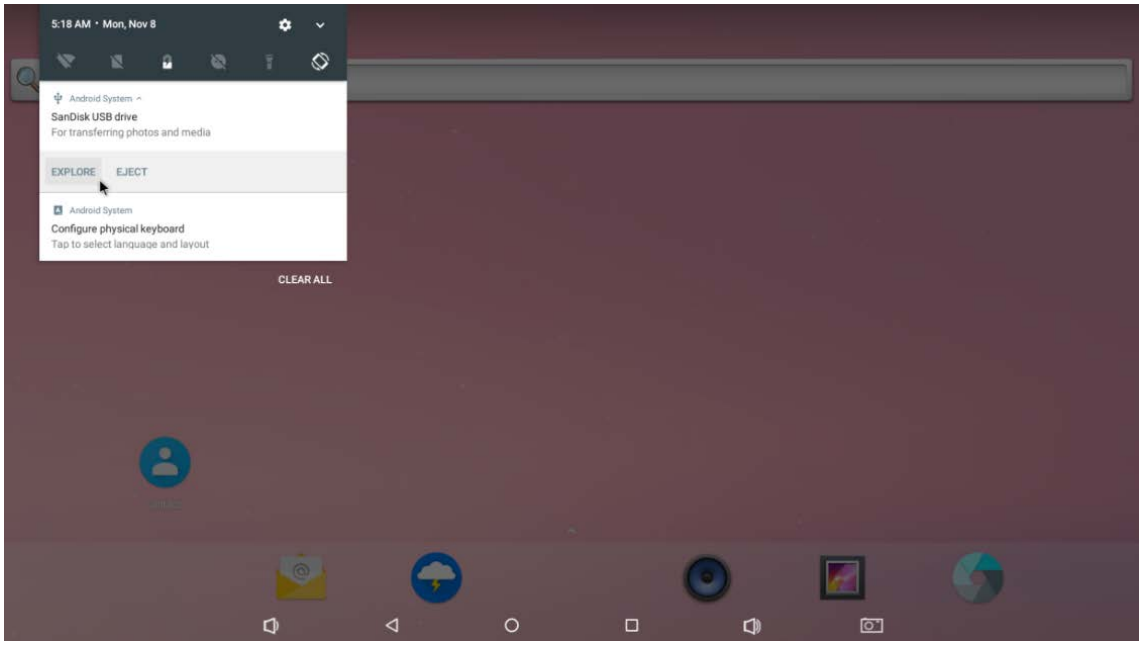
## 4.7 Storage

### 4.7.1 USB Storage

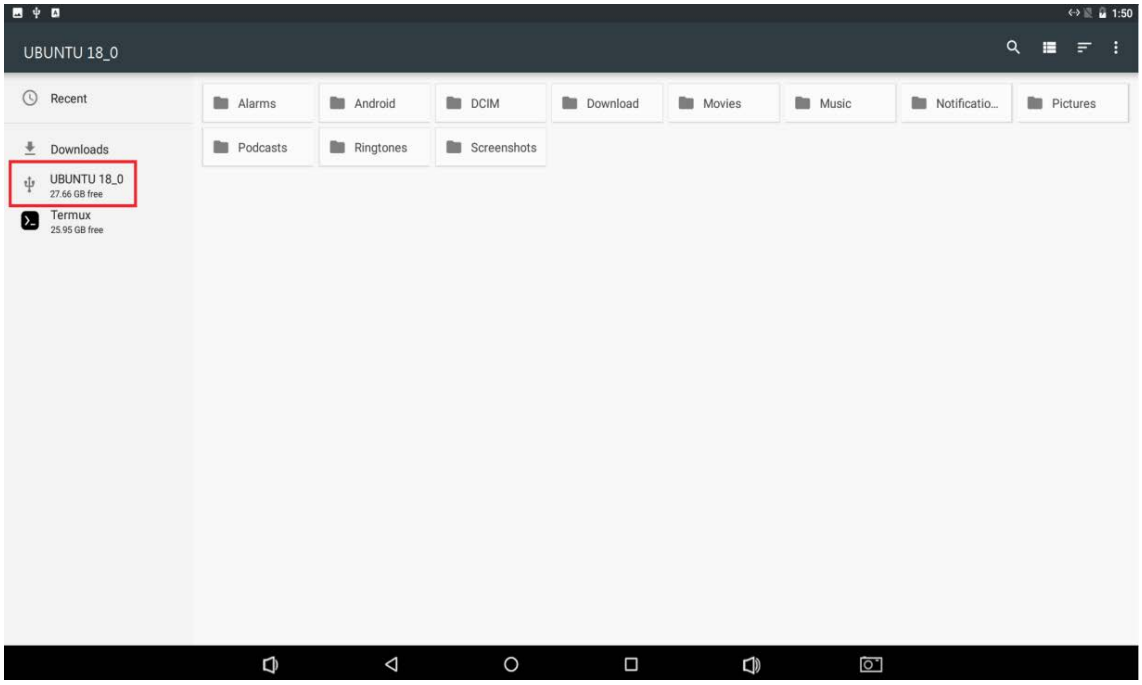
**Step 1** Click the upper-left icon on the desktop.




