



NexAloT Co., Ltd.

Intelligent Platform & Services Business Unit

AI Edge Computer

AIGE101/102

User Manual

CONTENTS

Preface

Copyright	iv
Disclaimer	iv
Acknowledgements	iv
Regulatory Compliance Statements	iv
Declaration of Conformity	iv
RoHS Compliance	v
Warranty and RMA	vi
Safety Information	viii
Installation Recommendations	viii
Safety Precautions	ix
Technical Support and Assistance	x
Conventions Used in this Manual	x
Global Service Contact Information	xi
Package Contents	xiii
Document Amendment History	xiv

Chapter 1: Product Introduction

AIGE101/102	1
Overview	1
Product Introduction	1
Key Features	1
Hardware Specifications	2
Physical Features	4

Physical Features	5
Mechanical Dimensions	6

Chapter 2: Jumpers and Connectors

Before You Begin	7
Precautions	7
Jumper Settings	8
Locations of the Jumpers and Connectors for AIGE101/102	9
Top View	9
Bottom View	10
Jumpers	11
RS422/485 Mode Terminal Resistance	11
Power-on self-start setting	11
Connectors Pin Definitions	12
External I/O Interfaces - Front Panel	12
Switch button	12
Indicator	12
Line Out	13
USB 3.0	13
LAN1 and LAN2 Ports	14
External I/O Interfaces - Bottom Panel	15
DC IN (9-30V)	15
GPIO	16
COM1~COM2 (DB9 Interface)	17
Internal Connectors	18
CAN Interface	18



Chapter 3: System Setup

Expansion Device Installation..... 19

Chapter 4: Function Introduction

4.1 General usage..... 25
4.2 Power mode setting..... 26
4.3 Expansion device configuration method..... 26

Appendix A:

5.1 Mirror burning 28

PREFACE

Copyright

This publication, including all photographs, illustrations and software, is protected under international copyright laws, with all rights reserved. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written consent from NexAIoT Co., Ltd.

Disclaimer

The information in this document is subject to change without prior notice and does not represent commitment from NexAIoT Co., Ltd. However, users may update their knowledge of any product in use by constantly checking its manual posted on our website: <http://www.nexaiot.com>. NexAIoT shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of any product, nor for any infringements upon the rights of third parties, which may result from such use. Any implied warranties of merchantability or fitness for any particular purpose is also disclaimed.

Acknowledgements

AIGE101/102 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, Chung-Cheng 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

13F, No.916, 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: sales@nexaiot.com
www.nexaiot.com

NexCOBOT Taiwan Co., Ltd.

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

GreenBase Technology Corp.

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

EMBUX Technology Co., Ltd.

13F, No.916, Chung-Cheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: sales@nexcom.com.tw
www.nexcom.com.tw

TMR Technology Corp.

13F, No.916, Chung-Cheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: sales@nexcom.com.tw
www.nexcom.com.tw

China

NEXSEC Incorporated

5F, No.4, No.7 Fengxian Middle Rd.,
(Beike Industrial Park), Haidian District,
Beijing, 100094, China
Tel: +86-10-5704-2680
Fax: +86-10-5704-2681
Email: marketing@nexsec.cn
www.nexsec.cn

NEXCOM Shanghai

No.4, 16 Building,
Shanghai OMNI Tech & Science Park
No. 1699, Douhui Rd.,
Shanghai, 201108, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

NEXCOM Surveillance Technology Corp.

5F, Building C, ZhenHan 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

NEXCOM United System Service

Room 603/604, Huiyinmingzun Plaza Bldg. 1,
No. 609, Yunlin East Rd.,
Shanghai, 200062, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: renwang@nexcom.com.tw
www.nexcom.cn

NEXGOL Chongqing

1F, Building B4, Electronic 2nd Area,
(Phoenix Lake Industrial Park), Yongchuan Dist.,
Chongqing City, 402160, China
Tel: +86-23-4960-9080
Fax: +86-23-4966-5855
Email: sales@nexgol.com.cn
www.nexcobot.com/NexGOL

NexCOBOT China

Room 501, Building 1, Haichuang Building,
No.7 Qingyi Road, Guicheng Street,
Nanhai District, Foshan City,
Guangdong Province, 528314, China
Tel: +86-757-8625-7118
Email: sales@nexcobot.com
www.nexcobot.com.cn

Beijing NexGemo Technology Co.,Ltd.

