User's Manual

KGEC-6310

Ver.: A0.1

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Version Note

No.	Ver.	Note	Date	Writer
1	A0.1	first publish	20201022	Echo Guo

Copyright

Product Warranty (2 years)

JHC warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for 2 years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by JHC, or which have been subject to misuse, abuse, accident or improper installation.

JHC assumes no liability under the terms of this warranty as a consequence of such events.

Because of JHC.s high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If a JHC product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, JHC products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from JHC. Please contact your local supplier for ordering information. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

Step 1. Visit the JHC web site at www.jhctech.com.cn where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or JHC's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

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CHAPTER 1

General Information

1.1 Introduction

The KGEC-6310 is a new edge controller by JHC, and the mainboard and sub-board are designed with an all-in-one architecture without connection. The KGEC-6310 is equipped with Intel® Whiskey lake-U CPU, support for 2* DDR4 2400Mhz, up to 32GB, and the 9th generation Intel® UHD Graphics.

The KGEC-6310 provides rich IO interfaces, including 1*HDMI, 1*DVI-D, 4*LAN, 2*USB3.1，2*USB2.0, 2*COM, 1*8-bit DIO. A variety of expansion options, 1*Mini PCIe with PCIe X1+USB signal, with dual SIM card slot, support for dual 4G LTE/Wifi/BT/GPS; 1*M.2 E-Key 2230 with PCIe X1+USB2.0 signal for extending the Wifi/BT module. 1*2.5" HDD SATA bay, 1* full mSATA (SATA+USB) for storage. DC 12~24V wide power input, support wall mounting and Din-Rail mounting. Adopt active and passive cooling design, fan wind speed can be intelligently controlled. BIOS optimized and support real-time system, Ubantu Preemt-RT, optional support INTime. The extension module and the host are designed with easy disassembly, and the extension quantity is flexible. Different extension modules can be selected for different application scenarios, which are very suitable for Machine Vision, CNC control, Motion control and so on.

1.2 Features

- Intel® Whiskey lake-U CPU
- CPU active and passive cooling design
- Intelligent temperature control fan, silent and dustproof
- DVI-D/HDMI the display signal can be extended without attenuation
- 3* I210 AT network chips, Optional support for a variety of real-time industrial Ethernet protocols
- 1*I219LM support to iAMT12.0
- BIOS optimization and support high real-time system INTime and Ubantu preemt-RT
- 1*Mini PCIe with SIM slot，1*M.2 2230 E-Key
- Support software development platform (optional)
- DC 12~24V, Wide power supply
- Support wall mounting and Din-Rail mounting

Model No. / Specification	KGEC-6310-S001	KGEC-6310-S002	KGEC-6310-S003	KGEC-6310-S004
CPU	Intel® Core I3-8145U	Intel® Core I5-8265U	Intel® Core I7-8565U	Intel® Celeron 4305U
Mermory	2*DDR4 Up to 32GB	2*DDR4 Up to 32GB	2*DDR4 Up to 32GB	2*DDR4 Up to 32GB
LAN	4	4	4	4
USB3.1	2	2	2	2
USB2.0	2	2	2	2
COM	2	2	2	2
DIO	8-bit DIO	8-bit DIO	8-bit DIO	8-bit DIO
HDMI	1	1	1	1
DVI-D	1	1	1	1
Mini PCIe	1	1	1	1
M.2	1	1	1	1
mSATA	1	1	1	1
2.5" SATA3.0	1	1	1	1
Power input	DC 12-24V	DC 12-24V	DC 12-24V	DC 12-24V

Table 1.1: Features

1.3 Specifications

1.3.1 General

CPU: Intel® Whiskey lake-U CPU

System Memory: 2*DDR4, 2400MHz, up to 32GB

Watchdog Timer: 255-level interval timer, setup by software

USB: 2*USB3.1, Type A, 2*USB2.0 Type A

Serial Ports: 2*RS232/422/485 with TVS isolated (DB9)

DIO： 8-bit isolated (1*10pin phonenix)

Expansion Interface:

1*Mini PCIe with PCIe X1+USB signal, 1*SIM slot, support 1*4G/LTE/Wifi/BT/GPS

1*M.2 E-key 2230 with PCIe X1+USB2.0 signal

Storage:

1*2.5" HDD/SSD bay,

1*mSATA (SATA+USB)

1.3.2 Display

Chipset: Intel Gen. 9th Intel UHD Graphics

Display Memory: Shared system memory

Resolution: HDMI： max. res. 4096*2160@60Hz, DVI-D: max. res. 2560x1600@60Hz

1.3.3 Ethernet

Chipset: 3*Intel I210AT PCIe Gig. Ethernet,1*Intel I219LM PCIe Gig.Ethernet

Speed: 10/100/1000 Mbps

Interface: 4*RJ45

1.3.4 Power Consumption

Input Voltage:

DC 12-24V，2*2-pin Phoenix

Power Consumption: TDP（12V/2.64 A I3-8145U 4GB ）

Power Adapter: AC/DC power adapter, DC12V/5A 60W

1.4 Environmental Specifications

Operating temperature: -20～60℃

Relative humidity: 10~90% @ 40°C (non-condensing)

Storage temperature: -40 ~ 85°C (-40 ~ 185°F)

Vibration loading during operation:

5grms/5~500Hz/random/in working (SSD); 1grms/5~500Hz/random/in working (HDD)

Shock during operation:

50g peak acceleration(11ms duration)(SSD); 20g peak acceleration(11ms duration)(HDD）

EMC/ Certification: CE/FCC Class B

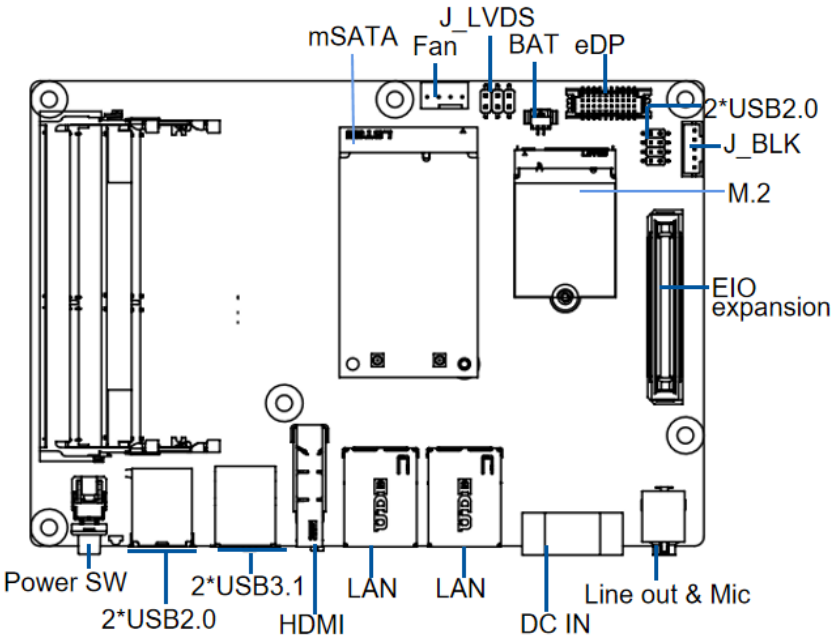
1.5 Order information

Model No.	CPU	Introduction
KGEC-6310/S001	Intel® Core I3-8145U	Edge controller, Dual-ch DDR4 2*SO-DIMM, 4*LAN, 2*USB3.1, 2*USB2.0, 2*COM,8-bit DIO, 1*Mini PCIe, 1*M.2, 1*DVI-D, 1*HDMI, 1*mSATA, 1*2.5" SATA3.0, DC 12~24V
KGEC-6310/S002	Intel® Core I5-8265U	Edge controller, Dual-ch DDR4 2*SO-DIMM, 4*LAN, 2*USB3.1, 2*USB2.0, 2*COM,8-bit DIO, 1*Mini PCIe, 1*M.2, 1*DVI-D, 1*HDMI, 1*mSATA, 1*2.5" SATA3.0, DC 12~24V
KGEC-6310/S003	Intel® Core I7-8565U	Edge controller, Dual-ch DDR4 2*SO-DIMM, 4*LAN, 2*USB3.1, 2*USB2.0, 2*COM,8-bit DIO, 1*Mini PCIe, 1*M.2, 1*DVI-D, 1*HDMI, 1*mSATA, 1*2.5" SATA3.0, DC 12~24V
KGEC-6310/S004	Intel® Celeron 4305U	Edge controller, Dual-ch DDR4 2*SO-DIMM, 4*LAN, 2*USB3.1, 2*USB2.0, 2*COM,8-bit DIO, 1*Mini PCIe, 1*M.2, 1*DVI-D, 1*HDMI, 1*mSATA, 1*2.5" SATA3.0, DC 12~24V
PA-60DC12	AC/DC adapter,DC 12V/5A 60W	

1.6 Mechanical Specifications

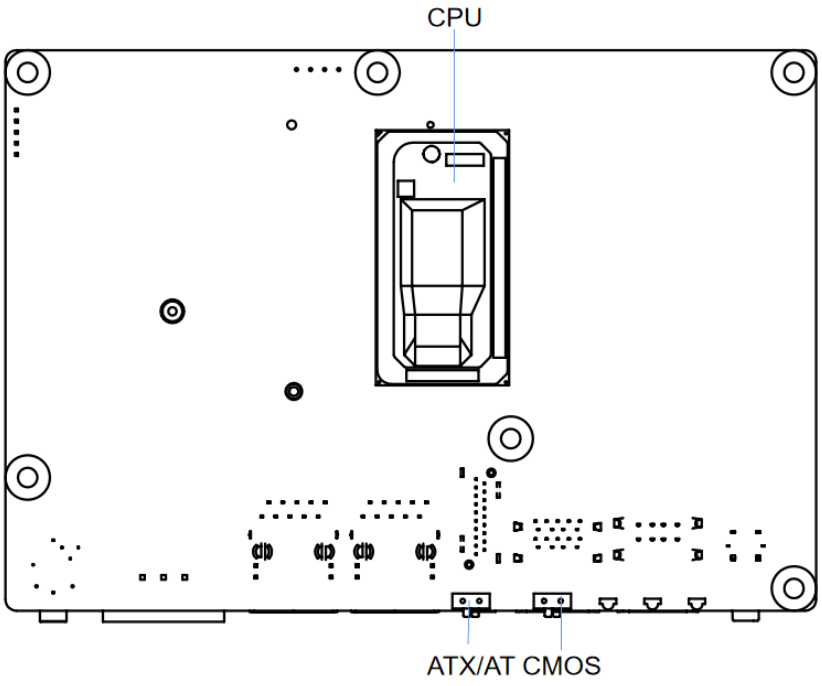
The KGEC-6310 edge controller is assembled by the splice of The OSBC (single-board computer ECM-I909) and the Sub-card (ECB-256) of JHC, and installed in the universal aluminum rectangular profile housing.

