

NexAloT Co., Ltd.

Intelligent Platform & Services Business Unit

AI Edge Computer

Coeus 3800 Series

User Manual



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PREFACE

Copyright

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Disclaimer

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Acknowledgements

Coeus 3800 Series is a trademark 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-3801T-16G & Coeus-3801T-8G package that you received is complete. Your package should have all the items listed in the following table.

Items	Coeus-3801T-16G	Coeus-3801T-8G
Platform	Jetson Orin NX-16GB	Jetson Orin NX-8GB
CPU	8-core NVIDIA® Arm® Cortex-A78AE v8.2 64-bit CPU (2MB L2 + 4MB L3)	6-core NVIDIA® Arm® Cortex-A78AE v8.2 64-bit CPU (1.5MB L2 + 4MB L3)
GPU	1024-core NVIDIA® Ampere GPU with 32 Tensor Cores	1024-core NVIDIA® Ampere GPU with 32 Tensor Cores
RAM	16GB LPDDR5	8GB LPDDR5
Storage	128GB Key M 2280 NVMe	128GB Key M 2280 NVMe
Others	LAN x 2, COM x 2, Line out, USB x 2, HDMI, GPIO (4DI & 4DO), Micro USB (OTG), M.2 Key B (4G/5G), Micro SD, 9-30V DC, LED	





Document Amendment History

Ver.	Modify record	Modified date	Remark
1.0	First draft	Dec 29, 2020	

CHAPTER 1: PRODUCT INTRODUCTION

Coeus 3800 Series

Overview



Key Features

- Support NVIDIA Jetson NANO, TX2 NX, Xavier NX, Orin NANO, Orin NX Module
- Support Tensorflow, Caffe, Paddlepaddle and other AI frameworks
- Support TensorRT, DeepStream library and other AI libraries and tools
- Fanless embedded design, -20~60°C wide temperature operation, DC9-30V wide voltage input, rich I/O interface, support wall and rail installation

Product Introduction

Coeus series products are artificial intelligence edge computers created by NexAloT. It is equipped with Nvidia Jetson platform and an industrial-grade hardware design, supporting multiple AI frameworks. It can be widely used in intelligent manufacturing, intelligent transportation as well as various edge computing fields.

Hardware Specifications

CPU Support

- 16GB: 8-core NVIDIA® Arm® Cortex-A78AE v8.2 64-bit CPU (2MB L2 + 4MB L3)
- 8GB: 6-core NVIDIA® Arm® Cortex-A78AE v8.2 64-bit CPU (1.5MB L2 + 4MB L3)

GPU

- 1024-core NVIDIA® Ampere GPU with 32 Tensor Cores

DL Accelerator

2x NVDLA Engines

Vision Accelerator

1 × PVA v2

RAM

- 16GB: 16GB LPDDR5
- 8GB: 8GB LPDDR5

I/O Interface - Front

- 2x USB3.0
- 2x RJ45 LAN
- 1x HDMI
- 1x PWR indicator light
- 1x SYS indicator light

- 1x Line Out
- 1x Power switch
- 2x Antenna reservation

I/O Interface - Bottom

- 1x Power connector
- 1x GPIO (4DI&4DO)
- 2x COM (incomplete signal, 1x DB9 form lead, COM1 RS-232/422/485; COM2 RS-232)
- 1x OTG
- 1x Recovery
- 1x Ground screw hole

Storage

- 128G SSD

Expansion

- 1x Micro SD
- 1x M.2 M-Key 2280 (1x signal)
- 1x M.2 B-Key 3052 supports 5G and 4G modules
- 1x miniPCIe full-size slot, not supporting mSATA

Power Supply

- DC 9~30V wide voltage



Environment

- Operating temperature: -10°C to 55°C with air flow
- Storage temperature: -20°C to 80°C
- Working humidity: 40°C, 95% (relative humidity, non-condensing)

Dimensions

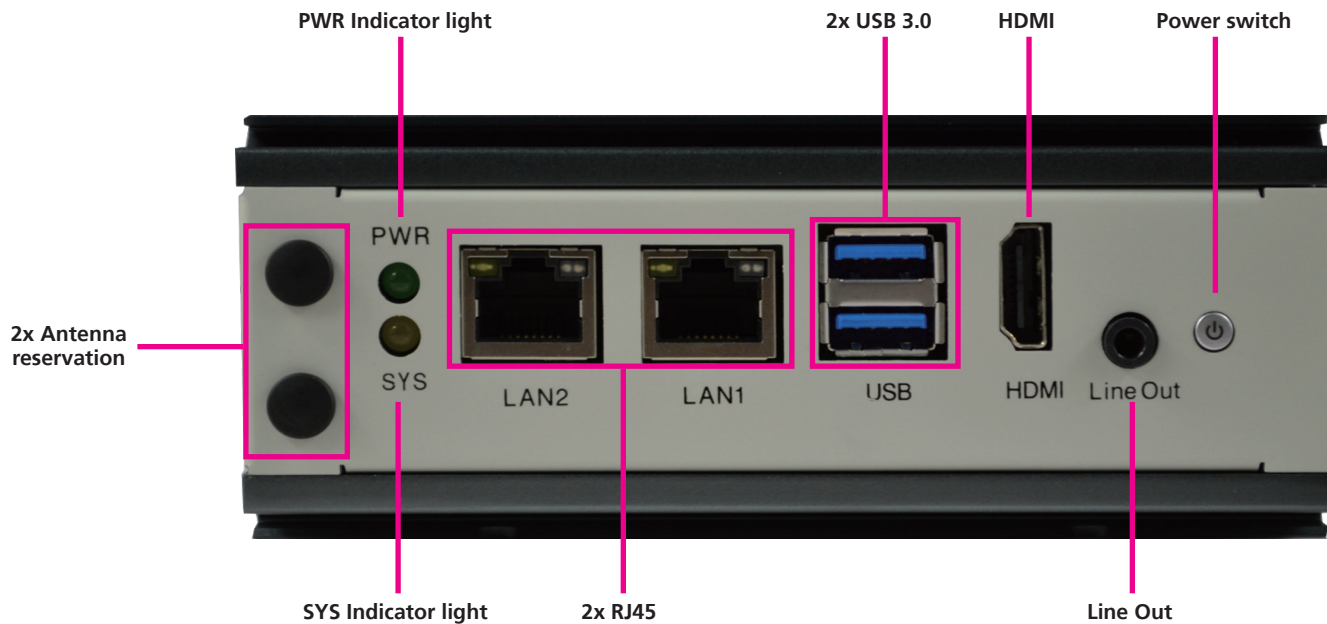
- 70.4mm (W) x 137mm (D) x 176mm (H)

