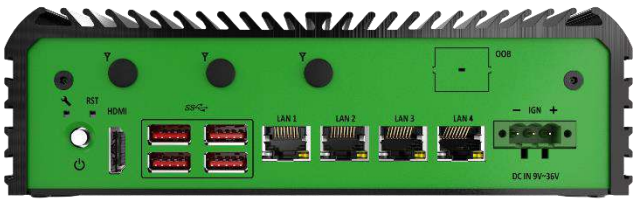
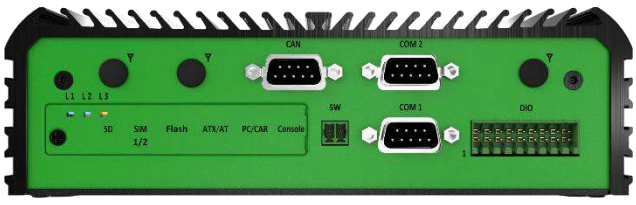
USER'S MANUAL

JCO-3000-ORN-B (4LAN)

Mid-Range AI Edge Computer





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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2024/9/11

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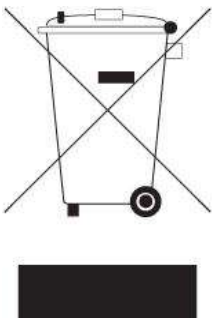
Environmental Protection Announcement

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 -30°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 be 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 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 Premio Inc website at www.premioinc.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.

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.

WARNING

(1) This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person or by Instructed person who have been instructed about the metal chassis of the equipment is so hot that Skilled person or Instructed person have to pay special attention or take special protection.
(2) CAUTION External metal parts are hot!! Before touching it, special attention or protection is necessary

WARNING

Power cord shall be connected to a socket-outlet with earthing connection.

WARNING

The equipment should only be used within a restricted access area.
The equipment should only be operated by skilled or instructed persons.
The equipment and its modules should only be repaired, maintained or replaced by skilled personnel.
Instructed person is a term applied to persons who have been instructed and trained by a skilled person, or who is supervised by a skilled person.

WARNING

CAUTION - Risk of fire or explosion if the battery is replaced by an incorrect type. Dispose of Used Batteries According to the Instructions

WARNING

The wiring of input terminal block shall be installed by a skilled person.
Wire type: Cu, Only use 12-28 AWG wire size, torque value 4.5 Lb In

Package Contents

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

Item	Description	Qty
1	*Choosing one：* • **JCO-3000-ORN-B-NX16** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NX8** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NN8** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NN4** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NX16-4P** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NX8-4P** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NN8-4P** Mid-Range AI Industrial Computer • **JCO-3000-ORN-B-NN4-4P** Mid-Range AI Industrial Computer	1
2	Wall Mount Kit	1
3	Accessory Kit	1

Ordering Information

Model No.	Product Description
JCO-3000-ORN-B-NX16	Mid-Range AI Computer with NVIDIA® Jetson Orin™ NX 16G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x LAN
JCO-3000-ORN-B-NX8	Mid-Range AI Computer with NVIDIA® Jetson Orin™ NX 8G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x LAN
JCO-3000-ORN-B-NN8	Mid-Range AI Computer with NVIDIA® Jetson Orin™ Nano 8G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x LAN
JCO-3000-ORN-B-NN4	Mid-Range AI Computer with NVIDIA® Jetson Orin™ Nano 4G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x LAN
JCO-3000-ORN-B-NX16-4P	Mid-Range AI Computer with NVIDIA® Jetson Orin™ NX 16G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x PoE RJ45
JCO-3000-ORN-B-NX8-4P	Mid-Range AI Computer with NVIDIA® Jetson Orin™ NX 8G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x PoE RJ45
JCO-3000-ORN-B-NN8-4P	Mid-Range AI Computer with NVIDIA® Jetson Orin™ Nano 8G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x PoE RJ45
JCO-3000-ORN-B-NN4-4P	Mid-Range AI Computer with NVIDIA® Jetson Orin™ Nano 4G, M.2 128G, 1x HDMI, 2x COM, 4x USB, 1x CAN, 4x PoE RJ45

Optional Accessories

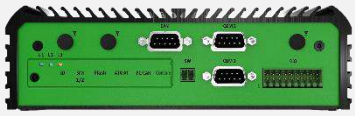
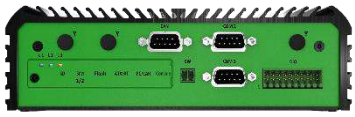
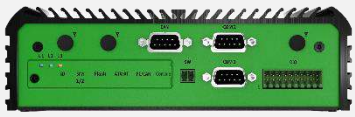
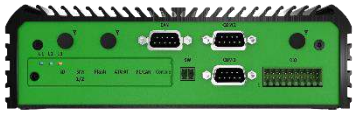
Model No.	Product Description
1-E09A06008	Adapter AC/DC 12V 5A 60W with 3pin Terminal Block Plug 5.0mm Pitch
1-E09A22102	Adapter AC/DC 24V 9.2A 220W with 3pin Terminal Block Plug 5.0mm Pitch
1-TPCD00005	Power Cord, 3-pin US Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm

Chapter 1

Product Introductions

1.1 Overview

The JCO-3000-Series is a fanless industrial-grade computer that is powered by NVIDIA Jetson NX (16GB/8GB) and Nano (8GB/4GB) Orin system-on-module (SOM), engineered for versatile industrial AI applications. This series offers configurations ranging from 40 to 100 TOPS of AI performance, adaptable between 7W and 25W, to ensure efficiency and power in applications like autonomous vehicles, security, robotics, and industrial automation. Leveraging advanced Ampere architecture with up to 2048 CUDA and 64 Tensor cores, the JCO-3000 Series meets the high demands of real-time AI inference and high performance computing in harsh environments, providing up to 80X the performance of previous generations, all within the smallest Jetson form factor.

Model No.	Rear Panel	Front Panel
• JCO-3000-ORN-B (4LAN)-NX16 • JCO-3000-ORN-B (4LAN)-NX16-4P		
• JCO-3000-ORN-B (4LAN)-NX8 • JCO-3000-ORN-B (4LAN)-NX8-4P		
• JCO-3000-ORN-B (4LAN)-NN8 • JCO-3000-ORN-B (4LAN)-NN8-4P		
• JCO-3000-ORN-B (4LAN)-NN4 • JCO-3000-ORN-B (4LAN)-NN4-4P		

Key Features

- NVIDIA® Jetson Orin™ NX 8GB/16GB or Nano 8GB/4GB GPU with 32 Tensor Cores
- 1x HDMI 4K (3840*2160) 60Hz
- 4x GbE RJ45 LAN with Optional PoE option
- 1x External Dual Nano SIM socket
- 1x M.2 (M Key, 2242/2280, PCIex 4,Support NVMe)
- 4x USB 3.2 Gen 2, 1x USB Type-C
- 8x DI + 8x DO with isolation
- 9 to 36VDC Wide Range Power Input Supporting AT/ATX Mode
- Wide Operating Temperature -20˚C to 55˚C (25W, NX Module)

1.2 Hardware Specification

System	
Processor **Support NVIDIA® Jetson Orin™ NX/Nano GPU with 32 Tensor Cores** • 16 GB: 1024-core NVIDIA Ampere architecture GPU (25W/100 TOPS) • 8 GB: 1024-core NVIDIA Ampere architecture GPU (20W/70 TOPS) • 8 GB: 1024-core NVIDIA Ampere architecture GPU (15W/40 TOPS) • 4 GB: 512-core NVIDIA Ampere architecture GPU (10W/20 TOPS)	
LAN Chipset	GbE1: RGMII GbE2: Intel LAN Chip
TPM	TPM 2.0
Display	
HDMI	1x HDMI 4K (3840*2160) 60Hz
Storage	
M.2	1x M.2 (M Key, 2242/2280, PCIe x4, NVMe) (Default 128GB)
SIM Socket	1x External Dual Nano SIM socket (M.2 B Key attached)
Expansion	
M.2	1x M.2 (B Key, 3042/3052, USB 3.2 Gen1, Support 4G/5G/Storage) 1x M.2 (E Key, 2230, PCIe x1, USB 2.0, Support Wi-Fi/Bluetooth)
I/O	
CAN	CAN 2.0 B
COM	2x RS-232/422/485 (Switch by MCU)
DIO	8 in / 8 out (Isolated)
LAN	4x RJ45 LAN
OOB	1x RJ45 (Optional OOB Management Module, Optional, Occupied 1x COM)
PoE	4x RJ45 (Optional, PoE+ 120W Module (Type 2, Max 25W per Port)
USB	4x USB 3.2 Gen 2 (10 Gbps, Shared with USB 3 Hub) 1x USB Type-C
Others	6x WiFi Antenna Holes 1x Power Switch 1x CMOS Battery Cable 1x 4-Pin FAN Connector
Operating System	
Linux	Linux Ubuntu 20.04 with JetPack

Power	
Power Adapter	Optional AC/DC 12V/5A, 60W (Optional) Optional AC/DC 24V/9.2A, 220W (For PoE Model)
Power Mode	AT, ATX
Power Supply Voltage	9~36VDC 12~36VDC (PoE Model)
Power Ignition Sensing	Adjustable Power Ignition Management
Power Connector	3-pin Terminal Block
Power Protection	OVP (Over Voltage Protection) OCP (Over Current Protection) Reverse Protection

Environment	
Operating Temp.	-20°C to 55°C (25W, NX Module) -20°C to 60°C (15W, Nano Module) Tested according to: IEC60068-2-1:2007 (Cold test procedure) IEC60068-2-2:2007 (Dry heat test procedure) IEC60068-2-3:2007 (Damp heat, steady state, test procedure) IEC60068-2-14:2009 (Wide temperature range thermal shock)
Storage Temp.	-30°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Certification	EMI: • CE • FCC Class A (47 CFR part 15.109 and part 15.107) • ICES-003 • UKCA EMC Compliance: • Railway EMC: EN 50155: 2017, EN 50121-1: 2017, EN 50121-3-2: 2016 • Industrial EMC: EN 61000-4-2: 2009, EN IEC 61000-4-3: 2020, EN 61000-4-4: 2012, EN 61000-4-5: 2014 +A1: 2017, EN 61000-4-6: 2014 • E-Mark (E13) Safety: • UL Safety Pending: UL62368-1, 3rd Ed., (cULus) • Test procedure: CB Scheme • Standard: IEC 62368-1:2018 Green Product: • RoHS 3.0 (Directive 2015/863/EU) • REACH

Vibration	IEC60068-2-64:2008 With SSD: 5 Grms (5 - 500 Hz, 0.5 hr/axis) Designed to comply with MIL-STD-810G Method 514.7 Procedure I
Shock	IEC60068-2-27:2008 With SSD: 50G half-sin 11ms Designed to comply with MIL-STD-810G Method 516.7 Procedure I Package Drop Test: ISTA 2A

Physical	
Dimensions	192 (W) x 140(D) x 58(H) mm
Weights	2.8 ~ 3.6 kg
Mounting Options	Extruded Aluminum with Heavy Duty Metal
Power Protection	Wall Mounting/DIN rail (Optional)

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

1.3 System I/O

JCO-3000-ORN-B (4LAN)

Front Panel

LAN port
Used to connect the system to a local area network

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

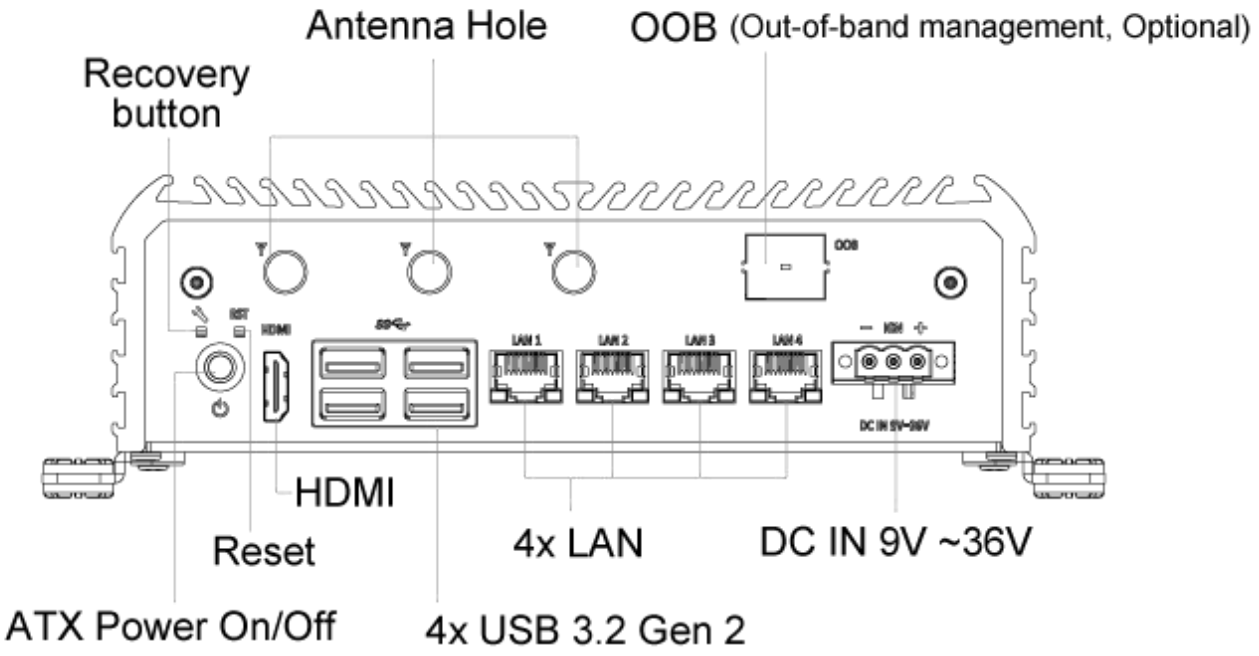
USB 3.2 Gen 2 port (10 Gbps)
Used to connect USB 3.2 device

OOB port (Optional)
The OOB can be connected through RJ45 port

HDMI
Used to connect to HDMI-compatible devices

DC IN 9V~36V
Used to plug a DC power input with terminal block

Power Switch
Used to plug a remote power on/off terminal block



Front Panel

JCO-3000-ORN-B (4LAN)