ECM-I909 Front



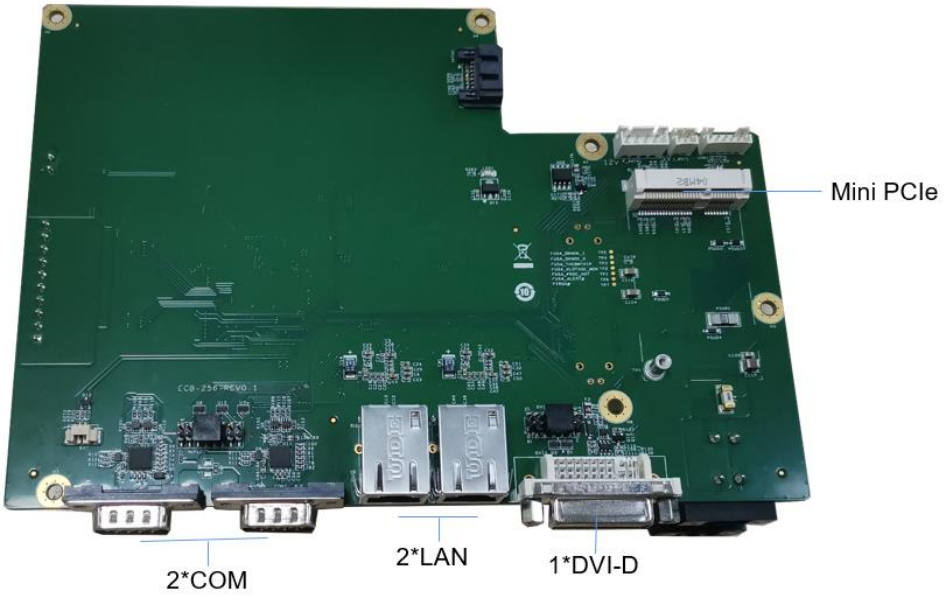
Picture 1.1: ECB-I909 Front

ECM-I909 Rear



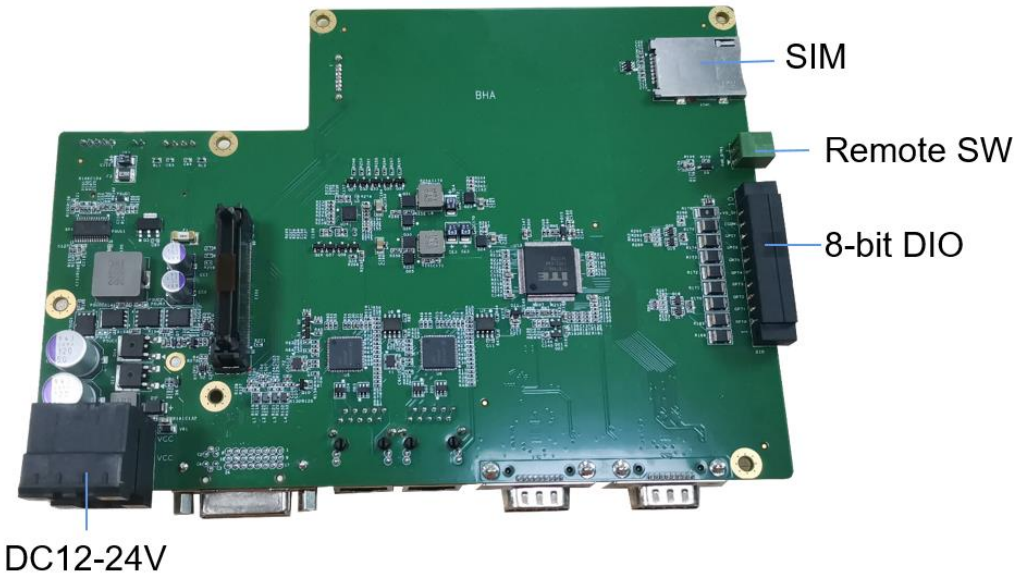
Picture 1.2: ECB-I909 Rear

ECB-256 Front



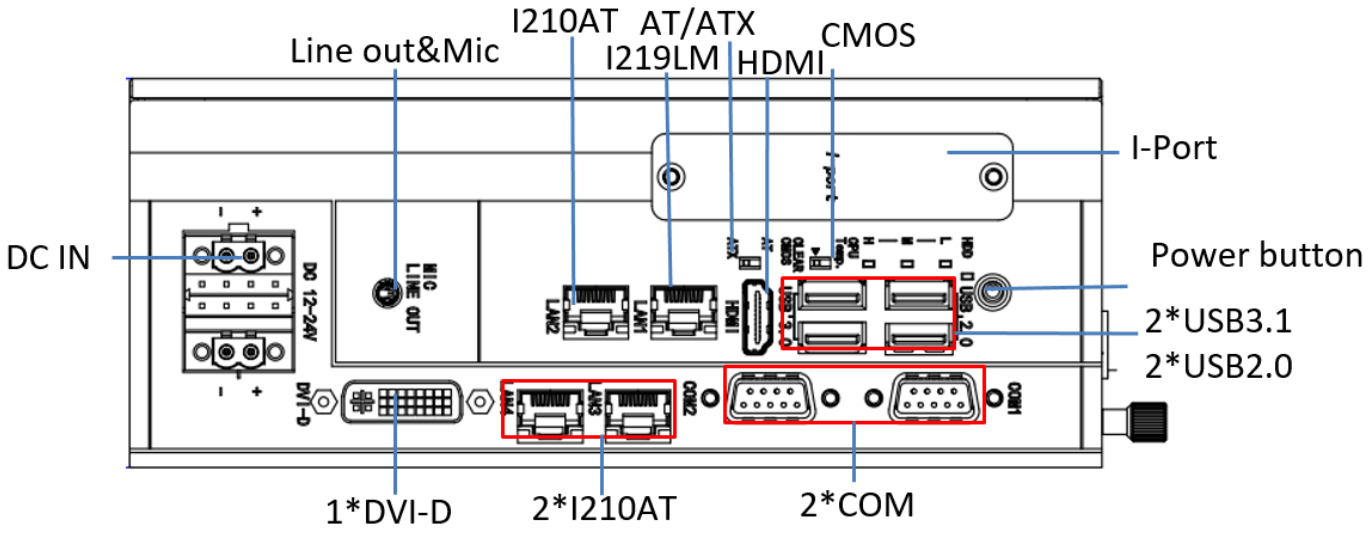
Picture 1.3: ECB-256 front

ECB-256 Rear



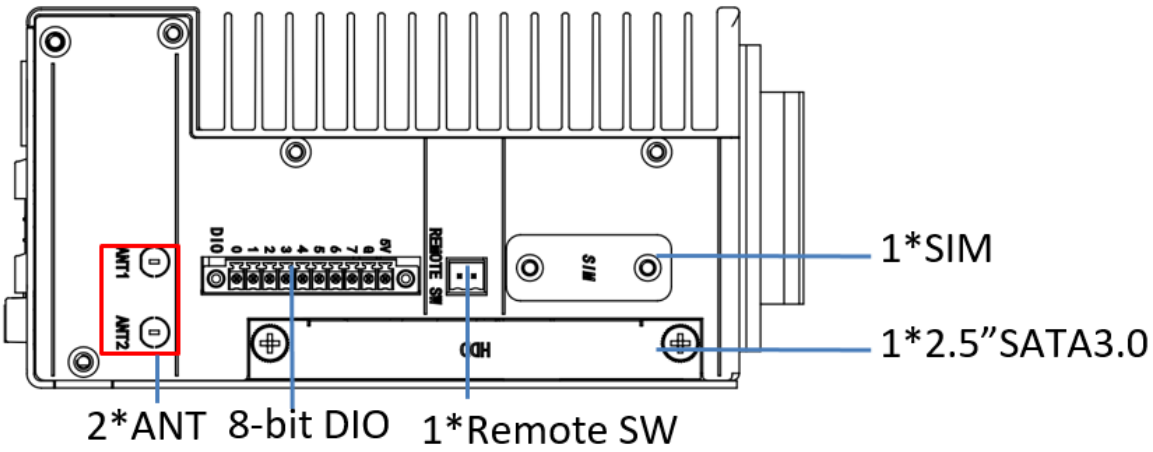
Picture 1.4: ECB-256 rear

KGEC-6310 Front Panel



Picture 1.5: KGEC-6310 Front Panel

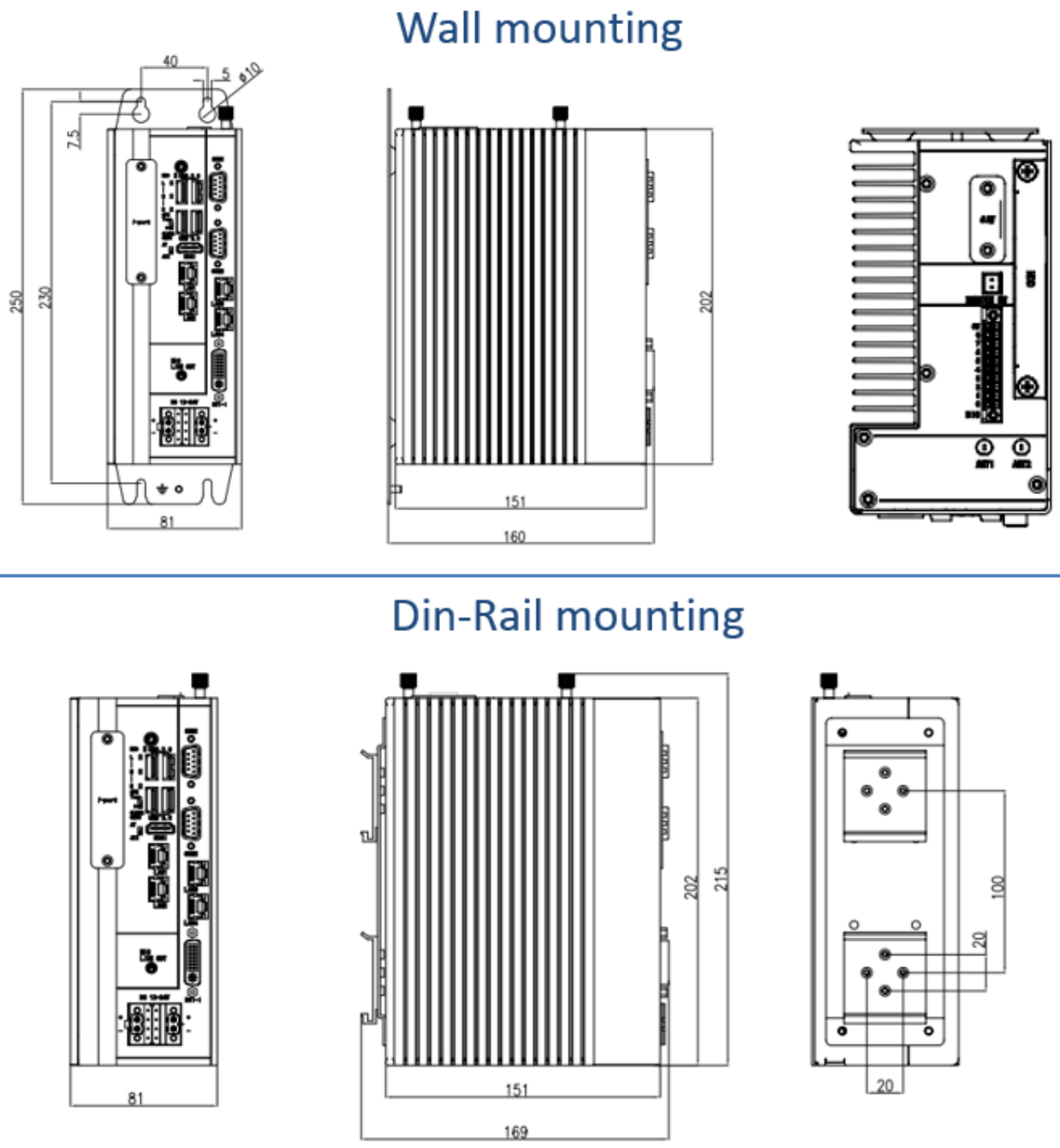
KGEC-6310 Rear Panel



Picture 1.6: KGEC-6310 Rear Panel

KGEC-6310 Dimension:

Unit: mm



Picture 1.7 KGEC-6310 Dimension

CHAPTER 2

Hardware Installation

2.1 Introduction

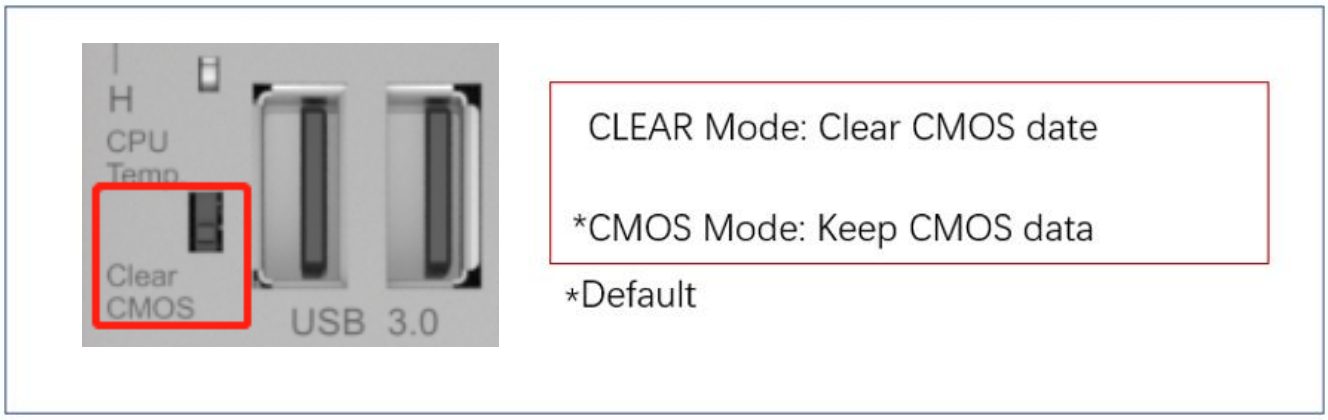
The following sections show the internal switch settings and the external connectors and pin assignments for applications.

2.2 Switches

The KGEC-6310 edge controller has a number of switches inside the chassis that allows you to configure your system to suit your application. The table below shows the function of each of the board's switches:

Switcher	Name	Description
CLEAR/CMOS	Clear CMOS Data Setting	3-Pin switch
AT/ATX	Set Power-on mode at AT or ATX	3-Pin switch

2.2.1 CLEAR/COMS -Clear CMOS Data



Picture 2.1: CLEAR/COMS

If you encounter the followings

a) CMOS data becomes corrupted.

b) You forget the supervisor or user password.

You can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

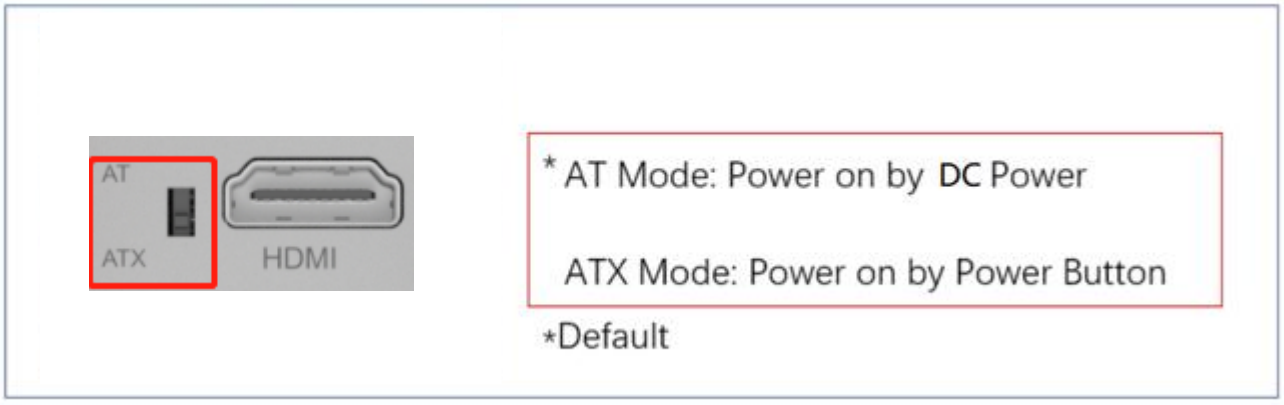
1. Power-off the system and unplug the power cord.

2. Dial the dip switch to CLEAR mode, stay for 5~6 seconds, and then revert to CMOS mode;

4. Power-On the computer, press the Del key to enter the BIOS setting and reload the optimal default value;

5. Save and exit the Settings.

2.2.2 AT/ATX Power on mode selection

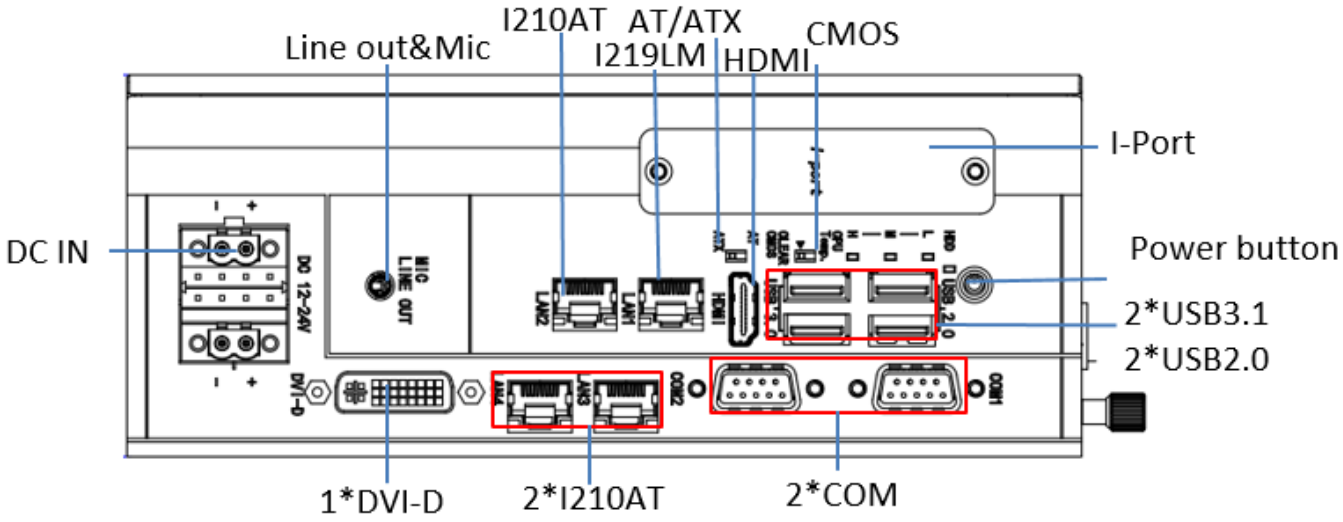


Picture 2.2: AT/ATX

The KGEC-6310 provides an AT/ATX SW, which users can set Power-on mode by it. When you dial it at AT, it means power on by AC Power; When you dial it at ATX, it means power on by Power button.

2.3 I/O/Button/LED Indication

KGEC-6310 Front：



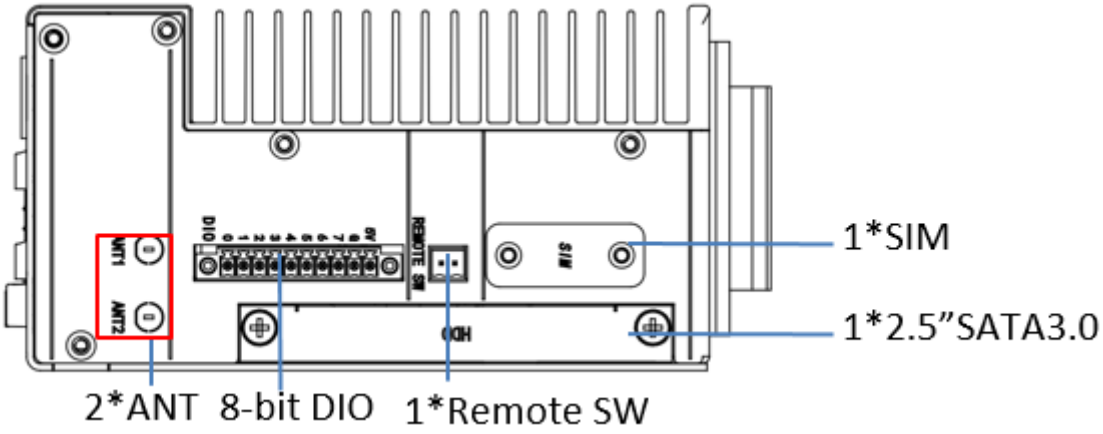
Picture 2.3: KGEC-6310 Front

The front panel contains the I/O interface：

- 1*DC-in Power: 2*2pin phoenix DC12~24V
- 2*USB3.1 Type A, 2*USB2.0 Type A
- 1*HDMI,1*DVI-D
- 4*LAN:RJ45

- 2*COM: DB9
- 8-bit DIO: 1*10Pin DIO
- Line out &Mic

KGEC-6310 Rear：



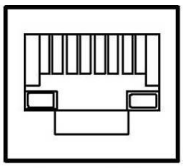
Picture 2.4: KGEC-6310 Rear

The rear panel contains the I/O interface：

- 1*2.5" SATA bay
- 1*8-bit DIO
- 1*Remote SW
- 1*SIM
- 2*ANT

2.3.1 Ethernet Connector

The KGEC-6310 is equipped with 3*Intel® I210AT, 1*Intel® I219LM supporting 10/100/1000Mbps rate adaptive. The Ethernet provides the standard RJ-45 interface. Table 2.1 provides a detailed description of pin assignment.



