ASRock Industrial

SOM-P104

User Manual

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HIGH-DEFINITION MULTIMEDIA INTERFACE

WARNING

THIS PRODUCT CONTAINS A BUTTOON BATTERY
If swallowed, a button battery can cause serious injury or death.
Please keep batteries out of sight or reach of children.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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Chapter 1 Introduction

Thank you for purchasing ASRockInd ***SOM-P104*** motherboard, a reliable motherboard produced under ASRockInd's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRockInd's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 contains the configuration guide to BIOS setup.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRockInd website without further notice.

ASRockInd website: https://www.asrockind.com/zh-tw/SOM-P104J

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

https://www.asrockind.com/technical-support

1.1 Package Contents

ASRockInd ***SOM-P104*** Motherboard (Pico-ITX (3.9-in x 2.8-in x 0.76-in, 10 cm x 7.2 cm x 1.93 cm))

- Gift Package:

1 x CPU SINK 100*72mm
2 x SCREW M2*2, D=5
1 x COM Cable

- Bulk Package:

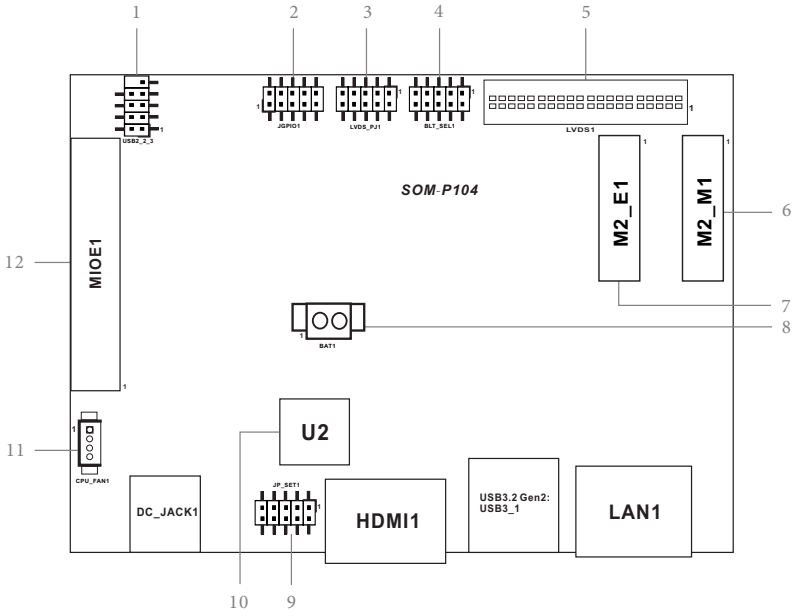
2 x SCREW M2*2, D=5

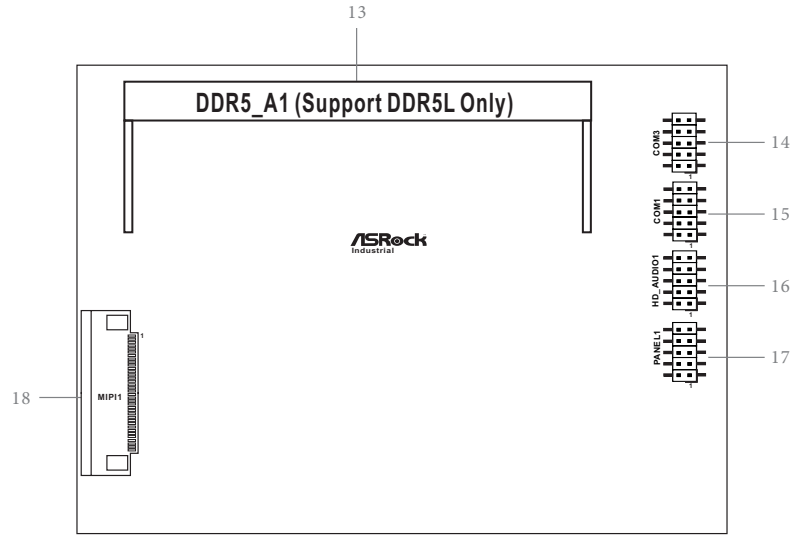
1.2 Specifications

Form Factor	Dimensions	Pico-ITX (3.9-in x 2.8-in x 0.76-in, 10 cm x 7.2 cm x 1.93 cm)
Processor System	CPU	Intel® Alder Lake-N SoC Processors SOM-P104J (N97, QC, Max Speed Up to 3.6GHz, 12W) *For other CPU SKUs request, please contact regional Sales for availability.
	Chipset	SoC
	BIOS	AMI SPI 256 Mbit
Memory	Technology	Dual Channel DDR5 4800 MHz
	Capacity	32GB
	Socket	1 x 262-pin SO-DIMM
Graphics	Controller	Intel® UHD Graphics
	HDMI	HDMI 2.0b Max resolution up to 4096 x 2160@60Hz
	DisplayPort	Display Port 1.4a, DP++ Max resolution up to 4096x2160@60Hz *From MIOe slot
	LVDS	Dual channel 24 bit up to 1920 x 1200@60Hz (Connector shared with eDP)