**Step 2** Click "Explore" to open file manager.

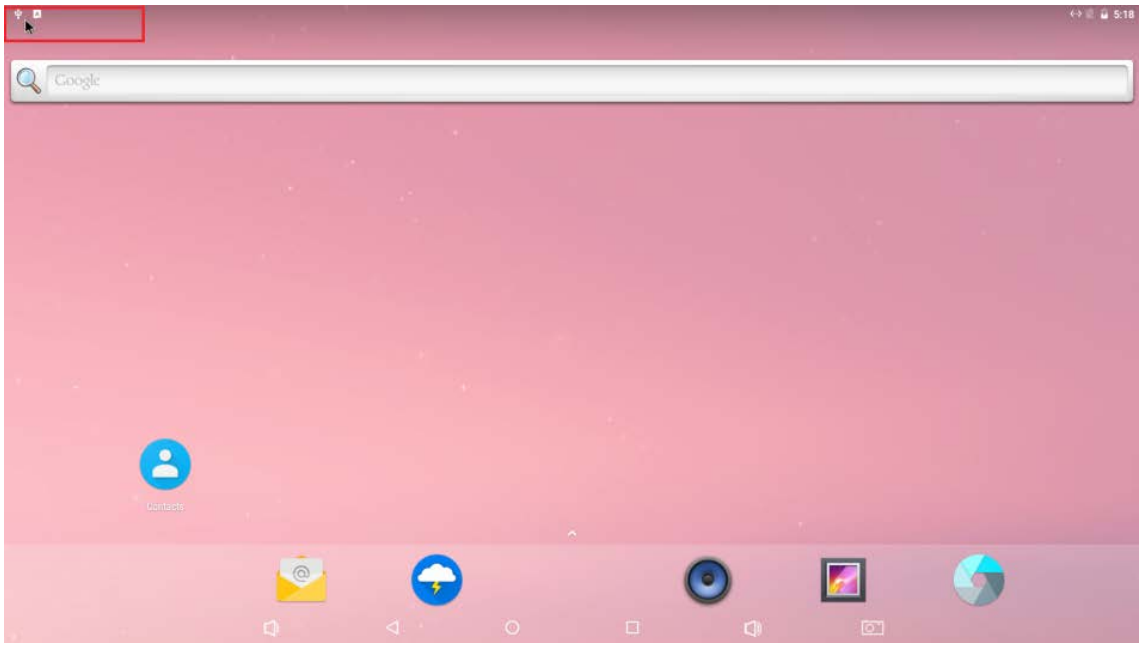


**Step 3** Click the corresponding device icon to access the files.

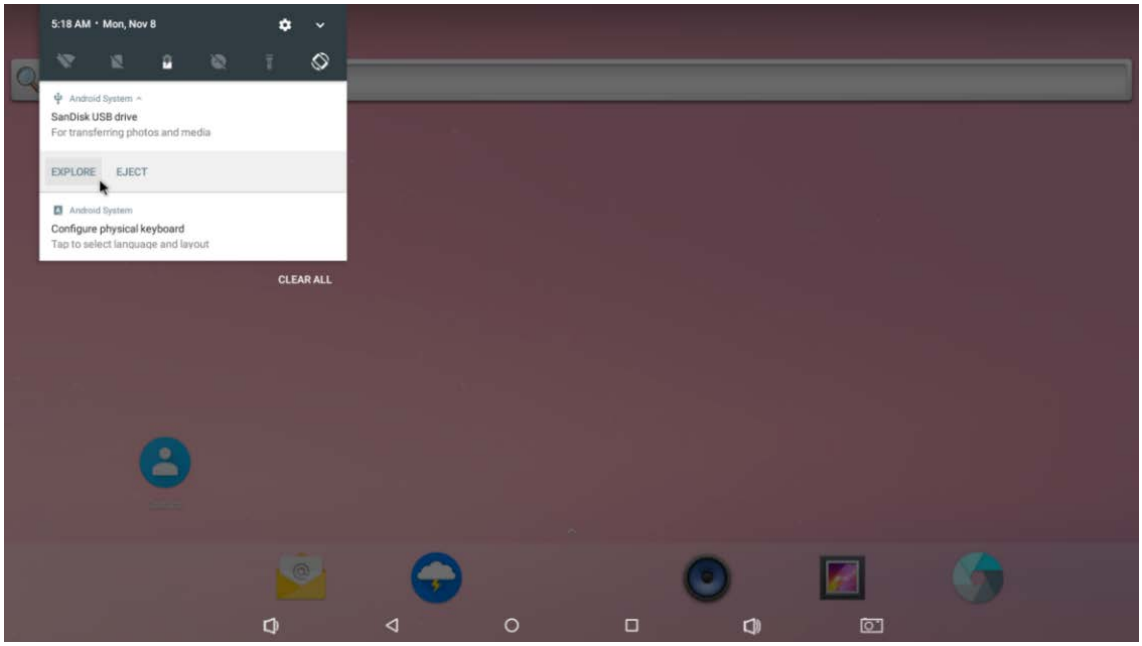