Picture 2.5: LAN

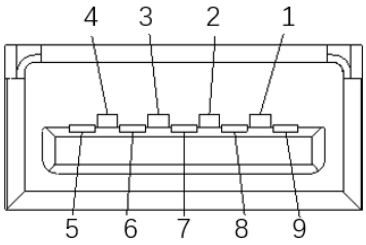
Tabel 2.1: LAN Connector Pin Assignments

PIn	10/100/1000BaseT Signal	Pin	10/100/1000BaseT Signal
1	TX+(10/100), LAN_DA+(GHz)	5	LAN_DC-(GHz)
2	TX-(10/100), LAN_DA-(GHz)	6	RX-(10/100), LAN_DB-(GHz)
3	RX+(10/100), LAN_DB+(GHz)	7	LAN_DD-(GHz)
4	LAN_DC+(GHz)	8	LAN_DD-(GHz)

2.3.2 USB

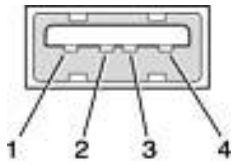
The USB device allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The KGEC-6310 provides 2*USB3.1, 2*USB2.0. The USB interface can be disabled in the system BIOS setup. Table 2.2 for USB3.1 pin assignments.



Picture 2.6: USB3.1

Table 2.2: USB3.1 Pin Assignments			
Pin	Signal	Pin	Signal
1	VBUS	6	StdA_SSRX+
2	D-	7	GND_DRAIN
3	D+	8	StdA_SAXM-
4	GND	9	StdA_SAXM+
5	StdA_SSRX-	Shell	Shield



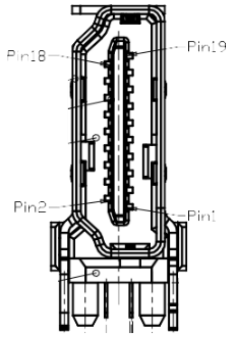
Picture 2.7: USB2.0

Table 2.3 for USB2.0 pin assignments.

Table 2.3: USB2.0 Pin Assignments			
Pin	Signal	Pin	Signal
1	USB_VCC	2	USB_D-
3	USB_D+	4	USB_GND

2.3.3 HDMI

The KGEC-6310 provides a high-resolution DP display port. They can support the most resolution up to 4096*2304@60Hz. Table 2.4 for HDMI pin assignments.

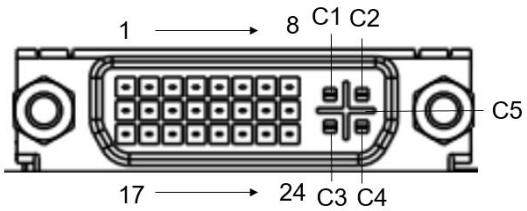


Picture 2.8: HDMI

Table 2.4: HDMI Pin Assignments					
Pin	Signal	Pin	Signal	Pin	Signal
1	DATA2_P	8	GND	15	SCL
2	GND	9	DATA0_N	16	SDA
3	DATA2_N	10	CLK_P	17	GND
4	DATA1_P	11	GND	18	VCC
5	GND	12	CLK_N	19	DETECT
6	DATA1_N	13	NC		
7	DATA0_P	14	NC		

2.3.4 DVI-D

The KGEC-6310 provides a DVI-D display port. The DVI-D can support the most resolution up to 2560x1600@60Hz, Table 2.5 for DVI-D pin assignments.



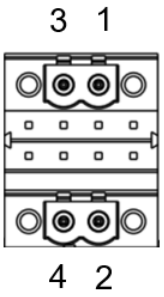
Picture 2.9: DVI-D

Table 2.5: DVI-D Pin Assignments			
Pin	Signal	Pin	Signal
1	CPU_TMDS_TN2_C	2	CPU_TMDS_TP2_C
3	GND	4	NC

5	NC	6	DDC_CPU_CLK_L
7	DDC_CPU_DATA_L	8	NC
9	CPU_TMDS_TN1_C	10	CPU_TMDS_TP1_C
11	GND	12	NC
13	NC	14	+5VS_HDMI_I3
15	GND	16	HDMI_HPD3
17	CPU_TMDS_TN0_C	18	CPU_TMDS_TP0_C
19	GND	20	NC
21	NC	22	GND
23	CPU_TMDS_CLKP_C	24	CPU_TMDS_CLKN_C
C1	NC	C2	NC
C3	NC	C4	GND
C5	GND		

2.3.5 Power input

The KGEC-6310 provides a 2*2Pin Phoenix for DC 12-24V power input. The power input use a double-layer power socket, and the upper and lower layers can be used as power input or output separately, and it is also connected in parallel with the built-in DC_OUT circuit. Table 2.6 for DC-IN pin assignments.

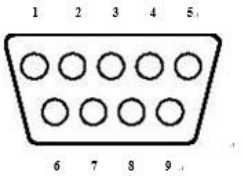


Picture 2.10: DC-IN

Table 2.6: DC12-24V Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	DC_12V	4	DC_12V

2.3.6 COM

The KGEC-6310 provides 2*COM through the 2* d-sub 9-pin connector. COM1/2 can be configured as RS232/422/485, Table 2.1 for COM pin assignments.



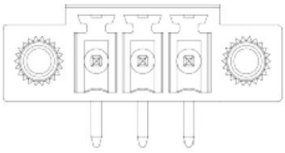
Picture 2.11: COM

Table 2.7: COM1/COM2 Pin Assignments

Pin	RS-232 signal	RS-422 signal	RS-485 signal
1	DCD	TX-	DATA-
2	RxD	TX+	DATA+
3	TxD	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.3.7 DIO

KGEC-6310 provides a 8-bit DIO port through the 1*10Pin phoenix connector. The DIO can be configured by setting the BIOS. Table 2.8 for DIO pin assignments.



Picture 2.12: DIO

Table 2.8: DIO Pin Assignments

Pin	Signal	Pin	Signal
1	GP0	2	GP1
3	GP3	4	GP4
5	GP5	6	GP6
7	GP7	8	GP8
9	GND	10	VCC_ISO

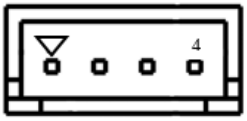
2.3.8 SATA

The KGEC-6310 provides a standard SATA3.0 interface with a data transfer rate up to 6Gb/s for connecting SATA devices. Table 2.9 for SATA pin assignments.

Picture 2.13: SATA

Table 2.9： SATA1 Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

2.3.9 SATA Power

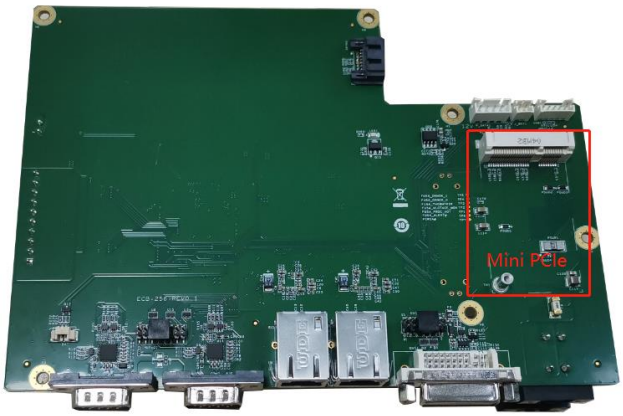


Picture 2.14: SATA Power

Table 2.10: SATA Power Pin Assignments			
Pin	Signal	Pin	Signal
1	5V	3	GND
2	GND	4	12V

2.3.10 Mini PCIe

The KGEC-6310 provides 1*Mini PCIe interface, with PCIe X1+USB signal, with SIM card slot, support for 4G LTE/Wifi/BT/GPS. The Mini PCIe interface definition is shown in table 2.11.

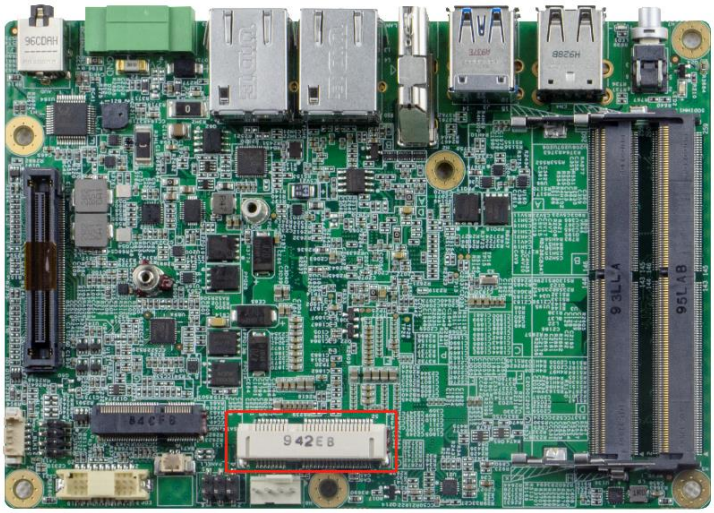


Picture 2.15: Mini PCIe

Table 2.11: Mini-PCIe Pin Assignments			
Pin	Signal	Pin	Signal
1	PCIe_WAKE	2	+V3.3
3	NC	4	GND
5	NC	6	+V1.5
7	+V3.3_MINICARD2	8	SIM1_PWR
9	GND	10	SIM1_DATA
11	CLK_MIO3_PCIE-	12	SIM1_CLK
13	CLK_MIO3_PCIE+	14	SIM1_RESET
15	GND	16	SIM1_VPP
17	NC	18	GND
19	NC	20	WIFI2_DISABLE#
21	GND	22	PERST
23	PCIE_MIO_RX16-	24	+V3.3_MINICARD2
25	PCIE_MIO_RX16+	26	GND
27	GND	28	+V1.5
29	GND	30	SMB_SCL_RSM
31	PCIE_MIO_TX16-	32	SMB_SDA_RSM
33	PCIE_MIO_TX16+	34	GND
35	GND	36	USB_N5
37	GND	38	USB_P5
39	+V3.3_MINICARD2	40	GND
41	+V3.3_MINICARD2	42	NC
43	GND	44	SIM1_DET
45	NC	46	NC
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	+V3.3_MINICARD2

2.3.11 mSATA

The KGEC-6310 provides a standard full- mSATA interface with SATA+USB signal for storage. Table 2.12 provides a detailed description of pin assignment.



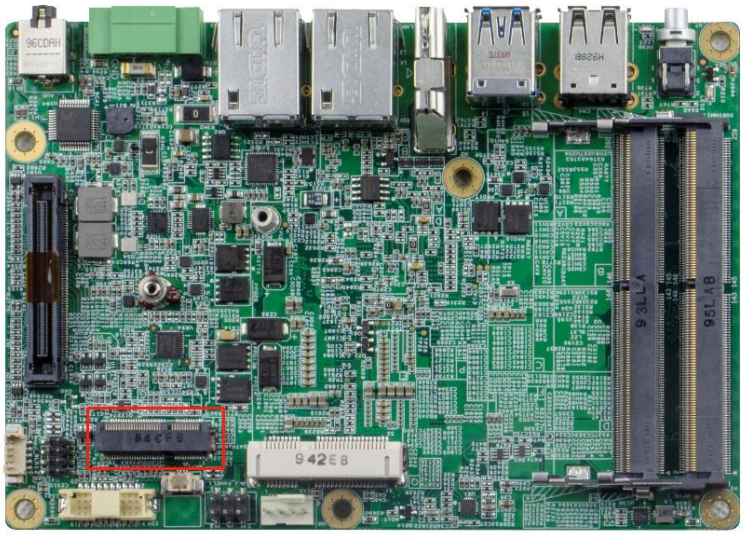
Picture 2.16: mSATA

Table 2.12: mSATA Pin Assignments			
Pin	Signal	Pin	Signal
1	NC	2	+V3.3
3	NC	4	GND
5	NC	6	+V1.5
7	NC	8	LPC_FRAME#
9	GND	10	LPC_AD3
11	NC	12	LPC_AD2
13	NC	14	LPC_AD1
15	GND	16	LPC_AD0
17	PLTRST#	18	GND
19	LPC_CLK1	20	NC
21	GND	22	PLTRST#
23	SATA1_mSATA_z_RX+	24	+V3.3
25	SATA1_mSATA_z_RX-	26	GND
27	GND	28	+V1.5
29	GND	30	SMB_SCL
31	SATA1_mSATA_z_TX-	32	SMB_SDA
33	SATA1_mSATA_z_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+V3.3	40	GND
41	+V3.3	42	NC
43	GND	44	NC

45	NC	46	NC
47	NC	48	+V1.5
49	NC	50	GND
51	NC	52	+V3.3

2.3.12 M.2

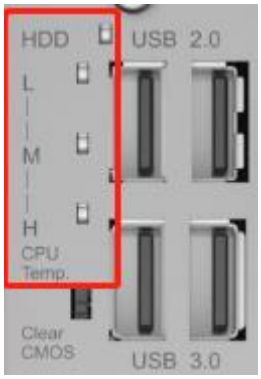
The KGEC-6310 provides 1*M.2 connector with PCIe X1+USB2.0 signal, expansion of Wifi/BT module signal, Install M.2 E-key 2230 modules such as SATA SSD module that comply to the M.2 E-key 2230 specifications into the M.2 slot.



Picture 2.17: M.2

2.3.13 LED

The KGEC panel has one power indicator, one hard disk indicator, three network connection status indicators, and three CPU operating temperature indicators. When the CPU operating temperature ≤85℃, the green light; When the CPU temperature is between 86℃ and 95℃, the yellow light is on, and when the CPU operating temperature is ≥96℃, the red light is on. If you keep the CPU running at a red light, it will affect the life of the machine.



Picture 2. 18: HDD/CPU/LAN LED

2.4 Installation

2.4.1 HDD/SSD installation

Step 1: unscrew the 2 screws on the HDD/SSD bracket of the rear panel.

Step 2: remove the HDD/SSD stent.

Step 3: load the HDD/SSD into the bracket and tighten the 4 screws on the left and right sides to fix the HDD/SSD.

Step 4: push the bracket with HDD/SSD into the slot and tighten the 2 screws on the bracket.