5F, Gemotech Building, No.1, Development Rd.,
Changping International Information Industry Base,
Changping District,
Beijing, 102206, China
Tel: +86-10-8190-9328
Fax: +86-10-8190-9456
Email: sales@gemotech.cn
www.nexgemo.cn

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

Europe

United Kingdom NEXCOM EUROPE

10 Vincent Avenue,
Crownhill Business Centre,
Milton Keynes, Buckinghamshire
MK8 0AB, United Kingdom
Tel: +44-1908-267121
Fax: +44-1908-262042
Email: sales.uk@nexcom.eu
www.nexcom.co.uk

Package Contents

Before continuing, verify that the AIGE101 & AIGE102 package that you received is complete. Your package should have all the items listed in the following table.

	AIGE102	AIGE101
Platform	Jetson Xavier NX	Jetson Nano
CPU	6-core NVIDIA Carmel ARM v8.2 64-bit	Quad-core ARM Cortex-A57 MPCore processor
GPU	384-core NVIDIA Volta GPU with 48 Tensor Cores	NVIDIA Maxwell architecture with 128 CUDA cores
RAM	8GB 128-bit LPDDR4x	4GB 64-bit LPDDR4x
Storage	16G eMMC	16G eMMC
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	Jan 19, 2020	
1.1	Position of the serial port jumper cap	Apr 23, 2020	
1.2	Modified content 3.2, 3.5, 4.1, 4.1.1, 4.1.2	Jun 17, 2020	

CHAPTER 1: PRODUCT INTRODUCTION

AIGE101/102

Overview



Key Features

- NVIDIA® Volta™ architecture with 384 NVIDIA® CUDA® cores and 48 Tensor cores (AIGE102)
- NVIDIA® Maxwell™ architecture with 128 NVIDIA® CUDA® cores (AIGE102)
- 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

AIGE100 series products are artificial intelligence edge computers created by NexAloT. It is equipped with Nvidia Jetson Nano/Xavier NX 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

- Quad-core ARM Cortex-A57 MPCore Processor (AIGE101)
- 6-core NVIDIA Carmel ARM v8.2 64-bit (AIGE102)

GPU

- NVIDIA® Maxwell architecture with 128 CUDA cores (AIGE101)
- 384-core NVIDIA® Volta GPU with 48 Tensor Cores (AIGE102)

DL Accelerator

2x NVDLA Engines (AIGE102)

Vision Accelerator

7-way VLIW vision processor (AIGE102)

RAM

- 4GB 64-bit LPDDR 4x (AIGE101)
- 8GB 128-bit LPDDR 4x (AIGE102)

I/O Interface - Front (AIGE101)

- 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 (AIGE101)

- 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

I/O Interface - Front (AIGE102)

- 2x USB3.0
- 2x RJ45 and LAN
- 1x HDMI
- 1x PWR indicator light
- 1x SYS indicator light
- 1x Line Out
- 1x Power switch
- 2x Antenna reservation

I/O Interface - Bottom (AIGE102)

- 1x Power connector
- 1x GPIO (4DI&4DO)
- 2x COM (incomplete signal, 1xDB9 form lead, COM1 RS-232/422/485;

- COM2 RS-232)
- 1x OTG
- 1x Recovery
- 1x Ground screw hole

Storage

- 16G eMMC (AIGE101)
- 16G eMMC (AIGE102)

Expansion

(AIGE101)

- 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, support mSATA

(AIGE102)

- 1x Micro SD
- 1x CAN
- 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 (AIGE101)
- DC 9~30V wide voltage (AIGE102)

Environment

(AIGE101)

- Operating temperature: -10°C to 60°C with air flow
- Storage temperature: -20°C to 80°C
- Working humidity: 40°C, 95% (relative humidity, non-condensing)

(AIGE102)

- Operating temperature: -10°C to 60°C with air flow
- Storage temperature: -20°C to 80°C
- Working humidity: 40°C, 95% (relative humidity, non-condensing)

