

IBR500 Series
Ruggedized Edge Computer
With MediaTek Genio 700 / MT8390
ARM Cortex-A78 Dual-core + Cortex-A55
Hexa-core Processor
Or
With MediaTek Genio 510 / MT8370
ARM Cortex-A78 Dual-core + Cortex-A55
Quad-core Processor

User Manual

Version 1.0A
(July 2026)



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Compliance

CE

The product described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

FCC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE



This product must not be disposed of as normal household waste, in accordance with the EU directive for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE



This product complies with RoHS 2 restrictions, which prohibit the use of certain hazardous substances in electrical and electronic equipment. The following substances must not exceed the specified concentrations:

- Hexavalent chromium: 1,000 ppm
- Polybrominated biphenyls (PBBs): 1,000 ppm
- Polybrominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

Carefully read the following safety information before using this device.

Setting up your system:

- Put the device horizontally on a stable and solid surface.
- Do not use this product near water.
- Do not use this product near any heat source.
- Leave plenty of space around the device and do not block the ventilation openings. Never drop or insert any objects of any kind into the openings.

Care during use:

- Do not place heavy objects on the top of the device.
- Make sure to connect the correct voltage to the device. Failure to supply the correct voltage could damage the unit.
- Do not place or allow objects to rest on the power cord, and do not walk on it.
- Ensure that the total ampere rating of all devices plugged into the extension cord does not exceed the cord's ampere rating.
- Do not spill water or any other liquids on your device.
- Always unplug the device and use only mild cleaning agents when cleaning.
- Use a computer vacuum cleaner to remove dust and particles from the vents.

Product Disassembly

Do not try to repair, disassemble, or make modifications to the device. Doing so will void the warranty and may result in damage to the product or personal injury.



CAUTION

Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries by observing local regulations.

 WARNING

- **INGESTION HAZARD:** This product contains a coin/button cell battery (BR-2450A).
- **DEATH or serious injury can occur if ingested.**
- A swallowed button cell or coin battery can cause **internal chemical burns in as little as 2 hours.**
- **KEEP new and used batteries OUT OF REACH OF CHILDREN.**
- **Seek immediate medical attention** if a battery is swallowed or suspected to be swallowed or inserted into any part of the body.



BATTERY SAFETY INSTRUCTIONS

- Remove and immediately recycle or dispose of used batteries in accordance with local regulations and keep them away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information if battery ingestion is suspected.
- Compatible Battery Models/Types: BR-2450A or equivalent lithium coin cell. Nominal Voltage: 3V.
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, or expose to temperatures outside the specified range, or incinerate. Doing so may result in injury due to venting, leakage, or explosion resulting in chemical burns.
- Ensure the battery is installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, or different brands or types of batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time in accordance with local regulations.
- Always securely close the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children. Battery replacement shall only be performed by qualified service personnel.

CAUTION:

- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type. Dispose of batteries according to the manufacturer's instructions.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, may result in an explosion.
- Leaving a battery in an extremely high temperature environment may result in an explosion or leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or leakage of flammable liquid or gas.

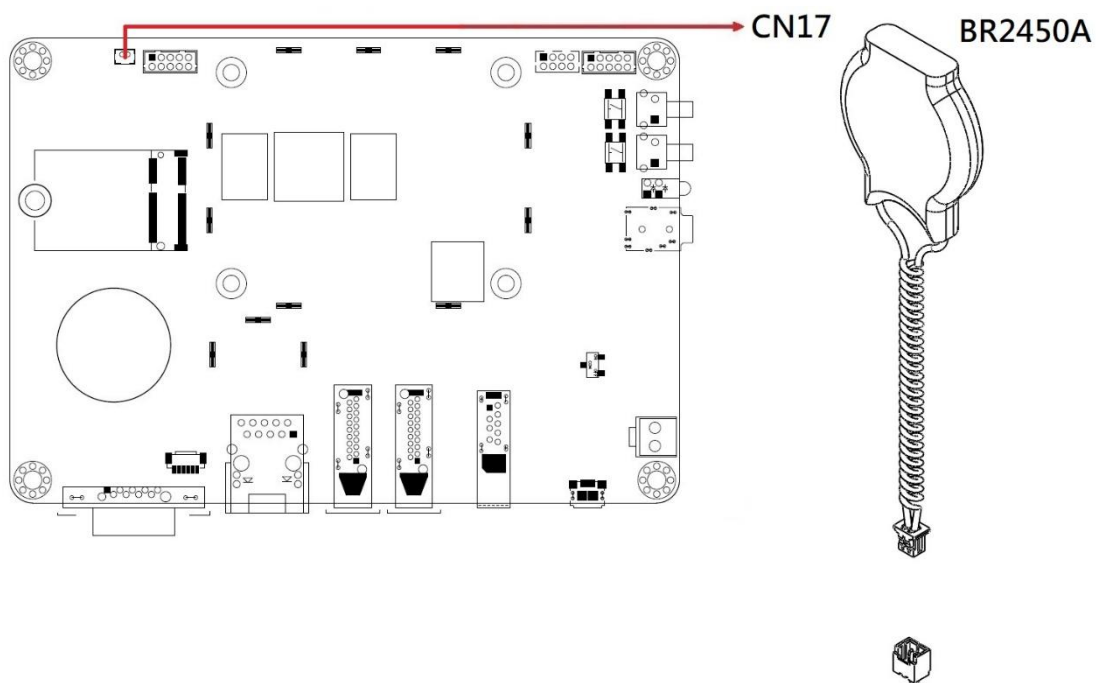
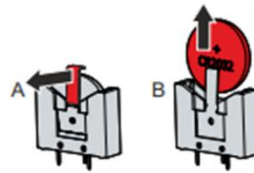
ATTENTION:

Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebut les batteries usagées selon les instructions.

BATTERY REPLACEMENT INSTRUCTIONS (For Qualified Service Personnel Only)

Battery replacement shall only be performed by qualified service personnel.

1. Bend the hook on the battery holder slightly outward (Section A).
2. Remove the battery from the holder using needle-nose pliers (Section B).
3. Insert a new BR-2450A (or equivalent) lithium coin cell into the battery holder with the correct polarity (+/-).
4. Ensure the battery is securely seated in the holder before operating the system.



Warranty Policy

- **IBASE standard products:**

24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

12-month (1-year) warranty from delivery for 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adaptor, display panel and touch screen.

- * However, products that fail due to misuse, accident, improper installation or unauthorized repair shall be treated as out of warranty and customers shall be billed for repair and shipping charges.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you encounter any technical problems and require assistance from your distributor or sales representative, please prepare and send the following information:
 - Product model name
 - Product serial number
 - Detailed description of the problem
 - Error messages in text or screenshots if any
 - The arrangement of peripherals
 - Software used (such as OS and application software)
3. If repair service is required, please apply for an RMA number through the IBASE website or contact your distributor or sales representative for assistance.

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Chapter 1

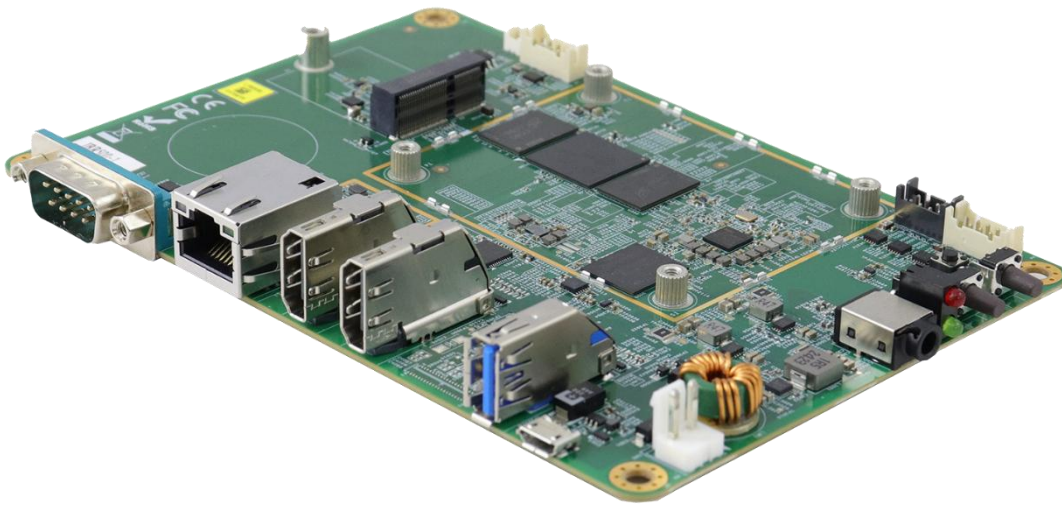
General Information

The information provided in this chapter includes:

- Introduction
- Features
- Packing List
- Specifications
- Product View
- Dimensions

1.1 Introduction

The IBR500 is a rugged edge computer powered by MediaTek Genio 700 / MT8390: Dual-core Cortex®-A78 & Hexa-core Cortex®-A55 or MediaTek Genio 510 / MT8370: Dual-core Cortex®-A78 & Quad-core Cortex®-A55 processor, designed for digital signage applications. It features 4GB or 8GB LPDDR4(x), 64GB or 128GB eMMC 5.1, and multiple connectivity options including COM, GPIO, USB, Ethernet and M.2 (E2230). The device is characterized by its ruggedized and fanless design, making it ideal for reliable operation in harsh environments.



