MATX-I961

User's Manual

Ver.A1.0

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Version Note

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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.

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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.

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

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- 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

MATX-I961 is powered by the Intel® Xeon® /8th/9th Gen Core I9/I7/I5/I3 LGA1151 CPU for industrial application. The motherboard supports 4*DDR4 2666/2400MHz memory, up to 128GB. It features Intel UHD Graphics, Supports DirectX11.1, OpenGL 5.0 and OpenCL 2.1.

MATX-I961 offers 1*HDMI,2* DP, VGA, multi-displays, 3*GbE LAN, 4*COM, 6*USB3.1，7*USB2.0，8-bit GPIO, 1*F-Mini PCIe with SIM slot, which supports 4G/LTE/Wifi/BT, 2*PCIe X16(or 2*PCIeX8） slot, 2*PCIeX4 slot; 1*M.2 2280 M-key, 4*SATA HDD/SSD are used for storage. ATX Power (12V/5V/3.3V) power input, high performance, multiple IO, multiple expansion, it is fit for Industrial automation, AI edge computing, small intelligent workstations, multimedia service systems, visual control and so on.

1.2 Features

Key Features

- Intel® Xeon® /8th/9th Gen Core I9/I7/I5/I3 LGA1151 CPU
- 4*288-Pin DIMM, support DDR4 2666/2400MHz, up to 128GB
- Intel® Q370 Chipset (MATX-I961-S001)，optional Intel® C246 Chipset (MATX-I961-S002)
- 1*F-mini PCIe with SIM slot, support 4G LTE and Wifi/BT
- 2*PCIe X16(or 2*PCIeX8) slot, 2*PCIe X4 expansion slot
- 1*M.2 2242 B-key for storage
- 4*SATA3.0 6.0Gbps, HDD/SSD, support Raid 0/1/5/10
- 2*DP, 1*HDMI, 3 independent display
- 2*Intel I210AT, 10/100/1000Mbps；1*Intel I219LM support iVpro technology
- Realtek ALC662VD controller, Audio out and MIC, support 5.1 channel
- 8-bit GPIO, 6*USB3.1, 7*USB3.0, 4*COM, Support TPM 2.0
- ATX Power (12V/5V/3.3V)

1.3 Specifications

1.3.1 General

CPU: Intel® Xeon® /8th/9th Gen Core I9/I7/I5/I3 LGA1151 CPU

System chipset: Intel® Q370, optional Intel® C246

BIOS: AMI 128 Mbit SPI BIOS

System Memory: 4*288-Pin DIMM DDR4 2666/2400MHz, Up to 128GB

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

Serial Ports: 4*COM header

USB: 6*USB 3.1 Type A ports, 5*USB 2.0 Type A ports, 2*USB 2.0 pin header

DIO: 8-bit DIO, TTL signal, programmable input and output

Expansion Interface:

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

PCIe slots:

2*PCIe X16(or 2*PCIeX8) slot (PCIe Gen3, support 1 PCIex16 device, When connecting 2 devices, it automatically switches to 2*PCIe X8)

2*PCIe X4 slot

Storage:

1*M.2 2280 M-Key

4*SATA3.0 HDD/SSD bay, support Raid 0/1/5/10

1.3.2 Display

Chipset: Intel UHD Graphics, supports DirectX11.1, OpenGL 5.0 and OpenCL 2.1

Display Memory: Shared system memory

Resolution: HDMI 3840*2160@30Hz； DP 4096*2304@60Hz

1.3.3 Ethernet

Chipset: 2*Intel® I210AT Ethernet controllers, 1* Intel® I219LM Ethernet controller

Speed: 10/100/1000 Mbps Integrated

Interface: **3**RJ45

1.3.4 Audio

Chipset: Realtek ALC662VD controller, support 5.1 channels

1.3.5 Power Consumption

Input Voltage: 24-pin ATX/8-pin ATX 12V

Power Consumption: TBD

1.4 Environmental Specifications

Operating temperature: -0~ 60° C

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

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

EMC: CE, FCC Class B

1.5 Model Specification

Model NO.	Introduction
MATX-I961/S001	Embedded Single Board, Intel® Q370 + Coffeelake LGA1151 CPU, 3*LAN, 6*USB3.1, 7*USB2.0, 4*COM, 1*Mini PCIe, 1*M.2 2280 M-Key, 8 位 DIO, 1*PCIe X16(or 2*PCIeX8), 2*PCIe X4, 1*HDMI, 2*DP, Audio out, Mic, PS/2, TPM 2.0, 4*SATA3, 24-pin ATX/8-pin ATX 12V
MATX-I961/S002	Embedded Single Board, Intel® C246 + Coffeelake LGA1151 CPU, 3*LAN, 6*USB3.1, 7*USB2.0, 4*COM, 1*Mini PCIe, 1*M.2 2280 M-Key, 8 位 DIO, 1*PCIe X16(or 2*PCIeX8), 2*PCIe X4, 1*HDMI, 2*DP, Audio out, Mic, PS/2, TPM 2.0, 4*SATA3, 24-pin ATX/8-pin ATX 12V

1.6 Mechanical Specifications

MATX-I961 Dimension: **Unit: mm**

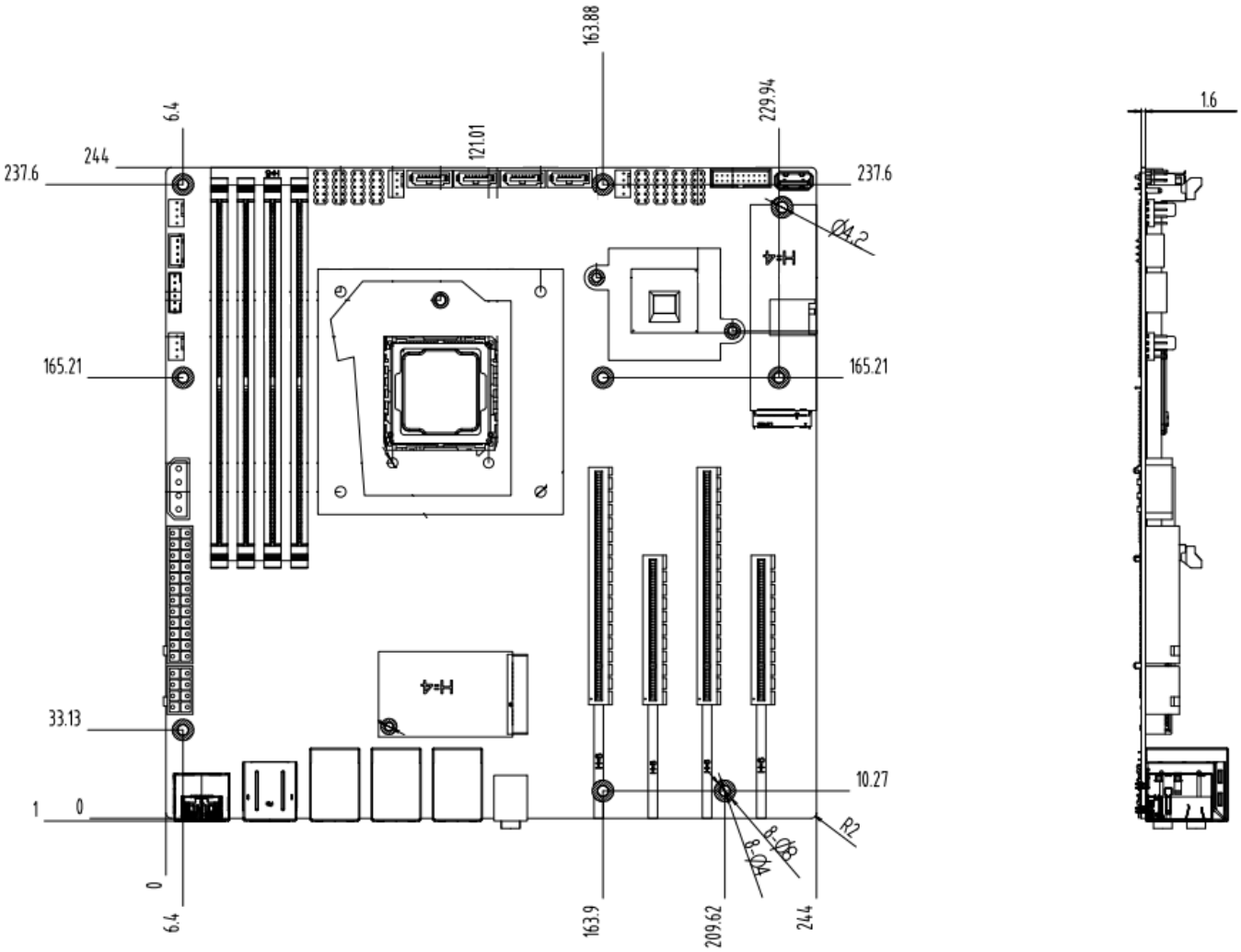


Figure 1.1

CHAPTER 2

Hardware Installation

2.1 Introduction

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

2.2 Jumpers and Connectors

You can configure your MATX-I961 to match the needs of your application by setting the jumpers. The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers.