Dimensions

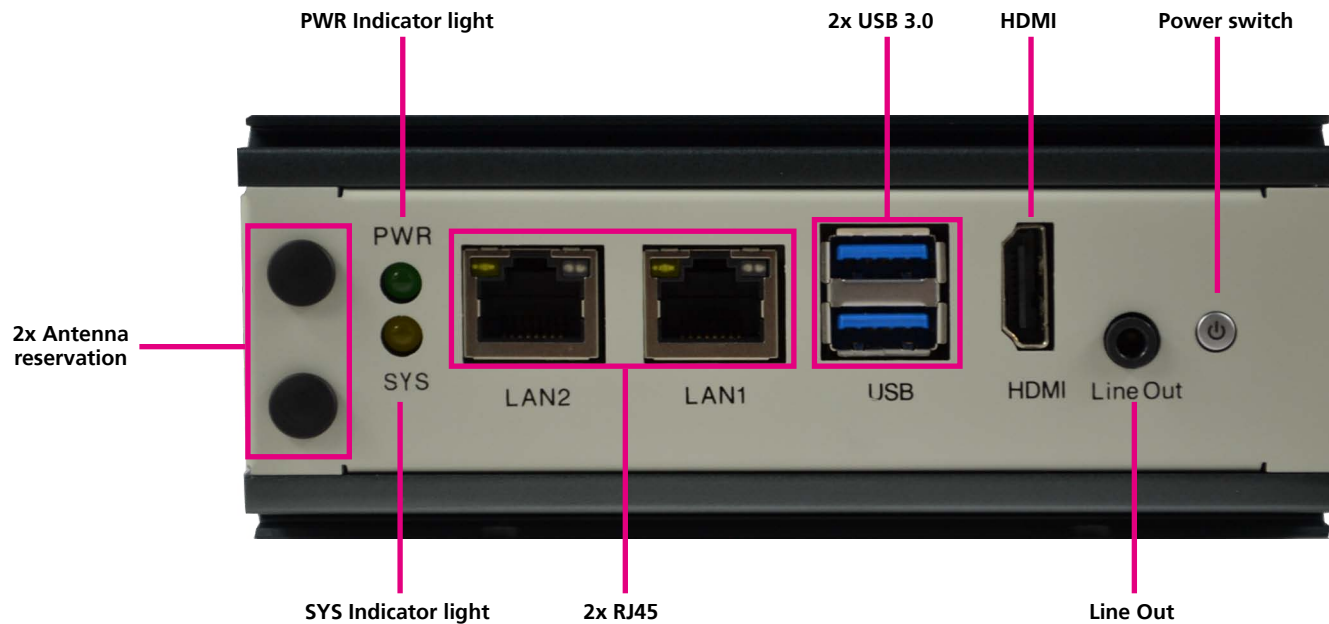
- 137mm x 52.4mm x 176mm (L x W x H) (AIGE101 & AIGE102)