### 4.7.2 Internal Storage (eMMC)

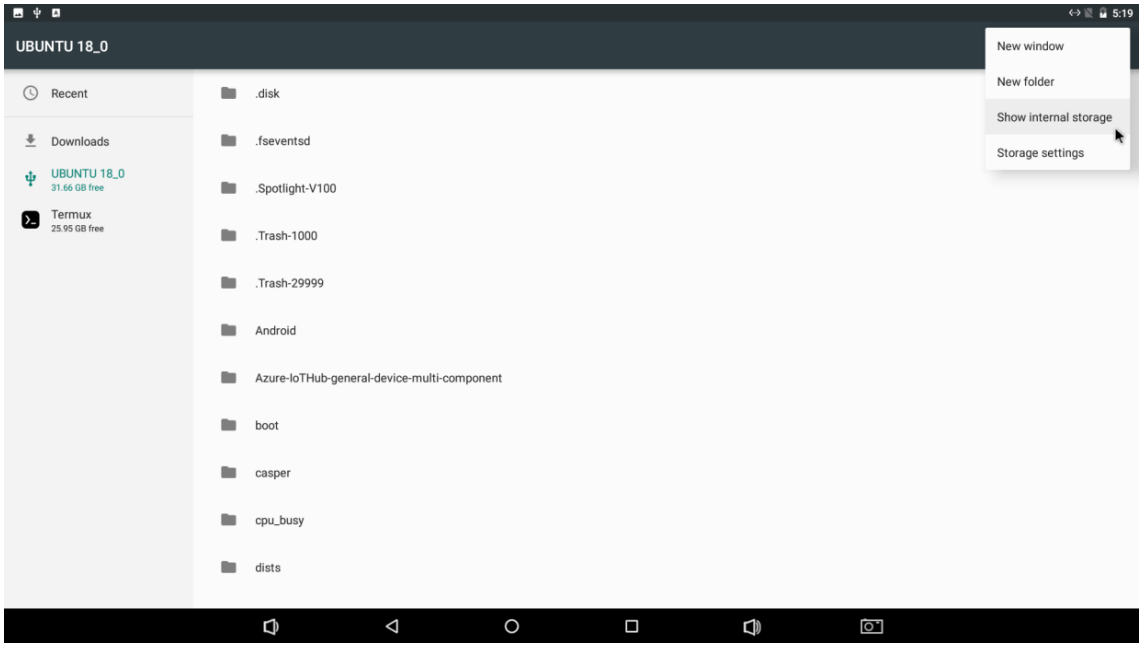
**Step 1** Click the upper-left icon on the desktop.



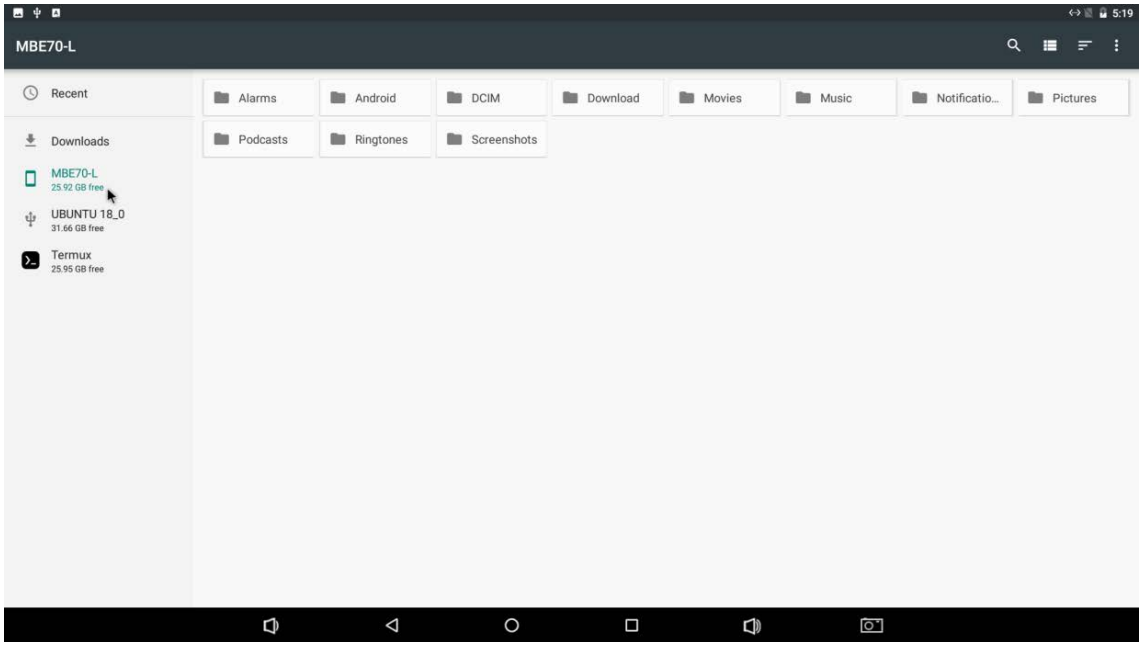
**Step 2** Click "Explore" to open file manager.