1.2 Features

- Supports MediaTek Genio 700/MT8390 or Genio 510/MT8370 processor
- On-board LPDDR4(x), 4GB or 8GB, 4000MT/s
- On-board eMMC 5.1, 64GB or 128GB for O.S.
- Supports dual HDMI (4K30) output
- Embedded I/O for COM, GPIO, USB, Ethernet
- Supports M.2 E-Key (2230) for WiFi 6 2T2R + Bluetooth 5.2 module
- Ruggedized and fanless design

1.3 Packing List

Your product package should include the items listed below.

- IBR500-1 or IBR500-2 or IBR500-3 SBC x1

The user manual can be downloaded from the IBASE website.

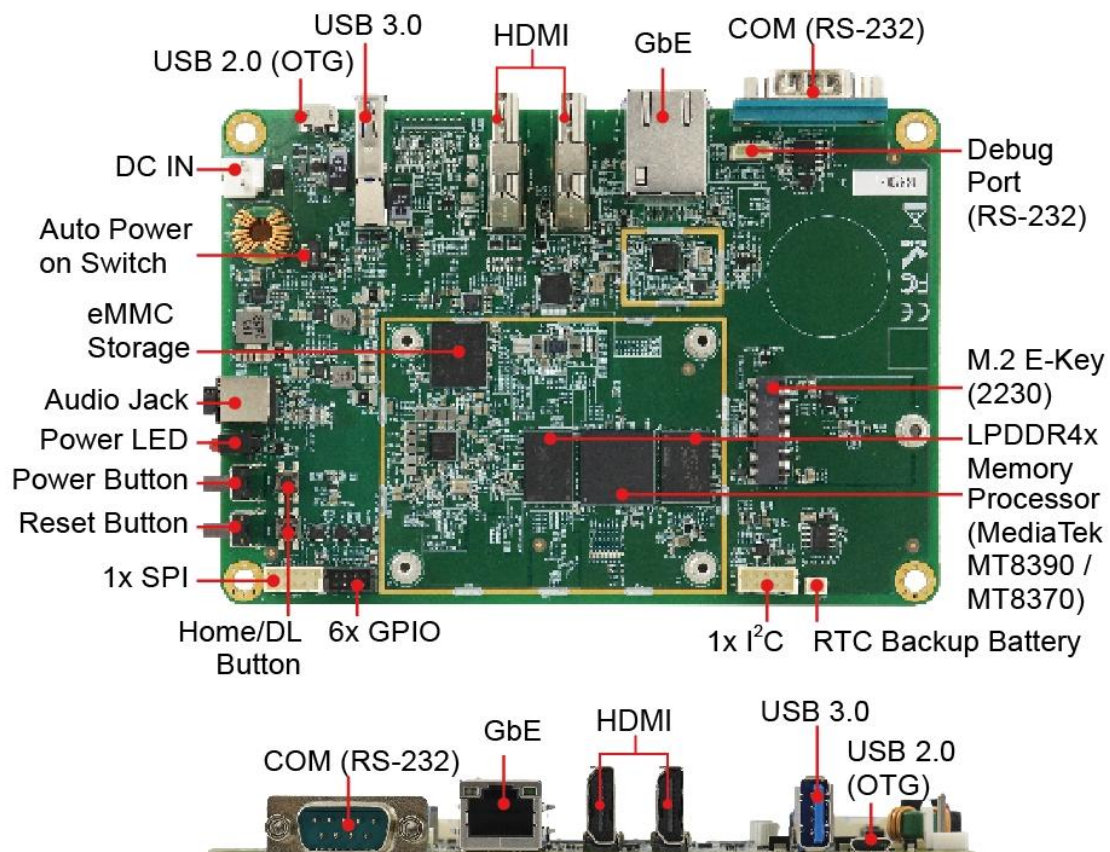
1.4 Specifications

Model	
IBR500-1	MediaTek Genio 700/MT8390, 8GB LPDDR4x, 64GB eMMC 5.1 onboard, 3.5-inch SBC
IBR500-2	MediaTek Genio 510/MT8370, 4GB LPDDR4x, 64GB eMMC 5.1 onboard, 3.5-inch SBC
IBR500-3	MediaTek Genio 700/MT8390, 8GB LPDDR4x, 128GB eMMC 5.1 onboard, 3.5-inch SBC
System	
Operating System	- Android 14 - Other OS (by request)
CPU Type	- MediaTek Genio 700/MT8390: 2x Cortex-A78 2.2GHz + 6x CA55 2.0GHz - MediaTek Genio 510/MT8370: 2x Cortex-A78 2.0GHz + 4x CA55 2.0GHz
GPU Type	- MediaTek Genio 700/MT8390: Mali-G57 MC3, 58 fps - MediaTek Genio 510/MT8370: Mali-G57 MC2, 39 fps
NPU Type	- MediaTek Genio 700/MT8390: MDLA3.0+VP6, 4.0 TOPs - MediaTek Genio 510/MT8370: MDLA3.0+VP6, 3.2 TOPs
Video Decode	- MediaTek Genio 700/MT8390: 4K@75, AV1, VP9, H.265, H.264 - MediaTek Genio 510/MT8370: 4K@60, AV1, VP9, H.265, H.264
Video Encode	- MediaTek Genio 700/MT8390: 4K@30, H.265, H.264 - MediaTek Genio 510/MT8370: 4K@30, H.265, H.264
Memory	On-board LPDDR4x, 4GB or 8GB, 4000 MT/s
Storage	On-board eMMC 5.1, 64GB or 128GB for OS
RTC	ST M41T81M6F
Power Supply	12V $\pm 5\%$ DC-in
Watchdog	256 levels, 0-128 seconds
I/O Ports	
Edge	1 x COM Port (RS-232, 2-wire) 1 x GbE Port (RJ45) 2 x HDMI Port (4K30-Out) 1 x USB 3.0 Port 1 x USB 2.0 Port (Micro-B, OTG) 1 x Audio Jack (Headphone-out) 1 x Power Button 1 x Reset Button 2 x Power LEDs
Internal	1 x Debug Connector (RS-232, 2-wire) 1 x RTC Battery Connector 1 x DC-in Jack (12V Max.) 1 x Home Button 1 x DL Button (Down Load) 1 x Auto-Power-On Switch

Expansion	• 1 x M.2 (E2230, USB 2.0, PCIe Gen2 x1) • 1 x SPI Connector (4-wire) • 1 x GPIO Connector (3 In, 3 out, 3.3V @ 1A) • 1 x I²C Connector
Dimension	
Dimensions	• PCB size = 147mm x 102mm (5.8" x 4") • PCB thickness = 1.2 mm
Environment	
Operating Temperature	With heatsink or heat dissipation through the chassis: -10°C ~ +50°C (14°F ~ 122°F)
Relative Humidity	0 % ~ 90 % (non-condensing)
RoHS	Yes
Certification	CE, FCC Class B

All specifications are subject to change without prior notice.