Installation Method

- Wall Mount, DIN-Rail Mount

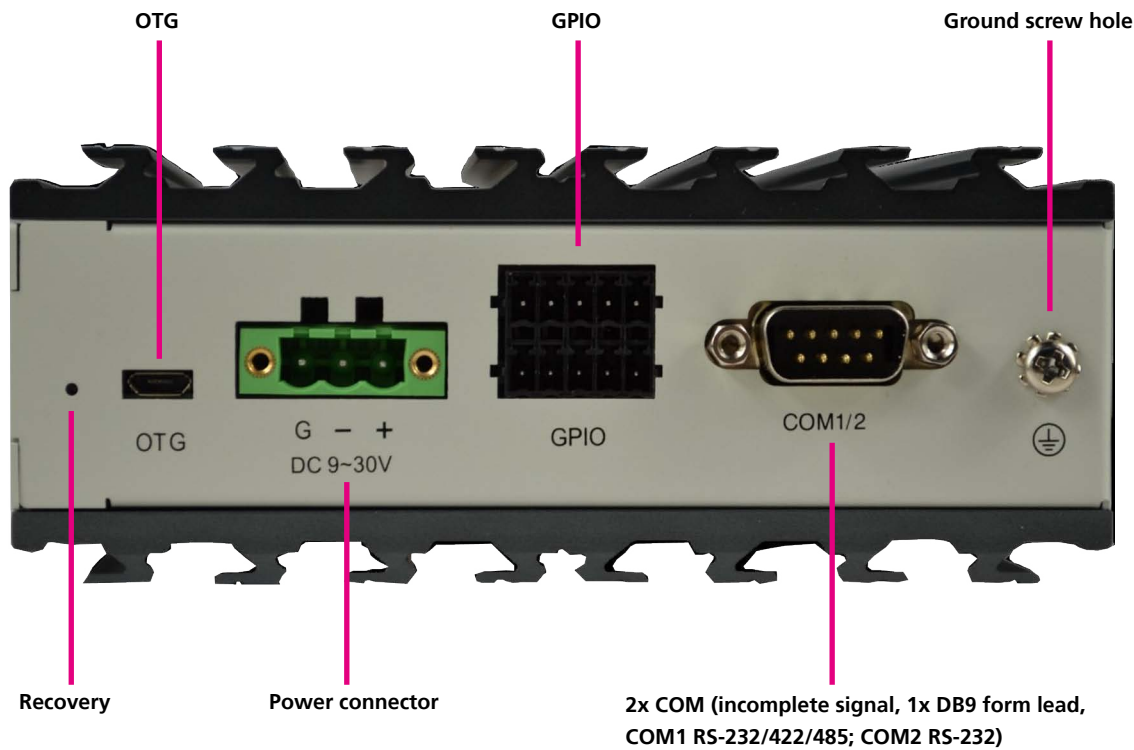
Physical Features

Front View

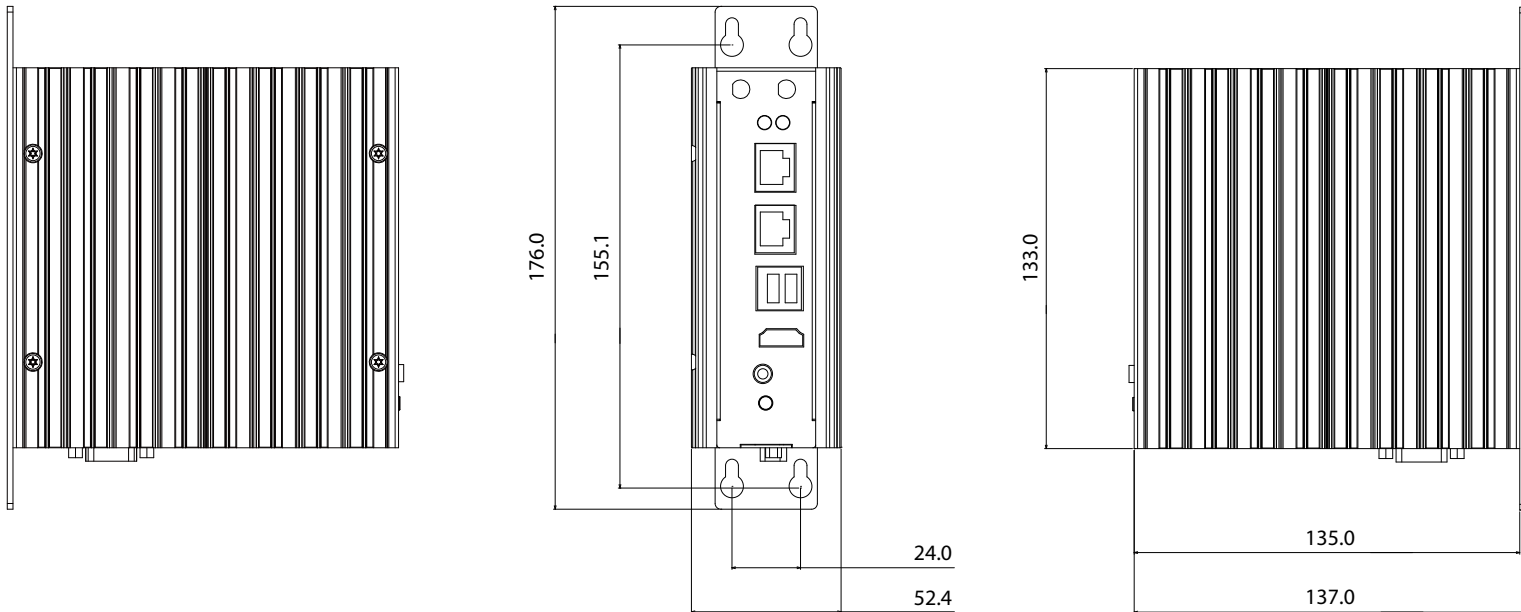


Physical Features

Bottom View



Mechanical Dimensions



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter lists the locations of the jumpers and connectors for AIGE101/102.

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:

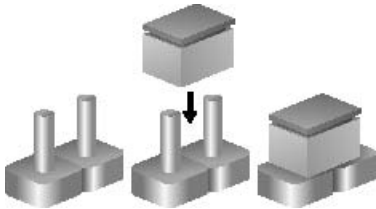
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

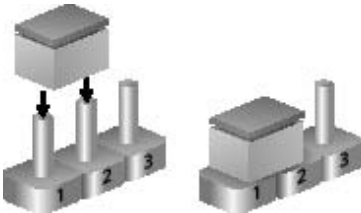
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



