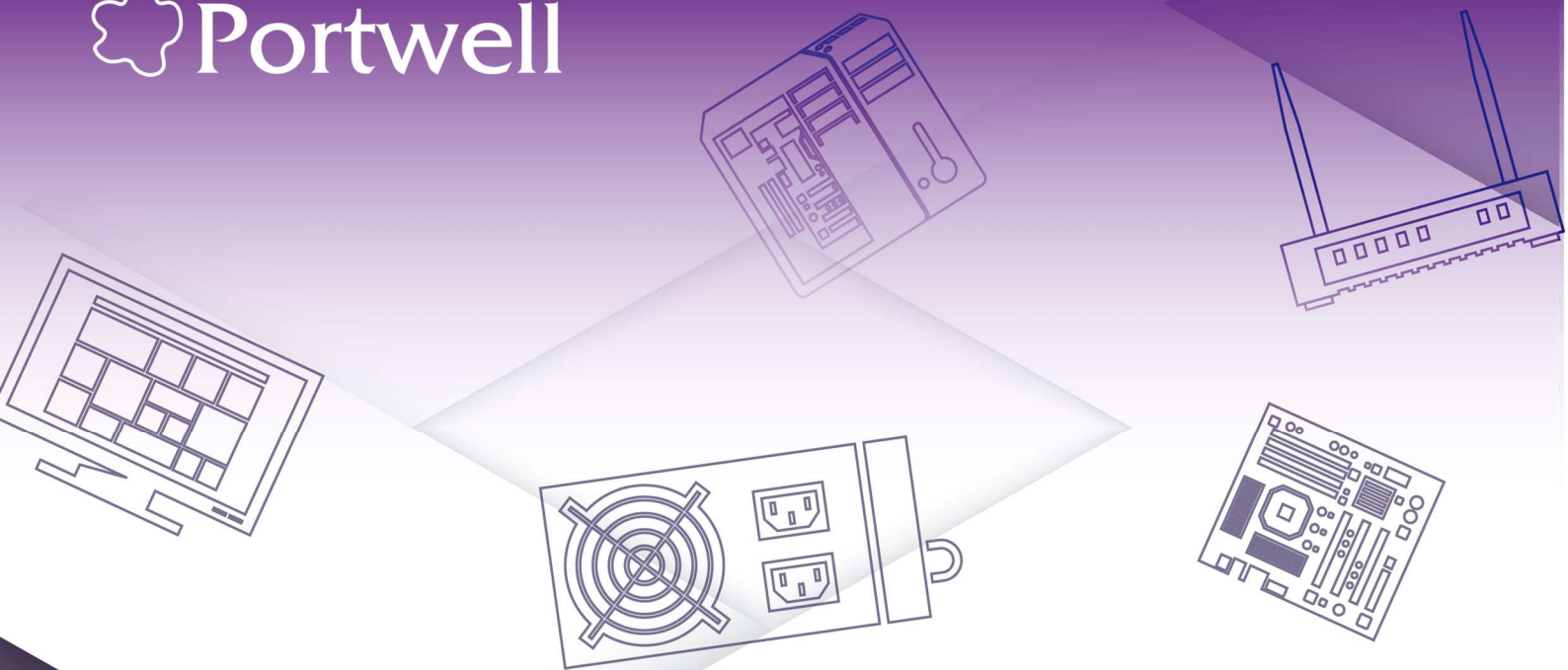




PJA1-1100 Series

Edge AI computing system

User Manual

Version R 1.0

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Revision History

R1.0	Official Release

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Chapter 1

Product Overview

- 1.1 Introduction
- 1.2 Product specification
- 1.3 Mechanical Dimension
- 1.4 Ordering Guide

1.1 Introduction

PJAI-1100 series are Edge AI computing systems pre-integrated with NVIDIA® Jetson Orin NX™ or Orin Nano™ modules.

The PJAI-1100 series is available in two models.

The PJAI-1100 features a fan less design delivering up to 100 TOPS of AI performance, the PJAI-1100F uses a system fan cooling solution to deliver up to 157 TOPS of AI performance.

The PJAI-1100 series provides a rich set of I/O interfaces, including:

- 1 × HDMI video output
- 2 × Gigabit Ethernet ports
- 3 × USB 3.2 Type-A ports
- M.2 expansion slots:
 - M-Key 2280 for NVMe
 - E-Key 2230 for Wi-Fi
 - B-Key 3042/3052 for 4G/5G modules
- 4-channel DI/DO
- 2 × DB9 COM ports
- 1 × CAN bus
- Removable door with 1 × USB Type-C (for OS installation) and 2 × SIM slots

Designed for versatility, the PJAI-1100 and PJAI-1100F are ideal for applications such as smart retail, logistics automation, smart cities, agriculture, healthcare, and other AI-driven edge deployments.

