

JEC-1300
(AIBOX-EHL)
User's Manual



Version 1.0

Disclaimer

The content of this manual is the intellectual property of the Company, and the copyright belongs to the Company. The ownership of all parts of this product, including accessories and software, is vested in the Company. Without the written permission of the Company, this manual and its any content shall not be imitated, copied, extracted or translated into other languages in any form.

We have carefully prepared this manual with an attitude of being responsible for users, but we do not guarantee that the contents of this manual are completely accurate. This manual is a purely technical document, without any hint or innuendo of third-party content, and does not bear any ambiguity in user understanding caused by typographical errors. In case of any direct or indirect information loss or business termination caused by this manual or all the information about the product mentioned in this manual, the Company and its employees shall not shoulder any responsibility.

Since our products are continuously being improved and updated, the Company reserves the right to amend the contents of this manual without prior notice.

Copyright Statement

The trademarks mentioned in this manual belong to their legally registered companies.

The product names involved in this manual are for identification purposes only, and their ownership belongs to their manufacturers or brand owners.

Safety Instructions

General Safety Instructions

 Caution

Before you have read related safety instructions, please do not expand your device.


 Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take practical measures against interference.

This device is compliant with the relevant safety measures required for information technology. If you have any doubt about the effectiveness of the installation in the planned environment, please contact your service representative.

Repair

The device can only be repaired by authorized personnel.

 Warning

Unauthorized opening of the device and improper repair may result in serious damage to the device or endanger the users' safety.

System expansion

Only system expansion devices designed for this device can be installed. Installing other expansion devices may damage the system and violate regulations on radio interference suppression. To know the system expansion devices that can be installed, please contact technical support team or local distributor.

 Caution

If the device is damaged by improper installation or replacement of system expansion devices, the warranty for the product will become invalid.

ESD Instructions

The following label can be used to identify the modules that contain electrostatic sensitive devices (ESD):



When operating the modules that contain ESD, please strictly follow the guidelines below:

- Be sure to release static electricity on your body (for example, by touching a grounded conductor) before operating the modules that contain ESD.
- All devices and tools must not carry static electricity.
- Before installing or removing the modules that contain ESD, make sure to pull out the power plug and remove the battery.
- When assembling the modules that contain ESD, always handle them by their edge.
- Please do not touch any connector pin or conductive part on modules that contain ESD.

Contents

Chapter 1	Product instruction	1
1.1	Overview	1
1.2	Specifications	1
1.3	Order information	2
Chapter 2	Application planning	4
2.1	Transportation	4
2.2	Storage	4
2.3	Open the box and perform the initial examination	4
2.3.1	Open the box and examine the device	4
2.4	External environment conditions	4
Chapter 3	Install the product	6
3.1	Installation method	6
3.2	Overall dimension drawing of product	6
Chapter 4	Device connection	7
4.1	Things to know before connection	7
4.2	Connect the device to power	7
Chapter 5	Instructions for use	8
5.1	Product appearance drawing	8
5.2	Product IO interface drawing	8
5.3	Status indicator	9
5.4	Power interface	9
5.5	COM1/2/3/4 Serial ports	9
5.6	Definition of motherboard interface pins	10
5.6.1	CN3 interface	10
5.6.2	PWRBTN2 interface	10
5.6.3	BAT1 interface	10
5.6.4	JSPK1 pin interface	10
5.6.5	CPUFAN1 pin interface	10
5.6.6	CN2 interface	11
5.6.7	CN1 interface	11
5.6.8	JSATA_PWR1 interface	11
Chapter 6	Expansion and maintenance	12
6.1	Machine Part Drawing	12
6.2	Install and remove M.2 2242/2280	13
6.3	Install and remove the memory module	14
6.4	Install and remove 4G/ 5G wireless module	15
Chapter 7	BIOS settings	16
7.1	BIOS explanation	16
7.2	BIOS setting	16
7.2.1	Enter the BIOS setup program	16
7.2.2	Control the keys	17
7.3	Introduction of BIOS main menu	17
7.4	Main	18

7.5	Advanced	19
7.6	Chipset	26
7.7	Security	28
7.8	Boot	28
7.9	Save&Exit	29
Chapter 8	Description about programming guide document	30
8.1	Definition of the functions involved	30
8.2	GPIO programming examples	31
8.3	WDT programming examples	33
Chapter 9	Instructions on driver program installation	34
Chapter 10	Appendix	35
10.1	Analysis and solutions of common malfunctions	35

Chapter 1 Product instruction

1.1 Overview

JEC-1300(AIBOX-EHL) industrial BOX machine adopts Intel Elkhart Lake series processor, featuring ultra-low power consumption and high cost-effectiveness. JEC-1300 adopts fanless design with an aluminum alloy die-casting shell for efficient heat dissipation and firm protection, making it suitable for application scenarios with heavy dust, high vibration and strong interference. With its rich expansion options and efficient transmission capabilities, JEC-1300 is suitable for a wide range of applications.

This product is equipped with Elkhart Lake J6413 quad-core processor and comes with standard features such as HDMI and DP dual displays, dual RJ45 2.5Gb high-speed Ethernet. It supports M.2 3042/3052 4G and 5G modules for applications like new infrastructure high-speed rail gates. It also supports M.2 Key-M 2242/2280 SATA protocol SSDs and has four RS232/422/485 COM ports. The machine is available with optional Expansion 1 or Expansion 2, suitable for applications requiring multiple USB and COM ports.

Expansion 1: 2*2.5GbE, 4*SWLAN, 16*GPIO, PS2, 3*USB3, 5*USB2, 6*COM, M.2- 3052 (Wifi optional)

Expansion 2: 2*2.5GbE, 3*USB3.0, 10*USB2.0, 14*COM, M.2-3052 (Wifi optional)

1.2 Specifications

Product model	-JEC-1300(AIBOX-EHL)
Product type	- Industrial BOX machine
Processor	- Intel® Celeron® Processor J series with 4 cores and 4 threads, basic frequency 1.80GHz, pulse frequency 3.00GHz, and BIOS default setting TDP6W
Chipset	- IntelElkhartLakeSOC
Memory	- 1 * DDR4SODIMM memory slot. A single memory slot supports up to 32GB DDR4-3200
Display controller	Intel CPU integrated Gen.11 Graphics Engines
Display interface	-Dual display interface HDMI+DP HDMI2.0maxresolutionupto4096*2160@60Hz DP1.4maxresolutionupto4096*2160@60Hz
Storage	- Supports 1 * SATA3.0+PWR; 1 * M.2, supports 2242/2280 (SATA signal)
Audio	- Supports Mic-in+Line-out (single hole 2 in 1), and digital audio output with power amplifier (3W, 4Pinwafer)