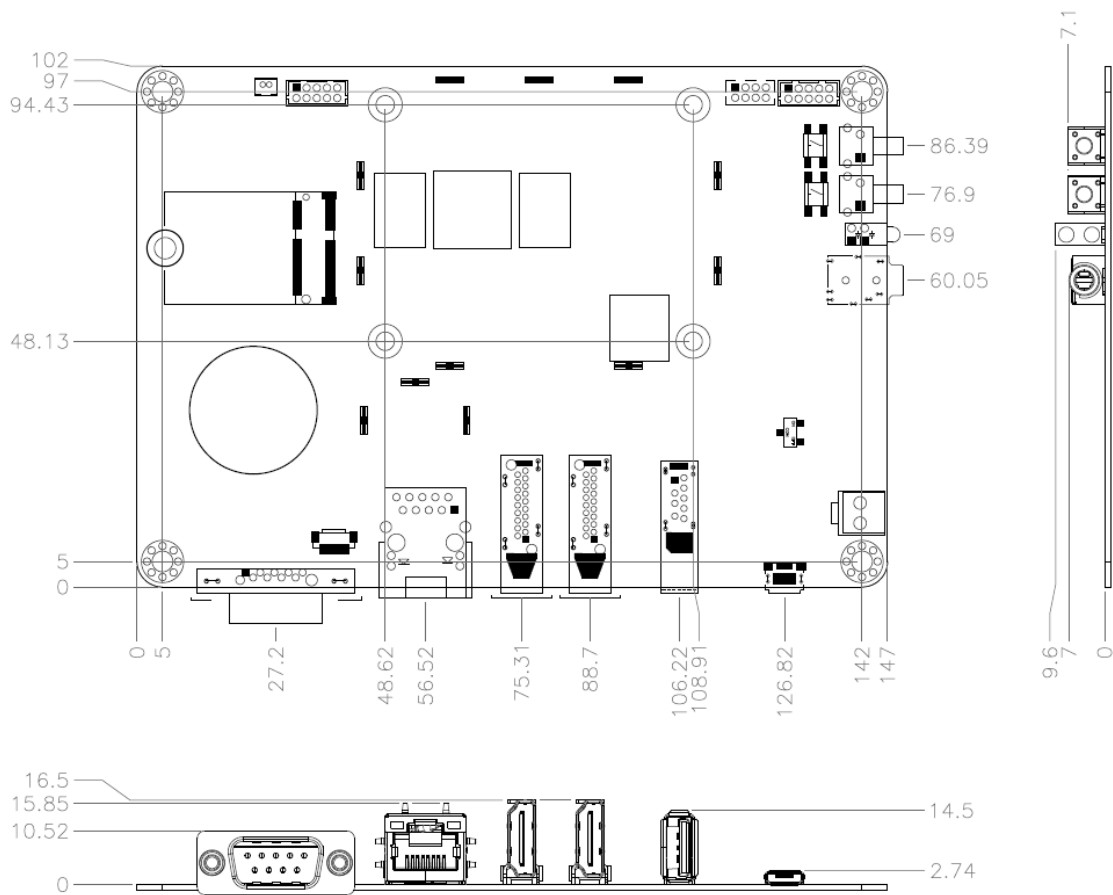
1.5 Product View



* The photos above are for reference only. Some minor components may differ.

1.6 Dimensions

Unit: mm



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Chapter 2

Hardware Configuration

This section contains general information about:

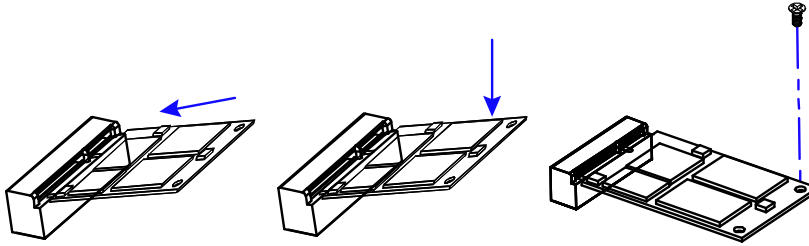
- Installation
- Jumpers and connectors

2.1 Installation

There are several connectors, sockets, and switches on the motherboard in the system.

2.1.1 M.2 Card Installation

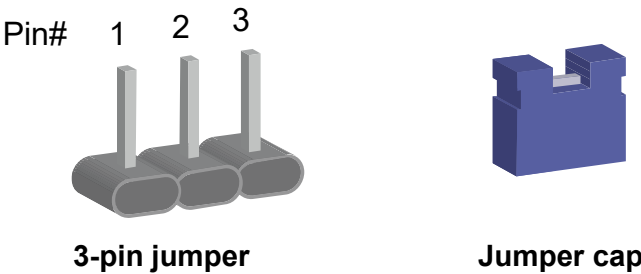
1. To install the M.2 card, remove the device cover, locate the slot and align the keys of the card with those of the interface as shown in the images below and secure the card onto the brass standoff with a screw.



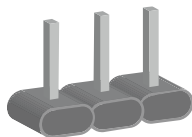
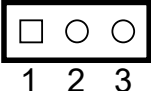
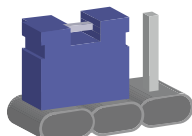
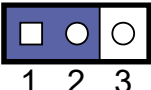
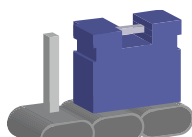
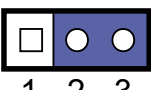
2.2 Setting the Jumpers

Configure your device by using jumpers to enable the features that you need based on your application. Contact your supplier if you have doubts about the best configuration for your use.

Jumpers are short-length connectors consisting of several metal pins with a base mounted on the circuit board. Jumper caps are placed (or removed) on the pins to enable or disable functions or features. If a jumper has 3 pins, you can connect Pin 1 to Pin 2 or Pin 2 with Pin 3 by shorting the jumper.



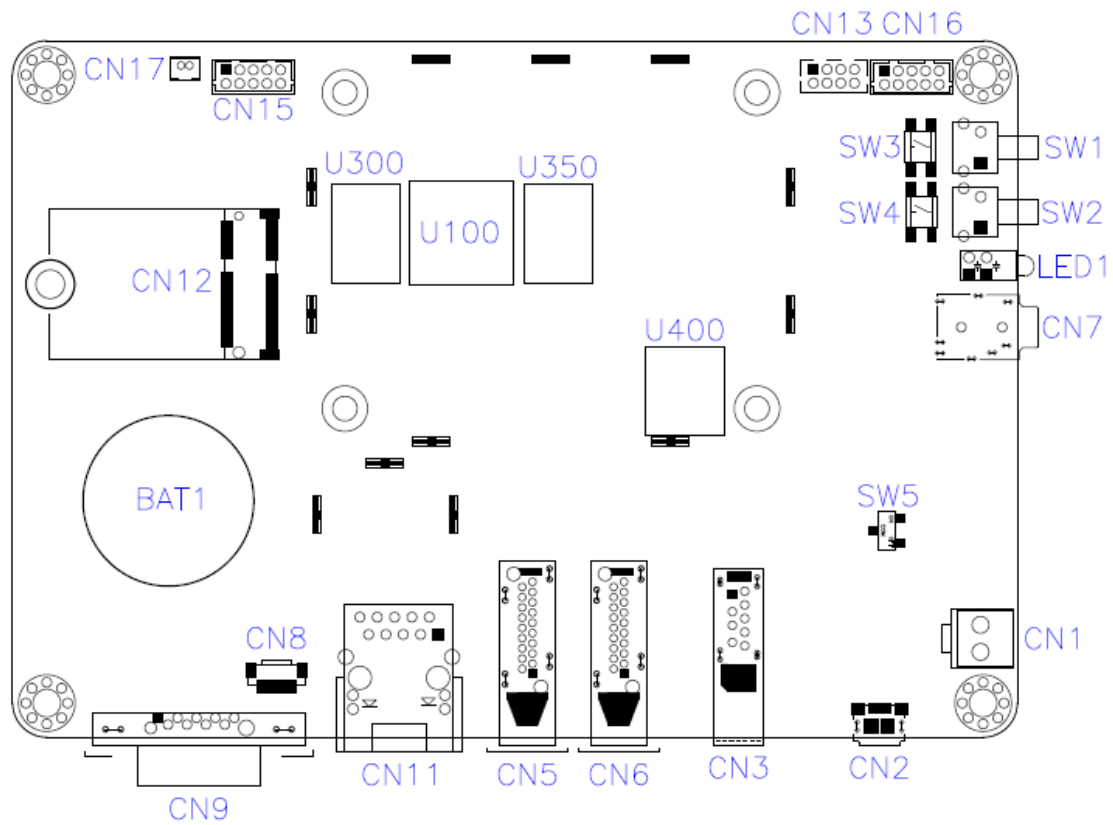
Refer to the illustration below to set jumpers.

