KMDA-3921/3920/3610

User's Manual

Ver.A1.0

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Version Note

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1	A1.0	first publish	20190725	Tracy Liu

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JHC warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two 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 an 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 A 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 resident installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, 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

CONTENTS

CHAPTER 1

General Information

1.1 Introduction

KMDA-3921/3920/3610 is an embedded industrial Box Computer of JHCTECH, with aluminum chassis. It powered by the Gen. 6th Intel® Skylake-S/Gen. 7th Intel® Kabylake-S CPU. It supports 2-Ch DDR4 2133/2400MHz memory, up to 32GB. It features multiple PCI or PCIe expansion slots, which can fulfill extensive requirements in various projects.

KMDA-3921/3920/3610 offers 1*HDMI, 1*DP, 1*VGA, 3 displays, 2*GbE LANs, 7*USB (1 inside for dongle), 4*COM, 8-bit DIO, 1*F-Mini PCIe with SIM slot, which supports 4G LTE/Wifi/BT. 1*mSATA, 1*M.2 2242 B-Key, 2*2.5" SATA HDD/SSD are used for storage, support raid0,1. It supports various optional expansion slots, including PCIe×16, PCIe×4, PCIeX1, PCI. So, users can conveniently select expansion boards based on their requirements. Besides, DC 12~24V wide power input. It is widely used for Industrial Automation, Intelligent Transportation (ITS), and Machine Vision.

1.2 Features

Key Features

- Universal aluminum chassis, SGCC frame
- Intel® Skylake-S/Kabylake-S Celeron/Core I3/I5/I7 CPU
- 2*260-pin SODIMM, DDR4 2133/2400MHz, up to 32GB
- 1*F-mini PCIe with SIM slot, support 4G LTE and Wifi/BT
- Expansion

  KMDA-3921 Series: 1*PCIe X16, 1*PCIeX1,2*PCI or 2*PCI or 2*PCIeX8, 1*PCIeX4

  KMDA-3920 Series: 1*PCIe X4, 1*PCIe X16
- 2*2.5" SATA HDD/SSD bay, 1*mSATA, 1*M.2 2242 B-Key for storage
- 1*DP, 1*HDMI, 1*VGA, 3 displays
- Realtek ALC662VD controller, 1*LINE OUT, 1*MIC
- 1*Intel I211AT, 1*Intel I219LM, supports Intel vPro technology
- 8-bit DIO(KMDA-3921/3920), 8+16-bit DIO(3610), 4*USB3.0, 3*USB2.0(1 inside), 4*COM
- Support TPM 2.0
- Clear CMOS switch is on the front panel, easy to clear CMOS data
- AT/ATX power-on mode selection switch is on the front panel, easy to set power-on mode

- DC 12~24V, CPU temperature show in LED

1.3 Specifications

1.3.1 General

CPU: Intel® Skylake-S/Kabylake-S Celeron/Core I3/I5/I7 CPU

System Memory: 2*DDR4 2133/2400MHz SODIMM, Up to 32GB

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

Serial Ports: 2* RS232/422/485 DB9 male, 2*RS232 DB9 male

USB: 4*USB 3.0 Type A ports(front), 2*USB2.0 Type A ports(front), 1*USB 2.0 Type A port (inside)

DIO:

-KMDA-3921/3920: 8-bit DIO, 10-Pin Phoenix terminal

-KMDA-3610: 8-bit DIO, 10-Pin Phoenix terminal+16-bit DIO, DB25 Female

I-Port: optional 1*LPT、USB2.0、DIO or 1*Mini PCIe module interface(KMDA-3921/3920)

Expansion Interface:

1*Full size Mini PCIe (PCIeX1+USB) with SIM slot

PCI/PCIe slots:

KMDA-3921 Series: 1*PCIe X16, 1*PCIeX1, 2*PCI

KMDA-3920 Series: 1*PCIe X16, 1*PCIe X4

KMDA-3610 Series: none

Storage:1* mSATA, 1*M.2 2242 B-Key

2*2.5" SATA HDD/SSD bay, support Raid0,1(In Intel Q170)

1.3.2 Display

Chipset: Gen. 9th Intel® HD Graphics

Display Memory: Shared system memory

Resolution: HDMI 3840x2160@30Hz; DP 4096x2160@60Hz, VGA 1920x1200@60Hz

1.3.3 Ethernet

Chipset: 1*Intel® I211AT Ethernet controllers, 1* Intel® I219LM Ethernet controller

Speed: 10/100/1000 Mbps Integrated

Interface: 2*RJ45

1.3.4 Audio

Chipset: Realtek ALC662VD controller

Interface: 1*Audio out, 1*MIC, 3.5mm phone jack

1.3.5 Power Consumption

Input Voltage: DC 12~24V Input

Power Consumption: TDP 19V/3.62A (I7-6700T CPU, 4GB RAM, 1TB HDD)

Power Adapter: AC to DC 19V/6.32A, 120W（when not installing GPU card）

AC to DC 24V/9.17A, 220W（when installing GPU card）

1.4 Environmental Specifications

Operating temperature:

-20 ~ 65° C (SSD, Airflow)

-10 ~ 50° C (HDD, Airflow)

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

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

Vibration loading during operation:

With SSD: 5.0 Grms, random, 5 ~ 500 Hz

With HDD:1.0 Grms, random, 5 ~ 500 Hz

Shock during operation:

With SSD: 50g, peak acceleration (11 ms duration)

With HDD:20g peak acceleration (11 ms duration)

EMC: CE, FCC Class B

1.5 3921/3920/3610 Series Specifications

Model.	KMDA-3921	KMDA-3920	KMDA-3610
CPU	Intel® Skylake-S/Kabylake-S Celeron/Core I3/I5/I7 CPU	Intel® Skylake-S/Kabylake-S Celeron/Core I3/I5/I7 CPU	Intel® Skylake-S/Kabylake-S Celeron/Core I3/I5/I7 CPU
Chipset	Intel® H110/Q170	Intel® H110/Q170	Intel® H110/Q170

SODIMM	2	2	2
Storage	2*SATA3	2*SATA3	2*SATA3
LAN	2	2	2
USB	4*USB3.0 3*USB2.0	4*USB3.0 3*USB2.0	4*USB3.0 3*USB2.0
COM	4	4	4
DIO	8-bit	8-bit	8-bit+16-bit
Display	1*HDMI, 1*DP, 1*VGA	1*HDMI, 1*DP, 1*VGA	1*HDMI, 1*DP, 1*VGA
PS/2	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse
Audio	1*Line Out, 1*MIC	1*Line Out, 1*MIC	1*Line Out, 1*MIC
I-port	Optional LPT, 2*USB2.0,16-bit DIO	Optional LPT, 2*USB2.0,16-bit DIO	16-bit DIO (default)
Expansion	1*mini-PCIe, 1*M.2 2242 B-Key 1*PCIeX16+1*PCIeX1 2*PCI	1*mini-PCIe 1*M.2 2242 B-Key 1*PCIeX16+1*PCIeX4 Or 2*PCI	1*mini-PCIe 1*M.2 2242 B-Key

1.6 Mechanical Specifications

The KMDA-3921/3920/3610 new industrial design Box computer of JHCTECH, consists of a JHC SBC(STX-I951), a sub-card (ECD-9050), and an expansion card ECX-241 or ECI-242 or ECI-245. The specific combination is as follows:

Model No.	KMDA-3921	KMDA-3920	KMDA-3610
AXM-I951	✓	✓	✓
ECD-9050	✓	✓	✓
ECX-241	×	✓	×

ECX-242	✓	×	×
ECI-245	×	✓	×

(Note: ECX-241 and ECI-245 are 2 alternatives in KMDA-3920)

Main Board Front (AXM-I951)

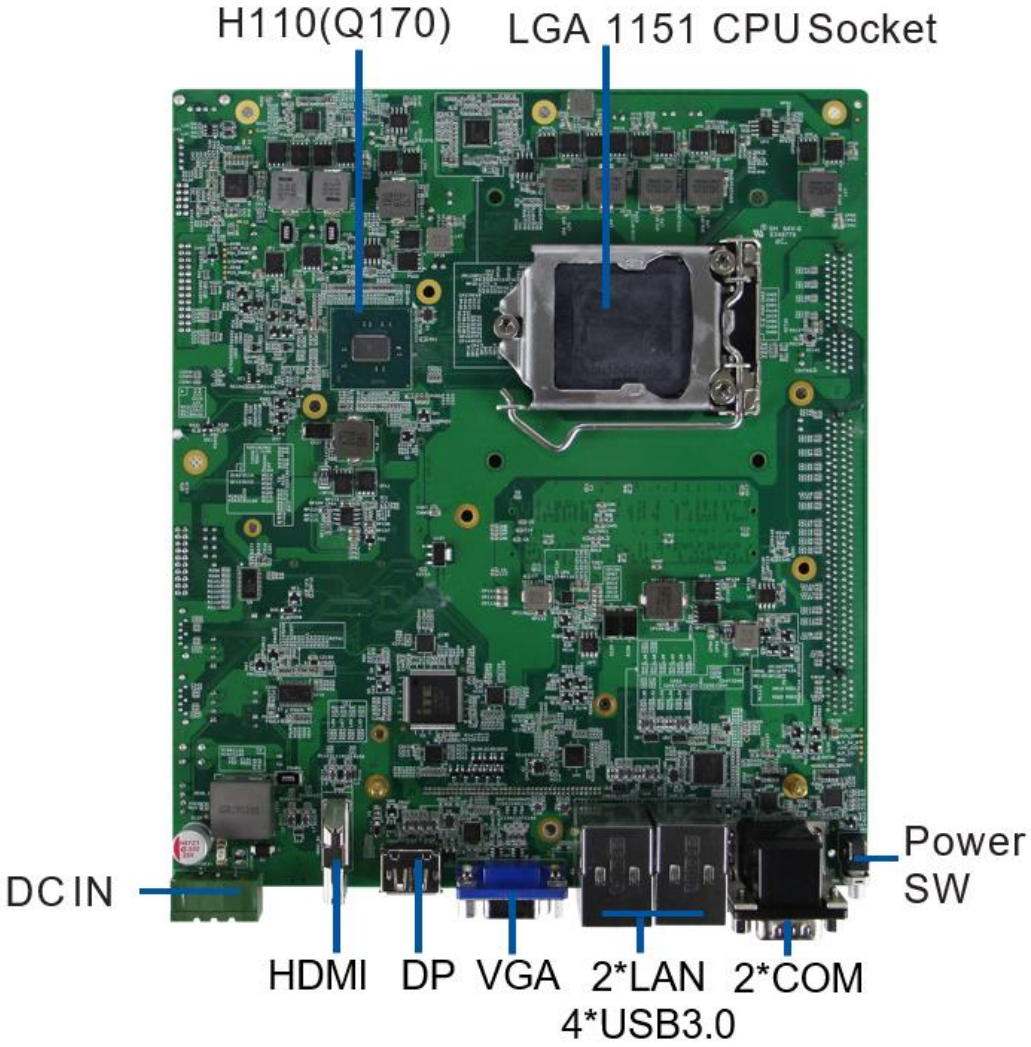


Figure 1.1

Main Board Rear (AXM-I951)

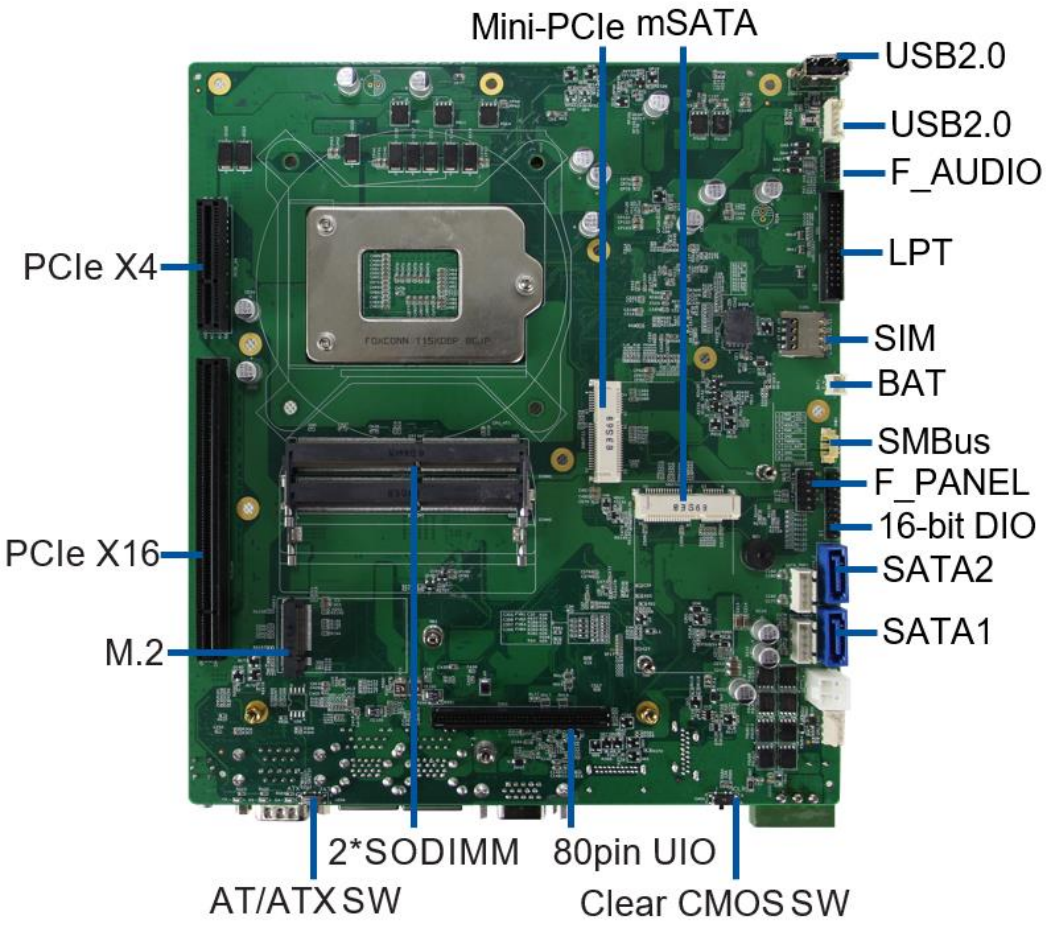


Figure 1.2

Sub-card (ECD-9050)

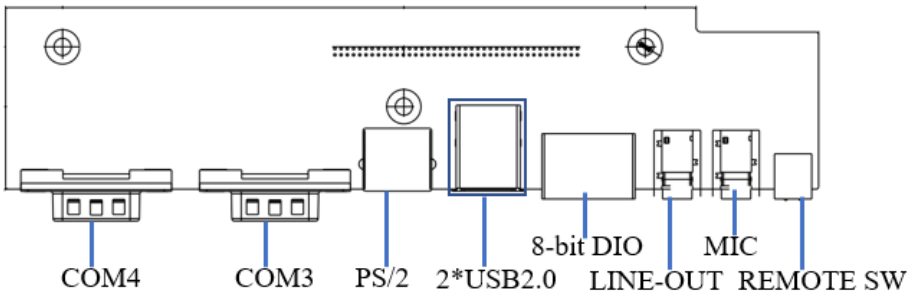


Figure 1.3

Riser card (ECX-241)