Installation Method

- Wall Mount, DIN-Rail Mount

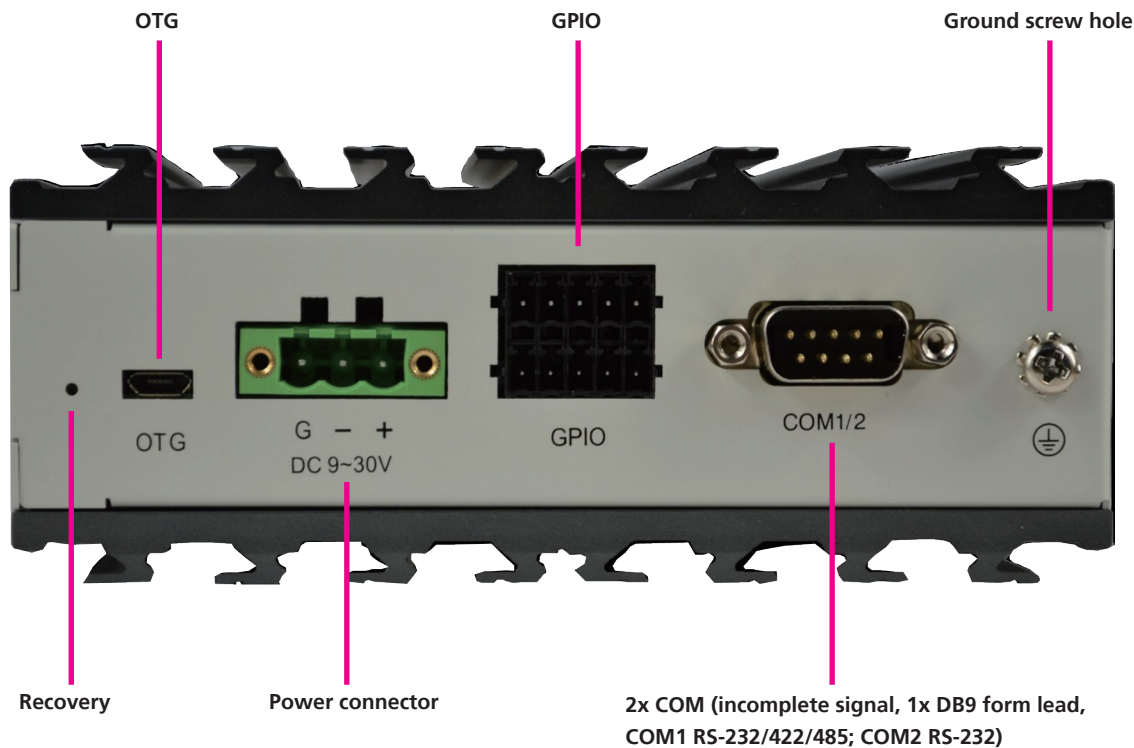
Physical Features

Front View



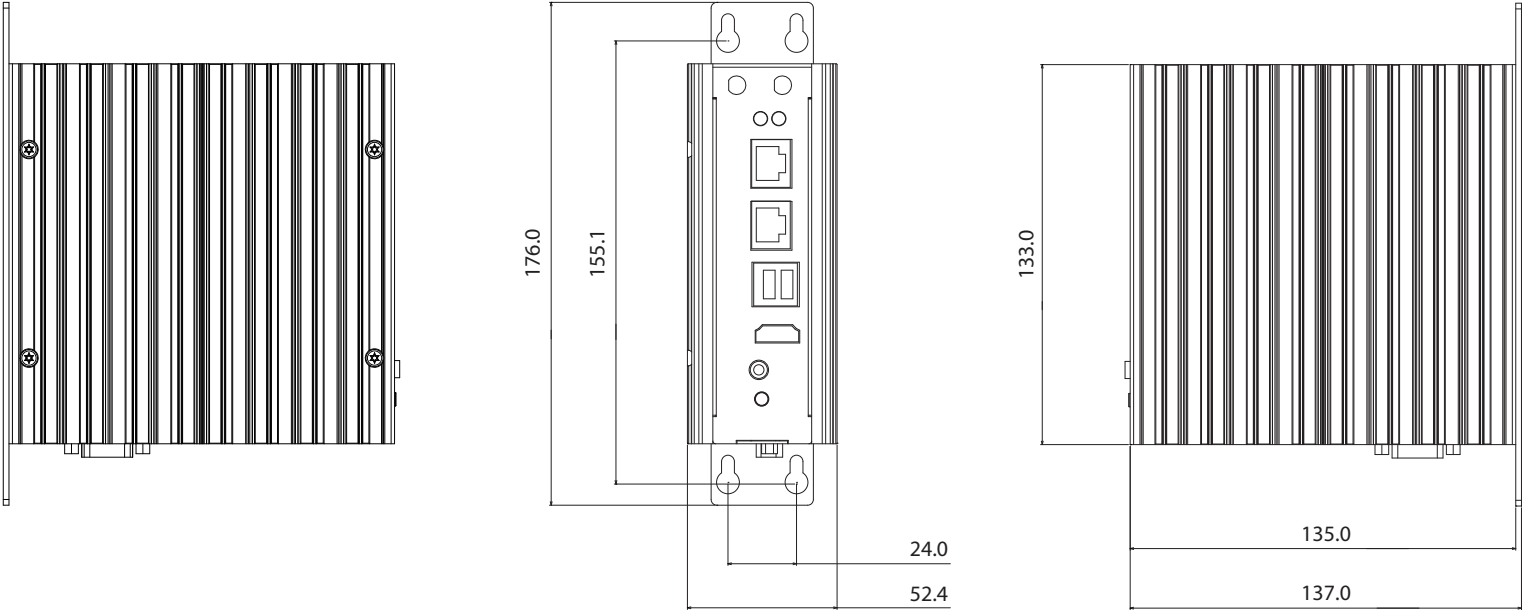
Physical Features

Bottom View





Mechanical Dimensions



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:

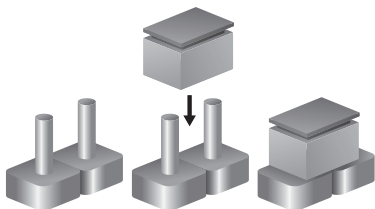
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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