Pin closed	Oblique view	Setting
Open		 1 2 3
1-2		 1 2 3
2-3		 1 2 3

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e., turned **on**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **off**.

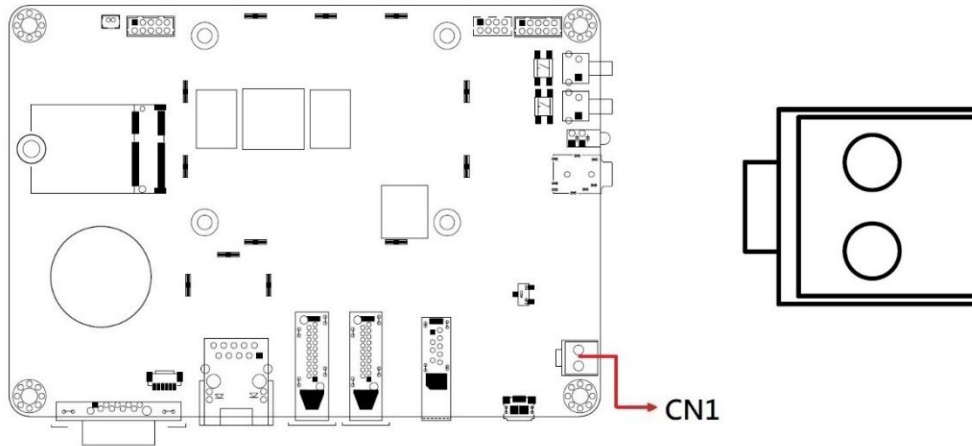
2.3 Jumpers & Connectors Locations on Motherboard



2.4 Jumpers & Connectors Quick Reference

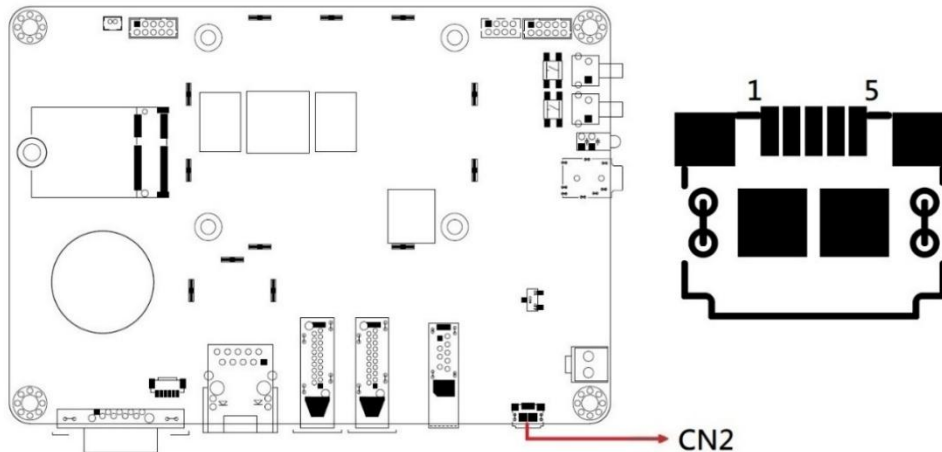
Function	Connector
DC-in Jack	CN1
USB 2.0 Port (Micro-B, OTG)	CN2
USB 3.0 Port	CN3
HDMI1 Port	CN5
HDMI2 Port	CN6
Audio Jack (Headphone-out)	CN7
Debug Connector (RS-232, 2-wire)	CN8
COM Port (RS-232, 2-wire)	CN9
GbE Port (RJ45)	CN11
M.2 (E2230, USB 2.0, PCIe Gen2 x1)	CN12
GPIO Connector (3 In, 3 out, 3.3V @ 1A)	CN13
I ² C Connector	CN15
SPI Connector (4-wire)	CN16
RTC Battery Connector	CN17
RTC Battery	BAT1
Power LED	LED1
Reset Button	SW1
Power Button	SW2
DL Button (Down Load)	SW3
Home Button	SW4
Auto-Power On Switch	SW5

2.4.1 DC-in Jack (CN1)



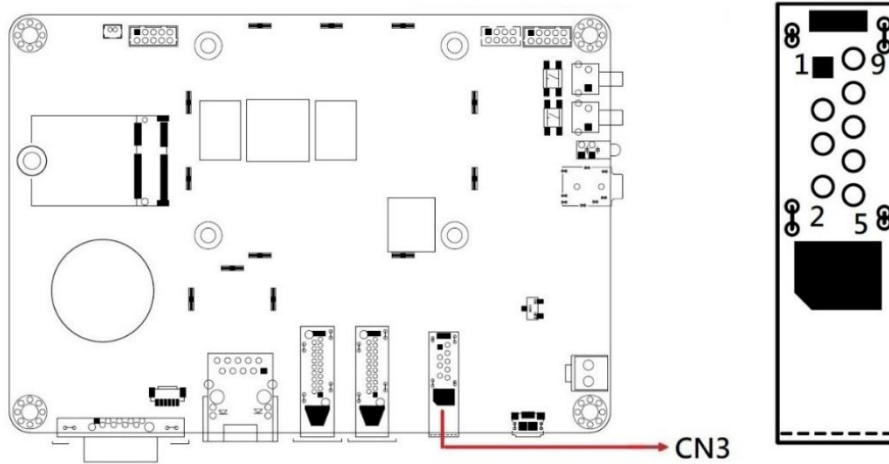
Pin	Signal Name
1	DC_IN
2	DC_IN_GND

2.4.2 USB 2.0 Port (Micro-B, OTG) (CN2)



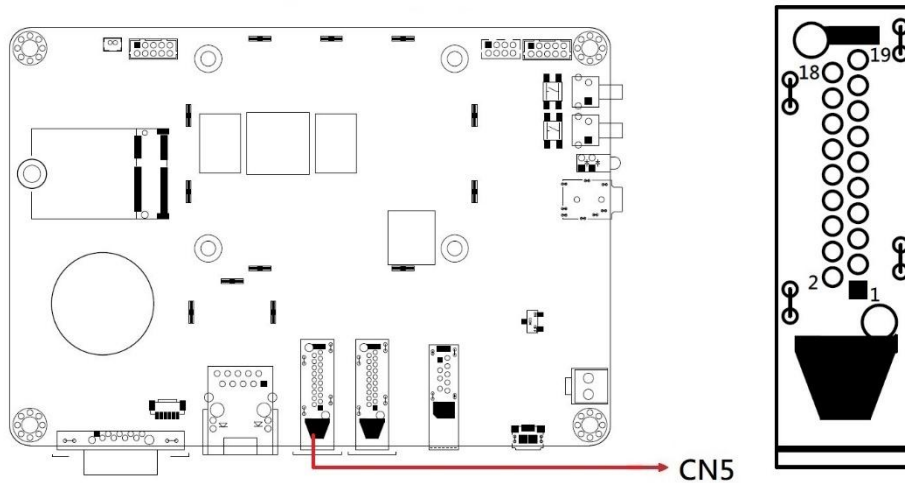
Pin	Signal Name
1	VBUS_P0
2	USB0_D-
3	USB0_D+
4	USB0_ID
5	GND

2.4.3 USB 3.0 Port (CN3)



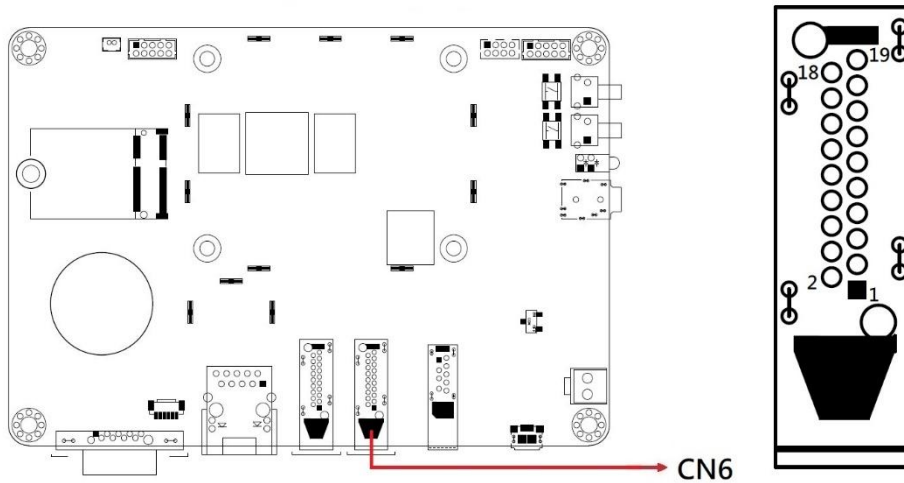
Pin	Signal Name	Pin	Signal Name
1	VBUS_P1	6	USB1_SSRX+
2	USB1_D-	7	GND
3	USB1_D+	8	USB1_SSTX-
4	GND	9	USB1_SSTX+
5	USB1_SSRX-		