Picture 2.21: HDD/SSD installation（1）

Picture 2.22: HDD/SSD installation（2）

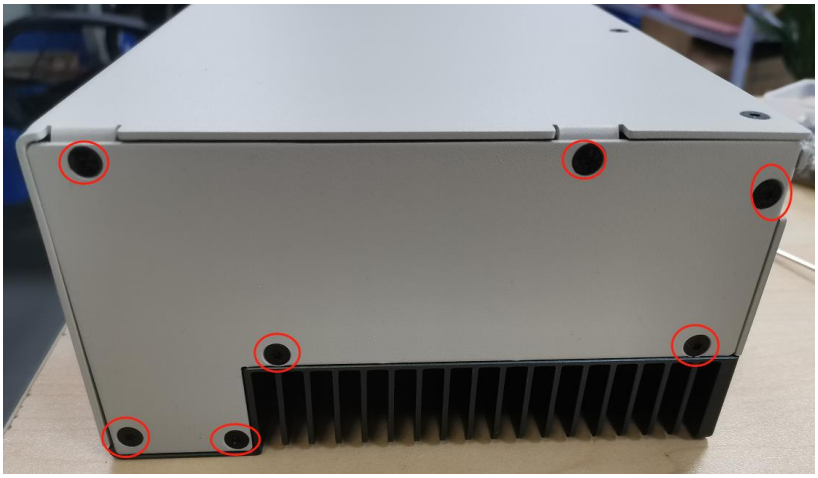
Picture 2.23: HDD/SSD installation（3）

2.4.2 Mini PCIe installation

Step 1: Unscrew the HDD bracket and 5 screws of the side plate and remove the side plate

Step 2: Unscrew the 10 screws on the side plate and bottom plate, and remove the side plate and bottom cover

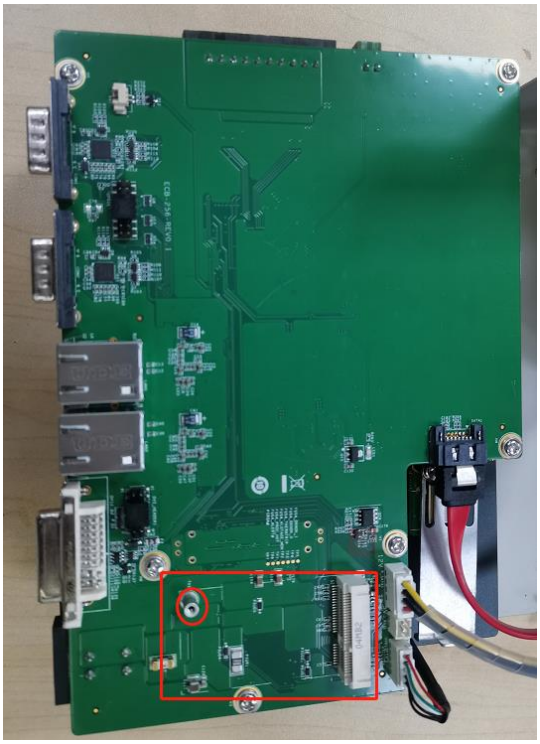
Picture 2.24: Mini PCIe installation（1）



Picture 2.25: Mini PCIe installation（2）

Picture 2.26: Mini PCIe installation（3）

Step 3: Insert the Mini PCIe module and turn the screws.



Picture 2.27: Mini PCIe installation（4）

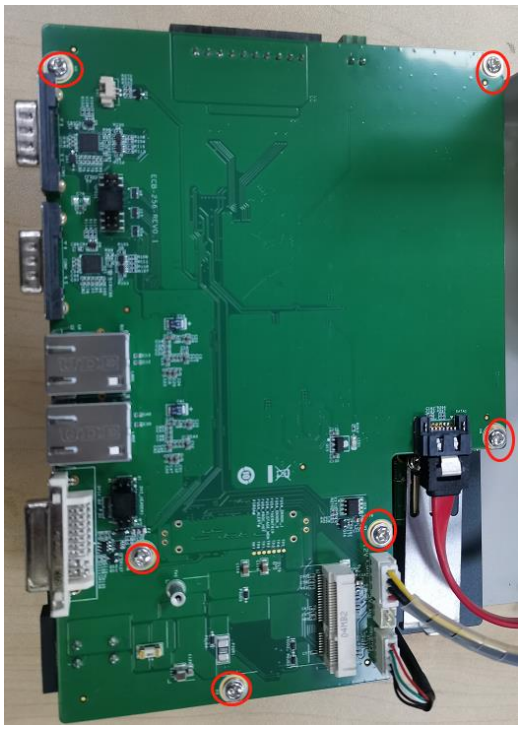
Step 4: Complete the installation of the machine in reverse steps.

2.4.3 mSATA installation

Step 1: it is consistent with Mini PCIe module installation steps. For details, please refer to "2.4.2 Mini PCIe installation- step 1".

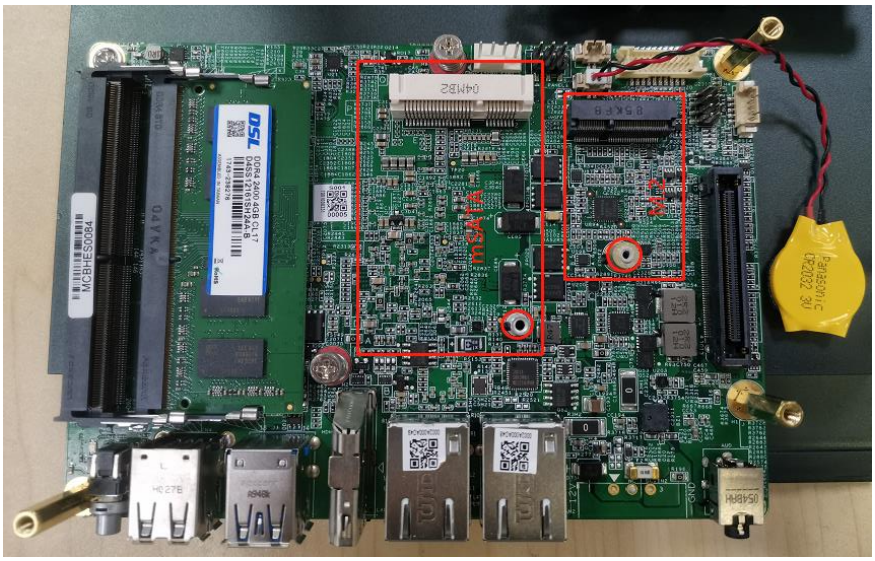
Step 2: it is consistent with Mini PCIe module installation steps. For details, please refer to "2.4.2 Mini PCIe installation- step 2".

Step 3: Unscrew the 6 screws on the ECB-256 and take out the ECB-256.



Picture 2.33: mSATA installation（1）

Step 4: Insert the mSATA module and turn the screws.



Picture 2.34: mSATA installation（2）

Step 4: Complete the installation of the machine in reverse steps.

2.4.4 M.2 module installation

Step 1: it is consistent with mSATA module installation steps. For details, please refer to "2.4.3 Mini PCIe installation".

CHAPTER 3

BIOS Setup

3.1 BIOS Description

BIOS is the communication bridge between hardware and software. How to correctly set the BIOS parameters is crucial for the system to work stably and whether the system works at its best.

This chapter describes how to change the system settings through the BIOS settings.

Note: For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS.

You need to make SETUP settings as follows:

1. An error message appears on the screen during the system self-test and asks for the SETUP setting.

2. You want to change the factory default settings based on customer characteristics.

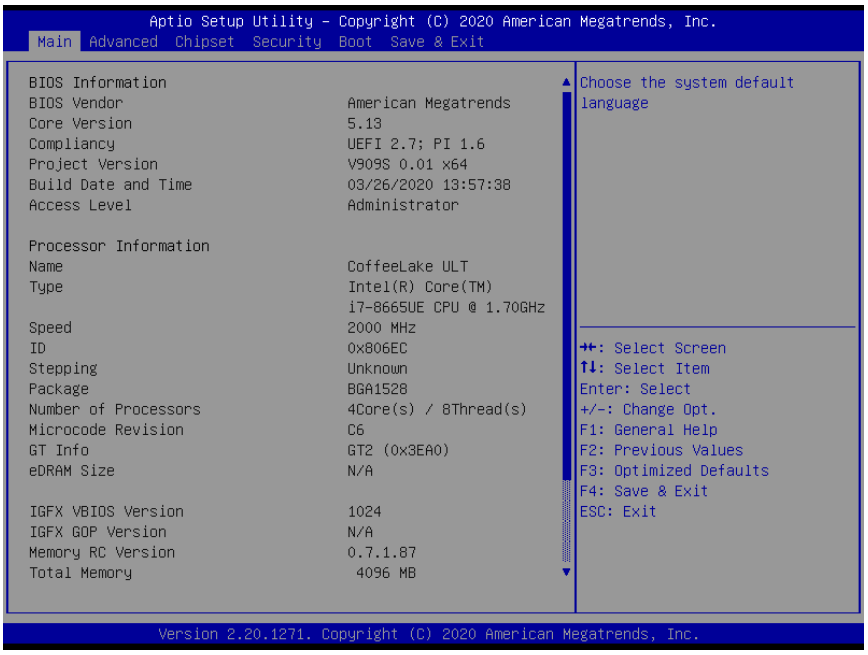
(But in general, customers are not recommended to set it up. In most cases, using the default value is already the best setting.)

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

3.1.1 Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self-Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, Press the "**DEL**" key to enter BIOS Setup Utility.



3.2 BIOS parameter settings

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ▶.

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

3.2.1 BIOS Navigation Keys

Enter the SETUP settings interface, The BIOS navigation keys are listed below:

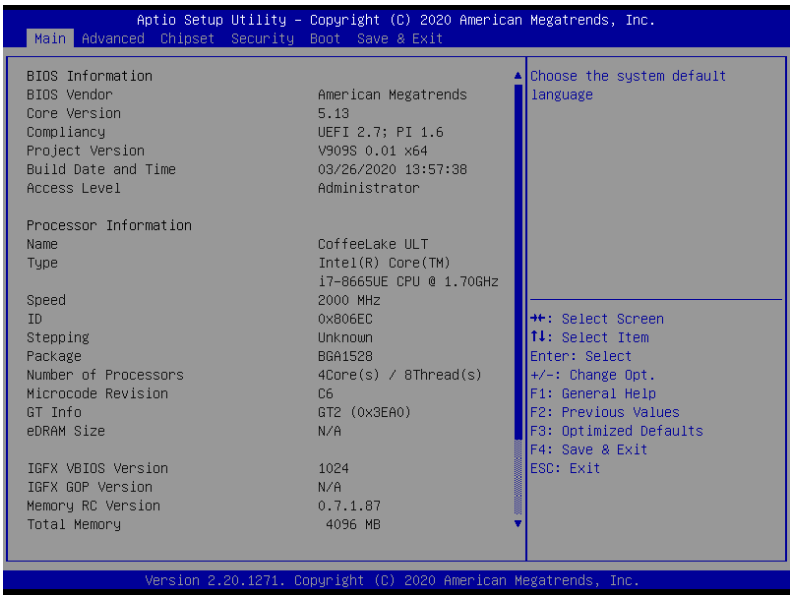
Table 3.1: The BIOS navigation keys

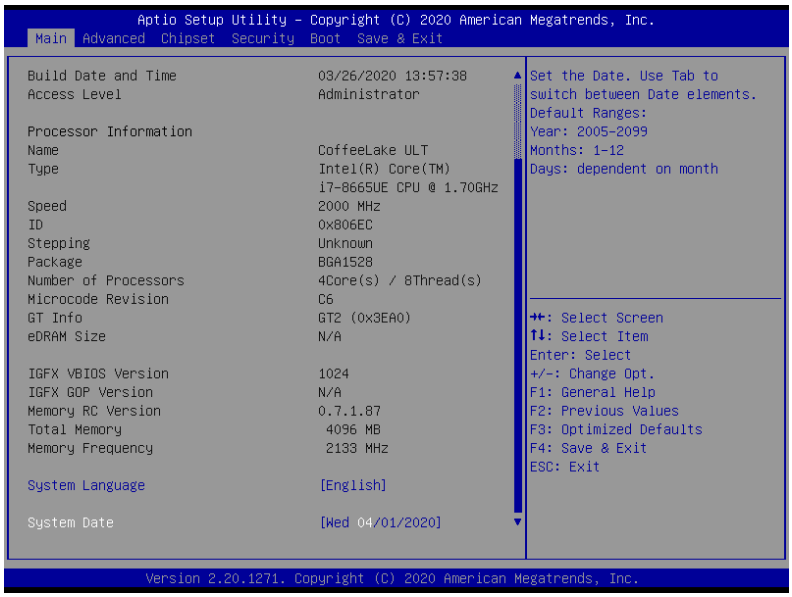
KEY	FUNCTION
ESC	Exit the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Change Opt.
Enter	Select
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit

3.2.2 Main Menu

When you enter the BIOS Setup program, the main menu appears, giving you an overview of the basic system information. Select an item and press <Enter> to display the submenu. Press <Esc> to back to the main menu.

The BIOS setup program provides a help screen. You can call up this help screen from any menu by simply pressing the <F1> key. This help screen lists the corresponding keys and possible selections. Press <Esc> to exit the help screen.





BIOS Vendor (American Megatrends)

This item shows the information of the BIOS vendor.

Core Version (5.13)

This item shows the information of the Core Version.

Project Version (V909S 0.01 X64)

This item shows the information of the motherboard Version.

Build Date and Time

This item shows the information of the BIOS build date and time

Processor Information

This item shows the basic information about the currently used processor, including name, type, speed.

IGFX VBIOS Version

This item shows the Current VBIOS version of the CPU integrated graphics.

Total Memory

This item shows the total memory size of the current motherboard.

Memory Frequency

This item shows the current memory operating frequency.

PCH Information

This item shows the basic information about PCH, including name, PCH SKU, etc.

System Language

Set the language interface of the BIOS.

System Date

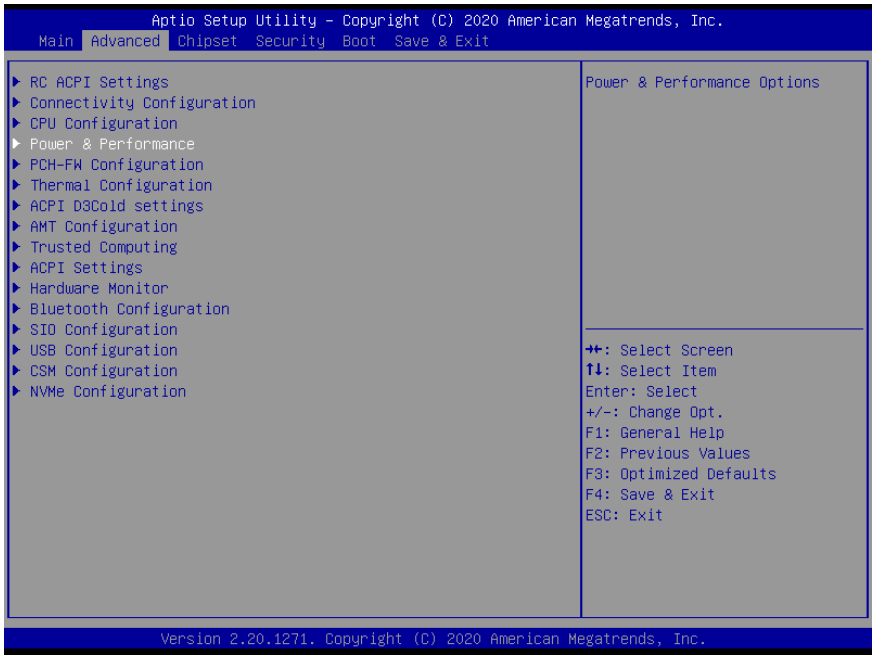
Set the date. The format of the date is <week><month><day><year>.

System Time

Set the time. The format of the time is <hour><minute><second>.