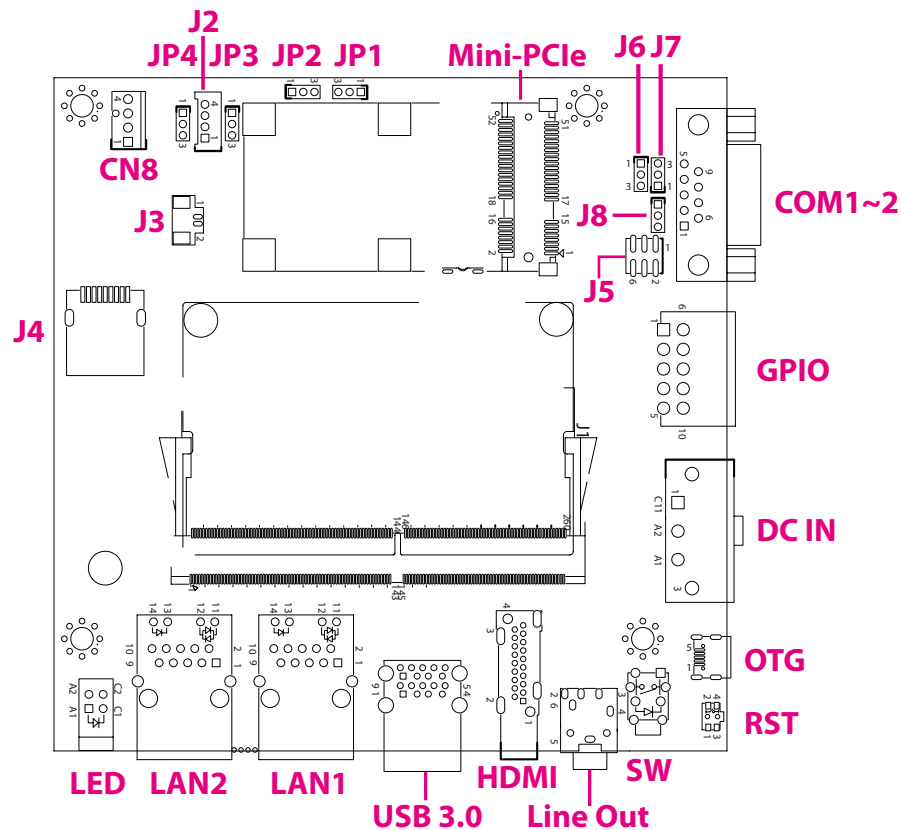
Three-Pin Jumpers: Pins 1 and 2 are Short



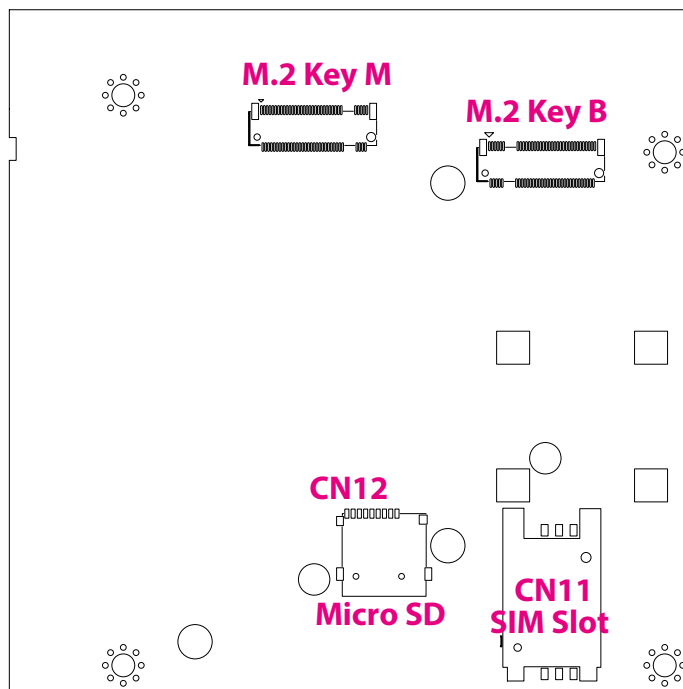
Locations of the Jumpers and Connectors for AIGE101/102

The figure below is the top and bottom view of the mainboard used in AIGE101/102. 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	Terminal resistance is on
*2-3 (Default)	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

Power



SYS

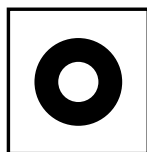
Machine State	PWR Indicator	SYS Indicator
Boot up	Always on	Always on
Shut down	Always off	Always off

- SYS: The indicator light can be customized according to the situation.