Network	- 2 * Intel Fast Ethernet: LAN1&LAN2: 2.5Gb
USB	-4*Type-A: 3 * USB3.1, 1 * USB2.0, 2 * internal USB2.0 with 2.0mmWafer
Serial port	- 4 * serial port for back-end I/O: COM1&2&3&4, supports RS232/422/485 (BIOS settings) Optional serial port expansion modules up to 10 * RS232 or 4 * 485 serial port
Expansion bus	- 1 * M.2Key- B3052, supports 4G/5G wireless module (USB3+PCIex1) - 1 * customized MIX-IO bus integrated with SGMII PCIeX1/16GPIO/2*COM/2*USB2.0/PS2/SMBus
Watch Dog	- 255-level WDT, programmable in the mode of seconds/minutes, supports timeout interrupt or system reset
BIOS	-AMIUEFI/LegacyBIOS
Operating System	-Win10x64, Win11x64, LinuxUbuntu22.04, CentOS8
Temperature & Humidity	- Temperature -40°C-85°C; RH 5%-95% (40°C), BP 85-105kPa - Temperature -20°C-60°C; RH 10%-85% (40°C), BP 85-105kPa
Vibration resistance	- If 2.5" HDD is installed: Operating state 1Grms@5-500Hz, non-operating state: 2Grms@5~500Hz - If SSD is used: Operating state 3Grms@5-500Hz, non-operating state: 5Grms@5~500Hz
Shock resistance	- If SSD is used: Operating state, 15G@11ms half-sine wave, 3 directions, 3 times / direction, non-operating state: 50G
Machine reference standards	- Meets the requirements of GB/T9813.4-2017 <i>General Specification for Computers - Part 4: Industrial Application Microcomputer</i>
Power source	- DC +10V-30V 2 Pin terminal input, switch button, power and hard disk indicator lights 13.1W (with J6413, 8GB memory, 32GB SSD, no expansion)
Dimensions (L*W*H)	- With no expansion: 150mm(W)×107mm(D)×39mm(H) - With MIO1: 150mm(W)×116mm(D)×83mm(H) - With MIO2: 150mm(W)×116mm(D)×77mm(H)

1.3 Order information

Order Information of JEC-1300 (AIBOX-EHL) Series Machine with No Expansion:

Part No.	Model / Description	Configuration Description
5CBX-BC6311-00	Industrial BOX	Industrial BOX Barebone System

	Barebone System AIBOX-EHL13 With no expansion (JW brand)	AIoT3-EHL13-225, AIoT3-EHLV1.0, J6413, 2xi225V, 3*USB3, 3*USB2, 4*COM, M.2, 4G_5G (Wifi optional) with power supply and no expansion, silver JWIPC Logo
5CBX-BC6315-00	Industrial BOX Barebone System AIBOX-EHL13 With no expansion (neutral)	Industrial BOX Barebone System AIoT3-EHL13-225, AIoT3-EHL V1.0, silver, neutral, J6413, 2xi225V, 3*USB3, 3*USB2, 4*COM, M.2, 4G_5G (optional Wifi) with power supply and no expansion, silver JWIPC Logo
5CBX-C32612-00	Industrial BOX Machine AIBOX-EHL13-4G1 28G With no expansion (JW brand)	Industrial BOX Machine AIoT3-EHL13-225, 4G128G, AIoT3-EHLV1.0, J6413, 2xi225V, 3*USB3, 3*USB2, 4*COM, M.2-2280, M.2-3052 (Wifi optional) with power supply and no expansion box, silver JWIPC Logo
5CBX-C32590-00	Industrial BOX Machine AIBOX-EHL13-8G2 56G With no expansion (JW brand)	Industrial BOX Machine, AIoT3-EHL13-225, 8G256G, AIoT3-EHLV1.0, J6413, 2xi225V, 3*USB3, 3*USB2, 4*COM, M.2-2280, M.2-3052 (Wifi optional) with power supply and no expansion box, silver JWIPC Logo
5CBX-C83948-00	Industrial BOX Machine AIBOX-EHL26-16G 256G with no expansion (JW brand)	Industrial BOX Machine AIoT3-EHL26-225, 16G256G, Pentium J6426, AIoT3-EHL V2.0, 2*i226V, 3*USB3, 3*USB2, 4*COM, M.2-2280, M.2-3052 (optional Wifi) with power supply and no expansion box, silver JWIPC Logo

Chapter 2 Application planning

2.1 Transportation

Well-packaged products are suited for transportation to any place by all kinds of vehicles. During the long-distance transportation, products should not be put in the open cabin and carriage. During the transshipment on route, products should not be stored in the open warehouse. Products should not be transported together with inflammable, explosive and corrosive substances by the same vehicle (or other means of transport) and are not allowed to be exposed to rain, snow or liquid substances and mechanical force.

2.2 Storage

Products should be stored in the original package box when unused. The warehouse temperature should be 0°C-40°C, and relative humidity should be 20%-85%. In the warehouse, there should be no harmful gas, inflammable and explosive products, corrosive chemical products, and strong mechanical vibration, shock and strong magnetic field interference. The package box should be at least 10 cm above ground and 50 cm away from wall, thermal and cold source, window or air inlet.

Risk of destroying the device!

When shipping the device in cold weather, attention should be paid to the extreme temperature variation. Under this circumstance, please make sure no water drop (condensation) is formed on the surface or interior of the device. If condensation is formed on the device, please wait for at least 12 hours before connecting the device.

2.3 Open the box and perform the initial examination

2.3.1 Open the box and examine the device

Please pay attention to the following issues when opening the box:

- Do not discard the original packing material. Please keep the original packing material for re-transportation.
- Please keep the documentation at a safe place. The documentation, which is a part of the device, is required for initial device debugging.
- When conducting the initial examination, please check whether there are distinct damages to the device caused during the transportation.
- Please check whether the goods contain the intact device and all of the independently ordered accessories. Please contact the customer service when any unconformity or transportation damages occur.

2.4 External environment conditions

When planning a project, the following conditions should be considered:

- Please observe the weather and mechanical environment conditions specified in the operating instructions.
- Please avoid extreme environmental conditions, and keep the device away from dust, moisture and heat.
- Please avoid direct sunlight on the device.
- Please make sure other assemblies or the side of cabinet is 50 mm and 100 mm respectively away from the upper / lower sides of the device.
- Please do not cover the ventilation hole of the device.
- The installation location requirement allowed for the device should always be observed.
- The I/O connected or installed should not generate reverse voltage of larger than 0.5 V in the device.