1.2 Product specification

1.2.1 Specifications of PJAI-1100

System	
SoM	<ul style="list-style-type: none"> • NVIDIA® Jetson Orin Nano • NVIDIA® Jetson Orin NX
CPU	<ul style="list-style-type: none"> • 6-core Arm® Cortex®-A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3 • 8-core Arm® Cortex®-A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3
Memory	<ul style="list-style-type: none"> • 4GB 64-bit LPDDR5 51 GB/s • 8GB 128-bit LPDDR5 102 GB/s • 8GB 128-bit LPDDR5 102.4GB/s • 16GB 128-bit LPDDR5 102.4GB/s
External I/O	
Ethernet	2x RJ45 GbE ports
USB	<ul style="list-style-type: none"> • 3 x USB 3.2 Type-A (0.9A/port) • 1x USB 2.0 Type C for OS Flash
DIO	4 x DI, 4 x DO (w/ isolation)
Display	1x HDMI up to 3840x2160 @ 30Hz
Serial Port	<ul style="list-style-type: none"> • 2x DB9 COM port for RS-232/422/485, COM2 support debug port • 1x DB9 CAN Bus
SIM	2x Nano SIM slots
Button	<ul style="list-style-type: none"> • Power Button • Force Recovery Button • Reset Bitton
LED	<ul style="list-style-type: none"> • Power LED • SSD LED
Antenna	<ul style="list-style-type: none"> • 6 Antenna for WiFi/4G/5G/LTE/GPRS
Expansion	

M.2	<ul style="list-style-type: none"> 1x M.2 3042/3052 B-Key for 4G/5G (PCIex1, USB2.0/3.0, I2C) 1x M.2 2230 E-Key for Wifi/BT (PCIex1, USB2.0, I2C and PCM)
Storage	
M.2	1x M.2 2280 M-Key for NVMe SSD (PCIex4)
Power	
Power Input	DC 12V to 24V
Power Interface	3-pin Terminal Block : V+, V-, PWBTN
Remote Switch	3-pin Terminal Block : V+, V-, PWBTN
Environmental	
Operating Temp	15W TDP Mode : -20°C to 60°C (-4°F to 140°F) 25W TDP Mode : -20°C to 55°C (-4°F to 131°F)
Storage Temp	-40°C to 85°C (-40°F ~ 185°F)
Humidity	5 ~ 95% @ 60°C, non-condensing
Shock	Operating, IEC 60068-2-27: 50G, half-sine, 11 ms duration
Vibration	Operating, IEC 60068-2-64: 3Grms, random, 5 to 500 Hz
Mechanical	
Dimension	152 x 109 x 63 mm (5.9" x 4.3" x 2.5")
Weight	1.31kg (2.89 lbs)
Mounting	<ul style="list-style-type: none"> Wall mount (Optional) DIN-Rail (Optional)