	AIGE102	AIGE101
SYS corresponding address of indicator	gpio-419	gpio-62

Line Out

Connector location: Line Out

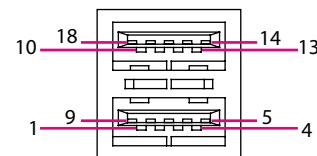


Line-Out

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

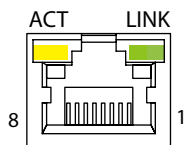
Connector location: USB 3.0



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

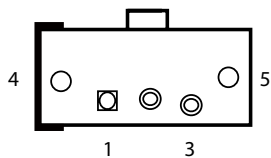
Link	Status
Steady Green	1000M LAN
Off	10/100M LAN

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

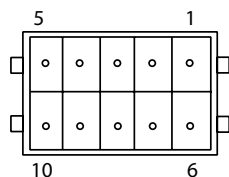


Pin	Signal Definition
1	DC Input (+9V~30V)
2	GND
3	Chassis_GND

GPIO

Connector type: 2x5 10-pin header

Connector location: GPIO



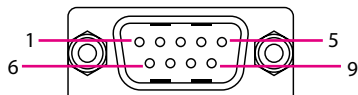
Pin	Definition	Pin	Definition
1	GPIO	2	GPI1
3	GPI2	4	GPI3
5	+5V	6	GPO0
7	GPO1	8	GPO2
9	GPO3	10	GND

Exposed Interface	AIGE102	AIGE101
1-pin GPIO	gpio-421	gpio-149
2-pin GPI1	gpio-264	gpio-66
3-pin GPI2	gpio-266	gpio-63
4-pin GPI3	gpio-267	gpio-64
6-pin GPO0	gpio-424	gpio-168
7-pin GPO1	gpio-417	gpio-169
8-pin GPO2	gpio-422	gpio-200
9-pin GPO3	gpio-268	gpio-194

- GPIO mapping in the system.

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

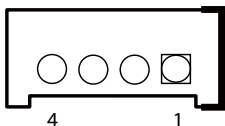
- COM1 serial port mode jumper setting

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

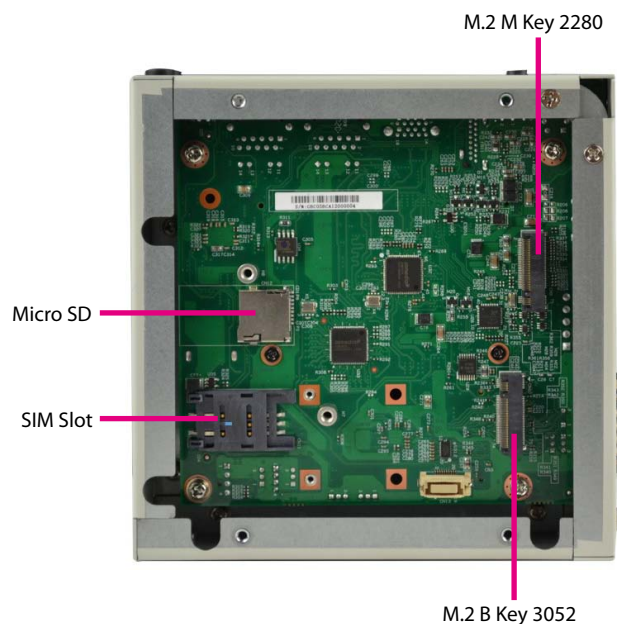


The following functions are recommended to be confirmed and installed before leaving the factory or assembled by our company; non-professionals are not allowed to disassemble by themselves.

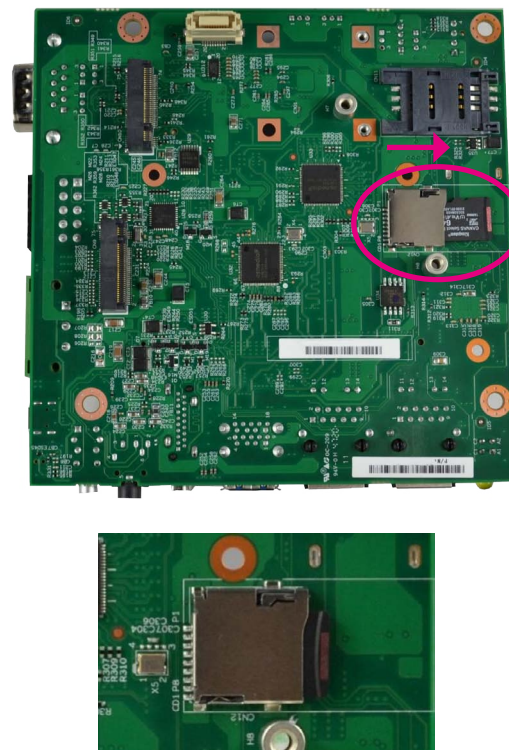
1. Equipment disassembly: Use a star shaped screwdriver to unscrew the four screws shown (red circle) to remove the side cover of the whole machine.