2.4.4 HDMI1 Port (CN5)



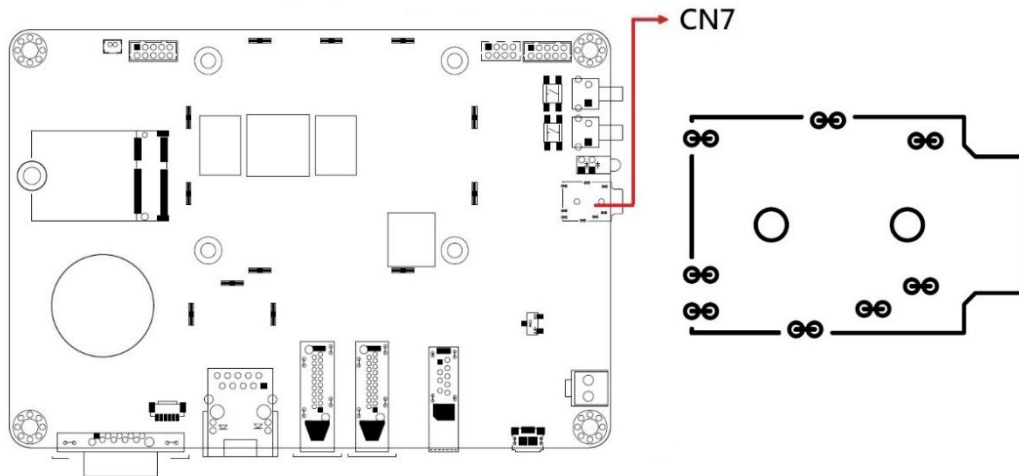
Pin	Signal Name	Pin	Signal Name
1	HDMITX0_CH2_P	11	GND
2	GND	12	HDMITX0_CLK_M
3	HDMITX0_CH2_M	13	HDMITX0_CEC
4	HDMITX0_CH1_P	14	NC
5	GND	15	TX0_DDCSCL
6	HDMITX0_CH1_M	16	TX0_DDCSDA
7	HDMITX0_CH0_P	17	GND
8	GND	18	HDMITX0_5V
9	HDMITX0_CH0_M	19	HDMITX0_HPD
10	HDMITX0_CLK_P		

2.4.5 HDMI2 Port (CN6)



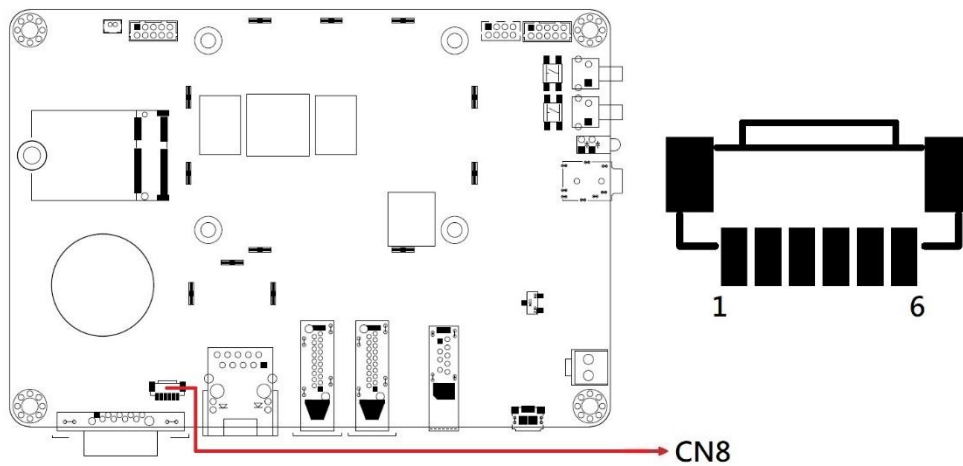
Pin	Signal Name	Pin	Signal Name
1	HDMITX1_CH2_P	11	GND
2	GND	12	HDMITX1_CLK_M
3	HDMITX1_CH2_M	13	HDMITX1_CEC
4	HDMITX1_CH1_P	14	NC
5	GND	15	TX1_DDCSCL
6	HDMITX1_CH1_M	16	TX1_DDCSDA
7	HDMITX1_CH0_P	17	GND
8	GND	18	HDMITX1_5V
9	HDMITX1_CH0_M	19	HDMITX1_HPD
10	HDMITX1_CLK_P		

2.4.6 Audio Jack (Headphone-out) (CN7)



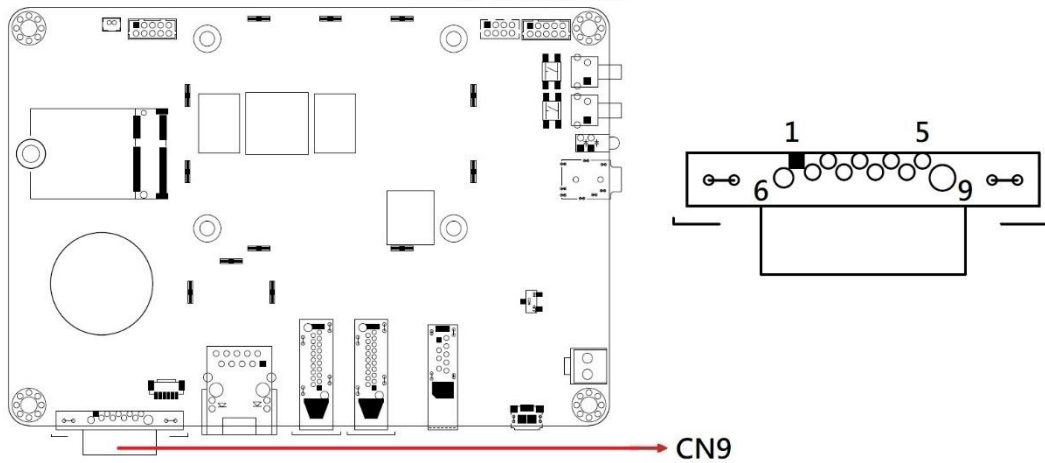
Pin	Signal Name	Pin	Signal Name
1	NC	4	HP_R
2	HP_L	5	HP_EINT_
3	HP_REFN	6	HP_REFN

2.4.7 Debug Connector (RS-232, 2-wire) (CN8)



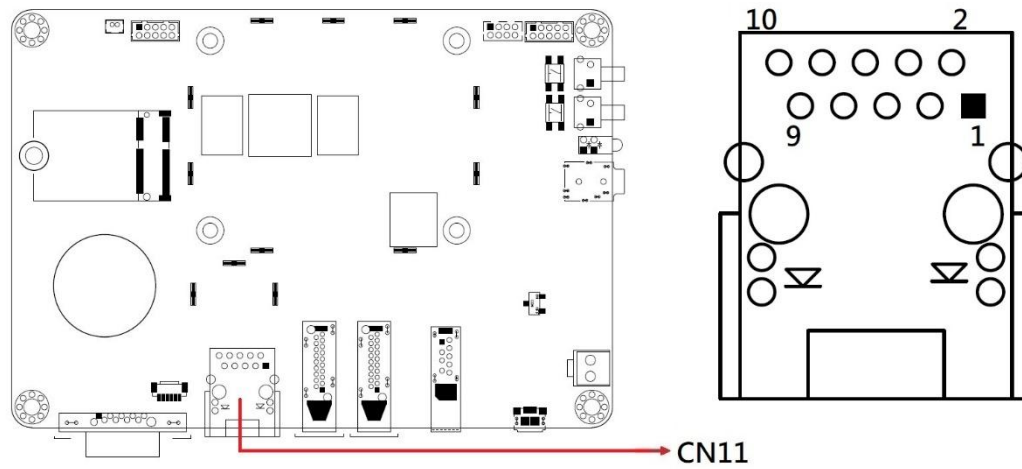
Pin	Signal Name	Pin	Signal Name
1	RS232_0_TXD_DEBUG	4	NC
2	RS232_0_RXD_DEBUG	5	NC
3	GND	6	GND