Rear Panel

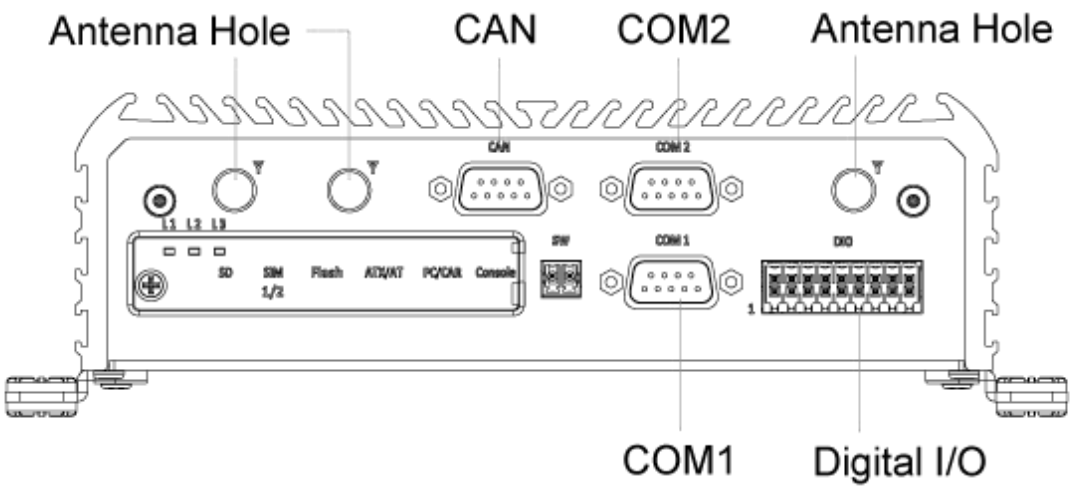
COM port
COM1 ~ COM2 support RS232/422/485 (Switch by MCU)

CAN port
Used to connect an ECU (Electronic control unit) device with D-SUB 9 pin connector

SIM card
Used to insert SIM card

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

Digital I/O Terminal Block
The Digital I/O terminal block supports 4 digital input and 4 digital output

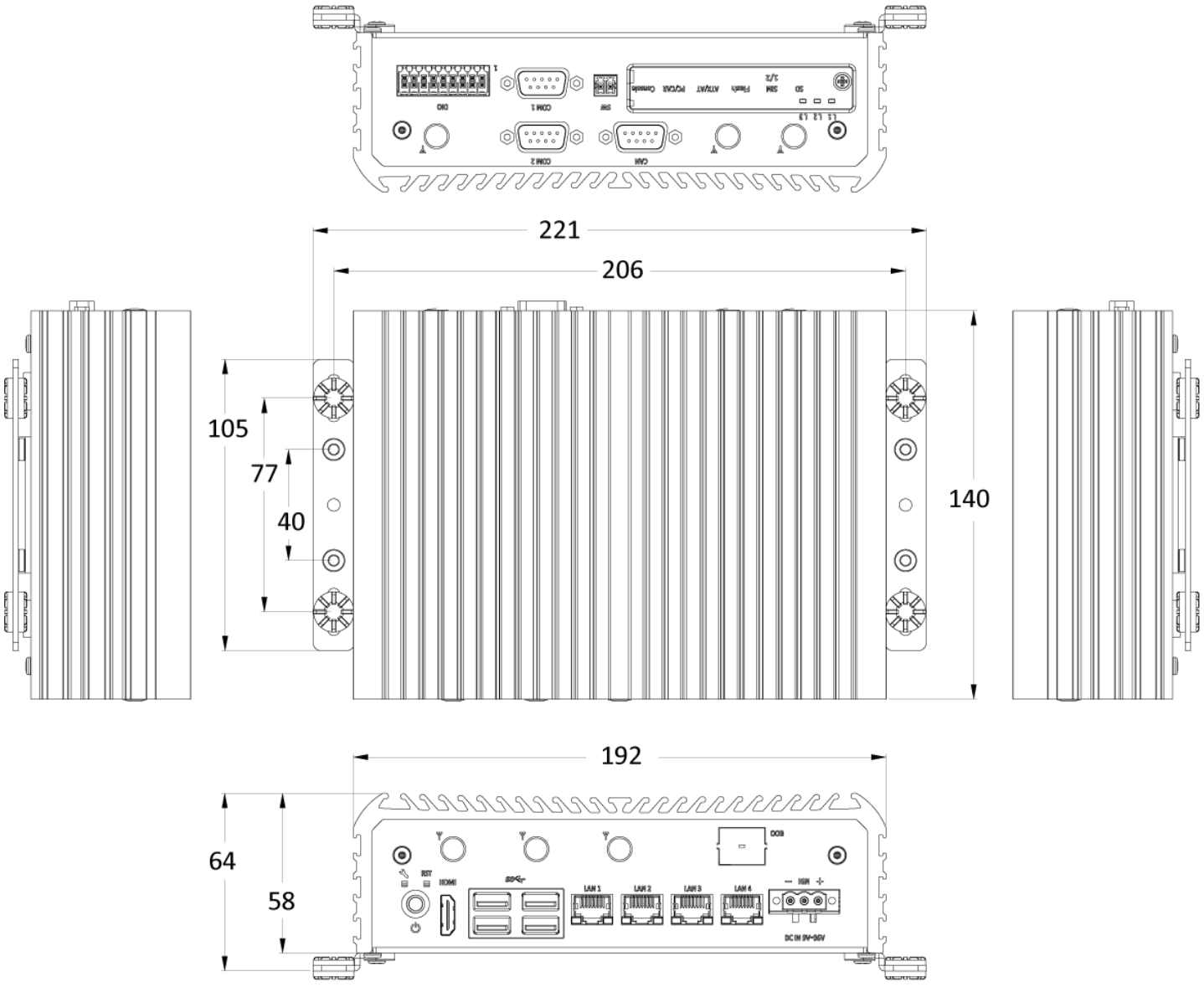


Rear Panel

1.4 Mechanical Dimensions

JCO-3000-ORN-B (4LAN)

Unit: mm

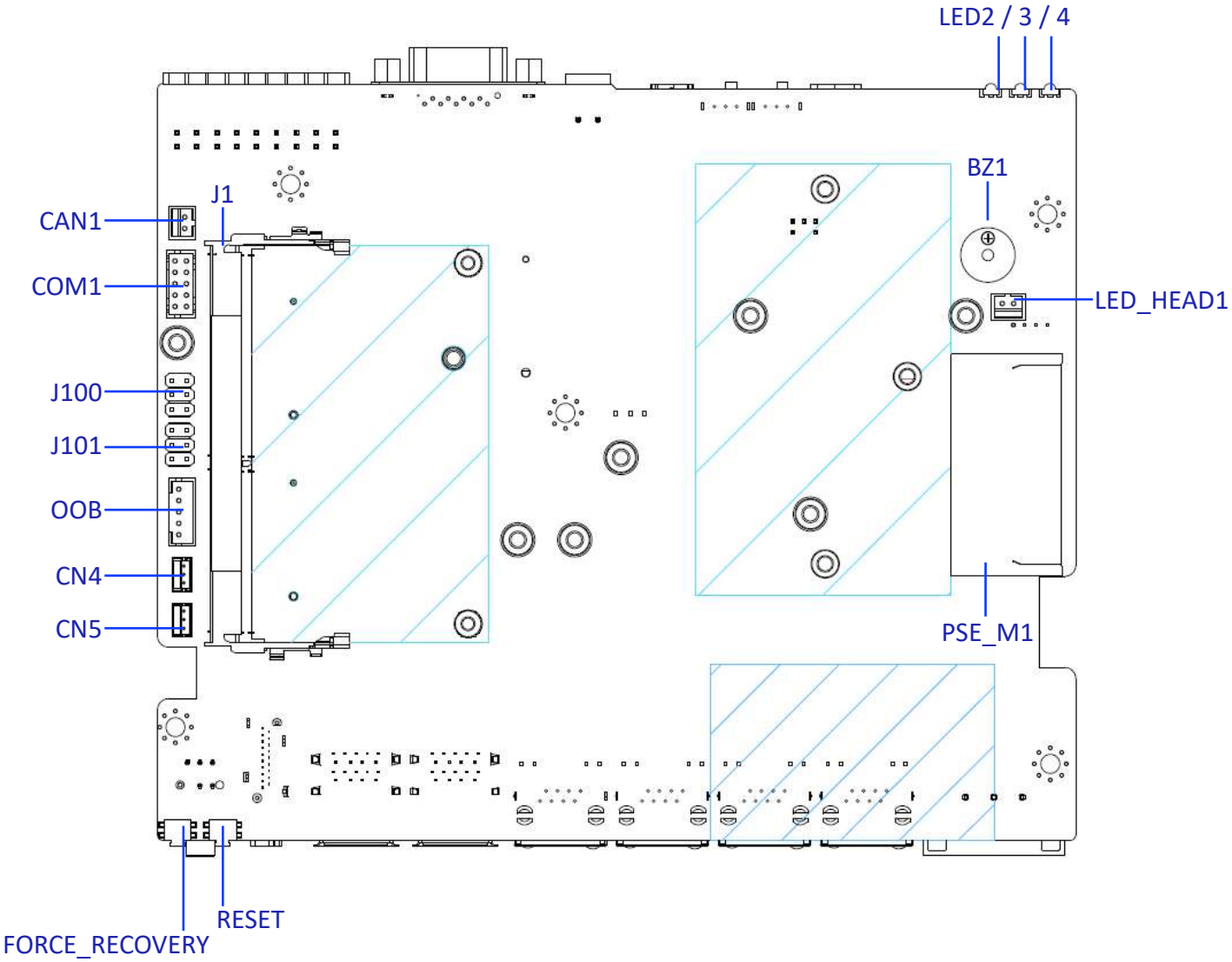


Chapter 2

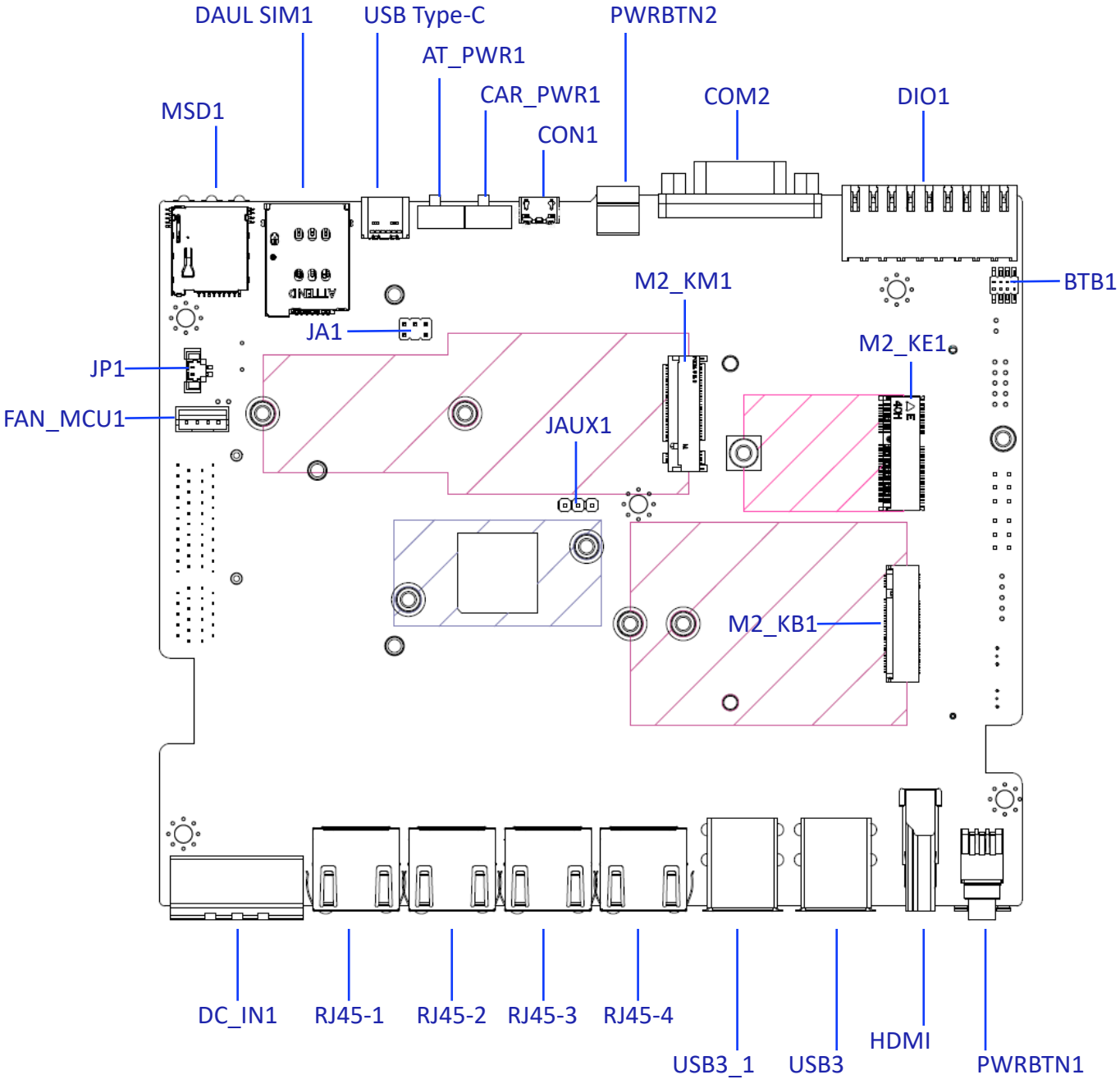
Mechanical Specifications

2.1 Switch and Connector Locations

2.1.1 Top View



2.1.2 Bottom View



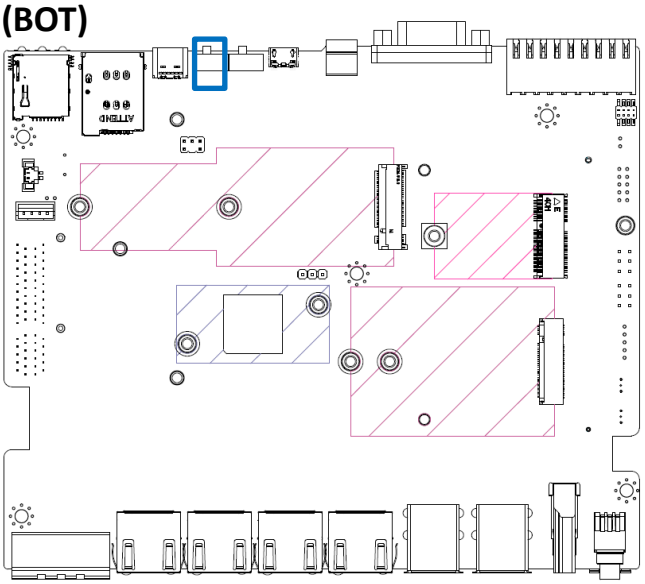
2.2 Connector / Switch Definition

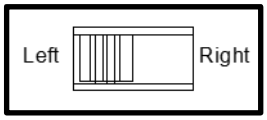
Connector Location	Definition
AT_ATX	AT/ ATX Power Mode Switch
PWRBTN1 & PWRBTN2	Power Switch
Reset	Reset Switch
FORCE_RECOVERY1	FORCE_RECOVERY
DC_IN1	3-pin DC +9~36V Power Input Connector
DIO **(Digital Input / Output Connector)**	DIO1(PIN Header 2*9 Pin)
COM1	Pin Header 2*5 (RS232 / RS422 / RS485 Connector)
COM2	DB9 (RS232 / RS422 / RS485 Connector)
Can1	Can Bus 1*2 Pin Header
Display Port	HDMI Connector
USB Port	USB3_2*4, USB2_1*4
Dual SIM	SIM Card Socket
FAN Connector	Smart FAN Connector 1*4Pin
CAR_PWR	PC mode / CAR mode select
M.2 Key	M2_KE , M2_KB , M2_KM
Console Micro USB	Debug Port
OOB_SW	OOB Power Input
CN4/5(J100/J101)	UART OOB (Select Function)
PSE_M	PoE Module Slot

