



NexAloT Co., Ltd.

Intelligent Platform & Services Business Unit

AI Edge Computer

Coeus-3X21T

User Manual



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PREFACE

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Disclaimer

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Acknowledgements

Coeus-3821T, Coeus-3821T-8, Coeus-3721T, and Coeus-3721T-4 are trademarks of NexAIoT Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



NexAloT RoHS Environmental Policy and Status Update

NexAloT is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NexAloT has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NexAloT development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NexAloT are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NexAloT RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NexAloT naming convention.

Warranty and RMA

NexAloT Warranty Period

NexAloT manufactures products that are new or equivalent to new in accordance with industry standard. NexAloT warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NexAloT.

NexAloT Return Merchandise Authorization (RMA)

- Customers shall enclose the “NexAloT RMA Service Form” with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the “NexAloT RMA Service Form” for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NexAloT is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as “Out of Warranty.”
- Any products returned by NexAloT to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NexAloT will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NexAloT will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NexAloT products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NexAloT will return it to the customer without any charge.

Board Level

- Component fee: NexAloT will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NexAloT will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. Do not place heavy objects on the equipment.
16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
17. **CAUTION:** DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
18. Ensure to connect the power cord of the power adapter to a socket-outlet with earthing connection.

Technical Support and Assistance

1. For the most updated information of NexAloT products, visit NexAloT's website at www.nexaiot.com.
2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
 - Product name and serial number
 - Detailed information of the peripheral devices
 - Detailed information of the installed software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

Conventions Used in this Manual



Warning:

Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.



Caution:

Information to avoid damaging components or losing data.



Note:

Provides additional information to complete a task easily.

Global Service Contact Information

Headquarters

NEXCOM International Co., Ltd.

9F, No. 920, Zhongzheng Rd.,
Zhonghe District, New Taipei City, 23586,
Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
www.nexcom.com

Asia

Taiwan

NexAIoT Headquarters

Industry 4.0 and Cloud Services

12F, No.922, Zhongzheng Rd.,
Zhonghe District, New Taipei City,
23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7926
Email: sales@nexaiot.com
www.nexaiot.com

NexAIoT Co., Ltd.

Taichung Office

16F, No.250, Sec.2, Chongde Rd.,
Beitun District,
Taichung City, 406, Taiwan, R.O.C.
Tel: +886-4-2249-1179
Fax: +886-4-2249-1172
Email: jacobhuang@nexaiot.com
www.nexaiot.com

NexCOBOT Taiwan Co., Ltd.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7926
Email: jennyshern@nexcobot.com
www.nexcobot.com

GreenBase Technology Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7900
Email: vivianlin@nexcom.com.tw
www.nexcom.com.tw

DivioTec Inc.

19F-1A, No.97, Sec.4, ChongXin Rd.,
Sanchong District,
New Taipei City, 24161, Taiwan, R.O.C.
Tel: +886-2-8976-3077
Email: sales@diviotec.com
www.diviotec.com

AloT Cloud Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: alantsai@aiotcloud.net
www.aiotcloud.dev

EMBUX TECHNOLOGY CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: info@embux.com
www.embux.com

TMR TECHNOLOGIES CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: services@tmrtek.com
www.tmrtek.com

China NEXSEC Incorporated

201, Floor 2, Unit 2, Building 15, Yard 3,
Gaolizhang Road, Haidian District,
Beijing, 100094, China
Tel: +86-10-5704-2680
Fax: +86-10-5704-2681
Email: marketing@nexsec.cn
www.nexsec.cn

NEXCOM Shanghai

Room 406-407, Building C, No 154, Lane 953,
Jianchuan Road, Minhang District,
Shanghai, 201108, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

NEXCOM Surveillance Technology Corp.

Floor 8, Building B3, Xiufeng Industrial Zone,
GanKeng Community, Buji Street,
LongGang District,
ShenZhen, 518112, China
Tel: +86-755-8364-7768
Fax: +86-755-8364-7738
Email: steveyang@nexcom.com.tw
www.nexcom.cn

NEXGOL Chongqing

1st Building No.999,
Star Boulevard, Yongchuan Dist,
Chongqing City, 402160, China
Tel: +86-23-4960-9080
Fax: +86-23-4966-5855
Email: sales@nexgol.com.cn
www.nexcom.cn

Beijing NexGemo Technology Co.,Ltd.

Room 205, No.1, Fazhan Rd.,
Beijing International Information Industry Base,
Changping District,
Beijing, 102206, China
Tel: +86-10-8072-2025
Fax: +86-10-8072-2022
Email: sales@nexgemo.cn
www.nexgemo.com

Japan

NEXCOM Japan

9F, Tamachi Hara Bldg.,
4-11-5, Shiba Minato-ku,
Tokyo, 108-0014, Japan
Tel: +81-3-5419-7830
Fax: +81-3-5419-7832
Email: sales@nexcom-jp.com
www.nexcom-jp.com

America

USA NEXCOM USA

46665 Fremont Blvd.,
Fremont CA 94538, USA
Tel: +1-510-656-2248
Fax: +1-510-656-2158
Email: sales@nexcom.com
www.nexcomusa.com

Package Contents

Before continuing, verify that the Coeus-3X21T package that you received is complete. Your package should have all the items listed in the following table.

Item	P/N	Product Name	Qty
1		Coeus Host	1
2	50311F0013X0H	M3*8 screw	2
3	50311F0014X0H	M4*12 screw	4
4	50311F0015X0H	M3*6 screw	4
5	50311F0005X0H	M3*5 screw	1
6	4NCPF00301X0H	3P terminal	1
7	4NBPM05001X0H	5P terminal	2
8	5061700001X0H	Reset pin	1
9	5040480001X0H	Main chassis fixing plate	1
10	5040410001X0H	Fixed buckle	1

Order Information

The following information provides ordering information for the Coeus 3X21T series.

Coeus-3821T (P/N: 10JD3821T00XH)

Coeus-3821T-8 (P/N: 10JD3821T02XH)

Coeus-3721T (P/N: 10JD3721T00XH)

Coeus-3721T-4 (P/N:10JD3721T02XH)



Document Amendment History

This manual is intended for use with the following models:
Coeus-3821T/Coeus-3821T-8/Coeus-3721T/Coeus-3721T-4

Ver.	Modify record	Modified date	Remark
1.0	First draft	March 20, 2025	



CHAPTER 1: PRODUCT INTRODUCTION

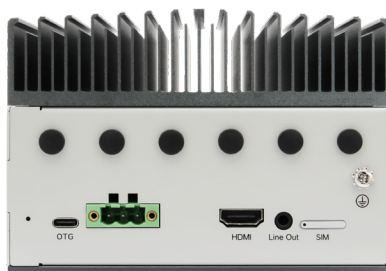
Coeus 3x21T Series

Overview

Front View



Rear View



Key Features

- Support NVIDIA® Jetson Orin™ NX series and Orin Nano™ series modules
- Support 4G, 5G, and Wi-Fi expansion
- Rich I/O interfaces including
- DC 9-30V wide voltage input, -10~55°C wide temperature design

Hardware Specifications

Dimensions

- 91.3mm (W) x 137mm (D) x 176mm (H)

CPU Support

- NVIDIA® Jetson Orin NX™, Jetson Orin Nano™ series
* Refer to the [following page](#) for additional details

Display

- 1 × HDMI®, up to 3840x2160@60Hz

Network

- 2 × 1GbE RJ-45 port

Audio

- 1 × Line out, 3.5mm headphone jack

USB

- 4 × USB 3.2 Gen 1
- 1 × OTG

Storage

- 1 × M.2 Key M 2280

Power Supply

- 1 × 3-Pin DC 9-30V wide voltage
 - Support AT/ATX mode

Serial Port

- 2 × COM (non-full signal, 1 × DB9, COM1: RS-232/422/485; COM2: RS-232)
- 1 × debug serial port, RS-232 level
- 1 × CAN (DB9)

Extension Interface

- 1 × M.2 Key B 3052, supports 5G or 4G module
- 1 × M.2 Key E 2230, supports Wi-Fi module
- 1 × Mini PCIe full size slot
- 2 × MIPI CSI