Table 2.1: Jumpers	
Label	**Function**
ATX	Set Power-on mode at AT or ATX
CMOS	Clear CMOS Data Setting

Table 2.2: Connectors	
Label	**Function**
ATX_PWR	ATX power connector
J_CPU-POWER	CPU power connector
J4	1*DP,1*HDMI connector
J_USB1	2*USB3.0,1*DP connector
CN208	1*LAN,2*USB2.0 connector
CN207	1*LAN,2*USB2.0 connector
J7	1*LAN,2*USB3.0 connector
MPE1	Mini PCIe connector
AUD1	Audio connector
PCIE1/2	PCIe X16 connector
PCIE3/4	PCIe X8 connector
NGFF	M.2 Type 2280 M-Key
U4	Q370/C246

USB10	1*USB2.0 connector
CN10	2*USB3.0 connector,2x10pin header
J_COM1/2/3/4	4*COM connector,2*5pin header
CPU_FAN1	CPU fan pin header, 1*4pin header
S_SATA1/2/3/4	4*SATA HDD/SSD connector
CPU_FAN1	CPU fan pin header, 1*4pin
J_GPIO	8-bit GPIO, 2*5pin header
CN8	2*USB2.0,2*5pin header
F_PANEL1	Front panel signal, 2*5 pin header
DIMM1/2/3/4	4*DDR4 connector1/2/3/4
GPU_FAN2	GPU fan pin header, 1*4pin
SMB1	SMBUS, 1*4pin wafer
KBMS	KBMS 1*6pin wafer
SIM0	SIM card slot
GPU_FAN1	GPU fan pin header, 1*4pin
F_AUDIO1	Front Panel ADUIO signal, 2*5 pin header
SATA_PWR1	SATA1 power connector, 1*4 pin wafer

2.3 Board layout: Jumpers and Connectors Location

The MATX-I961 Box Computer has a number of jumpers and connectors that allows you to configure your system to suit your application.

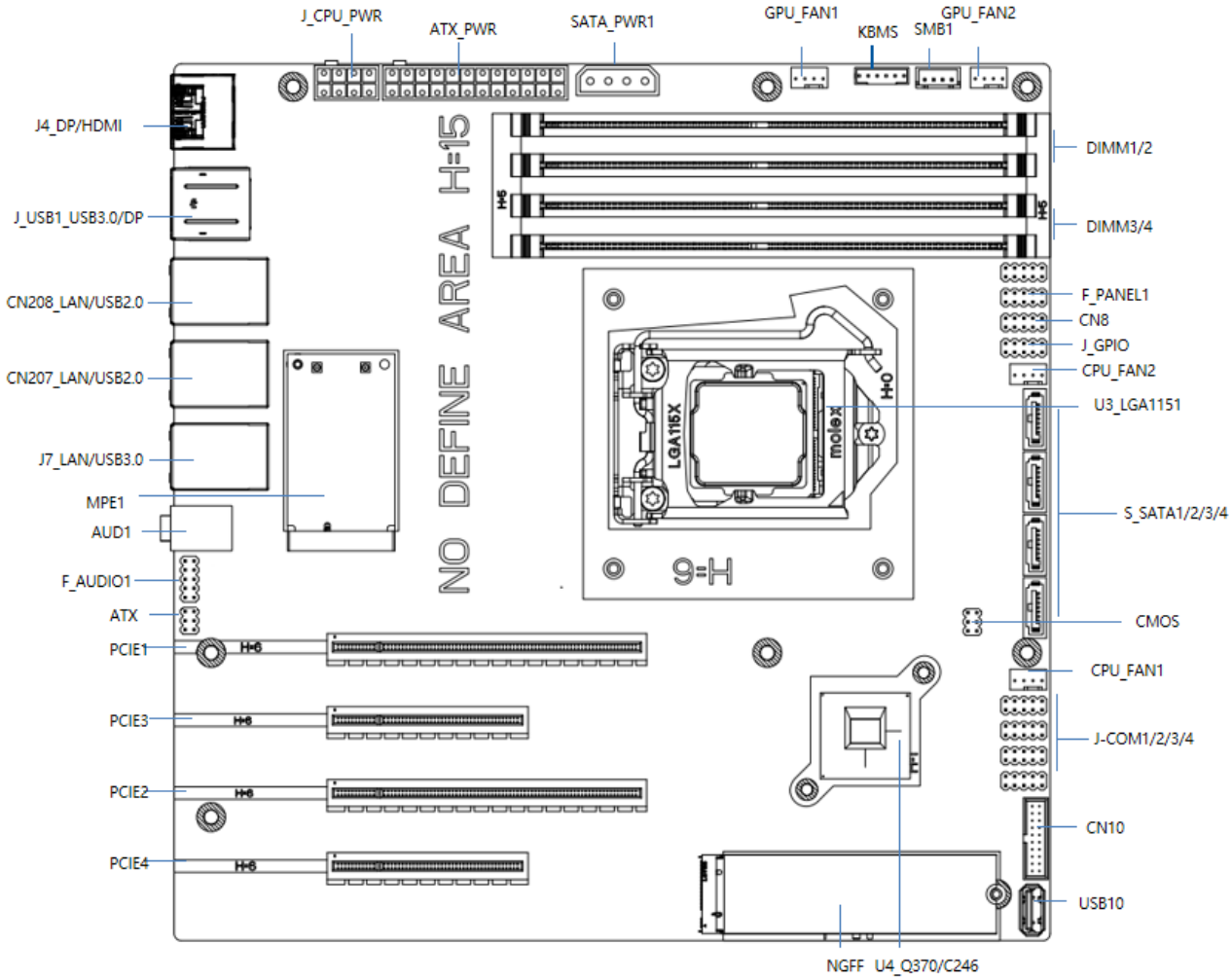


Figure 2. 1 Jumpers and Connectors Location 1

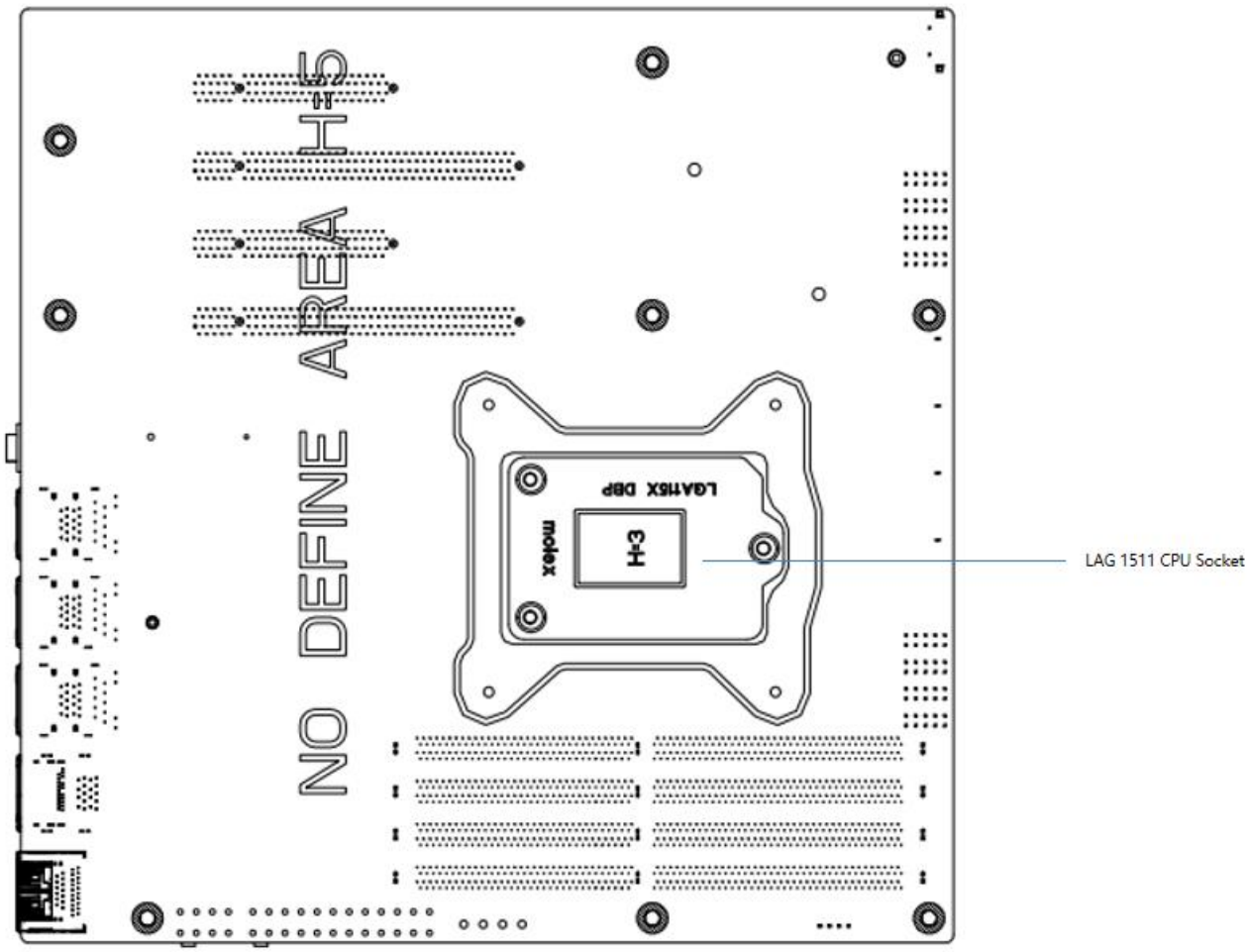


Figure 2. 2 Jumpers and Connectors Location 2

Figure 2. 3 I/O Connector 1

2.4 Jumpers Settings

This section provides instructions on how to configure your motherboard by setting the jumpers . It also includes the motherboard's default settings and your options for each jumper.