2.3 I/O Interface Descriptions

2.3.1 AT/ ATX Power Mode Switch

(BOT)

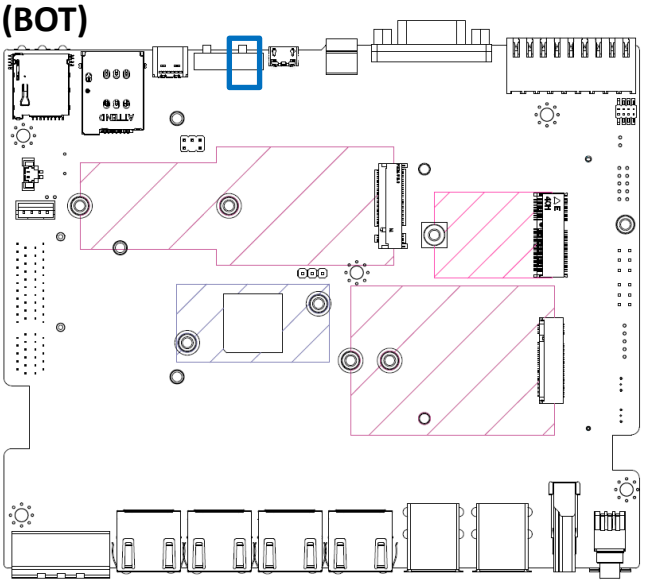


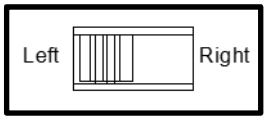


Switch	Definition
1-2	ATX Power Mode (Default)
2-3	AT Power Mode

2.3.2 CAR_PWR Mode Switch

(BOT)

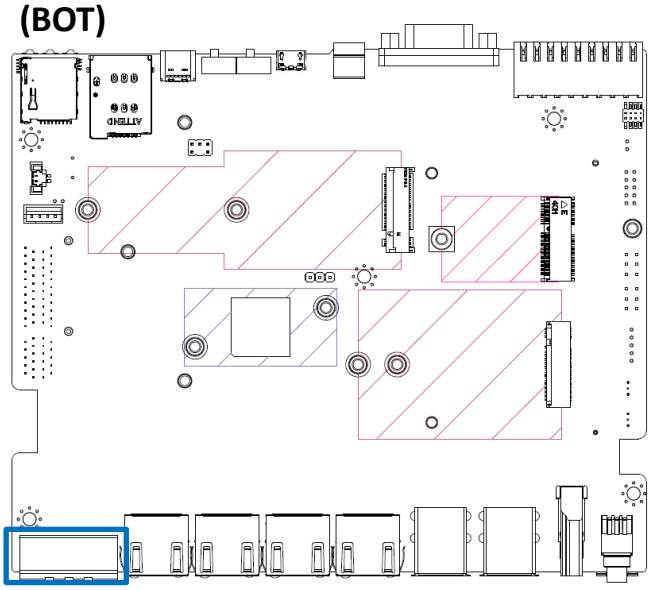


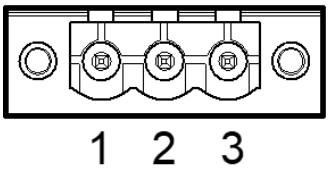


Switch	Definition
1-2	CAR mode Mode
2-3	PC mode Mode (Default)

2.3.3 DC_IN1

(BOT)

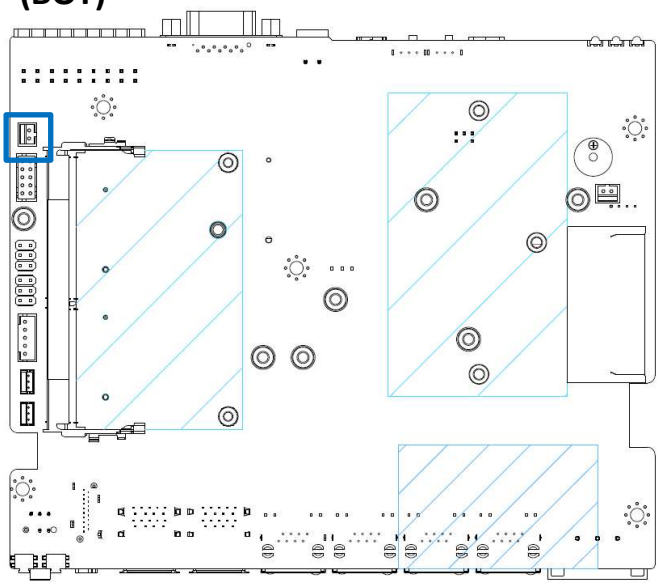


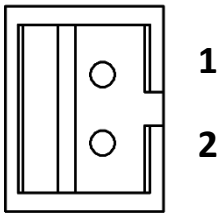


Pin	Signal
1	+9 ~ 36
2	IGN
3	GND

2.3.4 CAN Bus

(BOT)

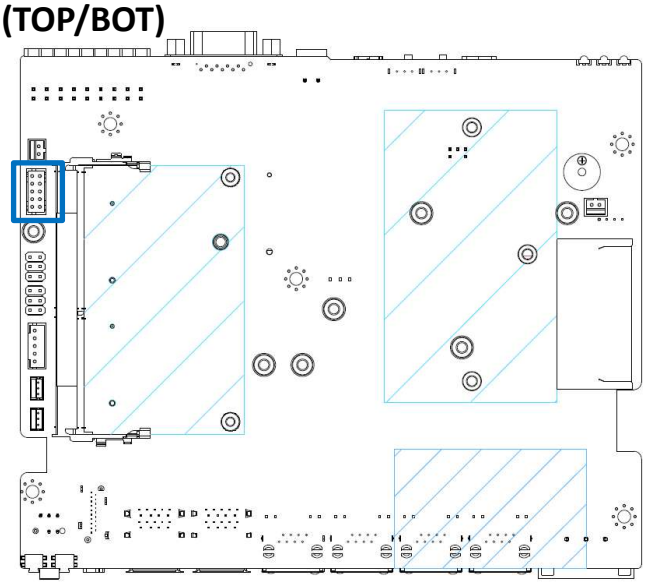


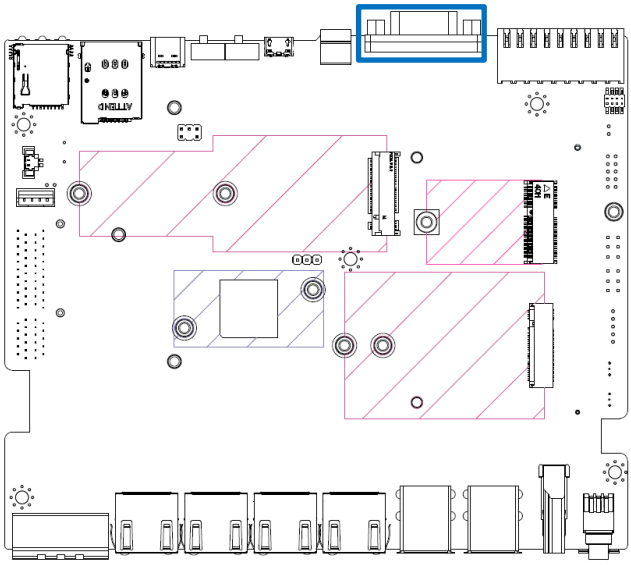


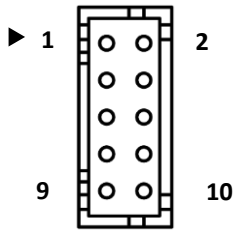
Pin	Signal
1	CAN_L
2	CAN_H

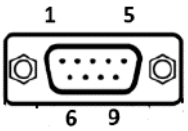
2.3.5 COM Port

(TOP/BOT)









COM 1 COM 2

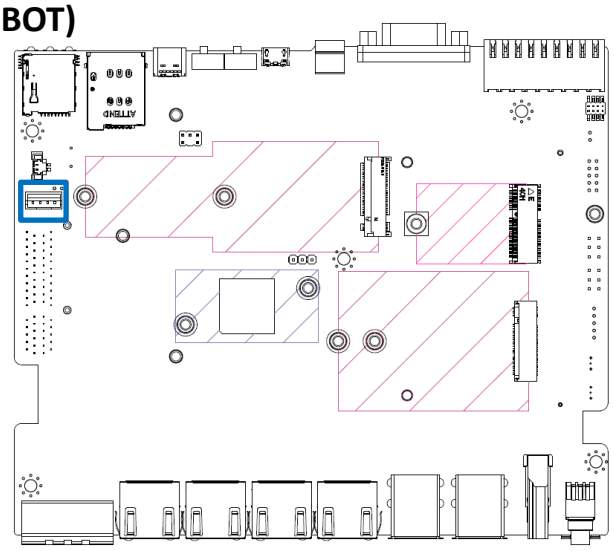
Pin	Signal	Pin	Signal	========	Pin	Signal	Pin	Signal
1	DCD	2	X	========	1	DCD	6	X
3	RXD	4	RTS	========	2	RXD	7	RTS
5	TXD	6	CTS	========	3	TXD	8	CTS
7	DTR	8	X	========	4	DTR	9	XO
9	GND	10	GND	========	5	GND		

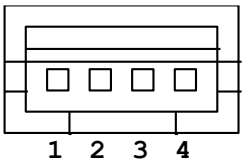
RS232/RS422/RS485 Conn" 2*5 =>10Pin Box Header, 2.0mm Pitch DB_9 Port

Pin	Signal	RS422/RS485 Half Duplex Definition	RS485 Half Duplex Definition
1	DCD1/2	TX-	DATA-
2	X		
3	RXD1/2	TX+	DATA+
4	RTS1/2		
5	TXD1/2	RX+	
6	CTS1/2		
7	DTR1/2	RX_	
8	X		
9	GND	GND	GND
10	GND	GND	GND

2.3.6 FAN Conn"

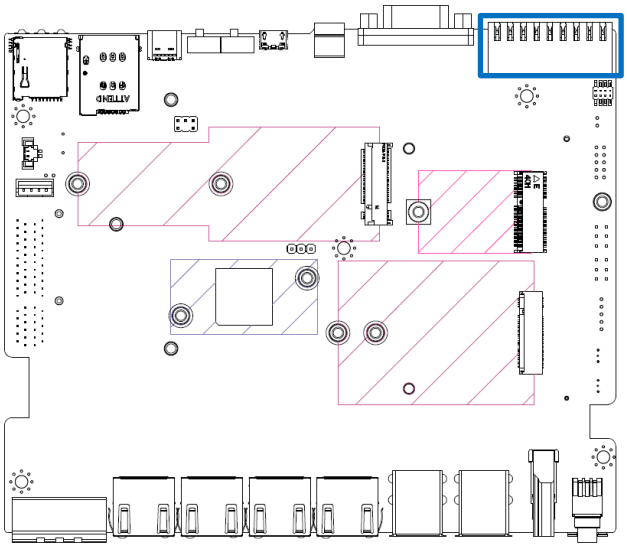
(BOT)

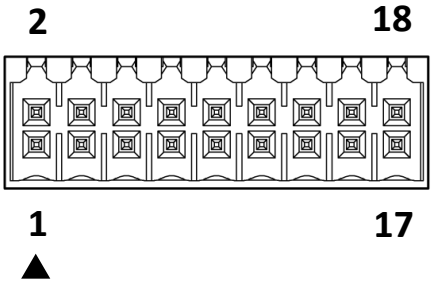




Pin	Signal
1	GND
2	PWR
3	TACH
4	PWM

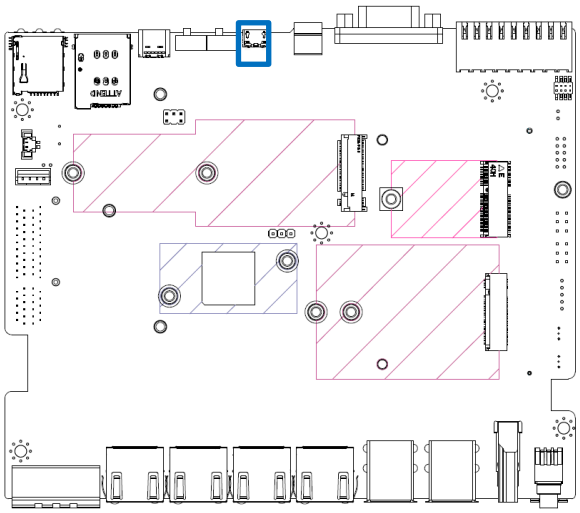
2.3.7 DIO (Digital Input / Output Connector)