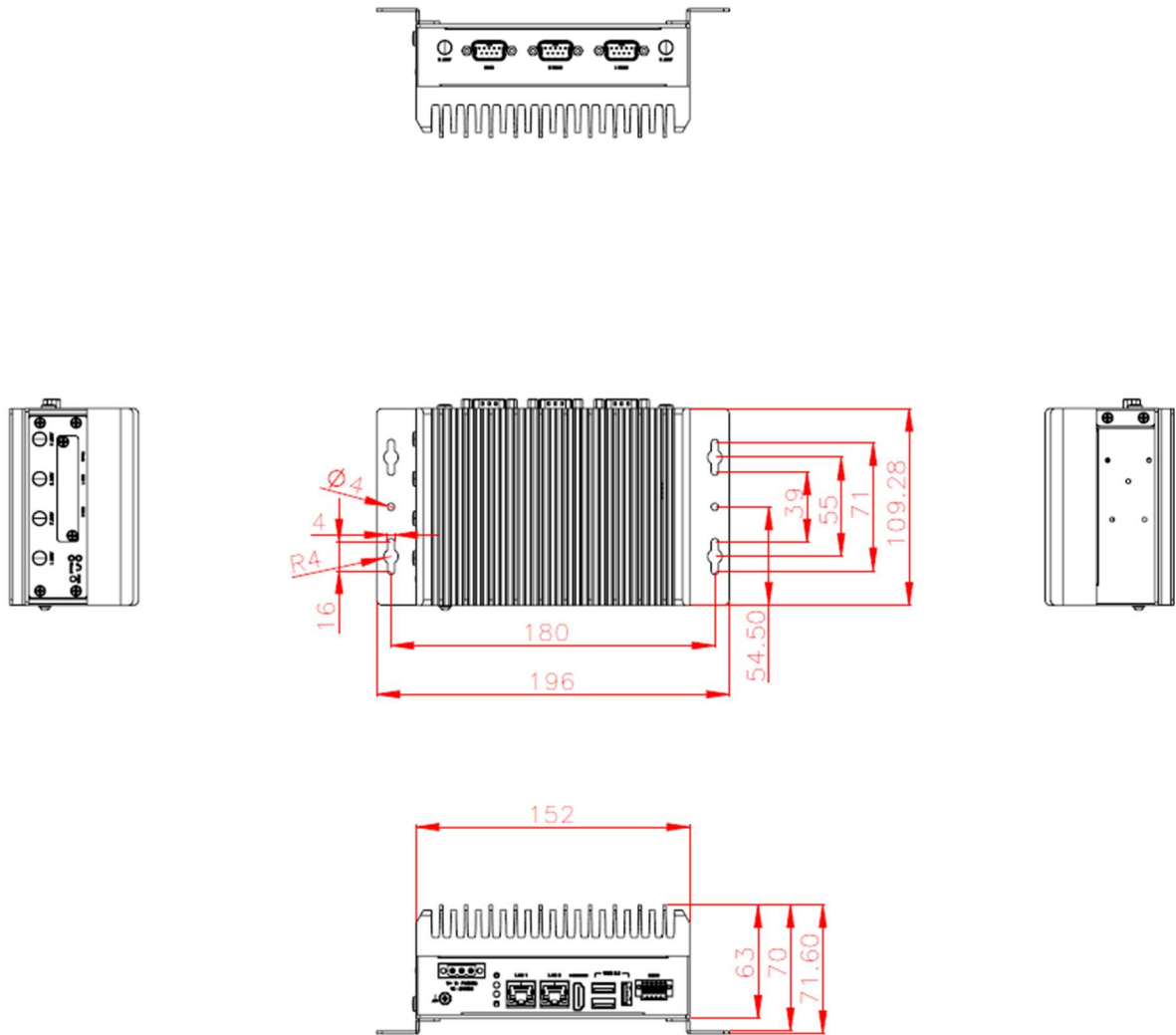
1.2.2 Specifications of PJAI-1100F

System	
SoM	NVIDIA® Jetson Orin NX
CPU	<ul style="list-style-type: none"> 6-core Arm® Cortex®-A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3 8-core Arm® Cortex®-A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3
Memory	<ul style="list-style-type: none"> 8GB 128-bit LPDDR5 102.4GB/s 16GB 128-bit LPDDR5 102.4GB/s
External I/O	
Ethernet	2x RJ45 GbE ports
USB	<ul style="list-style-type: none"> 3 x USB 3.2 Type-A (0.9A/port) 1x USB 2.0 Type C for OS Flash
DIO	4 x DI, 4 x DO (w/ isolation)
Display	1x HDMI up to 3840x2160 @ 60Hz
Serial Port	<ul style="list-style-type: none"> 2x DB9 COM port for RS-232/422/485, COM2 support debug port 1x DB9 CAN Bus
SIM	2x Nano SIM slots
Button	<ul style="list-style-type: none"> Power Button Force Recovery Button Reset Bitton
LED	<ul style="list-style-type: none"> Power LED SSD LED
Antenna	6 Antenna for WiFi/4G/5G/LTE/GPRS
Expansion	
M.2	<ul style="list-style-type: none"> 1x M.2 3042/3052 B-Key for 4G/5G (PCIex1, USB2.0/3.0, I2C) 1x M.2 2230 E-Key for Wifi/BT (PCIex1, USB2.0, I2C and PCM)
Storage	