**Step 3** Right click and select "Show internal storage"

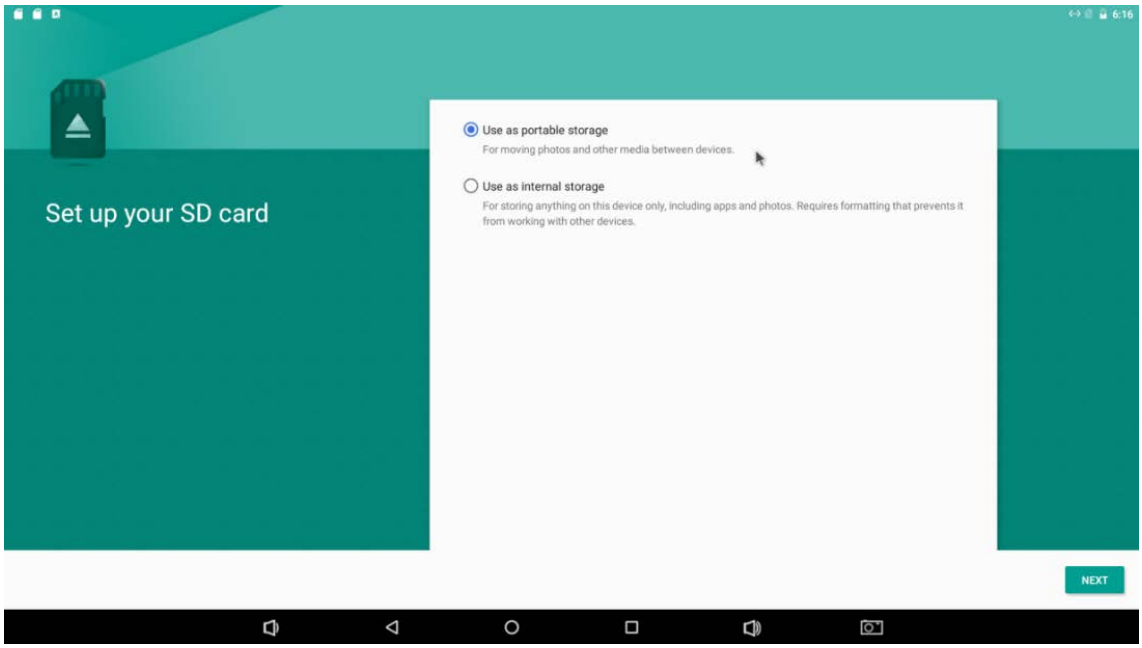


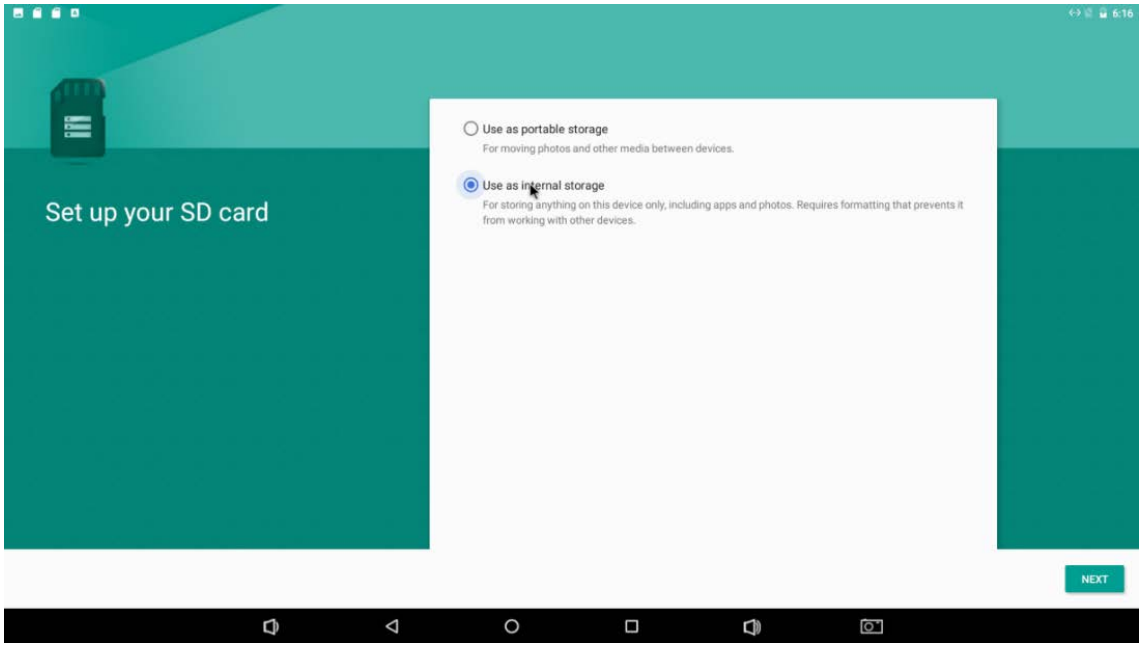
**Step 4** Click the corresponding