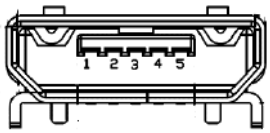




Pin	Signal	Pin	Signal
1	IN1_1	2	OUT1_1
3	IN2_1	4	OUT2_1
5	IN3_1	6	OUT3_1
7	IN4_1	8	OUT4_1
9	IN5_1	10	OUT5_1
11	IN6_1	12	OUT6_1
13	IN7_1	14	OUT7_1
15	IN8_1	16	OUT8_1
17	XCOM+_1	18	XCOM-_1

2.3.8 Mirco USB (Console / Debug Port)

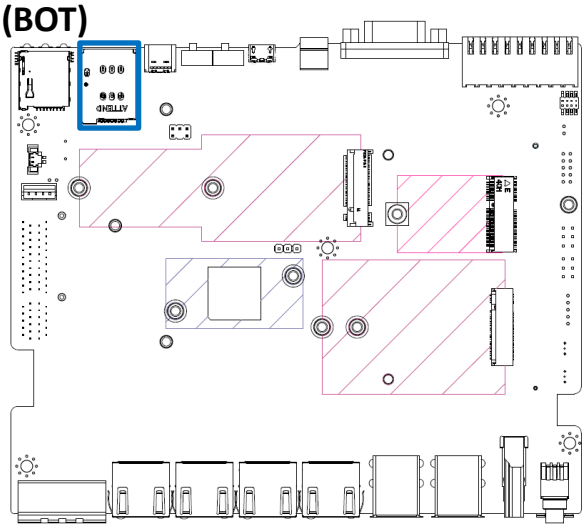


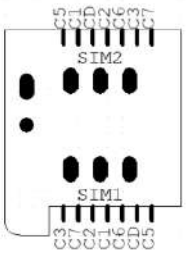


Pin	Signal
1	VBUS
2	DM
3	DP
4	ID
5	GND

2.3.9 SIM 1

(BOT)

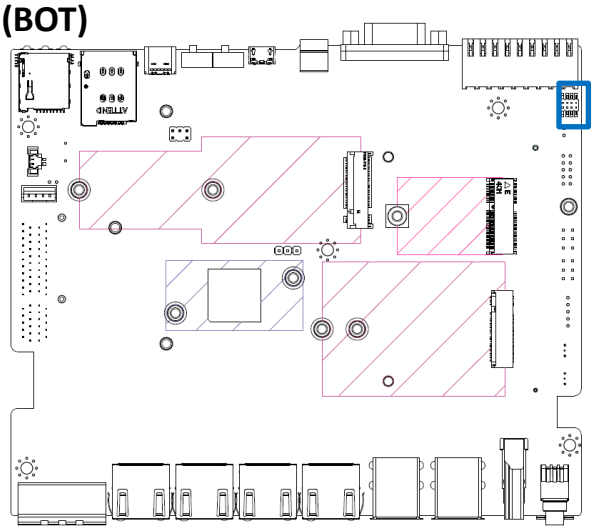


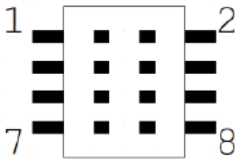


Pin(SIM1/2)	Signal
C1	PWR
C2	RST
C3	CLK
C5	GND
C6	VPP
C7	I/O
CD	Card Detect Switch

2.3.10 BTB1

(BOT)

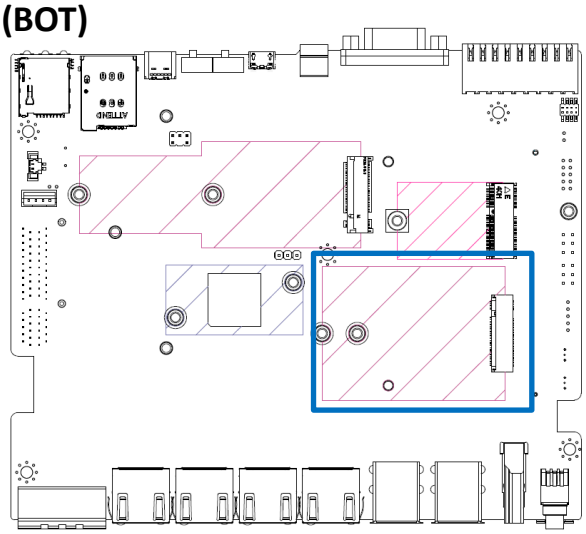


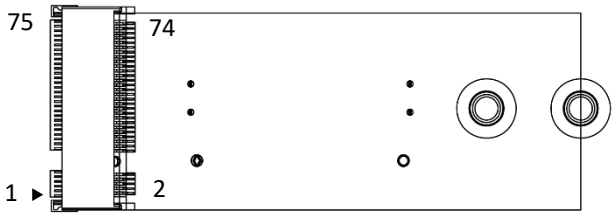


Pin	Signal	Pin	Signal
1	3Vcc	2	5Vcc
3	I2C_CLK	4	X
5	I2C_DAT	6	INT
7	GND	8	GND

2.3.11 M.2 B Key Socket

(BOT)

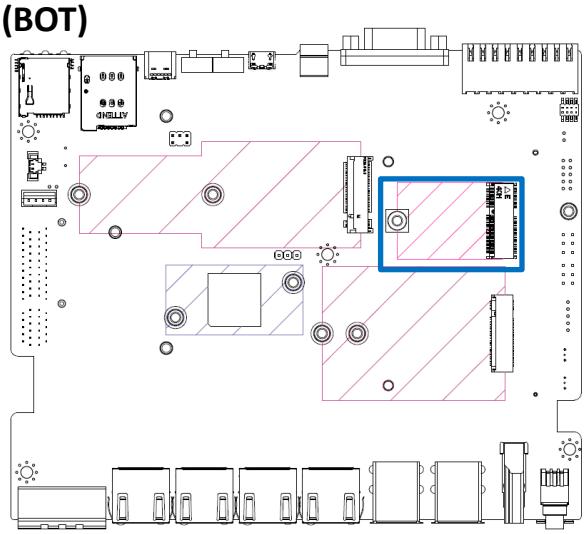


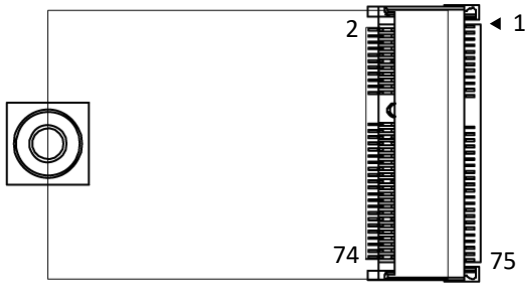


Pin	Definition	Pin	Definition
1	CONFIG_3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FULL_CARD_POWER_OFF#
7	USB_D+	8	W_DISABLE1#
9	USB_D-	10	WWAN_LED#
11	GND	20	NC
21	CONFIG_0	22	NC
23	GPIO_11(0/1.8V)	24	NC
25	DPR	26	NC
27	GND	28	P_UIM_VPP
29	PERn1/USB3.0-Rx-	30	USIM1_RST
31	PERp1/USB3.0-Rx+	32	USIM1_CLK
33	GND	34	USIM1_DATA
35	PETn1/USB3.0-Tx-	36	USIM1_VDD
37	PETp1/USB3.0-Tx+	38	NC
39	GND	40	NC
41	PERn0/SATA-B+	42	NC
43	PERp0/SATA-B-	44	NC
45	GND	46	NC
47	PETn0/SATA-A-	48	NC
49	PETp0/SATA-A+	50	PCIE_RST_N
51	GND	52	PCIE_CLKREQ_N
53	PCIE_REFCLK_M	54	PCIE_WAKE_N
55	PCIE_REFCLK_P	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	USIM1_DET
67	NC	68	SUSCLK(32kHz)
69	CONFIG_1	70	+3.3VAUX
71	GND	72	+3.3VAUX
73	GND	74	+3.3VAUX
75	CONFIG_2		

2.3.12 M.2 E Key Socket

(BOT)

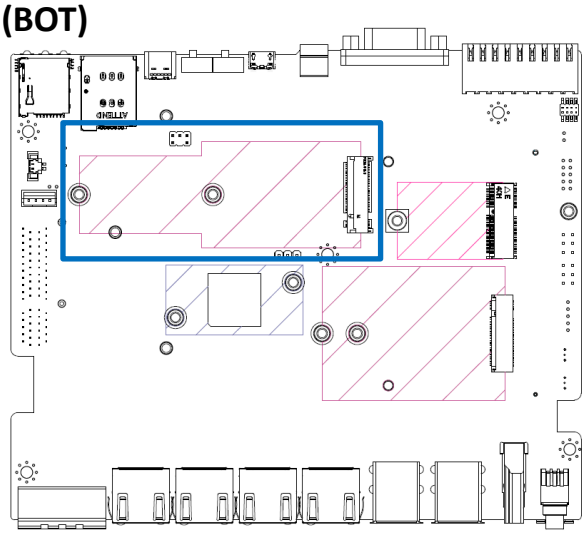


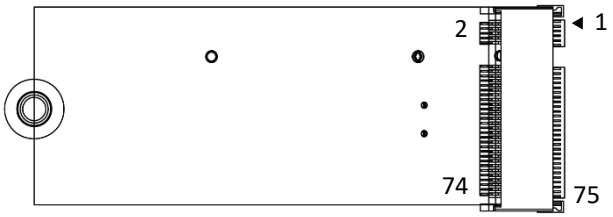


Pin	Definition	Pin	Definition
1	GND	2	+3.3VAUX
3	USB2_D+	4	+3.3VAUX
5	USB2_D-	6	NC
7	GND	8	I2S2_SCLK
9	CNV_WR_1_DN	10	CNV_RF_RESET#
11	CNV_WR_1_DP	20	I2S2_RXD
21	GND	22	MODEM_CLKREQ
23	CNV_WR_0_DN	24	NC
25	CNV_WR_0_DP	26	GND
27	GND	28	UART_WAKE_L
29	CNV_WR_CLK_DN	30	CNV_BRI_RSP
31	CNV_WR_CLK_DP	32	CNV_RGI_DT
33	GND	34	CNV_RGI_RSP
35	TxP0	36	CNV_BRI_DT
37	TxN0	38	CL_RST#
39	GND	40	CL_DATA
41	RxP0	42	CL_CLK
43	RxN0	44	CNV_PA_BLANKING
45	GND	46	CNV_MFUART2_TXD
47	REFCLK0+	48	CNV_MFUART2_RXD
49	REFCLK0-	50	SUSCLK
51	GND	52	PERST0#
53	NC	54	M2_KEY-E_BT_DIS2#
55	WAKE0#	56	M2_KEY-E_WIFI_DIS1#
57	GND	58	SMBDATAS_DUAL
59	CNV_WT_1_DN	60	SMBCLKS_DUAL
61	CNV_WT_1_DP	62	SMBALERT#
63	GND	64	Pull Low
65	CNV_WT_0_DN	66	PERST1#
67	CNV_WT_0_DP	68	NC
69	GND	70	WAKE1#
71	CNV_WT_CLK_DN	72	+3.3VAUX
73	CNV_WT_CLK_DP	74	+3.3VAUX
75	GND		

2.3.13 M.2 M Key Socket

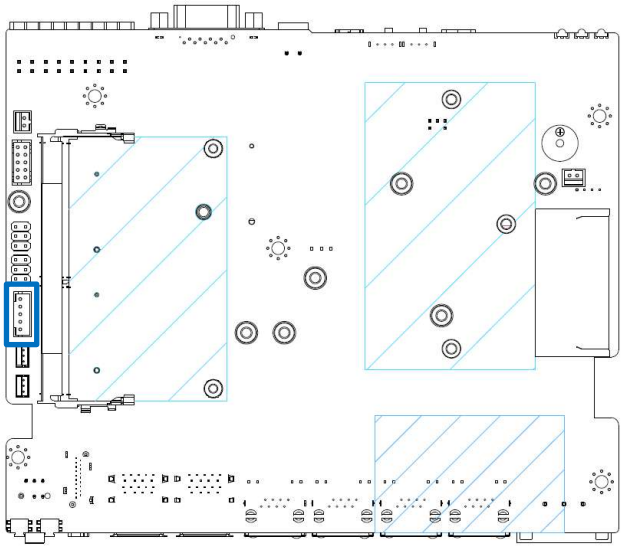
(BOT)

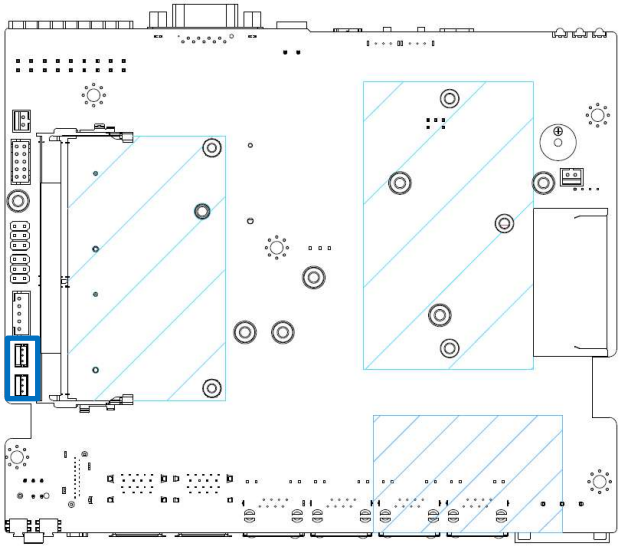


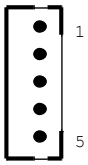


Pin	Definition	Pin	Definition
1	GND	2	3.3VAUX
3	GND	4	3.3VAUX
5	PER3-	6	NC
7	PER3+	8	NC
9	GND	10	DAS/DSS-
11	PET3-	20	3.3VAUX
21	PET3+	22	3.3VAUX
23	GND	24	3.3VAUX
25	PER2-	26	3.3VAUX
27	PER2+	28	NC
29	GND	30	NC
31	PET2-	32	NC
33	PET2+	34	NC
35	PET1-	36	NC
37	PET1+	38	DEVSLP
39	GND	40	SMB_CLK
41	PET0-/SATA_B+	42	SMB_DATA
43	PER0+/SATA_B+	44	ALERT-
45	GND	46	NC
47	PET0-/SATA_A+	48	NC
49	PET0-/SATA_A-	50	PERST-
51	GND	52	CLKREQ-
53	REFCLKN	54	PEWAKE-
55	REFCLKP	56	NC
57	GND	58	NC
59	---	60	---
61	---	62	---
63	---	64	---
65	---	66	---
67	NC	68	SUSCLK(32KHz)
69	PEDET	70	3.3VAUX
71	GND	72	3.3VAUX
73	GND	74	3.3VAUX
75	GND		