	eDP	Max resolution up to 1920 x 1080@60Hz (Connector shared with LVDS)
	Multi Display	Triple Display
Expansion Slot	M.2	1 x M.2 (Key E, 2230) with PCIe Gen3 x1 and USB 2.0 for Wireless
	MIOe	1 (DP, 1 x USB 3.2 Gen2, 1 x USB 2.0, 3 x PCIe x1)
Audio	Interface	Realtek ALC897, High Definition Audio. Line-In, Line-Out, Mic-In
Ethernet	Controller/ Speed	Realtek RTL8125BG with 10/100/1000/2500 Mbps
	Controller	1 x RJ-45
Rear I/O	HDMI	1 x HDMI 2.0b
	Ethernet	1 x 2.5 Gigabit LAN
	USB	1 x USB 3.2 Gen2 (Type A)
	DC Jack	1
Internal Connector	USB	2 x USB 2.0 (1 x 2.00mm pitch header)
	COM	COM1, COM3 (RS-232/422/485)
	GPIO	4 x GPI, 4 x GPO
	LVDS	1 (Connector with LVDS/eDP signal, switch by BIOS)
	MIPI Camera Header	1 (Optional)

Storage	M.2	1 x M.2 (Key M, 2242/2280) with PCIe Gen3 x1 or SATA3 and USB 2.0 for SSD
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255 Sec
Power Requirements	Input PWR	12V DC-In
	Power On	AT/ATX Supported -AT: Directly PWR on as power input ready -ATX: Press button to PWR on after power input ready
Environment	Operating Temp	-20°C - 70°C
	Storage Temp	-40°C - 85°C
	Operating Humidity	5% - 90%
	Storage Humidity	5% - 90%

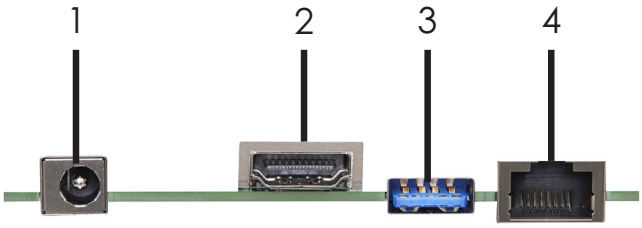
1.3 Motherboard Layout





1 : USB2.0 Header (USB2_2_3) (2.00mm pitch)
2 : Digital Input / Output Pin Header (JGPIO1)
3 : LVDS_PJ1
4 : BLT_SEL1
5 : LVDS Panel Connector (LVDS1)
6 : M.2 Key-M Socket (M2_M1)
7 : M.2 Key-E Socket (M2_E1)
8 : Battery Connector (BAT1)
9 : JP_SET1
10 : BIOS ROM (U2)
11 : 4-Pin CPU FAN Connector (CPU_FAN1)
12 : MIOE1
13 : DDR5 (DDR5_A1)
14 : COM Port Header (COM3) (RS-232/422/485)
15 : COM Port Header (COM1) (RS-232/422/485)
16 : HD Audio Header (HD_AUDIO1)
17 : System Panel Header (PANEL1)
18 : MIPI1 (BOM option)

1.4 I/O Panel



1 DC-In Jack (DC_JACK1)
2 HDMI Port (HDMI1)
3 USB3.2 Gen2 Port (USB3_1)
4 RJ45 LAN Port (LAN1)*

* There are two LEDs next to the LAN ports. Please refer to the table below for the LAN port LED indications.