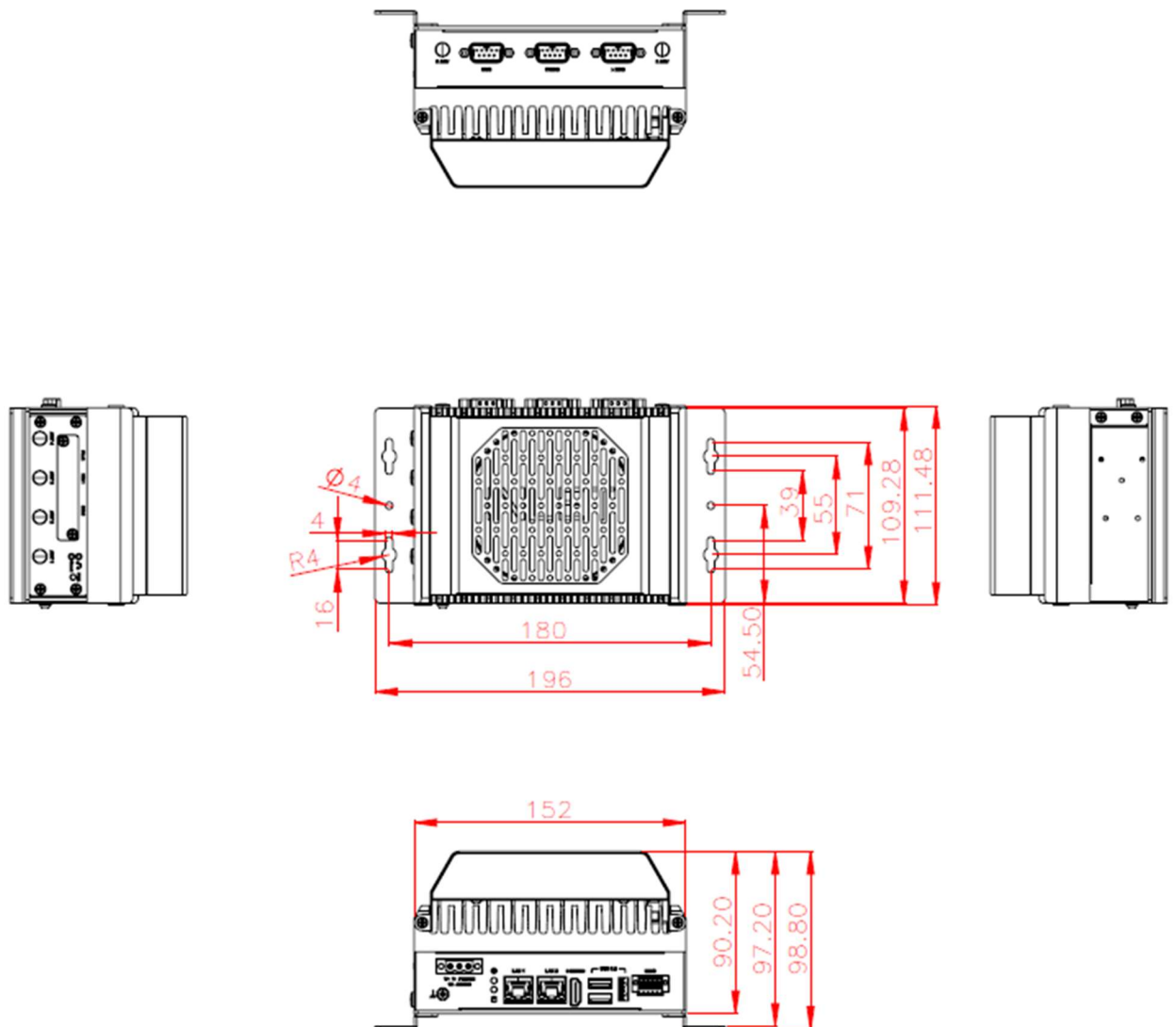
M.2	1x M.2 2280 M-Key for NVMe SSD (PCIex4)
Power	
Power Input	DC 12V to 24V
Power Interface	3-pin Terminal Block : V+, V-, PWBTN
Remote Switch	3-pin Terminal Block : V+, V-, PWBTN
Environmental	
Operating Temp	40W TDP Mode : -20°C to 60°C (-4°F to 114°F)
Storage Temp	-40°C to 85°C (-40°F ~ 185°F)
Humidity	5 ~ 95% @ 60°C, non-condensing
Shock	Operating, IEC 60068-2-27: 50G, half-sine, 11 ms duration
Vibration	Operating, IEC 60068-2-64: 3Grms, random, 5 to 500 Hz
Mechanical	
Dimension	152 x 112 x 90 mm (5.9" x 4.4" x 3.5")
Weight	1.61kg (3.55 lbs)
Mounting	Wall mount (Optional)

1.3 Mechanical Dimension

1.3.1 Dimensions of PJA1-1100



1.3.2 Dimensions of PJA1-1100F



1.4 Ordering Guide

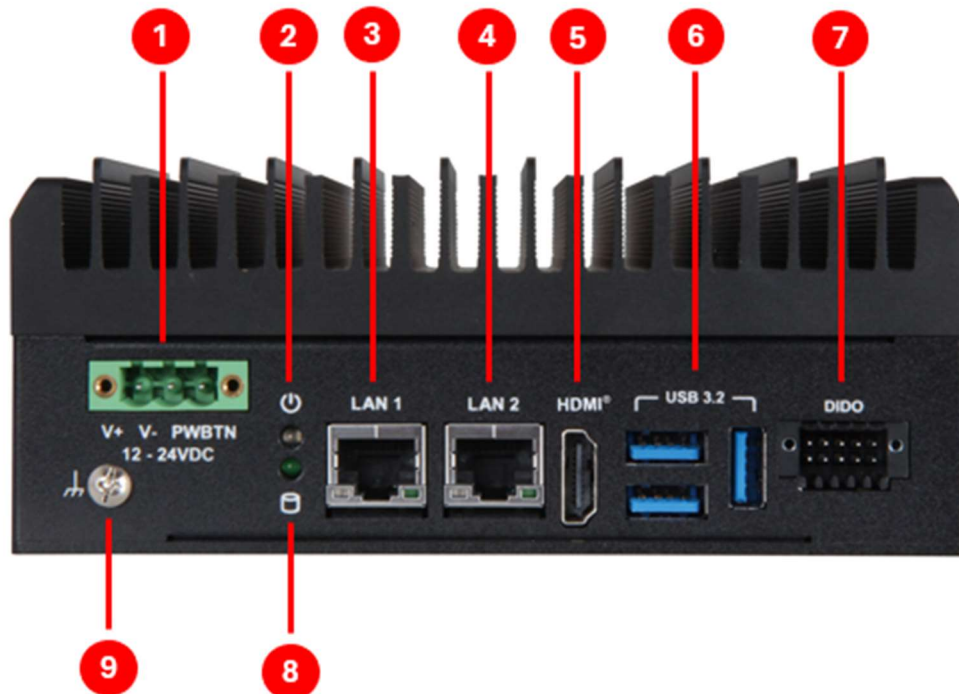
Part Number	Description
AS5-3724	(R).PJAI-1100F-OX8G. NVIDIA Jetson Orin NX 8G. 2xGbE. 2xCOM+1xCAN. 3xUSB3.2+1xUSB2.0
AS5-3725	(R).PJAI-1100F-OX16G. NVIDIA Jetson Orin NX 16G. 2xGbE. 2xCOM+1xCAN. 3xUSB3.2+1xUSB2.0
AS5-3748	(R).ATO.PJAI-1100-ON4G.Embedded System. Nvidia Jetson Orin Nano(4GB) (260pin SO-DIMM),12-24V
AS5-3747	(R).ATO.PJAI-1100-ON8G.Embedded System. Nvidia Jetson Orin Nano(8GB) (260pin SO-DIMM),12-24V
AS5-3746	(R).ATO.PJAI-1100-OX8G.Embedded System. Nvidia Jetson Orin NX(8GB) (260pin SO-DIMM),12-24V
AS5-3745	(R).ATO.PJAI-1100-OX16G.Embedded System. Nvidia Jetson Orin NX(16GB) (260pin SO-DIMM),12-24V