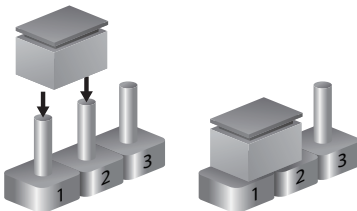
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



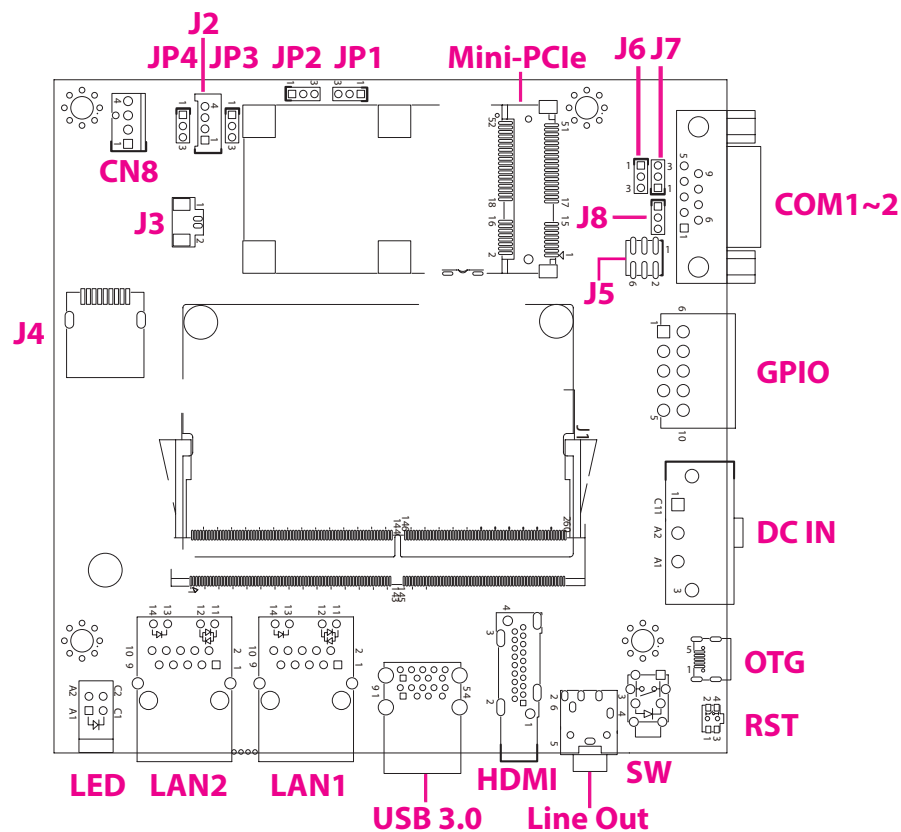
Three-Pin Jumpers: Pins 1 and 2 are Short



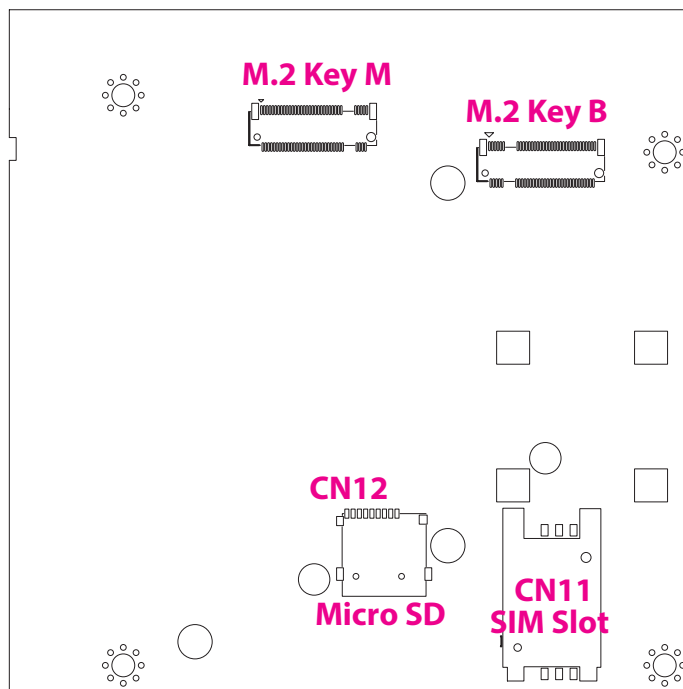
Locations of the Jumpers and Connectors

The figure below is the top and bottom view of the mainboard. It shows the locations of the jumpers and connectors.

Top View



Bottom View





Jumpers

RS422/485 Mode Terminal Resistance

Connector type: 1x3 3-pin header
Connector location: JP1



Pin	Signal Definition
1-2 (Default)	Terminal resistance is on
2-3	Terminal resistance is disconnected

Power-on self-start setting

Connector type: 1x3 3-pin header
Connector location: JP4



Pin	Signal Definition
*1-2 (Default)	ATX, Power on and turn off
2-3	AT, automatically open after power-on



Connectors Pin Definitions

External I/O Interfaces - Front Panel

Switch button

Connector location: SW



Machine State	Indicator Color
Power on standby	Red
Boot up	Blue

Indicator

Connector location: SW



Machine State	PWR Indicator	SYS Indicator
Boot up	Always on	Always on
Shut down	Always off	Always off





Line Out

Connector location: Line Out

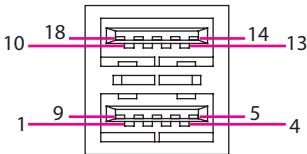


Line-Out

Pin	Definition	Pin	Definition
1	AUD_LOUTR	2	AUD_HP_JD
3	NC	4	AUD_LOUTL
5	AUD_GND	6	AUD_GND

USB 3.0

Connector location: USB 3.0



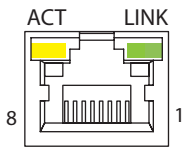
Pin	Definition	Pin	Definition
1	VCC5(+5V)	2	USB2N_2
3	USB2P_2	4	GND
5	USB31_RXN2	6	USB31_RXP2
7	GND	8	USB31_TXN2
9	USB31_TXP2	10	VCC5(+5V)
11	USB2N_1	12	USB2P_1
13	GND	14	USB31_RXN1
15	USB31_RXP1	16	GND
17	USB31_TXN1	18	USB31_TXP1
MH1	GND_CHASIS	MH2	GND_CHASIS
MH3	GND_CHASIS	MH4	GND_CHASIS