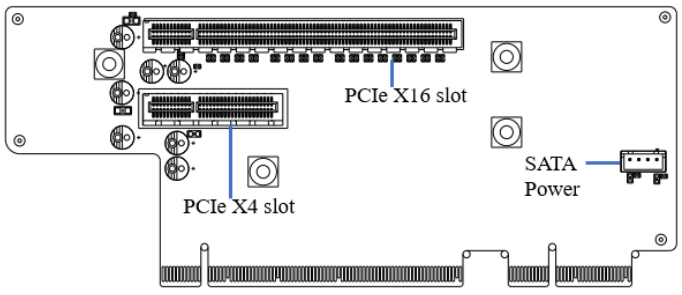


Figure 1.4

Riser card (ECX-242)

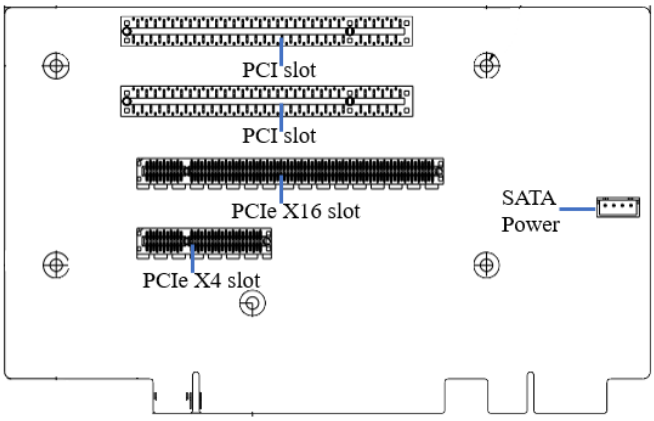


Figure 1.5

Riser card (ECI-245)

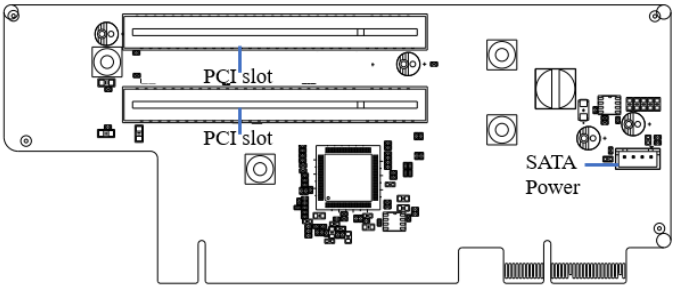


Figure 1.6

KMDA-3921 Dimension: **Unit: mm**

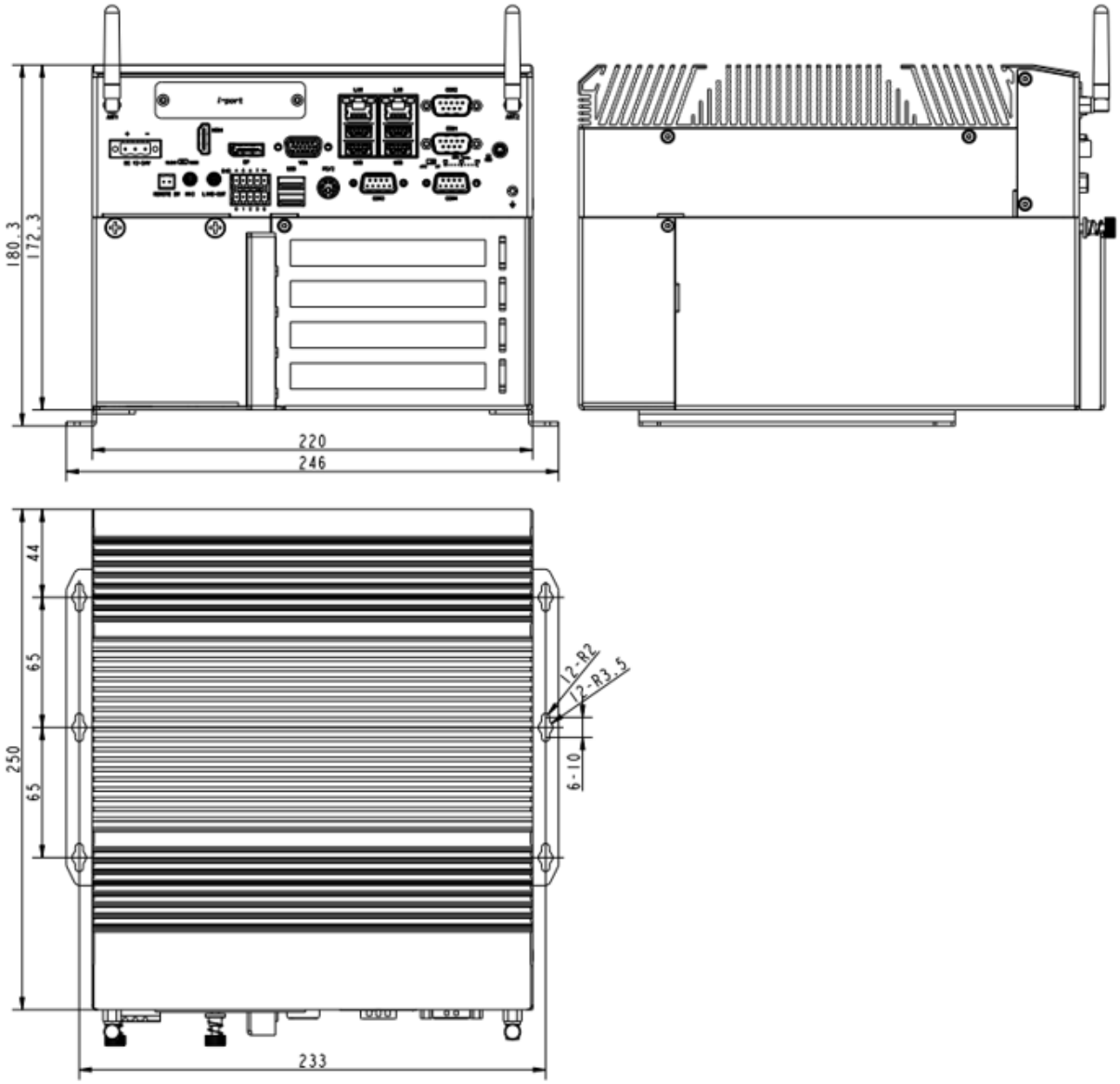


Figure 1.7

KMDA-3920 Dimension: **Unit: mm**

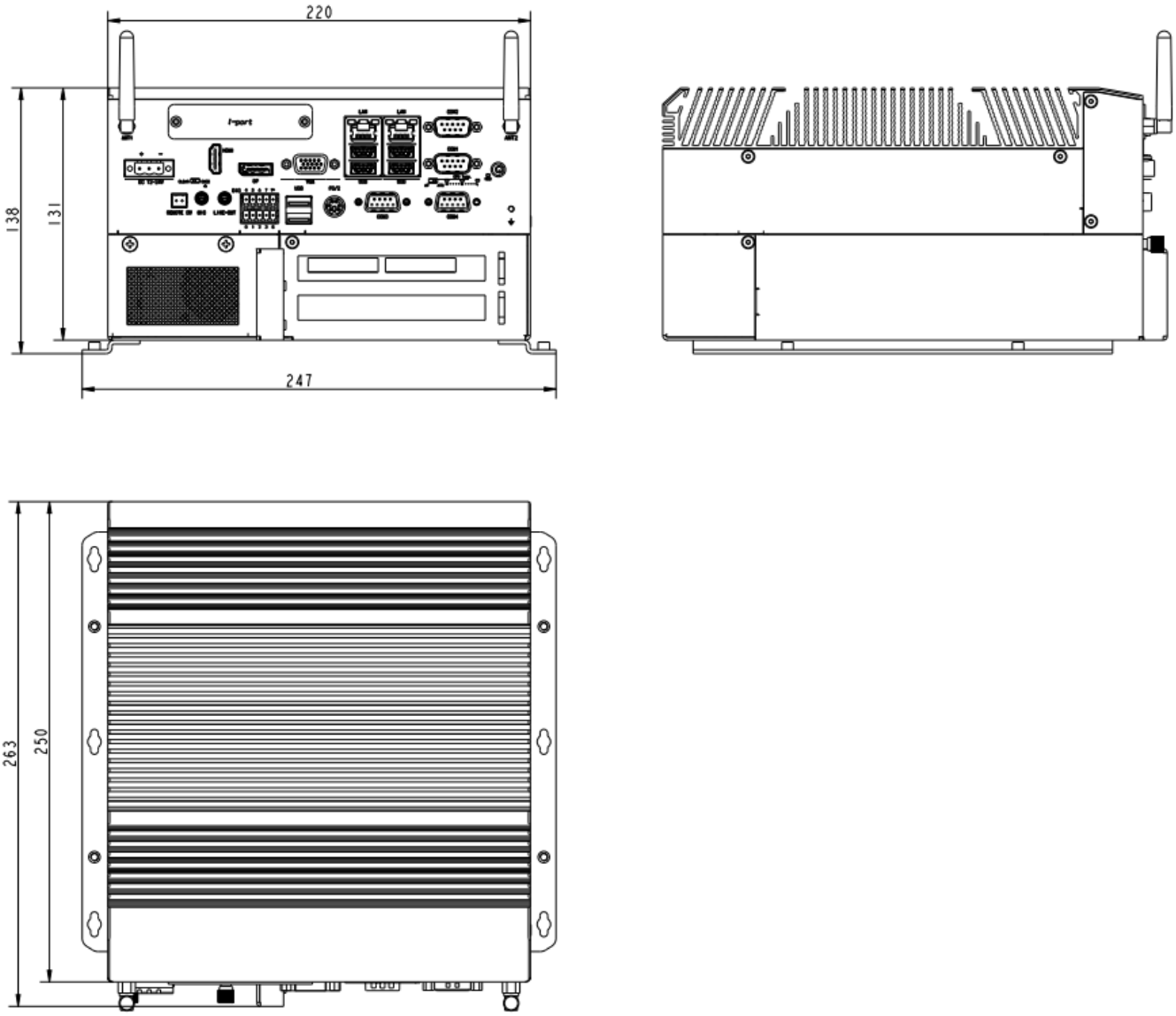


Figure 1.8

KMDA-3610 Dimension: **Unit: mm**

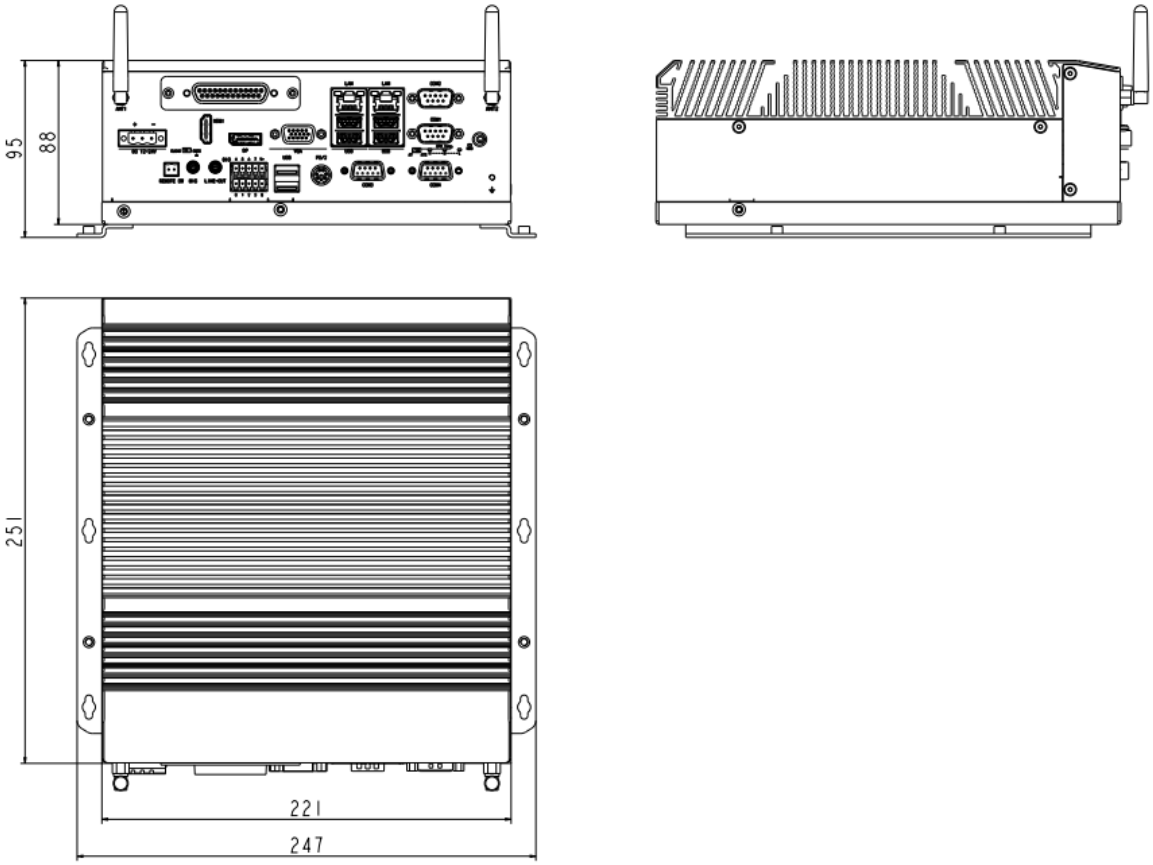


Figure 1.9

CHAPTER 2

Hardware Installation

2.1 Introduction

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

2.2 Switches setting

The KMDA-3921/3920/3610 Box Computer has a number of switches that allows you to configure your system to suit your application. The table below shows the function of each of the board's Switches:

Switches

Jumpers/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/CMOS -Clear CMOS Data

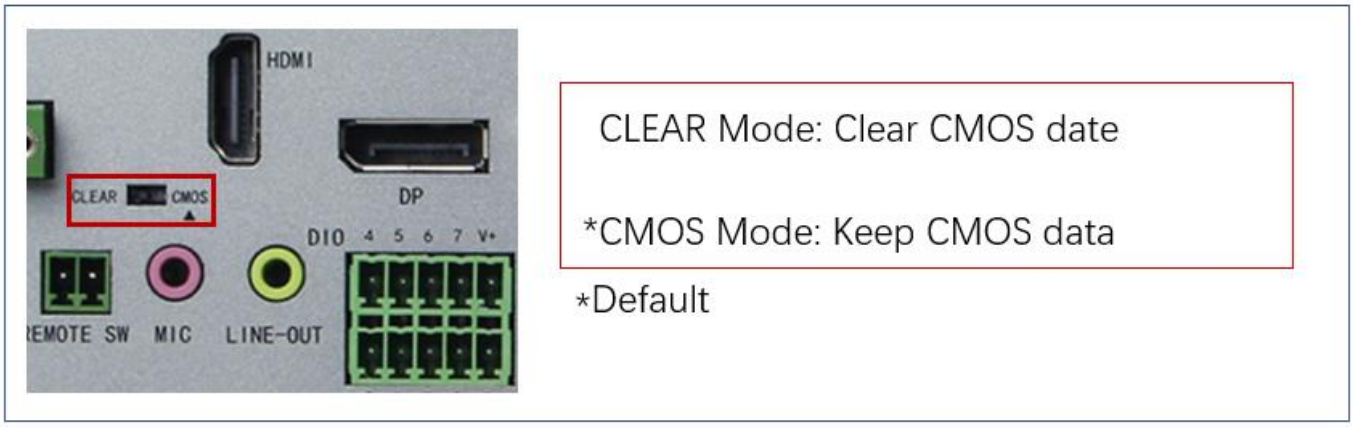


Figure 2. 1

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. Set CMOS pins 2 and 3 to On. Wait for a few seconds and set CMOS back to its default setting, pins 1 and 2 On.