Chapter 2

System Overview

- 2.1 Front view
- 2.2 Rear view
- 2.3 Left view
- 2.4 Right view
- 2.5 Jumper setting

2.1 Front view



1. DC Power input jack:

DC 12V to 24V with 3-pin terminal block.

PIN No.	Function
1	V+
2	V-
3	PWBTN

2. Power LED:

- Green Light: Indicate whether the unit is connected to DC input.
- Yellow Light: When SOM Throttling.

3. LAN1:

RJ-45 LAN port supports for 10/100/1000 Mbps connection.

4. LAN2:

RJ-45 LAN port supports for 10/100/1000 Mbps connection.

5. HDMI:

HDMI (Display Port) display output.

6. USB 3.2:

3 x USB 3.2 Gen2 (Universal Serial Bus) port.

7. DIDO:

Provides electrical isolation (Up to 2500VDC) of digital input and output signals.

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	GN
3	DI_3	4	DO_3
5	DI_2	6	DO_2
7	DI_1	8	DO_1
9	DI_0	10	DO_0

8. SSD LED:

The SSD LED is presented with the storage active status.

9. Earth Ground:

Grounding point.

2.2 Rear view



1. ANT 5 / ANT 6:
Wi-Fi antenna jack.
2. COM1:
Support RS-232/RS-422/RS-485, default set to RS-202.

PIN No.	Signal Description	PIN No.	Signal Description
1	485D-/422T-	2	RXD#/485D+/422T+
3	TXD#/422R+	4	422R-
5	GND	6	N/C
7	RTS#	8	CTS#
9	GND		

3. COM2:
Support RS-232/RS-422/RS-485 and debug mode, default set to RS-232.

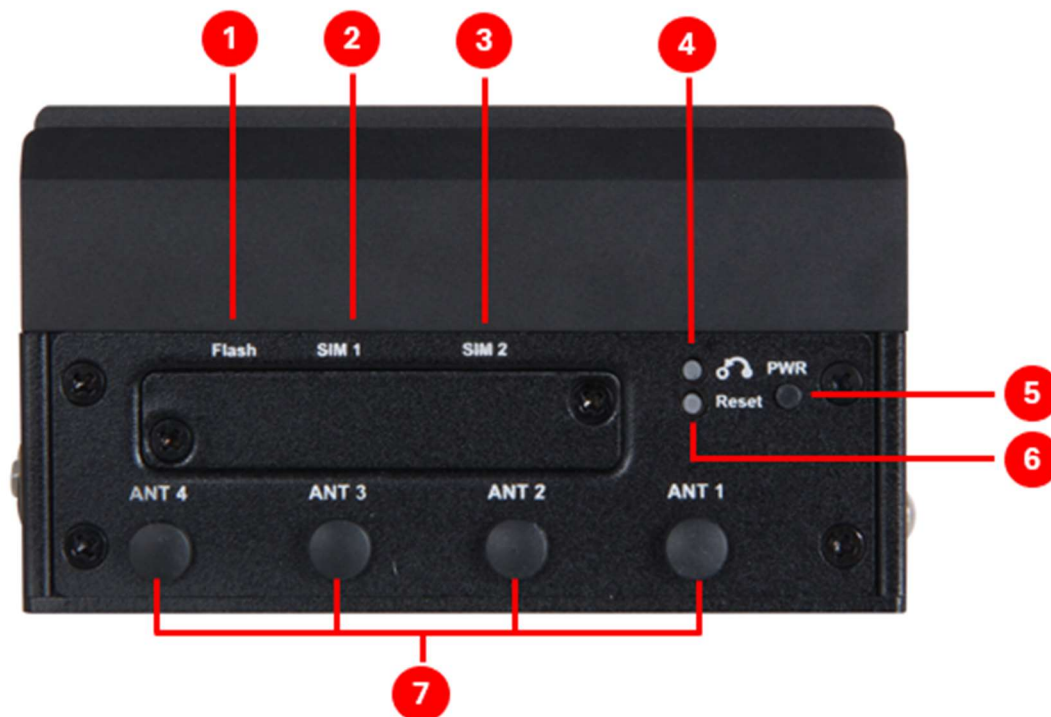
PIN No.	Signal Description	PIN No.	Signal Description
1	485D-/422T-	2	RXD#/485D+/422T+
3	TXD#/422R+	4	422R-
5	GND	6	N/C
7	RTS#	8	CTS#
9	GND		