Extension Interface

- 1 × GPIO (4DI & 4DO)
- 1 × Push button switch (reset mode)
- 1 × nano-SIM

Operating System

- Ubuntu 22.04

Software

- Jetpack 6.2

Environment

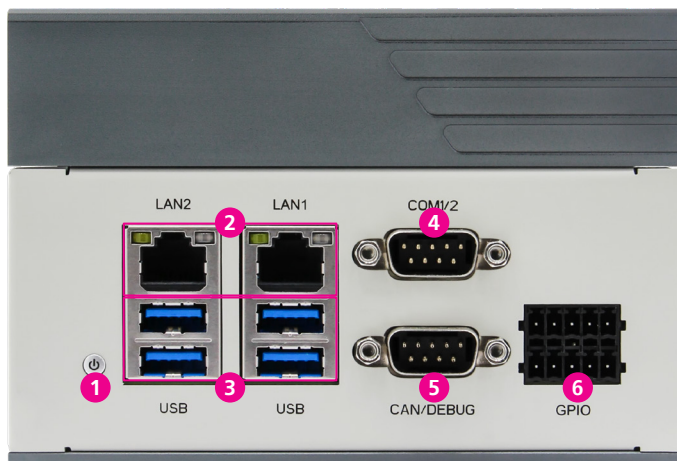
- Operating temperature: -10°C~55°C
- Storage temperature: -20°C~80°C
- Working humidity: 40°C, 95% relative humidity, non-condensing



No.	Model	Core board	CPU	Memory	GPU	Hashrate
1	Coeus-3821T	Orin NX 16GB	8-core Arm® Cortex®-A78AE 64-bit 2GHz	16 GB	1024-core NVIDIA Ampere GPU with 32 Tensor Cores, 1173MHz	157 TOPS
2	Coeus-3821T-8	Orin NX 8GB	6-core Arm® Cortex®-A78AE 64-bit 2GHz	8GB	1024-core NVIDIA Ampere GPU with 32 Tensor Cores, 1173MHz	117 TOPS
3	Coeus-3721T	Orin Nano 8GB	6-core Arm® Cortex®-A78AE v8.2 1.7GHz	8GB	1024-core NVIDIA Ampere GPU with 32 Tensor Cores, 1020MHz	67 TOPS
4	Coeus-3721T-4	Orin Nano 4GB	6-core Arm® Cortex®-A78AE v8.2 1.7GHz	4GB	512-core NVIDIA Ampere GPU with 16 Tensor Cores, 1020MHz	34 TOPS

Physical Features

Front View



1 Power Button

Lights blue when the power is on and lights red when the power is off

2 1GbE RJ45 LAN Ports

3 USB 3.2 Gen 1 Type-A Ports

4 DB9 COM1/2 Port

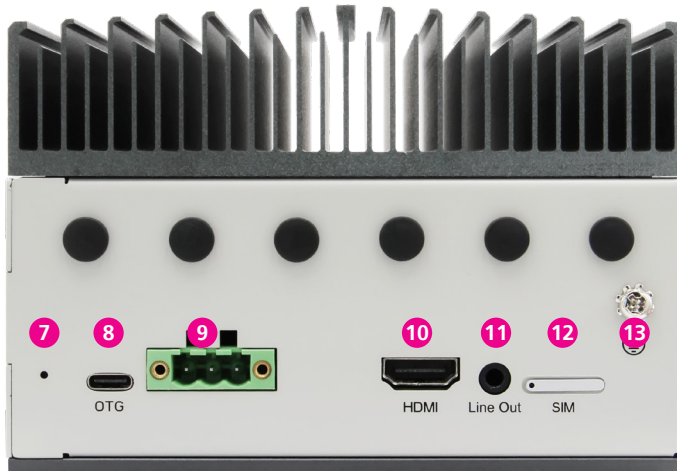
2 × COM (non-full signal, 1 × DB9, COM1 RS-232/422/485; COM2 RS-232)