device icon to access the files.



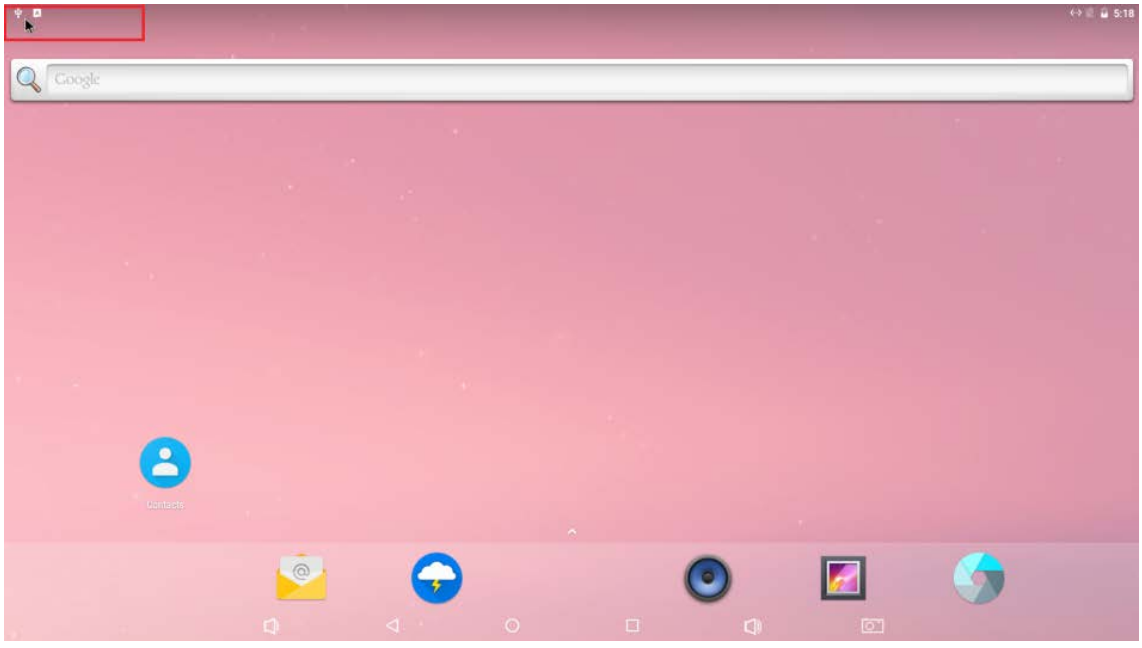

## 4.7.3 SD Card

You can configure the SD card as portable or internal storage device.