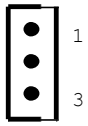
2.3.14 OOB_SW & UART OOB





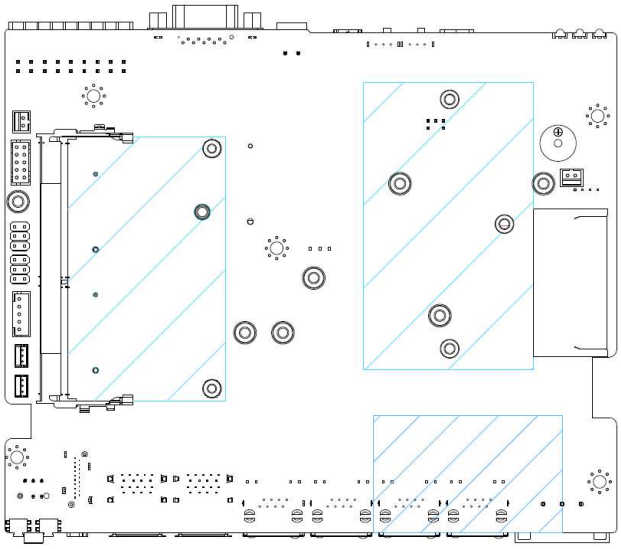


Pin	Signal
1	Power 5Vcc
2	GND
3	Power Botton
4	System Reset
5	Power On Off

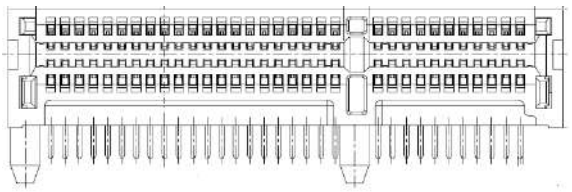


Pin	Signal
1	RX
2	TX
3	GND

2.3.15 POE Module



B32



Pin A	Signal	Pin B	Signal
A1 ~ A11	DC_IN	B1~B12	DC_IN
A12~A20	GND	B12~B20	GND
A21~A23	5Vcc	B21	I2C_DAT
		B22	I2C_CLK
A24~A26	3Vcc	B23~B24	12Vcc
A27~A32	+56S	B25	PSE_OUT1
		B26	PSE_OUT2
		B27	PSE_OUT3
		B28	PSE_OUT4
		B29	PSE_OUT5
		B30	PSE_OUT6
		B31	PSE_OUT7
		B32	PSE_OUT8

Chapter 3

System Setup

3.1 Set torque force to 3.5 kgf-cm to screw or unscrew system parts.

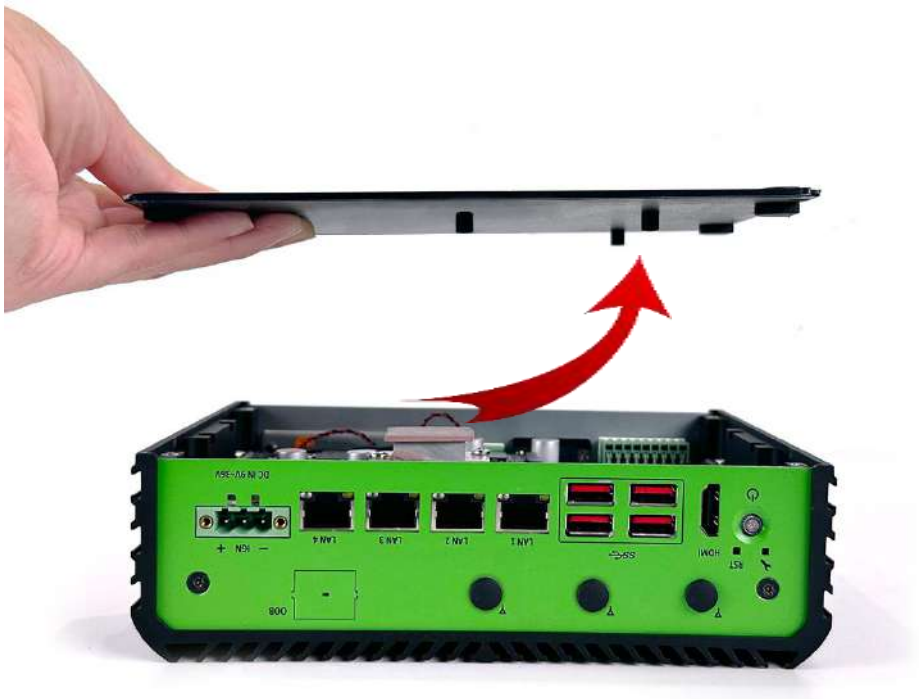
WARNING

To ensure safety and prevent system damage, before disassembly, please switch off the system and disconnect the unit from its power source.

3.2 Removing Chassis Bottom Cover

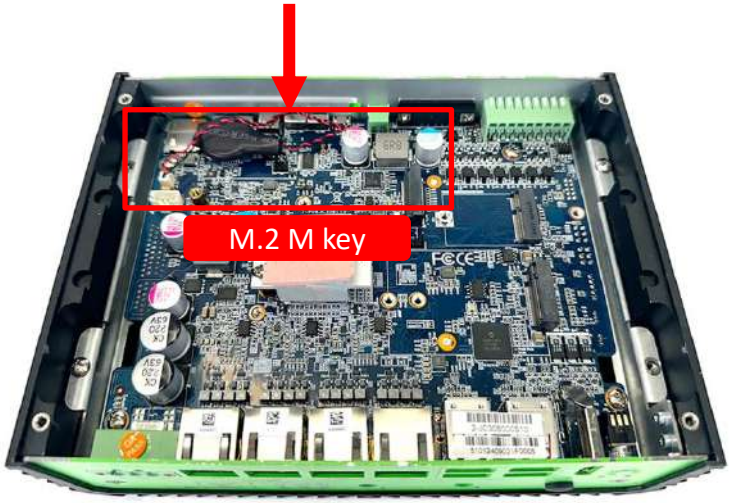
1. Turn the computer upside down. Loosen the four screws on the bottom cover as highlighted same as the picture below.

2. Now you can remove the bottom cover.

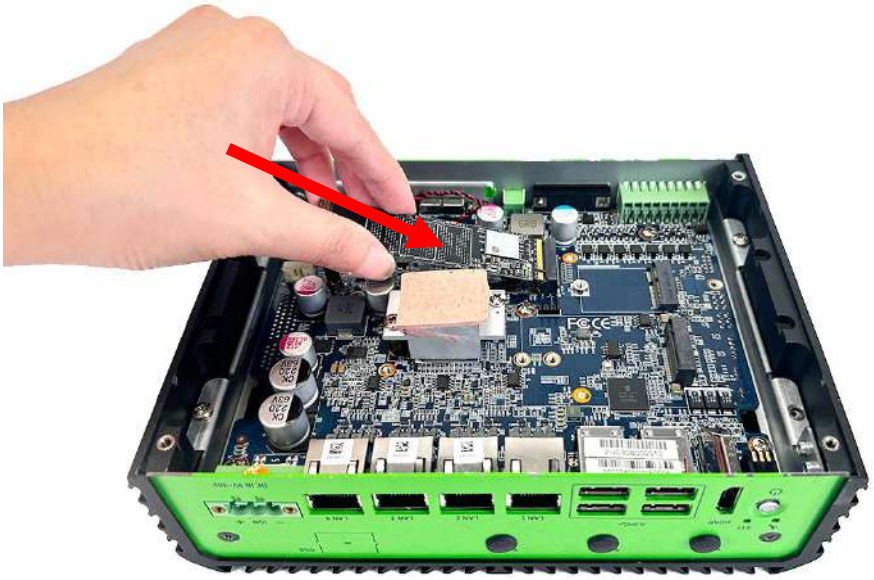


3.3 Install M.2 M Key card

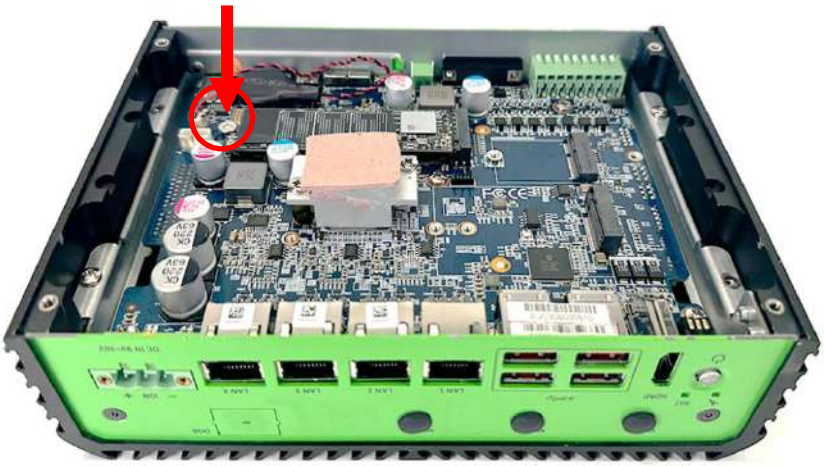
1. JCO-3000-ORN-B (4LAN) series PCBA features an M.2 M Key slot on the top, which supports NVMe Module.



2. Insert M.2 M Key card at a 45 degree angle.



3. Press the M.2 M Key card down and secure it with one screw (M3x5L).



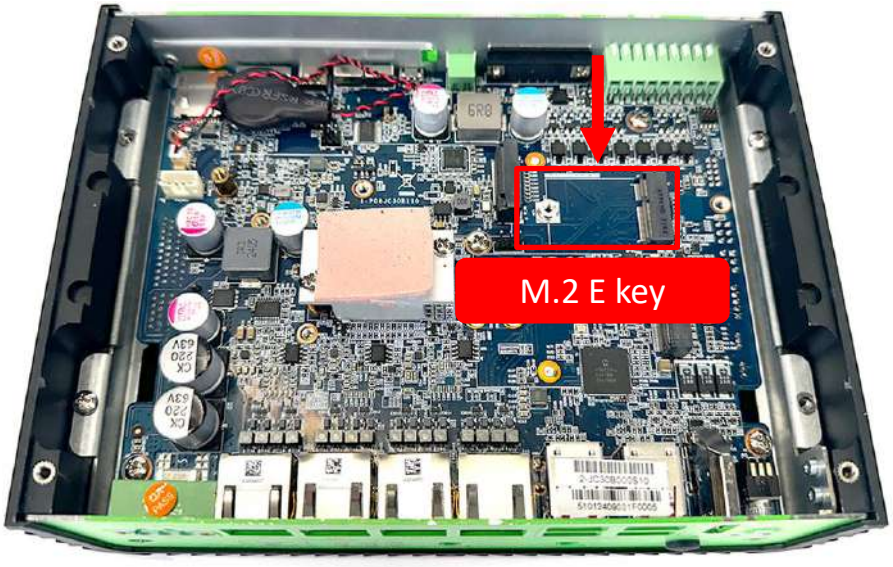
3.4 Installing Wi-Fi Module and Antenna

1. JCO-3000-ORN-B (4LAN) system has 6 antenna holes in total, 2 are located on the front panel and the other 2 are located at the rear panel as pictured below.

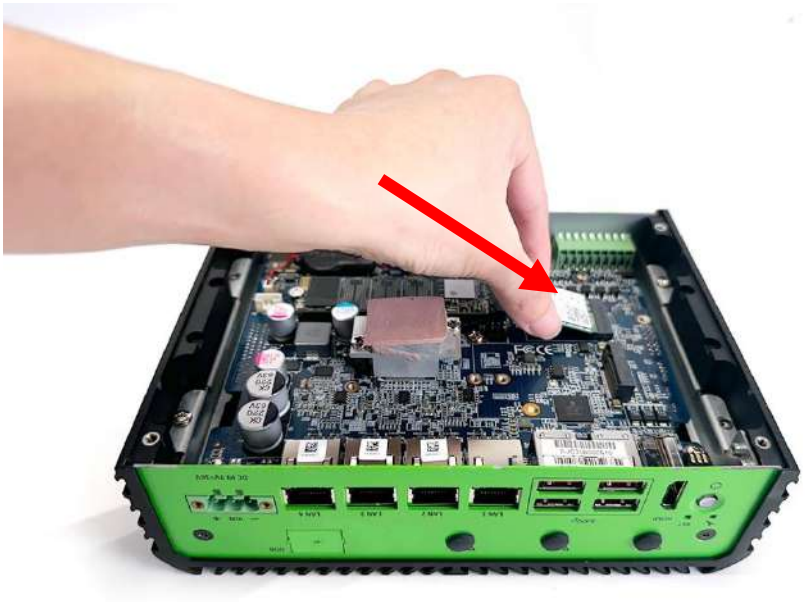
Front panel

Rear panel

2. JCO-3000-ORN-B (4LAN) series PCBA has an M.2 Key E slot on the top, which currently supports Wi-Fi application.



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

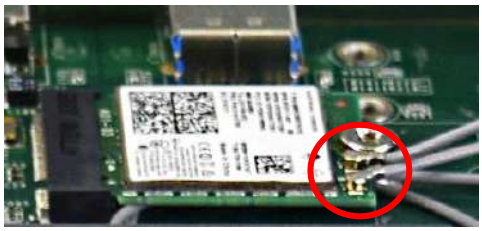


4. Press the M.2 E Key card down and secure it with one screw (M3x5L).

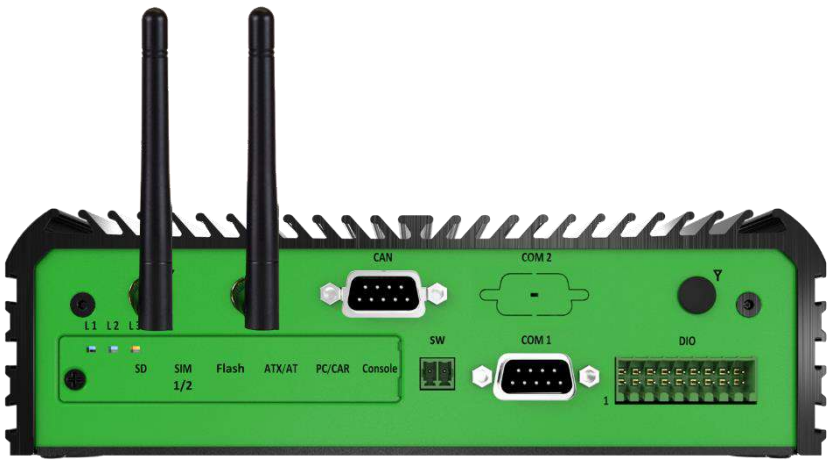
5. Remove antenna hole cover on the system panel.