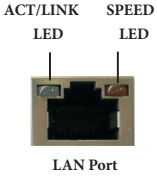
LAN Port LED Indications

Activity/Link LED

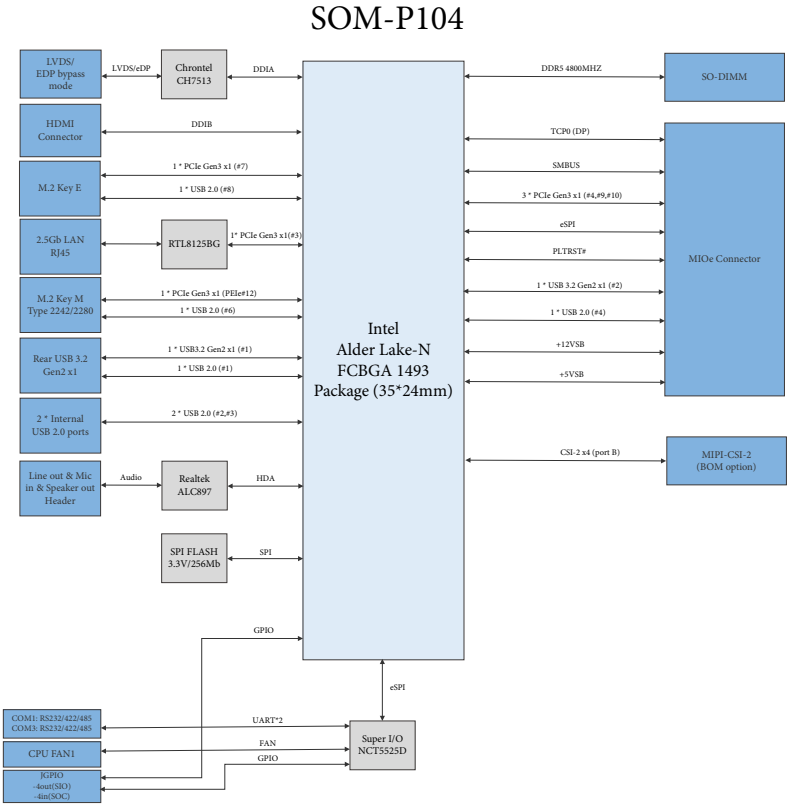
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED

Status	Description
Off	10Mbps connection
Orange	100Mbps connection
Green	2.5Gbps connection



1.5 Block Diagram



Chapter 2 Installation

This is a Pico-ITX (3.9-in x 2.8-in x 0.76-in, 10 cm x 7.2 cm x 1.93 cm) form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.

Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.
5. Heatsink (The thermal solution of whole system needs to be designed additionally.)

Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

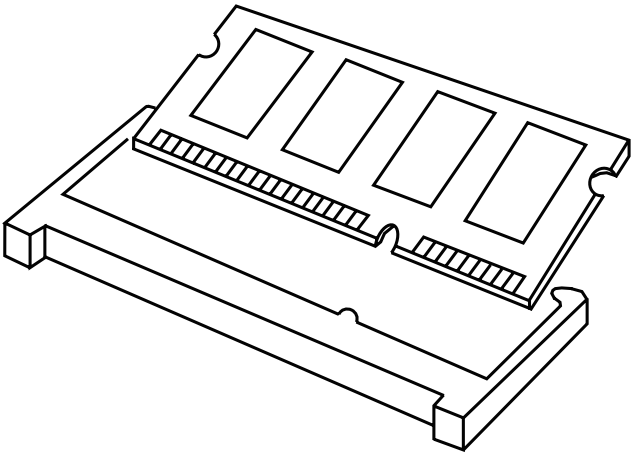
2.3 Installation of Memory Modules

SOM-P104 provides one 262-pin DDR5 (Double Data Rate 5) SO-DIMM slots, and supports Dual Channel Memory Technology.

1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one memory module installed.*
3. *It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.*

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot in the incorrect orientation.

Step 1. Align a SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.