5 DB9 Port

- COM3 (RS-232 debug) port
- CAN port

6 GPIO (4DI & 4DO)

Rear View



7 Recovery Pin Hole

8 OTG Port

On-The-Go functionality only

9 9~30V DC Input

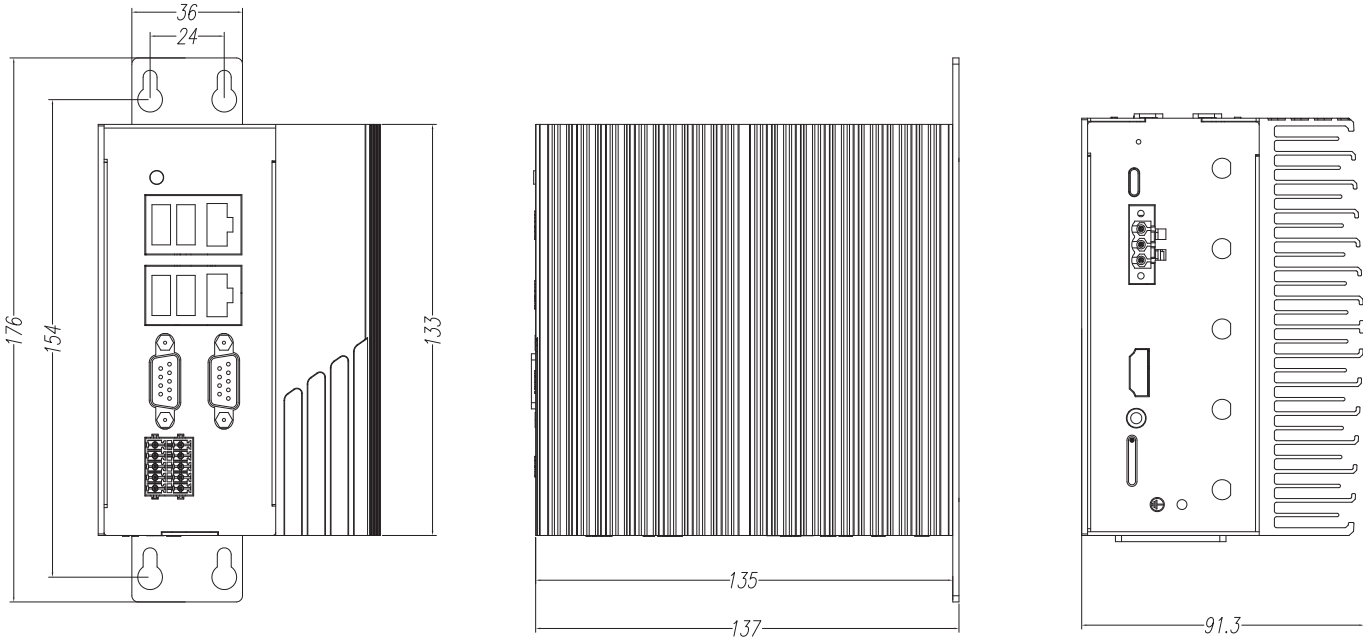
10 HDMI® Port

11 Line Out Jack

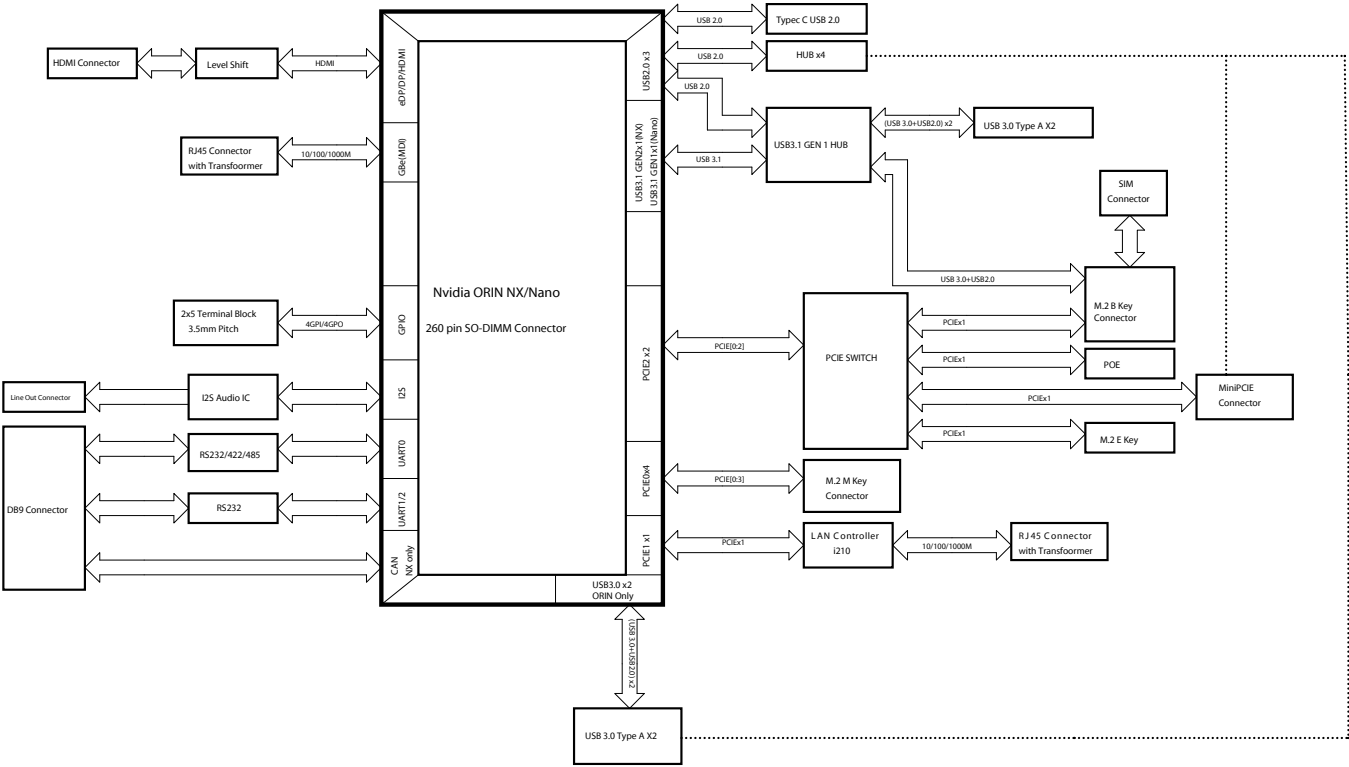
12 SIM Card Slot

13 Ground

Mechanical Dimension



System Diagram



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter lists the locations of the jumpers and connectors.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
 - A Philips screwdriver
 - A flat-tipped screwdriver
 - A set of jewelers screwdrivers
 - A grounding strap
 - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

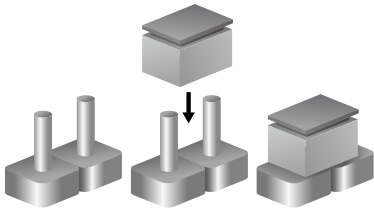
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

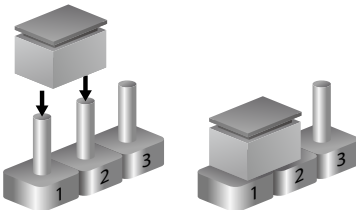
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



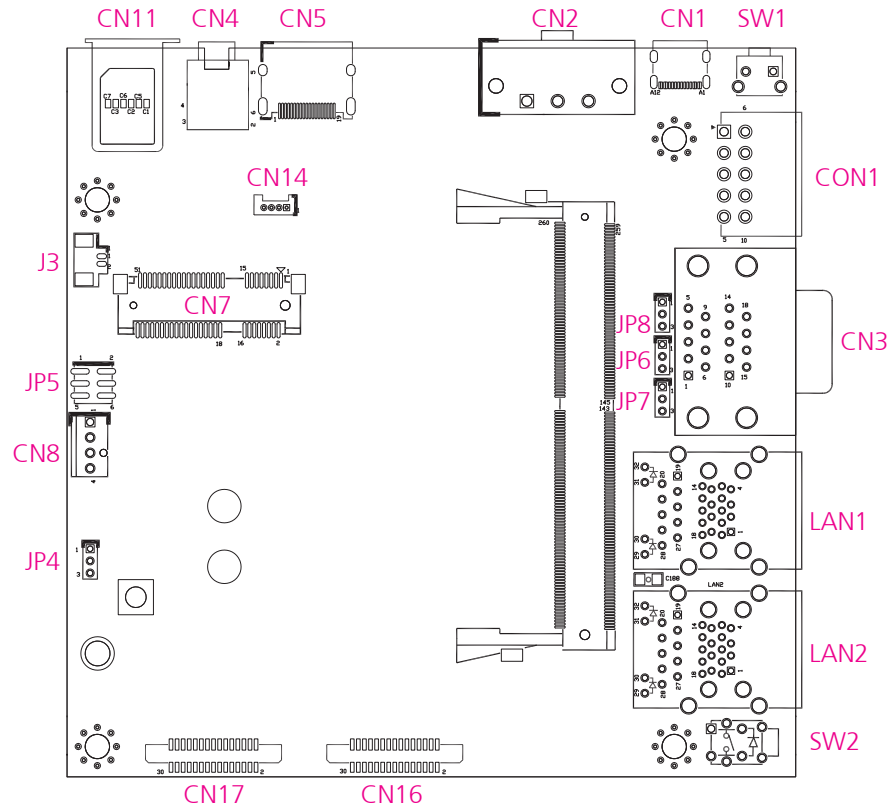
Three-Pin Jumpers: Pins 1 and 2 are Short



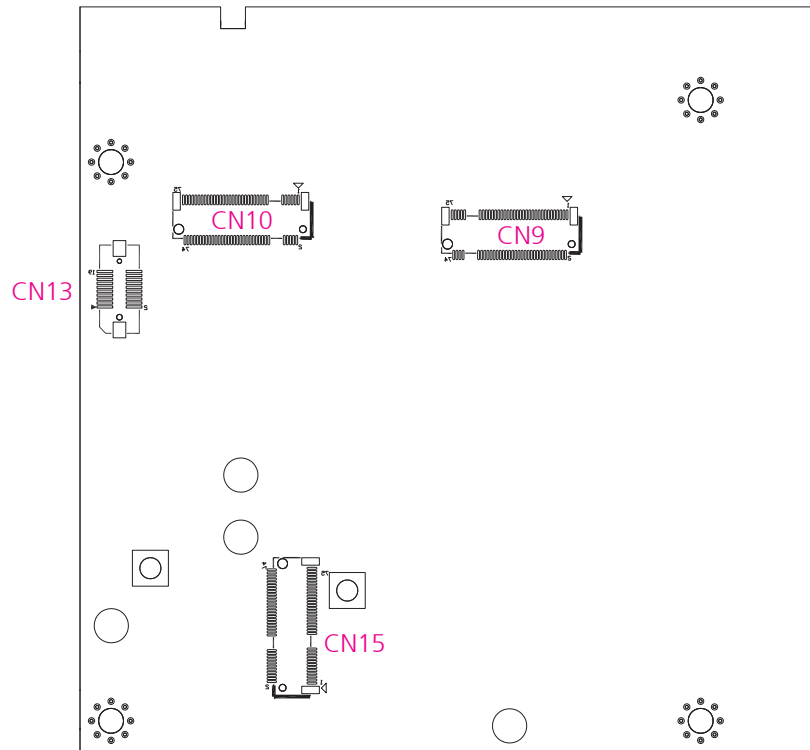
Locations of the Jumpers and Connectors

The figures in this section display the top and bottom views of the mainboard, indicating the locations of the jumpers and connectors.

Top View



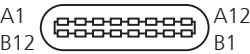
Bottom View



External I/O Interface

Type-C

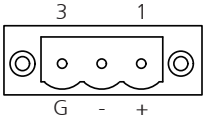
Connector location: CN1



Pin	Definition	Pin	Definition
A1	GND1	B1	GND3
A2	none	B2	none
A3	none	B3	none
A4	VBUS1	B4	VBUS3
A5	CC1	B5	CC2
A6	D1+	B6	D2+
A7	D1-	B7	D2-
A8	SBU1	B8	SBU2
A9	VBUS2	B9	VBUS4
A10	none	B10	none
A11	none	B11	none
A12	GND2	B12	GND4
NH1	NC	MH2	Chassis_GND
NH2	NC	MH3	Chassis_GND
MH1	Chassis_GND	MH4	Chassis_GND

Power Connector

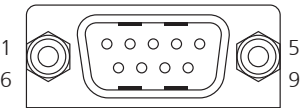
Connector location: CN2



Pin	Definition
1	DC_IN
2	GND
3	Chassis_GND

COM1/2

Connector location: CN3 (upper)



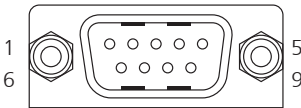
Pin	COM1/2 RS-232	COM1 RS-422/ COM2 RS-232	COM1 RS-485/ COM2 RS-232
1	COM2_RXD	COM2_RXD	COM2_RXD
2	COM1_RXD	TX+	D+
3	COM1_TXD	TX-	D-
4	COM2_TXD	COM2_TXD	COM2_TXD
5	GND	GND	GND
6	COM2_CTS	COM2_CTS	COM2_CTS
7	COM1_RTS	RX+	NC
8	COM1_CTS	RX-	NC
9	COM2_RTS	COM2_RTS	COM2_RTS



The serial port mapping relationship in the system:
COM1 - ttyTHS3; COM2 - ttyTHS1.