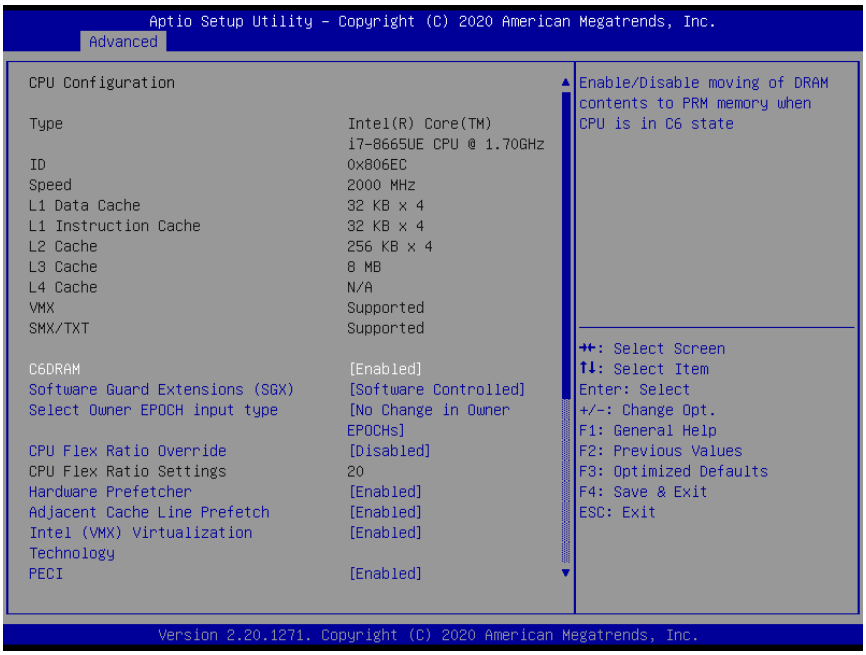
3.2.3 Advanced Menu

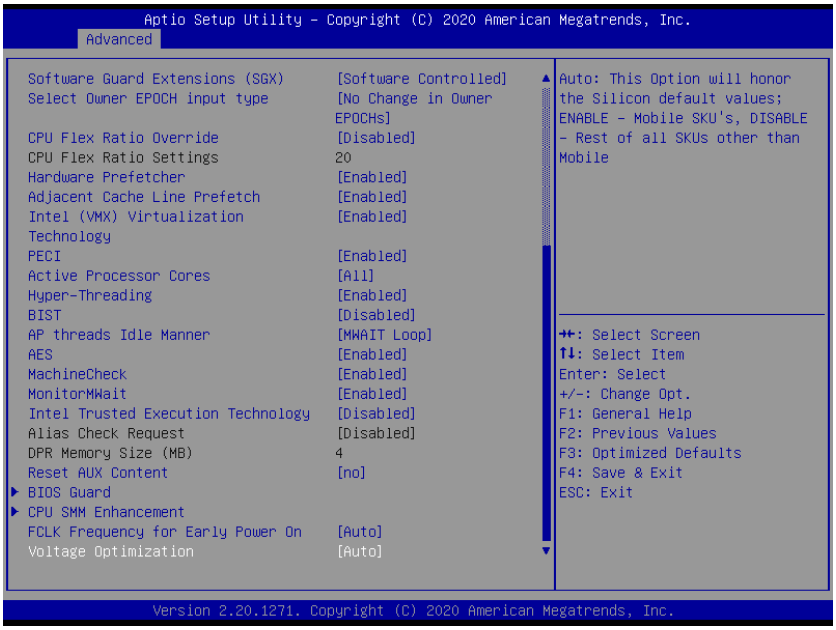
This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.



▶CPU Configuration

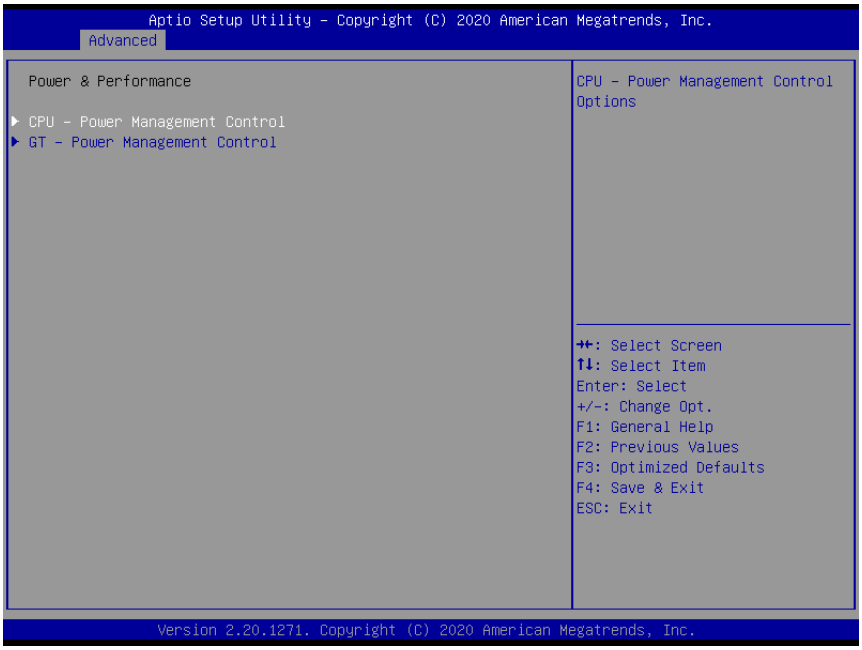
The configuration of the central processor, enter this sub-menu, there will be detailed details of the CPU, as well as various settings of the CPU.

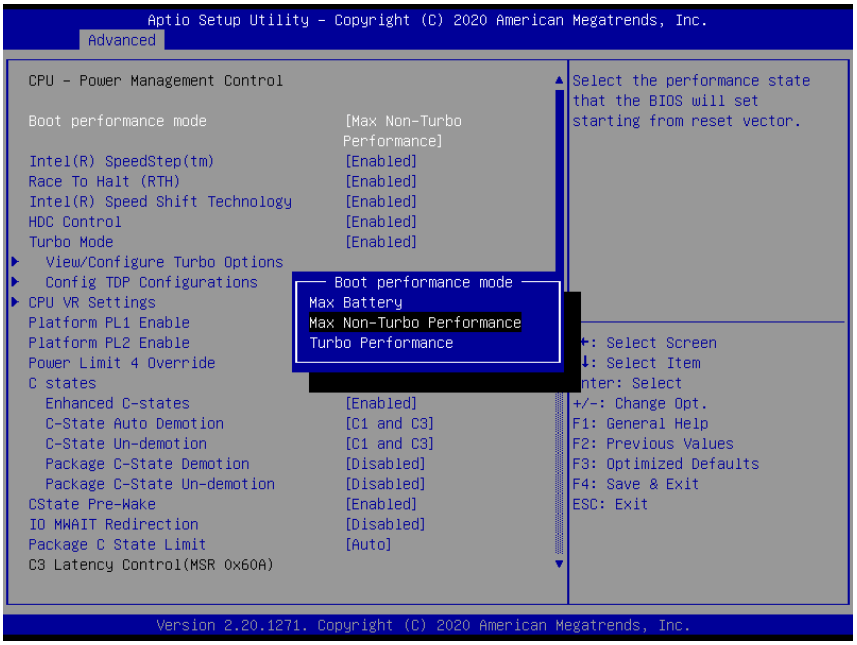


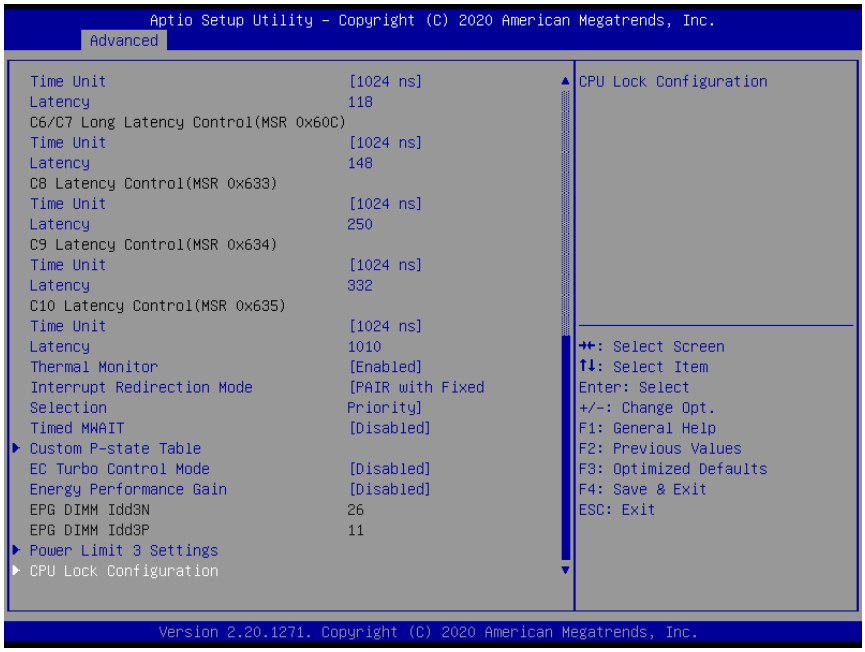


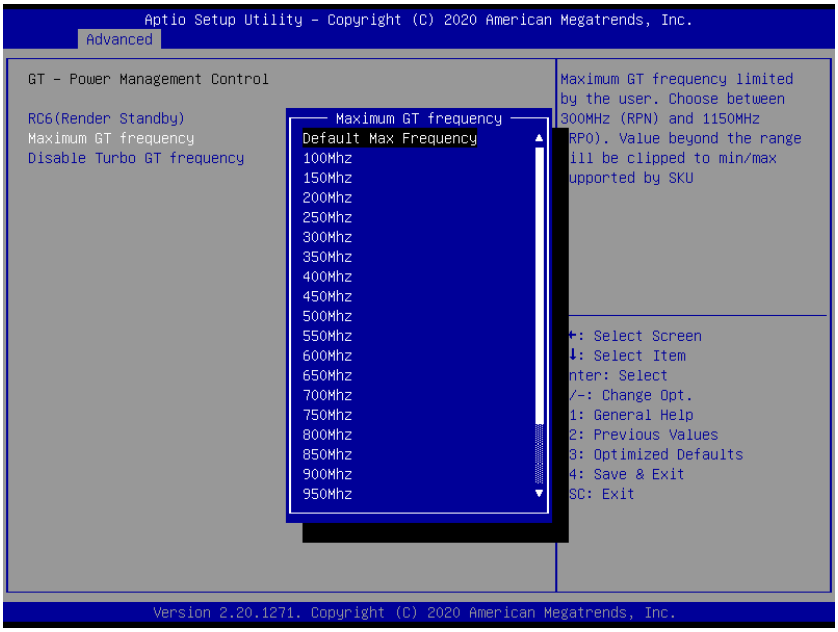
▶Power & Performance

This item in the menu shows how to set the Power Management Control of CPU and GT.


Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
Advanced
Power & Performance
CPU – Power Management Control
GT – Power Management Control
CPU – Power Management Control Options
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.

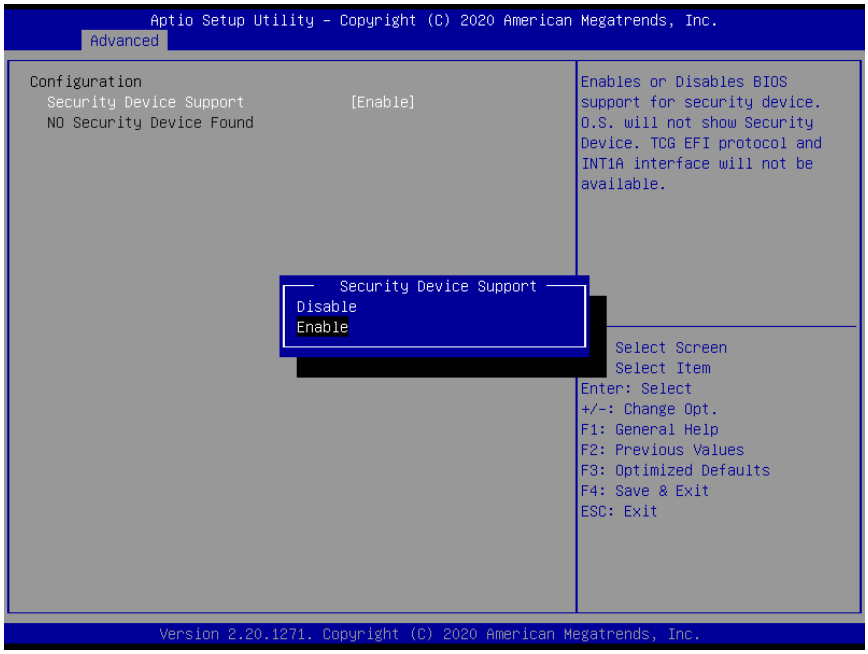

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
Advanced
CPU – Power Management Control
Boot performance mode [Max Non-Turbo Performance]
Intel(R) SpeedStep(tm) [Enabled]
Race To Halt (RTH) [Enabled]
Intel(R) Speed Shift Technology [Enabled]
HDC Control [Enabled]
Turbo Mode [Enabled]
View/Configure Turbo Options
Config TDP Configurations
CPU VR Settings
Platform PL1 Enable
Platform PL2 Enable
Power Limit 4 Override
C states
Enhanced C-states [Enabled]
C-State Auto Demotion [C1 and C3]
C-State Un-demotion [C1 and C3]
Package C-State Demotion [Disabled]
Package C-State Un-demotion [Disabled]
CState Pre-Wake [Enabled]
IO MWAIT Redirection [Disabled]
Package C State Limit [Auto]
C3 Latency Control(MSR 0x60A)
Boot performance mode
Max Battery
Max Non-Turbo Performance
Turbo Performance
Select the performance state that the BIOS will set starting from reset vector.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.20.1271. Copyright (C) 2020 American Megatrends, Inc.





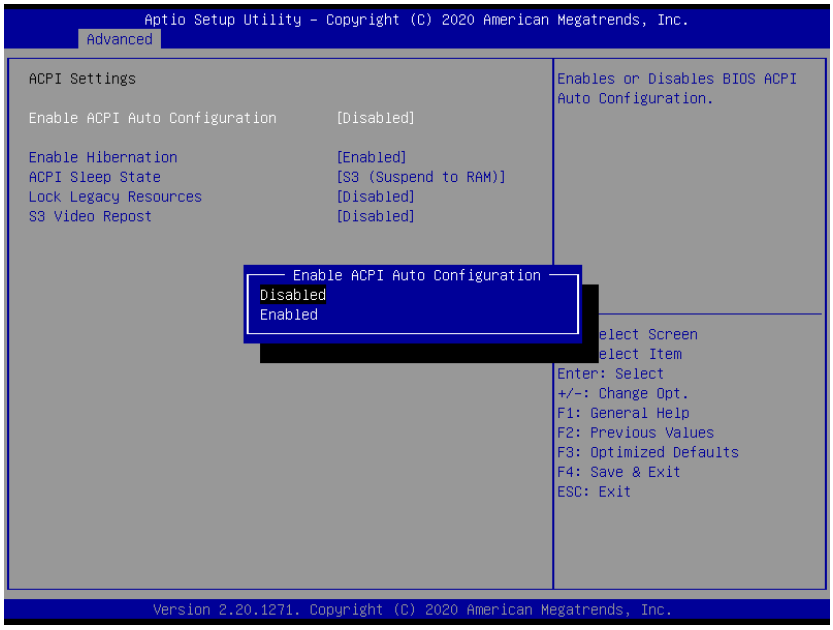
▶Trusted Computing

Trusted computing, enter this sub-menu, there will be the setting of the encryption security module (the motherboard will install the encryption module hardware will take effect)



▶ACPI Settings

Advanced configuration and power management interface settings, enter this submenu, there will be ACPI related settings.



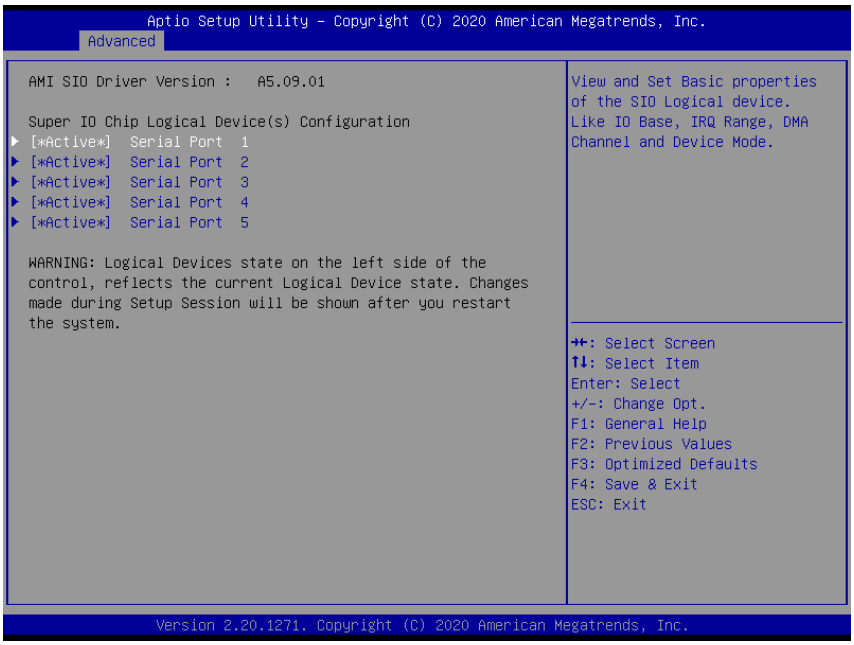
ACPI Sleep State (S3 (Suspend to RAM))

This item allows user to enter the ACPI S3 (Suspend to RAM) Sleep State (default).