LAN1 and LAN2 Ports

Connector location: LAN1, LAN2



Act	Status
Flashing Yellow	Data Activity
Off	No activity

Link	Status
Steady Green	1000M LAN
Off	10/100M LAN

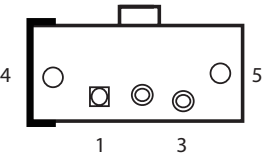
Pin	Definition	Pin	Definition
1	MDIO_P	2	MDIO_N
3	MDI1_P	4	MDI1_N
5	TCT	6	TCT
7	MDI2_P	8	MDI2_N
9	MDI3_P	10	MDI3_N
11	LED_G-	12	LED_O-
13	LED_Y+	14	LED_Y-



External I/O Interfaces - Bottom Panel

DC IN (9-30V)

Connector location: DC IN



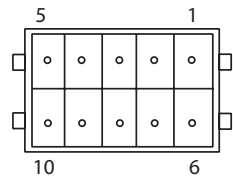
Pin	Signal Definition
1	DC Input (+9V~30V)
2	GND
3	Chassis_GND





GPIO

Connector type: 2x5 10-pin header
Connector location: GPIO



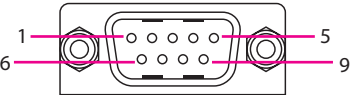
Pin	Definition	Pin	Definition
1	GPIO	2	GPI1
3	GPI2	4	GPI3
5	+5V	6	GPO0
7	GPO1	8	GPO2
9	GPO3	10	GND

Exposed Interface	COEUS3801T-8
1-pin GPIO	gpio-453(PQ.05)
2-pin GPI1	gpio-328(PCC.00)
3-pin GPI2	gpio-330(PCC.02)
4-pin GPI3	gpio-331(PCC.03)
6-pin GPO0	gpio-398(PG.06)
7-pin GPO1	gpio-341(PEE.02)
8-pin GPO2	gpio-454(PQ.06)
9-pin GPO3	gpio-433(PN.01)



COM1~COM2 (DB9 Interface)

Connector location: COM1~2



Pin	Signal Definition	Signal Definition	Signal Definition
Mode Description	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

Pin	RS-232 (Default)	RS-422	RS-485
JP5	Pin 1-pin2 short	Pin5-pin6 short	Pin3-pin4 short
JP6	Pin 1-pin2 short	Pin2-pin3 short	Pin2-pin3 short
JP7	Pin1-pin2 short	Pin2-pin3 short	Do not care
JP8	Pin1-pin2 short	Pin2-pin3 short	Do not care

- COM1 serial port mode jumper setting



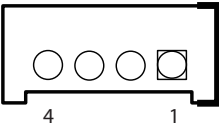


Internal Connectors

CAN Interface

Connector type: 1x4 4-pin header

Connector location: J2



Pin	Signal Definition
1	CAN_H
2	CAN_L
3	GND
4	NC



CHAPTER 3: SYSTEM SETUP

Expansion Device Installation

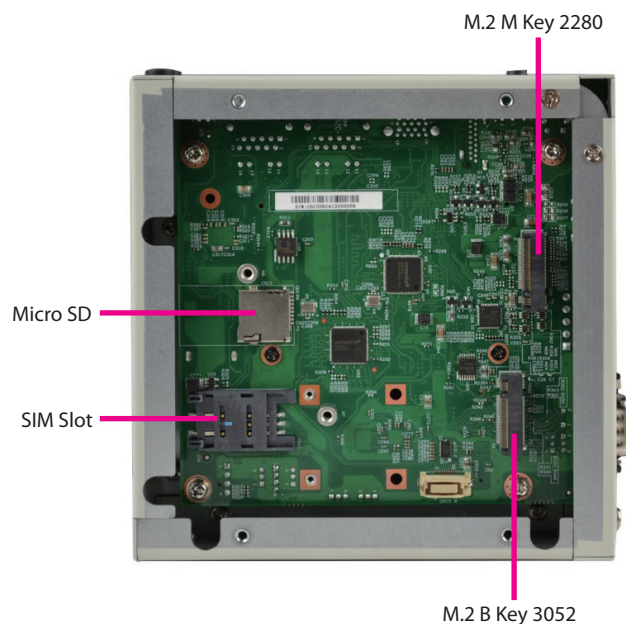


The following functions are recommended to be confirmed and installed before leaving the factory or assembled by our company; non-professionals are not allowed to disassemble by themselves.

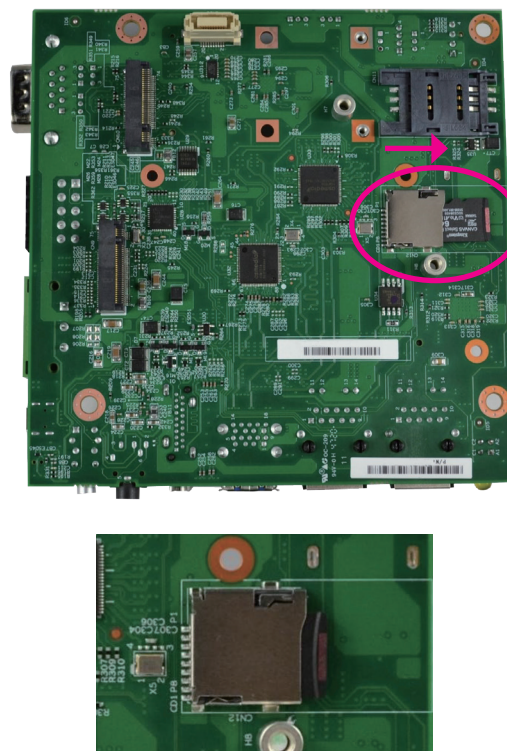
1. Equipment disassembly: Use a star shaped screwdriver to unscrew the four screws shown (red circle) to remove the side cover of the whole machine.



2. Once the side cover is removed, the motherboard can be expanded. The interface is shown in the figure. (Note: Introduced in the full-featured version, other corresponding interfaces have corresponding equipment reductions), you can refer to items 3-5 for direct corresponding installation.



3. Micro SD card expansion: As shown in the figure below, it supports mainstream MicroSD card insertion to expand the storage space; the pin gold finger is flushed and inserted until the card is the master.