2.4.1 How to set jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers .

Jumpers

Label	Function	Description
ATX	Set Power-on mode at AT or ATX	3-Pin Jumper
CMOS	Clear CMOS Data Setting	3-Pin Jumper

2.4.2 CMOS - Clear CMOS Data Setting

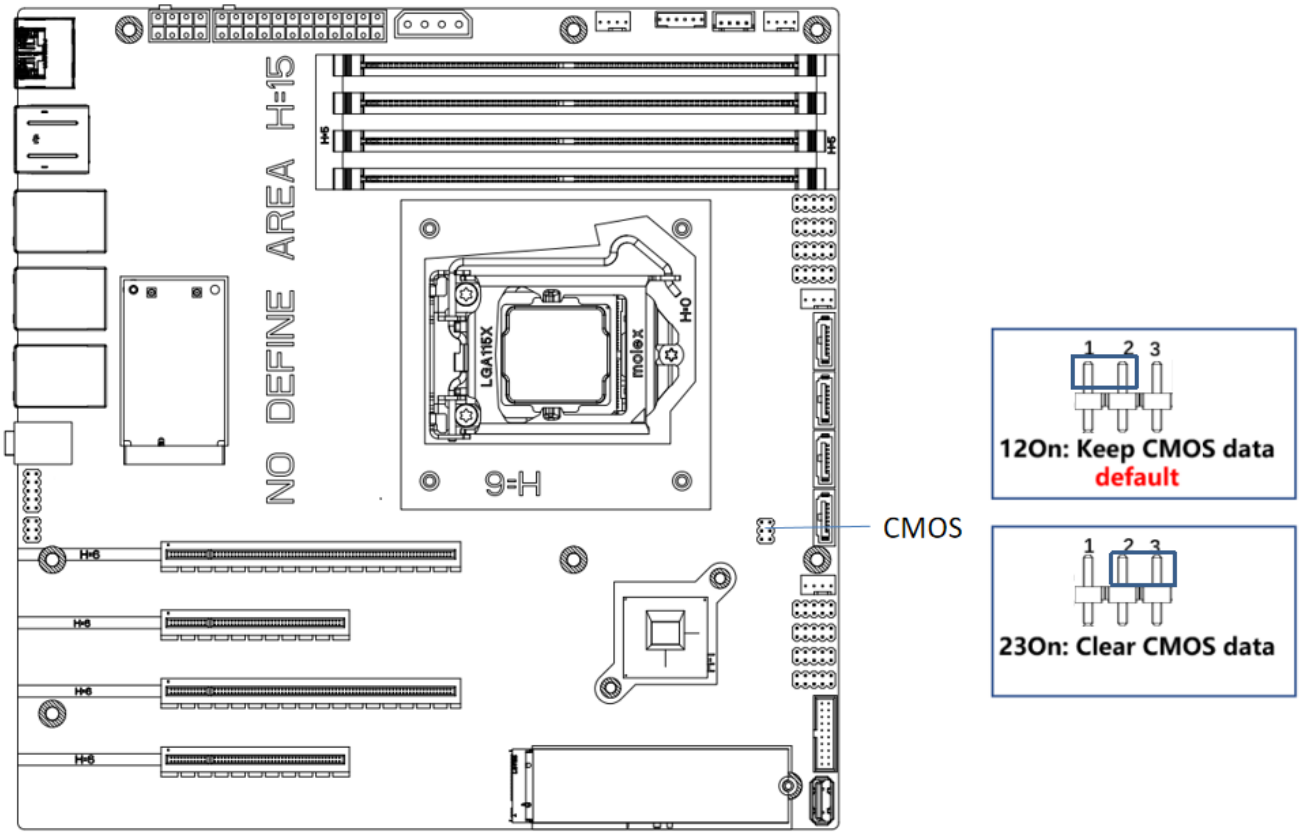


Figure 2. 4

The MATX-I961 motherboard contains a Jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set SW2 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

2.4.3 ATX AT-Power on mode AT or ATX selection jumpers

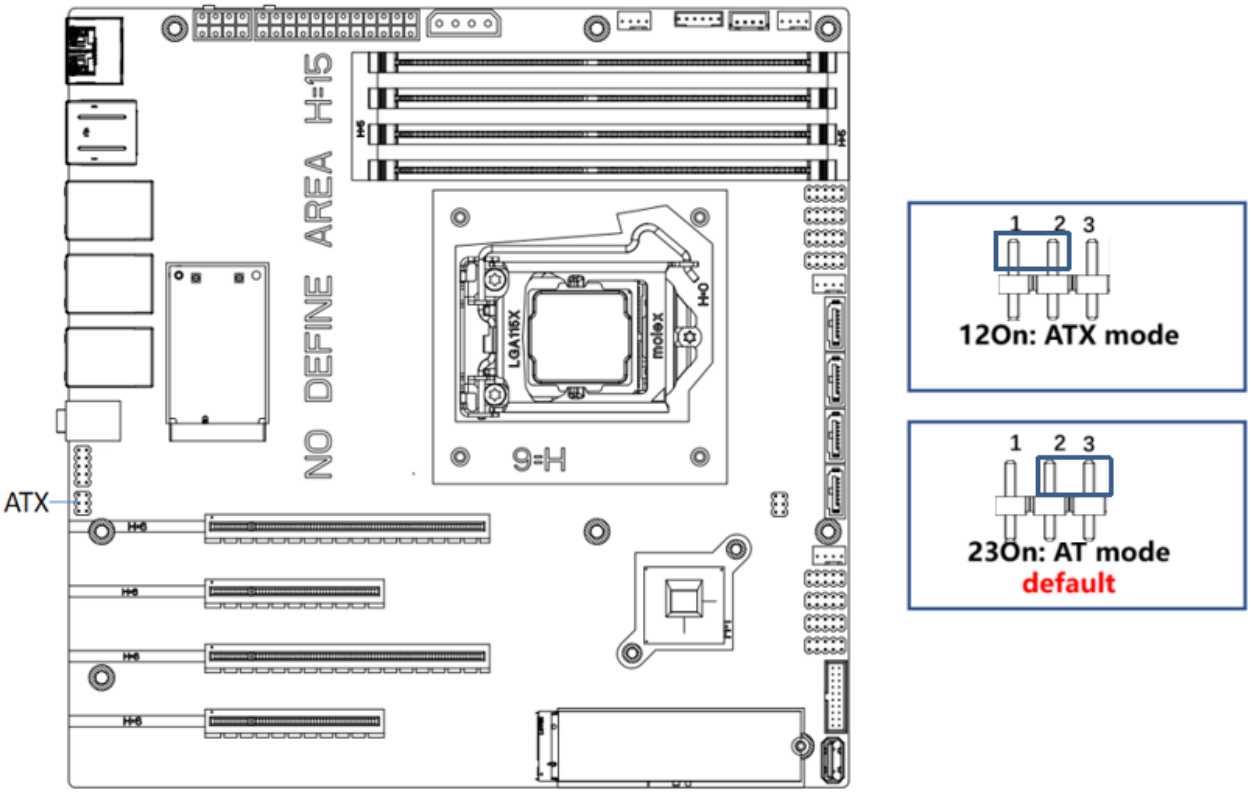


Figure 2. 5

The MATX-I961 motherboard provides a AT/ATX jumper, 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.

CHAPTER 3

I/O Introduction

3.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

3.2 I/O Introduction and Pin Assignments

This chapter will give the motherboard I/O interfaces introduction and Pin assignments.

3.2.1 Ethernet port (CN208/CN207/J7)

The MATX-I961 is equipped with 2 Intel I210AT chip and 1 Intel I219LM for 10/100/1000Mbps Ethernet controllers. The product provides 3*RJ45, with LED indicators on the front side to show its Active/Link status and Speed status.

Table 3.1 for pin assignments.

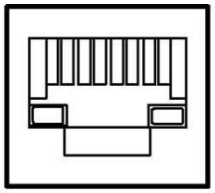


Figure 3. 1

Table 3.1: Ethernet 10/100/1000 Mbps RJ-45 port

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)

3.2.2 USB Connectors (CN208/CN207/J7/CN10/CN8/USB10)

The MATX-I961 provides up to 13 USB ports, 4*USB3.1(type A), 2*USB3.1(pin header), 5*USB2.0(type A), 2*USB2.0(pin header).

Table 3.2 for USB3.1 pin assignments.

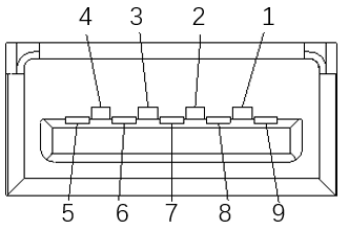


Figure 3. 2

Table 3.2: USB3.1 type A 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

Table 3.3 for USB2.0 Type A pin assignments.

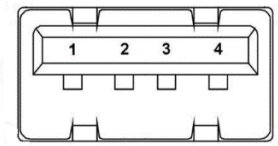


Figure 3. 3

Table 3.3: USB2.0 Connector	
Pin	Signal
1	USB_VCC
2	USB_D-
3	USB_D+
4	USB_GND

Table 3.4 for USB3.1(CN10) pin assignments.