2.4.8 COM Port (RS-232, 2-wire) (CN9)



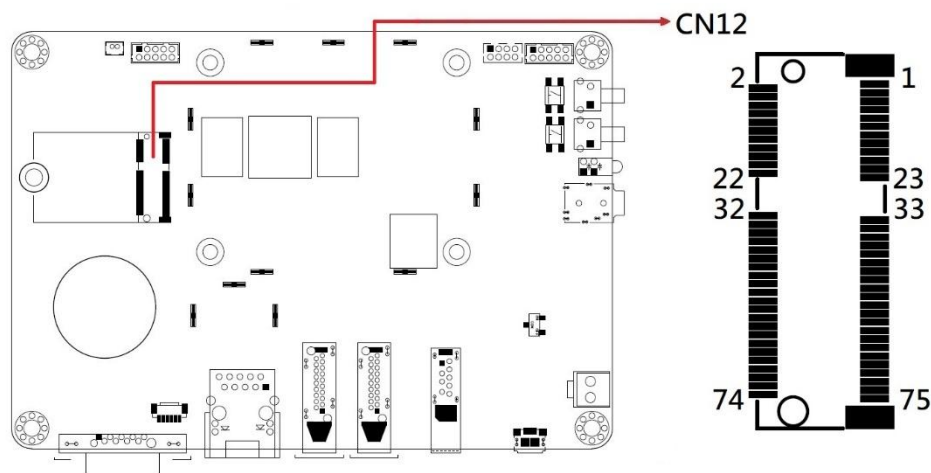
Pin	Signal Name	Pin	Signal Name
1	NC	6	NC
2	RS232_1_RXD	7	NC
3	RS232_1_TXD	8	NC
4	NC	9	NC
5	GND		

2.4.9 GbE Port (RJ45) (CN11)



Pin	Signal Name	Pin	Signal Name
1	GND	2	MDI_3-
3	MDI_3+	4	MDI_1-
5	MDI_2-	6	MDI_2+
7	MDI_1+	8	MDI_0-
9	MDI_0+	10	LAN_CT

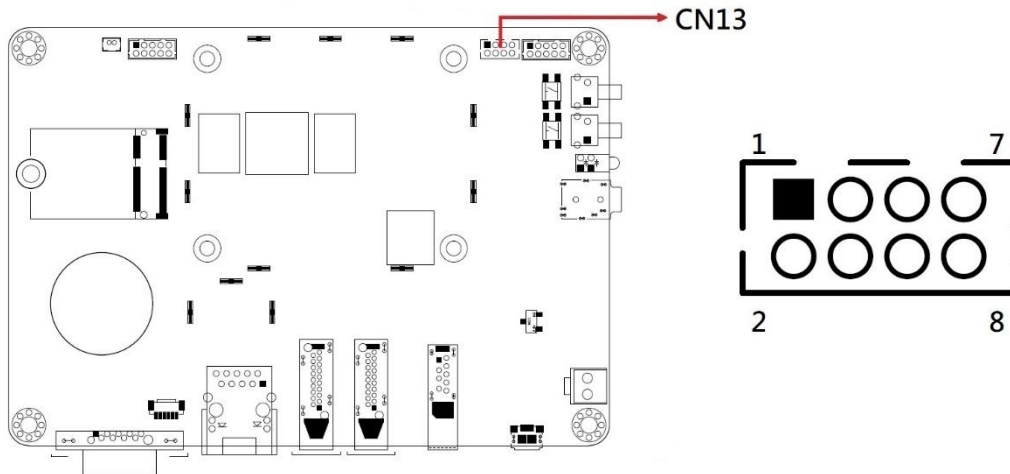
2.4.10 M.2 (E2230, USB 2.0, PCIe Gen2 x1) (CN12)



Pin	Signal Name	Pin	Signal Name
2	WIFI_3.3V	1	GND
4	WIFI_3.3V	3	USB_DP_P2
6	LED_WLAN_L	5	USB_DM_P2

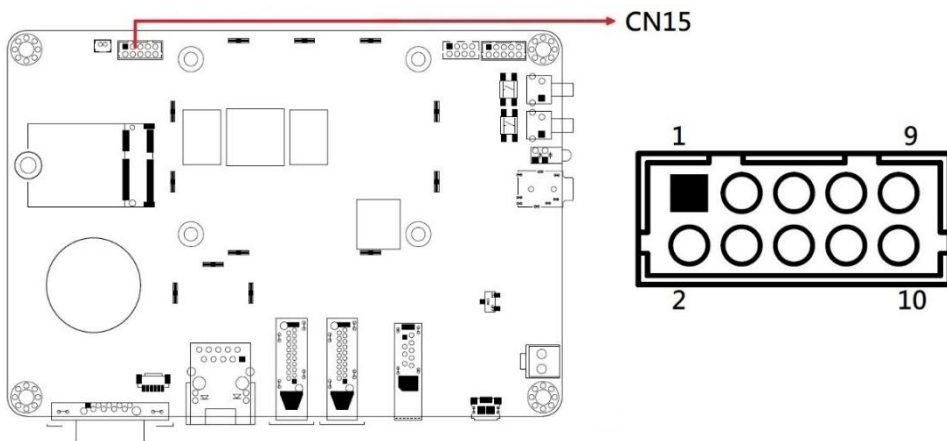
8	NC	7	GND
10	NC	9	NC
12	NC	11	NC
14	NC	13	NC
16	LED_BT_L	15	NC
18	GND	17	NC
20	NC	19	NC
22	NC	21	NC
		23	NC
Pin	Signal Name	Pin	Signal Name
32	NC	33	GND
34	NC	35	PCIEG2_LN0_TXP_
36	NC	37	PCIEG2_LN0_TXN_
38	NC	39	GND
40	NC	41	PCIEG2_LN0_RXP
42	NC	43	PCIEG2_LN0_RXN
44	NC	45	GND
46	NC	47	PCIEG2_CLK_P
48	NC	49	PCIEG2_CLK_N
50	NC	51	GND
52	WIFI1_PERESET_N_3V3	53	WIFI1_CLKREQ0_3V3
54	WIFI1_BT_DISABLE#_3V3	55	WIFI1_PEWAKE#_3V3
56	WIFI1_WF_DISABLE#_3V3	57	GND
58	NC	59	NC
60	NC	61	NC
62	NC	63	GND
64	NC	65	NC
66	NC	67	NC
68	NC	69	GND
70	NC	71	NC
72	WIFI_3.3V	73	NC
74	WIFI_3.3V	75	GND

2.4.11 GPIO Connector (3 In, 3 out, 3.3V @ 1A) (CN13)



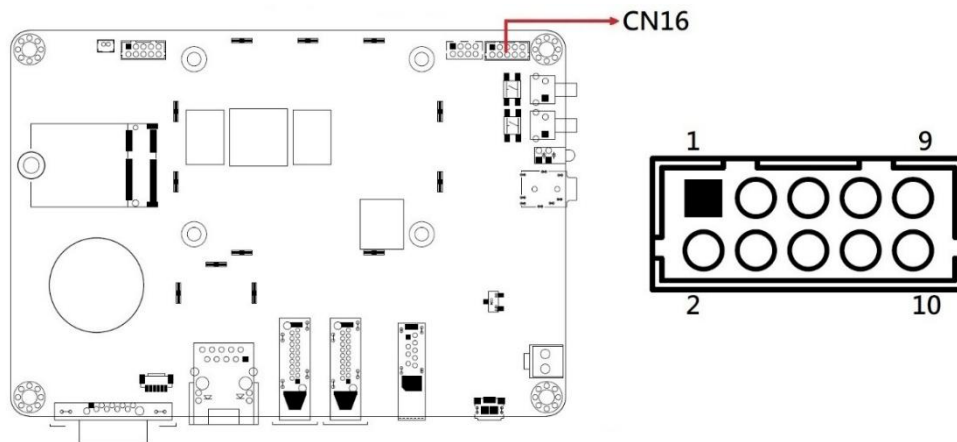
Pin	Signal Name	Pin	Signal Name
1	GND	2	EXT1_3V3
3	GPIO78_3V3	4	GPIO77_3V3
5	GPIO69_3V3	6	GPIO73_3V3
7	GPIO72_3V3	8	GPIO71_3V3