3. Now plug the power cord and power-on the system.

2.2.2 AT/ATX- AT/ATX Power on mode selection

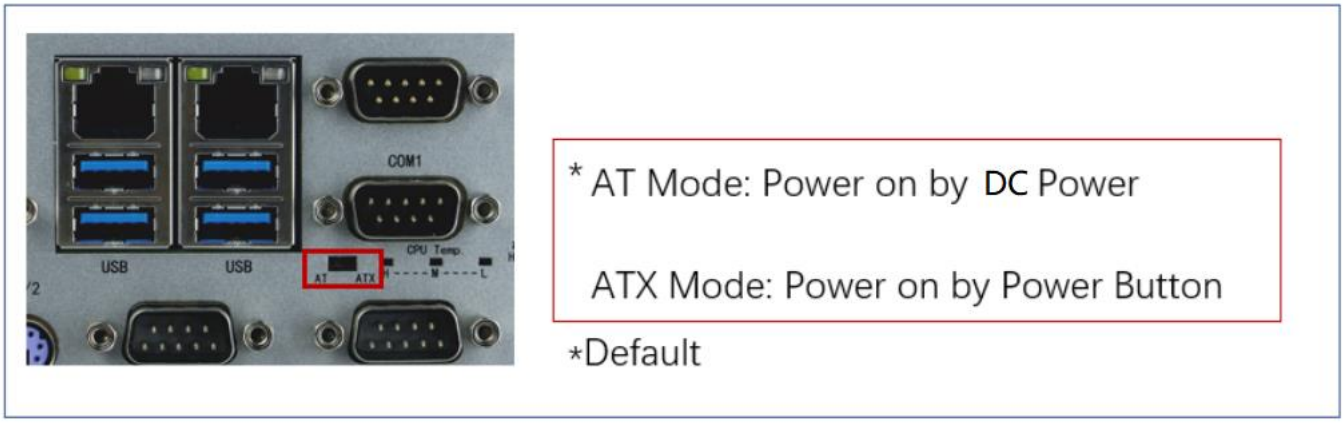


Figure 2. 2

The KMDA-3921/3920/3610 provides a 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 Ports Indication

KMDA-3921 Front Panel I/O Ports

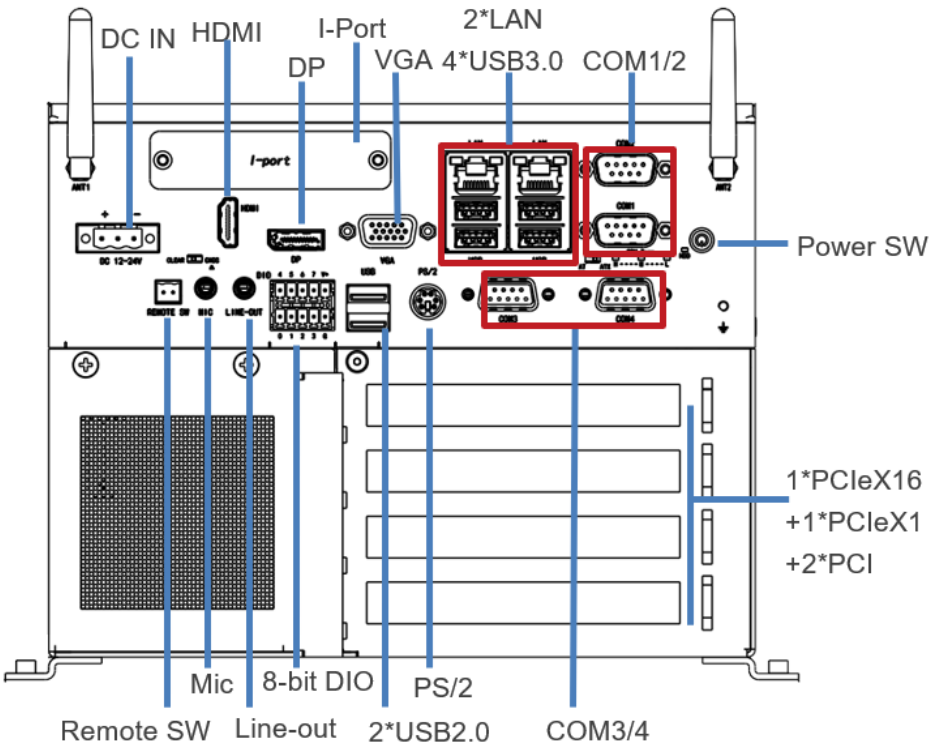


Figure 2. 3

The front panel I/O ports consist of the following:

- 1*DC-in Power jack: 3-pole Phoenix terminal block
- 1*Remote SW: 2-pole terminal block
- 1*Mic, 1*Line out: 3.5mm phone jack
- 1*DP, 1*HDMI, 1*VGA
- 1*PS/2, 2*USB 2.0 Type A, 4*USB3.0 Type A, 1*I-Port
- 2*Gigabit LAN: RJ45 with LEDs
- 4*COM: DB9 2*RS232, 2*RS232/422/485
- 8-bit DIO: 10-pole terminal block
- 1*PCIeX1, 1*PCIeX16, 2*PCI slots
- Power button
- HDD LED, CPU LEDs
- AT/ATX SW, Clear CMOS SW

KMDA-3921 Rear Panel I/O Ports

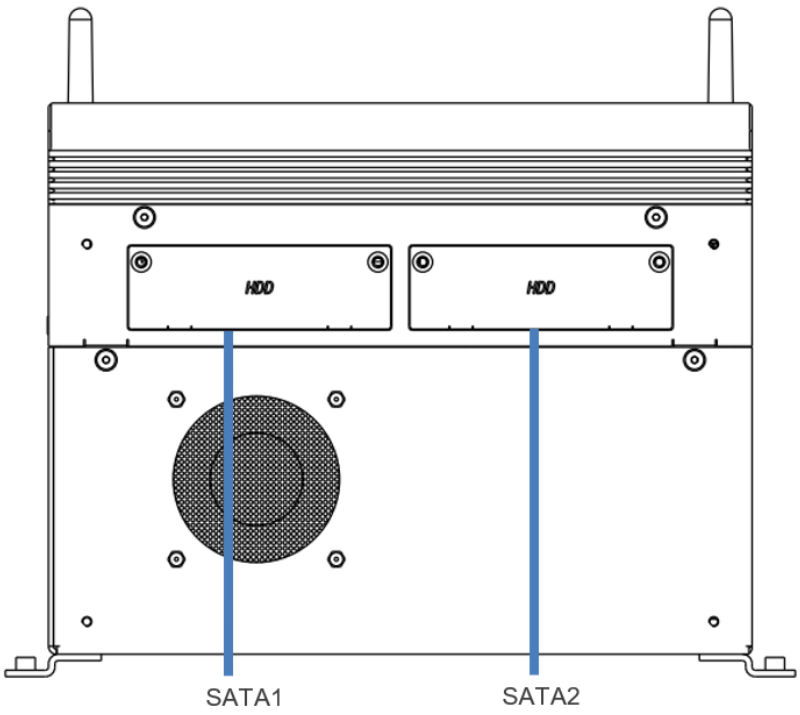


Figure 2. 4

The Rear panel I/O ports consist of the following:

- 2*SATA SSD/HDD

KMDA-3920 Front Panel I/O Ports

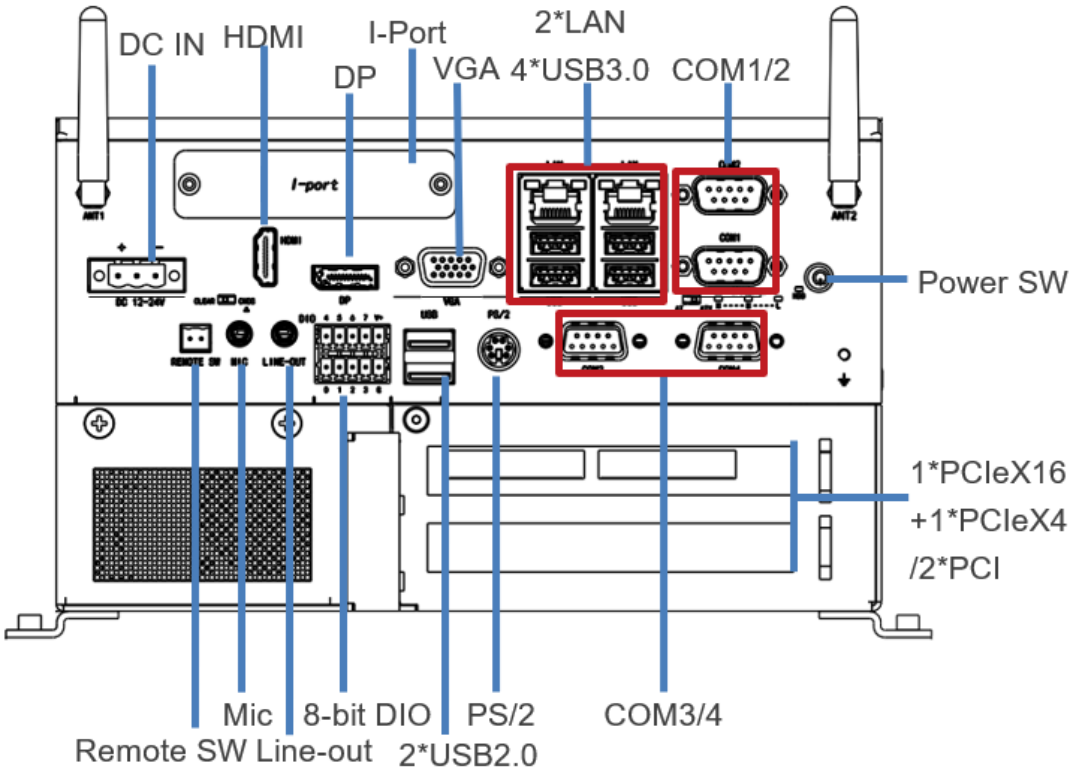


Figure 2. 5

The front panel I/O ports consist of the following:

- 1*DC-in Power jack: 3-pole Phoenix terminal block
- 1*Remote SW: 2-pole terminal block
- 1*Mic, 1*Line out: 3.5mm phone jack
- 1*DP, 1*HDMI, 1*VGA
- 1*PS/2, 2*USB 2.0 Type A, 4*USB3.0 Type A, 1*I-Port
- 2*Gigabit LAN: RJ45 with LEDs
- 4*COM: DB9 2*RS232, 2*RS232/422/485
- 8-bit DIO: 10-pole terminal block
- 1*PCIeX4, 1*PCIeX16 slots or 2*PCI slots
- Power button
- HDD LED, CPU LEDs
- AT/ATX SW, Clear CMOS SW

KMDA-3920 Rear Panel I/O Ports

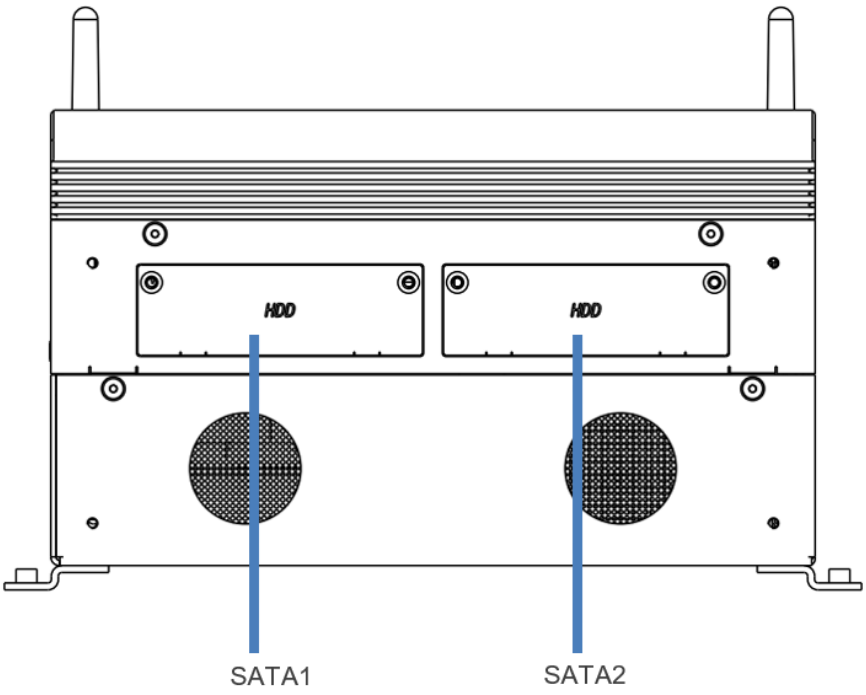


Figure 2. 6

The Rear panel I/O ports consist of the following:

- 2*SATA SSD/HDD

KMDA-3610 Front Panel I/O Ports

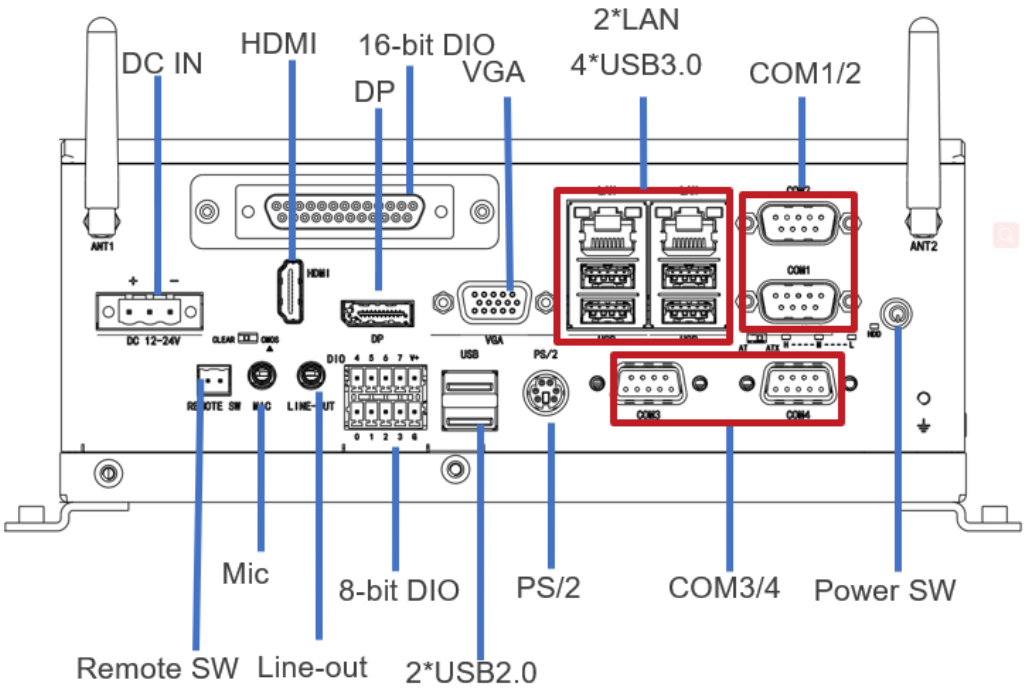


Figure 2. 7

The front panel I/O ports consist of the following:

- 1*DC-in Power jack: 3-pole Phoenix terminal block
- 1*Remote SW: 2-pole terminal block
- 1*Mic, 1*Line out: 3.5mm phone jack
- 1*DP, 1*HDMI, 1*VGA
- 1*PS/2, 2*USB 2.0 Type A, 4*USB3.0 Type A
- 2*Gigabit LAN: RJ45 with LEDs
- 4*COM: DB9 2*RS232, 2*RS232/422/485
- 8-bit DIO: 10-pole terminal block, 16-bit DIO: DB25 Female
- Power button
- HDD LED, CPU LEDs
- AT/ATX SW, Clear CMOS SW

KMDA-3610 Rear Panel I/O Ports

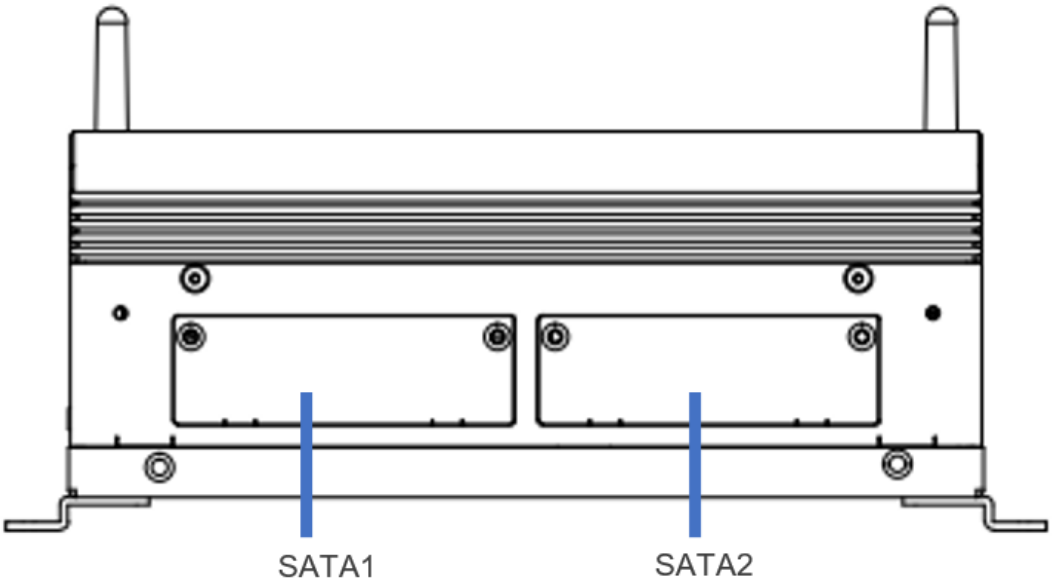


Figure 2. 8

The Rear panel I/O ports consist of the following:

- 2*SATA SSD/HDD

2.3.1 Ethernet Connector (LAN)

The KMDA-3921/3920/3610 is equipped with 1 Intel I211AT chips and 1 Intel I219LM for 10/100/1000Mbps Ethernet controllers. The product provides 2*RJ45, with LED indicators on the front side to show its Active/Link status (Green LED) and Speed status (yellow LED).

Table 2.1 for pin assignments.

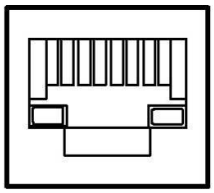


Figure 2. 9

Table 2.1: RJ-45 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 Connector

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

The KMDA-3921/3920/3610 provides 4*USB3.0, 3*USB2.0(one inside for dongle). The USB interface can be disabled in the system BIOS setup. Table 2.2 for USB2.0 pin assignments.

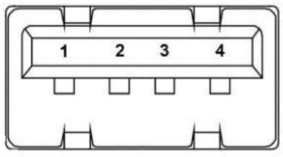


Figure 2. 10

Table 2.2: USB2.0 Port Pin Assignments			
Pin	Signal	Pin	Signal
1	USB_VCC	2	USB_D-
3	USB_D+	4	USB_GND

Table 2.3 for USB3.0 pin assignments.

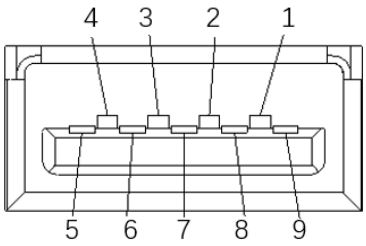


Figure 2. 11

Table 2.3: USB3.0 Port Pin Assignments			
Pin	Signal	Pin	Signal
1	VBUS	6	StdA_SSRX+
2	D-	7	GND_DRAIN
3	D+	8	StdA_SSTX-
4	GND	9	StdA_SSTX+
5	StdA_SSRX-	Shell	Shield

2.3.3 HDMI

The KMDA-3921/3920/3610 provides a high-resolution HDMI display port. They can support the most resolution up to 3840*2160@30Hz.

Table 2.4 for HDMI pin assignments.

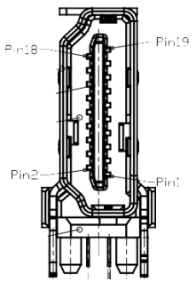


Figure 2. 12

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 DP

The KMDA-3921/3920/3610 provides a high-resolution DP ports, it supports the most resolution up to 4096*2160@60Hz.

Table 2.5 for DP pin assignments.

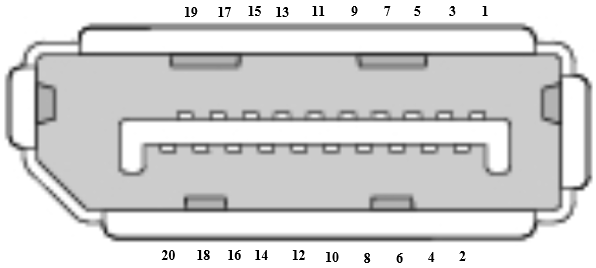


Figure 2. 13

Table 2.5: DP Pin Assignments					
Pin	Signal	Pin	Signal	Pin	Signal
1	DATA0_P	8	GND	15	AUXP
2	GND	9	DATA2_N	16	GND
3	DATA0_N	10	DATA3_P	17	AUXN
4	DATA1_P	11	GND	18	HPD
5	GND	12	DATA3_N	19	GND
6	DATA1_N	13	CTRL	20	PWR
7	DATA2_P	14	GND		

2.3.5 VGA

The KMDA-3921/3920/3610 provides a VGA ports via a D-sub 15-pin connector, it supports the most resolution up to 1920*1200@60Hz.

Table 2.6 for DP pin assignments.

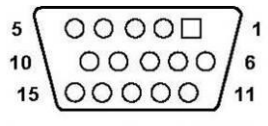


Figure 2. 14

Table 2.6: VGA port pin assignments			
Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	SPD
4	SPC	12	SDA
5	GND	13	HS
6	GND	14	VS
7	GND	15	SCL
8	GND		

2.3.6 DIO Connector

The KMDA-3921/3920 provides 8-bit DIO by 2*5Pin 8-bit DIO terminal connector in rear. Table 2.7 for Pin assignments.

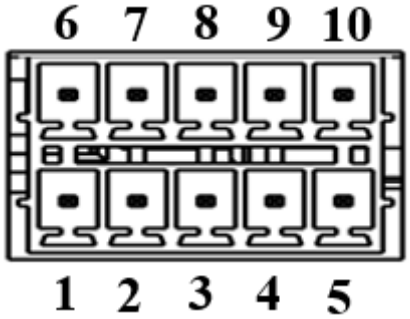


Figure 2. 15

Table 2.7: 8-bit DIO Pin Assignments			
Pine	DIO Signal	Pin	DIO Signal
1	GP70	2	GP71
3	GP72	4	GP73
5	GND	6	GP74
7	GP75	8	GP76
9	GP77	10	+5V

The KMDA-3610 provides 8-bit + 16-bit DIO. The 8-bit DIO definition is identical to the above-mentioned KMDA-3921/3920 8-bit DIO definition. The other 16-bit DIO is derived from a DB25 female. The pins are defined as follows:

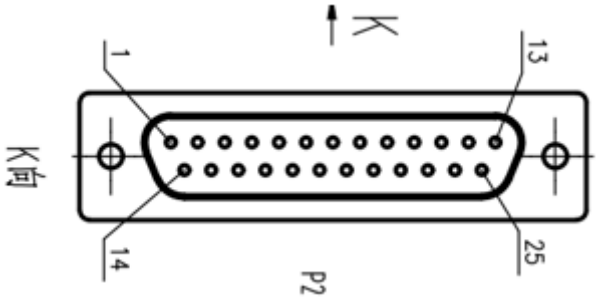


Figure 2. 16

Table 2.8: 16-bit DIO pin assignments					
Pin	Signal	Pin	Signal	Pin	Signal
1	GPIO1	10	NC	19	GPIO14
2	GPIO2	11	NC	20	GPIO15
3	GPIO3	12	NC	21	GPIO16
4	GPIO4	13	GND	22	NC
5	GPIO5	14	GPIO9	23	NC
6	GPIO6	15	GPIO10	24	NC
7	GPIO7	16	GPIO11	25	NC
8	GPIO8	17	GPIO12		
9	5V	18	GPIO13		

(All of the above DIOs are TTL signals, digital inputs (high level 1: 2-5.25V, low level 0: 0-0.8V), digital output (high level 1: minimum 2.4V, low level 0: Maximum 0.4V).)

2.3.7 Power Input Connector (DC-IN)

The KMDA-3921/3920/3610 provides a wide power input (DC 12~24V) by a 3-pin terminal.

Table 2.9 for pin assignments.

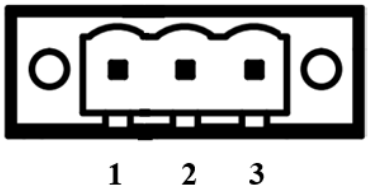


Figure 2. 17

Table 2.9:DC-IN port pin assignments			
Pin	Signal	Pin	Signal

1	12~24V	2	NC
3	GND		

2.3.8 COM1/2 Connector

The KMDA-3921/3920/3610 provides 2 serial ports of COM1/2 by 2*D-sub 9-pin connectors. COM1/2 can be configured as RS232、RS422 or RS485 by BIOS setup. Table 2.10 for pin assignments.

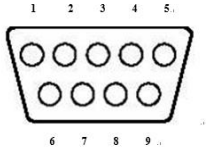


Figure 2. 18

Table 2.10: COM1/2 Serial Ports 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

2.3.9 COM3/4 Connector

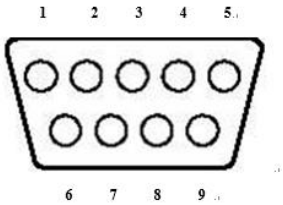


Figure 2. 19

COM3/4 are only for RS232. The Pin assignments are as follows:

Table 2.11: COM3/4 Serial Port Pin Assignments

Pin	Signal	Pin	Signal
1	DCD	2	RxD
3	TxD	4	DTR

5	GND	6	DSR
7	RTS	8	CTS
9	RI		

2.3.10 PS/2 Connector

The KMDA-3921/3920/3610 provides a PS/2 connector which is used to connect keyboard or mouse.

Table 2.12 for pin assignments.

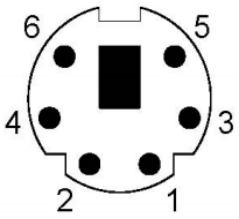


Figure 2. 20

Table 2.12:PS/2 Pin Assignments			
Pin	Signal	Pin	Signal
1	SIO_KDAT	4	VCC
2	SIO_MDAT	5	SIO_KCLK
3	GND	6	SIO_MCLK

2.3.11 Remote Switch signal Connector

For the remote switch signal interface of the switch machine, the terminal of the motherboard coastline is a 2-pin terminal. Table 2.13 for pin assignments.

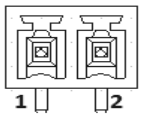


Figure 2. 21

Table 2.13: Remote Switch Pin Assignments	
Pin	Signal
1	PWR_BTN
2	GND

2.3.12 Serial ATA1 (S_SATA1/S_SATA2)

Figure 2. 22

Table 2.14 for pin assignments.

Table 2.14: Serial ATA1 pin assignments			
Pin	Signal	Pin	Signal
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

2.3.13 SATA power connector (SATA_PWR1/SATA_PWR2)

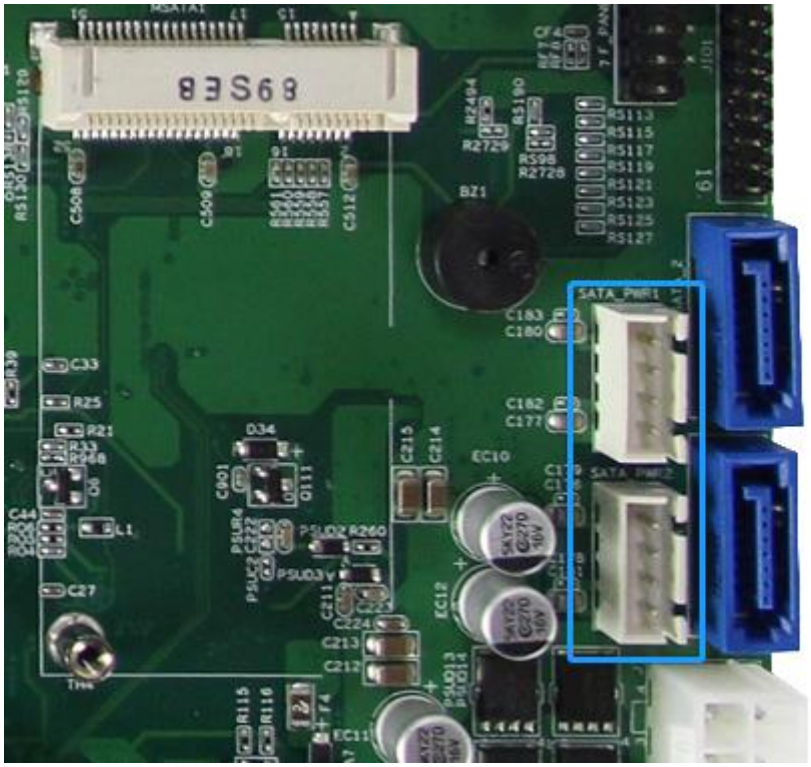


Figure 2. 23

Table 2.15 for pin assignments.

Table 2.15: SATA power connector			
Pin	Signal	Pin	Signal
1	5V	3	GND
2	GND	4	12V

2.3.14 mSATA Connector (MSATA1)

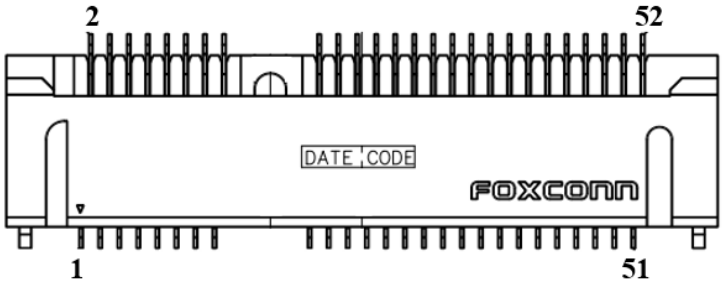


Figure 2. 24

MSATA interface with SATA and USB signal.

The Serial ATA connectors are used to connect mSATA module.