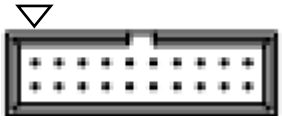


Figure 3. 4

Table 3.4: USB3.1(CN10) pin assignments			
Pin	Signal	Pin	Signal
1	+5VSB	11	USB14_z_P+
2	USB5_z_SSRX-	12	USB14_z_P-
3	USB5_z_SSRX+	13	GND
4	GND	14	USB6_z_SSTX+
5	USB5_z_SSTX-	15	USB6_z_SSTX-
6	USB5_z_SSTX+	16	GND
7	GND	17	USB6_z_SSRX+
8	USB13_z_P-	18	USB6_z_SSRX-
9	USB13_z_P+	19	+5VSB
10			

Table 3.5 for USB2.0(CN8) pin assignments.

Table 3.5: USB2.0(CN8) pin assignments			
Pin	Signal	Pin	Signal
1	+5VSB	6	UBS_z_P10
2	+5VSB	7	GND
3	UBS_z_N9	8	GND
4	UBS_z_N10	9	
5	UBS_z_P9	10	

3.2.3 HDMI port (J4)

The MATX-I961 provides high-resolution HDMI display ports. They can support the most resolution up to 3840*2160@30Hz.

Table 3.6 for HDMI pin assignments.

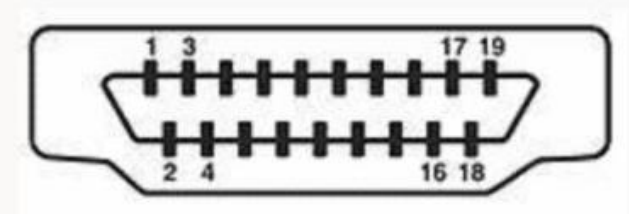


Figure 3. 6

Table 3.6: 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		

3.2.4 DP port (J4/J_USB1)

The MATX-I961 provides four high-resolution DP ports, it supports the most resolution up to 4096*2304@60Hz.

Table 3.7 for DP pin assignments.

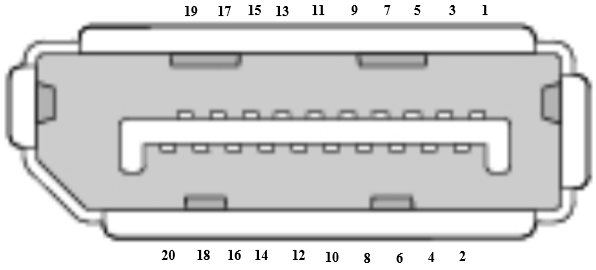


Figure 3. 7

Table 3.7: 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		

3.2.5 Power Input Connector (ATX_PWR)

The MATX-I961 provides a ATX power input (3.3V/5V/12V) by a 24-pin terminal. The MATX-I961 also provides a CPU power input by a 8-pin terminal.

Table 3.8 for ATX power input pin assignments.

Figure 3. 8

Table 3.8:DC-IN（ATX_PWR）port pin assignments

Pin	Signal	Pin	Signal
1	+3.3V1	13	+3.3V13
2	+3.3V2	14	-12V
3	GND3	15	GND15
4	+5V4	16	PS_ON#
5	GND5	17	GND17
6	+5V6	18	GND18
7	GND7	19	GND19
8	PWR_OK	20	-5V
9	+5VSB	21	+5V21
10	+12V10	22	+5V22
11	+12V10	23	+5V23
12	+3.3V12	23	GND24

Table 3.9 for CPU power input pin assignments.

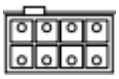


Figure 3. 9

Table 3.9:J_CPU_PWR port pin assignments			
Pin	Signal	Pin	Signal
1	GND	5	+V12S_CPU_R
2	GND	6	+V12S_CPU_R
3	GND	7	+V12S_CPU_R
4	GND	8	+V12S_CPU_R

3.2.6 CMOS battery connector (BAT1)

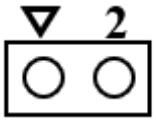


Figure 3.10

Table 3.10 for pin assignments.

Table 3.10: CMOS battery connector pin assignments			
Pin	Signal	Pin	Signal
1	+VBAT	2	GND

3.2.7 Serial ATA1/2/3/4 (S_SATA1/2/3/4)

Figure 3. 11

Table 3.11 for pin assignments.

Table 3.11: Serial ATA1 pin assignments			
Pin	Signal	Pin	Signal
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

3.2.8 SATA power connector (SATA_PWR1)

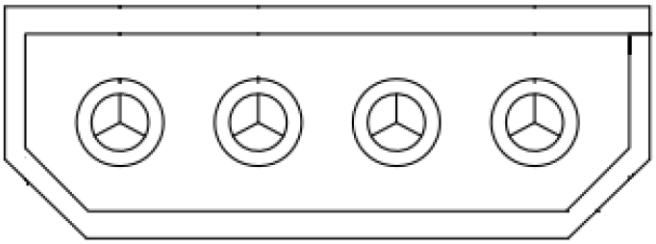


Figure 3. 12

Table 3.12 for pin assignments.

Table 3.12: SATA power connector			
Pin	Signal	Pin	Signal
1	5V	3	GND
2	GND	4	12V

3.2.9 Serial port connector1/2/3/4 (J_COM1/2/3/4)

The MATX-I961 provides 4 serial ports of COM1/2/3/4 by 2*5pin header.COM1/2 can be configured as RS232、RS422 or RS485 and COM3/4 can be configured as RS232 by BIOS setup.

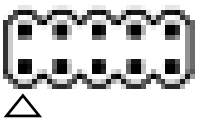


Figure 3. 13

Table 3.13 for pin assignments.

Table 3.13: J_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

Table 3.14 for pin assignments.

Table 3.14: J_COM3/4 Serial Ports Pin Assignments			
Pin	Signal	Pin	Signal
1	DCD	6	DSR
2	SIN1	7	RTS
3	SOUT1	8	CTS
4	DTR	9	RI
5	GND		

3.2.10 CPU fan connector (CPU_FAN1/FAN2)

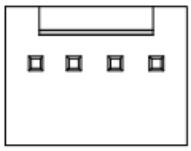


Figure 3. 14

Table 3.15: CPU_FAN2 Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	2	12V
3	FAN_TAC	4	FAN_CTL

3.2.11 GPU fan connector (GPU_FAN1/FAN2)

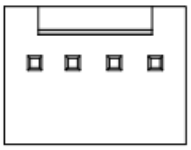


Figure 3. 15

Table 3.16: GPU_FAN1/FAN2 Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	2	+12V_FAN
3	FAN_TAC3	4	FAN_CTL3

3.2.12 8-bit DIO connector（J_GPIO）

The MATX-I961 provides 1 8-bit DIO connector by 2*5pin header.

Table 3.17 for pin assignments.

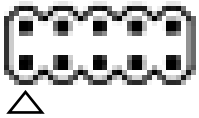


Figure 3. 16

Table 3.17: 8-bit DIO(J_GPIO) Pin Assignments			
Pin	Signal	Pin	Signal
1	+5V	2	GP74
3	GP70	4	GP75
5	GP71	6	GP76
7	GP72	8	GP77
9	GP73	10	GND

3.2.13 AUDIO pin header 2X5 P (F_AUDIO1)

The MATX-I961 provides 1*ADUIO connector by a 2X5 pin header.

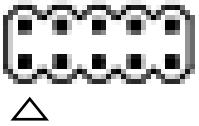


Figure 3. 17

Table 3.18 for Pin assignments.

Table 3.18: AUDIO Connector Pin Assignments			
Pine	Signal	Pin	Signal
1	MCIN1_L	2	GND_AUD
3	MCIN1-R	4	FRONTR
5	LINE_R_R	6	NC
7	GND_AUD	8	FRONTL
9	LINE1_L_R	10	GND_AUD

3.2.14 SMBUS Connector (SMB1)

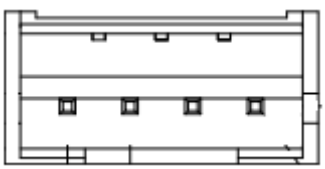


Figure 3. 18

Table 3.19 for Pin assignments.

Table 3.19: SMB1 Pin Assignments			
Pine	Signal	Pin	Signal
1	GND	2	DAT
3	CLK	4	VCC

3.2.15 KBMS connector (KBMS)

The MATX-I961 provides 1*KBMS connector by a 1*6 pin header.

Figure 3. 19

Table 3.20 for Pin assignments.