4. CAN:

CAN Bus serial connector.

PIN No.	Signal Description	PIN No.	Signal Description
1	N/C	2	CAN_L
3	GND	4	N/C
5	GND	6	N/C
7	CAN_H	8	N/C
9	N/C		

2.3 Left view



1. Flash:

This flash port allows you to connect to a host computer to flash the OS image.

2. SIM1:

Nano SIM card.

3. SIM2:

Nano SIM card.

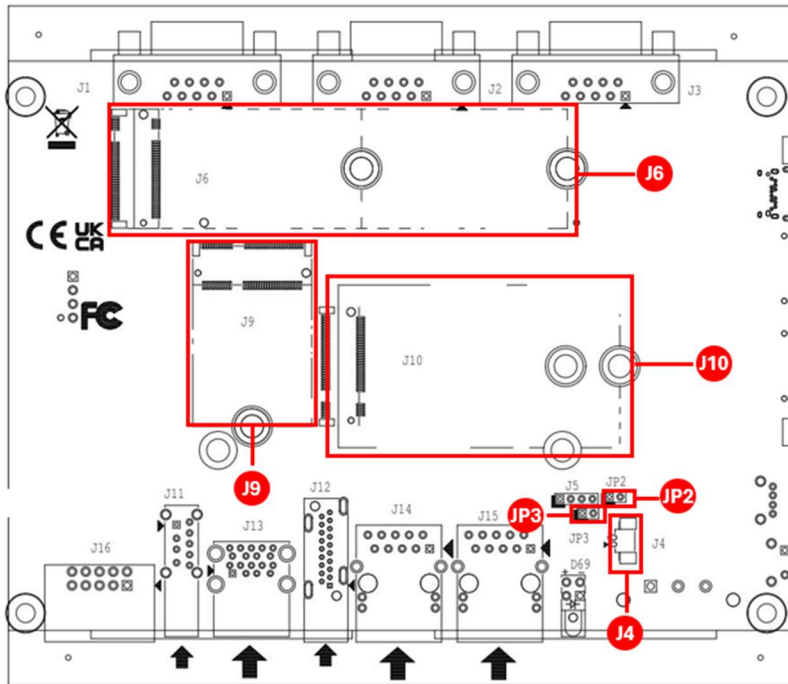
4. Recover:
Force recover switch.
5. Power Button:
Press the power button to turn the system on and off.
6. Reset:
Force reset switch.
7. ANT 1/ANT 2/ANT 3/ANT 4:
WWAN-MIMO antenna jack.

2.4 Right view



1. Din Rail:
Holes for installing DIN rail screws.

2.5 Jumper Setting



- **J6 M.2 (M-Key) slot:**
M.2 (M-Key) slot allows you to install an M-key type 2280 M.2 device.
- **J10 M.2(B-Key) 3052:**
M.2 (B-key) slot allows you to install a B-key type 3052 M.2 device, such as 5G NR or AEM module.
- **J9 M.2(E-Key) 2230:**
M.2 (E-key) slot allows you to install an E-key type 2230 M.2 Wi-Fi module.
- **JP2 Auto on disable:**