Step 2. Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.

2.4 Expansion Slots

There are 2 M.2 sockets on this motherboard.

M.2 sockets: 1 x M.2 (Key E, 2230) with PCIe Gen3 x1 and USB 2.0 for Wireless
1 x M.2 (Key M, 2242/2280) with PCIe Gen3 x1 or SATA3 and USB 2.0 for SSD

M.2 Key-M Socket (M2_M1)

Pin	Signal Name	Signal Name	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	NA	NA	6
7	NA	NA	8
9	GND	HD_LED	10
11	NA	+3.3V	12
13	NA	+3.3V	14
15	GND	+3.3V	16
17	NA	+3.3V	18
19	NA	NA	20
21	GND	NA	22
23	NA	NA	24
25	NA	NA	26
27	GND	NA	28
29	NA	NA	30
31	NA	NA	32
33	GND	USB D+	34
35	NA	USB D-	36
37	NA	NA	38
39	GND	SMB_CLK	40
41	PERn0/SATA-B+	SMB_DATA	42
43	PERp0/SATA-B-	NA	44
45	GND	NA	46
47	PETn0/SATA-A-	NA	48
49	PETP0/SATA-A+	PERST#	50
51	GND	CLKREQ#	52
53	PEFCLKn	WAKE#	54
55	PEFCLKp	NA	56
57	GND	NA	58
67	NA	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

M.2 Key-E Socket (M2_E1)

Pin	Signal Name	Signal Name	Pin
1	GND	+3VSB	2
3	USB_D+	+3VSB	4
5	USB_D-	NA	6
7	GND	NA	8
9	CNV_WGR_D1-	CNV_RF_RESET	10
11	CNV_WGR_D1+	NA	12
13	GND	MODEM_ CLKREQ	14
15	CNV_WGR_D0-	NA	16
17	CNV_WGR_D0+	GND	18
19	GND	BC_PROCHOT	20
21	CNV_WGR_CLK-	CNV_BRI_RSP	22
23	CNV_WGR_CLK+		
		CNV_BGI_DT	32
33	GND	CNV_RGI_RSP	34
35	PETp	CNV_BRI_DT	36
37	PETn	NA	38
39	GND	NA	40
41	PERp	NA	42
43	PERn	CNV_PA_ BLANKING	44
45	GND	CNV_MFUART2_ TXD	46
47	PEFCLKp	CNV_MFUART2_ RXD	48
49	PEFCLKn	SUSCLK	50
51	GND	PERST#	52
53	CLKREQ#	W_DISABLE1#	54
55	NA	W_DISABLE2#	56
57	GND	SMB_DATA	58
59	CNV_WT_D1-	SMB_CLK	60
61	CNV_WT_D1+	NA	62
63	GND	NA	64
65	CNV_WT_D0-	NA	66
67	CNV_WT_D0+	NA	68
69	GND	NA	70
71	CNV_WT_CLK-	+3VSB	72
73	CNV_WT_CLK+	+3VSB	74
75	GND		

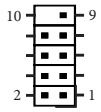
2.5 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard!

USB2.0 Header (2.00mm pitch)

(9-pin USB2_2_3)

(see p. 4, No. 1)



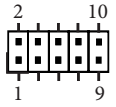
Pin	Signal Name	Signal Name	Pin
1	USB_PWR	USB_PWR	2
3	P-	P-	4
5	P+	P+	6
7	GND	GND	9
9	DUMMY		10

There is one USB 2.0 header on this motherboard.

Digital Input / Output Pin Header

(10-pin JGPIO1)

(see p. 4, No. 2)

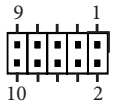


Pin	Signal Name	Signal Name	Pin
1	SIO_GP63	GPP_B15	2
3	SIO_GP64	GPP_E1	4
5	SIO_GP86	GPP_E2	6
7	SIO_GP87	GPP_E13	8
9	+JGPIOPWR	GND	10

LVDS_PJ1

(10-pin LVDS_PJ1)

(see p. 4, No. 3)

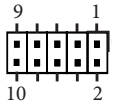


Pin	Signal Name	Signal Name	Pin
1	+3V	PLVDD	2
3	+5V	PLVDD	4
5	+5V	BLTVCC	6
7	+12V	BLTVCC	8
9	+12V	BLTVCC	10