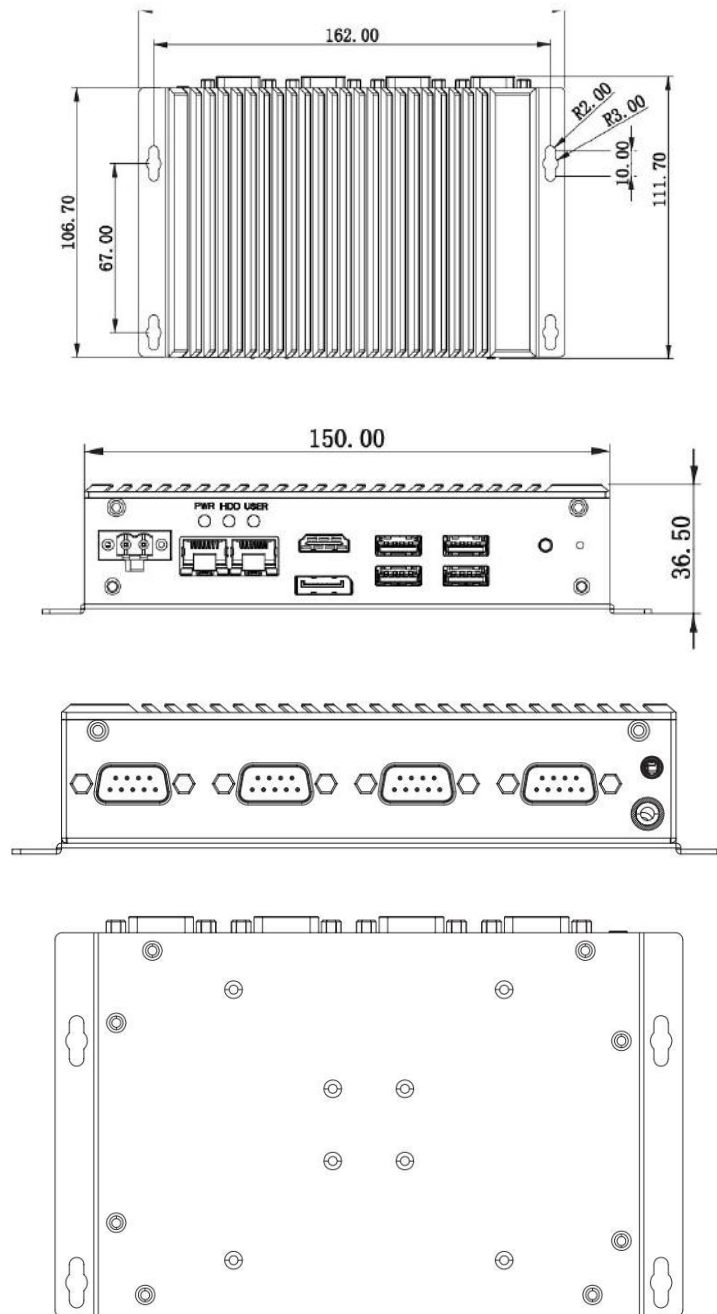
Chapter 3 Install the product

3.1 Installation method

- 19" Rack Mount Desktop (Deck) Embedded Panel
- Wall Mount VESA Standard Arm Portable
- Others _____

3.2 Overall dimension drawing of product

Unit: mm



Chapter 4 Device connection

4.1 Things to know before connection

Warning

The connected or built-in peripherals with opposite polarities are not allowed.

Warning

The device may only be operated when connecting with grounded power. No operation is allowed when the device power is ungrounded or only impedance is grounded.

Warning

Rated voltage of the device in use must be in accord with the power feature of the product.

Notes

Only the peripheral devices approved for industrial application can be connected. When operating the device, hot swappable I/O modules (USB) can be connected. The IO devices without hot swap function can only be connected when the device is powered off.

4.2 Connect the device to power

Steps to connect the device to power:

Connect the power adapter to the power cable, and then insert the power cable into the DCIN power socket.



Danger

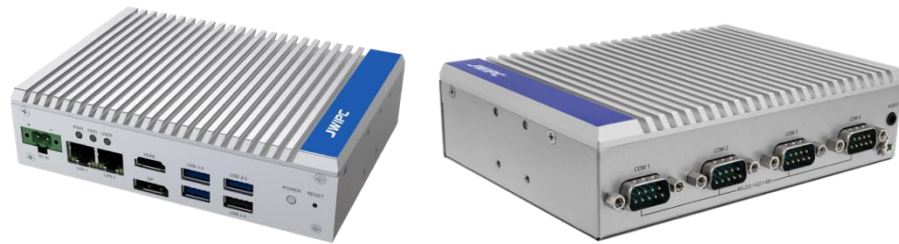
Disconnect the power and data cables during a lightning storm.

Attention

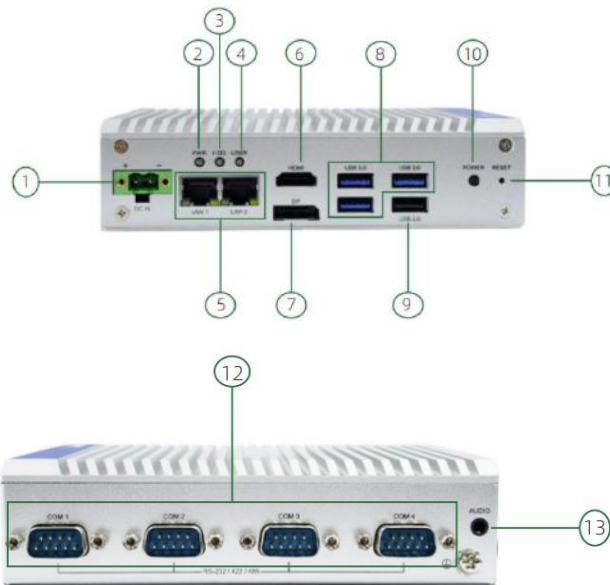
The device is completely isolated from the power supply only by disconnecting the power connector.

Chapter 5 Instructions for use

5.1 Product appearance drawing



5.2 Product IO interface drawing

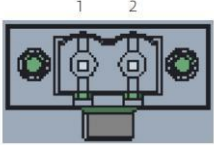


1. DC_IN: DC power interface
2. PWR: Power indicator
3. HDD: Hard disk indicator
4. USER: User indicator
5. LAN: RJ45 Ethernet interface
6. HDMI: HDMI display interface
7. DP: DP display interface
8. USB 3.0: USB 3.0 interface
9. USB 2.0: USB 2.0 interface
10. Power Button: Power switch (Remarks: ON/OFF button signal will not power off the device!)
11. RESET: Reset button (Short press the reset button, the signal will trigger a hardware reset, long press for 4 seconds will clear CMOS)
12. COM: Serial port
13. AUDIO: Audio port

5.3 Status indicator

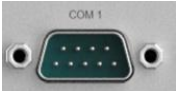
Display	Meaning	LED	Description
POWER	PC status display	Unlighted	The device stops operating
		Green	PC is running
HDD	Display the hard disk access	Unlighted	No access
		Orange	Access
USER	User indicator	Unlighted	No access
		Orange	Access

5.4 Power interface

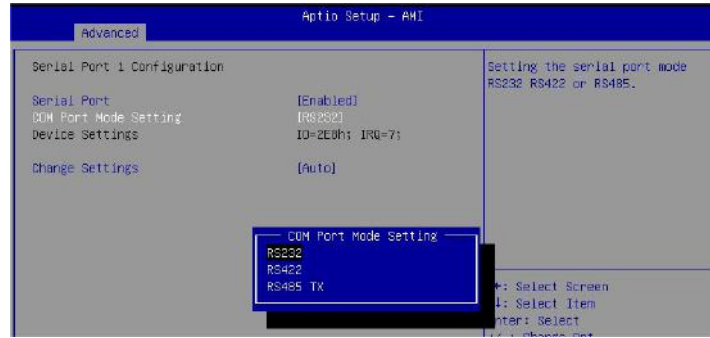
	Pin	Signal name
	1	DC+
	2	DC-

This product uses the 4pin crimp terminal (PHOENIX terminal with pitch 3.5 mm) connector to provide external DC power input:

5.5 COM1/2/3/4 Serial ports

	Pin	Definition of pin		
	PIN	RS232	RS422	RS485
	1	DCD	422TX-	485-
	2	SIN	422TX+	485+
	3	SOUT	422RX+	/
	4	DTR	422RX-	/
	5	GND	/	/
	6	DSR	/	/
	7	RTS	/	/
	8	CTS	/	/
	9	RI	/	/

Notes: To set COM1/2/3/4 under RS232/422/485 mode: It is required to enable the corresponding options, as shown in below figure:



5.6 Definition of motherboard interface pins

5.6.1 CN3 interface

Pin	Definition of pin	Pin	Definition of pin	Pin	Definition of pin	Pin	Definition of pin
1	GND	2	GND	3	USB-	4	USB+
5	GND	6	SIN	7	SOUT	8	CTS#
9	RTS	10	GND	11	GP33	12	GP43
13	GP34	14	GP42	15	GP35	16	GP41
17	GP36	18	GP40	19	GND	20	NC
21	NC	22	GP64	23	GP37	24	GP63
25	GP32	26	GP86	27	GP31	28	GP65
29	GP30	30	GND	31	GND	32	GND
33	GND	34	GND	35	VCC	36	VCC
37	VCC	38	VCC	39	VCC	40	VCC

