

USER'S MANUAL

BCO-500-RK3568J

Fanless Mini Industrial Computer



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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2025/07/29

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. C&T Solution Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of C&T Solution Inc.

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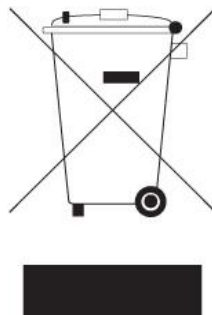
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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.



Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid the dusty, humidity and temperature extremes.
- Do not place heavy objects on the equipment.
- If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -40°C and below 85°C.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- If one of the following situation arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well or it cannot work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.

Technical Support and Assistance

1. Visit the C&T Solution Inc website at www.candtsolution.com where you can find the latest information about the product.
2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:
 - Model name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Conventions Used in this Manual



WARNING

This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.



CAUTION

This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.



NOTE

This indication provides additional information to complete a task easily.

Package Contents

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	BCO-500-RK3568J Series Fanless Mini Computer	1
2	Accessory Kit	1

Ordering Information

Model No.	Product Description
BCO-500-RK3568J	Semi-Rugged Fanless Mini Computer with RK3568J Quad-core Cortex-A55, 1x HDMI, 2x USB, 2x LAN, 2x COM, 1x CAN, 60W ADP

Optional Accessories

Model No.	Product Description
1-TPCD00005	Power Cord, 3-pin US Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm
1-TPCD00003	Power Cord, Japan Type, 180cm
3-BC5AD110S10-S0	Din Rail Mounting Kit
3-BC5AD020S10-S0	M.2 B KEY Thermal Kit

Chapter 1

Product Introductions

1.1 Overview

C&T Fanless Mini industrial computer are designed for entry-level applications and basic needs. The BCO series can oversee connected devices and manage the collection, storage, and transmission of sensor data, and is capable of distilling unexplored value in data. It is not only robust and can withstand dust, shock, and vibration, but also can suitable for industrial automation, industrial control, kiosk & retail, and digital signage (without high demand in graphics).



Key Features

- Supports Rockchip RK3568J ARM Quad Cortex-A55, up to 2.0 GHz
- LPDDR4 2133MHz 4 GB
- 64GB of eMMC for OS
- 1x M.2 B-Key, 1x M.2 E-Key
- 2x RS-232/422/485, 2x USB 3.0 Type A, 2x LAN
- 4K Independent Display by 1x HDMI
- Wide Operating Temperature: -40°C to 70°C
- Power Input: 12 to 24VDC
- Android 13/Debian 11/Ubuntu 22.04
- UL 61010-1, UL 61010-2-201, CE, FCC Class A, UKCA, IC

1.2 Hardware Specification

System

Processor

- Rockchip RK3568J ARM Quad Cortex-A55, up to 2.0 GHz

System Chipset

SoC integrated

LAN Chipset

GbE1/2: RTL8211FDI 10/100/1000 Mbps

System Memory

LPDDR4 2133MHz 4 GB

Graphics

Mali-G52 support OpenGL ES 1.1/2.0/3.2, Vulkan 1.0/1.1, OpenCL 2.0

Display

HDMI

1 x HDMI Max. resolution 4096 x 2160 @60Hz

I/O

CAN

1x CAN

COM

2x RS-232/422/485

LAN

2x GbE RJ45 (10/100/1000 Mbps)

USB

2x USB 3.0 Type A

Audio

1x Line-out

DC-in Jack

1x DC IN Power Jack with Lock

Others

6x Antenna Holes
1x Power Switch with LED

Storage

eMMC

64GB

Expansion

M.2

1x M.2 B Key (3042, USB2.0) support 4G/LTE
1x M.2 E Key (2230, USB 2.0) for Wi-Fi/Bluetooth

Internal I/O

USB

2x USB 2.0

Others

1x Micro SD Slot
1x SIM Nano Socket

Operating System

Linux

Debian 11
Ubuntu 22.04

Android

Android 13

Power

Power Adapter

AC/DC 12V/5A, 60W

Power Mode

AT/ATX (Default ATX)

Power Supply Voltage

12~24VDC

Power Connector

DC in Power Jack

Power Protection

OVP (Over Voltage Protection)
OCP (Over Current Protection)
Reverse Protection

Environment

Operating Temp.	-40°C to 70°C
Storage Temp.	-40°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Certification	UL 61010-1, UL 61010-2-201 CE, FCC Class A, UKCA, IC
Vibration	With SSD: 5 Grms (5 - 500 Hz, 0.5 hr/axis)
Shock	With SSD: 50G half-sin 11ms

Physical

Construction	Extruded Aluminum with Heavy Duty Metal
Dimension	225 (W) x 130 (D) x 41 (H) mm
Weights	1.2 KG
Mounting	Wall Mounting Vesa Mounting Din-Rail Mounting (Optional)

*All specifications and photos are subject to change without notice.

1.3 System I/O

BCO-500-RK3568J

Front Panel

USB port

Used to connect USB device

HDMI port

Used to connect a HDMI monitor or connect optional split cable for dual display mode

DC IN

Used to plug a DC power input with terminal Block

LAN port

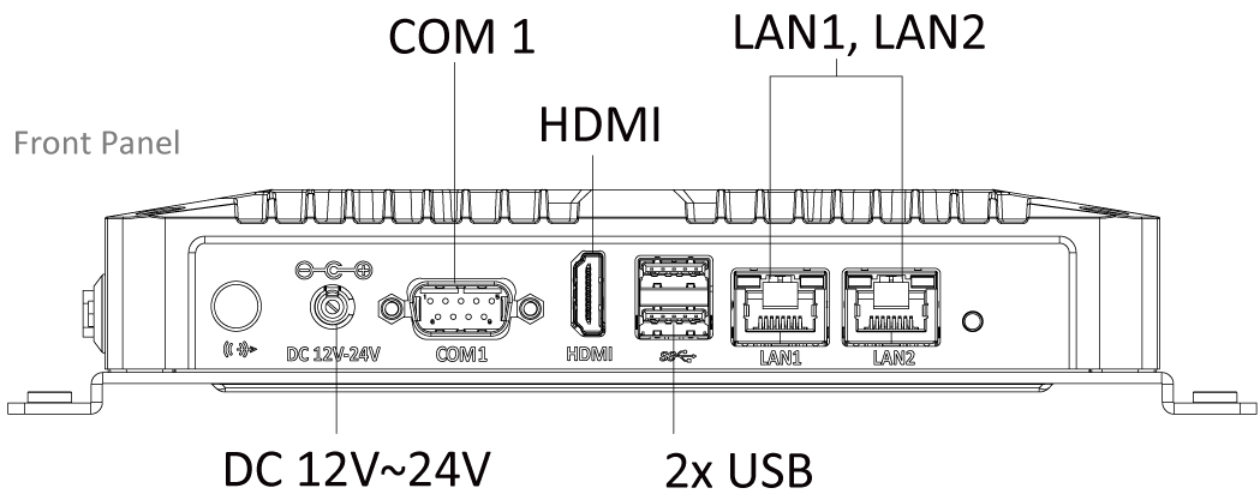
Used to connect the system to a local area network

Line-out

Used to connect a speaker

COM port

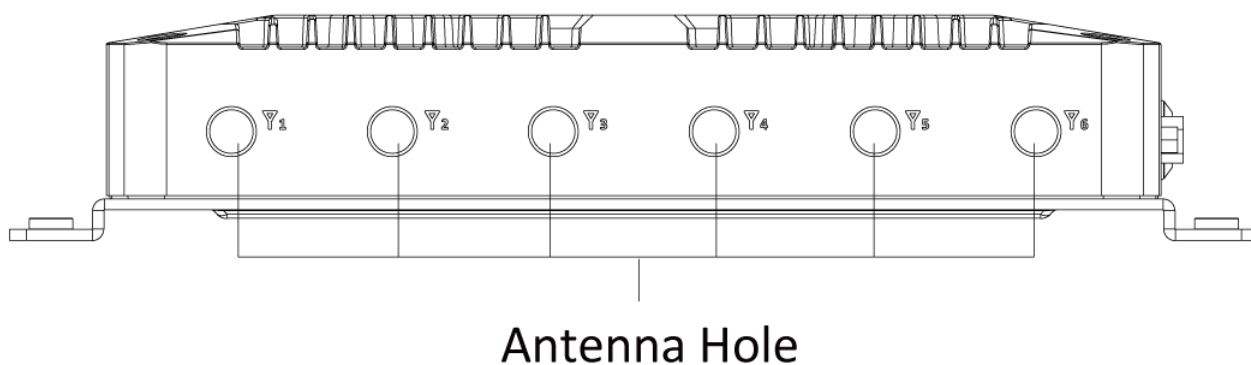
COM1 support RS232/422/485 serial device



BCO-500-RK3568J**Rear Panel****Antenna hole**

Used to connect an antenna for optional Mini-PCIe WiFi module

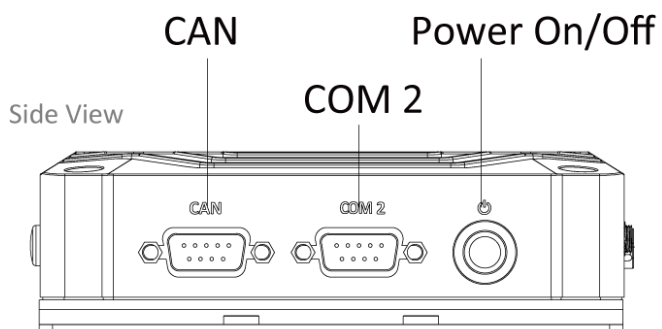
Rear Panel

**Side View****COM port**

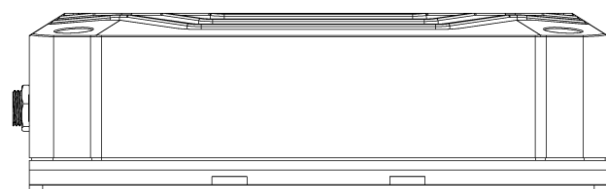
COM2 support RS232/422/485 serial device