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 AIGE100 series, 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.

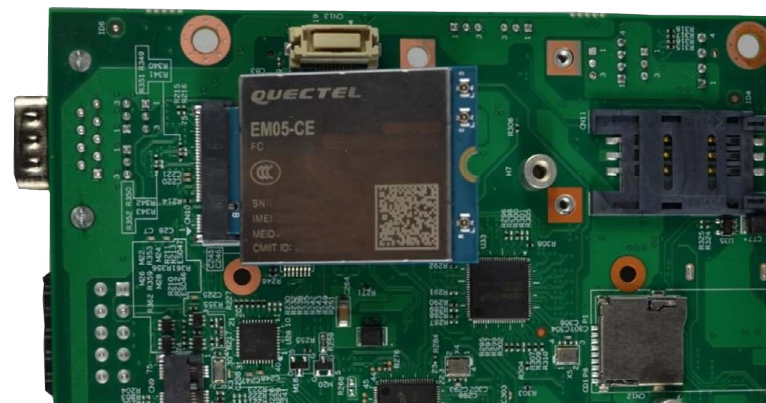


Note:

AIGE100 series devices provide 1X PCIe signals in this slot.

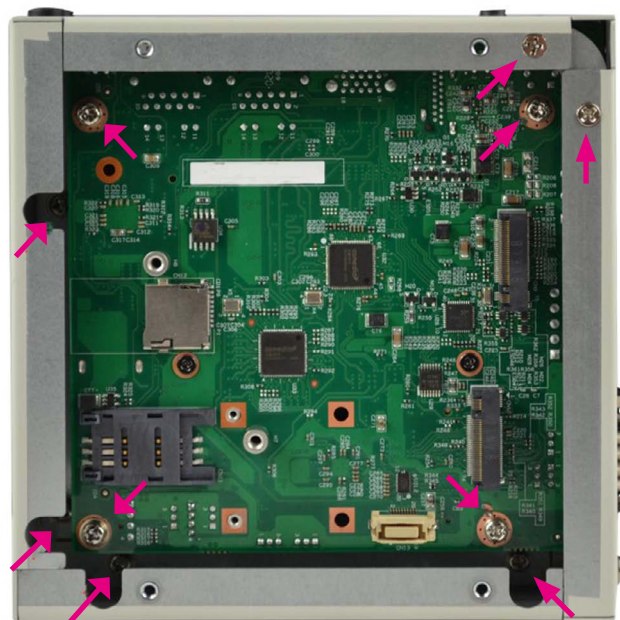


- M.2 B Key device, supports 3052 size 4G, 5G, Wi-Fi modules. It can be fixed with M3 screws.

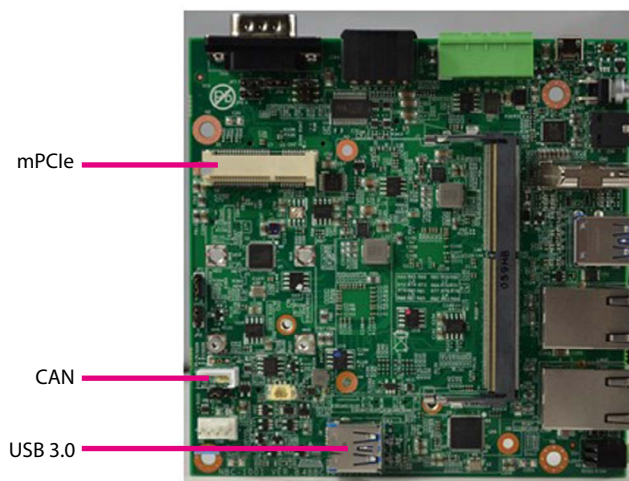


5. The SIM card slot supports the insertion of a standard SIM card and is used with 4G and 5G communication modules.

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.



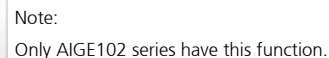
8. The miniPCIe interface supports mainstream miniPCIe full-card and half-length card devices, and can be fixed with M2 screws.



Note:

AIGE102 supports mSATA memory card; AIGE101 does not support mSATA function.

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



CHAPTER 4: FUNCTION INTRODUCTION

4.1 General usage

4.1.1 System introduction

4.1.2 AIGE100 series equipment uses Ubuntu 18.04 system.

Default username: nexaiot; password: nexaiot

4.1.3 View the system version number:

`lsb_release -a` Burn image

Burning tool, programming tool description and corresponding mirror image.