COM3

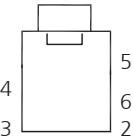
Connector location: CN3 (lower)



Pin	Definition
1	GND
2	COM_RXD3
3	COM_TXD3
4	GND
5	GND
6	CAN0_H
7	CAN1_H
8	CAN0_L
9	CAN1_L

Audio Jack

Connector location: CN4



Pin	Definition
1	AUD_LOUTR
2	AUD_HP_JD
3	NC
4	AUD_LOUTL
5	GND_AUD
6	GND_AUD
NH1	NC
NH2	NC

HDMI®

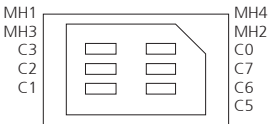
Connector location: CN5



Pin	Definition	Pin	Definition
1	HDMI_TX2_CON_P	13	HDMI_CEC_CON
2	GND	14	NC
3	HDMI_TX2_CON_N	15	HDMI_DDC_SCL_5V0
4	HDMI_TX1_CON_P	16	HDMI_DDC_SDA_5V0
5	GND	17	GND
6	HDMI_TX1_CON_N	18	HDMI_PWR
7	HDMI_TX0_CON_P	19	HDMI_HPD
8	GND	MH1	GND
9	HDMI_TX0_CON_N	MH2	GND
10	HDMI_TXC_CON_P	MH3	GND
11	GND	MH4	GND
12	HDMI_TXC_CON_N		

SIM Card Slot

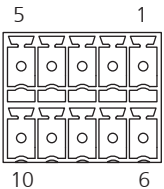
Connector location: CN11



Pin	Definition	Pin	Definition
C 1	UIM_PWR	MH1	GND
C2	UIM_RESET	MH2	GND
C3	UIM_CLK	MH3	GND
C5	GND	MH4	GND
C6	UIM_VPP	NH1	NC
C7	UIM_DATA	NH2	NC
CD	SW		

GPIO

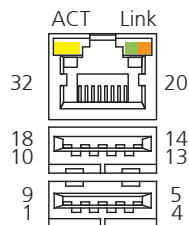
Connector location: CON1



Pin	Definition	Pin	Definition
1	GPIO_IN	6	GPO0_OUT
2	GPI1_IN	7	GPO1_OUT
3	GPI2_IN	8	GPO2_OUT
4	GPI3_IN	9	GPO3_OUT
5	GPIO_PWR	10	GND

LAN1 and USB 3.2

Connector location: LAN1



Pin	Definition	Pin	Definition
1	5VUSB3	11	USB2N_1
2	USB2N_2	12	USB2P_1
3	USB2P_2	13	GND
4	GND	14	USB3HUB_RX_N1
5	USB3HUB_RX_N2	15	USB3HUB_RX_P1
6	USB3HUB_RX_P2	16	GND
7	GND	17	USB31_TXN1
8	USB31_TXN2	18	USB31_TXP1
9	USB31_TXP2	MH1	Chassis_GND
10	5VUSB3	MH2	Chassis_GND

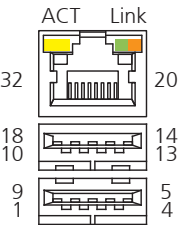
Pin	Definition	Pin	Definition
19	GBE_TCT	29	VCC3
20	GBE_MDIO_P	30	GBE_ACT#
21	GBE_MDIO_N	31	VCC3
22	GBE_MDI1_P	32	GBE_LINK#
23	GBE_MDI1_N	MH3	Chassis_GND
24	GBE_MDI2_P	MH4	Chassis_GND
25	GBE_MDI2_N	MH5	Chassis_GND
26	GBE_MDI3_P	MH6	Chassis_GND
27	GBE_MDI3_N	MH7	Chassis_GND
28	GND	MH8	Chassis_GND



The LAN and USB port signals are lead out from the core board.

LAN2 and USB 3.2

Connector location: LAN2

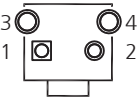


Pin	Definition	Pin	Definition
1	5 VUSB3_3	11	USB2N_3
2	USB20N_4	12	USB2P_3
3	USB20P_4	13	GND
4	GND	14	USBSS1_RX_N
5	USBSS2_RX_N	15	USBSS1_RX_P
6	USBSS2_RX_P	16	GND
7	GND	17	USB31_TXN3
8	USB30_TXN4	18	USB31_TXP3
9	USB30_TXP4	MH1	Chassis_GND
10	5VUSB3	MH2	Chassis_GND

Pin	Definition	Pin	Definition
19	LAN1_TCT	29	VCC3
20	LAN1MDI0P	30	LAN1LINK
21	LAN1MDI0N	31	VCC3
22	LAN1MDI1P	32	LAN1LED1G_R#
23	LAN1MDI1N	MH3	Chassis_GND
24	LAN1MDI2P	MH4	Chassis_GND
25	LAN1MDI2N	MH5	Chassis_GND
26	LAN1MDI3P	MH6	Chassis_GND
27	LAN1MDI4N	MH7	Chassis_GND
28	GND	MH8	Chassis_GND

Recovery

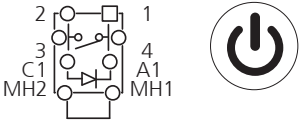
Connector location: SW1



Pin	Definition
1	FORCE_RECOVERY
2	GND
3	Chassis_GND
4	Chassis_GND

Power Button

Connector location: SW2



Pin	Definition
1	GND
2	PBT_PU
3	PBT_PU
4	GND
A1	PWRLED_N
C 1	5VSB
MH1	NC
MH2	NC



Internal I/O Interface

Jumpers

AT/ATX Selection

Connector location: JP4

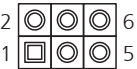


Pin	Definition
1	LATCH_SET_BUT
2	LATCH_SET
3	NC

Pin	Mode
1-2	ATX
2-3	AT (default)

COM1 RS-232/422/485 Jumper Settings

Connector location: JP5



Pin	Definition
1	VCC3
2	SP0_RS232
3	VCC3
4	SP0_RS485
5	VCC3
6	SP0_RS422

Pin	Mode
1-2	RS-232 (default)
3-4	RS-422
5-6	RS-485

COM1 RS-232/422/485 Jumper Settings

Connector location: JP6, JP7, JP8



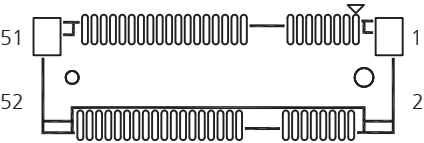
Pin	JP6	JP7	JP8
1	SP0_TXD	SP0_RTS#	SP0_CTS#
2	SP0_TXD_JP	SP0_RTS#JP	SP0_CTS#_JP
3	RS485_D-	SP0_TXD	RS422_RX-

Jumper	RS-232 (default)	RS-422	RS-485
JP6	Pin 1-2	Pin 2-3	Pin 2-3
JP7	Pin 1-2	Pin 2-3	None
JP8	Pin 1-2	Pin 2-3	None

Internal I/O Interface

Mini PCIe

Connector location: CN7

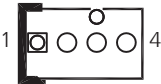


Pin	Definition	Pin	Definition
1	WAKE#	16	NC
2	3.3VSB	17	NC
3	NC	18	GND
4	GND	19	NC
5	NC	20	W_DISABLE#
6	1.5V	21	GND
7	CLKREQ#	22	PERST#
8	NC	23	PERn0
9	GND	24	3.3VSB
10	NC	25	PERp0
11	REFCLK -	26	GND
12	NC	27	GND
13	REFCLK+	28	GND
14	NC	29	GND
15	GND	30	SMBCLK

Pin	Definition	Pin	Definition
31	PETn0	46	NC
32	SMBDAT	47	NC
33	PETp0	48	1.5V
34	GND	49	NC
35	GND	50	GND
36	USB2N_10	51	REV1
37	GND	52	3.3VSB
38	USB2P_10	MH1	NC
39	3.3VSB	MH2	GND
40	GND	MH3	NC
41	3.3VSB	MH4	NC
42	NC	MH5	GND
43	NC	MH6	GND
44	NC	NH1	NC
45	NC	NH2	NC