6. Install the SMA female jack through the antenna holes and then secure it with the SMA male plug.

7. Attach the end of the cable from the Wireless RF connector to the communication module as shown in the picture below.

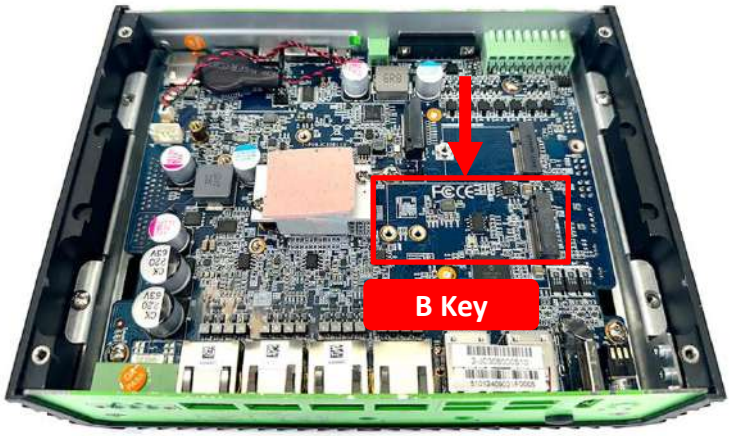


8. Assemble the antenna and SMA jack together; the outcome should resemble the picture below.

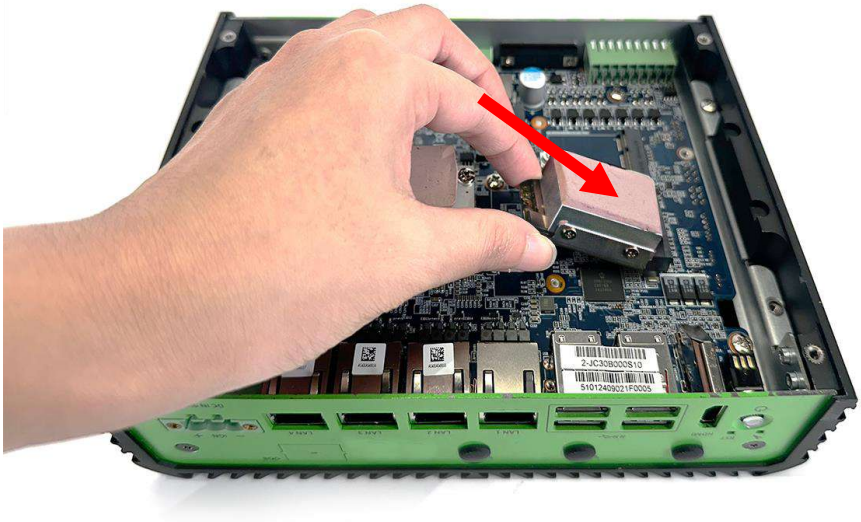


3.5 Installing 4G/5G Module and Antenna

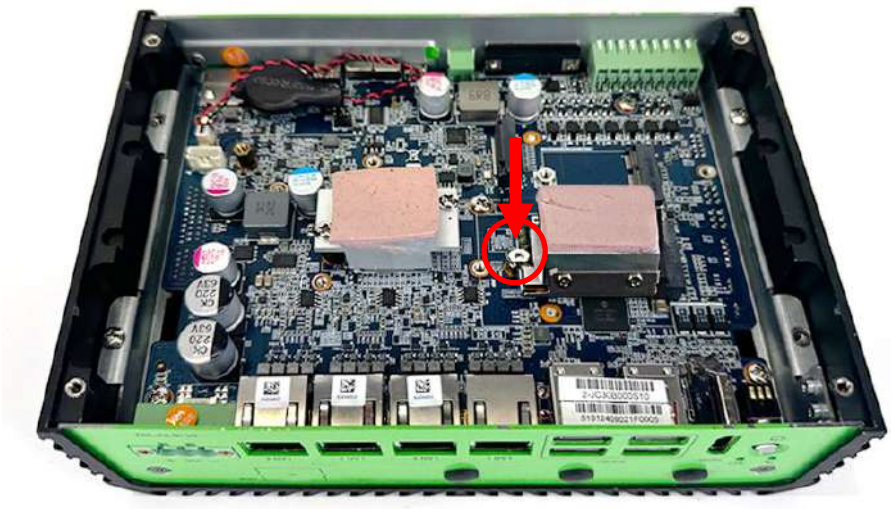
1. JCO-3000-ORN-B (4LAN) series PCBA has an M.2 B Key slot on the top, which currently supports 4G/5G application.



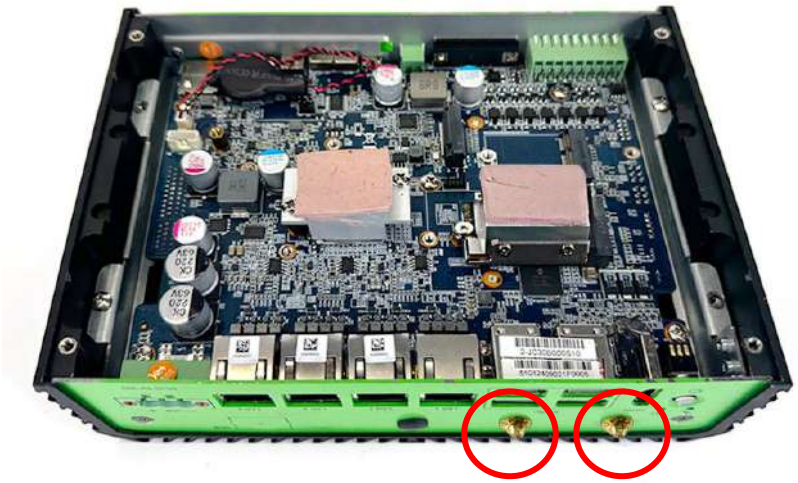
2. Insert 4G/5G module at a 45 degree angle.



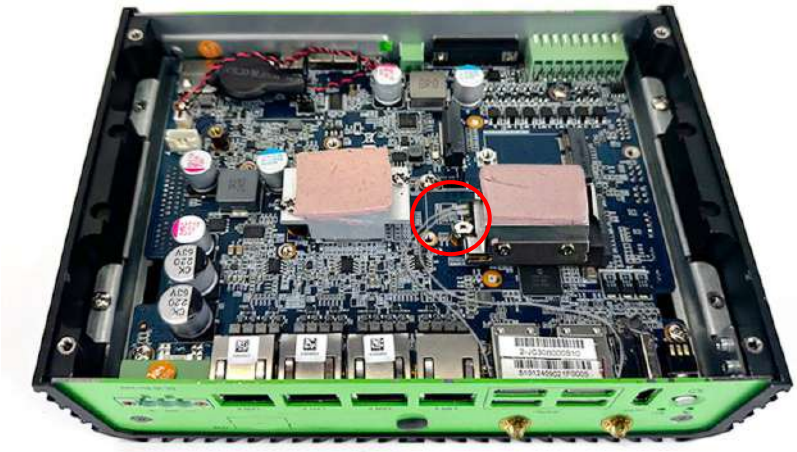
3. Press the M.2 B Key card down and secure it with one screw (M3x5L).

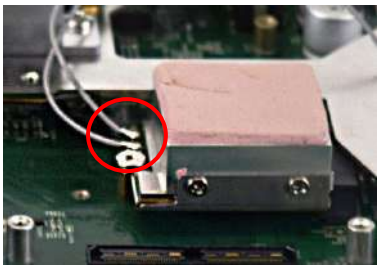


4. Install the SMA female jack through the antenna holes and then secure it with the SMA male plug.

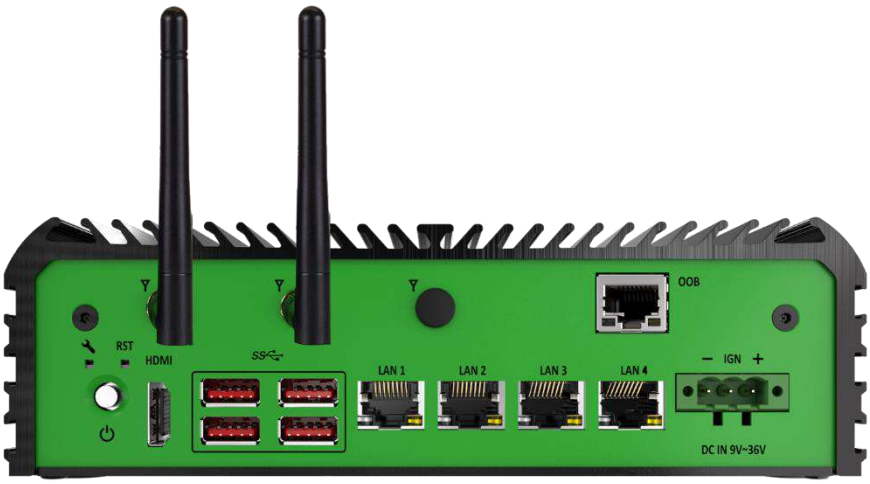


5. Attach the end of the cable from the Wireless RF connector to the communication module as shown in the picture below.





6. Assemble the antenna and SMA jack together; the outcome should resemble the picture below.



3.6 Assembling Chassis Bottom Cover

1. Place the bottom cover according to the direction shown in the picture below.

2. Lock the bottom cover with the four screws.

3.7 Installing SIM Card

1. SIM card socket is located on the back panel of the system.

Open the safety bracket

2. Pull out the SIM card tray and place the Nano SIM (SIM 1) on the bottom of sim tray

3. Place the Nano SIM (SIM 2) on the top of sim tray

3.8 Installing DIN Rail Holder

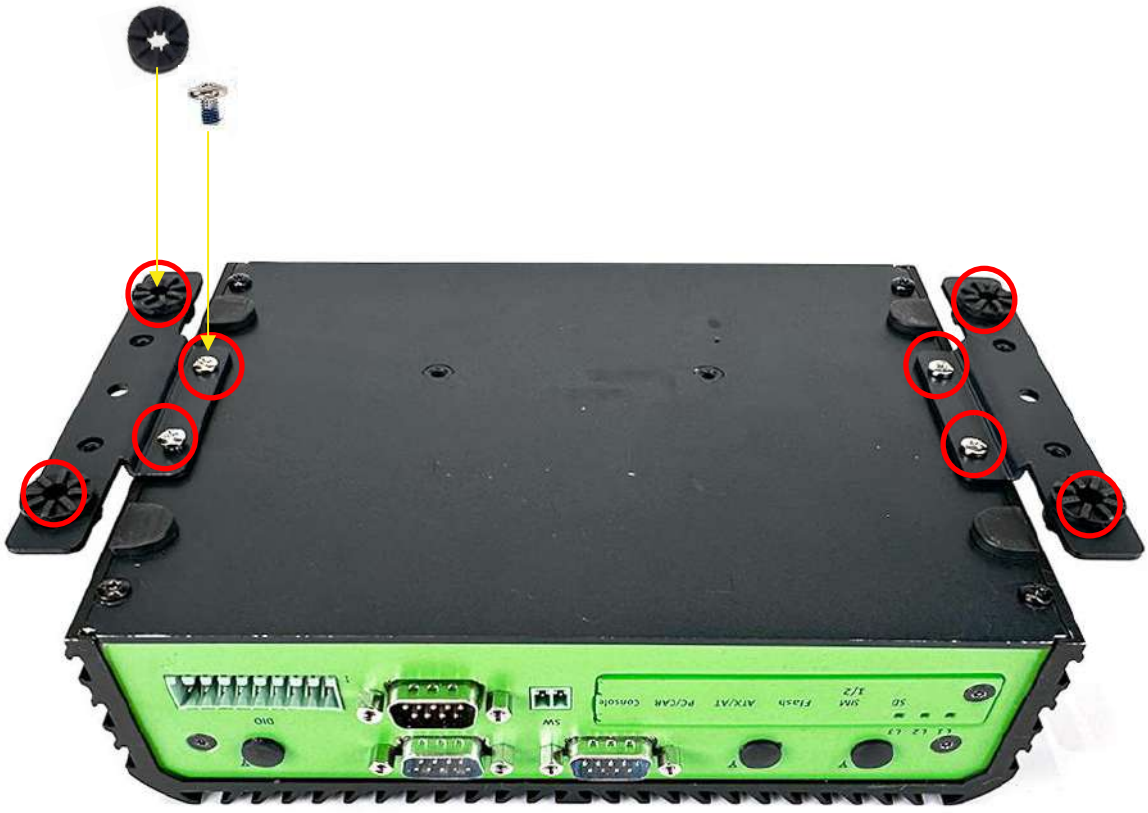
1. Din rail holder is available for JCO-3000-ORN-B (4LAN) series as optional accessories.