Power On/Off

Press to power-on or power-off the system



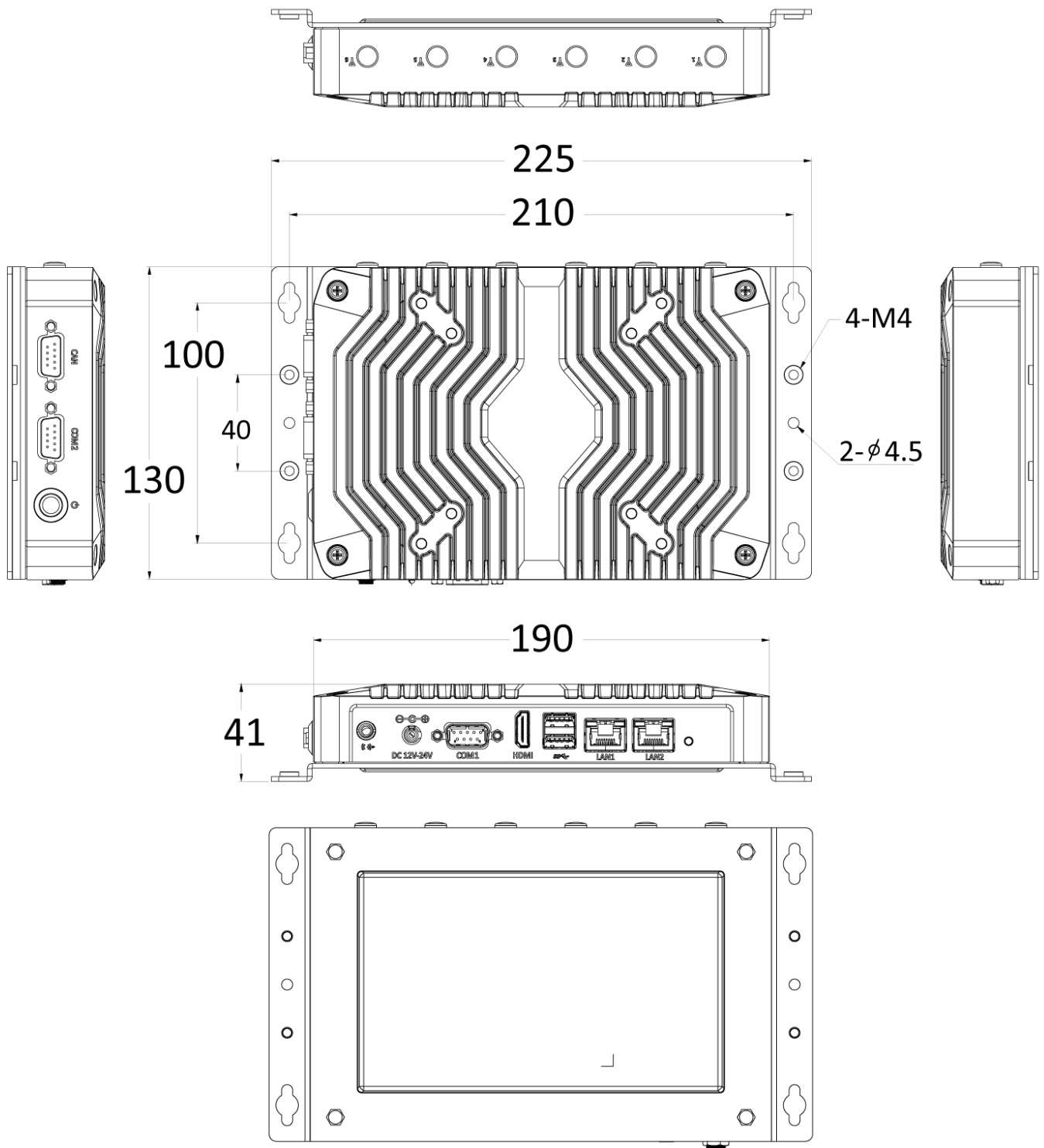
Side View



1.4 Mechanical Dimensions

BCO-500-RK3568J

Unit: mm

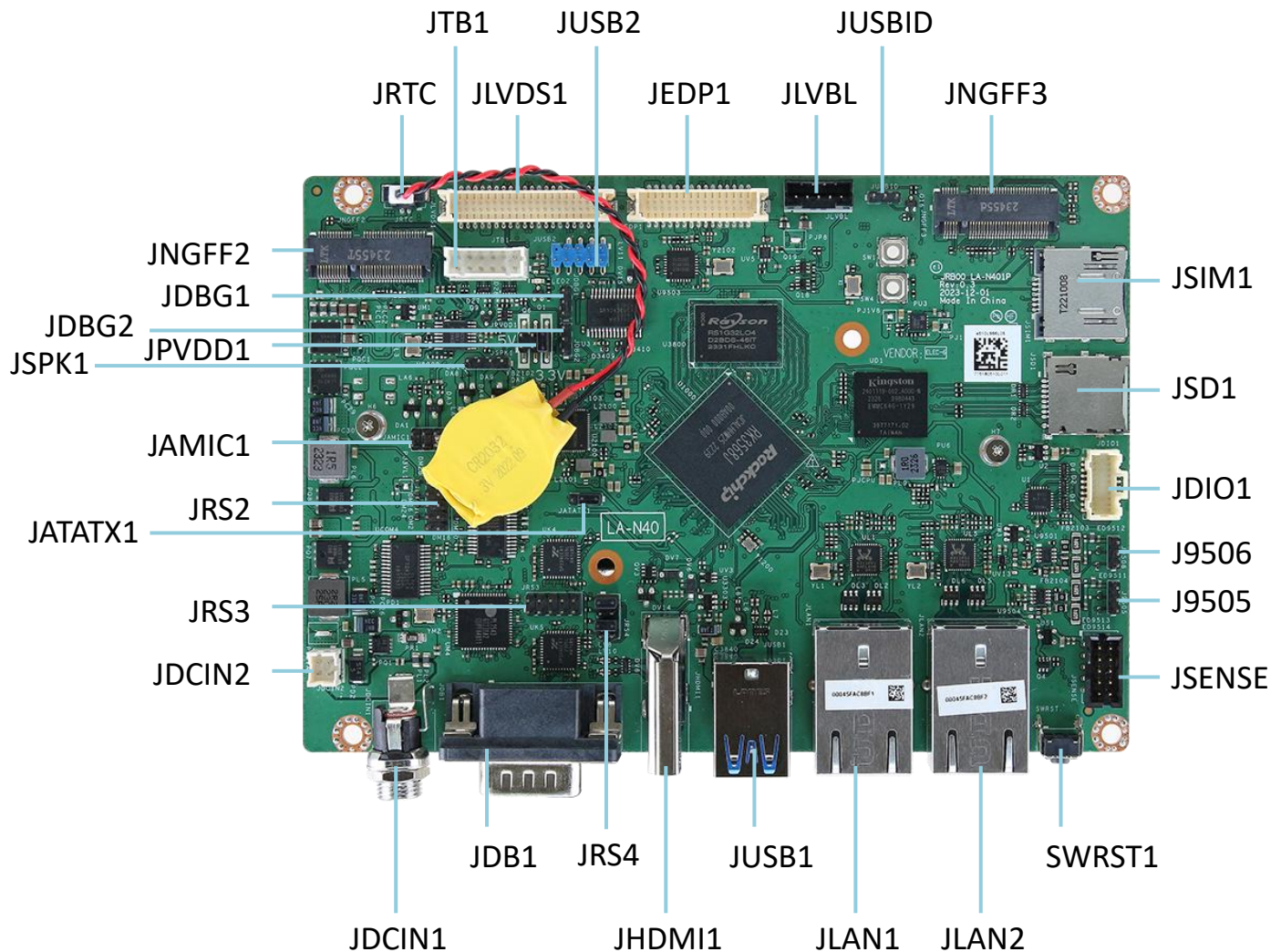


Chapter 2

Mechanical Specifications

2.1 Switch and Connector Locations

2.1.1 TopView



2.2 Component Contents

Jumpers

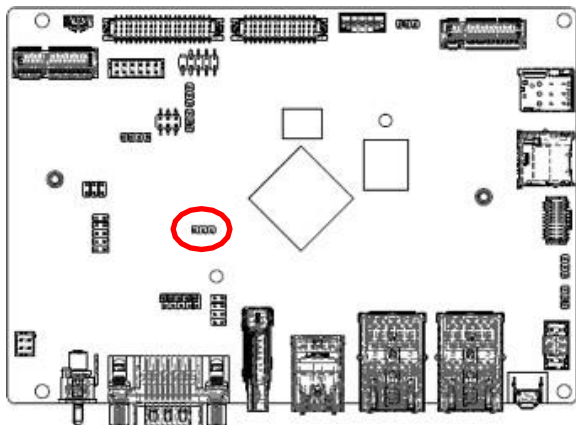
Label	Function
JATATX1	AT/ATX Input power select
JUSBID	JUSBID connector
JPVDD1	JPVDD connector
JRS4	JRS4 connector

Connectors

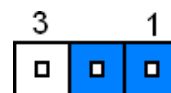
Label	Function
JLVBL	Backlight control interface
JDIO1	General purpose I/O connector
JNGFF2	M.2 KEY-E 2230 connector
JNGFF3	M.2 KEY-B 3042/2242 connector
JLAN1/2	2x RJ-45 Ethernet
JHDMI1	HDMI connector
JDB1	JDB connector
JDCIN1	JDCIN1 connector
JUSB1	2x USB3.0 connector
JUSB2	USB2.0 connector
JAMIC1	JAMIC connector
J9505	J9505 connector
J9506	J9506 connector
JRS2	JRS2 connector
JRS3	JRS3 connector
JSENSE	JSENSE connector
JTB1	JTB connector
JEDP1	eDP interface connector
JLVDS1	LVDS/MIPI connector
JRTC	Battery connector
JDBG1/2	JDBG connector
JSIM1	Nano SIM card slot
JSD1	Micro SD card slot
SWRST	SWRST connector
JSPK1	Speaker connector

2.3 Setting Jumpers & Connectors

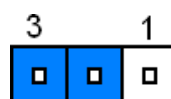
2.3.1 AT/ATX Input power select (JATATX1)



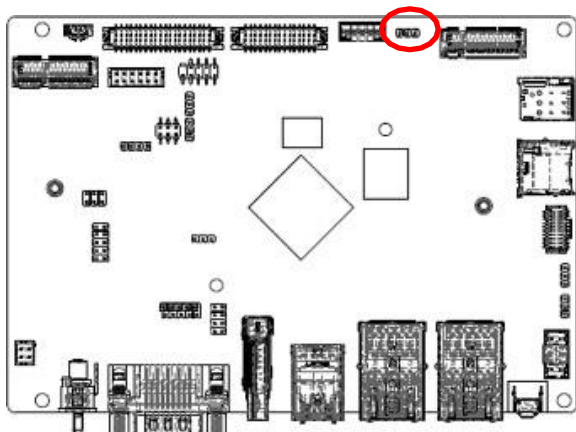
AT*



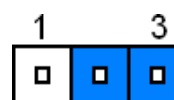
ATX



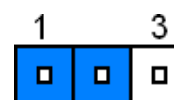
2.3.2 JUSBID connector (JUSBID)