2.3.15 Mini-PCIe Connector (3GWIFI1)

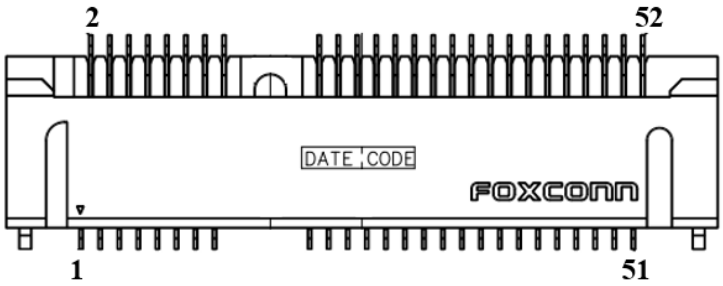


Figure 2. 25

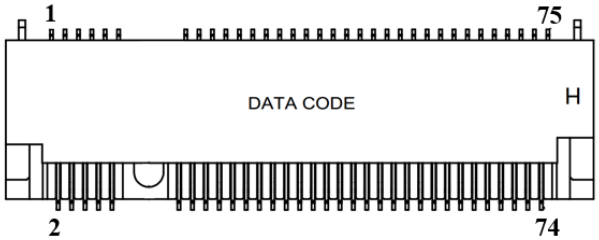
Mini PCIe interface with PCIe and USB signal, Install Mini PCI Express cards such as network cards or other cards that comply to the Mini PCI Express specifications into the Mini PCI Express slot.

(Note: SIM1 slot is connected to 3GWIFI1 slot)

2.3.16 SIM card connector (SIM1)

SIM1 slot is connected to 3GWIFI1 slot.

2.3.17 M.2 connector (NGFF1)

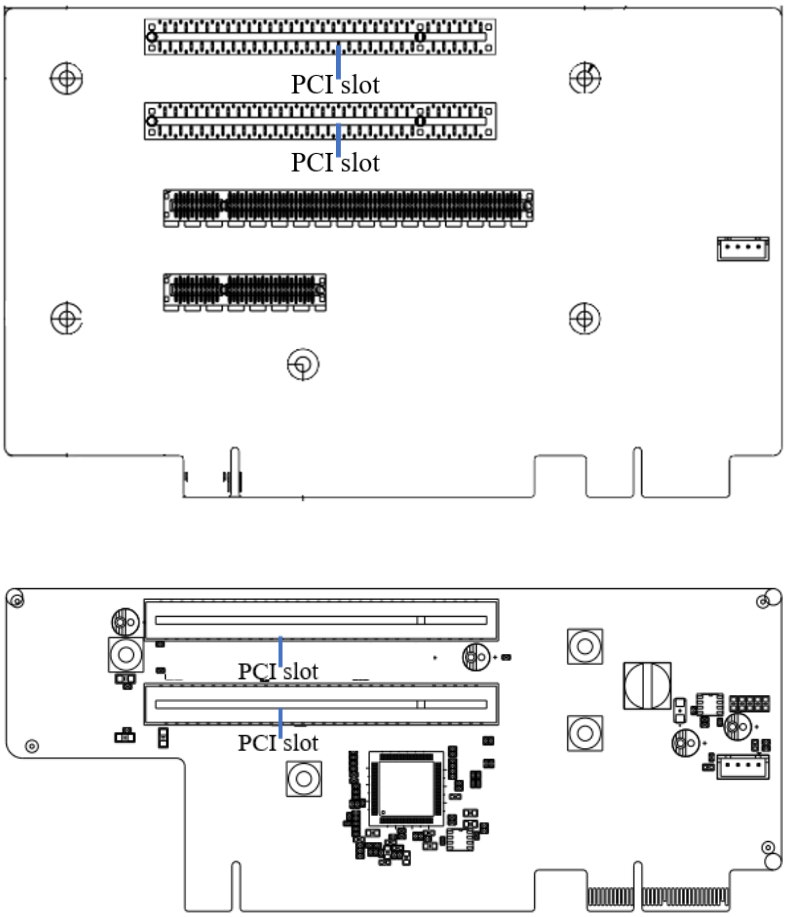


M.2(NGFF) interface with USB2.0 and SATA signal, Install M.2 2242 B-Key modules such as SATA SSD module that comply to the M.2 2242 B-Key specifications into the NGFF slot.

2.3.18 PCI Slot (In Sub-card ECX-242 or ECI-245)

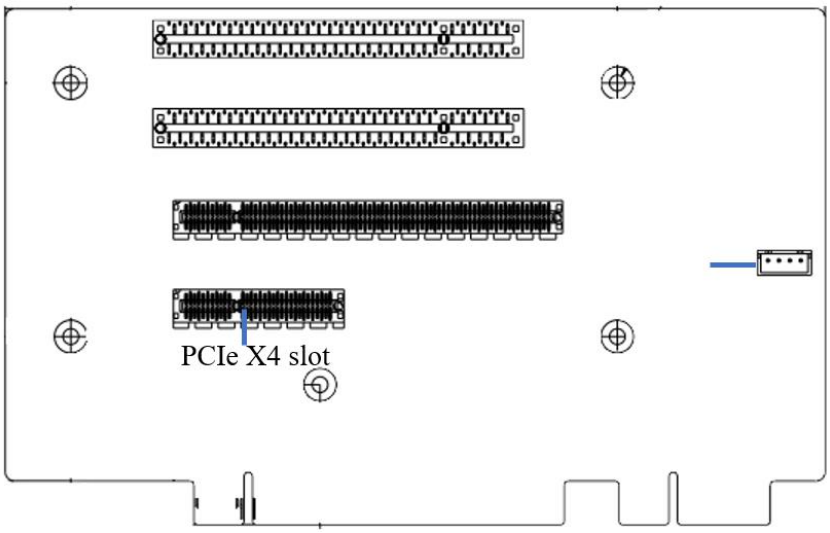
The KMDA-3921 provides two PCI expansion slots from the ECX-242 daughter card. The KMDA-3920

provides two PCI expansion slots from the ECI-245, used for connecting standard PCI devices such as motion control cards and data acquisition cards. The length of the expansion card should be less than 235mm.



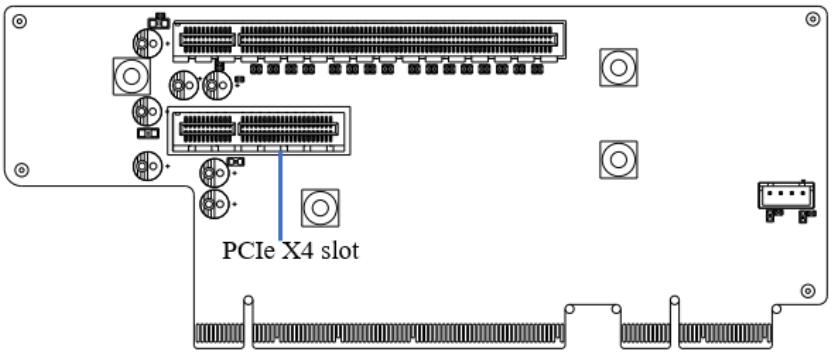
2.3.19 PCIeX1 Slot (In Sub-card ECX-242)

The KMDA-3921 provides PCIeX1 expansion slot from the ECX-242 daughter card, used for connecting standard PCIeX1 device. The length of the expansion card should be less than 225mm.



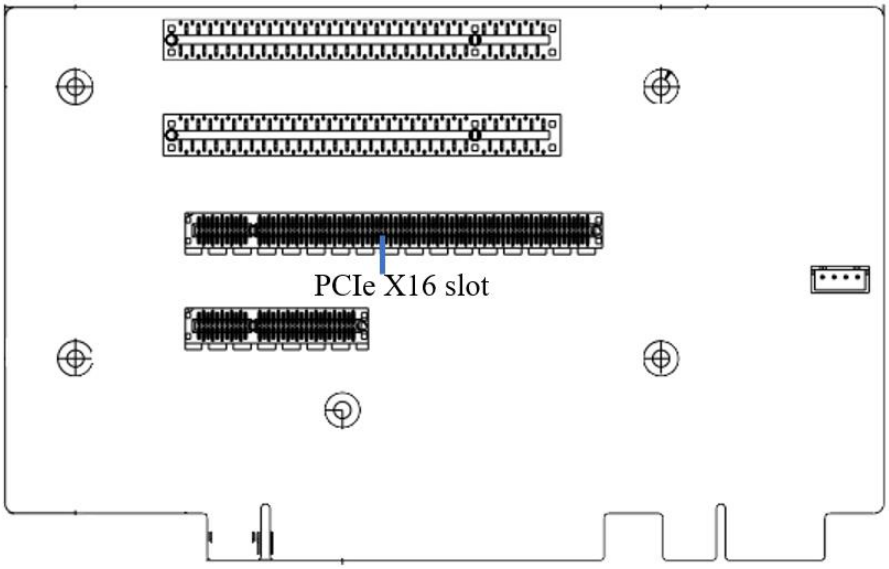
2.3.20 PCIeX4 Slot (In Sub-card ECX-241)

The KMDA-3921 provides PCIeX4 expansion slot from the ECX-242 daughter card, used for connecting standard PCIeX4 device. The length of the expansion card should be less than 225mm.



2.3.21 PCIeX16 Slot (In Sub-card ECX-241 or ECX-242)

The KMDA-3921 provides PCIeX16 expansion slot from the ECX-242 daughter card. The KMDA-3920 provides PCIeX16 expansion slot from the ECI-241, used for connecting standard PCIeX16 devices such GPU cards. The length of the expansion card should be less than 225mm.



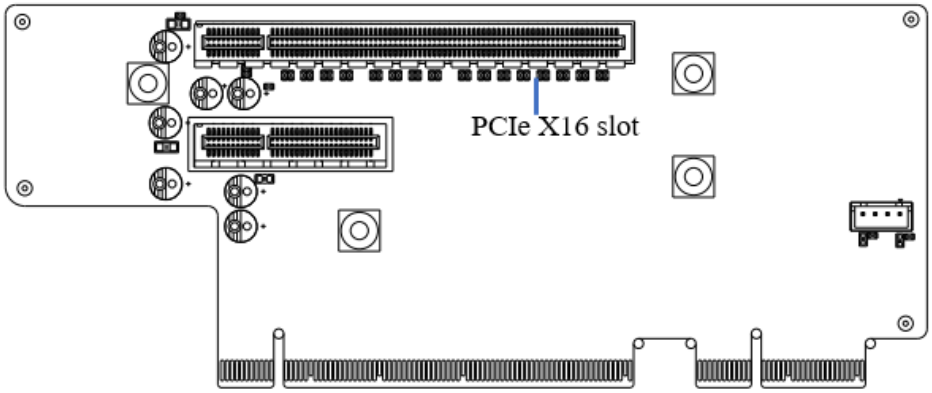


Figure 2. 26

Figure 2. 27

2.3.22 LED

There are 1*Power LED, 1*HDD LED, 3*CPU temperature class LEDS on the front. Users can monitor the working state of the CPU according to the display of LEDs.

Table 2.30 for LEDs state of CPU temperature class.

Table 2.30: LEDs state of CPU temperature class.

LED	State
Red	Warning
Yellow	High
Green	Normal

2.4 Installation

Here the hardware installation takes KMDA-3921 series for example, and the KMDA-3920, KMDA-3610 series installation operation is similar.

2.4.1 HDD/SSD Installation

Step 1: Unscrew 4 screws on the HDD/SSD cover, remove the HDD/SSD cover;

Step 2: Unscrew 2 screws on HDD/SSD bay, take out the HDD/SSD bay;

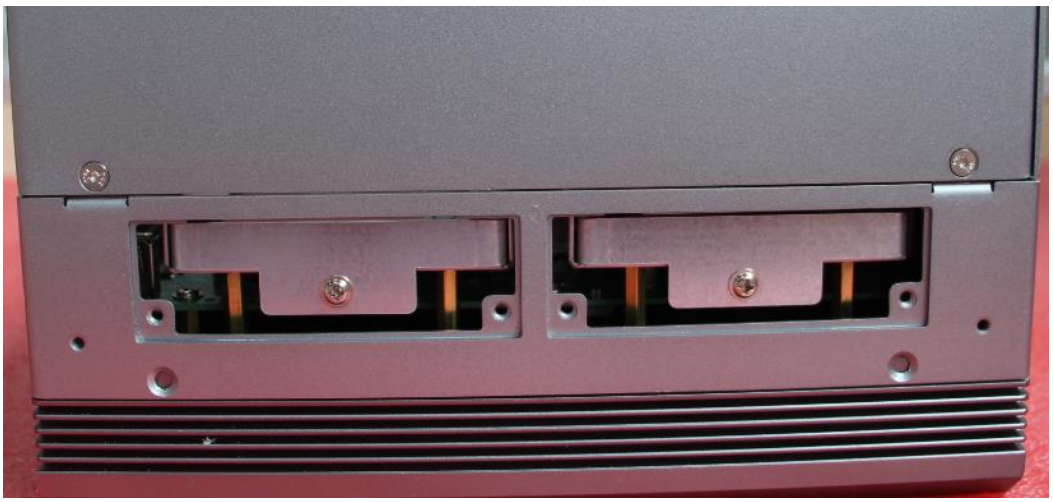
Step 3: Put the HDD/SSD into the HDD/SSD bay, screw 4 screws as the picture shows;

Step 4: Put the HDD/SSD bay into the HDD/SSD slot as the picture shows;

Step 5: Screw 2 screws on the HDD/SSD bay;

Step 6: Install the HDD/SSD cover, screw 4 screws as the picture shows.