2. Place Din rail holder on top of the bottom cover and secure it with two screws (M4x5L, Nylok).

3.9 Installing Wall Mount

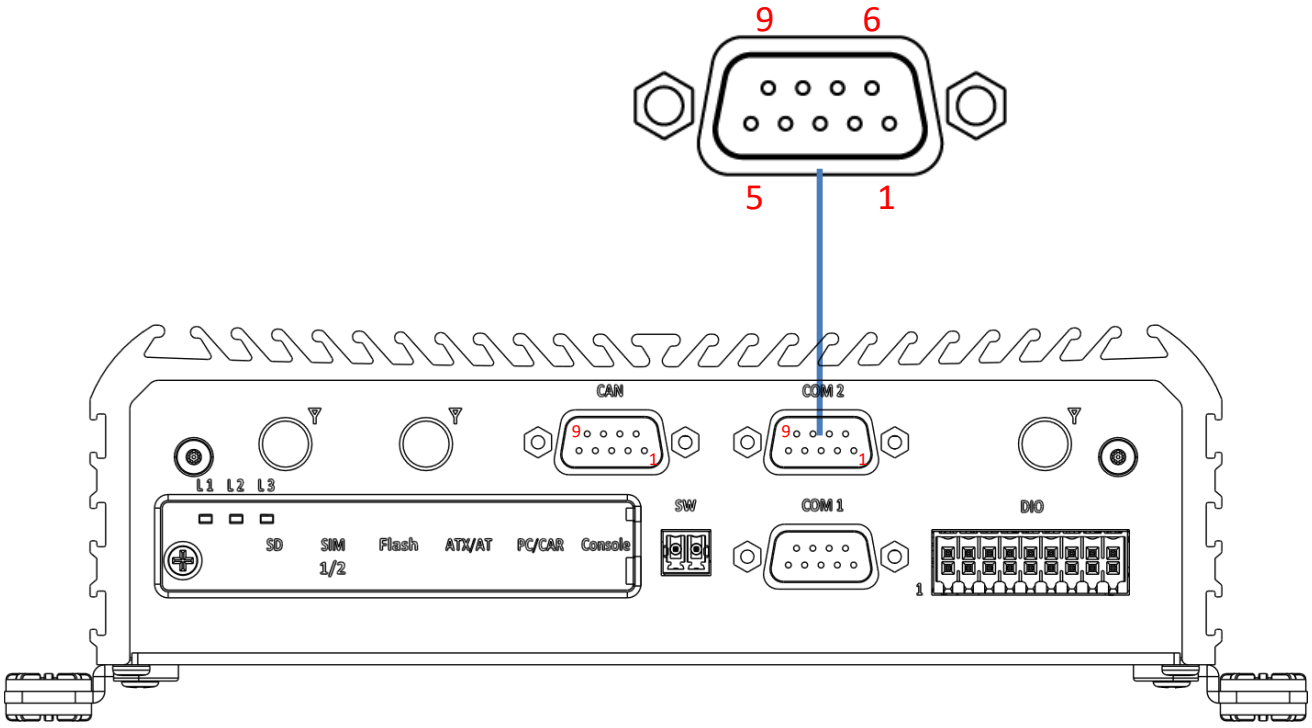
1. Wall Mount holder is available for JCO-3000-ORN-B (4LAN) series as optional accessories.

2. Place Wall Mount holder on top of the bottom cover and secure it with four black Anti-Vibration Grommets and four screws (M4x5L, Nylok) as shown in the picture below.



3.10 Appendix A Optional COM

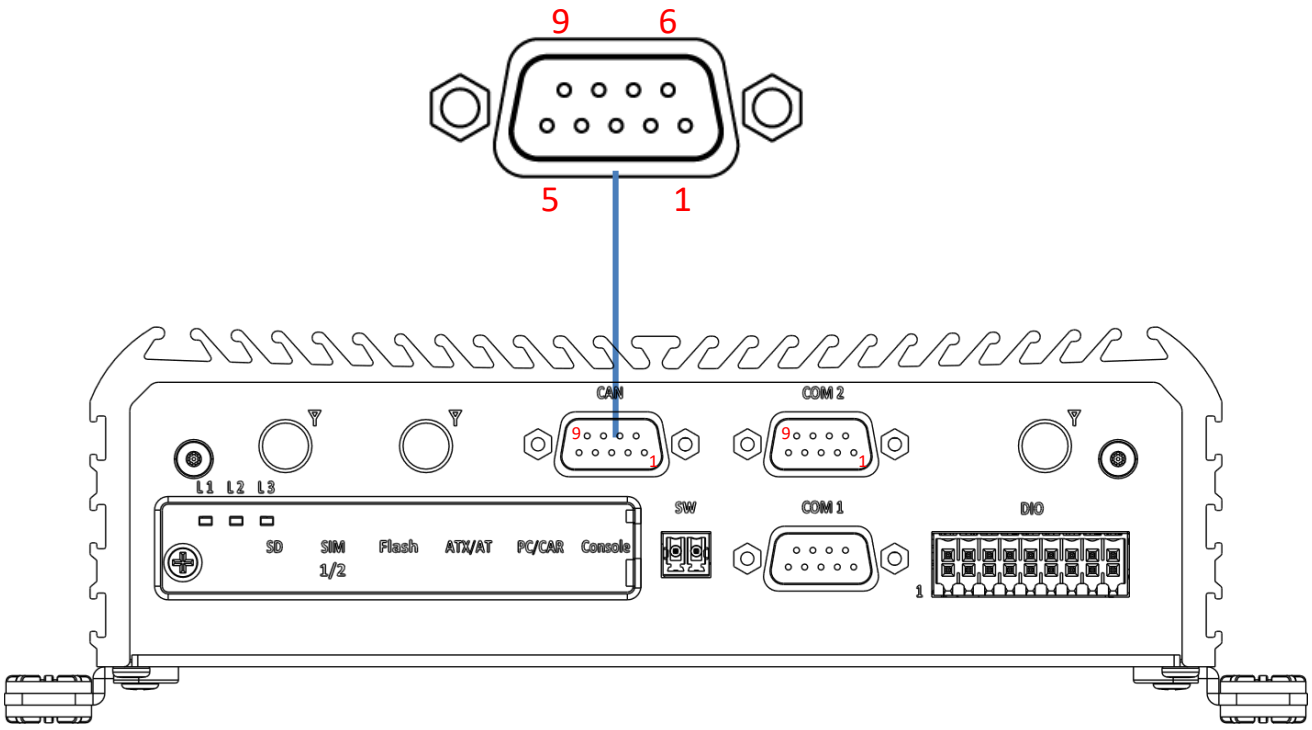
RS232 / RS422 / RS485



RS232	1	2	3	4	5	6	7	8	9
	DCD	RXD	TXD	DTR	GND	X	RTS	CTS	X
RS422	TX-	TX+	RX-	RX-	GND	X	X	X	X
RS485	DATA-	DATA+	X	X	GND	X	X	X	X

3.11 Appendix B Optional CAN

CAN Bus



CAN Bus	2	7
	L	H

Chapter 4

Software Setup Guide

4.1 OS Flash Image Guide

4.1.1 Preparation

- **Host PC**

  You need a host PC running Ubuntu Desktop 18.04 and 20.04. And need install below package:

  sudo apt-get install qemu-user-static

  sudo apt-get install sshpass

  sudo apt-get install abootimg

  sudo apt install nfs-kernel-server

  sudo apt-get install libxml2-utils

- **BSP Image:**

  Download the BSP image from Premio web site. The file name will follow the format of :

  {Model}_{JetPack_Ver}_{BSP_Ver}.tar.gz

  For example:

  JCO-3000-ORN-B_JP512_V0.0.1.tar.gz

4.1.2 Flash BSP Image

On Host Computer, open Linux terminal and enter the following command to extract compressed OS image files (file name may vary):

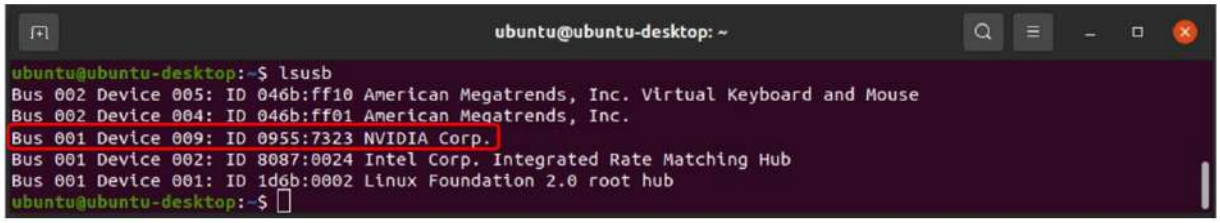
```
$ sudo tar zxvf JCO-3000-ORN-B_JP512_V0.0.1.tar.gz
```

Next, following steps to force the system to start in USB Recovery Mode:

1. Connect the USB type-C cable to the "Flash" port on the JCO-3000-ORN-B and the USB port on the host PC.

2. Press and hold force recovery button, then press power button on the system. Wait for two seconds then release the buttons.

3. When device is in recovery mode, lsusb command on host PC will list a line of "0955:7323 Nvidia Corp"



Next, following steps to flash BSP image in JCO-3000-ORN-B :

1. Connect the USB type-C cable to the "Flash" port on the JCO-3000-ORN-B and the USB port on the host PC.
2. Enter the following command in terminal to flash the image:

```
$ sudo ./flash-jco-3000.sh
```

3. Wait as the image is installed. Once finished you should see the following:

```
[ 330.1043 ] [.............................................] 100%
[ 330.1145 ] Writing partition B_bpmp-fw with bpmp_t234-TE990M-A1_prod_sigheader.bin.encrypt [ 1051136 bytes ]
[ 332.1415 ] [.............................................] 100%
[ 345.0480 ] Writing partition B_bpmp-fw-dtb with tegra234-bpmp-3701-0004-3737-0000_with_odm_sigheader.dtb.encrypt [ 260160 bytes ]
[ 345.0835 ] [.............................................] 100%
[ 345.0970 ] Writing partition B_psc-fw with pscfw_t234_prod_sigheader.bin.encrypt [ 375168 bytes ]
[ 348.3002 ] [.............................................] 100%
[ 348.3182 ] Writing partition B_mts-mce with mce_flash_o10_cr_prod_sigheader.bin.encrypt [ 196592 bytes ]
[ 352.9279 ] [.............................................] 100%
[ 352.9392 ] Writing partition B_sc7 with sc7_t234_prod_sigheader.bin.encrypt [ 184544 bytes ]
[ 355.2881 ] [.............................................] 100%
[ 355.2989 ] Writing partition B_pscrf with psc_rf_t234_prod_sigheader.bin.encrypt [ 122320 bytes ]
[ 357.5720 ] [.............................................] 100%
[ 357.5805 ] Writing partition B_mb2rf with mb2rf_t234_sigheader.bin.encrypt [ 122752 bytes ]
[ 359.0880 ] [.............................................] 100%
[ 359.0972 ] Writing partition B_cpu-bootloader with uefi_jetson_with_dtb_sigheader.bin.encrypt [ 3031104 bytes ]
[ 360.6112 ] [.............................................] 100%
[ 386.4523 ] Writing partition B_secure-os with tos-optee_t234_sigheader.img.encrypt [ 1127568 bytes ]
[ 397.9181 ] [.............................................] 100%
[ 410.8291 ] Writing partition B_eks with eks_t234_sigheader.img.encrypt [ 9232 bytes ]
[ 411.8079 ] [.............................................] 100%
[ 411.8127 ] Writing partition B_dce-fw with display-t234-dce_with_kernel_tegra234-p3701-0004-p3737-0000_aligned_blob_w_bin_sigheader.bi
n.encrypt [ 747936 bytes ]
[ 411.9398 ] [.............................................] 100%
[ 411.9721 ] Writing partition B_spe-fw with spe_t234_sigheader.bin.encrypt [ 270336 bytes ]
[ 421.1525 ] [.............................................] 100%
[ 421.1660 ] Writing partition B_rce-fw with camera-rtcpu-t234-rce_sigheader.img.encrypt [ 537952 bytes ]
[ 424.4859 ] [.............................................] 100%
[ 424.5101 ] Writing partition B_adsp-fw with adsp-fw_sigheader.bin.encrypt [ 400864 bytes ]
[ 431.1165 ] [.............................................] 100%
[ 431.1334 ] Writing partition B_VER with qspi_bootblob_ver.txt [ 109 bytes ]
[ 436.0570 ] [.............................................] 100%
[ 436.0616 ] Writing partition A_VER with qspi_bootblob_ver.txt [ 109 bytes ]
[ 436.0717 ] [.............................................] 100%
[ 436.0765 ] Writing partition master_boot_record with mbr_1_3.bin [ 512 bytes ]
[ 436.0870 ] [.............................................] 100%
[ 436.0913 ] Writing partition A_kernel with boot.img [ 43489280 bytes ]
[ 436.0975 ] [.............................................] 100%
[ 437.9265 ] Writing partition A_kernel-dtb with kernel_tegra234-p3701-0004-p3737-0000.dtb [ 378167 bytes ]
[ 437.9319 ] [.............................................] 100%
[ 437.9493 ] Writing partition B_kernel with boot.img [ 43489280 bytes ]
[ 437.9543 ] [.............................................] 100%
[ 439.8495 ] Writing partition B_kernel-dtb with kernel_tegra234-p3701-0004-p3737-0000.dtb [ 378167 bytes ]
[ 439.8548 ] [.............................................] 100%
[ 439.8730 ] Writing partition recovery with recovery.img [ 47073280 bytes ]
[ 439.8788 ] [.............................................] 100%
[ 441.9190 ] Writing partition recovery-dtb with tegra234-p3701-0004-p3737-0000.dtb.rec [ 378167 bytes ]
[ 441.9264 ] [.............................................] 100%
[ 441.9435 ] Writing partition esp with esp.img [ 67108864 bytes ]
[ 441.9484 ] [.............................................] 100%
[ 444.6100 ] Writing partition APP with system.img [ 59055800320 bytes ]
[ 444.6163 ] [.                                          ] 003%
```

```
tar: Read checkpoint 460000
tar: Read checkpoint 470000
tar: Read checkpoint 480000
tar: Read checkpoint 490000
tar: Read checkpoint 500000
tar: Read checkpoint 510000
tar: Read checkpoint 520000
tar: Read checkpoint 530000
tar: Read checkpoint 540000
tar: Read checkpoint 550000
tar: Read checkpoint 560000
tar: Read checkpoint 570000
tar: Read checkpoint 580000
writing item=16, 9:0:secondary_gpt, 61203267072, 16896, gpt_secondary_9_0.bin, 16896, fixed-<reserved>-0, 8b
2a095a2f0562b9f5d2d878102e074cc7086de7
[ 305]: l4t_flash_from_kernel: Successfully flash the external device
[ 305]: l4t_flash_from_kernel: Flashing success
[ 305]: l4t_flash_from_kernel: The device size indicated in the partition layout xml is smaller than the act
ual size. This utility will try to fix the GPT.
Flash is successful
Reboot device
Cleaning up...
Log is saved to Linux_for_Tegra/initrdlog/flash_1-1_0_20240506-150619.log
ubuntu@ubuntu-DWL01:~/JCO-3000-ORN-A_JP512_V0.0.1$
```

4. The system will reboot after flashing all images.

4.2 MCU Control Functions

4.2.1 Control Functions

MCU driver can control or get status of the below functions.