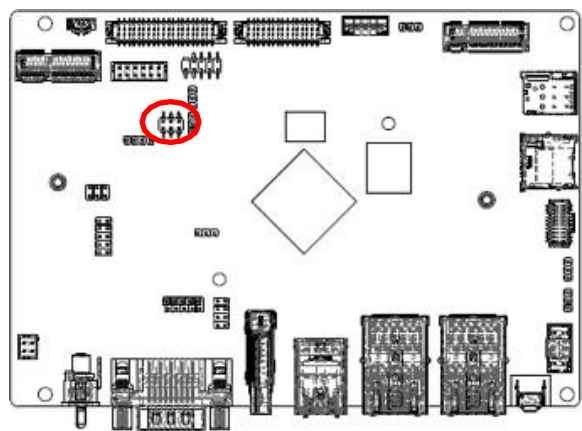
Client Mode



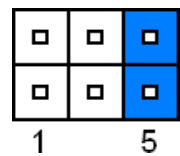
HOST *



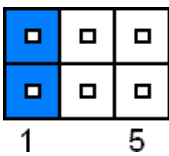
2.3.3 JPVDD connector (JPVDD1)



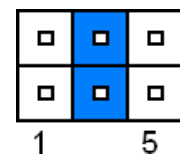
+3VALW*



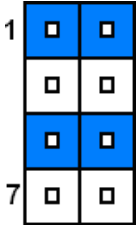
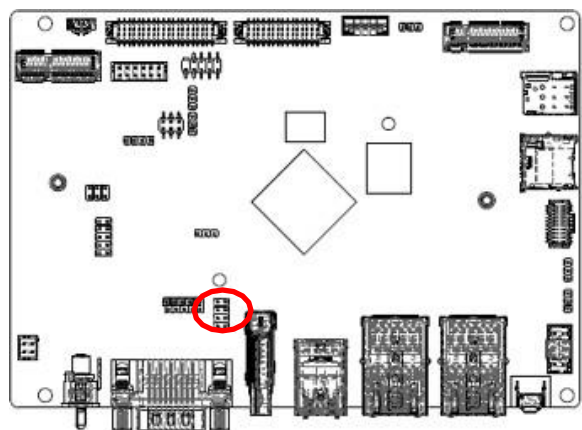
+5VALW



NC

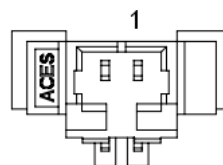
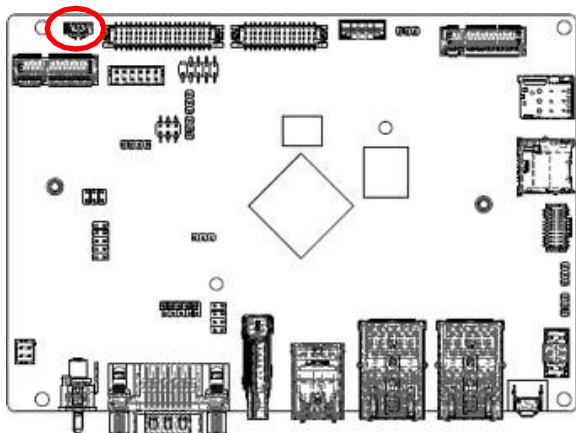


2.3.4 JRS4 connector (JRS4)



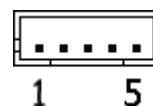
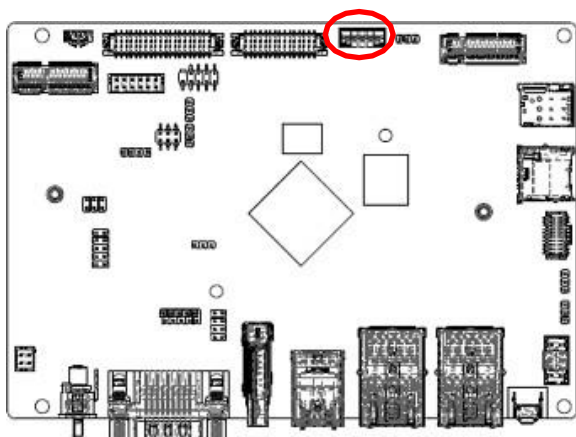
	RS-232		RS-485	RS-422
Mode	01		10	11
COMA	2	(1-2)	(1)	(1-2)
JDB1	4	(3)	(3-4)	(3-4)
COMB	6	(5-6)	(5)	(5-6)
JRS3	8	(7)	(7-8)	(7-8)

2.3.5 Battery connector (JRTC)



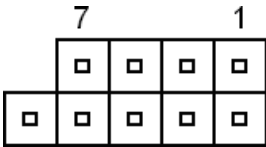
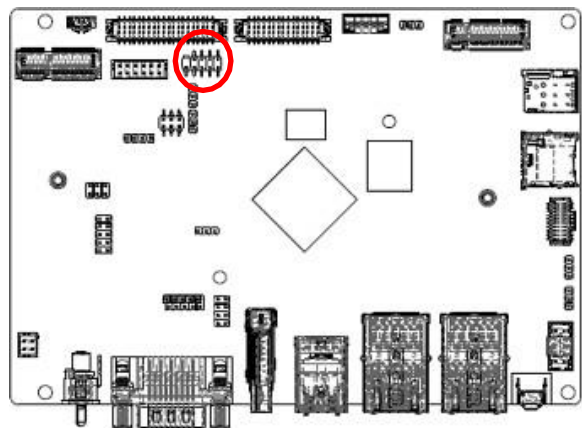
Signal	PIN
+RTCBATT	1
GND	2

2.3.6 Backlight control interface connector (JLVBL)



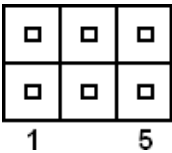
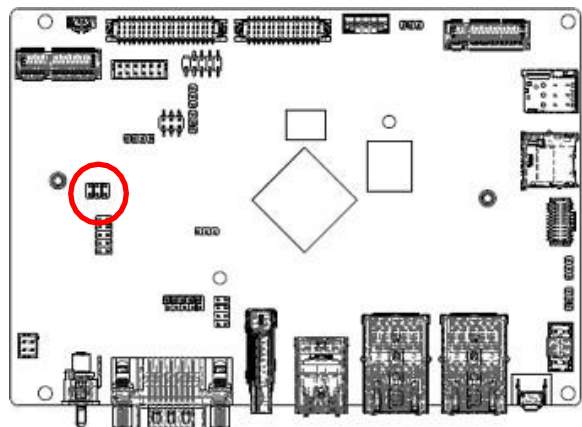
Signal	PIN
+12V_BL	1
+12V_BL	2
EN_BL	3
PWM_BL	4
GND	5

2.3.7 USB2.0 connector (JUSB2)



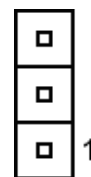
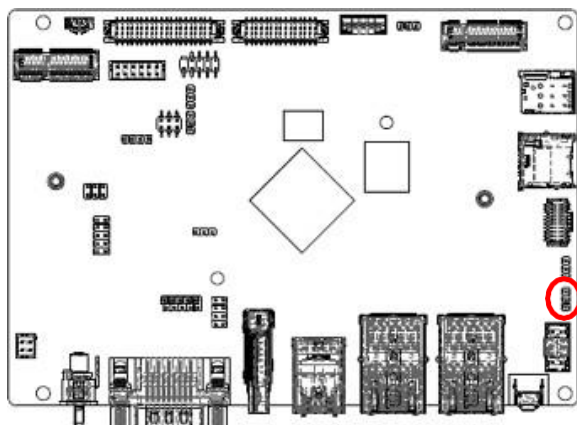
Signal	PIN	PIN	Signal
+USB_5V_TS	1	2	+USB_5V_TS
USB2_HUB3_DM_R	3	4	USB2_HUB4_DM_R
USB2_HUB3_DP_R	5	6	USB2_HUB4_DP_R
GND	7	8	GND
		10	GND

2.3.8 JAMIC connector (JAMIC1)



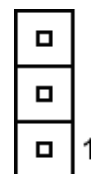
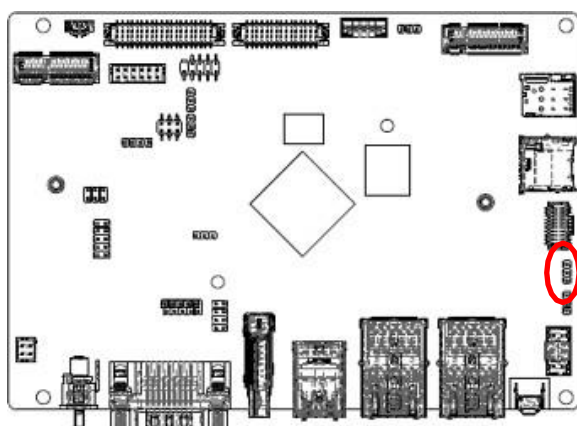
Signal	PIN	PIN	Signal
HP_RIGHT_R	1	2	HEAD_DET#_R
HP_LEFT_R	3	4	MIC1_INP
GND	5	6	MIC_JD#

2.3.9 J9505 connector (J9505)



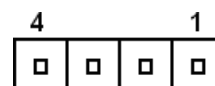
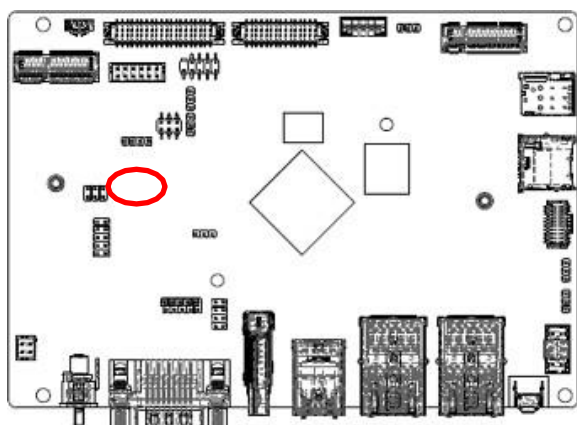
Signal	PIN
CAN1_VSS	3
CAN1_L	2
CAN1_H	1

2.3.10 J9506 connector (J9506)



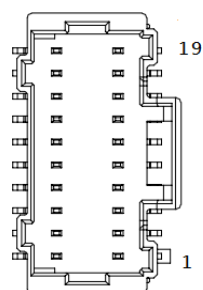
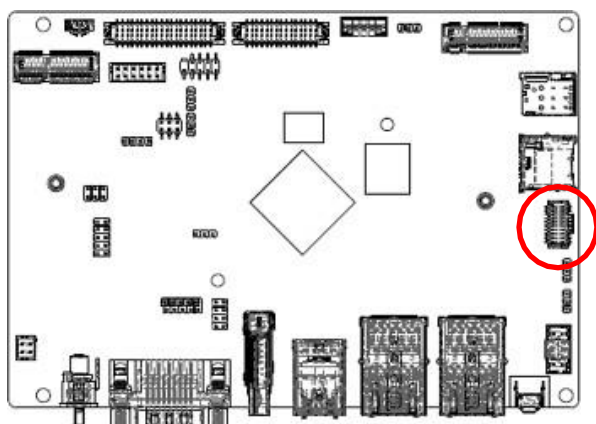
Signal	PIN
CAN_VSS	3
CANL	2
CANH	1