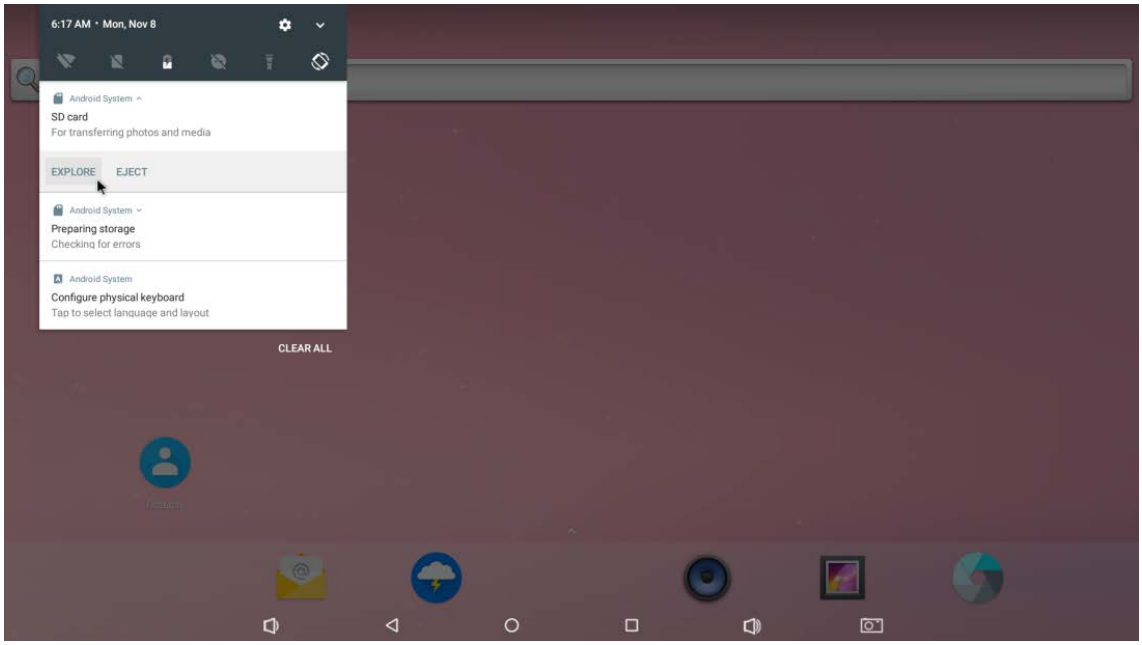





**Step 1** Click the upper-left icon on the desktop.

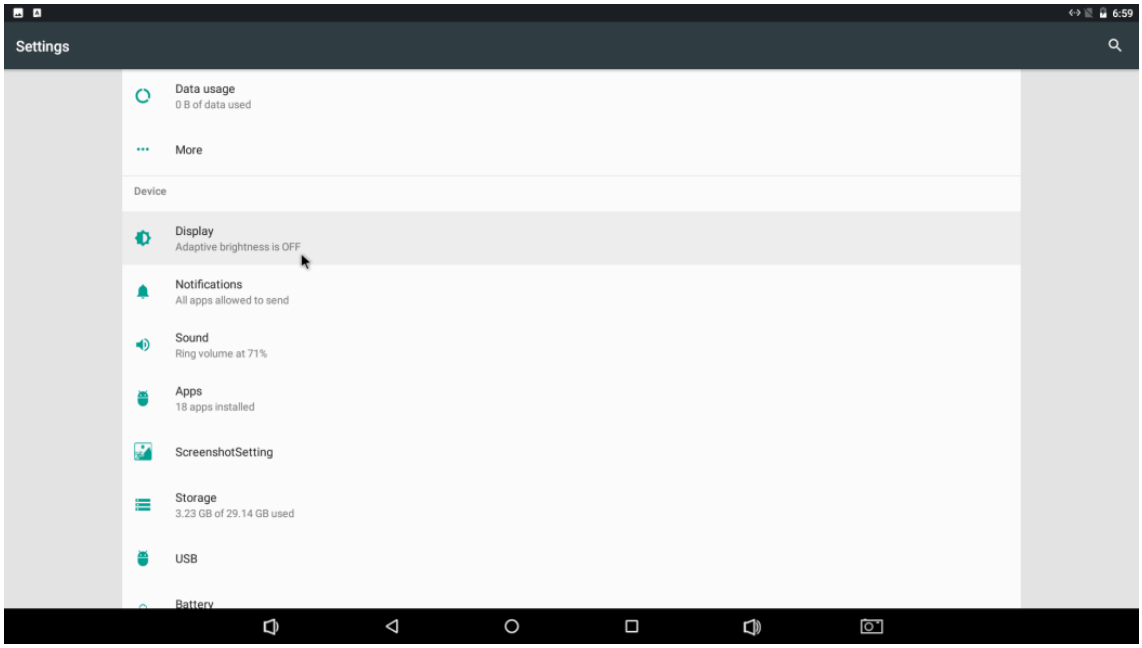


**Step 2** Click "Explore" to open file manager.

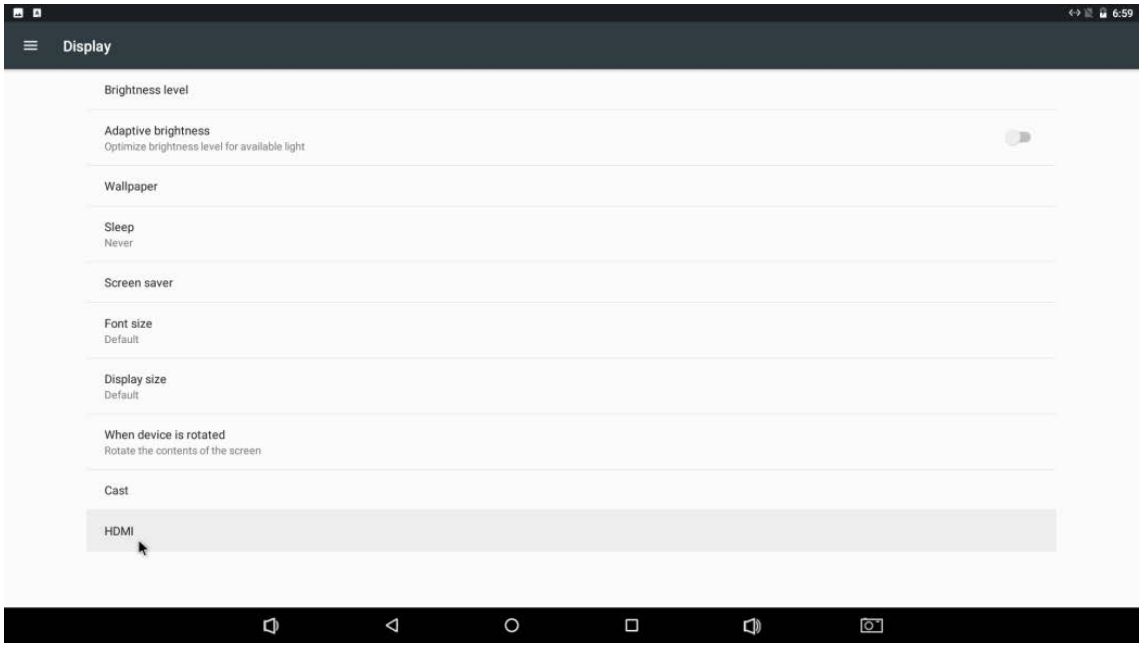


## 4.8 Display

**Step 1** Enter Settings and select "Display".



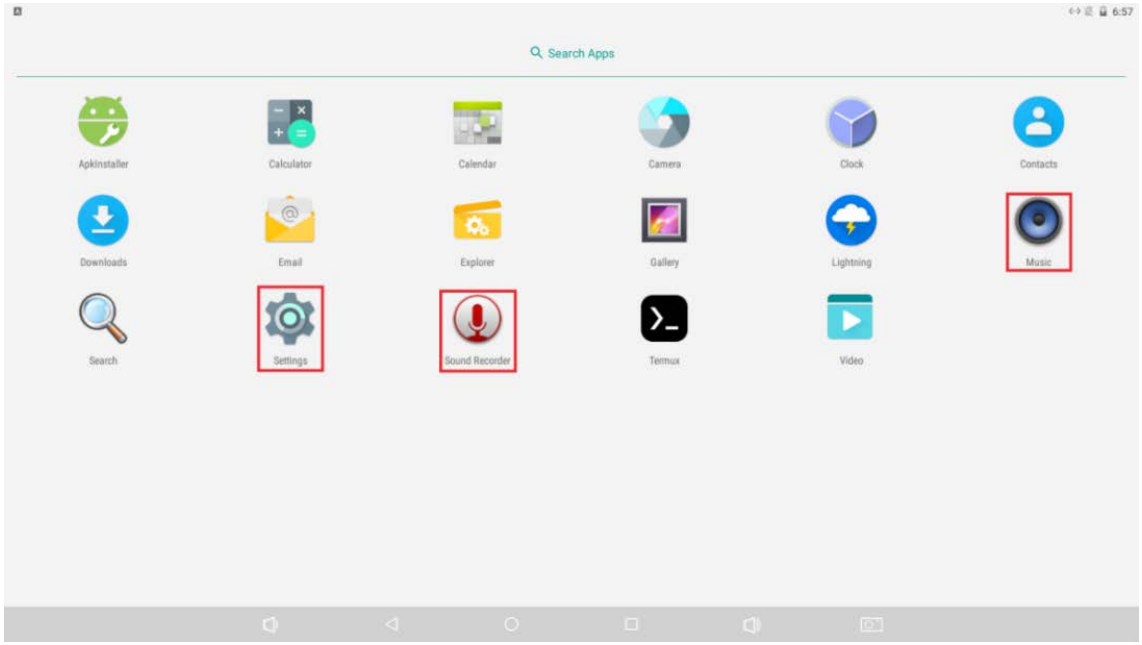

**Step 2** Select "HDMI".



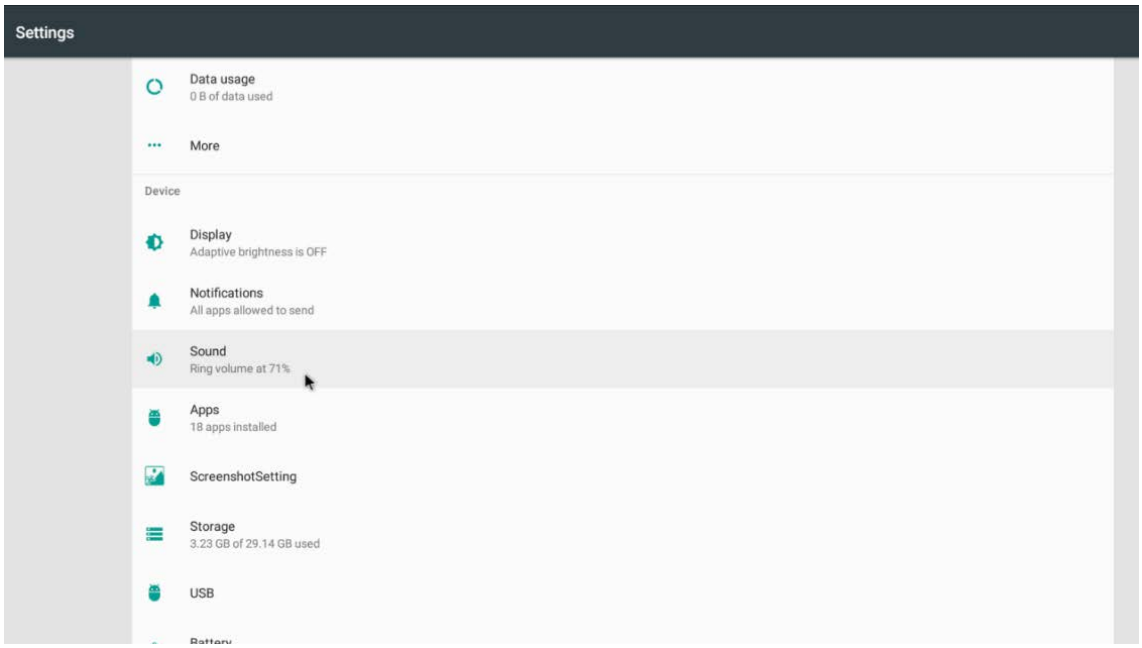
**Step 3** The settings of the display, e.g., resolution and rotation, can be changed in this section.

## 4.9 Audio

You can use the built-in software (Music & Sound Recorder) for the audio function.




To adjust volume, go to "Settings" and select "Sound".



For Debian OS, you need to install the third-party recording software (tinyAlSA) to use the recording function. Below is the installation method.