Press <Esc> to return to the Advanced Menu page.

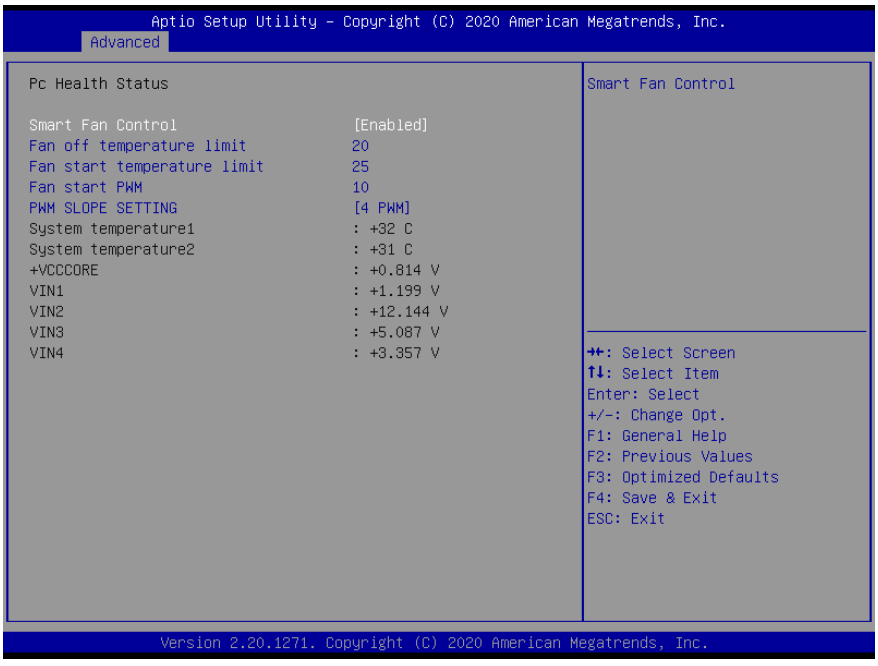
▶SIO Configuration setting

Super IO Configuration settings, enter this sub-menu, there will be set COM working mode or disabled the Serial port function.



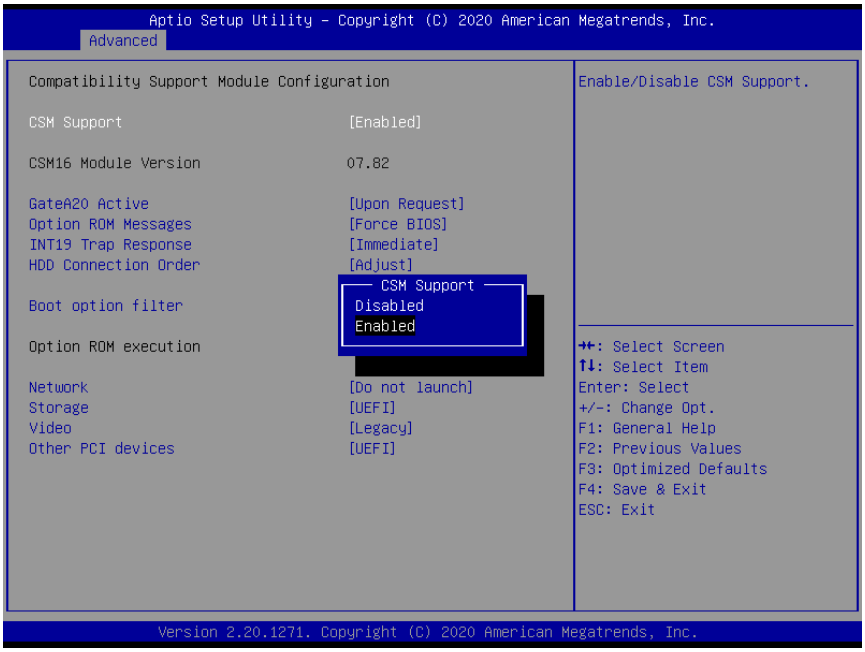
▶Hardware Monitor

Hardware monitoring, enter this sub-menu, there will be CPU temperature, System temperature, status display of each common working voltage.



▶CSM Configuration

CSM (Compatibility Support Module) configuration, enter this sub-menu, there will be various settings to support UEFI startup and non-UEFI startup. If you need to start the traditional MBR device, you need to enable CSM. Turning off the CSM turns it into a pure UEFI boot.



CSM Support

Compatibility Support Module, which is a compatibility module, is a special module of UEFI and provides compatibility support for system that do not support UEFI.

GateA20 Active

This item indicates whether to disable GA20 through the BIOS server or keep the activation status all the time.

Option ROM Messages

This item shows the display mode of option ROM Message.

Boot option filter

This item indicates the boot priority of controlling EFI or Legacy option ROM.

Network

This item is used to set the EFI network card Option ROM boot or the traditional network card Option ROM boot or priority boot.

Storage

This item is used to set the EFI storage Option ROM boot or the traditional storage Option ROM boot.

Video

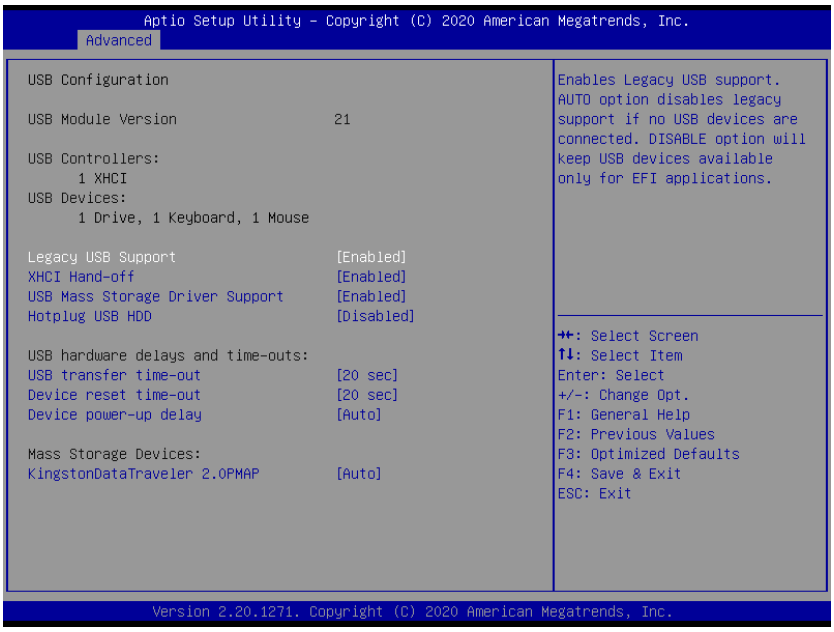
This item is used to set EFI display Option ROM startup or traditional display Option ROM startup.

Other PCI devices

This item is used to set the EFI PCI device Option ROM boot or the traditional PCI device Option ROM boot.

▶USB Configuration

USB configuration, enter this sub-menu, there will be USB-related detailed settings.



Legacy USB Support

This item is used to set the USB interface support. If you need to support USB devices under DOS, such as U disk, USB keyboard, etc., set this item to [Enabled]. Otherwise, select [Disabled].

USB Mass Storage Driver Support

USB mass storage device support switch.

USB Transfer time-out

This item Sets the timeout period for control, batch, and interrupt transmission. The default is 20 seconds.

Device reset time-out

This item sets boot command timeout of the large capacity USB disk. The default is 20 seconds.

Device power-up delay

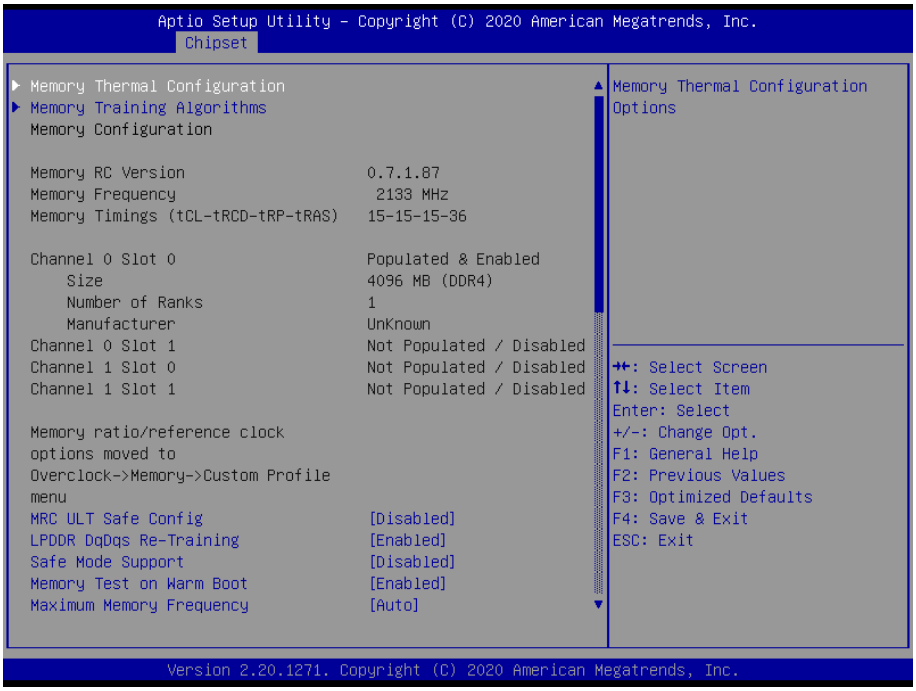
This item sets boot command delay of the large capacity USB disk. The default is Auto.

3.2.4 Chipset Menu

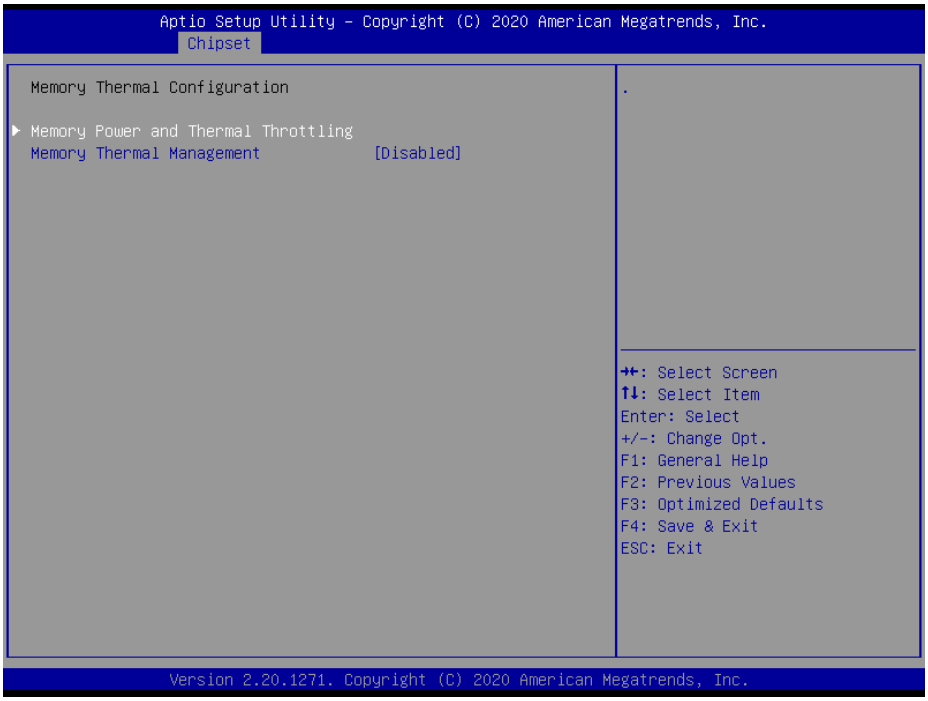
The chipset menu items allow you to change the settings for the North Bridge chipset, South Bridge chipset and other system.

▶Memory Configuration

Memory configuration, enter this submenu, there will be detailed memory information.



▶Memory Thermal Configuration



Memory Power and Thermal Throttling

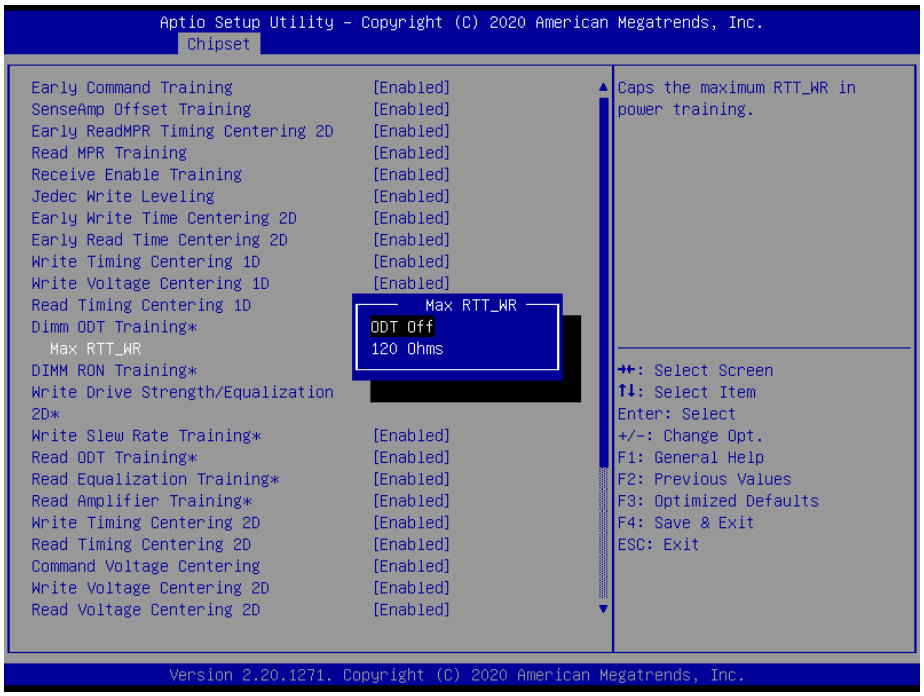
This item contains the configuration of the Memory Power and Thermal Throttling.

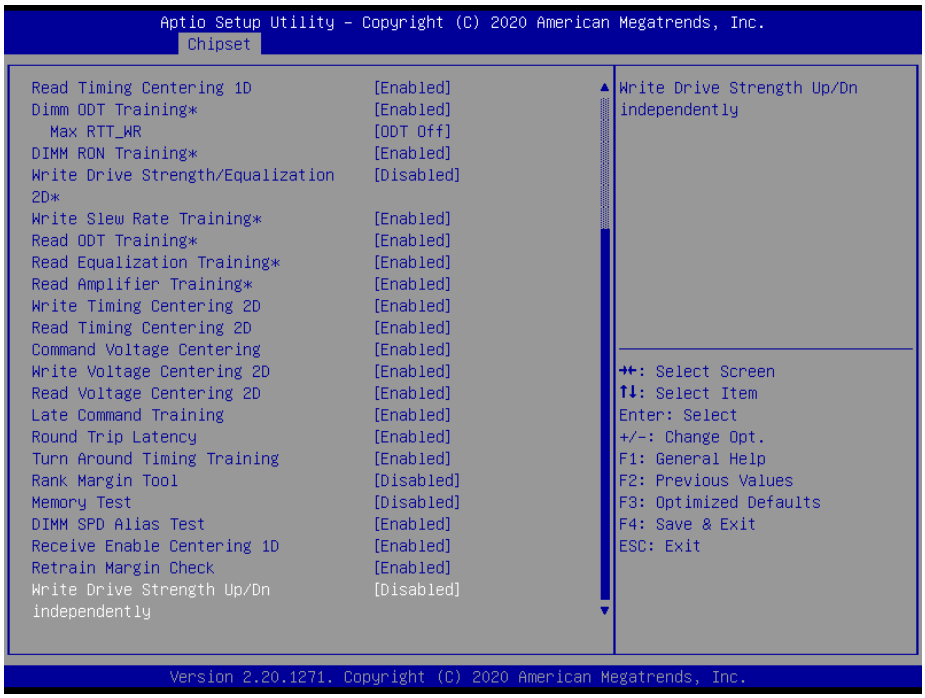
Memory Thermal Management

This item sets the Memory Thermal Management on(Enabled) or off(Disabled).