2.3.11 Speaker connector (JSPK1)



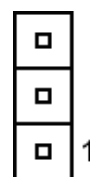
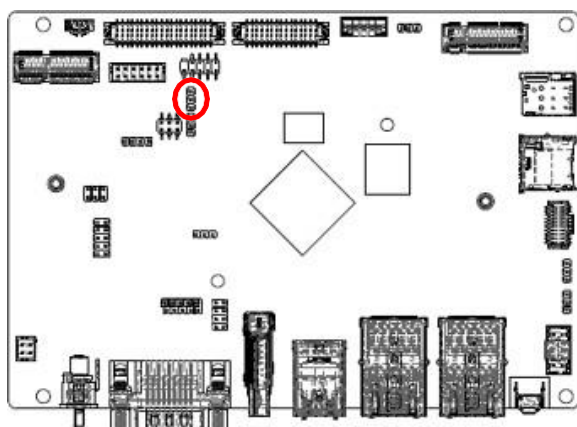
Signal	PIN
SPK_L+	1
SPK_L-	2
SPK_R+	3
SPK_R-	4

2.3.12 General purpose I/O connector (JDIO1)



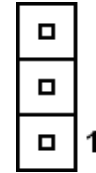
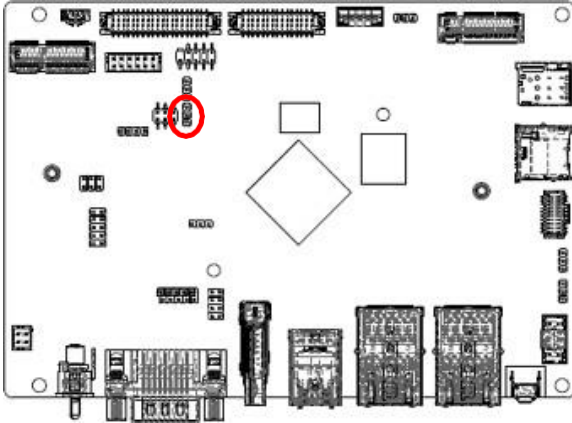
Signal	PIN	PIN	Signal
GND	20	19	+V5S_DIO
I2C_3_LV_SCL	18	17	I2C_3_LV_SDA
DIO_GP27	16	15	DIO_GP17
DIO_GP26	14	13	DIO_GP16
DIO_GP25	12	11	DIO_GP15
DIO_GP24	10	9	DIO_GP14
DIO_GP23	8	7	DIO_GP13
DIO_GP22	6	5	DIO_GP12
DIO_GP21	4	3	DIO_GP11
DIO_GP20	2	1	DIO_GP10

2.3.13 JDBG connector (JDBG1)



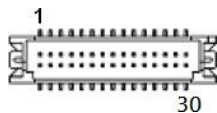
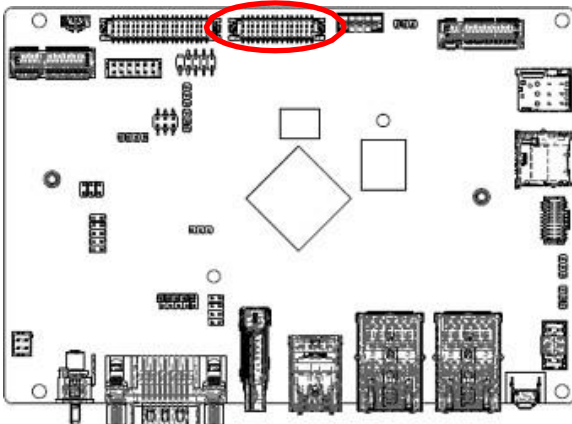
Signal	PIN
GND	3
DEBUG_RX2_CON	2
DEBUG_TX2_CON	1

2.3.14 JDBG connector (JDBG2)



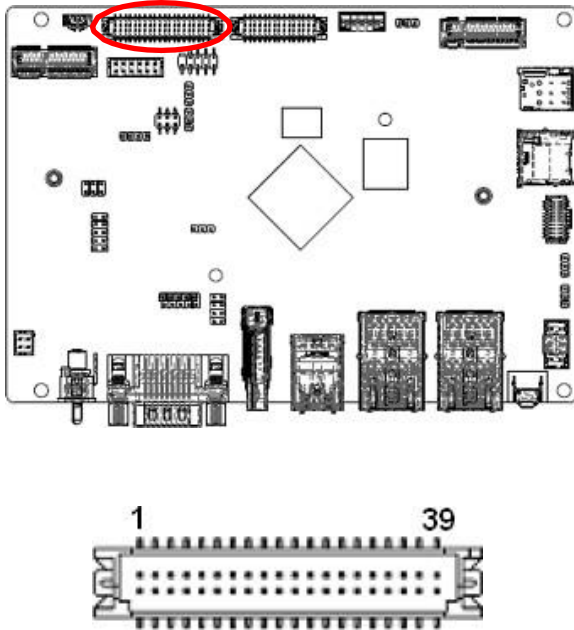
Signal	PIN
GND	3
RS232_RX3	2
RS232_TX3	1

2.3.15 eDP interface connector (JEDP1)



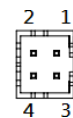
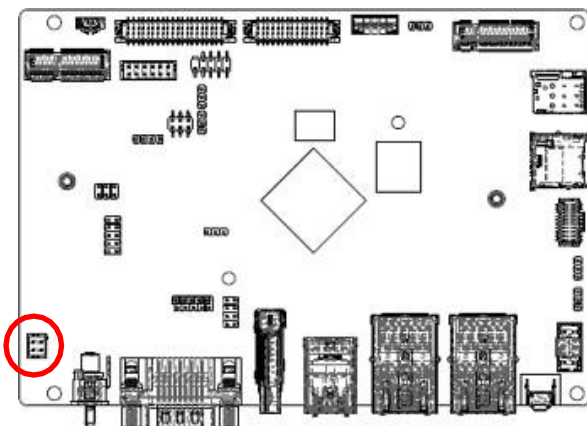
Signal	PIN	PIN	Signal
+12V_BL	2	1	+12V_BL
+12V_BL	4	3	+12V_BL
GND	6	5	GND
GND	8	7	GND
+PANEL_VDD	10	9	EDP_TX_D0P
+PANEL_VDD	12	11	EDP_TX_D0N
GND	14	13	GND
GND	16	15	EDP_TX_D1P
EDP_TX_AUXN	18	17	EDP_TX_D1N
EDP_TX_AUXP	20	19	GND
GND	22	21	EDP_HPD
GND	24	23	LCM_BL_EN_33V
GND	26	25	CPU_eDP_PWM_33V
GND	28	27	GND
GND	30	29	GND

2.3.16 LVDS connector (JLVDS1)



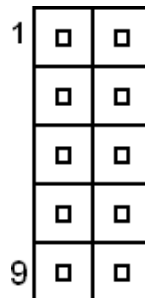
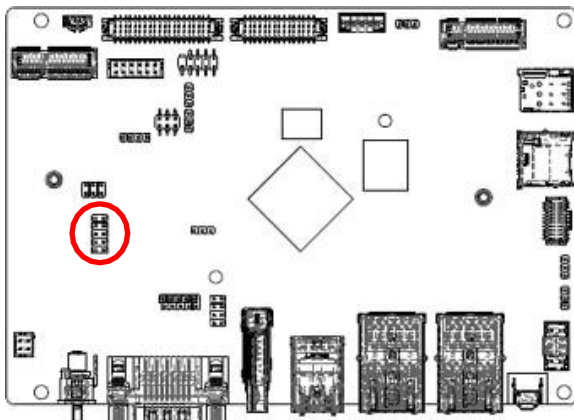
Signal	PIN	PIN	Signal
DSI_RESET#_3V3	2	1	+PANEL_VDD
7_10_BL	4	3	+PANEL_VDD
GND	6	5	GND
+PANEL_LEDK-	8	7	+PANEL_LED A
+PANEL_LEDK-	10	9	+PANEL_LED A
GND	12	11	GND
MIPI_DSI_TX1_D0N	14	13	MIPI_DSI_TX0_D0N
MIPI_DSI_TX1_D0P	16	15	MIPI_DSI_TX0_D0P
GND	18	17	GND
MIPI_DSI_TX1_D1N	20	19	MIPI_DSI_TX0_D1N
MIPI_DSI_TX1_D1P	22	21	MIPI_DSI_TX0_D1P
GND	24	23	GND
MIPI_DSI_TX1_CLKN	26	25	MIPI_DSI_TX0_CLKN
MIPI_DSI_TX1_CLKP	28	27	MIPI_DSI_TX0_CLKP
GND	30	29	GND
MIPI_DSI_TX1_D2N	32	31	MIPI_DSI_TX0_D2N
MIPI_DSI_TX1_D2P	34	33	MIPI_DSI_TX0_D2P
GND	36	35	GND
MIPI_DSI_TX1_D3N	38	37	MIPI_DSI_TX0_D3N
MIPI_DSI_TX1_D3P	40	39	MIPI_DSI_TX0_D3P

2.3.17 JDCIN connector (JDCIN2)



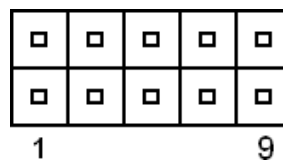
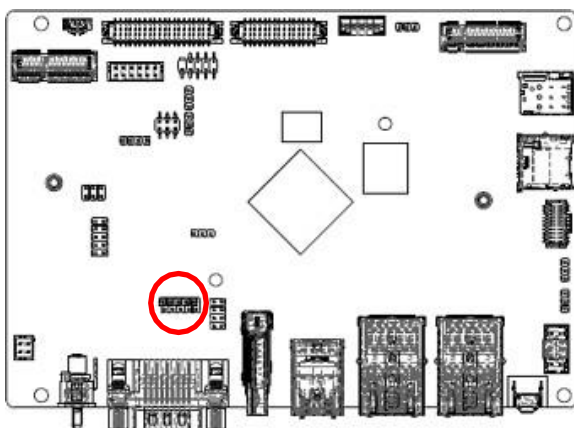
Signal	PIN	PIN	Signal
GND	2	1	+24V_ADP
GND	4	3	+24V_ADP