SEAGATE
BARRACUDA



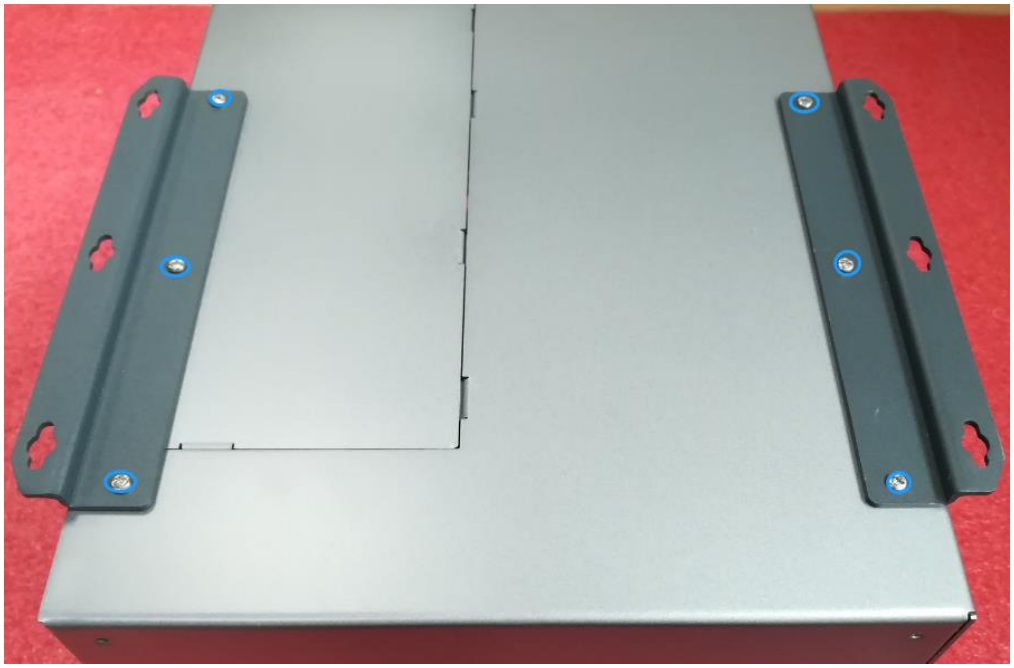
2.4.2 Installing mini-PCIe

Step 1: **(KMDA-3921/3920)**

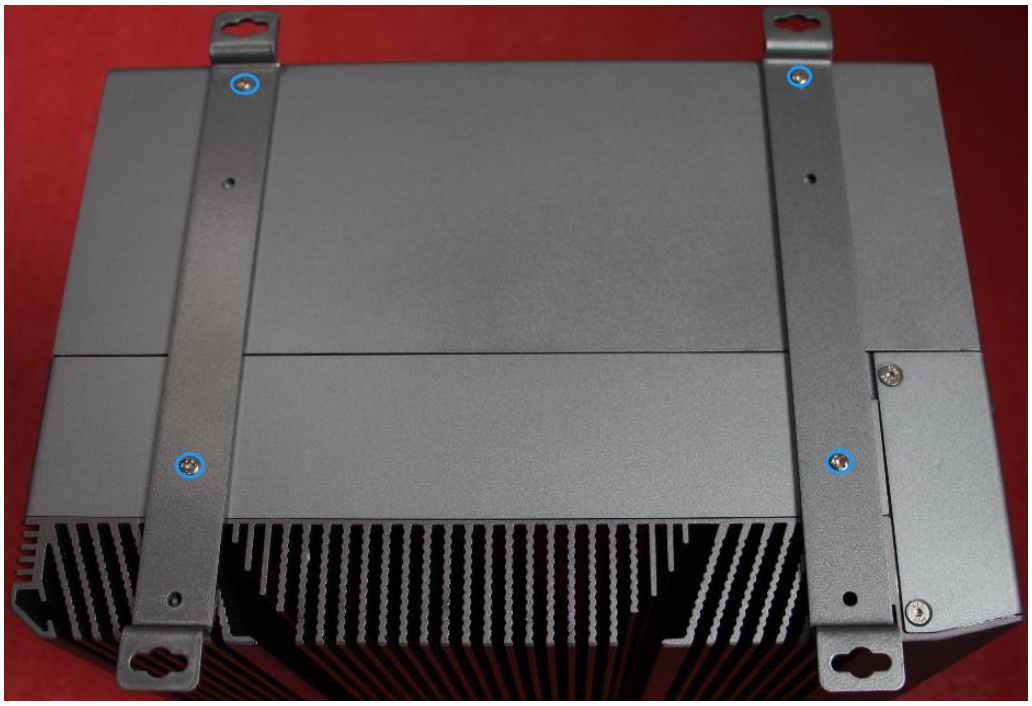
Unscrew screws on the Mounting brackets as picture shows, remove the mounting bracket; (Note: There are three types of mounting brackets, please disassemble according to your actual situation.);

Unscrew the Spring screw and take off the expansion cover;

(Installation mode I of KMDA-3921/3920)



(Installation mode II of KMDA-3921/3920)

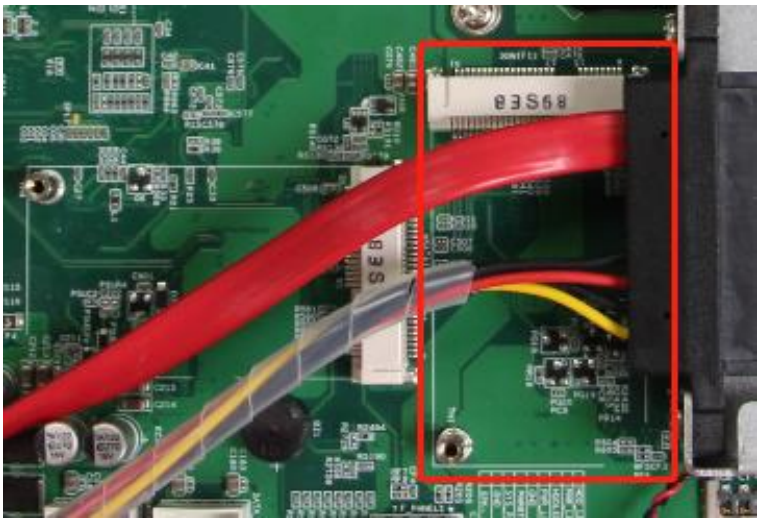


(Installation mode III of KMDA-3921/3920)

(KMDA-3610):

Unscrew the 7 screws on the bottom cover (4 in front & back, 3 in side) as shown in the picture, remove the bottom cover.

Step 2: Hold the Mini PCIe module with its notch aligned with the Mini PCIe socket of the board and insert it at a 30 degrees angle into the socket;



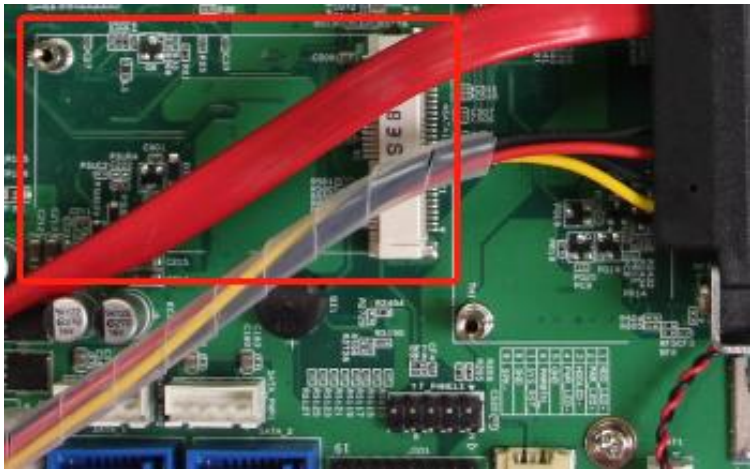
Step 3: Screw one screw to the holder;

Step 4: Follow the reverse steps of disassembly to complete the product installation.

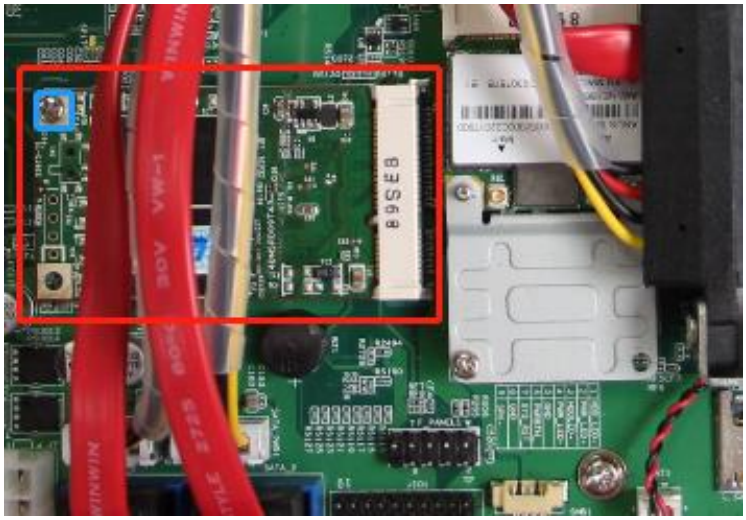
2.4.3 Installing MSATA

Step 1: The step here is the same as above chapter "2.5.2 Installing Mini PCIe Module -Step 1", For details, please refer to the above chapter "2.5.2 Installing Mini PCIe Module -Step 1"

Step 2: Hold the MSATA module with its notch aligned with the MSATA socket of the mother board and insert it at a 30 degrees angle into the socket (Note: Pay attention to avoiding the hard disk cable during the installation process);



Step 3: Screw one screw to the holder as shown in the picture.



Step 4: Follow the reverse steps of disassembly to complete the product installation.

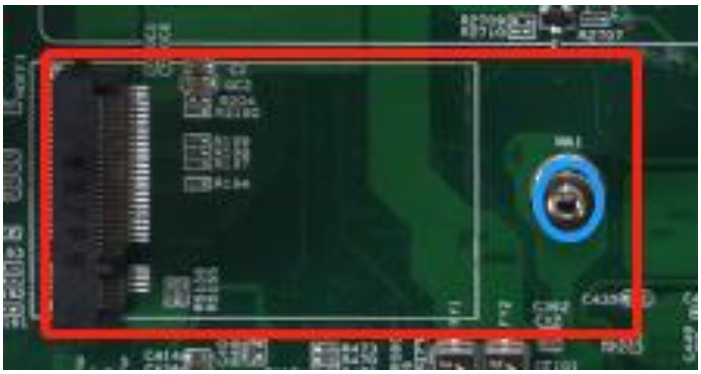
2.4.4 Installing M.2 Module

Step 1: The step here is the same as above chapter "2.5.2 Installing Mini PCIe Module -Step 1", For

details, please refer to the above chapter "2.5.2 Installing Mini PCIe Module -Step 1"

Step 2: Hold the M.2 module with its notch aligned with the NGFF socket of the mother board and insert it at a 30 degrees angle into the socket (Note: Pay attention to avoiding the hard disk cable during the installation process);

Step 3: Screw one screw to the holder as shown in the picture.



Step 4: Follow the reverse steps of disassembly to complete the product installation.

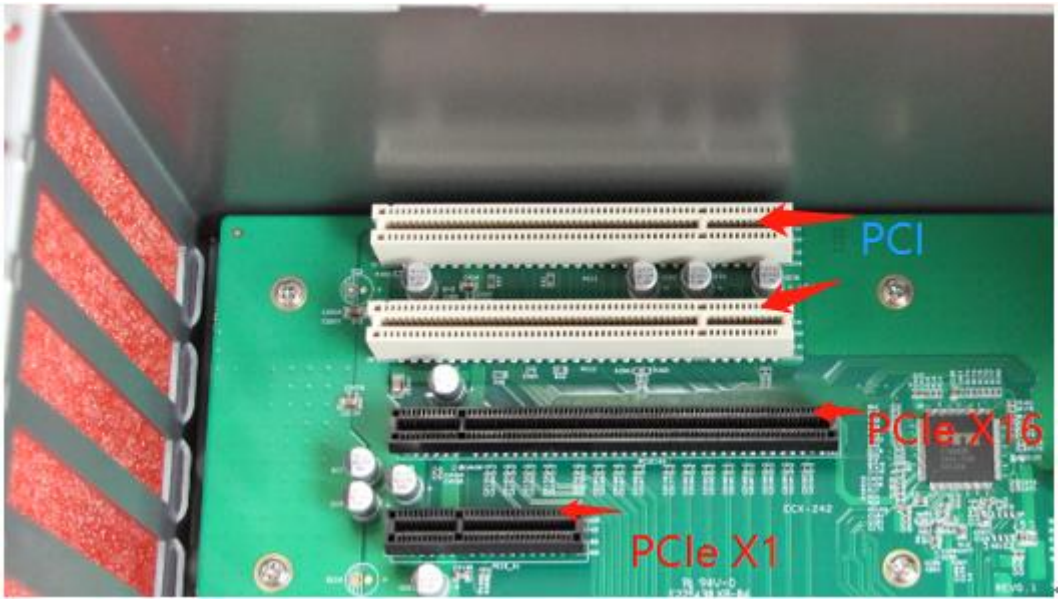
2.4.5 Installing Expansion Functional Module

(Note: this operation is only for KMDA-3921/3920, and KMDA-3610 does not support the installation of PCIe/PCI expansion module. Here is an example of KMDA-3921, and the installation of KMDA-3920 is similar)

Step 1: The step here is the same as above chapter "2.5.2 Installing Mini PCIe Module -Step 1", For details, please refer to the above chapter "2.5.2 Installing Mini PCIe Module -Step 1"

Step 2: Unscrew 4 screws on 4 bars, take off 4 bars;

Step 3: Put the PCIe/PCI functional module into the expansion slot which is on the ECX-242;



Step 4: Follow the reverse steps of disassembly to complete the product 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.

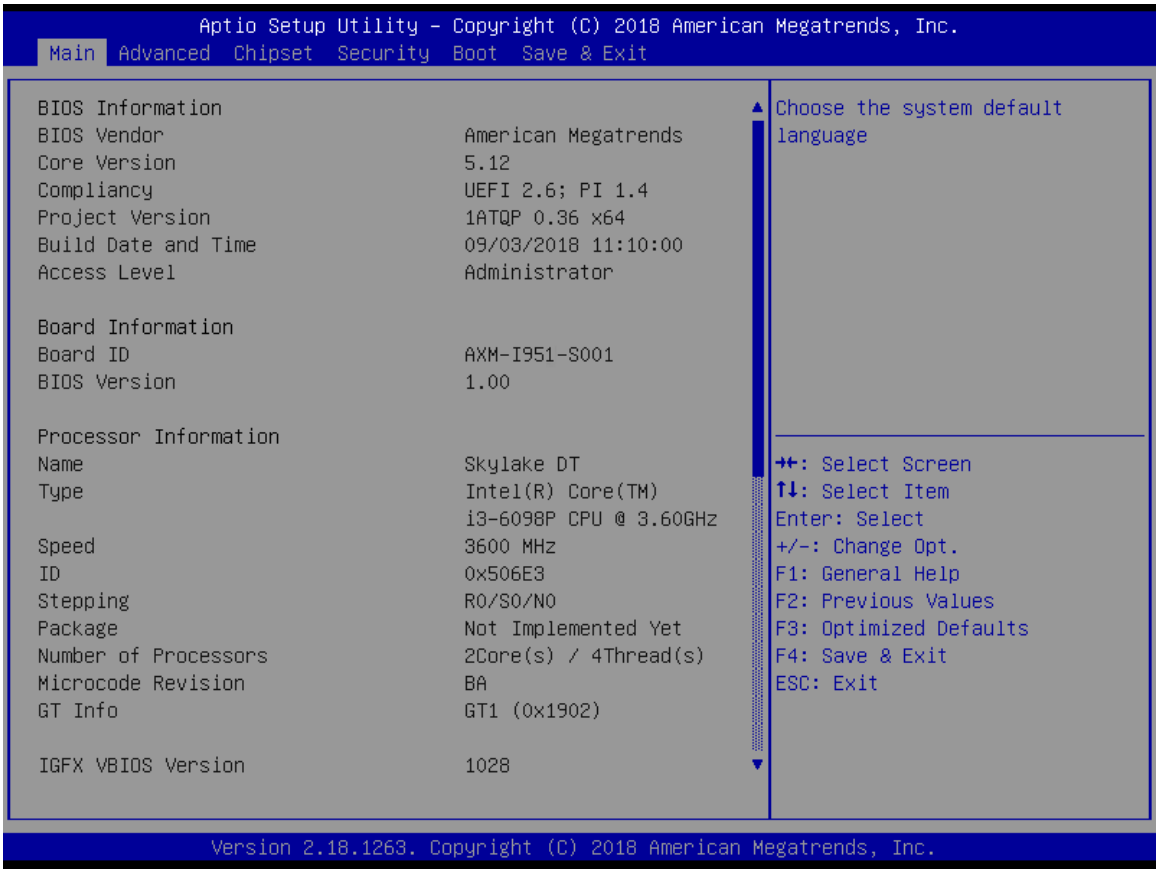
(But in general, customers are not recommended to set it up. In most cases, using the default value is already the best setting.)