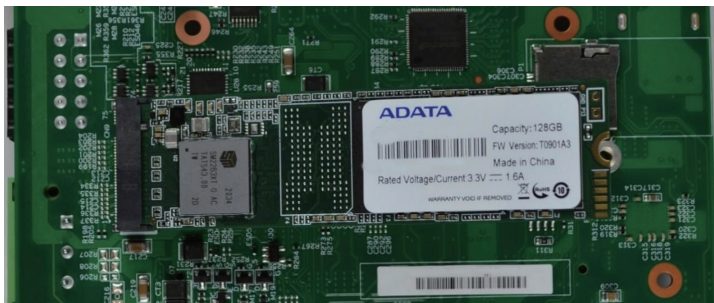
4. M.2 expansion:

- This device supports one extended M.2 B key and one M.2 M key device.
- M.2 M key device, support 2280 size memory card, can be fixed with M3 screws.

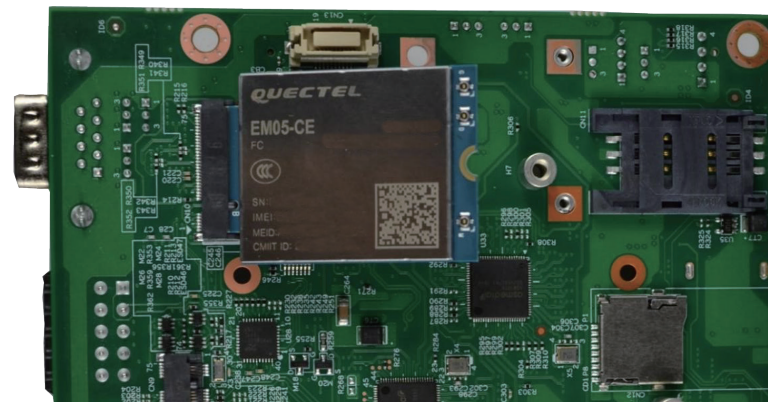


Note:

This series of devices offer 1X PCIe signals in this slot..

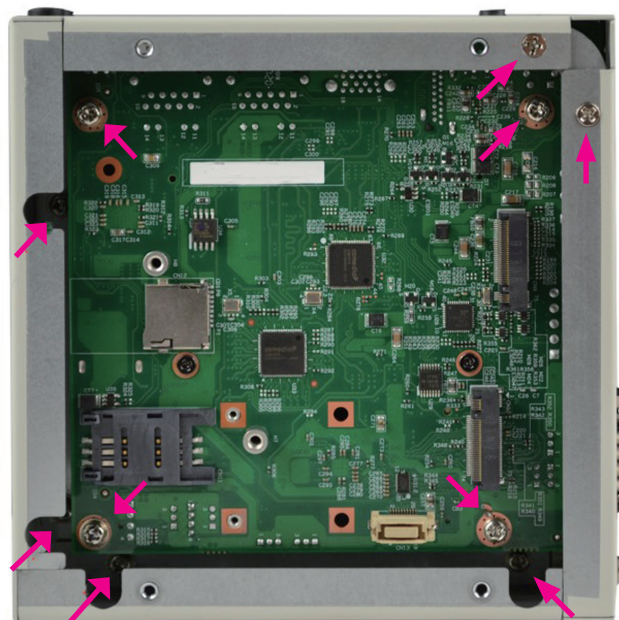


- M.2 B Key device, supports 3052 size 4G, 5G, Wi-Fi modules. It can be fixed with M3 screws.

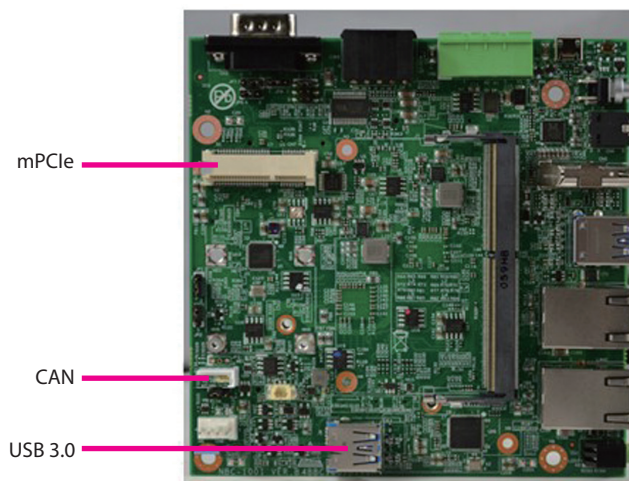


5. The SIM card slot supports the insertion of a standard SIM card and is used with 4G and 5G communication modules.

6. In order to remove 2 L-shaped interface boards, 1 stiffener and 1 motherboard., use a cross screwdriver to remove the 10 screws as shown in the figure.



7. Corresponding to the motherboard interface, you can see the expandable version. Please refer to 8-10 to install the device directly.

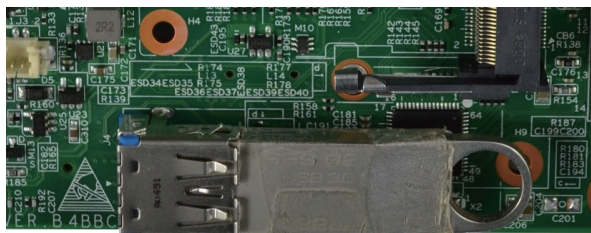


8. The miniPCIe interface supports mainstream miniPCIe full-card and half-length card devices, and can be fixed with M2 screws.

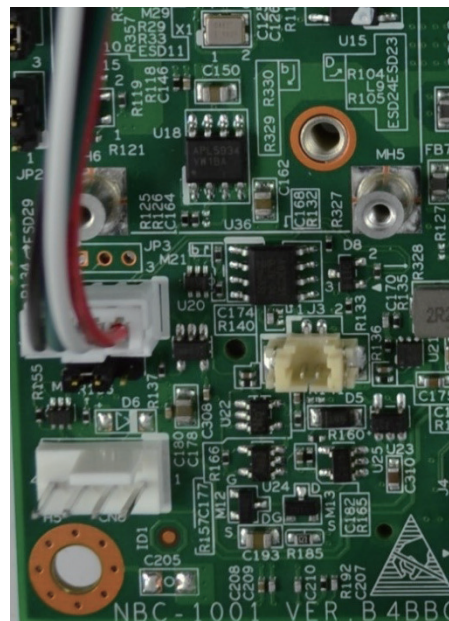


Note:
This series supports mSATA memory card.

9. USB 3.0 interface: Users can directly plug in usb disk, dongle, etc.



10. CAN interface: CAN device can be expanded through cable.



Note:
Only AIGE102 series have this function.