PIN No.	Signal Description
1	AUTO ON DISABLE
2	GND

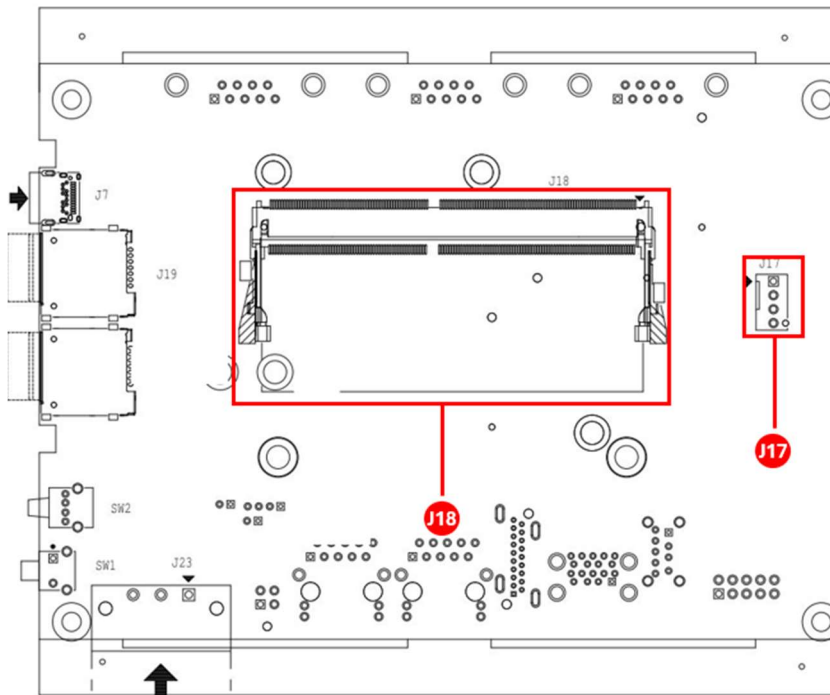
- **JP3 COM2 Source Select:**

PIN No.	Signal Description
1-2 Short	UART1
1-2 Open	Debug Console

- **J4 Battery connector:**

CAUTION: Risk of fire or explosion if the battery is replaced by an incorrect type.

PIN No.	Signal Description
1	V+
2	GND



- **J17 System Fan connector:**

PIN No.	Signal Description
1	GND
2	12V
3	FAN_TACHIN
4	PWM

- **J18 SO-DIMM slot:**

The SO-DIMM slot can support NVIDIA Jetson Orin Nano™ or NVIDIA Jetson Orin™ NX.

Chapter 3

System Installation

- 3.1 M.2 Key M 2280 Device installation
- 3.2 M.2 Key B 3052 Device installation
- 3.3 M.2 Key E 2230 Device installation
- 3.4 M.2 Key B 3052 Device installation
- 3.5 Wall Mount installation
- 3.6 DIN Rail Mount installation

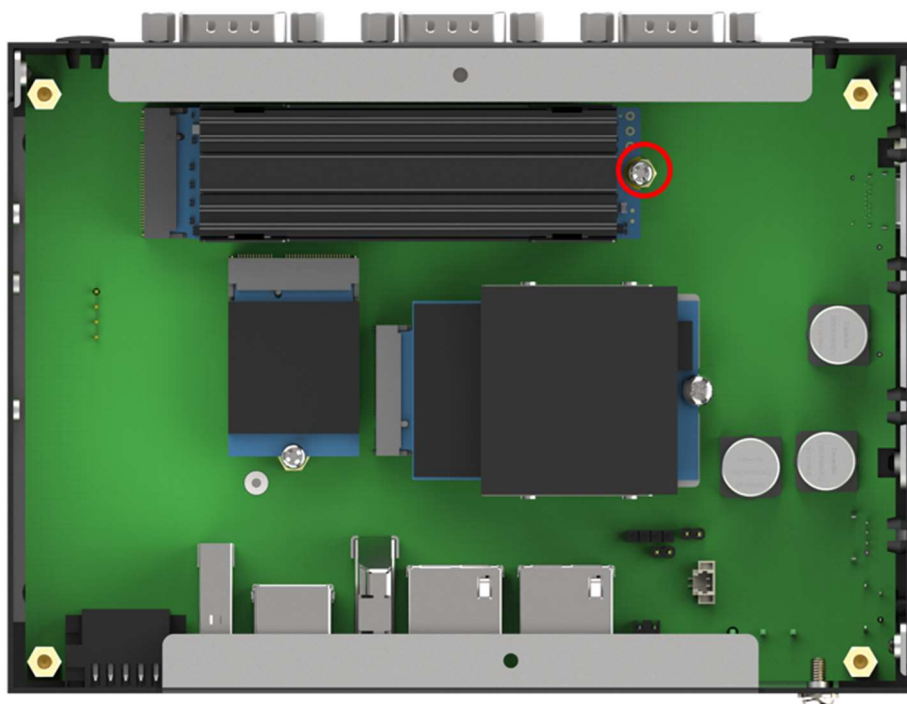
3.1 Opening the back cover

Loosen the 6 screws of the back cover and take out back cover.