Table 3.20: KBMS Pin Assignments			
Pine	Signal	Pin	Signal
1	MSVCC	2	KB_DATA_C
3	KB_CLK_C	4	MS_DATA_C
5	MS_CLK_C	6	MSGND

3.2.16 Mini-PCIe Connector (MPE1)

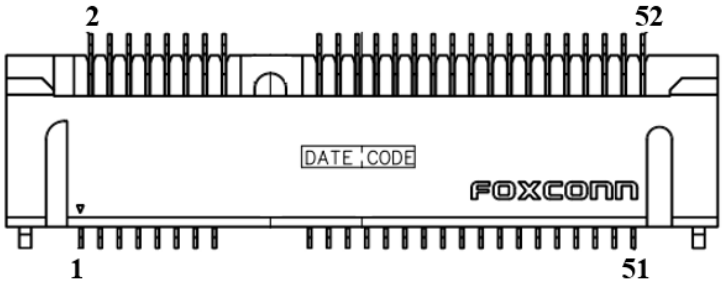


Figure 3. 20

Mini PCIe interface with PCIeX1 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: SIM0 slot is connected to MPE1 slot)

Table 3.21: Mini PCIe Pin Assignments			
Pin	Signal	Pin	Signal
1	PCIE_WAKE_N	2	+V3.3_MINICARD2
3	NC	4	GND

5	NC	6	+V1.5
7	CLKREQ#	8	+VUIM_PWR
9	GND	10	UIM_DATA
11	CLK_MIO1_PCIE-	12	UIM_CLK
13	CLK_MIO1_PCIE+	14	UIM_RESET
15	GND	16	+VUIM_VPP
17	NC	18	GND
19	NC	20	WIFI2_DISABLE#
21	GND	22	PLTRST#
23	PCIE_MINI_RX2-	24	+V3.3_MINICARD2
25	PCIE_MINI_RX2+	26	GND
27	GND	28	+V1.5
29	GND	30	SMB_SCL_RSM
31	PCIE_MINI_TX2-	32	SMB_SDA_RSM
33	PCIE_MINI_TX2+	34	GND
35	GND	36	USB_HUB_P2-
37	GND	38	USB_HUB_P2+
39	+V3.3_MINICARD2	40	GND
41	+V3.3_MINICARD2	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5
49	NC	50	GND
51	NC	52	+V3.3_MINICARD2

3.2.17 PCIe X16 connector (PCIE1/2)

MATX-I961 provides 2 standard PCIe X16 slots, which can support 2 PCIeX8 devices or 1 PCIeX16 device,when connecting 2 devices, it automatically switches to 2*PCIe X8)

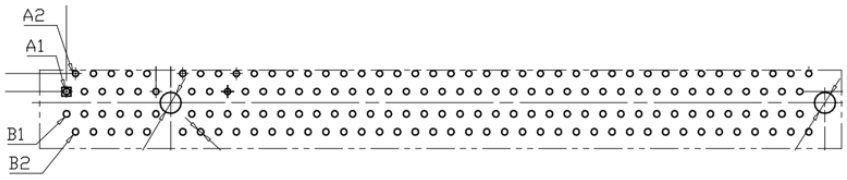


Figure 3. 21

Table 3.22 for Pin assignments.

Table 3.22: PCIeX16 Pin Assignments			
Pin	Signal	Pin	Signal
B1	+V12	A1	PRSNT1#
B2	+V12	A2	+V12
B3	+V12	A3	+V12
B4	GND	A4	GND
B5	SMBSCL	A5	TCLK
B6	SMBDAT	A6	TDI
B7	GND	A7	TDO
B8	+3.3V	A8	TMS
B9	TRST#	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	RSVD	A12	GND
B13	GND	A13	REFCLK+
B14	PETp0	A14	REFCLK-
B15	PETn0	A15	GND
B16	GND	A16	PERp0
B17	PRSNT2#	A17	PERn0
B18	GND	A18	GND
B19	PETp1	A19	RSVD
B20	PETn1	A20	GND
B21	GND	A21	PERp1
B22	GND	A22	PERn1
B23	PETp2	A23	GND
B24	PETn2	A24	GND
B25	GND	A25	PERp2
B26	GND	A26	PERn2
B27	PETp3	A27	GND
B28	PETn3	A28	GND
B29	GND	A29	PERp3
B30	RSVD	A30	PERn3
B31	PRSNT2#	A31	GND
B32	GND	A32	RSVD
B33	PETp4	A33	RSVD

B34	PETn4	A34	GND
B35	GND	A35	PERp4
B36	GND	A36	PERn4
B37	PETp5	A37	GND
B38	PETn5	A38	GND
B39	GND	A39	PERp5
B40	GND	A40	PERn5
B41	PETp6	A41	GND
B42	PETn6	A42	GND
B43	GND	A43	PERp6
B44	GND	A44	PERn6
B45	PETp7	A45	GND
B46	PETn7	A46	GND
B47	GND	A47	PERp7
B48	PRSNT2#	A48	PERn7
B49	GND	A49	GND
B50	PETp8	A50	NC
B51	PETn8	A51	GND
B52	GND	A52	PERp8
B53	GND	A53	PERn8
B54	PETp9	A54	GND
B55	PETn9	A55	GND
B56	GND	A56	PERp9
B57	GND	A57	PERn9
B58	PETp10	A58	GND
B59	PETn10	A59	GND
B60	GND	A60	PERp10
B61	GND	A61	PERn10
B62	PETp11	A62	GND
B63	PETn11	A63	GND
B64	GND	A64	PERp11
B65	GND	A65	PERn11
B66	PETp12	A66	GND
B67	PETn12	A67	GND
B68	GND	A68	PERp12

B69	GND	A69	PERn12
B70	PETp13	A70	GND
B71	PETn13	A71	GND
B72	GND	A72	PERp13
B73	GND	A73	PERn13
B74	PETp14	A74	GND
B75	PETn14	A75	GND
B76	GND	A76	PERp14
B77	GND	A77	PERn14
B78	PETp15	A78	GND
B79	PETn15	A79	GND
B80	GND	A80	PERp15
B81	PRSNT2#	A81	PERn15
B82	RSVD	A82	GND

3.2.18 PCIe X4 connector (PCIE3/4)

MATX-I961 provides 2 standard PCIe X4 slot, which can support PCIeX4 device.

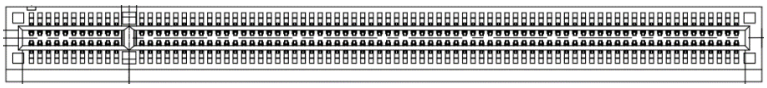


Figure 3. 22

Table 3. 23 for Pin assignments.

Table 3.23: PCIeX4 Pin Assignments			
Pin	Signal	Pin	Signal
B1	+V12	A1	PRSNT1#
B2	+V12	A2	+V12
B3	+V12	A3	+V12
B4	GND	A4	GND
B5	SMBSCL	A5	TCK
B6	SMBDAT	A6	TDI
B7	GND	A7	TDO
B8	+3.3V	A8	TMS
B9	TRST#	A9	+3.3V
B10	3.3Vaux	A10	+3.3V

B11	WAKE#	A11	PERST#
B12	RSVD	A12	GND
B13	GND	A13	REFCLK+
B14	PETp0	A14	REFCLK-
B15	PETn0	A15	GND
B16	GND	A16	PERp0
B17	PRSNT2#	A17	PERn0
B18	GND	A18	GND
B19	PETp1	A19	RSVD
B20	PETn1	A20	GND
B21	GND	A21	PERp1
B22	GND	A22	PERn1
B23	PETp2	A23	GND
B24	PETn2	A24	GND
B25	GND	A25	PERp2
B26	GND	A26	PERn2
B27	PETp3	A27	GND
B28	PETn3	A28	GND
B29	GND	A29	PERp3
B30	RSVD	A30	PERn3
B31	PRSNT2#	A31	GND
B32	GND	A32	RSVD
B33	PETp4	A33	RSVD
B34	PETn4	A34	GND
B35	GND	A35	PERp4
B36	GND	A36	PERn4
B37	PETp5	A37	GND
B38	PETn5	A38	GND
B39	GND	A39	PERp5
B40	GND	A40	PERn5
B41	PETp6	A41	GND
B42	PETn6	A42	GND
B43	GND	A43	PERp6
B44	GND	A44	PERn6

B45	PETp6	A45	GND
B46	PETn6	A46	GND
B47	GND	A47	PERp7
B48	PRSNT2#	A48	PERn7
B49	GND	A49	GND

3.2.19 SIM card connector (SIM0)

Figure 3. 23

SIM0 slot is connected to MPE1 slot.

3.2.20 M.2 connector (NGFF)

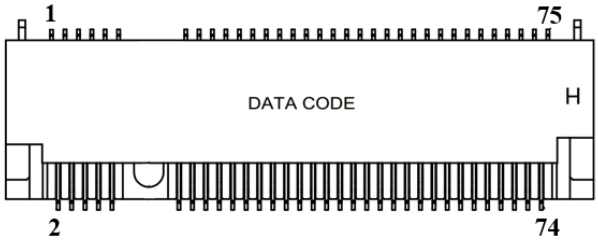


Figure 3. 24

M.2(NGFF) interface with PCIeX4 signal, Install M.2 2280 M-key modules such as SATA SSD module that comply to the M.2 2280 M-key specifications into the NGFF slot.

3.2.21 Audio connector (AUD1)

MATX-I961 provides Two-In-One MIC/Line Out dual audio connector.

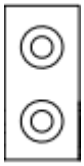


Figure 3. 25

Table 3.24 for Pin assignments.

Table 3.24: Audio (AUD1) Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	22	LOUT_L
2	MCIN2_L	23	LINE2_JD
3	MIC2_JD	24	GND
4	GND	25	LOUT_R
5	MCIN2_R		

3.2.22 Front panel signal connector (F_PANEL1)

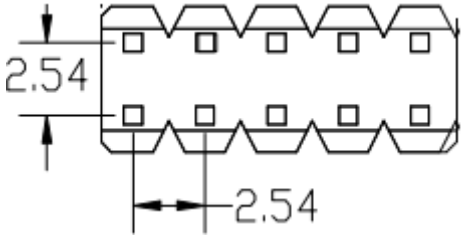


Figure 3. 26

Table 3.25: Front panel signal Connector Pin Assignments			
Pine	Signal	Pin	Signal
1	HDD_LED+	2	PWR_LED+
3	HDDLED-	4	PWR_LED-
5	GND	6	PWR_SW
7	RST_SW	8	GND
9	SPK-		

CHAPTER 4

BIOS Setup

4.1 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.