2.4.12 I²C Connector (CN15)



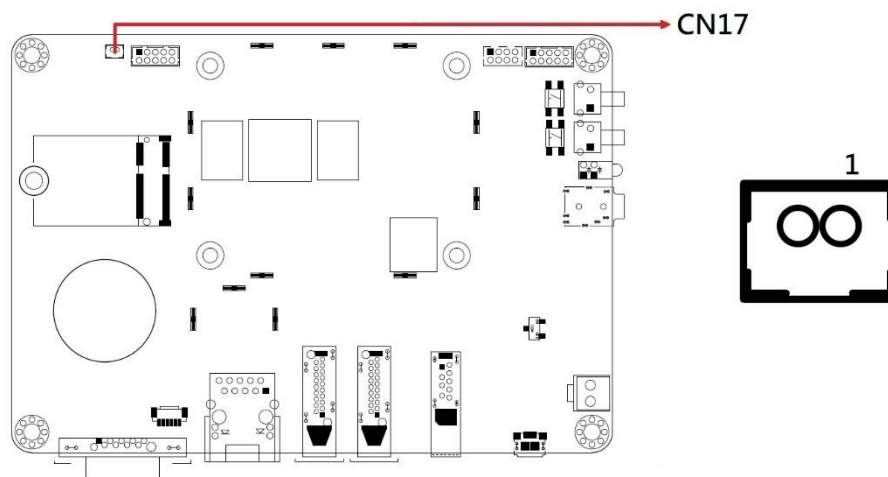
Pin	Signal Name	Pin	Signal Name
1	GND	2	EXT2_3V3
3	GND	4	NC
5	GND	6	NC
7	GND	8	SCL0_3V3
9	GND	10	SDA0_3V3

2.4.13 SPI Connector (4-wire) (CN16)



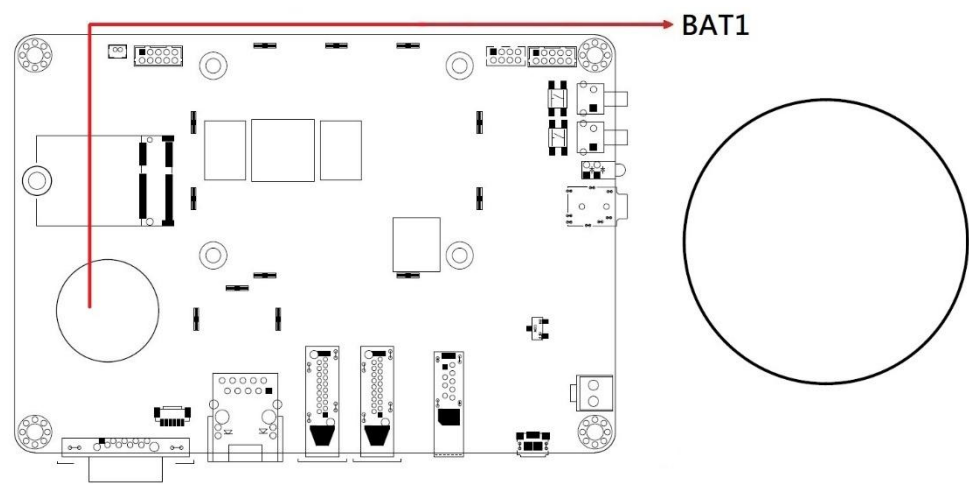
Pin	Signal Name	Pin	Signal Name
1	GND	2	EXT1_3V3
3	GND	4	SPI_CK_3V3
5	GND	6	SPI_CS_3V3
7	GND	8	SPI_MO_3V3
9	GND	10	SPI_MI_3V3

2.4.14 RTC Battery Connector (CN17)



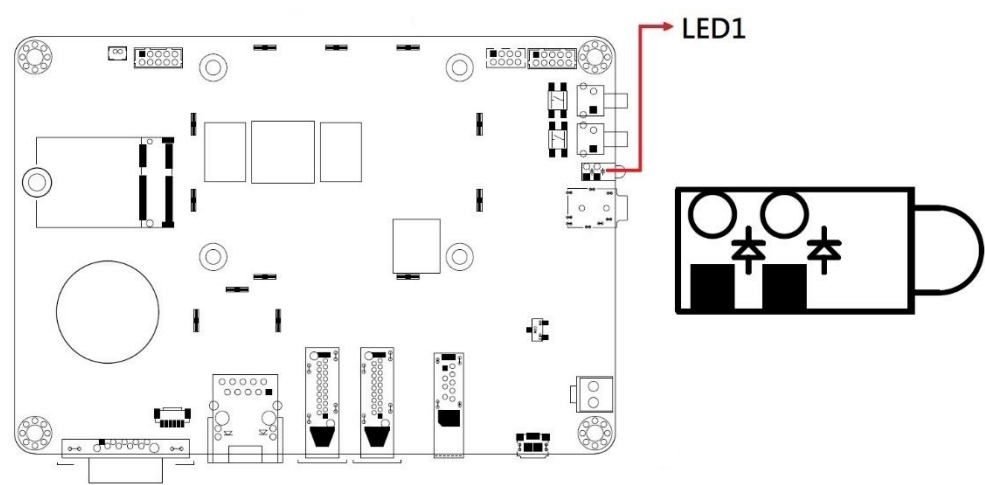
Pin	Signal Name	Pin	Signal Name
1	BAT_3V0	2	GND

2.4.15 RTC Battery (BAT1)



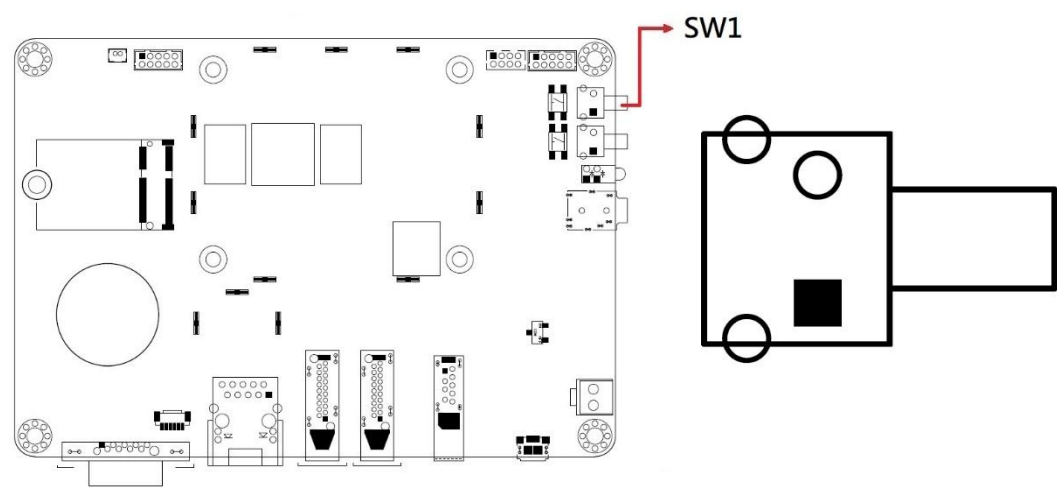
Function	Action
Battery Location	Mount RTC Battery On BAT1