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:

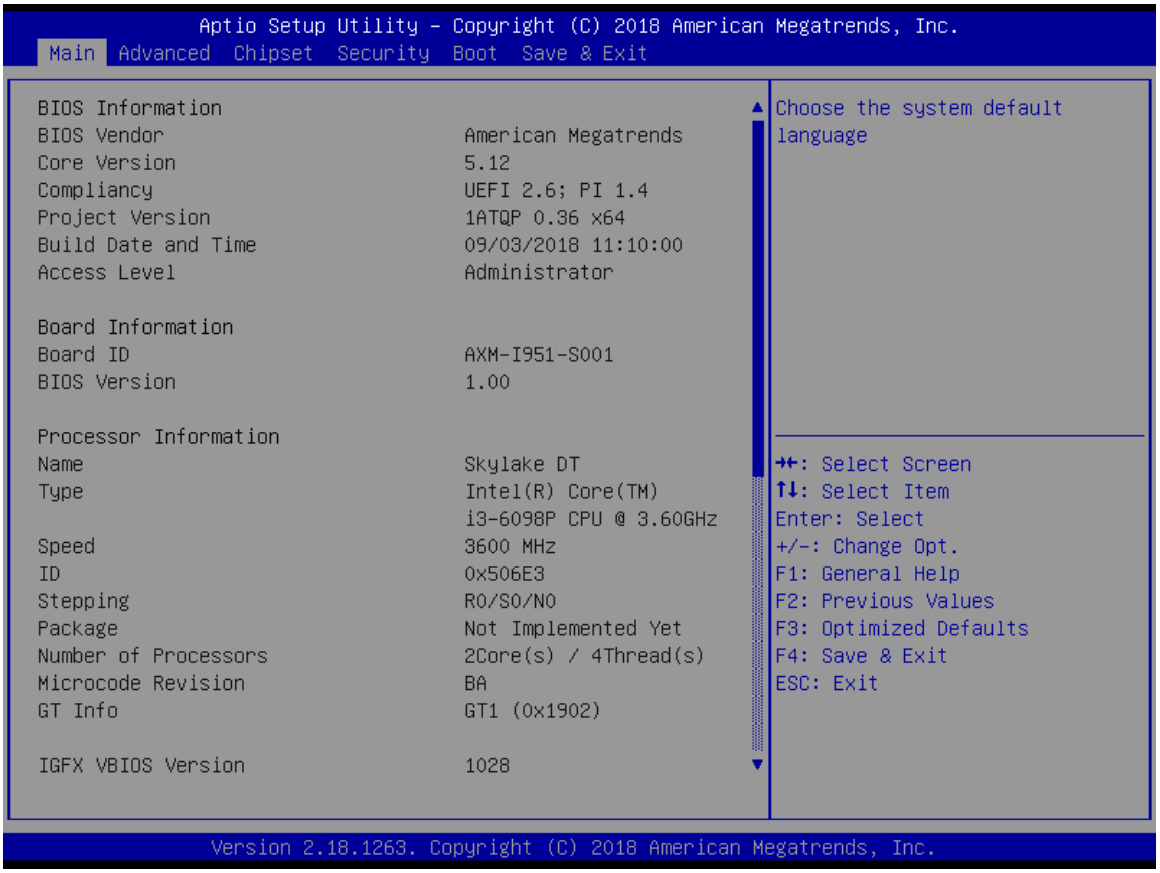
Table 3.1: The BIOS navigation keys

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 Information

This item shows the information of the BIOS vendor, version, build date and time etc.

Board Information

This item shows the basic information of the motherboard, including the Board ID and BIOS Version of the motherboard.

Processor Information

This item shows the basic information about the currently used processor, including name, type, speed, ID, core, Microcode version, etc.

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, model, type, etc.

ME FW Version

This item shows the version number of the ME firmware

ME firmware SKU

This item shows the ME firmware model number

System Language

Set the language interface of the BIOS.

System Date

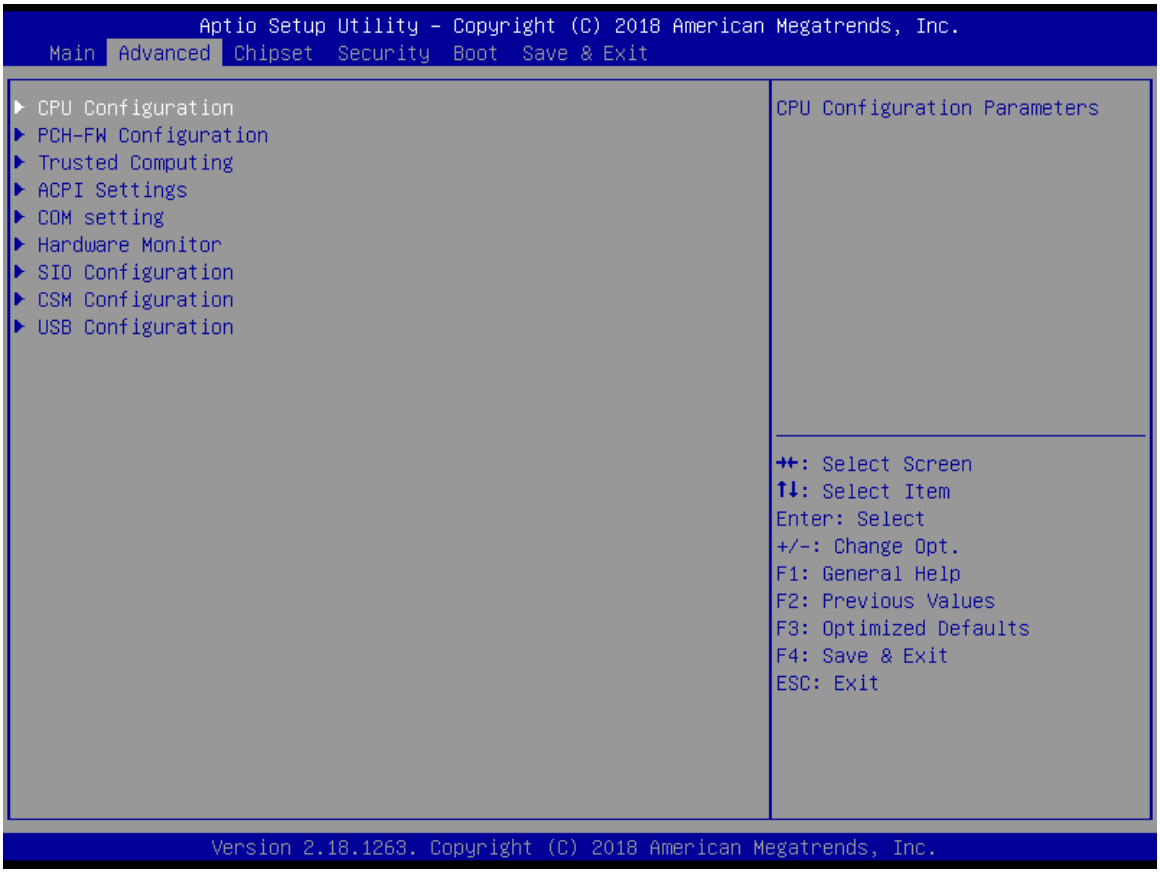
Set the date. The format of the date is <week><month><day><year>.

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.

PCH-FW Configuration

This item contains the PCH firmware configuration, enter this sub-menu, there will be detailed details of the ME, as well as related settings of the AMT function.

Trusted Computing

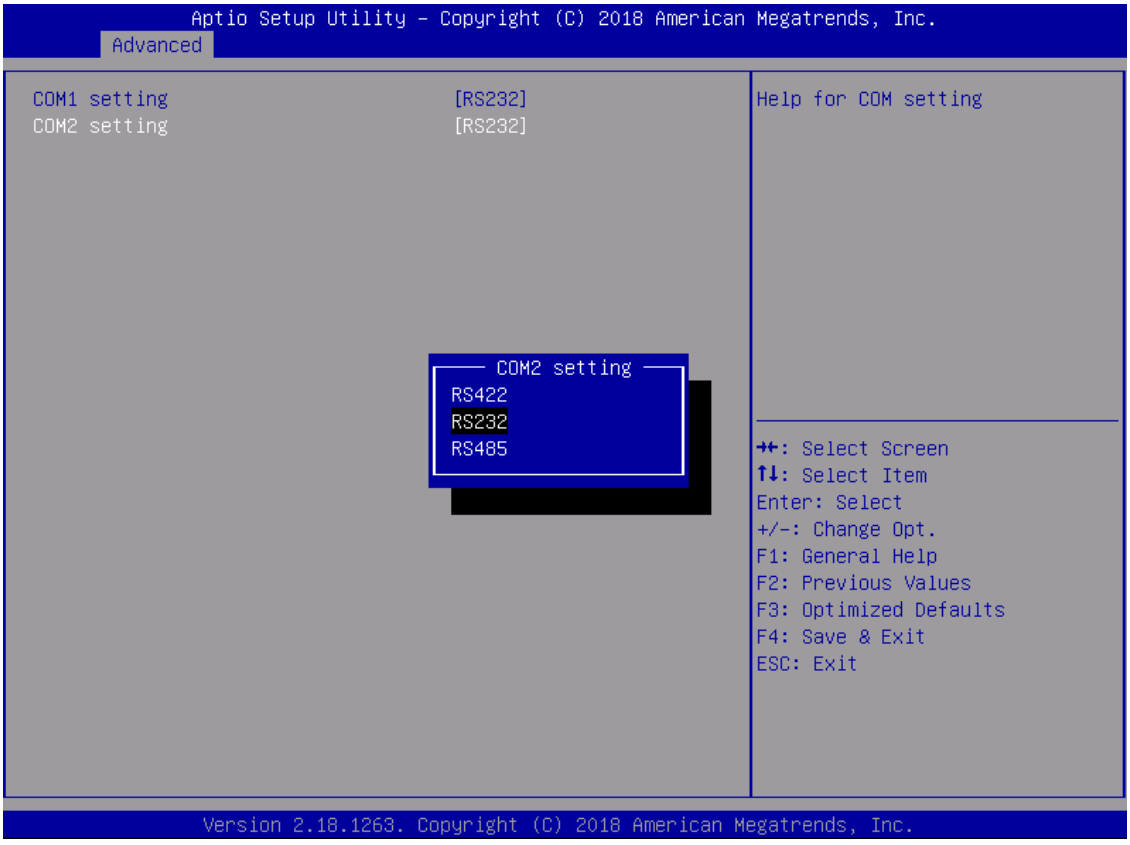
Trusted computing, enter this sub-menu, there will be the setting of the encryption security module (the motherboard will install the encryption module hardware will take effect)

ACPI Settings

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

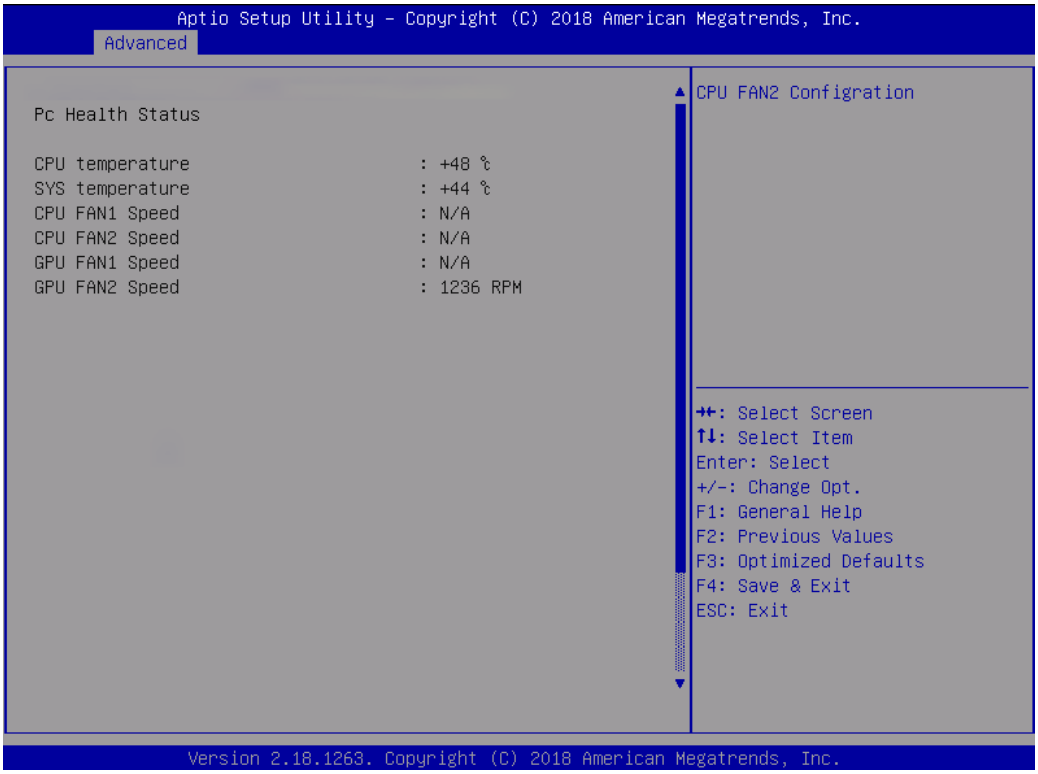
COM setting

COM port settings, enter this sub-menu, there will be set COM working mode: RS422, RS232, RS485



Hardware Monitor

Hardware monitoring, enter this sub-menu, there will be CPU temperature, fan speed, status display of each common working voltage, as well as parameter settings of intelligent fan control.



SIO Configuration

Super IO configuration, enter this sub-menu, there will be the port configuration of the serial/parallel port which are included in IO.

CSM Configuration

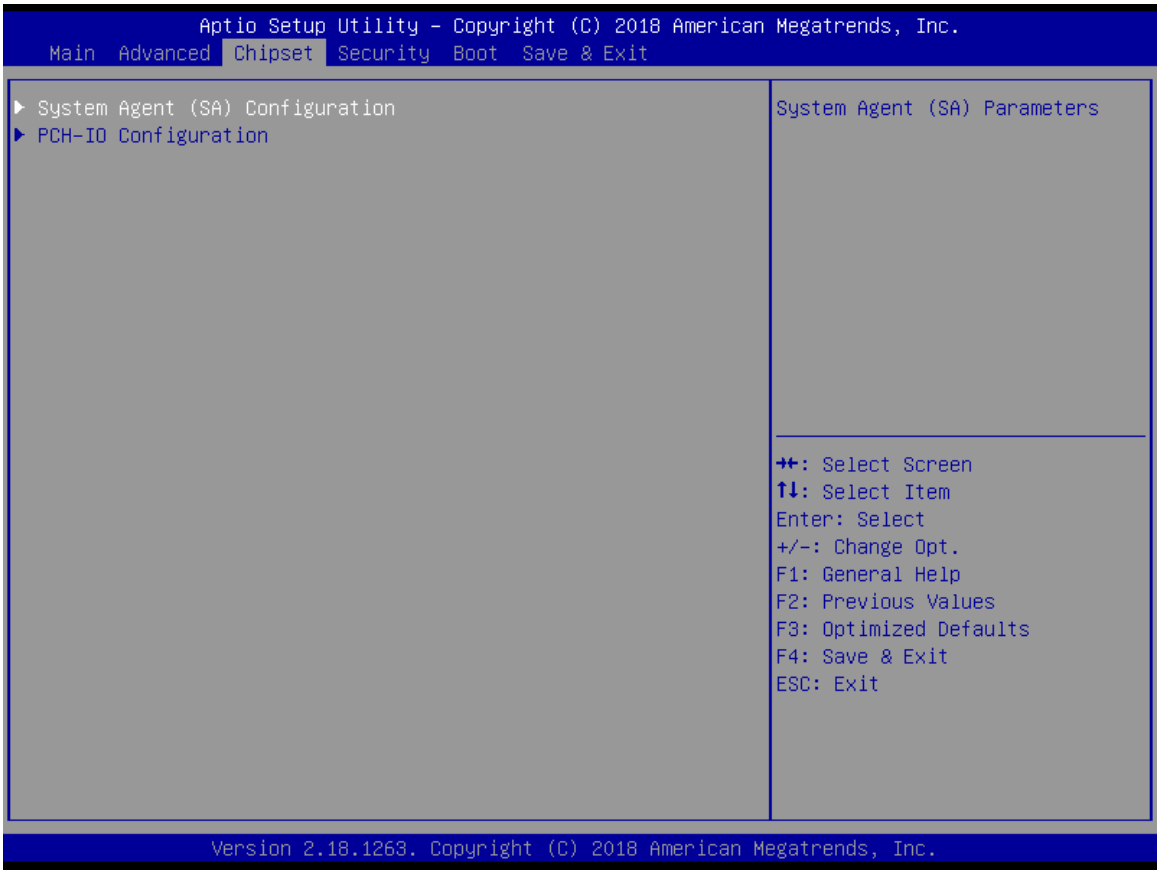
CSM (Compatibility Support Module) configuration, enter this sub-menu, there will be various settings to support UEFI startup and non-UEFI startup. If you need to start the traditional MBR device, you need to enable CSM. Turning off the CSM turns it into a pure UEFI boot.