5.6.2 PWRBTN2 interface

Pin	Definition of pin
1	Switch +
2	GND

5.6.3 BAT1 interface

Pin	Definition of pin
1	BAT+
2	BAT-

5.6.4 JSPK1 pin interface

Pin	Definition of pin
1	SPK_R-
2	SPK_R+
3	SPK_L-
4	SPK_L+

5.6.5 CPUFAN1 pin interface

Pin	Definition of pin
1	GND
2	+5V
3	PWM_IN
4	PWM_OUT

5.6.6 CN2 interface

Pin	Definition of pin	Pin	Definition of pin	Pin	Definition of pin	Pin	Definition of pin
1	GND	2	GND	3	GND	4	GND
5	VCC	6	VCC	7	VCC	8	VCC
9	SMBDATA	10	SMBCLK	11	RTS#	12	SOUT
13	CTS#	14	SIN	15	GND	16	USB-
17	USB+	18	GND	19	MCLK	20	KCLK
21	MDAT	22	KDAT	23	MDIO	24	MDC
25	GBE1_RSTN	26	GND	27	SGMII_RXP	28	SGMII_RXN
29	GND	30	SGMII_RXN	31	SGMI_TXP	32	GND
33	CLK+	34	CLK-	35	GND	36	PCIE_RXN
37	PCIE_RXP	38	GND	39	PCIE_TXP	40	PCIE_TXN

5.6.7 CN1 interface

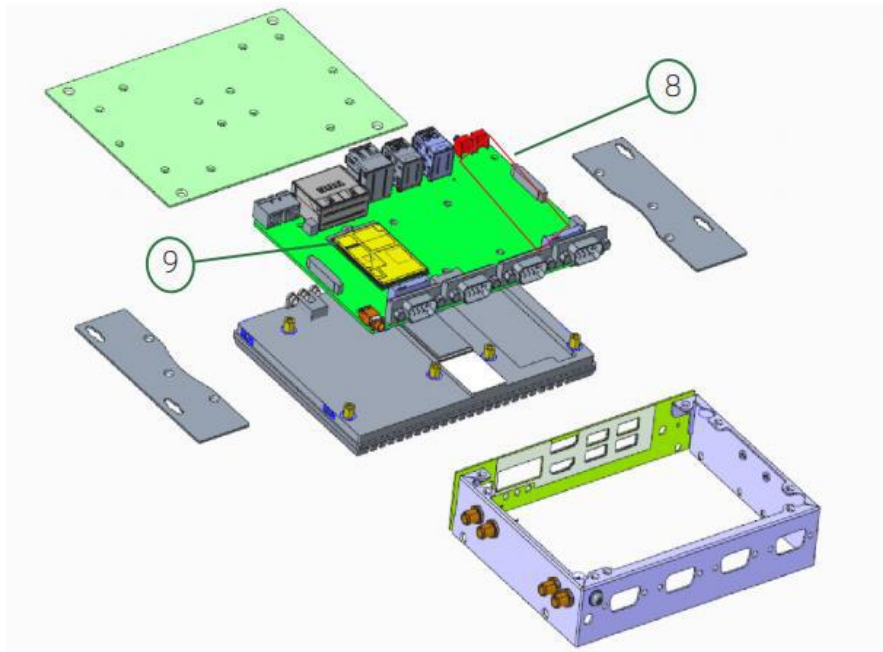
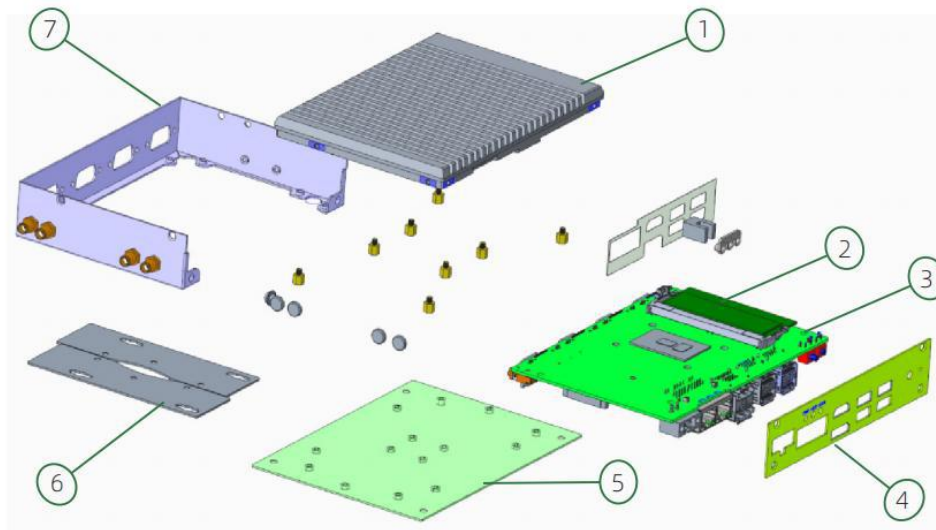
Pin	Definition of pin
1	Switch +
2	GND

5.6.8 JSATA_PWR1 interface

Pin	Definition of pin
1	5V
2	GND

Chapter 6 Expansion and maintenance

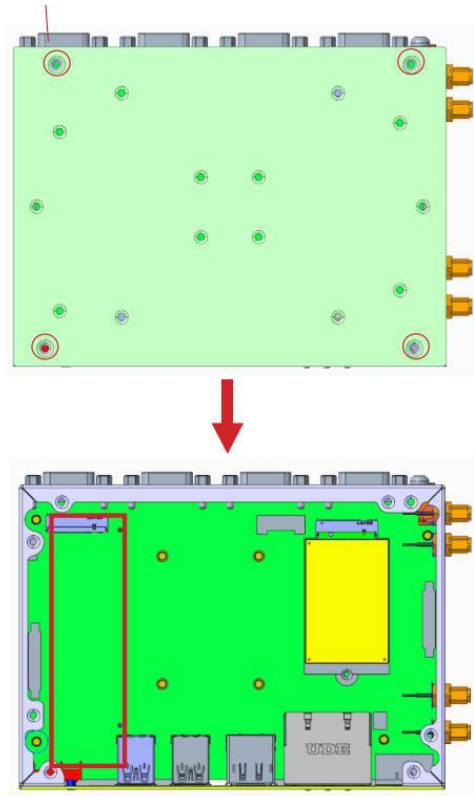
6.1 Machine Part Drawing



S/N	Name	S/N	Name	S/N	Name
1	Upper cover profile	2	Memory	3	Motherboard
4	Front panel	5	Bottom cover	6	Wall-hanging strip
7	Cabinet	8	Hard disk	9	Wireless module