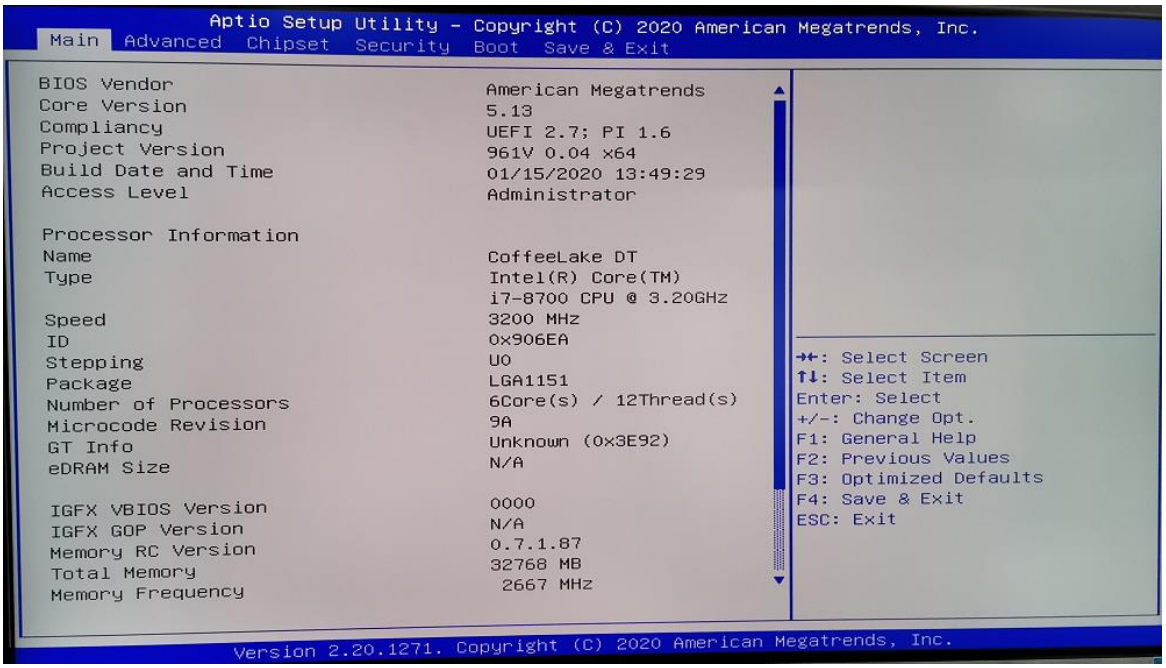
(But in general, customers are not recommended to set it up. In most cases, using the default value is already the best setting.)

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

4.1.1 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.



4.2 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.

4.2.1 BIOS Navigation Keys

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

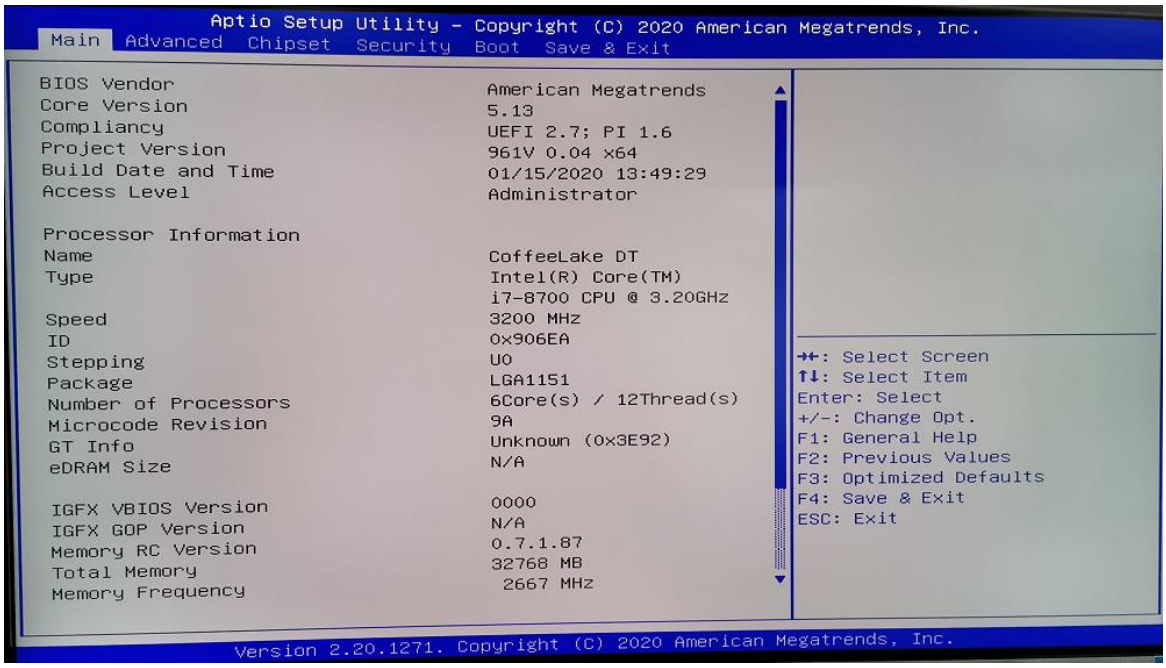
Table 3.1: The BIOS navigation keys

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

4.2.2 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.

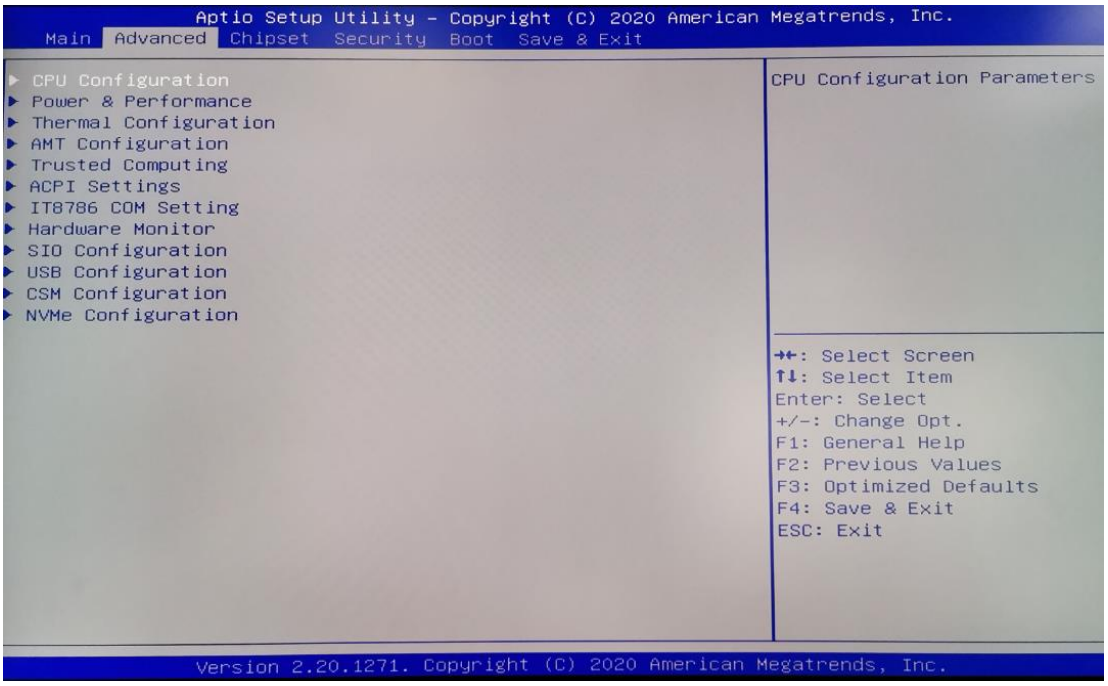
System Date

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>.

4.2.3 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 Configuration

This item contains the Power&Performance configuration, enter this sub-menu, there will be detailed details of the Power&Performance, as well as related settings of the Power&Performance function.

Thermal Configuration

Thermal configuration, enter this sub-menu, there will be the setting of the thermal configuration

parameter.

AMT Configuration

This item contains the AMT configuration, enter this sub-menu, there will be detailed details of the ATM, as well as related settings of the configure intel (R) Active Management Technology parameters .