FAN1 Connector

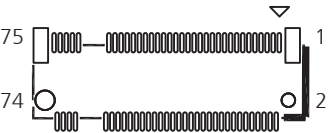
Connector location: CN8



Pin	Definition
1	GND
2	VCC12
3	FANIN_5V
4	FANOUT_5V
NH1	NC

M.2 Key M

Connector location: CN9



Pin	Definition	Pin	Definition
1	GND1	11	PETN3
2	3.3V_1	12	3.3V_6
3	GND2	13	PETP3
4	3.3V_2	14	3.3V_7
5	PERN3	15	GND4
6	NC	16	3.3V_8
7	PERP3	17	PERN2
8	NC1	18	3.3V_9
9	GND3	19	PERP2
10	DAS/DSS#	20	NC2

Pin	Definition	Pin	Definition
21	GND5	31	PERP1
22	NC3	32	NC8
23	PETN2	33	GND7
24	NC4	34	NC9
25	PETP2	35	PETN1
26	NC5	36	NC10
27	GND6	37	PETP1
28	NC6	38	DEVSLP
29	PERN1	39	GND8
30	NC7	40	NC11

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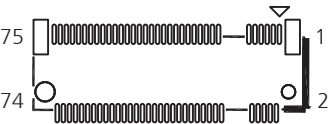
Pin	Definition	Pin	Definition
41	PERN0/SATA_B+	49	PETP0/SATA_A+
42	NC12	50	PERST*/NC
43	PERP0/SATA_B-	51	GND10
44	NC13	52	CLKREQ*/NC
45	GND9	53	REFCLKN
46	NC14	54	PEWAKE*/NC
47	RETN0/SATA_A-	55	REFCLKP
48	NC15	56	NC16

Pin	Definition	Pin	Definition
57	GND11	73	GND13
58	NC17	74	3.3V_5
67	NC26	75	GND14
68	SUSCLK(32KhZ)	MH1	GND
69	PEDET	MH2	GND
70	3.3V_3	NH1	NC
71	GND12	NH2	NC
72	3.3V_4		



M.2 Key B

Connector location: CN10



Pin	Definition	Pin	Definition
1	CONFIG_3	11	REFCLK -
2	3.3V_1	20	GPIO_5
3	GND1	21	CONFIG_0
4	3.3V_2	22	GPIO_6
5	GND2	23	GPIO_11
6	POWER_OFF#	24	GPIO_7
7	USB_D+	25	DPR
8	W_DISABLE1#	26	GPIO_10
9	USB_D-	27	GND3
10	GPIO_9/DAS/DSS#	28	GPIO_8

Pin	Definition	Pin	Definition
29	PERn1/USB3.0-RX-/SSIC- RxN	39	GND5
30	UIM_RESET	40	GPIO_0
31	PERp1/USB3.0-Rx-/SSIC- RxP	41	PERn0/SATA-B+
32	UIM_CLK	42	GPIO_1
33	GND	43	PERp0/SATA-B-
34	UIM_DATA	44	GPIO_2
35	PETn1/USB3.0-Tx-/SSIC- TxN	45	GND6
36	UIM_PWR	46	GPIO_3
37	PETp1/USB3.0-Tx-/SSIC- TxP	47	PETn0/SATA-A-
38	DEVSLP	48	GPIO_4

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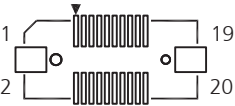
Pin	Definition	Pin	Definition
49	PETp0/SATA-A+	57	GND8
50	PERST#	58	NC_2
51	GND7	59	ANTCTL0
52	CLKREQ#	60	COEX3
53	REFCLKn	61	ANTCTL1
54	PEWAKE#	62	COEX2
55	REFCLKp	63	ANTCTL2
56	NC_1	64	COEX1

Pin	Definition	Pin	Definition
65	ANTCTL3	73	GND_10
66	SIM_DETECT	74	3.3V_5
67	RESET#	75	CONFIG_2
68	SUSCLK(32KhZ)	MH1	GND
69	CONFIG_1	MH2	GND
70	3.3V_3	NH1	NC_3
71	GND_9	NH2	NC_4
72	3.3V_4		



PoE Connector

Connector location: CN13



Pin	Definition	Pin	Definition
1	GND	11	DPE_CLKNO
2	GND	12	DPE_RST#
3	VCC5	13	GND
4	SMB_DATA	14	GND
5	VCC5	15	DPE_TXP0_C
6	SMB_CLK	16	DPE_RXP0
7	GND	17	DPE_TXN0_C
8	GND	18	DPE_RXN0
9	DPE_CLKP0	19	GND
10	PCIE_WAKE	20	GND
MH1	NC	NH1	NC
MH2	NC	NH2	NC

FAN2 Connector

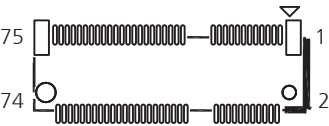
Connector location: CN14



Pin	Definition
1	FANOUT_5V
2	FANIN_5V
3	VCC5
4	GND

M.2 Key E

Connector location: CN15



Pin	Definition	Pin	Definition
1	GND	11	SDIO_CMD
2	3.3V_1	12	PCM_IN
3	USB_D+	13	SDIO_DATA0
4	3.3V_2	14	PCM_OUT
5	USB_D-	15	SDIO_DATA1
6	LED1#	16	LED2#
7	GND2	17	SDIO_DATA2
8	PCM_CLK	18	GND3
9	SDIO_CLK	19	SDIO_DATA3
10	PCM_SYNC	20	UART_WAKE#

Pin	Definition	Pin	Definition
21	SDIO_WAKE#	39	GND5
22	UART_RXD	40	RESERVED_2
23	SDIO_RESET#	41	PERNP0
32	UART_TXD	42	RESERVED_3
33	GND4	43	PERN0
34	UART_CTS	44	COEX3
35	PETP0	45	GND6
36	UART_RTS	46	COEX2
37	PETN0	47	REFCLKP0
38	RESERVED_1	48	COEX1

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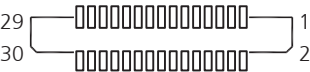
Pin	Definition	Pin	Definition
49	REFCLKN0	57	GND8
50	SUSCLK	58	I2C_DATA
51	GND7	59	PETP1
52	PERST0#	60	I2C_CLK
53	CLKREQ0#	61	PETN1
54	W_DISABLE2#	62	ALERT#
55	PEWAKE0#	63	GND9
56	W_DISABLE1#	64	RESERVED

Pin	Definition	Pin	Definition
65	PERP1	73	PEFCLKN1
66	UIM_SWP	74	3.3V_4
67	PERN1	75	GND11
68	UIM_POWER_SNK	MH1	GND
69	GND10	MH2	GND
70	UIM_POWER_SRC	NH1	NC
71	PEFCLKP1	NH2	NC
72	3.3V_3		



MIPI CSI-1

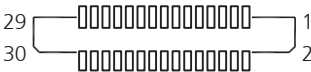
Connector location: CN16



Pin	Definition	Pin	Definition
1	GND	16	NC
2	NC	17	CSI0_CLK_P
3	CSI0_D0_N	18	NC
4	NC	19	GND
5	CSI0_D0_P	20	NC
6	NC	21	CAM0_PWDN
7	GND	22	NC
8	NC	23	CAM0_MCLK
9	CSI0_D1_N	24	NC
10	NC	25	CAM_I2C_SCL
11	CSI0_D1_P	26	NC
12	NC	27	CAM_I2C_SDA
13	GND	28	NC
14	NC	29	VCC3
15	CSI0_CLK_N	30	NC

MIPI CSI-2

Connector location: CN17



Pin	Definition	Pin	Definition
1	GND	16	NC
2	NC	17	CSI2_CLK_P
3	CSI2_D0_N	18	NC
4	NC	19	GND
5	CSI2_D0_P	20	NC
6	NC	21	CAM1_PWDN
7	GND	22	NC
8	NC	23	CAM1_MCLK
9	CSI2_D1_N	24	NC
10	NC	25	CAM_I2C_SCL
11	CSI2_D1_P	26	NC
12	NC	27	CAM_I2C_SDA
13	GND	28	NC
14	NC	29	VCC3
15	CSI2_CLK_N	30	NC



Battery Connector

Connector location: J3



Pin	Definition
1	GND
2	BBAT_CONN

CHAPTER 3: HARDWARE INSTALLATION

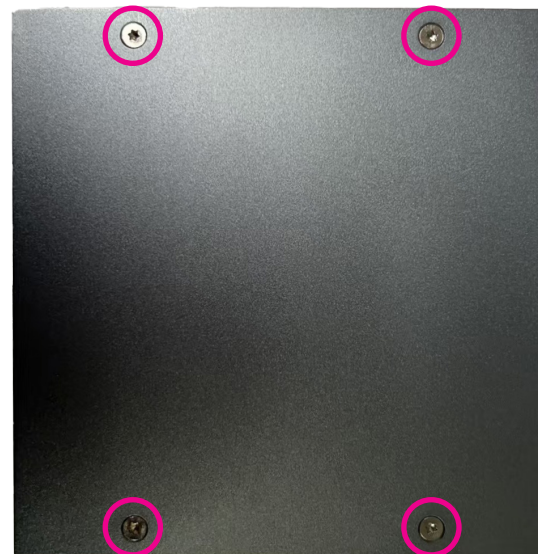


The following functions are recommended to be confirmed and installed before leaving the factory or assembled by our company; non-professionals are not allowed to disassemble by themselves.