6.2 Install and remove M.2 2242/2280

Flat head screw



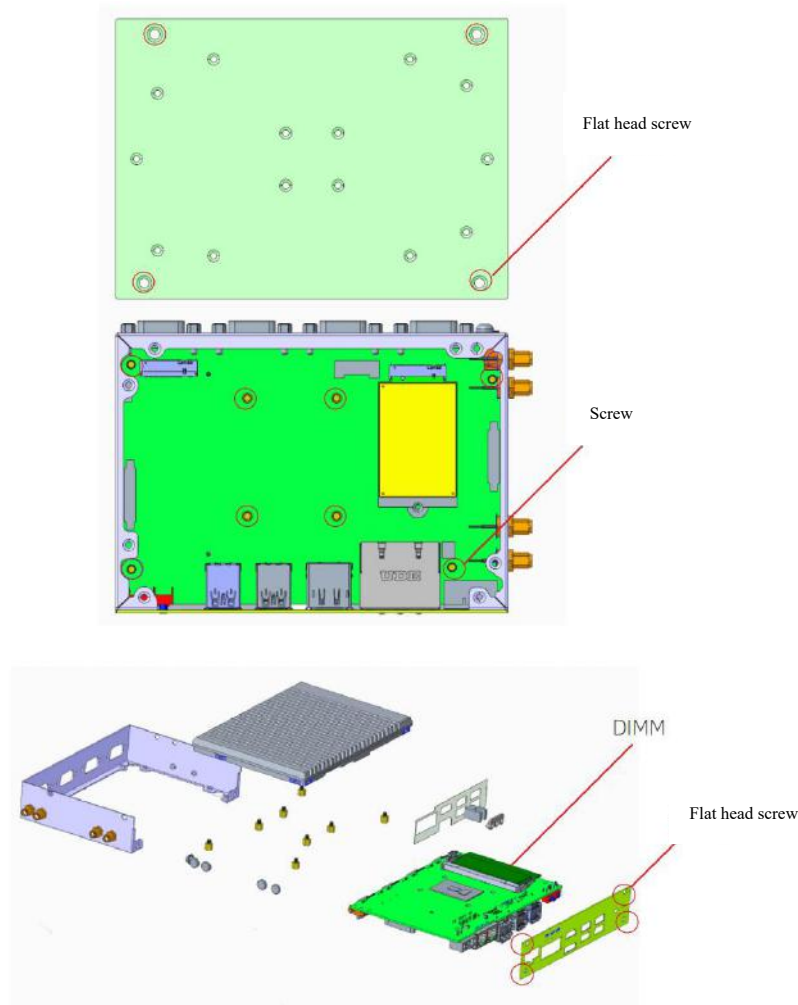
As shown in the above figure:

1. Loosen the four flat head screws on the bottom cover to remove the bottom cover.

Notes:

1. When installing this card, please insert the card at an angle of 30°, press down to the stud, and then fix it with screws;
2. To install M.2 2242, move the studs and screws on the M.2 2280 to M.2 2242.

6.3 Install and remove the memory module



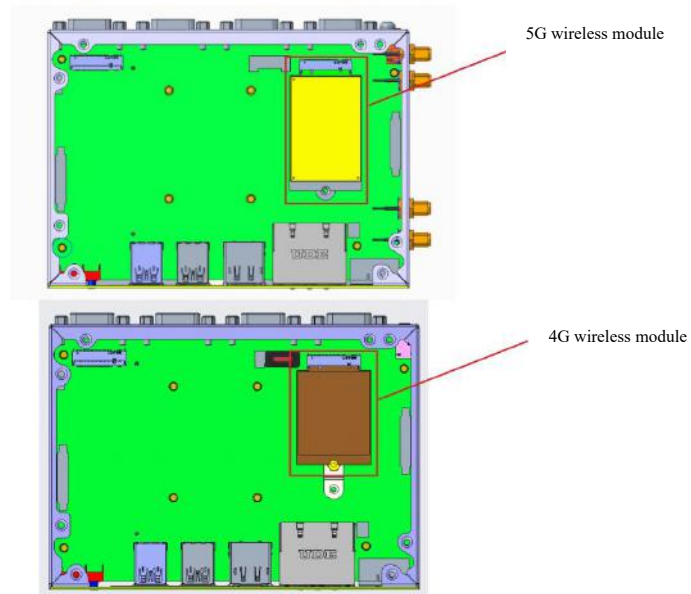
As shown in the above figure:

1. Loosen the four flat head screws on the bottom cover to remove the bottom cover.
2. Loosen the eight screws fastening the motherboard and four screws on the front panel to directly take out the motherboard.
3. Push the retaining clips on both ends of the DIMM slot outward at the same time, and then take out the memory module.

Notes:

1. Static electricity can damage the electronic components of the computer or memory, so before performing the above steps, be sure to briefly touch the grounded metal objects to remove static electricity from your body;
2. Be careful to hold both ends of the memory module, do not touch its metal contacts, and take out the DIMM memory module;
3. To install the memory module, insert it into the slot at an angle of 30° and fasten them.

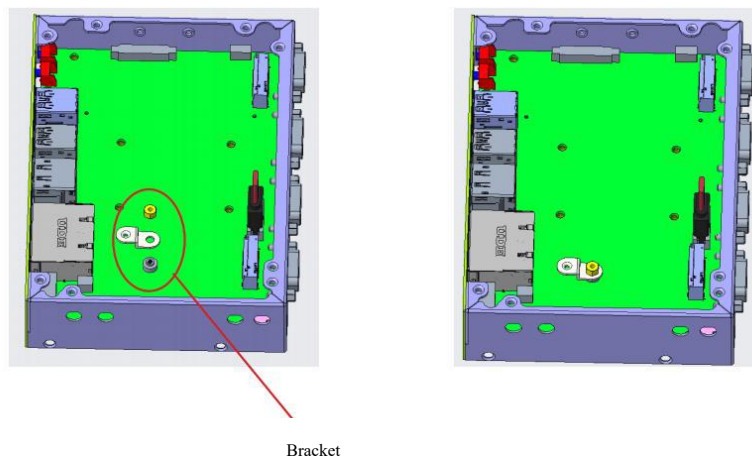
6.4 Install and remove 4G/ 5G wireless module



As shown in the above figure: Uniformly pull out the 4G/5G card.

To install the 4G/5G card, insert it at an angle of 30°.

Notes: To install the 4G module, the user requires to install the screw bracket in the package as shown in the below figure, and then fix the 4G module.



Chapter 7 BIOS settings

7.1 BIOS explanation

This motherboard uses AMI BIOS. The full name of BIOS is Basic Input Output System. It is stored in a ROM (Read-Only Memory) chip on the computer motherboard. When you turn on your computer, BIOS is the first program to run. It mainly has the following functions:

- a. Initialize your computer and detect hardware, this process is called POST (Power On Self Test).
- b. Load and run the operating system.
- c. Provide the lowest and most basic control over your computer hardware.
- d. Manage your computer through SETUP.

The modified BIOS data will be stored in a battery-maintained CMOS RAM, and the stored data area will not be lost when the power is cut off. Generally, there is no need to modify the BIOS when the system is running normally. If the CMOS data is lost due to other reasons, the BIOS value must be reset.

7.2 BIOS setting

This chapter provides information about the BIOS Setup program, allowing users to configure and optimize system settings by themselves. Some items in the BIOS that have not been explained too much are not commonly used items. It is recommended to keep the default settings and not change them arbitrarily before fully understanding their functions.

You need to run the SETUP program under the following cases:

- a. An error message appears on the screen during the system self-test, and it is required to enter the SETUP program;
- b. You want to change the factory default settings according to customer characteristics.

Notes: Since the BIOS version of the motherboard is constantly being upgraded, the description of the BIOS in this manual is for reference only. We do not guarantee that the relevant content in this manual is consistent with the information you have obtained.