2.3.18 JRS connector (JRS2)



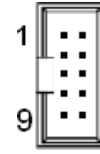
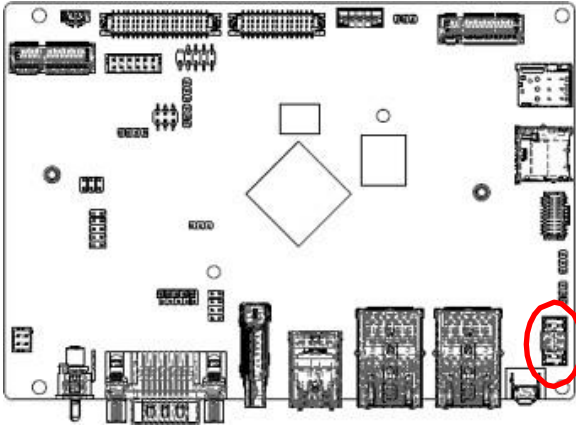
Signal	PIN	PIN	Signal
COM4_RXD	1	2	COM3_RXD
COM4_TXD	3	4	COM3_TXD
COM4_RTS	5	6	COM3_RTS
COM4_CTS	7	8	COM3_CTS
GND	9	10	GND

2.3.19 JRS connector (JRS3)



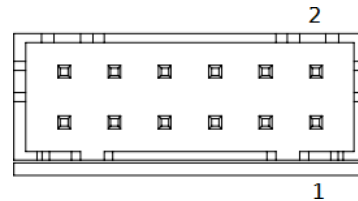
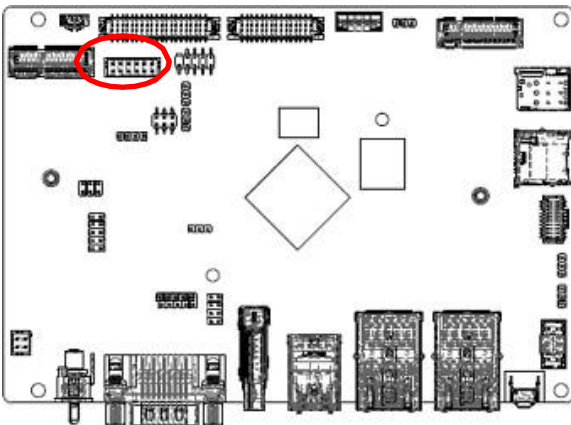
Signal	PIN	PIN	Signal
RXD_B	1	2	DCD#_B
TXD_B	3	4	DTR#_B
RTS#_B	5	6	N/A
CTS#_B	7	8	N/A
GND	9	10	N/A

2.3.20 JSENSE connector (JSENSE)



Signal	PIN	PIN	Signal
+3VS_SEN_CONN	1	2	+3VS_SEN_CONN
I2C3_SCL_3.3V_CONN	3	4	I2C5_SCL_3.3V_CONN
I2C3_SDA_3.3V_CONN	5	6	I2C5_SDA_3.3V_CONN
SENSE0_IRQ_R	7	8	SENSE2_IRQ_R
GND	9	10	GND

2.3.21 JTB connector (JTB1)



Signal	PIN	PIN	Signal
GND	2	1	+PWR_JTB1 (+5VALW)
BU1_TV_3V	4	3	LINUX_SW
VOL_DOWN_3V	6	5	VOL_UP_3V
BU_BR+_3V	8	7	PWRBTN_3V
BU7_3V	10	9	BU_BR-_3V
LED_ORANGE_R	12	11	LED_GREEN_R

Chapter 3

System Setup

Set torque force to 3.5 kgf-cm to execute all the screwing and unscrewing.

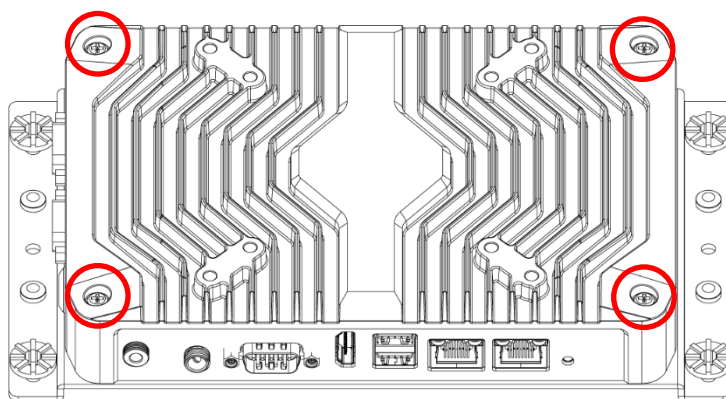
3.1 Replacement of Internal Modules



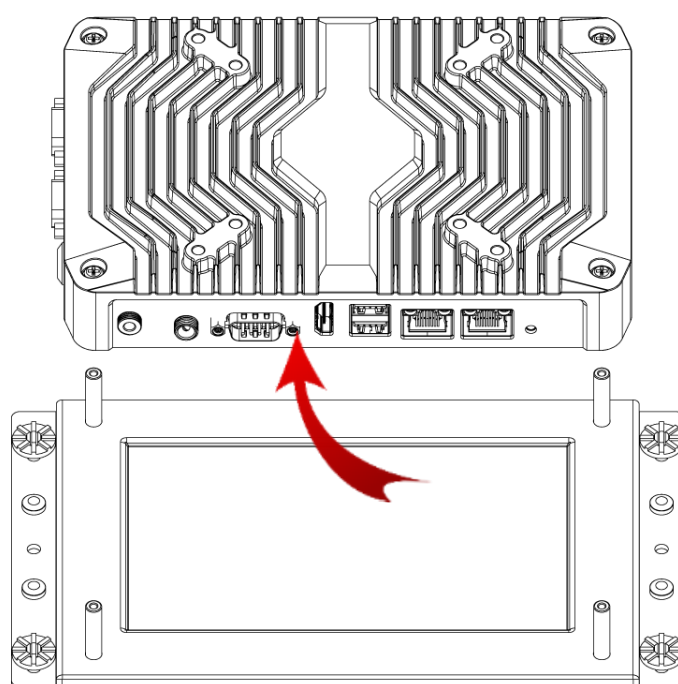
WARNING

In order to prevent electric shock or system damage, before removing the chassis cover, must turn off power and disconnect the unit from power source.

1. Use a screwdriver to remove the four screws securing the back cover.

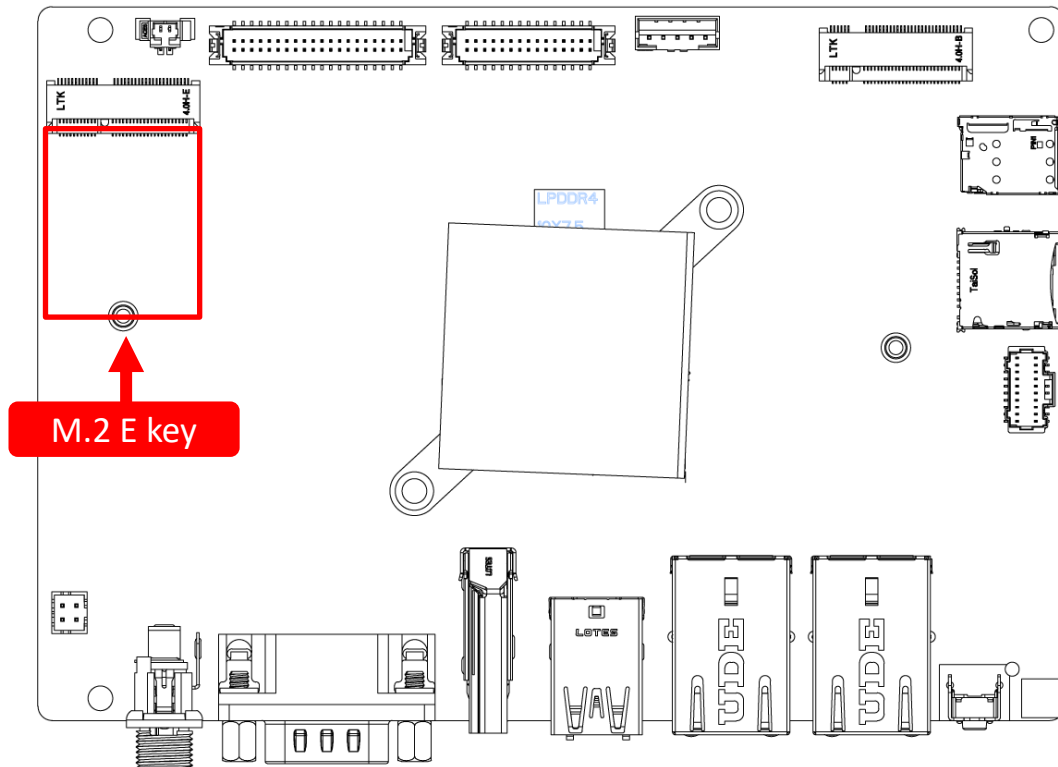


2. Remove the screws, then separate the main unit from top to bottom.

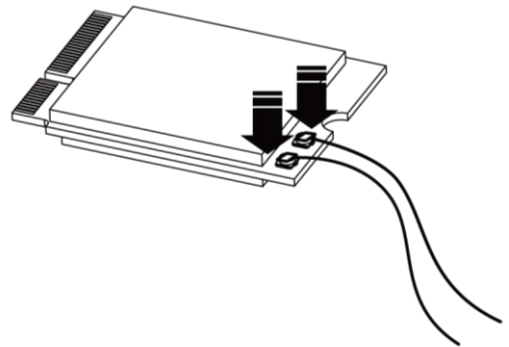


3.2 Install wireless network card and antenna

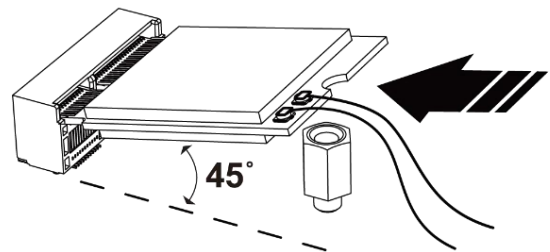
1. The M.2 E-Key supports Wi-Fi module, as highlighted in the picture below.



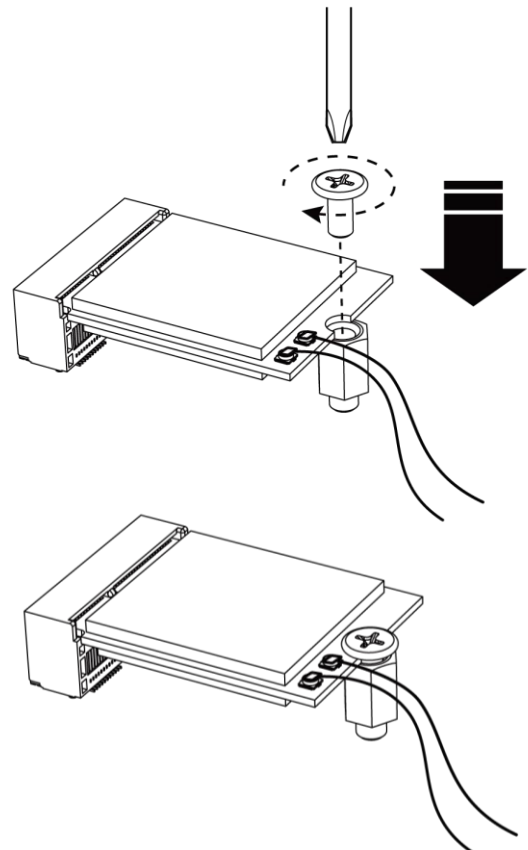
2. Connect the SMA cables to the Wi-Fi module.