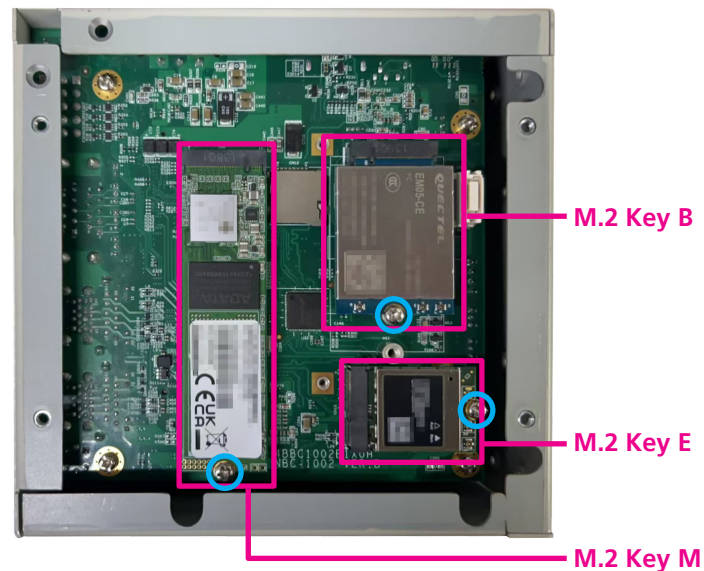
Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

Installing the M.2 Peripherals

1. Use a hexagonal screwdriver to remove the four screws securing the side panel cover, and then carefully lift it.

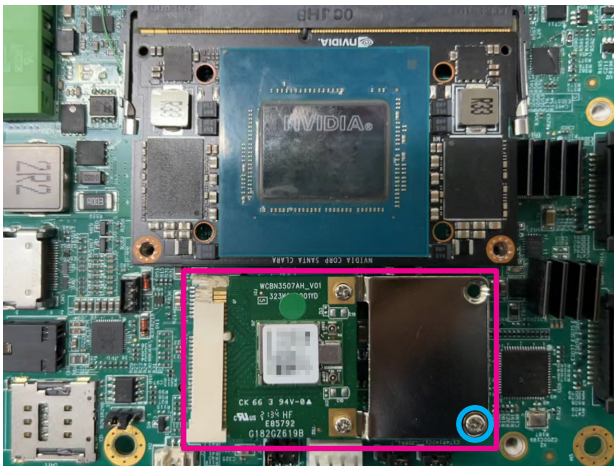


2. Once the chassis is open, the underside of the motherboard will be visible. Refer to the image on the right for the positions of the M.2 peripherals.
3. Insert the M.2 module, as required, into the corresponding slot at a 45-degree angle until the gold-plated connector on the edge of the module completely disappears. Once the module is fully inserted, push it down and secure it in place with an M3*5 cross screw.
4. Put the side panel cover back and secure it with the four removed hexagonal screws when the installation is complete.



Installing the Mini PCIe Module

1. Use a hexagonal screwdriver to remove the four screws securing the side panel cover (on the fins side), and then carefully lift it.
2. Insert the Mini PCIe module into the Mini PCIe slot at a 45-degree angle until the gold-plated connector on the edge of the module completely disappears. Once the module is fully inserted, push it down and secure it in place with an M2*3 cross screw.



If the module is half-size, secure the Mini PCIe bracket to the Mini PCIe module. The Mini PCIe bracket is included in the system package.



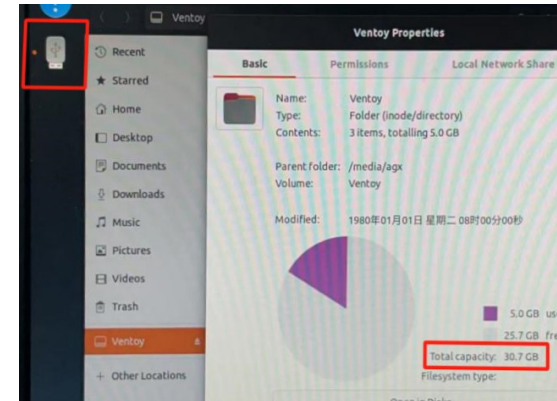
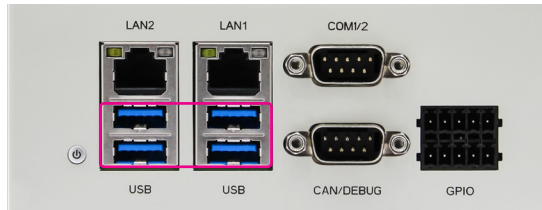
3. Put the side panel cover back and secure it with the four removed hexagonal screws when the installation is complete.



To disassemble or assemble the components on the fins side of the device, it is strongly recommended to consult technical support for detailed guidance.

Using a USB

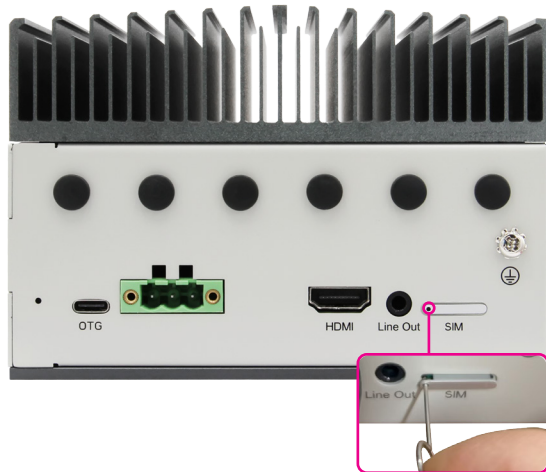
1. Insert a USB drive into the device's USB port.
2. To check the USB capacity, click on the USB drive icon displayed on the screen.



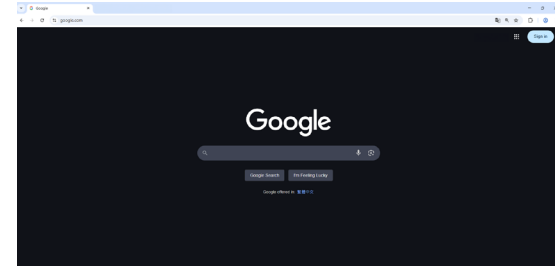
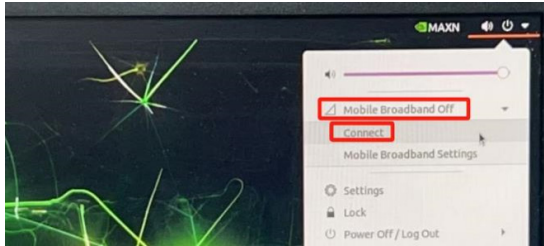
Enabling Network Access

Accessing Cellular Network via M.2 Key B Interface

1. Refer to [Chapter 3](#) for instructions on installing a communication module using the M.2 Key B interface.
2. Use a paperclip to eject the SIM card tray, as shown below.
3. Place the SIM card into the card tray, then gently push the tray back to its original position.