7.2.1 Enter the BIOS setup program

Turn on the power or restart the system, you can see the following information on the self-test screen, press key to enter the BIOS setup program.

Press <Delete> to enter SETUP

Press <F11> to enter Boot Menu

7.2.2 Control the keys

You can use the arrow key to move the highlighted option, and press <Enter> key to select, <F1> key for help, and <Esc> key to exit. The following table will detail how to use the keyboard to boot the program settings of system.

Control key	Functional description
←/→	Move the left and right arrows to select the screen
↑/↓	Move the up and down arrows to select the items up and down.
+/-	Increase/decrease value or change option
<Enter>	Select this option to enter the sub-menu
<ESC>	Return to the main screen, or end the CMOSSETUP program from the main screen
<F1>	Show the related help
<F7>	Previous settings
<F9>	Load the optimized settings
<F10>	Save the modified CMOS settings and reboot

7.3 Introduction of BIOS main menu

Identification	Description	Comments
Main	Basic information page	BIOS basic information page
Advanced	Advanced options	BIOS advanced configuration page
Chipset	Chipset	Chipset setting
Security	Security setting	Include the user name and password settings.
Boot	Boot options	Select the sequence of booting devices
Save & Exit	Save and exit	Save settings and exit BIOS

7.4 Main



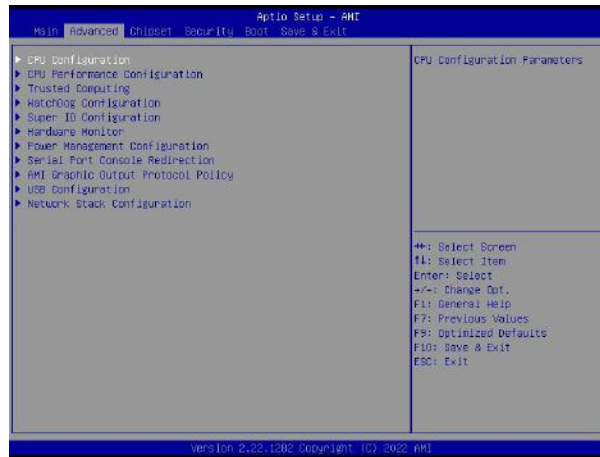
System Date (system date setting)

Set the date of the computer in the format of “day of the week, month/day/year”.

System Time (system time setting)

Time format is <hour><minute><second>.

7.5 Advanced



Identification	Description	Comments
CPU Configuration	Configure CPU	Sub-menu selection available
CPU Performance Configuration	Configure the CPU performance	Sub-menu selection available
Trusted Computing	Set the trusted computing	Sub-menu selection available
Watch Dog Configuration	Set Watch Dog	Sub-menu selection available
Super IO Configuration	Super IO setting information	Sub-menu selection available
Hardware Monitor	Hardware state	Sub-menu selection available
Power Management Configuration	Configure the power management	Sub-menu selection available
Serial Port Console Redirection	Set the redirection of serial port	Sub-menu selection available
AMI Graphic Output Protocol Policy	Set the graphic output protocol policy	Sub-menu selection available
USB Configuration	USB information and control option	Sub-menu selection available
Network Stack Configuration	Configure the network stack.	Sub-menu selection available

- ▶ CPU Configuration Press <Enter> key to enter the sub-menu.



CPU Flex Ratio Override

Set the flexibility ratio programming of CPU.

Options: Disable, Enable.

Intel(VMX) Virtualization Technology

Set the Intel (VMX) Virtualization Technology.

Options: Disable, Enable.

Active Processor Cores

Number of cores in each processor package to be activated.

Options: ALL, 1,2,3.

- ▶ CPU Performance Configuration Press <Enter> key to enter the sub-menu.



Boot performance mode

Select the performance state that BIOS will set from the reset vector.

Options: Max Battery, Max Non-Turbo Performance, Turbo Performance.

Intel(R) SpeedStep(tm)

Allow or not allow to support more than two frequency ranges.

Options: Disable, Enable.

Turbo Mode

Enable or disable the turbo mode of processor.

Options: Disable, Enable.

Power Limit 1/2 Override

Enable or disable power limit 1/2 override.

Options: Disable, Enable.

Power Limit 1 Time Window

Power limit 1 override, time window value (seconds).

Options: 0,1,2,3,4,5,6,7,8,10,12,14,16,20,24,28,32,40,48,56,64,80,96,112,128.

- ▶ Trusted Configuration Press <Enter> key to enter the sub-menu.



Security Device Support

Enable or disable the BIOS support of security device.

Options: Disable, Enable.

SHA256 PCR Bank

Enable or disable SHA256 PCR Bank.

Options: Disable, Enable.

Pending Operation

Planned operation of security device.

Options: None, TPM Clear.

Platform Hierarchy

Enable or disable the structure setting of platform hierarchy.

Options: Disable, Enable.

Storage Hierarchy

Enable or disable the structure setting of memory hierarchy.

Options: Disable, Enable.

Endorsement Hierarchy

Enable or disable the structure setting of memory hierarchy.

Options: Disable, Enable.

Physical Presence Spec Version

Select the operating system to support the physical presence specification.

Options: 1.2,1.3.

Device Select

Set the TPM device selection.

Options: TPM 1.2, TPM 2.0, Auto.

- ▶ **Watch Dog Configuration** Press <Enter> key to enter the sub-menu.



WatchDog Support

Disable or enable Watch Dog.

Options: Disable, Enable.

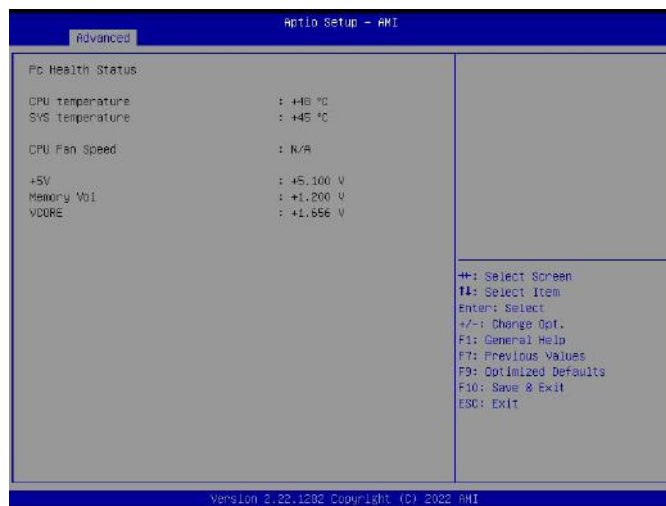
- ▶ **Super IO Configuration** Press <Enter> key to enter the sub-menu.



Serial Port 1/2/3/4 Configuration

Configure the serial port.

- ▶ **Hardware Monitor** Press <Enter> key to enter the sub-menu.



- ▶ **Power Management Configuration** Press <Enter> key to enter the sub-menu.



State After G3

Set the state after the device is powered on again.

Options: Power On, Power Off, Last State.

Wake system with Fixed Time

Enable or disable the wake events of system alarm.

Options: Disable, Enable.

- ▶ **Serial Port Console Redirection** Press <Enter> key to enter the sub-menu.



Console Redirection

Disable or enable the console redirection.

Options: Disable, Enable.

Console Redirection EMS

Disable or enable Console Redirection EMS.

Options: Disable, Enable.

- ▶ AMI Graphic Output Protocol Policy Press <Enter> key to enter the sub-menu.