```
$ sudo apt-get update
```

```
$ sudo apt-get install gcc
```

```
$ unzip tinyalsa-master.zip
```

```
$ cd tinyalsa-master
```

```
$ sudo make install
```

```
$ tinymix -D 1 set 31 1
```

```
$ tinymix -D 1 set 43 1
```

```
$ tinymix -D 1 set 44 1
```

# A

# APPENDIX A : POWER CONSUMPTION

| Testing Board | EIC-1000 |
|---|---|
| RAM | DDR3L-1066 SDRAM, 2GB |
| USB-1 : (USB 3.0) | USB MicroSD card reader (with 4GB) |
| USB-2 : (USB 3.0) | USB MicroSD card reader (with 4GB) |
| Micro SD | Sandisk Ultra 32GB |
| Storage | eMMC Flash memory, 32GB |
| LAN 1 (Realtek RTL8211E) | 1.0 Gbps |
| Graphics Output | HDMI |
| Power Plan | Default , Debian GNU/Linux 9.13 (stretch) |
| Power Source | Chroma 62006P-100-25 |
| Test Program | Stress-ng Test |

## A.1 RK3399 Dual Cortex-A72 & Quad Cortex-A53 Processor

Power on and boot to Linux Debian GNU/Linux 9.13 (stretch)

| CPU | Power Input | Linux Debian GNU/Linux 9.13 (stretch) | | | |
|---|---|---|---|---|---|
| | | idle status CPU | | Run BurnInTest/Stress-ng Test | |
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| RK3399 Dual Cortex-A72 & Quad Cortex-A53 Processor | 9V | 0.434A | 03.91W | 0.975A | 08.78W |
| | 12V | 0.320A | 03.84W | 0.726A | 08.71W |
| | 24V | 0.180A | 04.32W | 0.349A | 08.38W |
| | 36V | 0.131A | 04.72W | 0.263A | 09.47W |
| | 55V | 0.094A | 05.17W | 0.175A | 09.63W |

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For further support information, please visit www.vecow.com

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