USB Configuration

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

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.



System Agent (SA) Configuration

Memory Configuration

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

Graphics Configuration

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

PEG Port Configuration

PEG graphics configuration, enter this sub-menu, there will be related settings for the external graphics card.

PCH-IO Configuration (South Bridge Configuration)

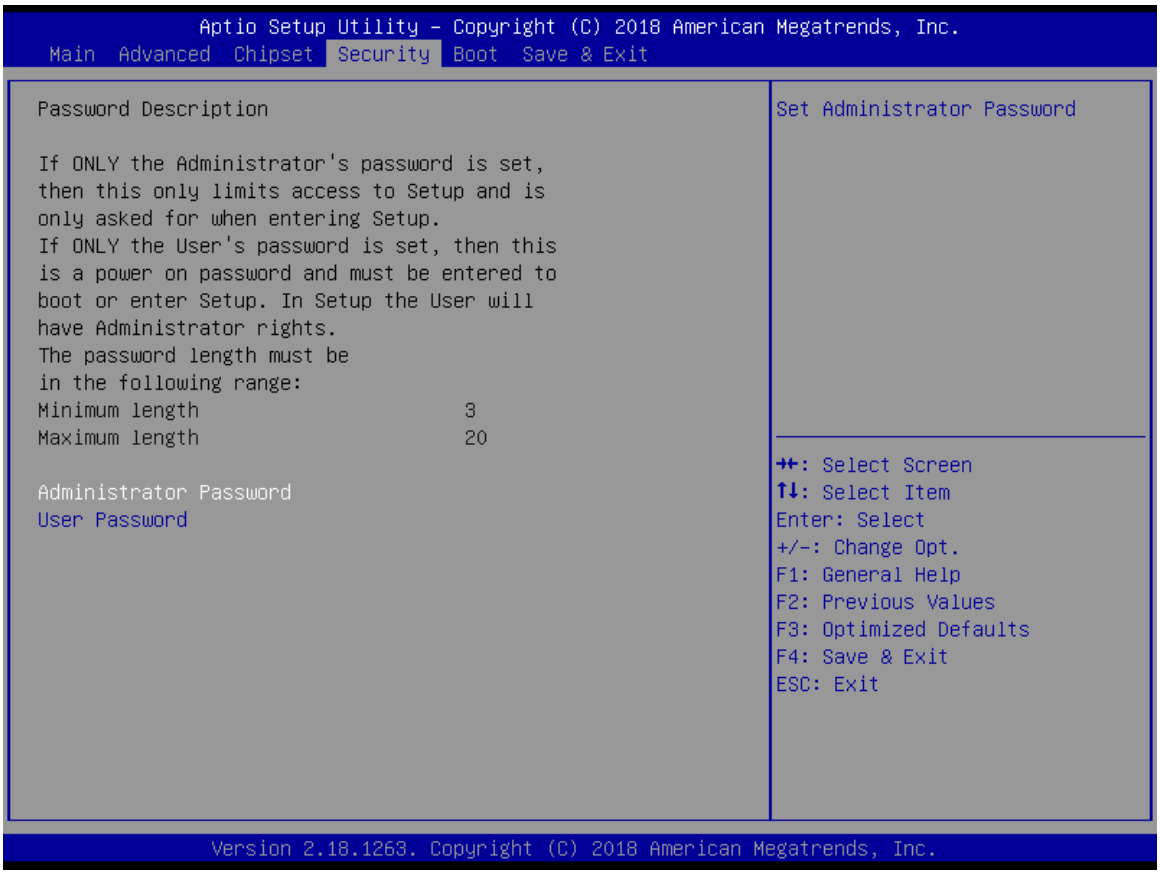
SATA And RST Configuration

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

HD Audio Configuration

High-fidelity audio, which controls the switch settings of the motherboard's sound card.

3.2.5 Security menu



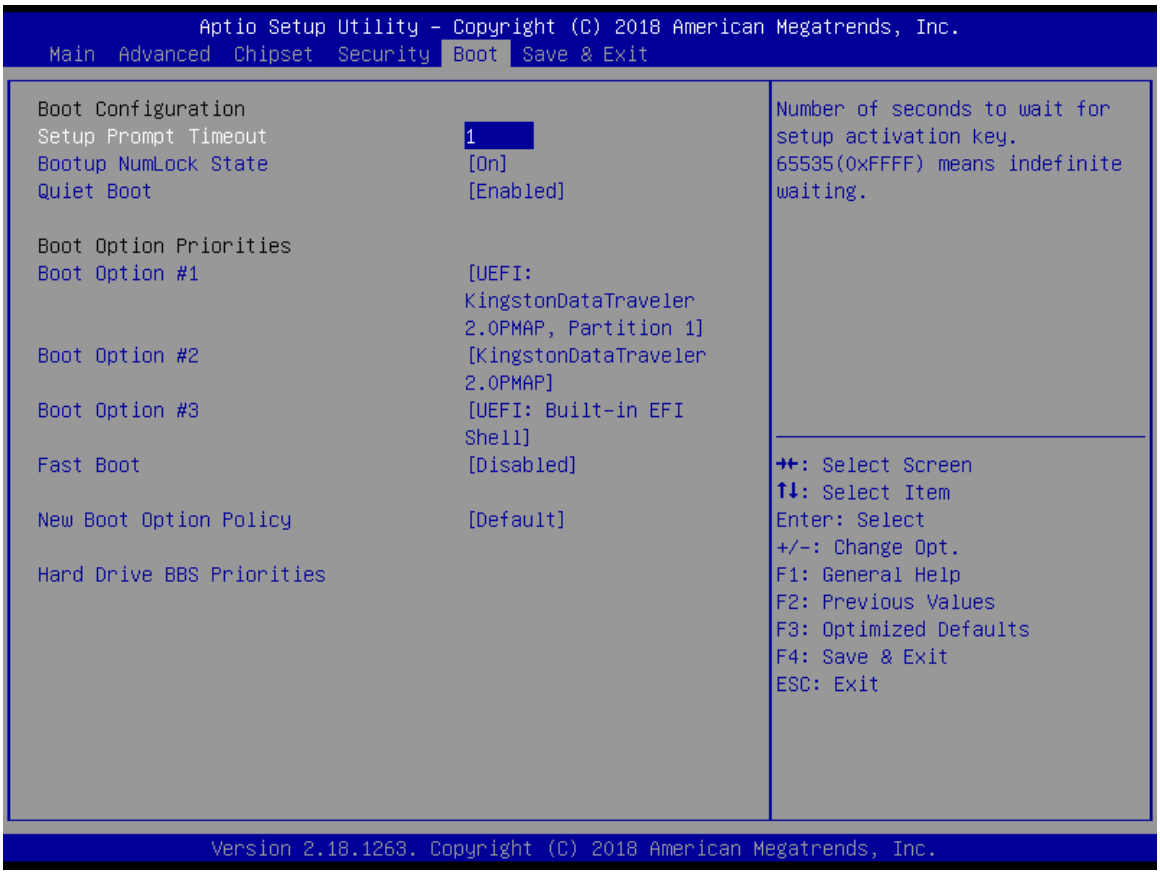
Administrator Password

This item sets the information of the administrator password.

User Password

This item sets the information of the normal user password.

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

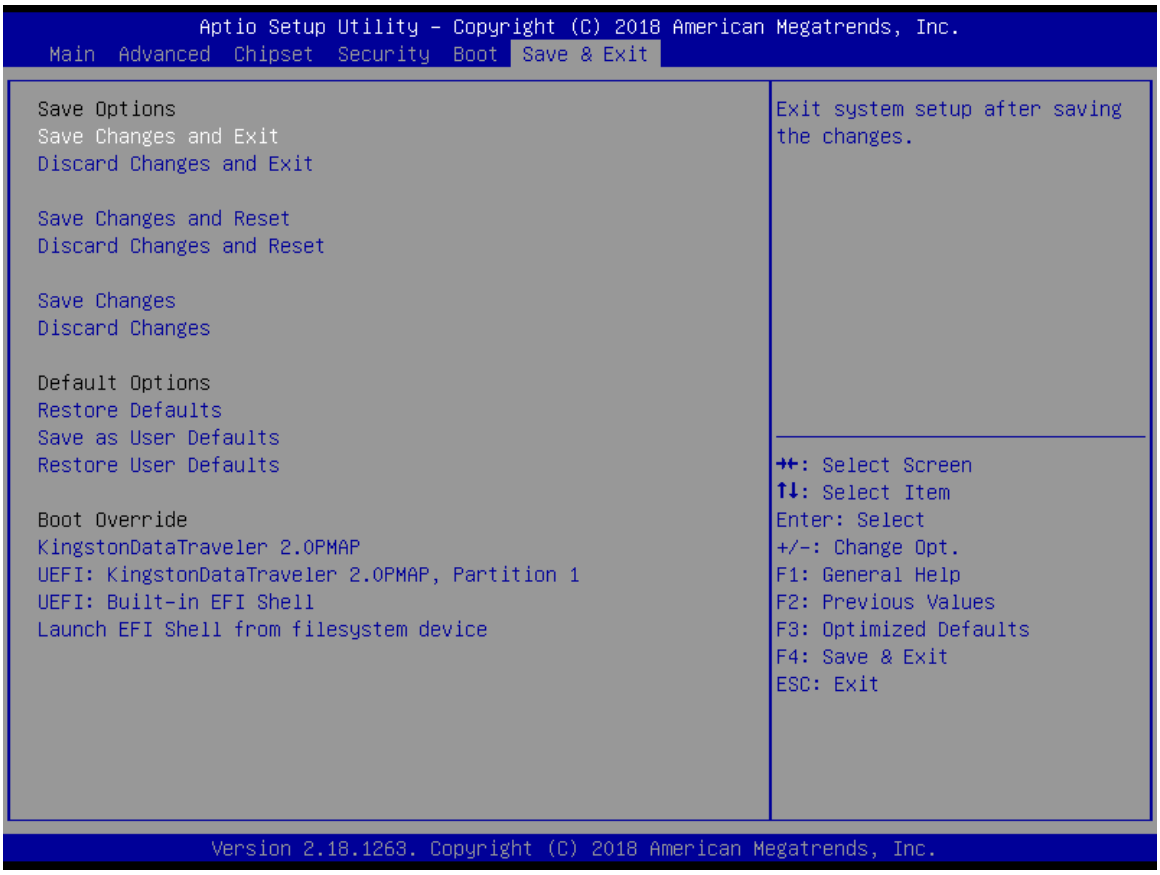
Fast Boot

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

Set Boot Priority

Start device priority settings. If the user wants to install the operating system, please set "Boot Option #1" as your CD-ROM device or your U disk device (make sure that your CD-ROM drive has an operating system or your U disk has a PE system). After the setting is completed, press the "F4" button to save and exit. The system will boot from your CD-ROM drive or USB flash drive.

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 KMDA-3921/3920/3610 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:

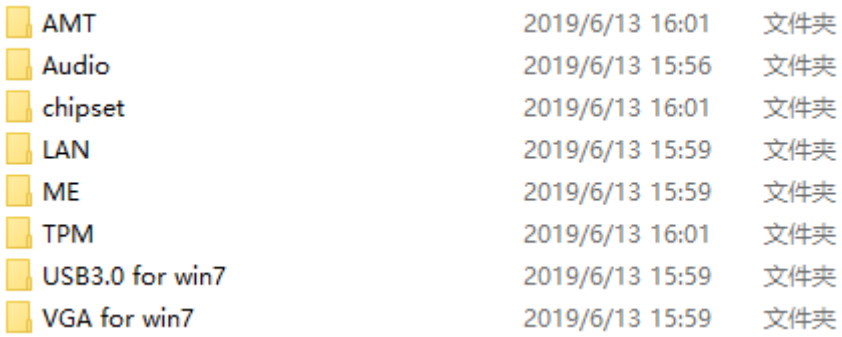


Figure 5. 1

Step 1 – Install AMT Driver
Step 2 – Install Audio Driver
Step 3 – Install Chipset Driver
Step 4 – Install LAN Driver
Step 5 – Install ME Driver
Step 6 – Install TPM Driver
Step 7 – Install USB3.0 Driver
Step 8 – Install VGA Driver

Please read instructions below for further detailed installations.

4.2 Installation:

Insert the AXM-I951 CD-ROM into the CD-ROM drive. And install the drivers in turn.

Step 1 – Install AMT Driver
1. Double click on the AMT 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 Chipset Driver
1. Double click on the Chipste 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 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 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

Step 6 –Install TPM Driver
1. Double click on the TPM 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 7 –Install USB3.0 Driver
1. Double click on the USB3.0 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 8 –Install VGA Driver
1. Double click on the VGA 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 AXM-I951 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.

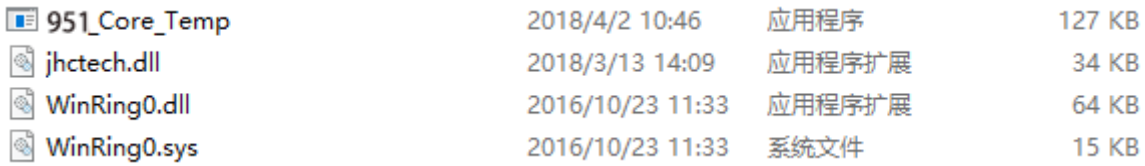


Figure 5. 2

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 initializated, 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  * 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*================================================================================*/

/*================================================================================
 1   * void smbus_16pin_gpio_mode(int port,int mode);
 2   * function description: Subcard input and output mode settings
 3   * parameter description:
```

Parameter: port represents the number of the GPIO, 1 or 2

Mode 8 bit of a bit, each bit controls the input and output mode of a GPIO pin,

Bit =1, the corresponding pin is used as the input port.

Bit =0, the corresponding pin is used as an output port.

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

Note: The output value is valid only when the pin is in output mode.

4 * creation date：

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

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

1 * void smbus_16pin_gpio_output(int port,int level);

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

3 * parameter description:

Parameter: port represents the number of the GPIO, 1 or 2

Level 8 bit of a bit, each bit controls a GPIO pin output value,

Bit =1, means output high level

Bit =0, means output low level

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

Note: The output value is valid only when the pin is in output mode.

4 * creation date：

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

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

1 * int smbus_16pin_gpio_input (int port);

2 * function description: read the motherboard GPIO input level

3 * parameter description:

Return value: return a byte (8 bit), each bit of the 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 sub-card GPIO number, 1 or 2

Note: The read value is valid only when the pin is in input mode

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.