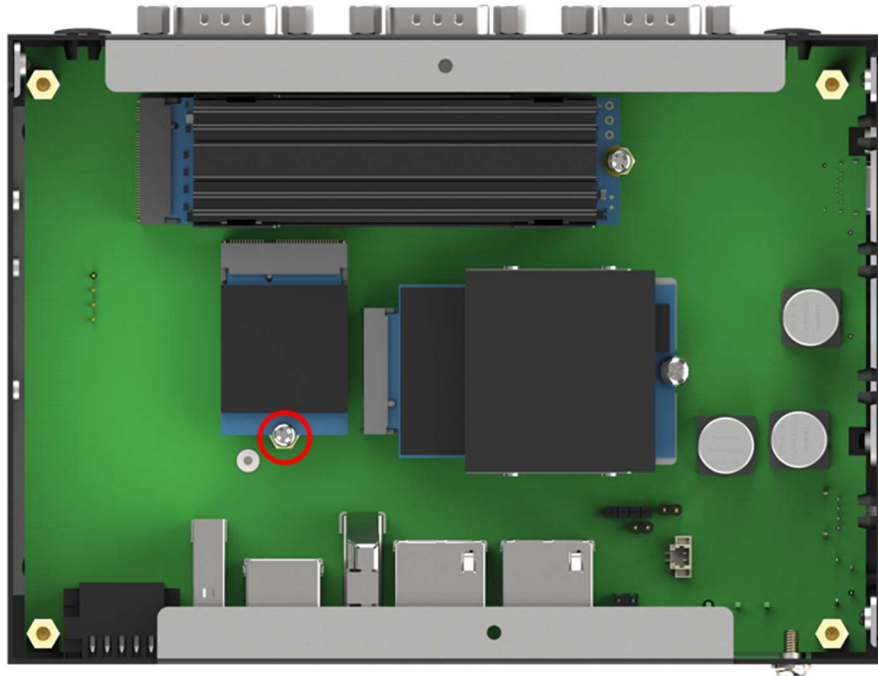
3.2 M.2 key M 2280 Device Installation

Assemble the M.2 2280 module and make sure it has been screwed.



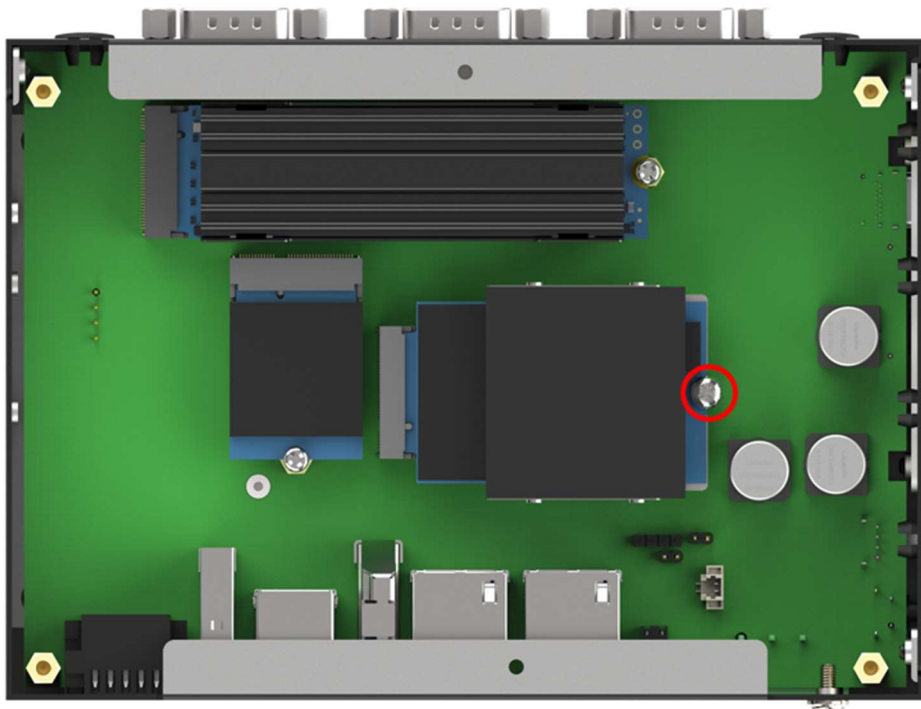
3.3 M.2 Key E 2230 Device Installation

Assemble the Key E device card and make sure it has been screwed.



3.4 M.2 Key B 3052 Device Installation

1. Assemble the Key B device card and make sure it has been screwed.



3.5 Wall Mount Installation



3.6 DIN Rail Mounting Installation

It's easy to install and maintain the DIN rail mounting device by simply opening the back cover.

1. Installing DIN rail bracket(optional).



Chapter 4

Important Instructions

- 4.1 Note on the Warranty
- 4.2 Exclusion of Accident Liability Obligation
- 4.3 Liability limitations/Exemption from Warranty Obligation
- 4.4 Declaration of Conformity

This chapter includes instructions which must be carefully followed when the Edge AI computing systems is used.

4.1 Note on the Warranty

Due to their limited-service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

Portwell, Inc. shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), Portwell, Inc. shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

EMC

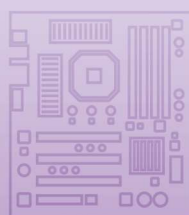
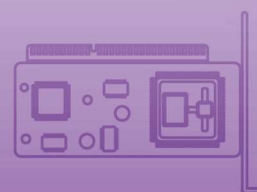
CE/FCC Class A

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.



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