▶Memory Training Algorithms

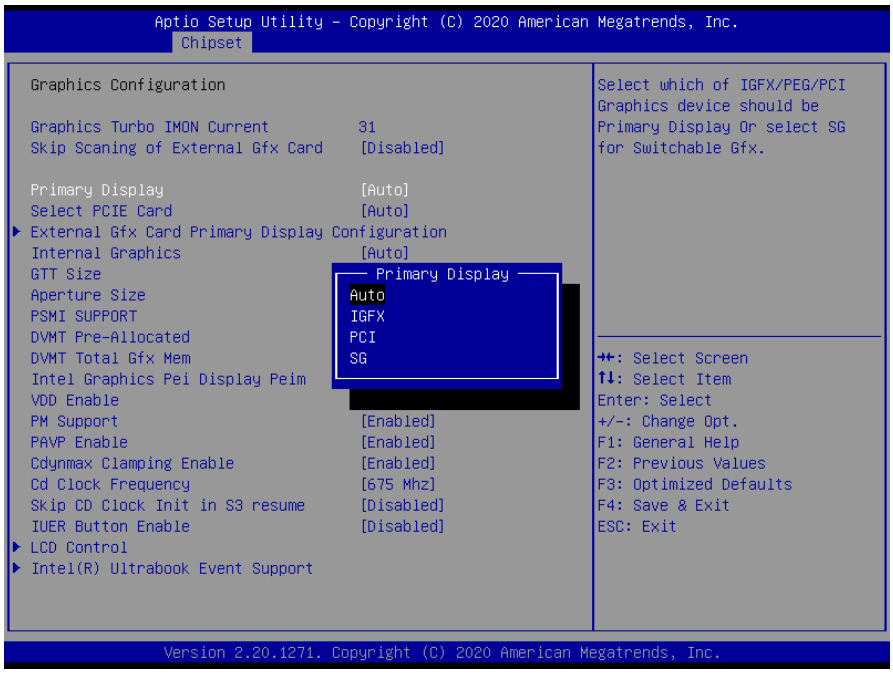
This item shows the information of the Memory Training Algorithms.



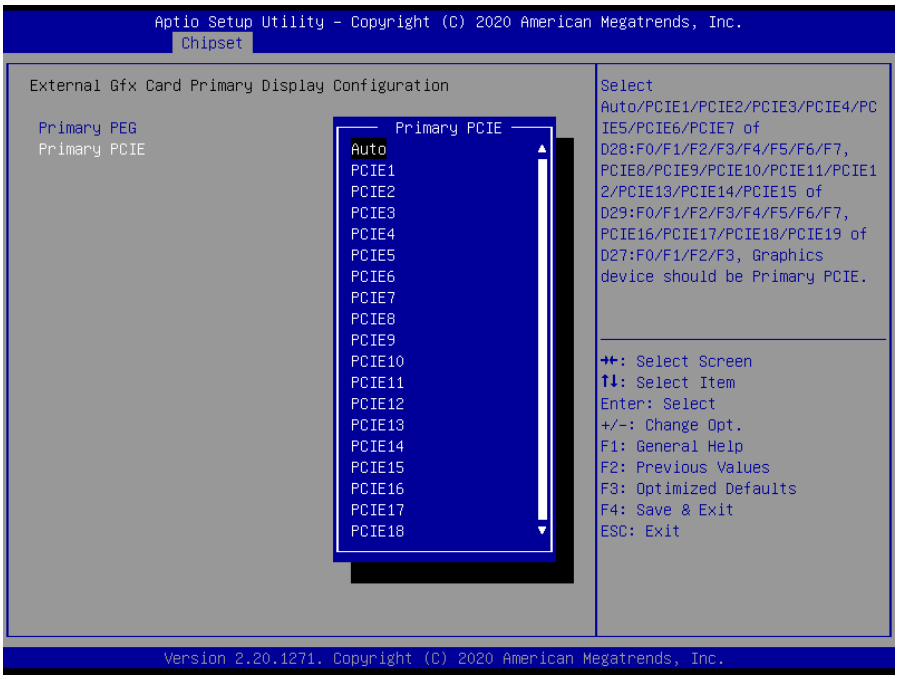


▶Graphics Configuration

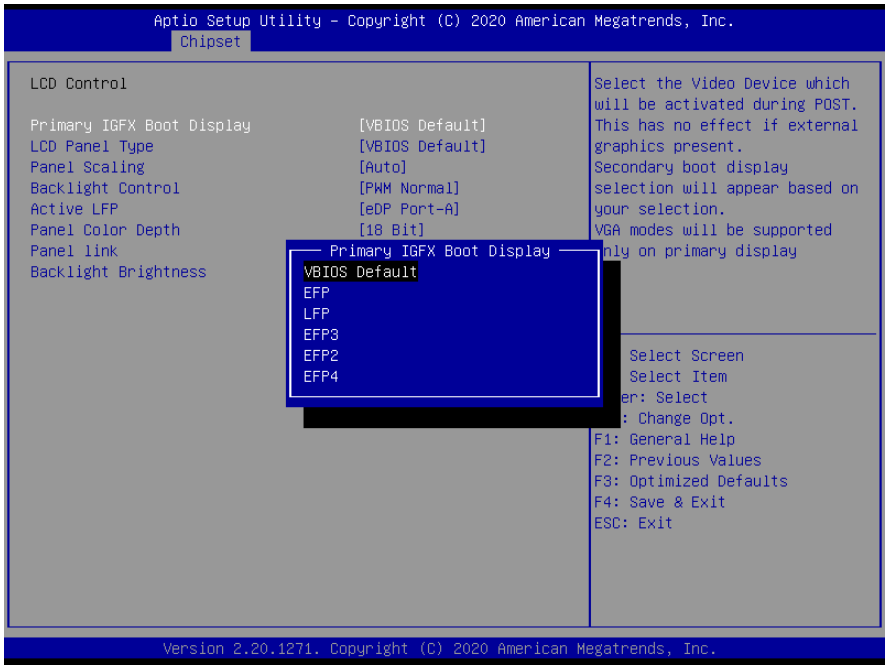
Image processing configuration, enter this sub-menu, there will be CPU-integrated graphics related settings.



▶External Gfx Card Primary Display Configuration



▶LCD Control

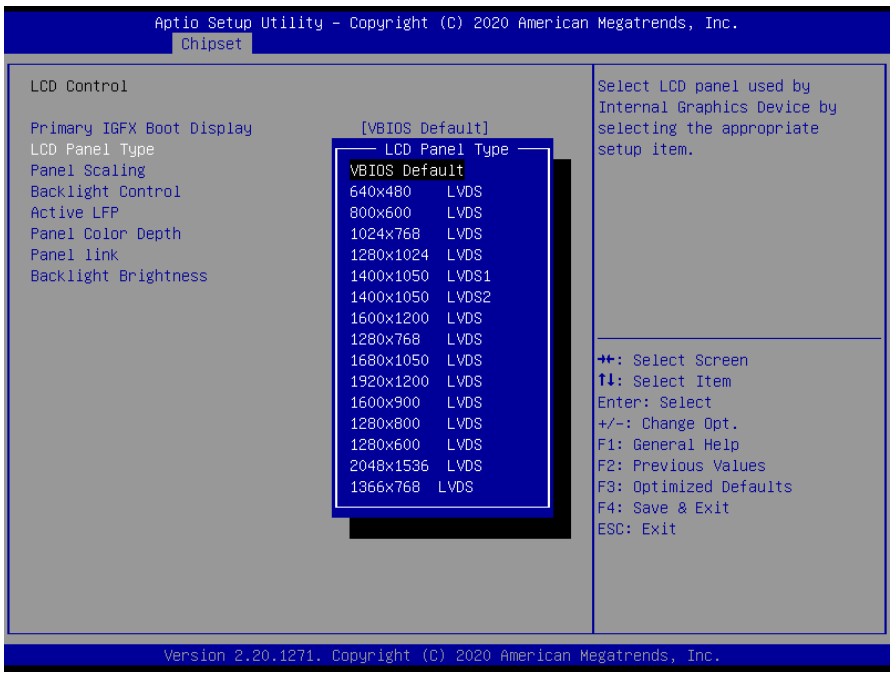


Primary IGFX Boot Display

This item sets IGFX main display device on POST stage, not affected by external graphics card, options are HDMI, LFP, EFP3, DP, EFP4. It defaults by VBIOS.

LCD Panel Type

This item sets resolution of the motherboard LVDS screen. It defaults by VBIOS.

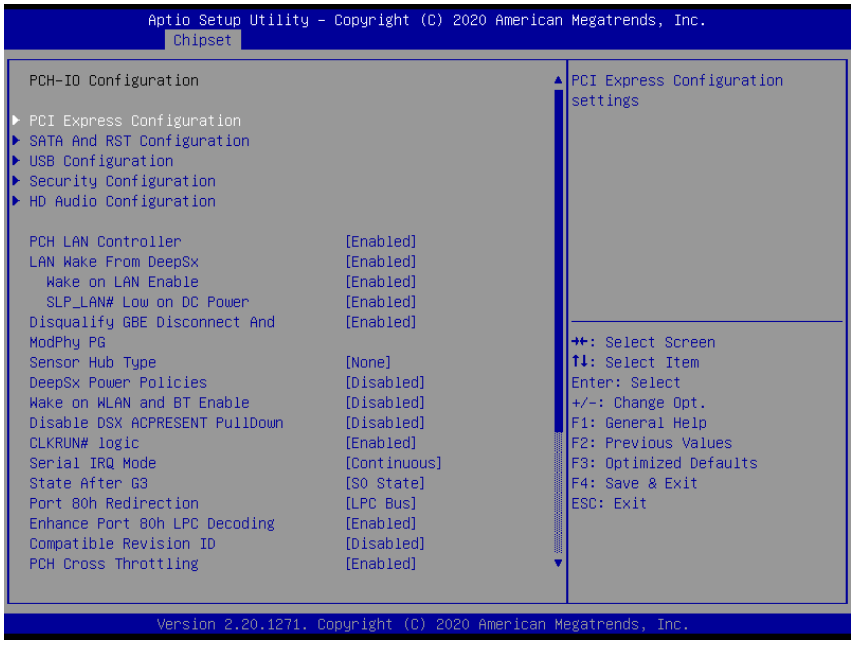


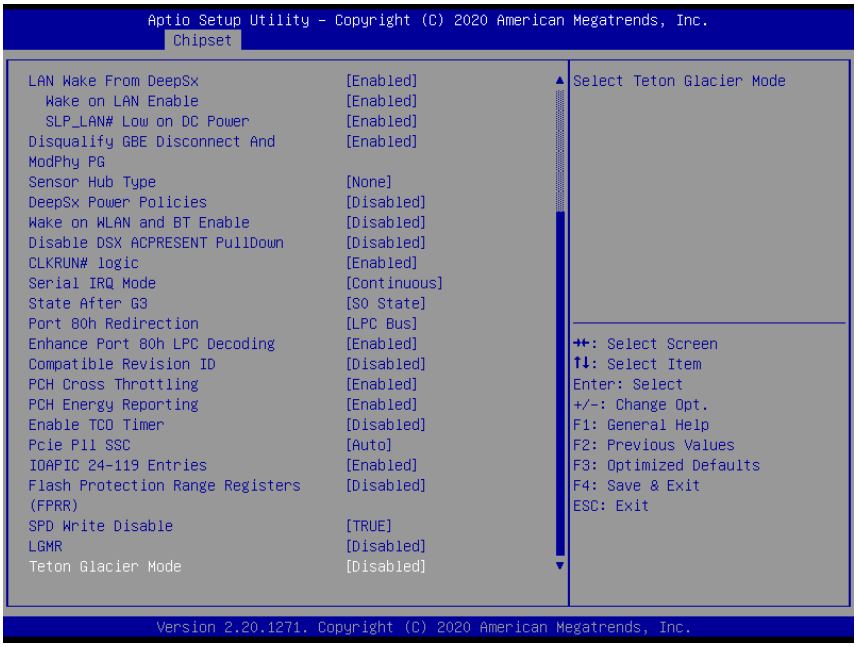
VT-d

This item sets the VT-d technology to open or close. The default is Enabled.

PCH-IO Configuration (South Bridge Configuration)