BLT_SEL1

(10-pin BLT_SEL1)

(see p. 4, No. 4)

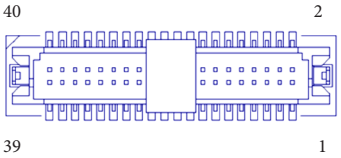


Pin	Signal Name	Signal Name	Pin
1	BLT_VCC	BLDN	2
3	BLT_VCC	BLUP	4
5	BLT_EN	PWRDN	6
7	BLT_CTL	GPIO_TEST#	8
9	GND	GND	10

LVDS Panel Connector

(40-pin LVDS1)

(see p. 4, No. 5)



Pin	Signal Name	Signal Name	Pin
1	LCD_VCC	LCD_VCC	2
3	+3.3V	N/A	4
5	N/A	LVDS_A_DATA0#	6
7	LVDS_A_DATA0	GND	8
9	LVDS_A_DATA1#	LVDS_A_DATA1	10
11	GND	LVDS_A_DATA2#	12
13	LVDS_A_DATA2	GND	14
15	LVDS_A_DATA3#	LVDS_A_DATA3	16
17	GND	LVDS_A_CLK#	18
19	LVDS_A_CLK	GND	20
21	LVDS_B_DATA0#	LVDS_B_DATA0	22
23	GND	LVDS_B_DATA1#	24
25	LVDS_B_DATA1	GND	26
27	LVDS_B_DATA2#	LVDS_B_DATA2	28
29	DPLVDD_EN	LVDS_B_DATA3#	30
31	LVDS_B_DATA3	GND	32
33	LVDS_B_CLK#	LVDS_B_CLK	34
35	GND	CON_LBKLT_EN	36
37	CON_LBKLT_CTL	LCD_BLT_VCC	38
39	LCD_BLT_VCC	LCD_BLT_VCC	40

Battery Connector

(BAT1)

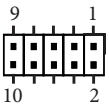
(see p. 4, No. 8)

Pin	Signal Name
1	+BAT
2	GND

JP_SET1

(10-pin JP_SET1)

(see p. 4, No. 9)



Pin	Signal Name	Signal Name	Pin
1	AT/ATX mode	GND	2
3	RTCRST2#	GND	4
5	RTC RST#	GND	6
7	JGPIO_VSET	GND	8
9	JGPIO_VSET	+3V	10

1-2: AT mode (short)

ATX mode (open)

3-5: Auto Clear CMOS (power off)

5-6: Clear CMOS

BIOS ROM

(U2)

(see p. 4, No. 10)

CPU FAN Connector

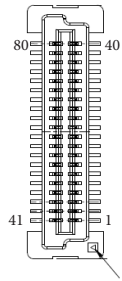
(4-pin CPU_FAN1)

(see p. 4, No. 11)

Pin	Signal Name
1	GND
2	+5V
3	FAN_SPEED
4	FAN_SPEED_CONTROL

MIOE1

(see p. 4, No. 12)



Pin	Signal Name	Signal Name	Pin
1	GND	GND	41
2	PCI_RXP1	PCIe_TXP1	42
3	PCI_RXN1	PCIe_TXN1	43
4	GND	GND	44
5	PCI_RXP2	PCIe_TXP2	45
6	PCI_RXN2	PCIe_TXN2	46
7	GND	GND	47
8	PCI_RXP3	PCIe_TXP3	48
9	PCI_RXN3	PCIe_TXN3	49
10	GND	GND	50
11	NC	NC	51
12	NC	NC	52
13	MIOE_DET#	GND	53
14	PCIe_CLKP1	AUDIO_AUX_L	54
15	PCIe_CLKN1	AUDIO_AUX_R	55
16	GND	AGND	56
17	SMB_CLK_MAIN	HDMI_DDCCLK	57
18	SMB_DATA_MAIN	HDMI_DDCDATA	58
19	PCIe_WAKE#	ESPI_CLK	59
20	SYS_RESET#	ESPI_IO_0	60
21	SLP_S3#	ESPI_IO_1	61
22	PWRBTN#	ESPI_IO_2	62
23	DDI_HPD#	ESPI_IO_3	63
24	GND	ESPI_RESET#	64
25	DDI_AUXP	ESPI_ALERT#	65
26	DDI_AUXN	ESPI_CS0#	66
27	GND	GND	67
28	DDI_TXP0	USB3_TXP	68
29	DDI_TXN0	USB3_TXN	69
30	GND	GND	70
31	DDI_TXP1	USB3_RXP	71
32	DDI_TXN1	USB3_RXN	72
33	GND	GND	73
34	DDI_TXP2	USB2_P+	74
35	DDI_TXN2	USB2_P-	75
36	GND	GND	76
37	DDI_TXP3	+5VSB	77
38	DDI_TXN3	+5VSB	78
39	GND	+5VSB	79
40	+12VSB	+12VSB	80