4.1.4: Switch on and off

Power-on: AIGE100 series default power-on mode is self-start after power on. Plug in the power supply and connect the monitor to AIGE100 series through the HDMI interface. The startup screen is as shown 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 Xavier NX have multiple working modes. It can be adjusted by setting the NVIDIA green logo in the upper right corner. The default mode of AIGE100 series is: MODE 10W 2CORE

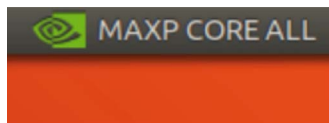


Figure 4.2.1 Setting icon

You can also use the command line to adjust:

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

4.3 Expansion device configuration method

Expand the use of SSD hard drives

View hard drive information: `$sudo fdisk -lu`

```
Disk /dev/mmcblk0boot0: 4 MiB, 4194304 bytes, 8192 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/nvme0n1: 119.2 GiB, 128035676160 bytes, 250069680 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/zram0: 647.7 MiB, 679096320 bytes, 165795 sectors
Units: sectors of 1 * 4096 = 4096 bytes
Sector size (logical/physical): 4096 bytes / 4096 bytes
```

Figure 4.3.1

Format the hard drive: `$sudo mkfs -t ext4 /dev/nvme0n1`

```
nexgemo@nexgemo-desktop:~$ sudo mkfs -t ext4 /dev/nvme0n1
mke2fs 1.44.1 (24-Mar-2018)
Discarding device blocks: done
Creating filesystem with 31258710 4k blocks and 7815168 inodes
Filesystem UUID: 80cbab50-c200-47f2-b39d-fd220bf2267b
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (131072 blocks): done
Writing superblocks and filesystem accounting information: done
```

Figure 4.3.2

View hard drive UUID: `$sudo blkid /dev/nvme0n1`

```
nexgemo@nexgemo-desktop:~$ sudo blkid /dev/nvme0n1
/dev/nvme0n1: UUID="80cbab50-c200-47f2-b39d-fd220bf2267b" TYPE="ext4"
nexgemo@nexgemo-desktop:~$
nexgemo@nexgemo-desktop:~$
```

Figure 4.3.3

Setting method of auto-mounting hard disk at boot:

Create a systemd service in the `/etc/systemd/system` path, which is used to automatically mount the hard disk at boot, such as: `coeus_mount_ssd.service`

```
#Create service coeus_mount_ssd.service
vim coeus_mount_ssd.service
[Unit]
Description=COEUS specific script
After=udev.service
```

```
[Service]
ExecStart=/etc/systemd/coeus_mount_ssd.sh
```

```
[Install]
WantedBy=multi-user.target
```

Create a script in the `/etc/systemd/` path to mount the hard disk, such as: `coeus _mount_ssd.sh`

```
#Create service script coeus_mount_ssd.sh
vim coeus_mount_ssd.sh
#!/bin/bash
mount -o rw /dev/nvme0n1 /home/nvidia/workspace
```

Add executable permissions to the created script file

```
sudo chmod +x coeus_mount_ssd.sh
```

Set the service of the mounted hard disk to start automatically after booting

```
sudo systemctl enable coeus_mount_ssd.service
```

Extend the use of TF refer to the use of extended SSD

APPENDIX A:

5.1 Mirror burning

5.1.1 Function introduction

Burning tool, suitable for AIGE100 series products. This tool has two main functions: flashing image and cloning image. You can burn the official image for AIGE100 series devices through ubuntu 18.04.

5.1.2 Prepare software and hardware

5.1.2.1 Host preparation

You need to connect the programming host to the AIGE100 series device to be able to burn the image. The recommended configuration for programming the host is as follows:

- CPU adopts Intel Core series processor of X86 architecture
- Memory 8G DDR3 and above
- Free hard disk capacity 40G and above
- The system is Ubuntu Linux v18.04

Method 1: Take out the AIGE100 series disassembled TF card, and use a card reader to program the system into the TF card (for AIGE101);

Method 2: Please refer to 5.1.2.2

5.1.2.2 Prepare to burn tool and device image

- Get link: <https://hzxts453b.myqnapcloud.cn:5001>
- "Customer upload data temporary storage/3401 (T), 3601 (T)" directory.
Guest account: guest1 Password: guest123456
- Download device image and programming instructions



Note: There can be no Chinese or special characters in the file storage path.

5.1.2.3 Prepare the hardware

- Equipment and power supply, USB-Micro data cable

5.1.3 Operation

5.1.3.1 Hardware connection

- Card reader production system (for AIGE101)
- Connect the programming port to the programming host via a USB data cable (for AIGE102)