CHAPTER 4: FUNCTION INTRODUCTION

4.1 General Usage

4.1.1 System introduction

4.1.2 Supports Ubuntu 20.04 system.

Default username: nexgemo; password: nexgemo

4.1.3 View the system version number:

`lsb_release -a`

4.1.4: Switch on and off

Power-on: The Power-On mode is self-start after powering on the system. Plug in the power supply and connect a HDMI monitor via HDMI interface. The startup screen will be shown as in Figure 4.1.1.

Shut down: Hold the POWER button to shut down, or execute `$ sudo poweroff` in the command line to complete soft shutdown.

Restart: Execute `$ sudo reboot` in the command line to complete the restart.



Figure 4.1.1 Startup screen

4.2 Power Mode Setting

Devices equipped with Jetson processor have multiple working modes. It can be adjusted by setting the NVIDIA green logo in the upper right corner. The default mode is: MODE 10W 2CORE

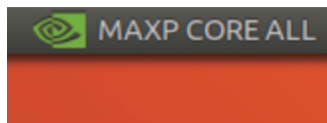


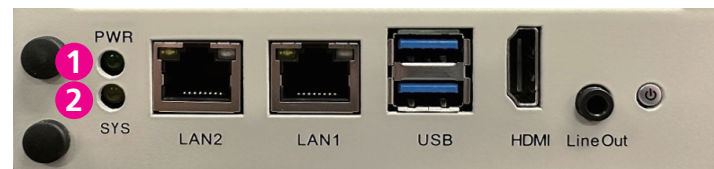
Figure 4.2.1 Setting icon

You can also use the command line to adjust:

```
# Check the current mode of the device
sudo nvpmode -q verbose
# Set to a mode
sudo nvpmode -m <MODE ID>
# Get the best performance in the current mode
sudo jetson_clocks
# check the detail information
sudo jetson_clocks --show
```

4.3 Power Testing

Locate the PWR (1) and SYS (2) indicators as shown below.



Test CMD:

PWR LED test
echo 329 > /sys/class/gpio/export
echo out > /sys/class/gpio/PCC.01/direction
echo 1 > /sys/class/gpio/PCC.01/value
echo 0 > /sys/class/gpio/PCC.01/value

SYS LED test
echo 446 > /sys/class/gpio/export
echo out > /sys/class/gpio/PP.06/direction
echo 1 > /sys/class/gpio/PP.06/value
echo 0 > /sys/class/gpio/PP.06/value



APPENDIX

How to flash a new OS image

Prepare an x86 device and install Ubuntu 18.04 or later, and the free disk space is greater than 30 Gbit/s, if you use SDKmanager to install CUDA and other libraries, the free disk space must be greater than 50 Gbit/s

- 1. Go to <https://developer.nvidia.com/embedded/jetson-linux-r3521>
- 2. Go to <https://github.com/mark-nexcom/3801/tree/main>
- 3. Download the **Driver Package (BSP)** and **Sample Root Filesystem**

Downloads and Links

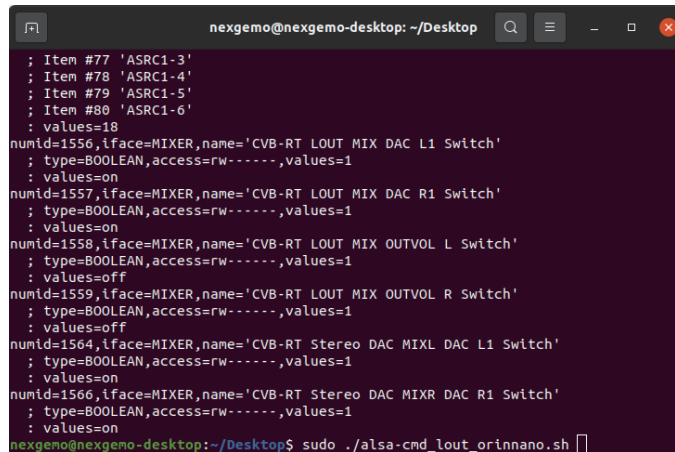
	Jetson Orin modules and developer kit	Jetson Xavier modules and developer kits
DRIVERS		<div>Driver Package (BSP)</div> <div>Sample Root Filesystem</div>
SOURCES		<div>Driver Package (BSP) Sources</div> <div>Sample Root Filesystem Sources</div> <div>Sensor Processing Engine Sources</div>
DOCS	<div>Jetson AGX Orin Developer Kit User Guide</div>	<div>Jetson AGX Xavier Developer Kit User Guide</div> <div>Jetson AGX Xavier Platform Adaptation Guide</div> <div>Release Notes</div> <div>Jetson Linux Developer Guide (online version)</div> <div>Jetson Linux Developer Guide (downloadable version)</div> <div>Software License Agreement</div> <div>Jetson Linux API Reference (formerly named Multimedia API Reference)</div>

- 4. Unzip the downloaded Driver Package (BSP) (no need to use sudo)
- 5. Unzip the Sample Root Filesystem file (sudo is required) in the Linux_for_Tegra/rootfs folder that was extracted in Step 3
- 6. Run the command `sudo ./apply_binaries.sh` on the Linux_for_Tegra
- 7. Copy the Image kernel to the Linux_for_Tegra/kernel/
- 8. Copy `tegra234-p3767-0000-p3509-a02dtb` file to `Linux_for_Tegra/kernel/dtb/`
- 9. Copy `tegra234-mb2-bct-misc-p3767-0000dts` and `tegra234-mb1-bct-pinmux-p3767-hdmi-a03.dtsi` files to `Linux_for_Tegra/bootloader/t186ref/bct/bct/`
- 10. Run the flashing command on the Linux_for_Tegra 3801 Series:
Rebuild a `system.img`: `sudo ./tools/kernel_flash/l4t_initrd_flash.sh --external-device nvme0n1p1 -c tools/kernel_flash/flash_l4t_external.xml -p "-c bootloader/t186ref/cfg/flash_t234_qspi.xml" --showlogs usb0 p3509-a02+p3767-0000 internal`
- 11. After the burning is completed, it will automatically restart, and occasionally there will be restart failures, you can directly power off and back on, and turn on the computer for basic settings