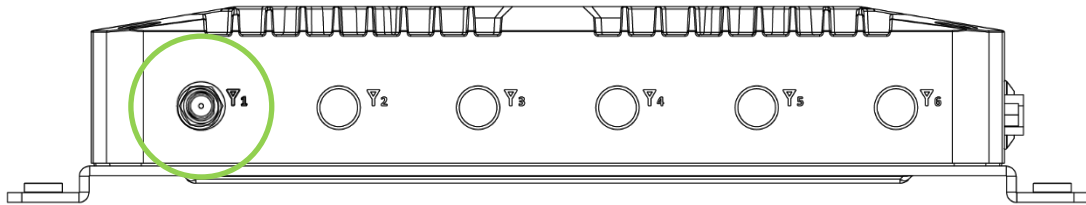
3. Insert the Wi-Fi module at a 45-degree angle.



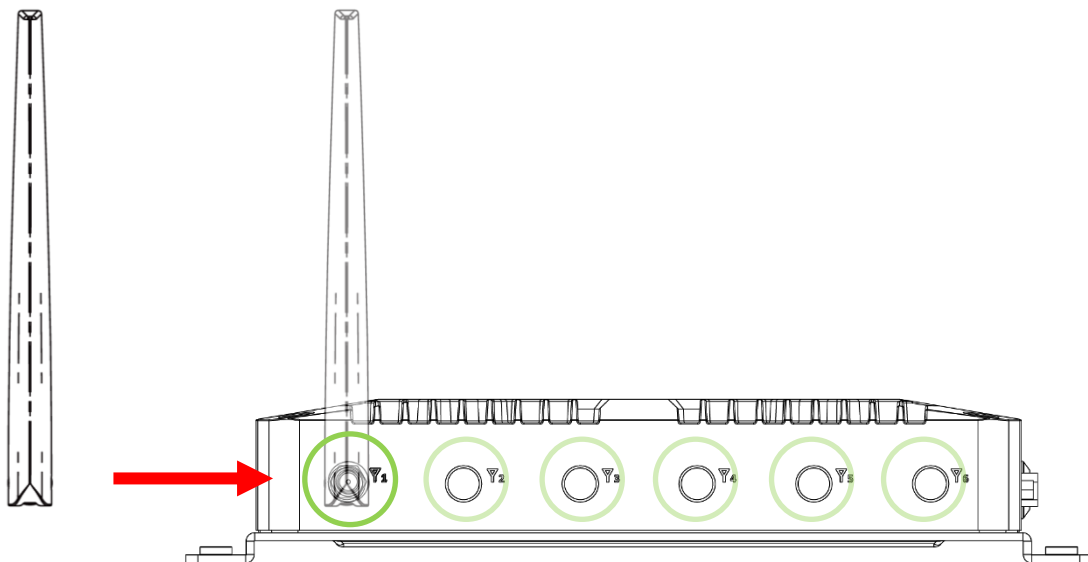
4. Press the Wi-Fi module down and secure it with one screw.



5. Ensure the internal antenna is securely connected to the network card, and the antenna interface is properly installed in the designated opening on the chassis cover.

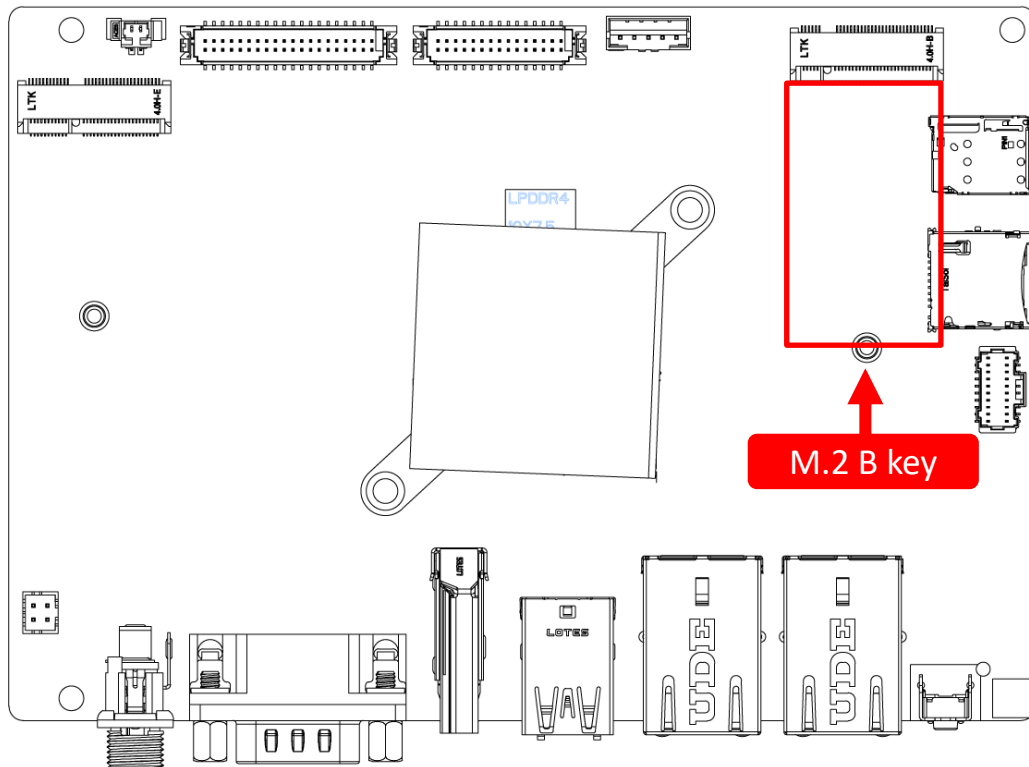


6. Attach the external antenna to the SMA jack by securely threading them together.

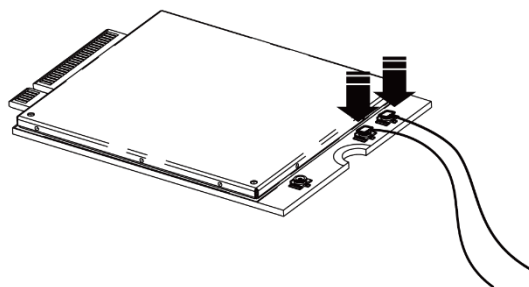


3.3 Install Communication Module and Antenna

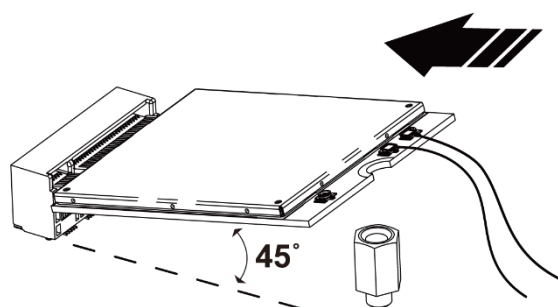
1. The M.2 B-Key supports communication (4G/LTE) module, as highlighted in the picture below.



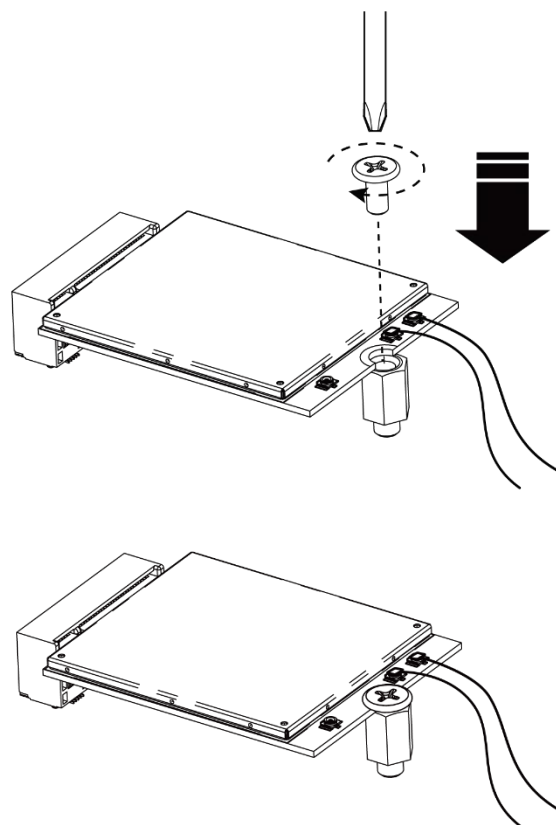
2. Connect the SMA cables to the communication (4G/LTE) module.



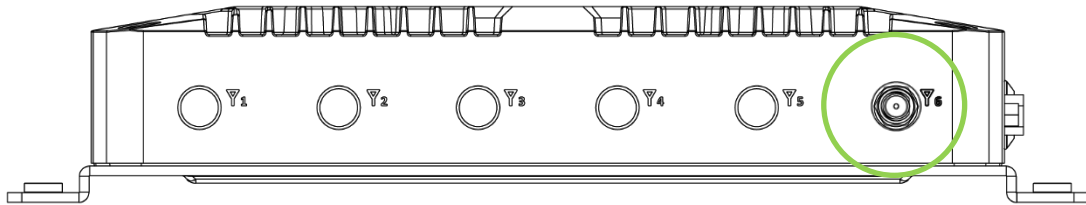
3. Insert the communication (4G/LTE) module at a 45-degree angle.



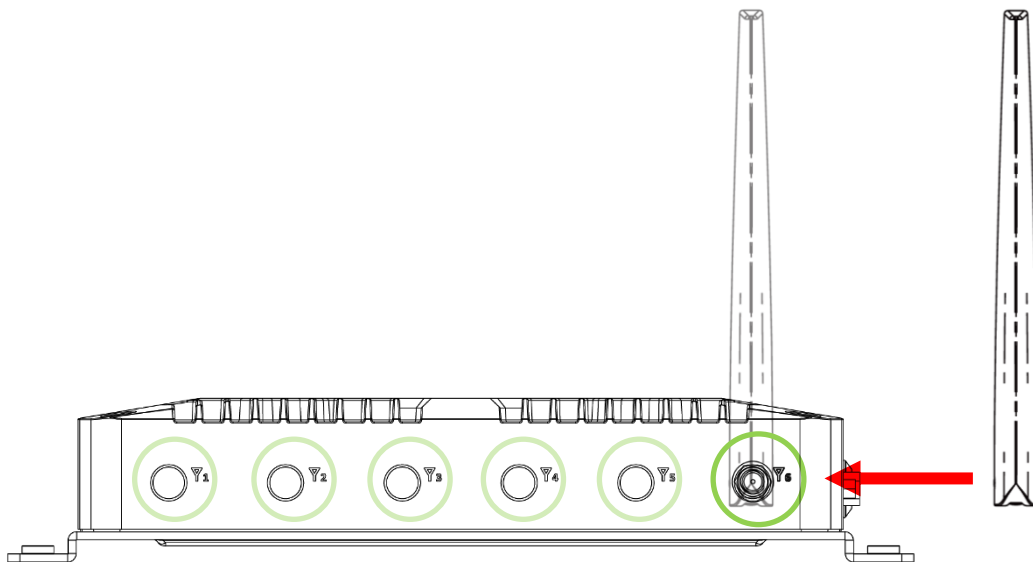
4. Press the communication module down and secure it with one screw.