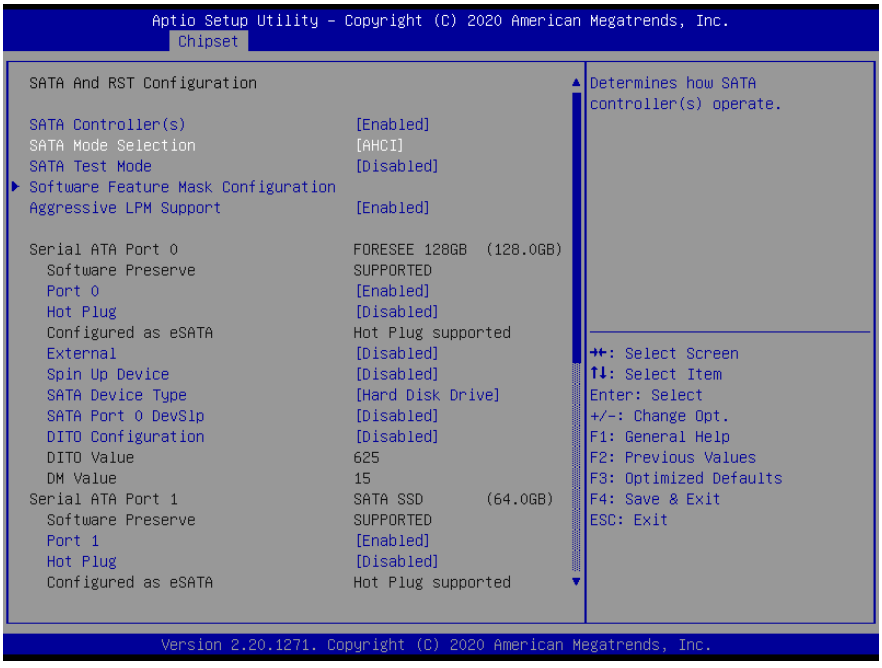
▶PCI Express Configuration



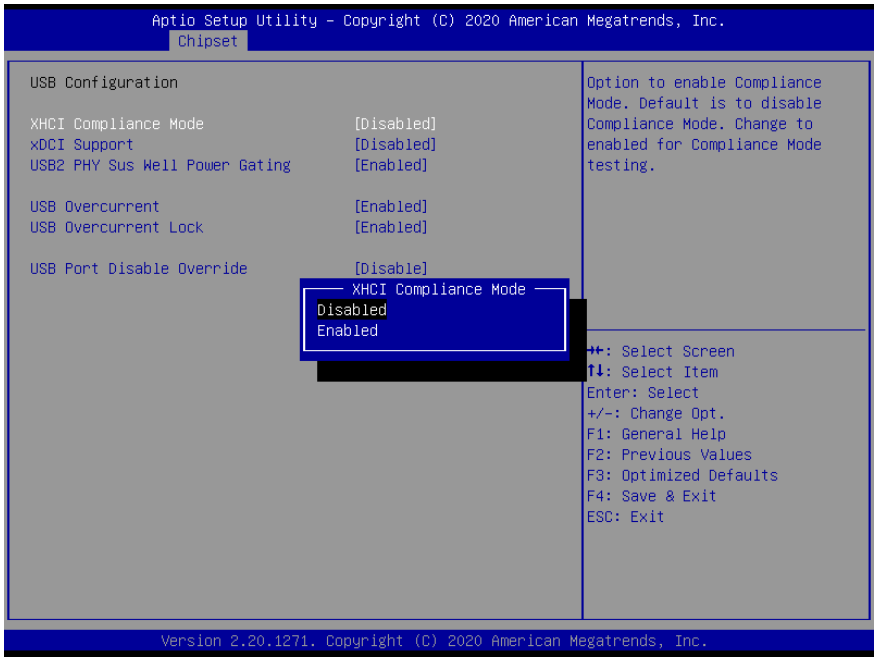


▶SATA And RST Configuration

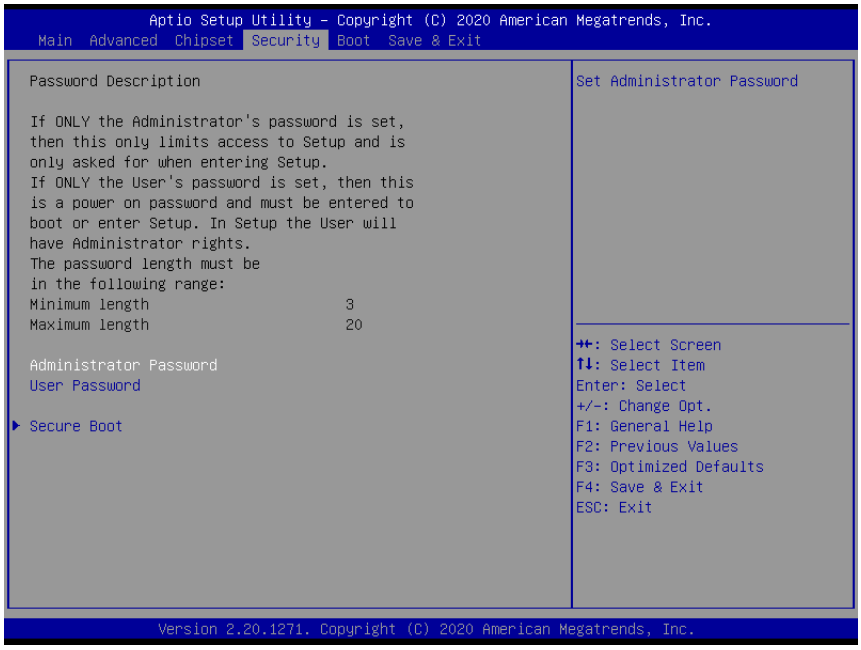
SATA hard disk and fast storage configuration, enter this sub-menu, there will be related settings of the hard disk.



▶USB Configuration



3.2.5 Security menu



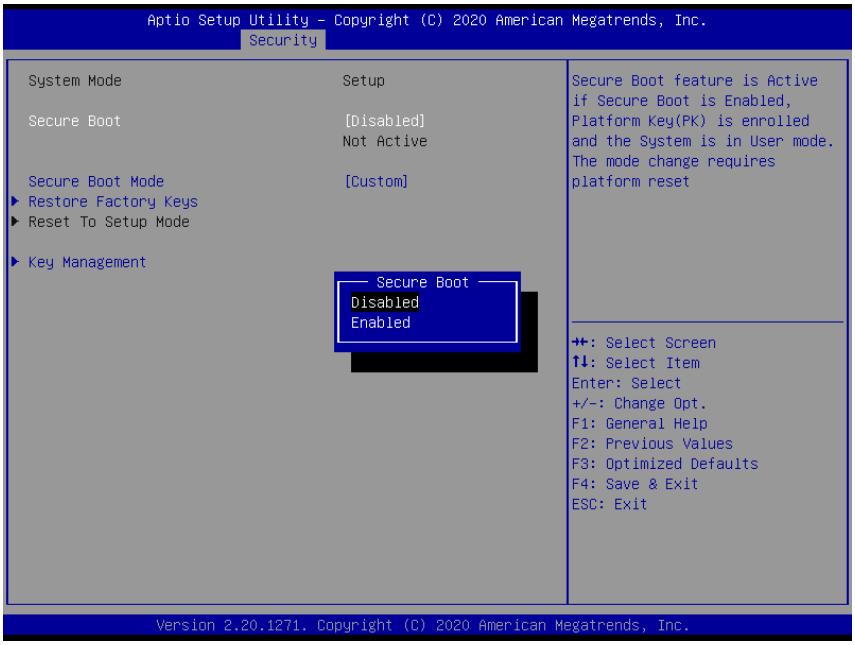
Administrator Password

This item sets the information of the administrator password.

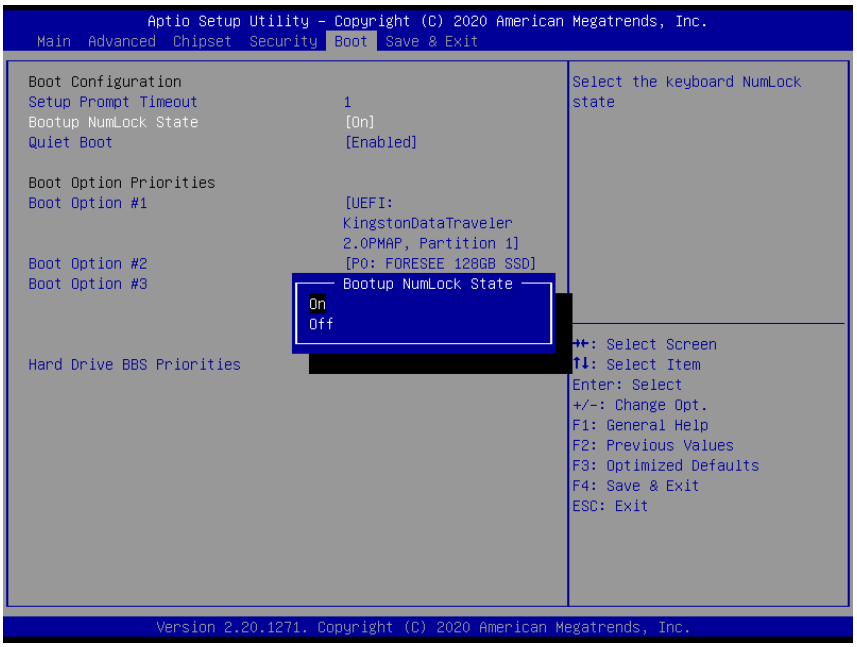
User Password

This item sets the information of the normal user password.

▶Secure Boot



3.2.6 Boot menu



Setup Prompt Timeout

Setup prompts for waiting time. This option is to set the time to wait for the Del key to enter the BIOS setup after booting.

Bootup NumLock State

Set the state of the small numeric keypad at startup.

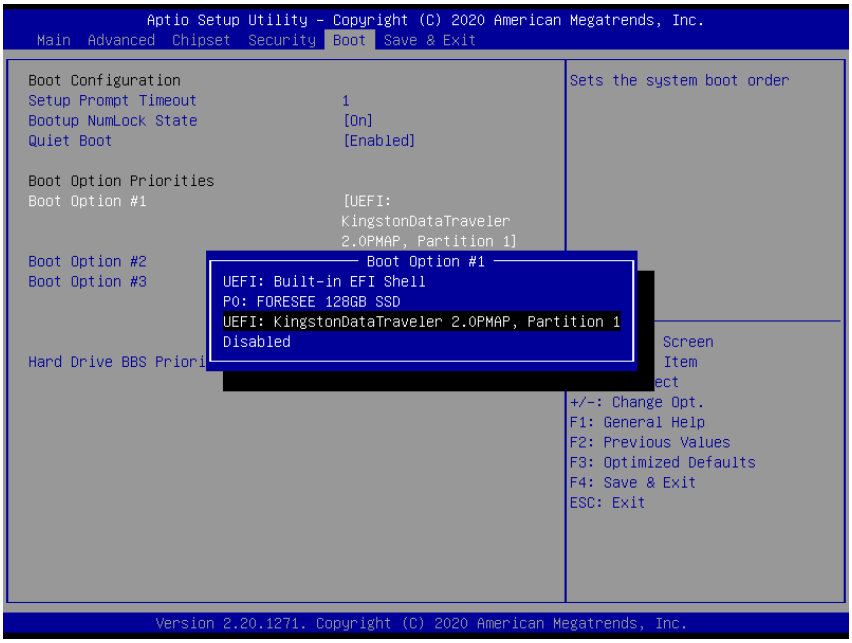
Quiet Boot

Switch full screen logo control

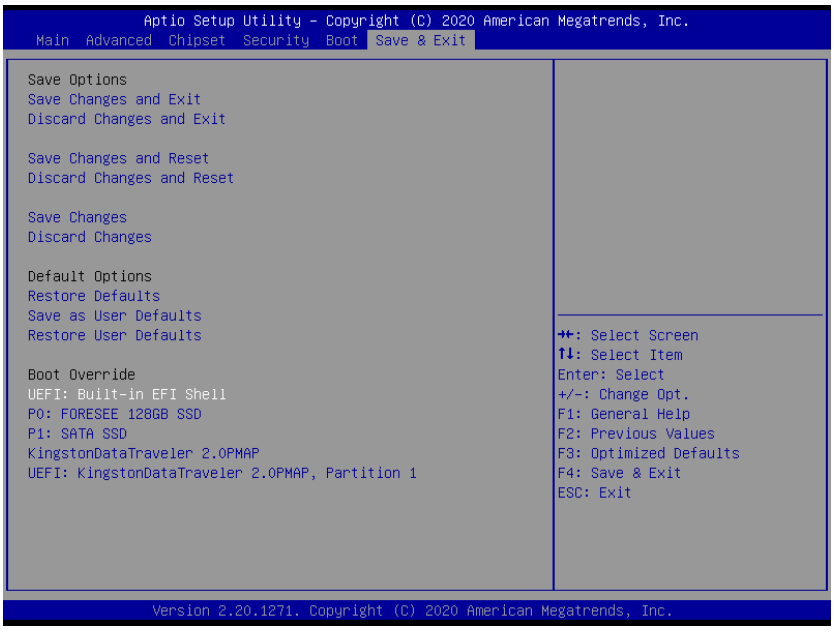
Fast Boot

Turn the quick start function on or off. When set to "Enabled", the system will skip some detection items and reduce the startup time.

New Boot Option Policy



3.2.7 Save & Exit menu



Save changes and Exit;

This item enables you to save the changes that you have made and exit.

Discard Changes and Exit;

This item enables you to discard the changes that you have made and exit.

Save Changes and Reset;

This item enables you to save the changes that you have made and reset.

Discard Changes and Reset;

This item enables you to discard the changes that you have made and reset.

Save Changes;

This item enables you to save the changes that you have made.

Discard Changes;

This item enables you to discard the changes that you have made.

Restore Defaults;

This item enables you to restore the system defaults.

Save as User Defaults;

This item enables you to save the changes as user defaults that you have made.

Restore User Defaults;

This item enables you to restore the user defaults.

3.3 Updating the BIOS

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS provides the underlying driver for hardware resources and is the bridge between hardware and operating system. Now hardware and various applications are constantly updated. When your system encounters problems, such as the system does not support the latest published CPU, you need to upgrade your BIOS.

NOTE：

1. Only upgrade the BIOS if you encounter problems and need to.

2. To upgrade the BIOS, please use the BIOS read/write program attached to our driver CD or download the updated version of the program from the relevant website.

3. Do not turn off the power or reboot the system during the upgrade process, so your BIOS data will be damaged and the system may not boot.

4. After the refresh is complete, you need to manually optimize the LOAD Default.

5. To prevent accidents, please backup the current BIOS data first.

CHAPTER 4

Driver Installation

The KGEC-6310 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

4.1 Follow the sequence below to install the drivers:

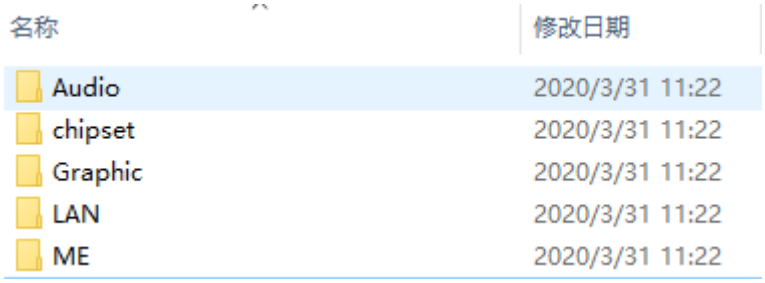


Figure 5.1 win7 drivers

Step 1 – Install Audio Driver

Step 2 – Install Chipset Driver

Step 3 – Install Graphic Driver

Step 4 – Install LAN Driver

Step 5 – Install ME Driver

Please read instructions below for further detailed installations.

4.2 Installation:

Insert the ECM-I909 CD-ROM into the CD-ROM drive. And install the drivers in turn.

Step 1 – Install Graphic Driver

1. Double click on the Display folder and double click on the Setup.exe
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install Audio Driver

1. Double click on the Audio folder and double click on the Setup.exe
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 3 –Install LAN Driver

1. Double click on the LAN folder and double click on the Setup.exe
2. Follow the instructions that the window shows

3. The system will help you install the driver automatically

Step 4 –Install Chipset Driver

1. Double click on the Chipset folder and double click on the Setup.exe
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 –Install ME Driver

1. Double click on the ME folder and double click on the Setup.exe
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

4.3 CPU TEMP LED driver

The ECM-I909 provides temperature showing in LEDs, economic and reliable. Users can monitor the working state of the CPU according to the display of the LED. Please perform the following operations, making LEDs work normally.

Find the CPU temperature test tool folder and open it, as shown below;

Run the exe application;

NOTE: Please add the exe application to the startup item to ensure that the program can run when power on.

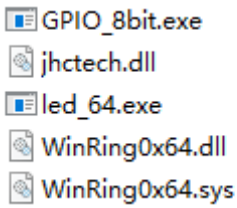


Figure 5.2

4.4 Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license. These software(s) are subject to change at any time without prior notice. Please refer to the support disk for available software.

CHAPTER 5

SYSTEM RESOURCE

5.1 WDT and GPIO

/* ==========

1 * void jhctech_init();

2 * function description: library initialization, this function must be called before calling other functions

3 * parameter description：

4 * creation date：

5*==========*/

/* ==========

1 * void jhctech_init ();

2 * function description: library release, Pair with jhctech_init, release the library's occupied resources when not needed

3 * parameter description：

4 * creation date：

5* ==========*/

/*==========

1 * BYTE MB_gpio_input (WORD port)

2 * function description: read the motherboard GPIO input level

3 * parameter description:

Return value: return a byte (8 bit), each bit of 8 bit corresponding to the level state of a GPIO pin

Return value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
GPIO pin	PIN8	PIN7	PIN6	PIN5	PIN4	PIN3	PIN2	PIN1

Parameter: port fill in motherboard GPIO number which is designed by factory

Note:

4 * creation date：

5*==========*/

/*==========

1 * void MB_gpio_output(WORD port,BYTE value);

2 * function description: high and low levels output of the motherboard

3 * parameter description:

Parameter: port fill in motherboard GPIO number which is designed by factory

Value 8 bit of a Byte, each bit controls a GPIO pin output value,

Bit =1, means output high level

Bit =0, means output low level

Note:

4 *

Value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
GPIO pin	PIN8	PIN7	PIN6	PIN5	PIN4	PIN3	PIN2	PIN1

creation date：

5*==*/

/*==

1 * void MB_gpio_init ();

2 * function description: initialization function of the motherboard gpio, this function must be called once before using it

3 * parameter description：

4 * creation date：

5*==*/

/*==

1 * void watchdog_set(int time);

2 * function description： Watchdog function

3 * parameter description： time is to Set the dog feeding time， Value between 0 and 255

Setting 0 means to turn off the watchdog

4 * creation date：

5*==*/

Note: If you want more programs of the motherboard's watchdog and subcard's GPIO, please call +86-0755-86021176-(8021)/+86-0755-86021176-(8023) for more information.