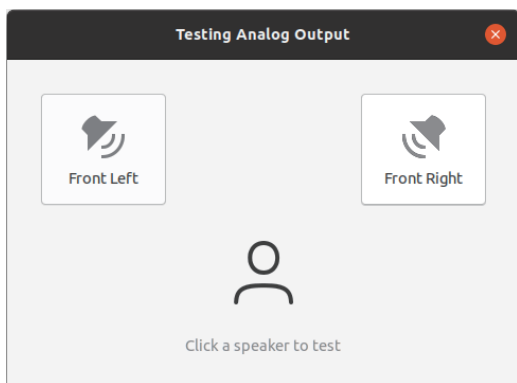
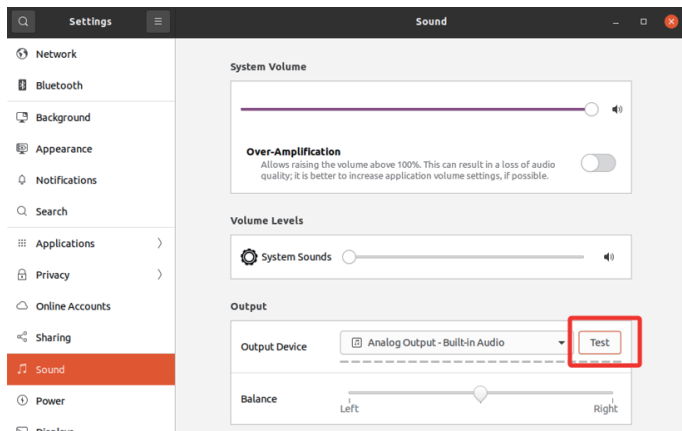
12. After the Coeus system enters the desktop, put the `alsa-cmd_lout_orinnx.sh` to `~/home/` of the Coeus device, give permissions, and execute (this step is to set audio, if you don't need audio, you can skip this step).

12.1 Open the terminal and execute the `sudo ./alsa-cmd_lout_orinnx.sh`, and after the execution, the results and commands are displayed as shown in the following figure:



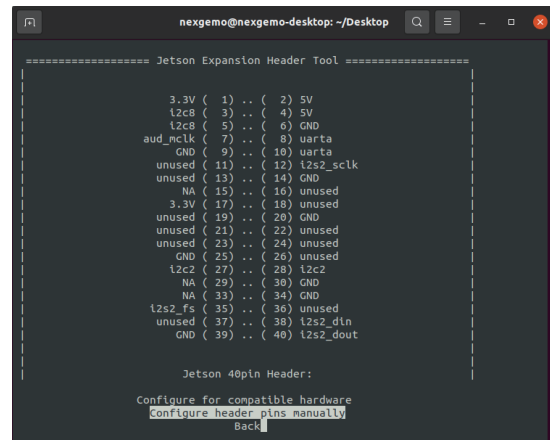
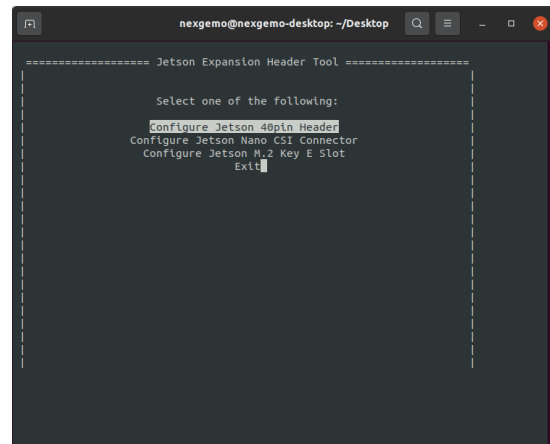
```
nexgemo@nexgemo-desktop: ~/Desktop
; Item #77 'ASRC1-3'
; Item #78 'ASRC1-4'
; Item #79 'ASRC1-5'
; Item #80 'ASRC1-6'
; values=18
numid=1556,iface=MIXER,name='CVB-RT LOUT MIX DAC L1 Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=on
numid=1557,iface=MIXER,name='CVB-RT LOUT MIX DAC R1 Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=on
numid=1558,iface=MIXER,name='CVB-RT LOUT MIX OUTVOL L Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=off
numid=1559,iface=MIXER,name='CVB-RT LOUT MIX OUTVOL R Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=off
numid=1564,iface=MIXER,name='CVB-RT Stereo DAC MIXL DAC L1 Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=on
numid=1566,iface=MIXER,name='CVB-RT Stereo DAC MIXR DAC R1 Switch'
; type=BOOLEAN,access=rw-----,values=1
; values=on
nexgemo@nexgemo-desktop:~/Desktop$ sudo ./alsa-cmd_lout_orinnano.sh
```

12.2 Open the Ubuntu Settings page and plug in your headphones. Click on the **Test** button to bring up the Testing Analog Output window, then click on the **Front Left** and **Front Right** buttons, and you will hear the sound.



12.3 If there is no sound, open the terminal and enter the command:
`sudo /opt/nvidia/jetson-io/jetson-io.py`

Enlarge the terminal window



12.4 Cancel the check box aud i2s2

```
nexgemo@nexgemo-desktop: ~/Desktop
Select desired functions (for pins):
[ ] aud      (7)
[ ] i2s2     (12,35,38,40)
[ ] spi1     (19,21,23,24,26)
[ ] spi3     (13,16,18,22,37)
[ ] uarta-cts/rts (11,36)
Back
```

12.6 After restarting, re-check AUD i2s2 -> (5)-> (1)-> (2) according to (3)->(4).

```
nexgemo@nexgemo-desktop: ~/Desktop
Select one of the following:
Re-configure Jetson 40pin Header
Configure Jetson Nano CSI Connector
Configure Jetson M.2 Key E Slot
Save and reboot to reconfigure pins
Save and exit without rebooting
Discard all pin changes
Exit
```

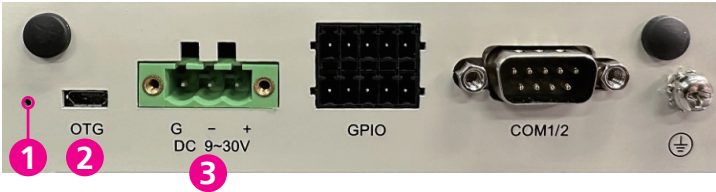
12.5 Save and exit

```
nexgemo@nexgemo-desktop: ~/Desktop
NA ( 29) .. ( 30) GND
NA ( 33) .. ( 34) GND
unused ( 35) .. ( 36) unused
unused ( 37) .. ( 38) unused
GND ( 39) .. ( 40) unused

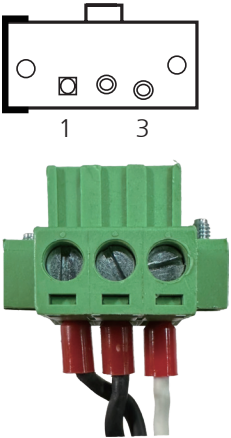
Jetson 40pin Header:
Export as Device-Tree Overlay
Save pin changes
Discard pin changes
```

Burning

Locate the Recovery Hole (1), OTG (2), and Power Interface (3) as shown below.