5. Ensure the internal antenna is securely connected to the network card, and the antenna interface is properly installed in the designated opening on the chassis cover.

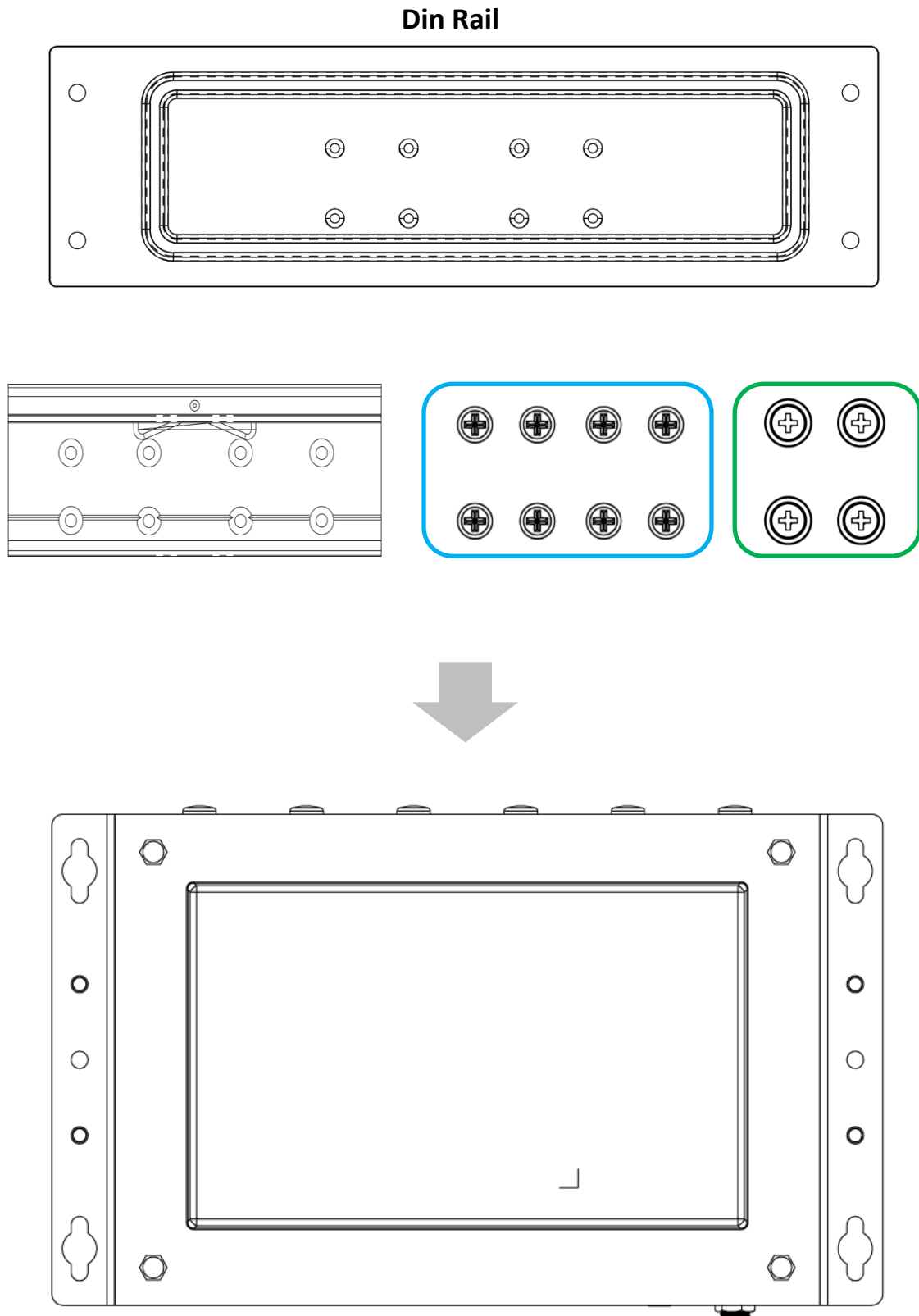


6. Attach the external antenna to the SMA jack by securely threading them together.

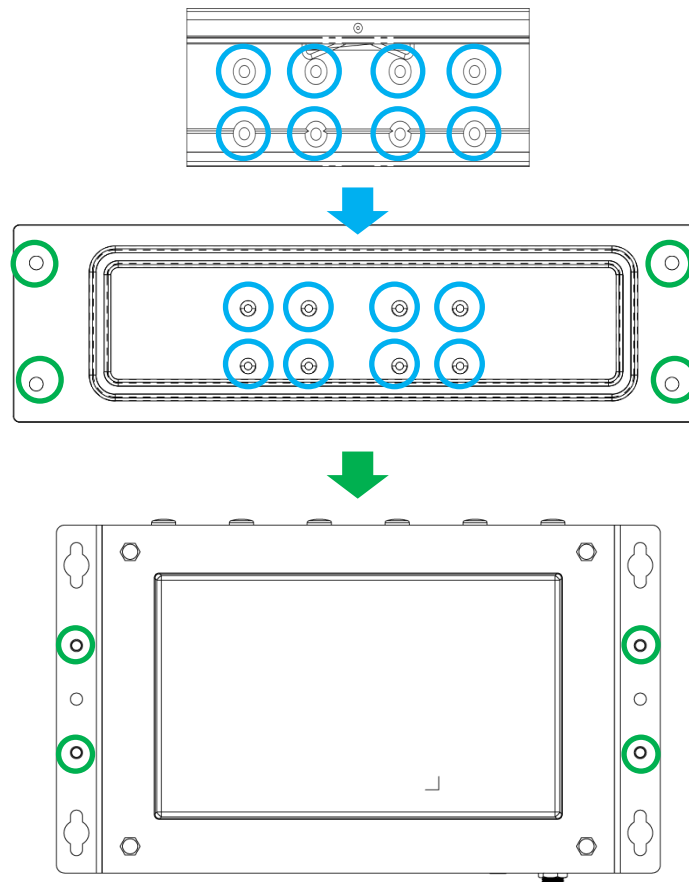


3.4 Installing DIN rail holder

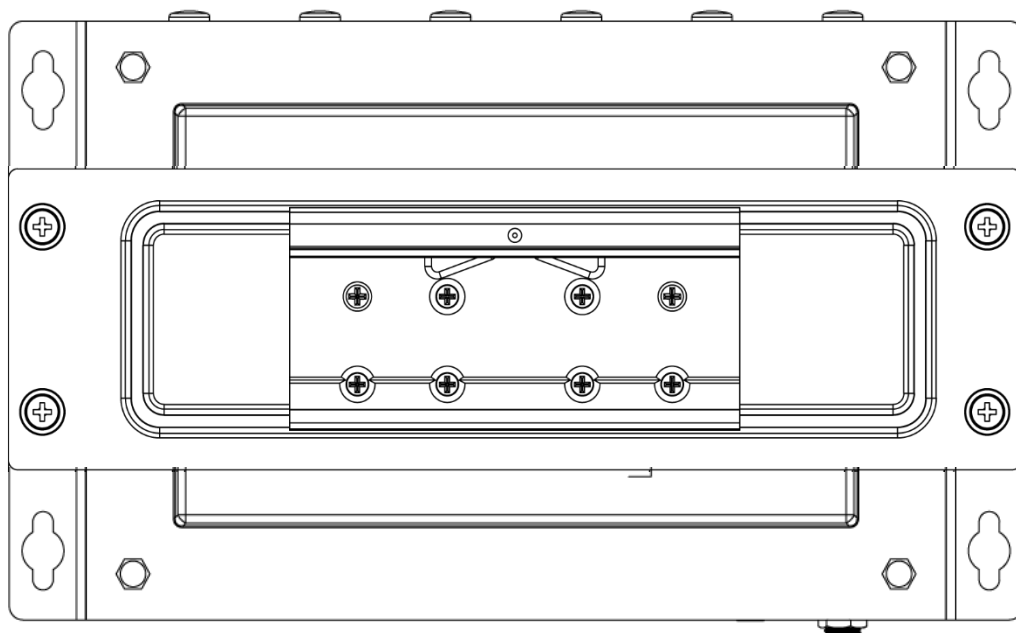
1. Din Rail holder is available for BCO-500-RK3568J series.



2. Place Din rail holder on the back of computer and secure it with four screws.



Complete the schematic diagram as shown.



Chapter 4

Firmware Flashing Guide (via RKDevTool)

4. Firmware Flashing Guide (via RKDevTool)

Version: V1.0.1

Date: 2025/07/16

4.1 Prepare the following items:

- One BCO-500-RK3568J device
- One Windows PC
- One USB Type-A to Type-A cable

4.2 Extract the image package:

The package includes:

- Drivers
- Flashing tool
- Image file

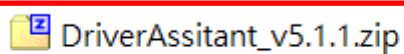
4.3 Important Notice:

The flashing tool must be located in a folder with English-only characters.

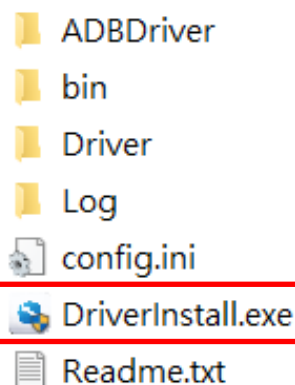
Avoid any folder names containing Chinese, Japanese, or other non-English characters.