Output Select

Set the output interface.

Options: DVI2[ACTIVE].

- ▶ USB Configuration Press <Enter> key to enter the sub-menu.



Legacy USB Support

Disable or enable the legacy USB support.

Options: Disable, Enable, Auto.

XHCI Hand-off

Disable or enable XHCI hand-off.

Options: Disable, Enable.

USB Mass Storage Driver Support

Disable or enable USB mass storage driver support.

Options: Disable, Enable.

USB transfer time-out

Set the USB transfer time-out.

Options: 1sec, 5sec, 10sec, 20sec.

Device reset time-out

Set the device reset time-out.

Options: 10sec,20sec,30sec,40sec.

Device power-up delay

Delay the device power-up.

Options: Auto, Manual.

- ▶ Network Stack Configuration Press <Enter> key to enter the sub-menu.



▪ **Network Stack**

Disable or enable CSM support.

Options: Disable, Enable.

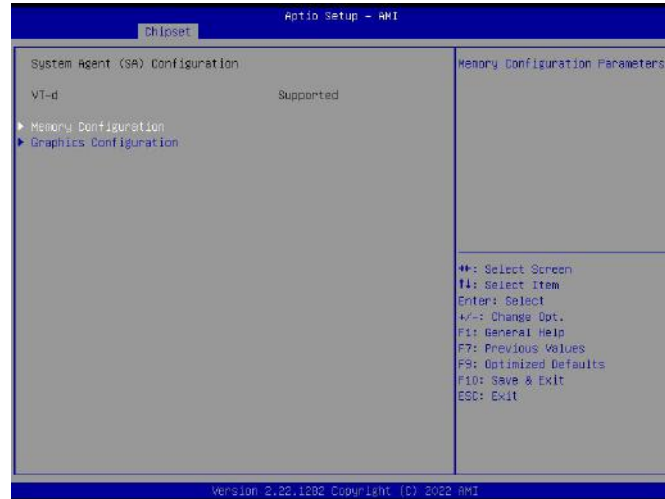
7.6 Chipset



Identification	Description	Comments
System Agent (SA) Configuration	Configure the system	Sub-menu selection available

	agent (SA)	
PCH-IO Configuration	Configure PCH-IO	Sub-menu selection available

- ▶ System Agent(SA) Configuration Press <Enter> key to enter the sub-menu.



- **Memory Configuration**

Configure memory.

- **Graphics Configuration**

Configure the graphics port.

- ▶ PCH-IO Configuration Press <Enter> key to enter the sub-menu.



- **HD Audio Configuration**

Configure HD Audio.

Options: Disable, Enable.

- **SATA Configuration**

Set the SATA option.

- **Onboard LAN Configuration**

Enable or disable the onboard LAN

7.7 Security

- **Administrator Password**

If this option is used to set the system administrator password, there are the following steps:

1. Select the Administrator Password setting item, and press <Enter> key.
2. Enter 3 to 20 character or numeric passwords to be set in the “Create New Password” dialog box. After the input is completed, press <Enter> key, and then enter the password again to confirm that the password is correct in the “Confirm Password” dialog box. If the screen shows “Invalid Password!”, it indicates that the passwords entered twice are different, please enter them again. To delete the system administrator password, please select “Administrator Password”, and complete deletion when the “Create New Password” dialog box appears after entering the old password in the “Enter Current Password” dialog box and pressing <Enter>.

- **P1: Hoodisk SSD**

HDD safety configuration of driver.

- **Secure Boot**

Secure boot configuration.

7.8 Boot



- **Setup Prompt Timeout**

Installation prompt timeout.

- **Boot NumLock State**

Set the NumLock state

Options: On, Off.

- **Quiet Boot**

Disable or enable the full screen logo display.

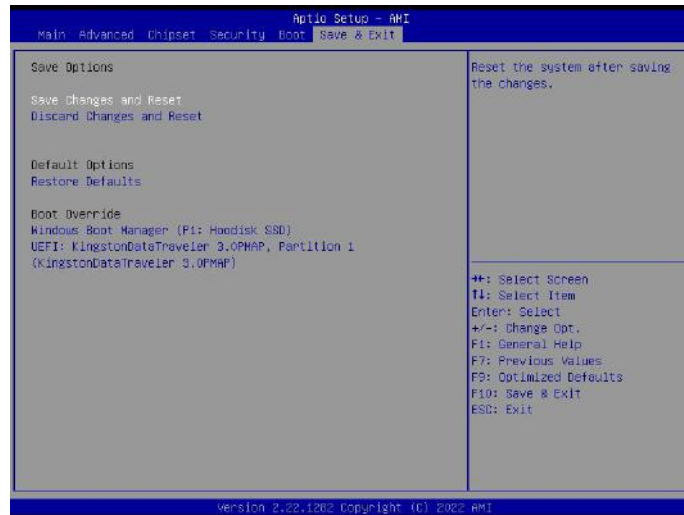
Options: Disable, Enable.

- **Boot Option #1**

Set the boot option 1.

Options: Kingston Data Traveler 2.01.00, Disable.

7.9 Save&Exit



- **Save Changes and Reset**

Installation prompt timeout.

- **Discard Changes and Reset**

Discard the changes and reboot the system.

- **Restore Defaults**

Restore factory settings.

Chapter 8 Description about programming guide document

This document contains the secondary development specification and software sample pseudo code for GPIO of AIoT3-EHL series motherboard.

Description: This programming guide applies to the project with the GPIO and WDT sourced from the corresponding signals of NCT6126 Super IO, and the specific signals used by different boards may be different.

8.1 Definition of the functions involved

Under Linux, several header files need to be included:

```
#include <stdio.h>
#include <errno.h>
#include <sys/io.h>
```

//read 1 Byte from IO address

```
/*
```

```
Name:IoRead8
```

```
Input:GpioAddress - GPIO base address
```

```
Output:GPIO port read value
```

```
Description:
```

```
*/
```

```
unsigned char IoRead8(unsigned short GpioAddress) {
```

```
unsigned char ret;
```

```
ret = iopl(3);
```

```
if (ret)
```

```
{
```

```
    printf("ret = %d\n", ret);
```

```
    printf("errno = %d\n", errno);
```

```
    printf("error for iopl\n");
```

```
    return 1;
```

```
}
```

```
return inb(GpioAddress);
```

// write 1 Byte to IO address

```
unsigned char IoWrite8(unsigned short GpioAddress, unsigned char Data) {
```

```
unsigned char ret;
```

```
ret = iopl(3);
```

```
if (ret)
```

```
{
```

```
    printf("ret = %d\n", ret);
```

```

printf("errno = %d\n", errno);
printf("error for iopl\n");
return 1;
}
outb(Data, GpioAddress);
return 0;
}

```

8.2 GPIO programming examples

The GPIO usage of AloT-EHL series board is as follows:

- (1) GP30/31/32/37/63/64/65/86, used as input function. The software can only perform read operation in this mode, and write operation is invalid;
- (2) GP33/34/35/36/40/41/42/43/82, used as output function. The software can perform both read and write operations in this mode;
- (3) Wherein, GPIO Group Gp3x/4x/6x belong to Logical Device 7 and GP8x belongs to Logical Device 9;
- (4) The data registers corresponding to GP3x (30 to 37) are located at Bit0 to Bit7 of Register 0xED of Logical Device 7, the data registers corresponding to GP4x (40 to 47) are located at Bit0 to Bit7 of Register 0xF1 of Logical Device 7, the data registers corresponding to P6x (60-67) are located at Bit0 to Bit7 of Register 0xF9 of Logical Device 7, and the data registers corresponding to Gp8x (80 -87) are located at Bit0 to Bit7 of Register 0xF1 of Logical Device 9.
- (5) This programming guide only takes GPIO Group3 as an example for reading and writing instructions. When reading and writing GPIO Group4/6, GPIO_GROUP_3_DATA_REGISTER in the example will be replaced with the corresponding parameters of GPIO Group4/6, and 0x30/0x37 will be replaced with 0x40/0x47 or 0x60/0x67; When reading and writing GPIO Group 8, in addition the parameters similar to Group4/6 that need to be replaced, GPIO_LDN7_DEVICE in step “//b.” should be replaced with GPIO_LDN9_DEVICE.