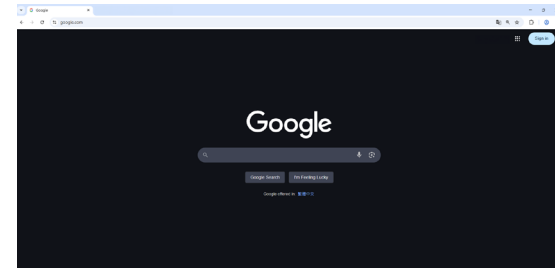
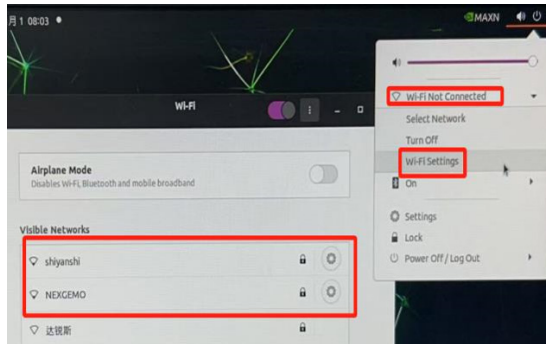


4. Click **Connect** under **Mobile Broadband Off** to configure 4G/5G dial-up networking.
5. Once the connection is successful, you can browse the Internet using the web browser.



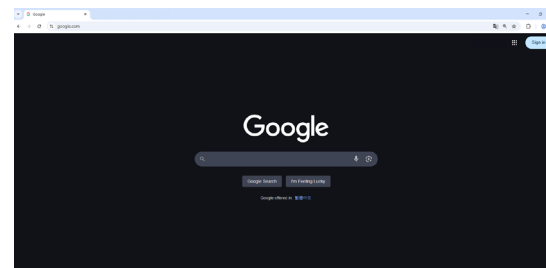
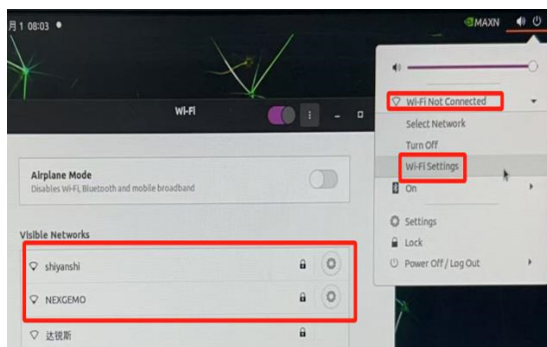
Accessing Wireless Network via M.2 Key E Interface

1. Refer to [Chapter 3](#) for instructions on installing a wireless module using the M.2 Key E interface.
2. Click **Wi-Fi Settings** under **Wi-Fi Not Connected** in the upper right corner to open the Wi-Fi list and select a hotspot to connect.
3. Once the connection is successful, you can browse the Internet using the web browser.



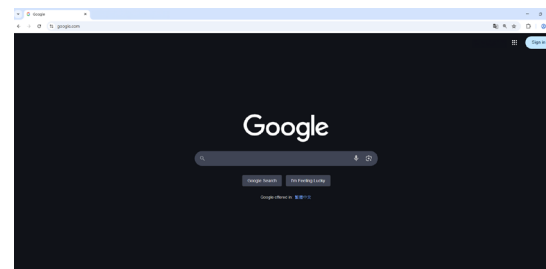
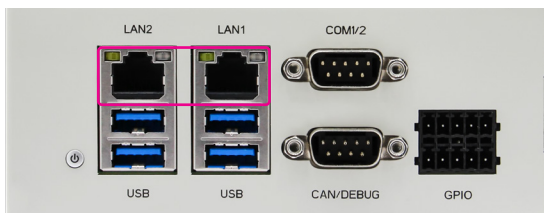
Accessing Wireless Network via Mini PCIe Interface

1. Refer to [Chapter 3](#) for instructions on installing a wireless module using the Mini PCIe interface.
2. Click **Wi-Fi Settings** under **Wi-Fi Not Connected** in the upper right corner to open the Wi-Fi list and select a hotspot to connect.
3. Once the connection is successful, you can browse the Internet using the web browser.



Accessing Network via Ethernet Connection

1. Plug one end of an Ethernet cable into an **RJ45 LAN port** on the device, and the other end into a router or switch connected to the Internet to.
3. Once the connection is successful, you can browse the Internet using the web browser.



2. Open the terminal and enter the command "ifconfig" to check whether the IP address is automatically obtained.

```

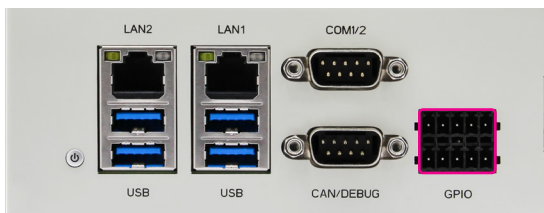
agn@agn-desktop: ~/Desktop
agn@agn-desktop:~/Desktop$ ifconfig
docker0: Flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
    ether 02:42:1e:1a:3a:b5 txqueuelen 0 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0: Flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.11.69 netmask 255.255.255.0 broadcast 192.168.11.255
    inet6 fe80::288e:4614:fa86:d7d9 prefixlen 64 scopeid 0x20<link>
    ether 3c:6d:6d:02:be:23 txqueuelen 1000 (Ethernet)
    RX packets 9162 bytes 1336055 (13.3 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 5808 bytes 467163 (467.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
  
```

Connecting GPIO

Before using the GPIO connection, ensure that BusyBox is installed. The installation command is “`sudo apt install busybox`”.

Connect one end of the GPIO cable to the GPIO port on the device, and the other end to the GPIO device you want to connect to.



GPIO0

```
sudo busybox devmem 0x2430068 w 0x50 (set GPI mode)
sudo busybox devmem 0x2434080 w 0x8 (set output high)
gpioget 0 105 (output is 1)
sudo busybox devmem 0x2434080 w 0x 4 (set output low)
gpioget 0 105 (output is 0)
```

GPIO1

```
sudo busybox devmem 0xc302048 w 0x50 (set GPI mode)
sudo busybox devmem 0xc301050 w 0x8 (set output high)
gpioget 0 105 (output is 1)
sudo busybox devmem 0xc301050 w 0x 4 (set output low)
gpioget 0 105 (output is 0)
```

GPIO2

```
sudo busybox devmem 0xc302028 w 0x50 (set GPI mode)
sudo busybox devmem 0x2430070 w 0x8 (set output high)
gpioget 0 105 (output is 1)
sudo busybox devmem 0x2430070 w 0x 4 (set output low)
gpioget 0 105 (output is 0)
```

GPIO3

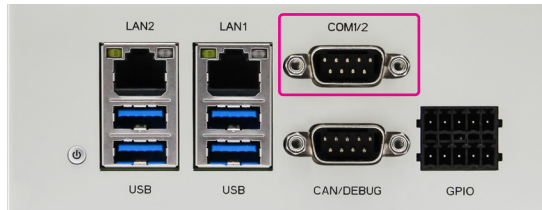
```
sudo busybox devmem 0x243d020 w 0x50 (set GPI mode)
sudo busybox devmem 0x2440020 w 0x8 (set output high)
gpioget 0 105 (output is 1)
sudo busybox devmem 0x2440020 w 0x 4 (set output low)
gpioget 0 105 (output is 0)
```

GPIO mapping relationship

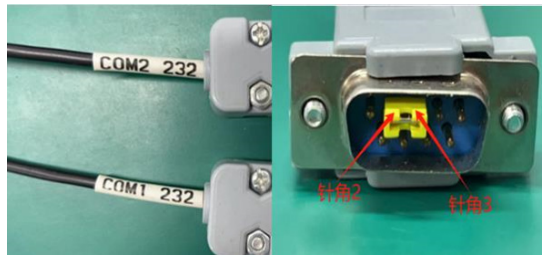
External Port	Physical Address	External Port	Physical Address
1-pin GPIO	0x2430068	6-pin GPO0	0x2434080
2-pin GPI1	0xc302048	7-pin GPO1	0xc301050
3-pin GPI2	0xc302028	8-pin GPO2	0x2430070
4-pin GPI3	0x243d020	9-pin GPO3	0x2440020

Connecting COM1/2

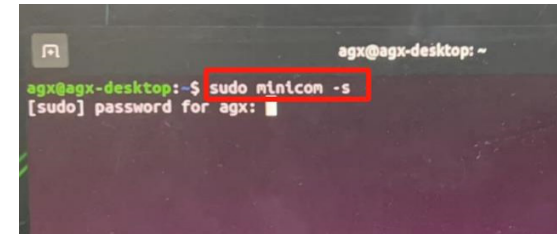
1. Connect one end of the serial port cable to the COM1/2 port on the device, and the other end to the COM device you want to connect to.