4.4 Install the driver on the Windows PC:

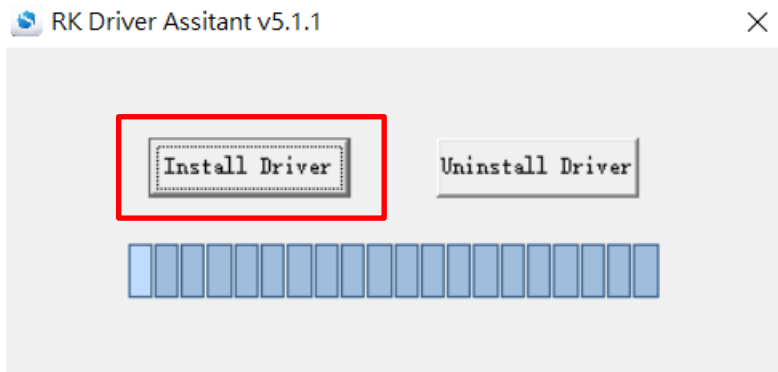
4.4.1. Extract DriverAssitant_v5.1.1.zip.



4.4.2. Run DriverInstall.exe.



4.4.3. Click the "Install Driver" button to complete installation.



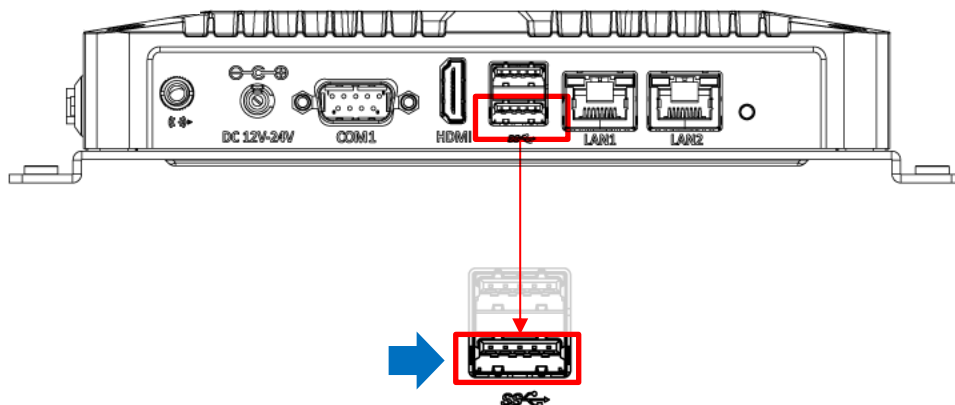
4.5 Enter Loader Mode on the BCO-500-RK3568J device:

4.5.1 Power on the BCO-500-RK3568J device.

4.5.2 Go to Settings > About tablet and tap Build number seven times.

Use the USB Type-A to Type-A cable to connect the Windows PC to the dedicated burning port on the BCO-500-RK3568J device.

The burning port is the bottom USB 3.0 port located beneath the top USB connector, next to the HDMI port.



4.6 Complete the process and reboot the device:

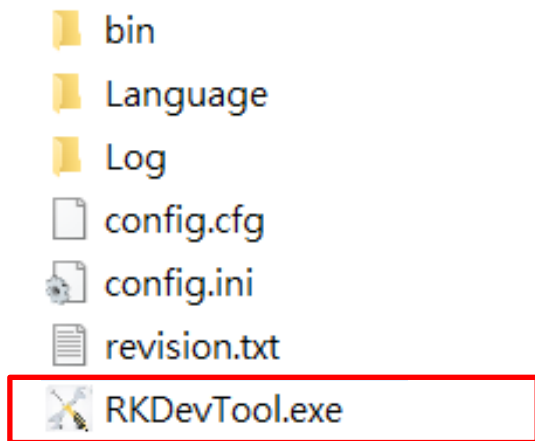
Once the upgrade is complete, the tool will display a success message.

Disconnect the USB cable and restart the BCO-500-RK3568J device.

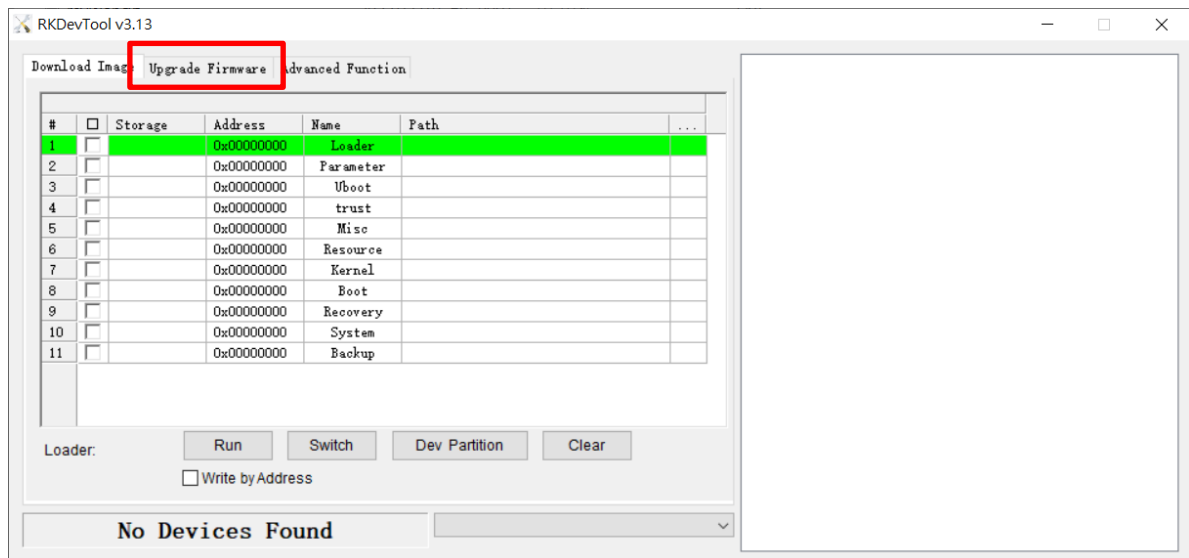
The device is now updated and ready for use.

4.7 Flash the firmware using RKDevTool:

4.7.1 Open the RKDevTool_v3.13_for_window folder, and run RKDevTool.exe.



4.7.2 Switch to the Upgrade Firmware tab.

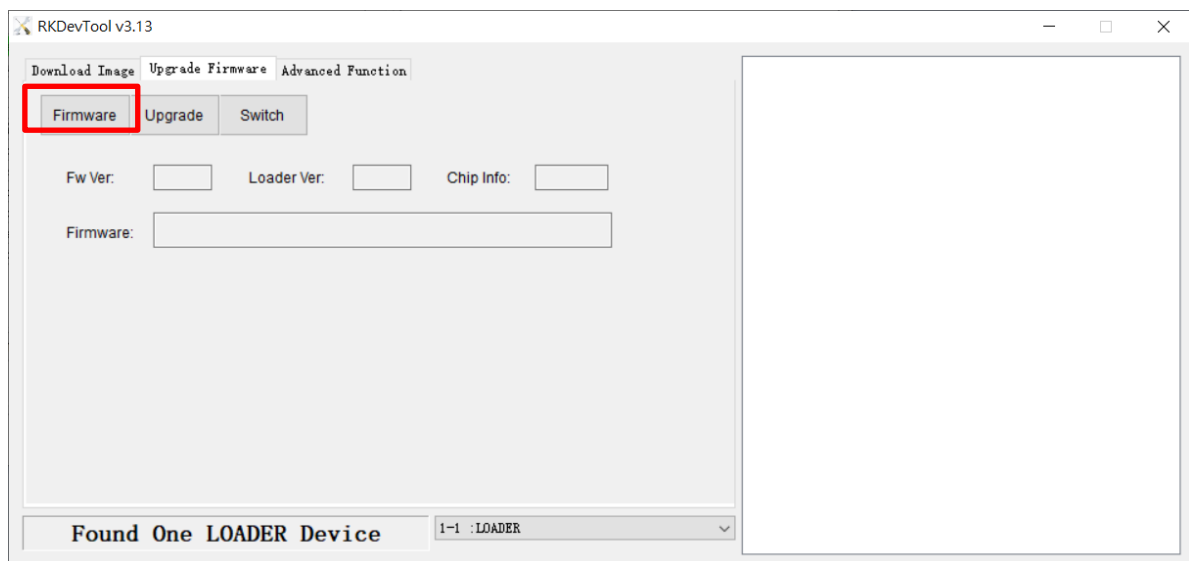


4.7.3 Click the Firmware button and select the update.img file from the image folder.

Image file example:

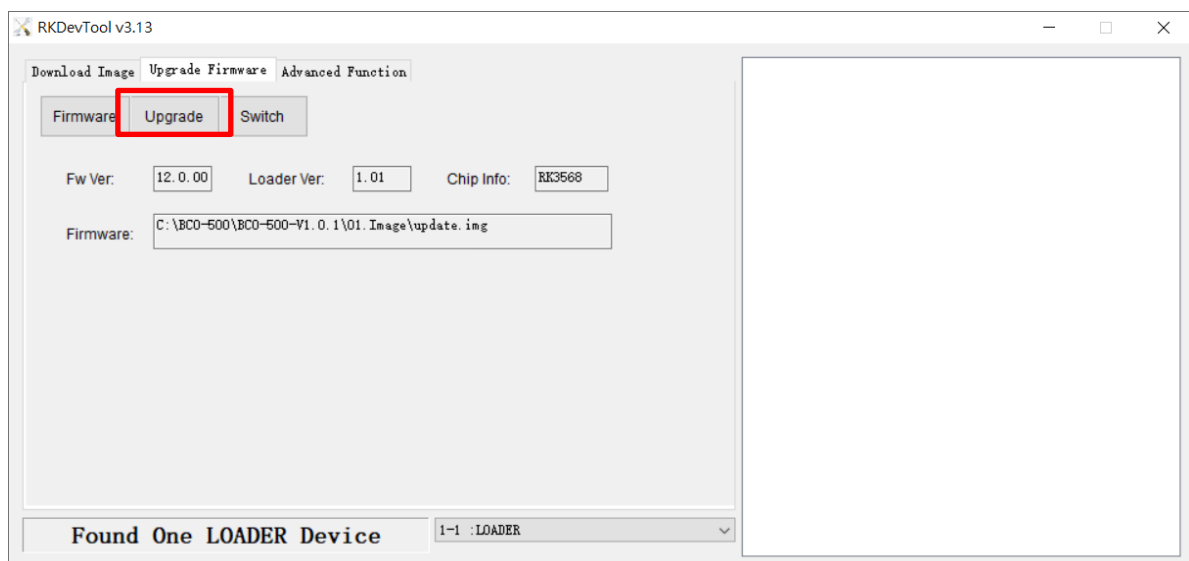


Firmware selection:



4.7.4 Confirm the tool displays “Found One LOADER Device” at the bottom.

Once detected, click the Upgrade button to start flashing.



⚠ Do not disconnect the device or close the tool during the flashing process.

4.8 Complete the process and reboot the device:

Once the firmware upgrade process is complete, you will see a “Download image OK” or “Upgrade successful” message in RKDevTool.

You can now safely disconnect the USB cable.

The BCO-500-RK3568J device will reboot automatically, or you may manually restart it.

The device is now updated and ready for use.