2.4.16 Power LED (LED1)



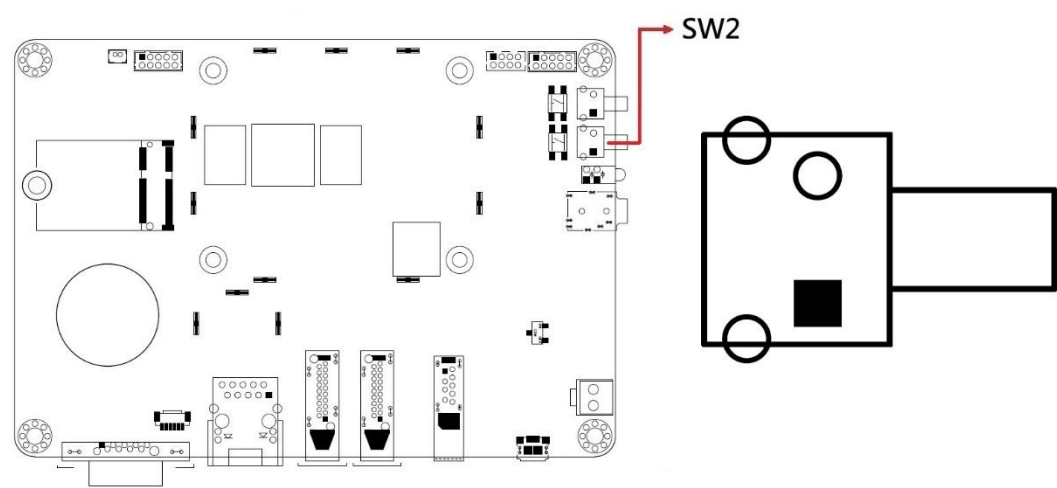
Pin	Signal Name	Pin	Signal Name
1	VSYS_4V2	2	PWR_LED_Red
3	VSYS_4V2	4	PWR_LED_Green

2.4.17 Reset Button (SW1)



Function	Action
Normal (default)	Release SW1
Reset	Press SW1

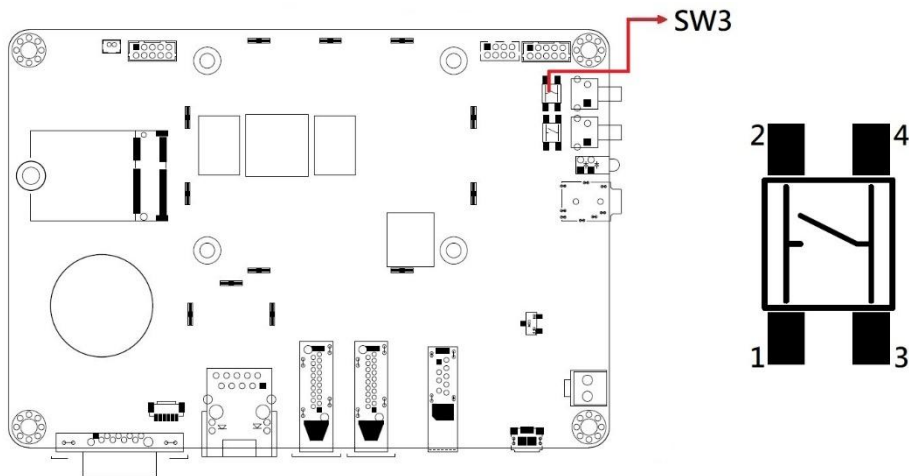
2.4.18 Power Button (SW2)



Function	Action
PWR Off (default)	Release SW2
PWR On	Press SW2 (Keep pressed 4~5 Second)

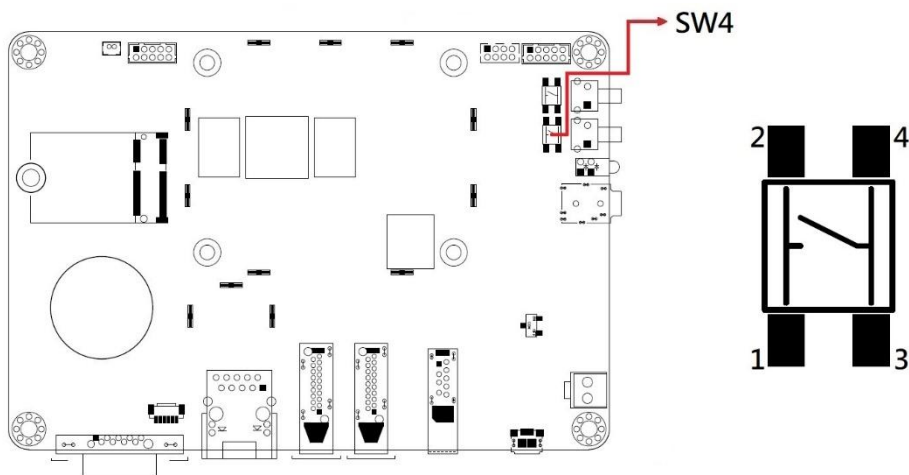
* The photos above are for reference only. Some minor components may differ.

2.4.19 DL Button (Down Load) (SW3)



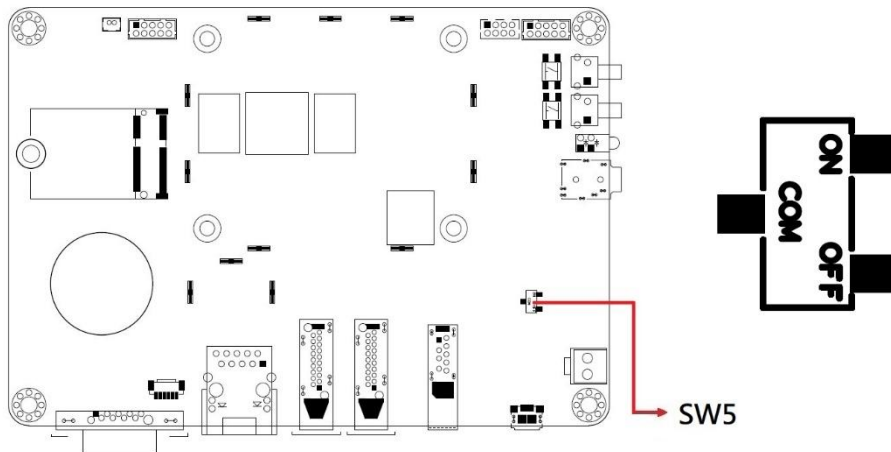
Function	Action
Normal (default)	Release SW3
Down Load	Press SW3 (Keep 4~5 Second)
VOL +	Press SW3

2.4.20 Home Button (SW4)



Function	Action
Normal (default)	Release SW4
VOL -	Press SW4

2.4.21 Auto-Power On Switch (SW5)



Function	Action
Auto PWR Off (default)	Slide SW5 to OFF
Auto PWR On	Slide SW5 to ON

Chapter 3

Software Setup

The IBR500 supports both Android and Ubuntu BSP. When placing an order, please inform the responsible sales representative whether you require Android or Ubuntu BSP pre-installed. The BSP provided by IBASE is intended for advanced users to develop their own systems. Any related commercial licenses must be obtained directly by the user from Google and Canonical. IBASE does not provide application development under either operating system.

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Chapter 4

BSP Source Guide

This chapter is intended for advanced software engineers to build BSP source code.

4.1 BSP version (Board Support Package)

Note: This is for advanced users who have IBASE standard image file only.

Android version: 14 (U)

Ubuntu version: 22.04.5

Please contact the manufacturer or vendor for the necessary authorization.

Appendix

This chapter contains the following information:

- Onboard Connector Types



A. Onboard Connector Types

Function	Connector	Onboard Type	Compatible Mating Type (for reference)
DC-in Jack	CN1	HAOGUO WAFER396-2S-WV	-
USB 2.0 Port (Micro-B, OTG)	CN2	TYCO 2013499-1	-
USB 3.0 Port	CN3	FOXCONN UEA3119C-4FB1-4H	-
HDMI1 Port	CN5	FOXCONN QJ3119C-WFB1-4F	-
HDMI2 Port	CN6	FOXCONN QJ3119C-WFB1-4F	-
Audio Jack (Headphone-out)	CN7	TECHBEST PJD-035-179ABF-R	-
Debug Connector (RS-232, 2-wire)	CN8	TECHBEST WT02M-30002-06132	-
COM Port (RS-232, 2-wire)	CN9	TECHBEST TCNDSM02G-GX09F260-T	-
GbE Port (RJ45)	CN11	UDE 24-31071M443-5	-
M.2 (E2230, USB 2.0, PCIe Gen2 x1)	CN12	DEREN 40-42280-06741RHF	-
GPIO Connector (3 In, 3 out, 3.3V @ 1A)	CN13	HAOGUO DF11-8S-PA66H	-
I ² C Connector	CN15	TECHBEST 2005-2WS-10-LF	-
SPI Connector (4-wire)	CN16	TECHBEST 2005-2WS-10-LF	-
RTC Battery Connector	CN17	TECHBEST WT04M-10003-02012	MOLEX 53047-0210

Connector types may be subject to change without prior notice.