Trusted Computing

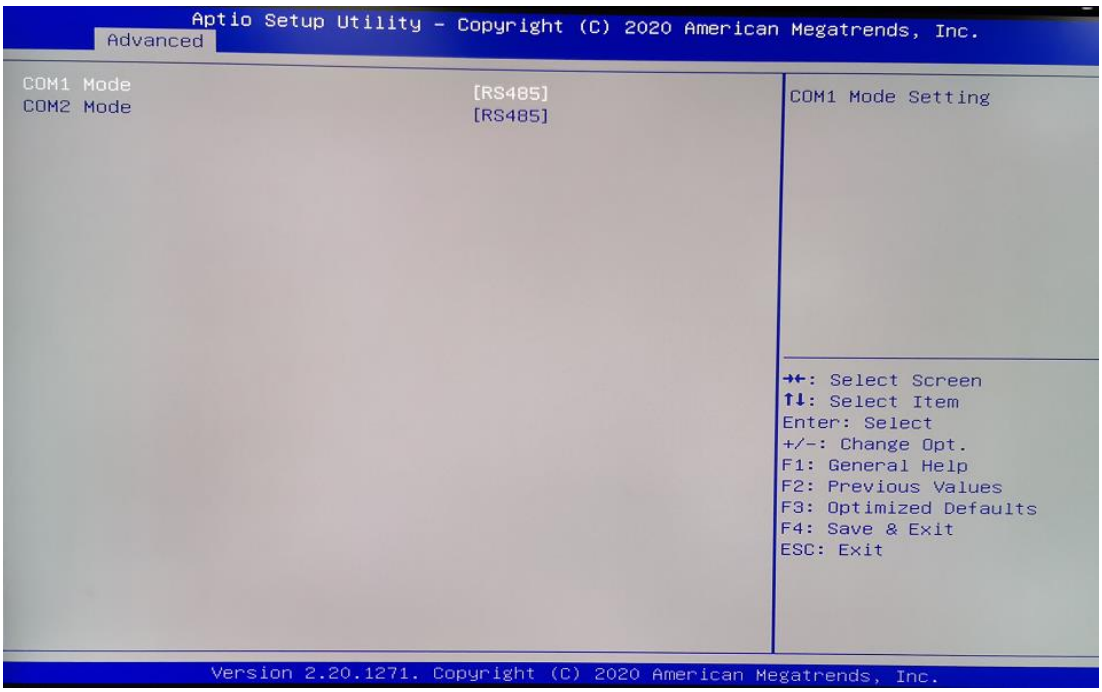
Trusted computing, enter this sub-menu, there will be the setting of the encryption security module (the motherboard will install the encryption module hardware will take effect)

ACPI Settings

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

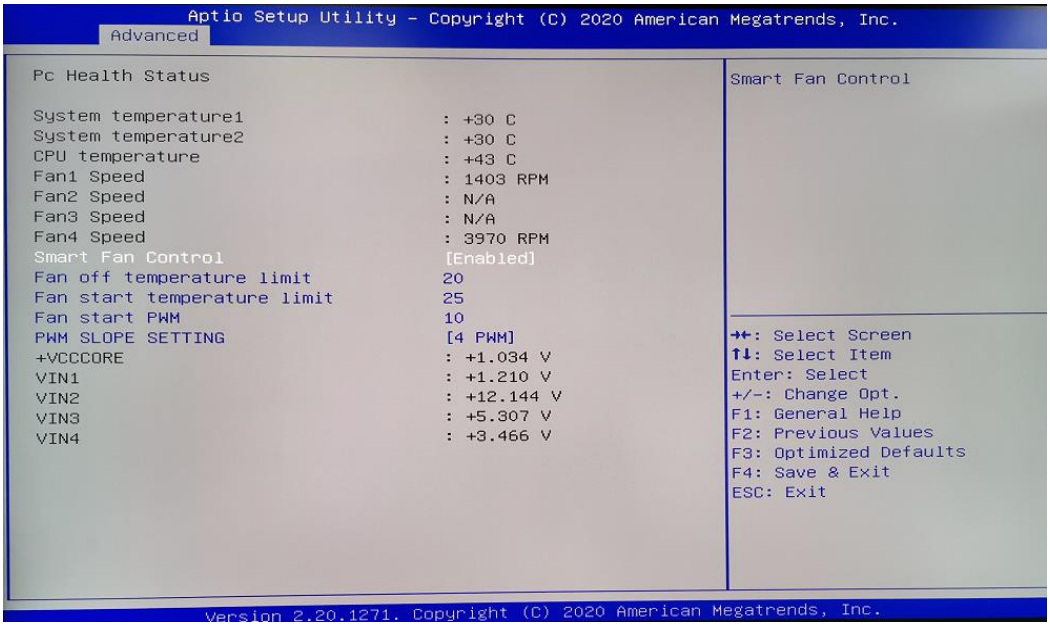
IT8786 COM setting

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

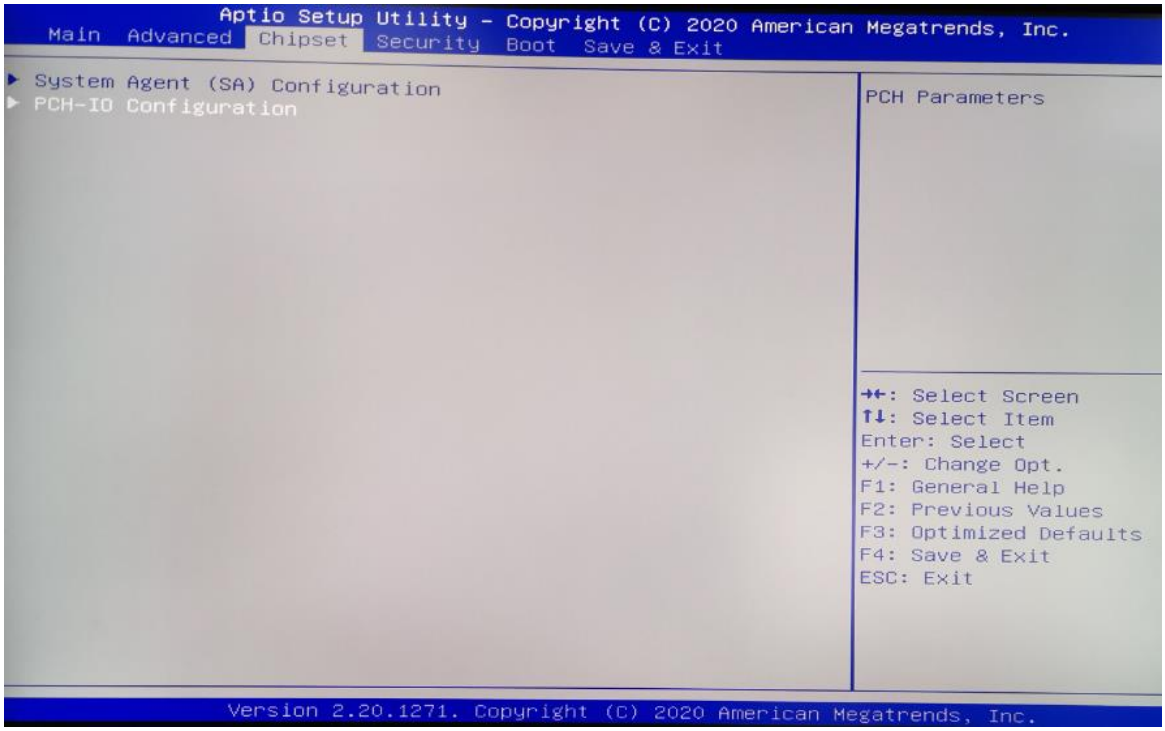
USB configuration, enter this sub-menu, there will be USB-related detailed settings.

NVMe Configuration

NVMe device settings, enter this sub-menu, there will be set NVMe device.

4.2.4 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)

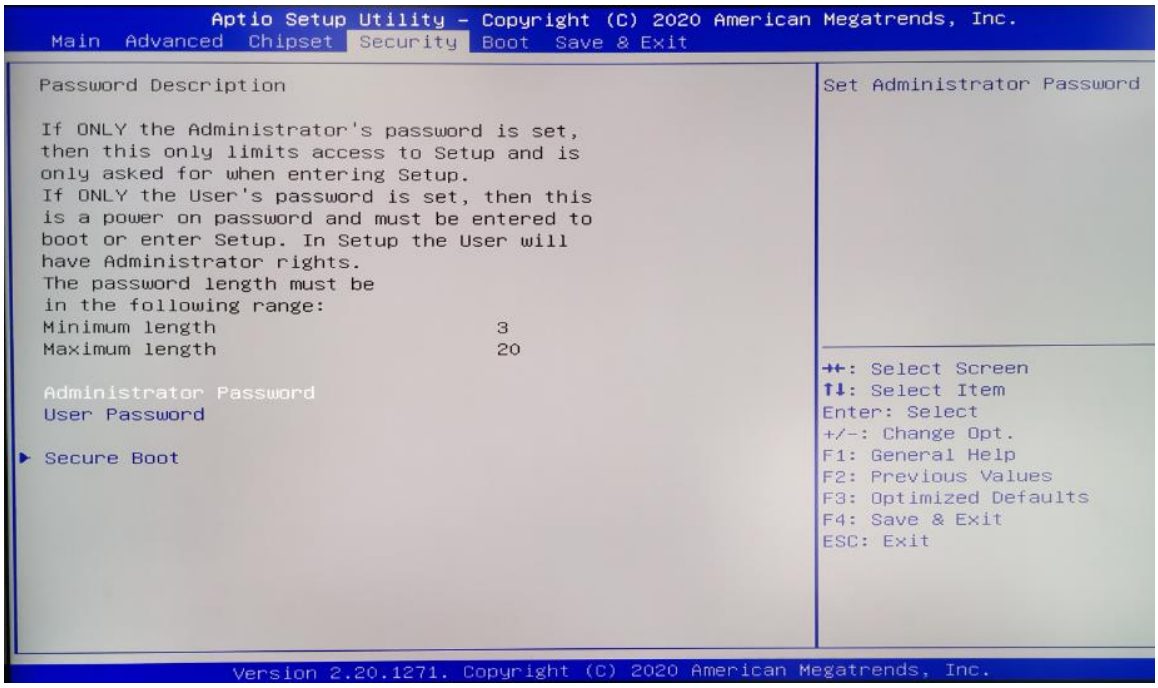
SATA And RST Configuration

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.