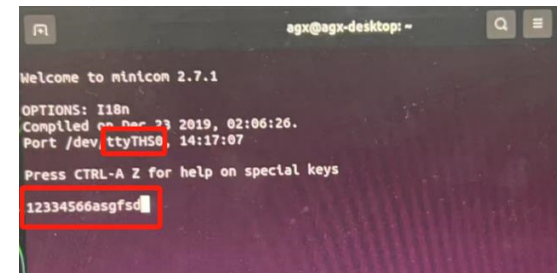
2. Short pins 2 and 3 of COM1 and COM2.



3. Open the terminal application and enter the command "sudo minicom -s" to configure the serial port test software.

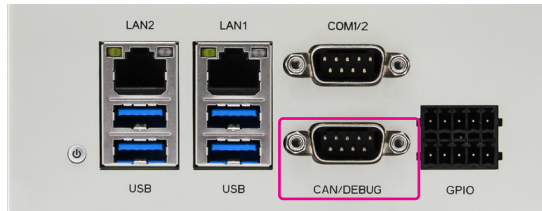


4. After configuration is completed, the input data will loop automatically.

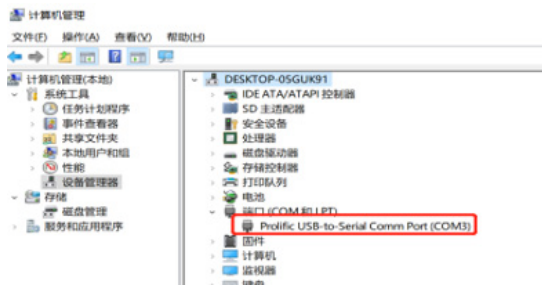


Connecting COM3 (Debug)

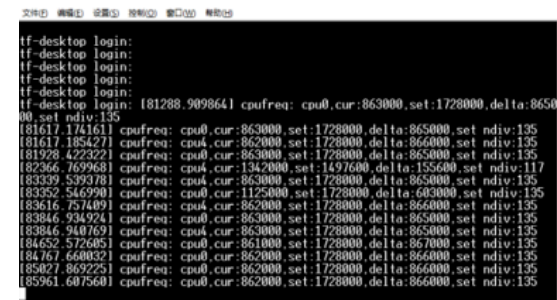
1. Plug one end of the USB to serial port converter into the COM3 port of the device and the other end into the USB port of the PC.
3. Open the general serial port application, select the corresponding serial port number, change the serial transmission rate to 115200, and confirm the changes.



2. Open the host PC's **Device Manager** and find the port number.

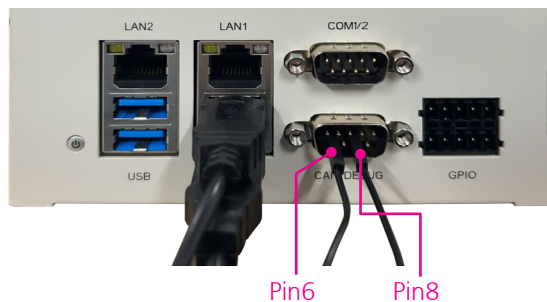


4. Printing information is displayed.



Connecting CAN

1. Connect the CAN tool to the CAN port on the device using pin 6 and pin 8 (under CN3): CAN: H-6, L-8.



2. Connect the other USB end to the PC. The scenario shown here is an example; the actual connection depends on the CAN device you want to connect.



3. Open the terminal on the PC and configure the CAN message transmission and reception.



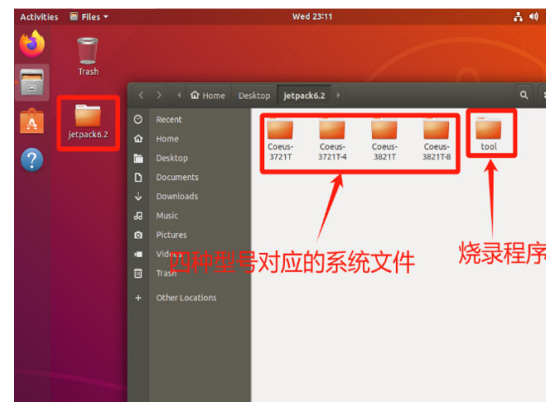
4. Here is a reference for the PC side screen.



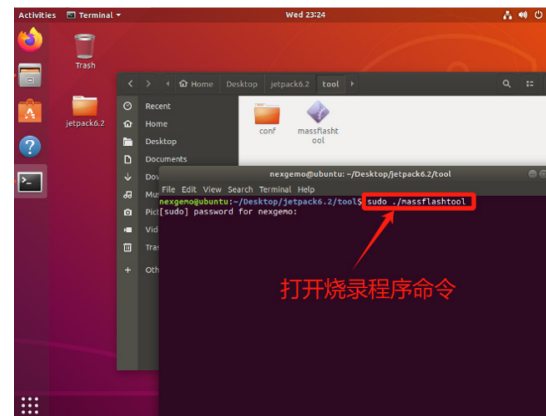
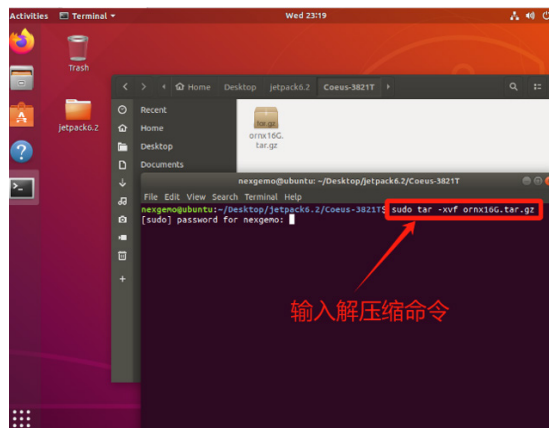
CHAPTER 5: RECOVERING THE SYSTEM

Flashing OS Image

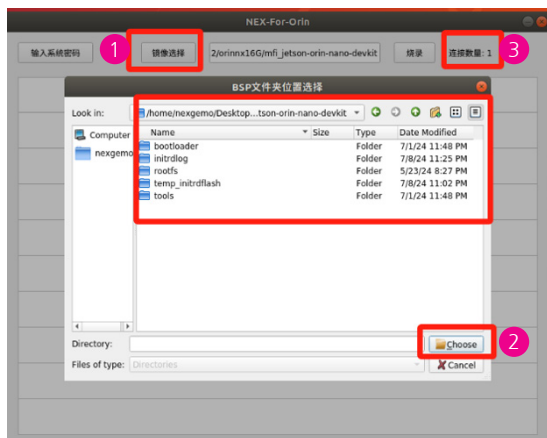
1. Prepare a PC running the Ubuntu operating system to serve as the server. Connect one end of a USB Type-C cable to the server's USB port, and the other end to the de-vice's OTG Type-C port.
2. Insert a reset pin or paperclip into the Recovery pinhole, press and hold it, then power on the de-vice. Release it after 3 seconds to enter recovery mode.
3. Download and extract the required file "jetpack6.2.tar.gz" on the server. Open the folder to locate the system and burning files.



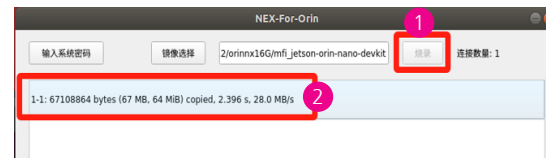
4. Navigate to one of the system files (using Coeus-3821T as an example). Enter the command “`sudo tar -xvf ornx16G.tar.gz`”, press <Enter> button, and input the local password (the password will remain hidden) to extract the file.
5. Open the terminal in the “jetpack6.2/tool” folder and execute the command “`sudo ./massflashtool`”. Press press <Enter> button and input the local password (the password will remain hidden) to launch the system burning program.



6. Select **Image Selection** (1) and choose the directory containing the image file (e.g., /home/nexgemo/Desktop/jetpack6.2/Coeus-3821T/orinrx16G/mfi_jetson-orin-nano-devkit). Click **Choose** (2) to confirm. Ensure that the number of connections in the upper right corner is "1," (3) indicating the device is in recovery mode.



7. Click **Burn** (1) to initiate the system burning process. The progress will be displayed on-screen (2).



8. Once the burning process is complete, the device will automatically exit recovery mode. The number of connections will revert to "0," and the device will into the system automatically.