Constant definition

```

#define SuperIo_Index_Port    0x2E
#define SuperIo_Data_Port    0x2F
#define GPIO_LDN7_DEVICE    0x07
#define GPIO_LDN9_DEVICE    0x09
#define GPIO_GROUP_3_DATA_REGISTER    0xED
#define GPIO_GROUP_4_DATA_REGISTER    0xF1
#define GPIO_GROUP_6_DATA_REGISTER    0xF9
#define GPIO_GROUP_8_DATA_REGISTER    0xF1

```

Read and write examples of GPIO Group 3:

//a. Enter the Configuration Mode of Super IO

```
IoWrite8(SuperIo_Index_Port, 0x87);  
IoWrite8(SuperIo_Index_Port, 0x87);
```

//b. Select the GPIO, LDN 7 of logical device

```
IoWrite8(SuperIo_Index_Port, 0x07);  
IoWrite8(SuperIo_Data_Port, GPIO_LDN7_DEVICE);
```

//c. Read GPIO Group 3 and program as follows

```
UINT8 BitOffset;  
UINT8 GpioNumber;  
UINT8 Data8;  
for(GpioNumber=0x30; GpioNumber<=0x37; GpioNumber++)  
{  
  
BitOffset = GpioNumber - 0x30;  
IoWrite8(SuperIo_Index_Port, GPIO_GROUP_3_DATA_REGISTER);  
Data8 = IoRead8(SuperIo_Data_Port);  
Data8 = Data8 >> BitOffset;  
Data8 = Data8 & 0x1;  
}  
if(Data8 & 0x1){  
return 1; //The corresponding GPIO is high  
}else{  
return 0; //The corresponding GPIO is low  
}
```

//d. Write value to GPIO Group 3. Notes: The value can be written to GPIO only when used as GPO, and writing value is invalid when used as GPI.

```
for(GpioNumber=0x30; GpioNumber<=0x37; GpioNumber++)  
{  
BitOffset = GpioNumber - 0x30;  
IoWrite8(SuperIo_Index_Port, GPIO_GROUP_3_DATA_REGISTER);  
Data8 = IoRead8(SuperIo_Data_Port);  
Data8 &= ~(0x1 << BitOffset); //The corresponding bit is cleared, and the corresponding GPIO  
outputs low level signal
```

```

//Data8 |= (0x1<<BitOffset);/*The corresponding bit is 1, and the corresponding GPIO
outputs high level signal*/
IoWrite8(SuperIo_Data_Port,Data8);//Write back
}

```

//f. Exit the Configuration Mode of Super IO

```
IoWrite8(SuperIo_Index_Port, 0xAA);//All logical devices of Super IO can't be accessed
after exiting the Configuration Mode of Super IO, unless re-entering the Configuration Mode
of Super IO.
```

8.3 WDT programming examples

Constant definition

```

#define SuperIo_Index_Port      0x2E
#define SuperIo_Data_Port      0x2F
#define GPIO_LDN8_DEVICE      0x08
UINT8 Data8;

```

//a. Enter the Configuration Mode of Super IO

```
IoWrite8(SuperIo_Index_Port, 0x87);
IoWrite8(SuperIo_Index_Port, 0x87);
```

//b. Select the GPIO, LDN 8 of logical device

```
IoWrite8(SuperIo_Index_Port,0x07);
IoWrite8(SuperIo_Data_Port,GPIO_LDN8_DEVICE);
```

//c. Enabled WDT device

```
IoWrite8(SuperIo_Index_Port,0x30);
IoWrite8(SuperIo_Data_Port,IoRead8(SuperIo_Data_Port)|0x01);
```

//d. Set WDT to the mode of minutes or seconds, if Bit3 of Register 0xF0 is 1, the mode of minutes is enabled, if 0, the mode of seconds is enabled.

```
IoWrite8(SuperIo_Index_Port,0xF0);
//Set to minute mode
IoWrite8(SuperIo_Data_Port,IoRead8(SuperIo_Data_Port)|0x08);
//Set to second mode
//IoWrite8(SuperIo_Data_Port,IoRead8(SuperIo_Data_Port)&0xF7);
```

Chapter 9 Instructions on driver program installation

Please refer to the disc attached to the machine for the driver program installation of this product, it will not be introduced here.

When the driver program cannot be installed normally, for example, yellow question mark, exclamation mark, etc. appear, it is recommended to install the latest patch package of the corresponding operating system or directly install the latest version of the operating system, and then install the driver program.

Chapter 10 Appendix

10.1 Analysis and solutions of common malfunctions

Common malfunctions	Possible reasons	Troubleshooting or avoiding mistakes
The device is not operating	No power supply	Please check the power supply and the power cable / connector.
	Improper device operating environment conditions	1. Check the environment conditions; 2. Please wait for about 12 hours before powering on the device shipped in cold weather.
The external display is black	The display has not been turned on	Turn on the display
	The display is under “power saving” mode	Press any key on the keyboard
	The luminance control is set to “Black”	Increase the screen luminance by luminance control. Please refer to the instructions of the display for detailed information.
	The power cable or display cable is not connected	1. Please check whether the power cable is correctly connected to the display, system unit or the grounded port. 2. Please check whether the display cable is correctly connected to the system unit and display. 3. Contact technique support if the screen remains black after implementing the above measures.
No system disk can be found when powering on	The HDD power cable or data cable is not connected well	Check whether the power cable and the data cable of the hard disk (it must be installed with operating system and be bootable) are well connected
	System files on the hard disk are damaged	Enter the system (usually Winpe system) with a bootable disk; Check whether the system in the hard disk is damaged. Reinstall the system if necessary.
Plug and play I/O card, no I/O card is detected or can be used when used again	Poor contact of the slot	Poor contact is usually caused by frequent installation / un-installation of the PCI or ISA card, unstable fixing, or improper dust-proof measures; Please remove and install the card for a few times or use another slot.
Incorrect time or date on the device	Incorrect BIOS settings	Follow the power-on prompt and press the key to enter the BIOS Setup; Adjust the time and date in BIOS Setup.
BIOS settings are correct while the time and date are incorrect	Insufficient backup battery capacity	Replace the battery
The computer is not booted or displays “Boot device not found”	In the booting priority of the BIOS settings, the device is not the first priority or the device is not included in the booting devices.	Modify the booting priority of the device in the Boot menu of BIOS settings, or include that device into the booting priority
USB device has no response	USB 2.0 device is connected, however USB 2.0 is disabled.	Enable USB 2.0
	USB port is not supported by the operating system.	1. Enable USB Legacy Support for the mouse and keyboard (Legacy USB is supported) 2. For other devices, appropriate USB drivers for the operating system are required.