- Use a paper clip to push the recovery hole next to the OTG port to enter Recovery mode
- Connect the Micro USB cable to the computer for burning.
- Power Interface and pin definition:
Type: 5.08mm MALE 90D DIP



Pin	Signal Definition
1	DC Input (+9V~30V)
2	GND
3	Chassis_GND

System Testing

Watchdog Test

Go to <https://github.com/mark-nexcom/3801/tree/main> for latest files.

CMD: `./watchdogcontrol <timeout> <sleep> &`

```
root@user-desktop:~# ./watchdogcontrol 10 1 &
[1] 3176
root@user-desktop:~# ps
PID TTY TIME CMD
3158 pts/0 00:00:00 sudo
3159 pts/0 00:00:00 bash
3176 pts/0 00:00:00 watchdogcontrol
3177 pts/0 00:00:00 ps
root@user-desktop:~# kill -9 3176 // Reboot the system after 10 seconds
root@user-desktop:~#
```

Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.10.104-tegra aarch64)

Documentation: <https://help.ubuntu.com>

Management: <https://landscape.canonical.com>

Support: <https://ubuntu.com/advantage>

This system has been minimized by removing packages and content that are not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

Expanded Security Maintenance for Applications is not enabled.

30 updates can be applied immediately.

27 of these updates are standard security updates.

To see these additional updates run: `apt list —upgradable`

36 additional security updates can be applied with ESM Apps.

Learn more about enabling ESM Apps service at <https://ubuntu.com/esm>

Last login: Mon Dec 4 15:15:33 2023 from 10.12.1.17

user@user-desktop:~\$



LED

Test CMD

PWR LED test
echo 329 > /sys/class/gpio/export
echo out > /sys/class/gpio/PCC.01/direction
echo 1 > /sys/class/gpio/PCC.01/value
echo 0 > /sys/class/gpio/PCC.01/value

SYS LED test
echo 446 > /sys/class/gpio/export
echo out > /sys/class/gpio/PEE.06/direction
echo 1 > /sys/class/gpio/PEE.06/value
echo 0 > /sys/class/gpio/PEE.06/value

ETHTOOL

Test CMD

Switch speed setting
LAN1
ethtool -s eth1 autoneg off
ethtool -s eth1 speed [10/100/1000]
ethtool eth1

USB

USB test CMD
lsusb
Bus 002 Device 003: ID 0781:5567 SanDisk Corp. Cruzer Blade
Bus 002 Device 002: ID 174c:3074 ASMedia Technology Inc. ASM1074 SuperSpeed hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 007: ID 1532:0098 Razer USA, Ltd
Bus 001 Device 002: ID 174c:2074 ASMedia Technology Inc. ASM1074 High-Speed hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub



GPIO

GPO0 test
echo 398 > /sys/class/gpio/export
echo out > /sys/class/gpio/PG.06/direction
echo 1 > /sys/class/gpio/PG.06/value
echo 0 > /sys/class/gpio/PG.06/value

GPO1 test
echo 341 > /sys/class/gpio/export
echo out > /sys/class/gpio/PEE.02/direction
echo 1 > /sys/class/gpio/PEE.02/value
echo 0 > /sys/class/gpio/PEE.02/value

GPO2 test
echo 454 > /sys/class/gpio/export
echo out > /sys/class/gpio/PQ.06/direction
echo 1 > /sys/class/gpio/PQ.06/value
echo 0 > /sys/class/gpio/PQ.06/value

GPO3 test
echo 433 > /sys/class/gpio/export
echo out > /sys/class/gpio/PP.06/direction
echo 1 > /sys/class/gpio/PP.06/value
echo 0 > /sys/class/gpio/PP.06/value

GPIO test
echo 453 > /sys/class/gpio/export
echo in > /sys/class/gpio/PQ.05/direction
cat /sys/class/gpio/PQ.05/value

GPI1 test
echo 328 > /sys/class/gpio/export
echo in > /sys/class/gpio/PCC.00/direction
cat /sys/class/gpio/PCC.00/value

GPI2 test
echo 330 > /sys/class/gpio/export
echo in > /sys/class/gpio/PCC.02/direction
cat /sys/class/gpio/PCC.02/value

GPI3 test
echo331 > /sys/class/gpio/export
echo in > /sys/class/gpio/PCC.03/direction
cat /sys/class/gpio/PCC.03/value

UART
COM mapping

/dev/ttyTHS1 --> COM1
/dev/ttyTHS0 --> COM2

Test CMD

COM1/2 RS232 Test CMD :	
DB9 2-3 short (Loopback)	DB9 1-4 short (Loopback)
stty -F /dev/ttyTHS1 -echo -onlcr 115200	stty -F /dev/ttyTHS0 -echo -onlcr 115200
cat /dev/ttyTHS1 &	cat /dev/ttyTHS0 &
echo "Serial test" > /dev/ttyTHS1	echo "Serial test" > /dev/ttyTHS0

COM1 RS422 Test CMD :
Transmitter
stty -F /dev/ttyTHS1 -echo -onlcr 115200
echo "Serial test" > /dev/ttyTHS1

COM1 RS422 Test CMD :
Receiver
stty -F /dev/ttyTHS1 -echo -onlcr 115200
cat /dev/ttyTHS1 &

COM1 RS485 Test CMD :
Transmitter
stty -F /dev/ttyTHS1 -echo -onlcr 115200
echo "Serial test" > /dev/ttyTHS1

COM1 RS485 Sample Code:

Python

```
import os
import time
from threading import Thread
import serial

def recv(rr,flag):
    while True:
        rr.setDTR(1)
        rr.setRTS(0)
        try:
            a = rr.read(9).decode()
            if a:
                if a == "":
                    print("ko")
                else:
                    print("recv:",a)
            else:
                print("fail")
        except:
            print("cuowushuju")
            time.sleep(0.5)

if __name__ == '__main__':
    os.system("sudo chmod 777 /dev/ttyTHS1")
    com = "/dev/ttyTHS1"
    comser = serial.Serial(com, 115200, timeout=0)
    t1 = Thread(target=recv,args=(comser,"r"))
    t1.start()
```