4.2.5 Security menu



Administrator Password

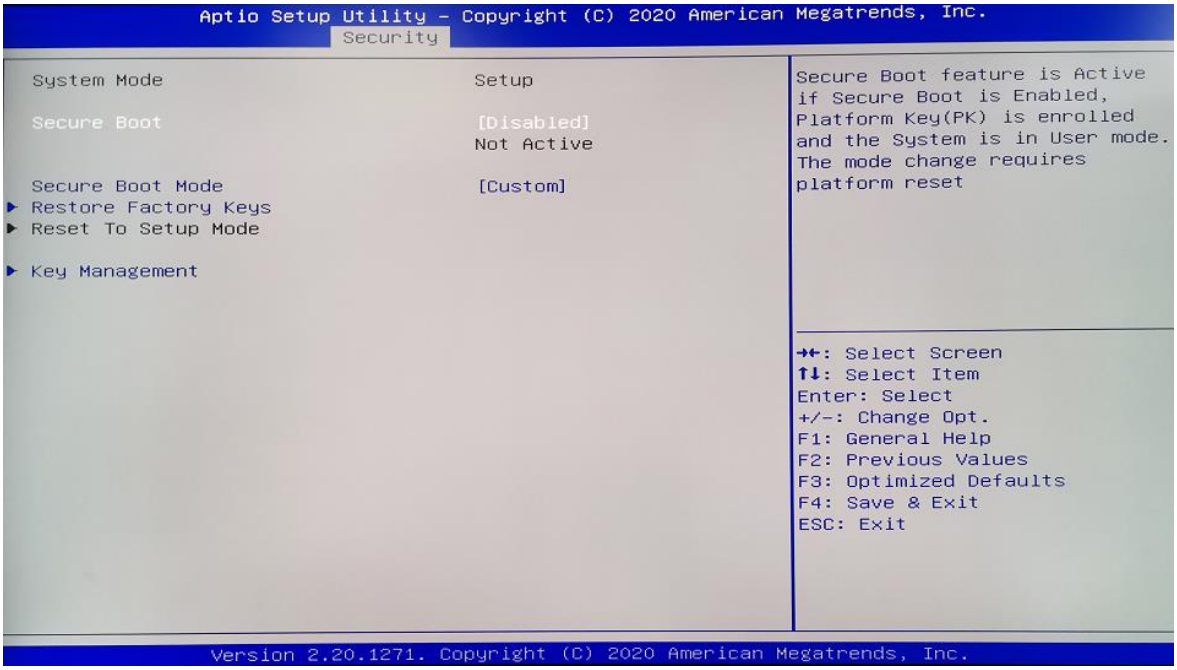
This item sets the information of the administrator password.

User Password

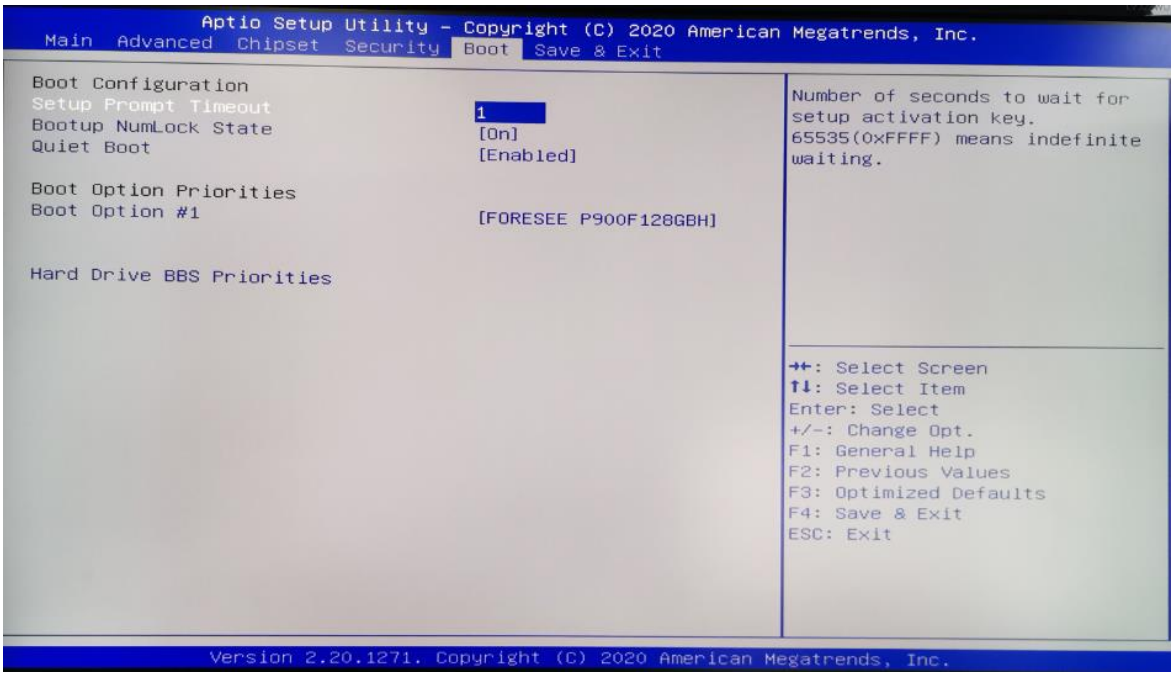
This item sets the information of the normal user password.

Secure Boot

This item sets the information of the secure boot.Secure Boot feature is Actice if Secure Boot is Enabled,Platform key(PK) is enrolled and mode change requires platform reset



4.2.6 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.

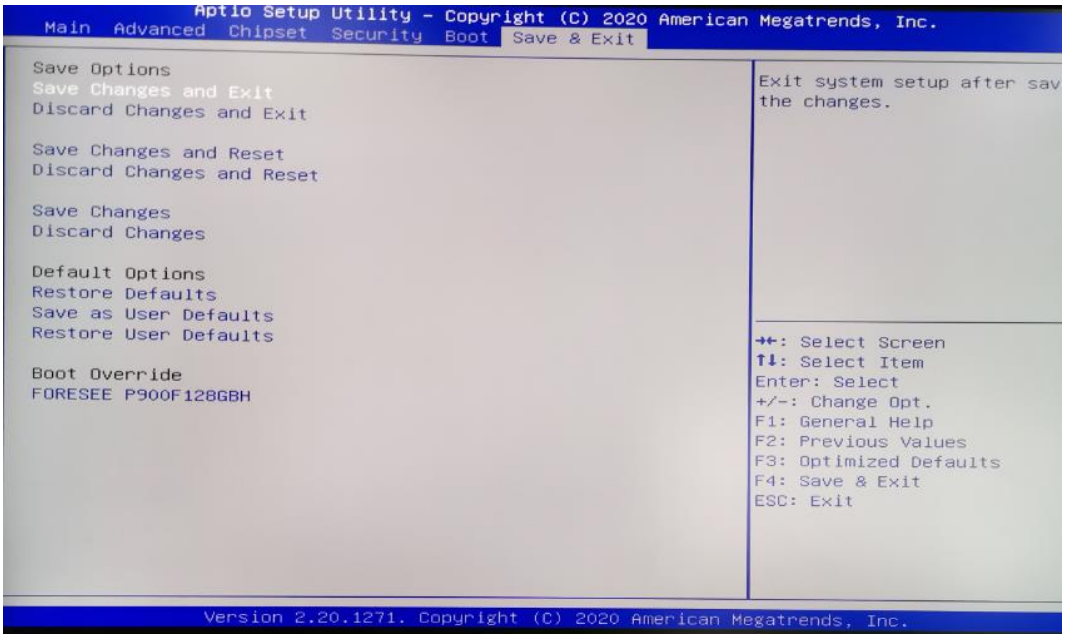
Quiet Boot

Switch full screen logo control

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.

4.2.7 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.

4.3 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 5

Driver Installation

The MATX-I961 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

5.1 Follow the sequence below to install the drivers:

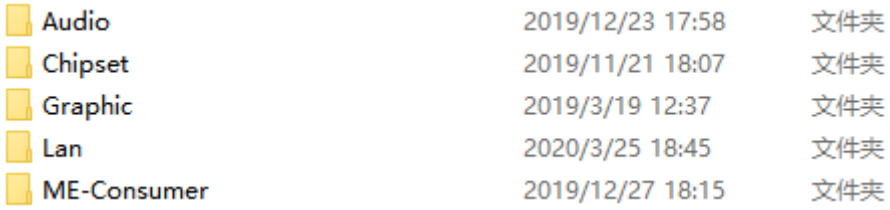


Figure 5. 1

Step 1 – Install Graphic Driver
Step 2 – Install Audio Driver
Step 3 – Install Chipset Driver
Step 4 – Install LAN Driver
Step 5 – Install ME Driver

Please read instructions below for further detailed installations.

5.2 Installation:

Insert the MATX-I961 CD-ROM into the CD-ROM drive. And install the drivers in turn.

Step 1 – Install Graphic 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

5.3 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 6

SYSTEM RESOURCE

6.1 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_8pin_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 sio_gpio_output(WORD port,BYTE value);

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 sio_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 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*==========*/