- LED Control
- GPIO Control
- Device Mode Status
- Buzzer Control
- Com Port Control
- IGN Power On/Off Delay Time Control
- Setting Save Control

4.2.2 LED Control

Control L2 ~ L4 leds's behavior.

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files : led_2 ~ led_4 (Read/Write)
- Control method :

```
$ echo value > /sys/bus/i2c/devices/7-0040/led_2
```

- Value format :

BIT number	Function	Default value
2 ~ 0	<Hz> 0: OFF, 7: ON, 1 ~6: Hz	0
5 ~ 3	<Light Count> 0: continuous, 1~ 7: count	0
6 ~ 7	<Gap Time> 0:continuous, 1 ~3 : 0.5~ 1.5S gap	0

4.2.3 GPIO Control

Read or setup GPIO status

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files :
  - gpio_in (Read-only) : default value 0
  - gpio_out (Read/Write) : default value 0
- Control method :

```
$ cat /sys/bus/i2c/devices/7-0040/gpio_in
$ echo value > /sys/bus/i2c/devices/7-0040/gpio_out
```

- GPIO bit mapping :
  - GPIO Input

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN8	IN7	IN6	IN5	IN4	IN3	IN2	IN1

  - GPIO Output

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
OUT8	OUT7	OUT6	OUT5	OUT4	OUT3	OUT2	OUT1

4.2.4 Device Mode Status

Read device mode as PC MODE or IGN MODE

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files : device_mode (Read-only)
- Control method :

```
$ cat /sys/bus/i2c/devices/7-0040/device_mode
```

Value format :
- PC MODE : PC mode
- IGN MODE : Ignition Mode

4.2.5 Buzzer Control

Control buzzer function

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files : buzzer_time (Read/Write) : default value 0
- Control method :

```
$ echo value > /sys/bus/i2c/devices/7-0040/buzzer_time
```

- Value format :

Buzzer turn on time : value * 0.1 seconds , then Buzzer turn off.
The value will auto clear to 0

4.2.6 Power on Buzzer Control

Enable or disable the buzzer when power on

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files : power_on_buzzer (Read/Write) : default value 1 (EEPROM Save)
- Control method :

```
$ echo value > /sys/bus/i2c/devices/7-0040/power_on_buzzer
```

- Value format :

  1 : Enable the Buzzer when power on.

  0 : Disable the Buzzer when power on.

4.2.7 Com Port Control

Set the COM port mode as RS-232, RS-485 or RS-422

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files : mgpio_out (Read/Write) : default value 5 (RS-232, EEPROM Save)
- Control method :

```
$ echo mode > /sys/bus/i2c/devices/7-0040/mgpio_out
```

- Value format :

  Writing a valid value (5, 10, 15) to change COM port settings

  - 5: RS-232 MODE
  - 10: RS-485 MODE
  - 15: RS-422 MODE

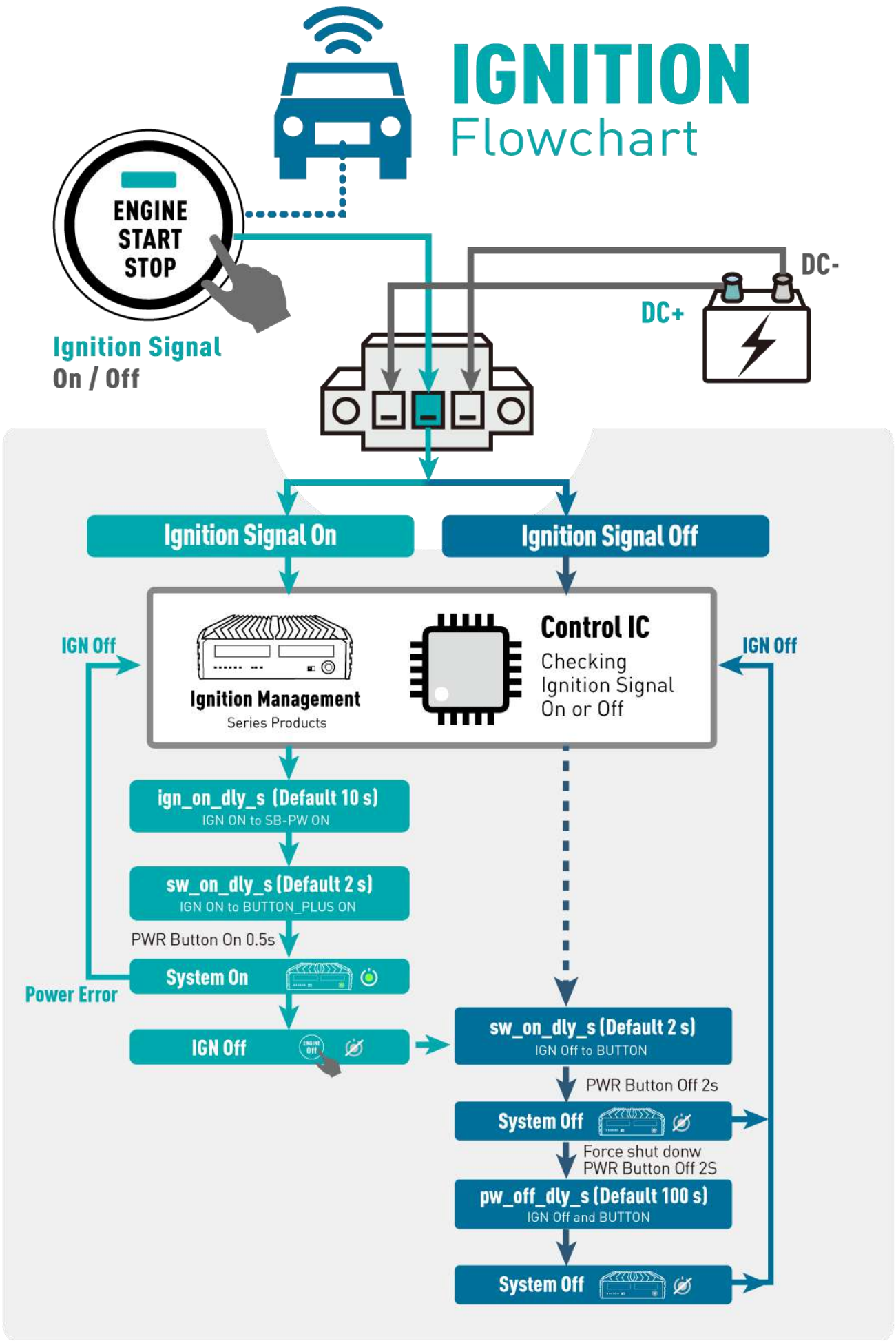
4.2.8 IGN Power On/Off Delay Time Control

Set IGN ON/OFF to SB-PW ON/OFF delay time at ignition mode

- The sysfs path : /sys/bus/i2c/devices/7-0040/
- Sysfs files :
  - ■ ign_on_dly_s (Read/Write) : default value 10 (EEPROM Save)
    - ◆ IGN ON to SB-PW ON delay second
  - ■ sw_on_dly_s (Read/Write) : default value 2 (EEPROM Save)
    - ◆ IGN ON to BUTTON_PLUS ON MB delay second
  - ■ sw_off_dly_s (Read/Write) : default value 2 (EEPROM Save)
    - ◆ IGN OFF to BUTTON_PLUS OFF MB delay second
  - ■ pw_off_dly_s (Read/Write) : default value 100 (EEPROM Save)
    - ◆ IGN OFF and BUTTON_PLUS send ,delay second forced Power OFF
- Control method examples:

  Value format :

  Range: 0 ~ 65535 seconds

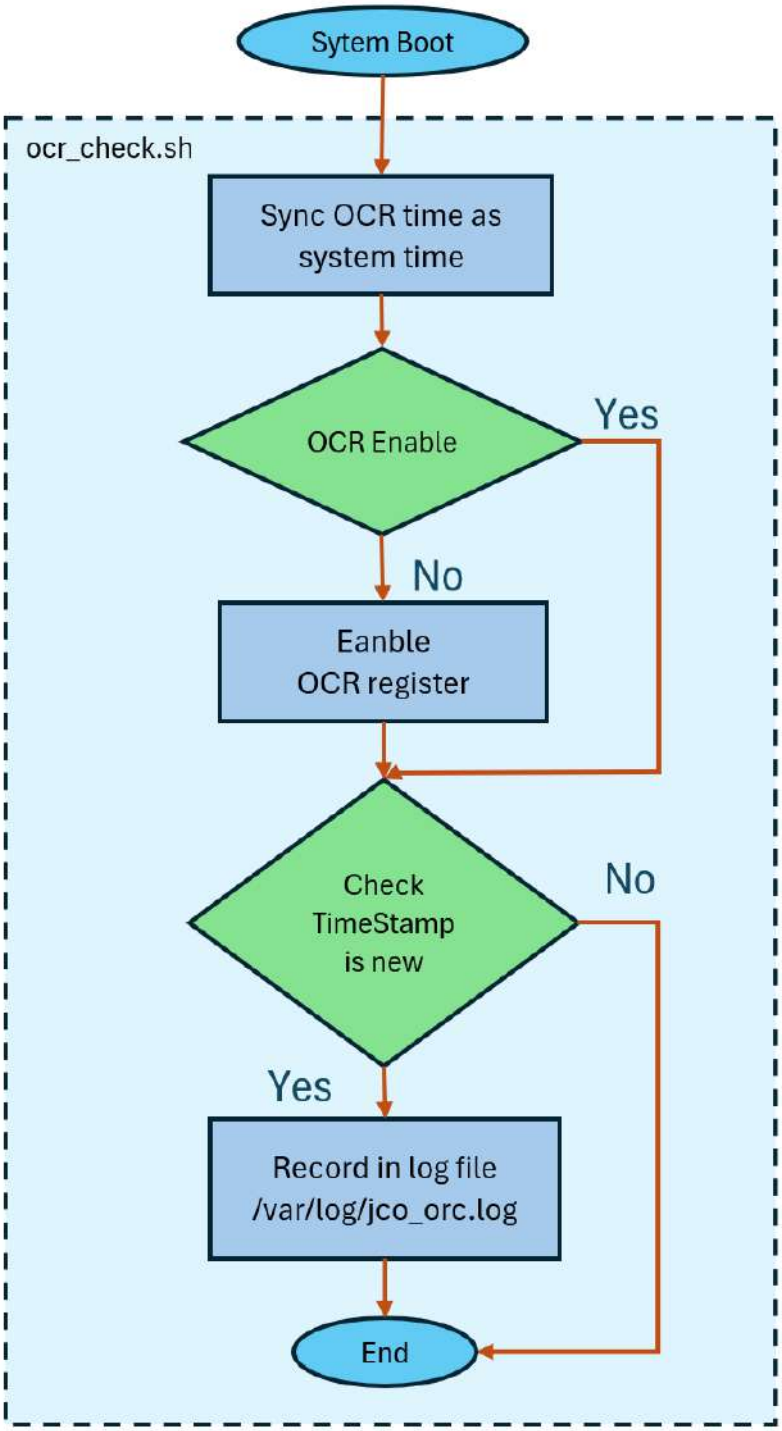

IGNITION
Flowchart
ENGINE
START
STOP
Ignition Signal
On / Off
DC-
DC+
Ignition Signal On
Ignition Signal Off
IGN Off
Ignition Management
Series Products
Control IC
Checking
Ignition Signal
On or Off
IGN Off
ign_on_dly_s (Default 10 s)
IGN ON to SB-PW ON
sw_on_dly_s (Default 2 s)
IGN ON to BUTTON_PLUS ON
PWR Button On 0.5s
System On
Power Error
IGN Off
sw_on_dly_s (Default 2 s)
IGN Off to BUTTON
PWR Button Off 2s
System Off
Force shut donw
PWR Button Off 2S
pw_off_dly_s (Default 100 s)
IGN Off and BUTTON
System Off

4.3 Case Open Detection (Option)

4.3.1 Driver Function

OCR (Open Case Recorder) driver can record case open time in log when system boot. However, can also check the case status by OCR function control at a specific time.

4.3.2 OCR function flow chart



4.3.3 OCR function control

- Get or Set the OCR time
  - The sysfs path : /sys/bus/i2c/devices/7-0051/
  - Sysfs files : time_now (Read/Write)
  - Control method :
    - Get OCR time

```
$ cat /sys/bus/i2c/devices/7-0051/time_now
```

    - Set OCR time

```
$ echo Value > /sys/bus/i2c/devices/7-0051/time_now
```

  - Value format :
    - YYYY/MM/DD_HH:MM:SS

      Ex: 2024/10/18_15:02:06

- Get the timestamp of the latest open case time
  - The sysfs path : /sys/bus/i2c/devices/7-0051/
  - Sysfs files : timestamp1 (Read)
  - Control method :
    - Get OCR time

```
$ cat /sys/bus/i2c/devices/7-0051/timestamp1
```

  - Value format :
    - YYYY/MM/DD_HH:MM:SS

      Ex: 2024/10/18_15:02:06

- Clear the timestamp of the latest open case time
  - The sysfs path : /sys/bus/i2c/devices/7-0051/
  - Sysfs files : clear_timestamp (Write)
  - Control method :

```
$ echo 1 > /sys/bus/i2c/devices/7-0051/clear_timestamp
```

- Enable open case recorder function
  - The sysfs path : /sys/bus/i2c/devices/7-0051/
  - Sysfs files : enable_tsr (Read/Write)
  - Control method :

    Enable function:

```
$ echo 1 > /sys/bus/i2c/devices/7-0051/enable_tsr
```

    Disable function:

```
$ echo 0 > /sys/bus/i2c/devices/7-0051/enable_tsr
```

    Check open case function status:

```
$ cat /sys/bus/i2c/devices/7-0051/enable_tsr
```

    Value format :

    1 : Function enable

    0: Function disable

- Read open case recorder log
  - The log file path : /var/log/jco_ocr.log
  - Control method :

```
$ cat /var/log/jco_ocr.log
```

    Value format example:

    Case Open Time [2024/10/18_13:12:11]

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