Support interface:
3* PCIe Gen3x1
1* USB3.2 Gen2
1* USB2.0
1* DP1.4

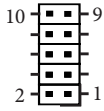
DDR5_A1

(see p. 4, No. 13)

COM Port Headers (RS-232/422/485)

(10-pin COM3)

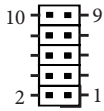
(see p. 4, No. 14)



Pin	Signal Name	Signal Name	Pin
1	DDCD#3	RRXD3	2
3	TTXD3	DDTR#3	4
5	GND	DDSR#3	6
7	RRTS#3	CCTS#3	8
9	N/A	N/A	10

(10-pin COM1)

(see p. 4, No. 15)



Pin	Signal Name	Signal Name	Pin
1	DDCD#1	RRXD1	2
3	TTXD1	DDTR#1	4
5	GND	DDSR#1	6
7	RRTS#1	CCTS#1	8
9	N/A	N/A	10

This motherboard supports RS232/422/485 on COM1 and COM3 ports. Please refer to the table below for the pin definition. In addition, COM1 and COM3 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer our manual for details.

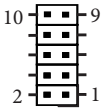
COM1, COM3 Ports Pin Definition

Pin	RS232	RS422	RS485
1	DCD#	TX-	DATA-
2	RXD	TX+	DATA+
3	TXD	RX+	N/A
4	DTR#	RX-	N/A
5	GND	GND	GND
6	DSR#	N/A	N/A
7	RTS#	N/A	N/A
8	CTS#	N/A	N/A
9	N/A	N/A	N/A

HD Audio Header

(10-pin HD_AUDIO1)

(see p. 4, No. 16)



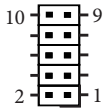
Pin	Signal Name	Pin	Signal Name
10	MIC1_L	9	MIC1_R
9	AGND_A	7	MIC1_JD
6	LIN1_L	5	FRONT_L
4	LIN1_JD	3	FRONT_JD
2	LIN1_R	1	FRONT_R

This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

System Panel Header

(10-pin PANEL1)

(see p. 4, No. 17)



Pin	Signal Name	Pin	Signal Name
10	N/A	9	GND
9	GND	7	RESET#
6	PWRBTN#	5	GND
4	PLED-	3	HDLED-
2	PLED+	1	HDLED+

Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

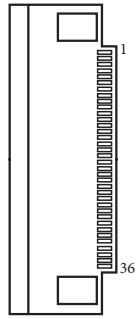
PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).
HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

MIPI1 (BOM option)

(36-pin MIPI1)

(see p. 4, No. 18)



Pin	Signal Name
1	GND
2	CSI_B_DN2
3	CSI_B_DP2
4	GND
5	CSI_B_DN1
6	CSI_B_DP1
7	GND
8	CSI_B_CLK_N
9	CSI_B_CLK_P
10	GND
11	CSI_B_DN0
12	CSI_B_DP0
13	CSI_B_DN3
14	CSI_B_DP3
15	GND
16	GND
17	+2.8V
18	GND
19	+2.8V
20	+1.8V
21	+1.2V
22	GND
23	IMBCLKOUT0
24	GND
25	I2C1_SCL
26	I2C1_SDA
27	N/C
28	BUF_PLT_RST_1.8_R_N
29	N/C
30	GND
31	N/C
32	+1.2V
33	GND
34	GPP_S1
35	GPP_S2
36	GPP_S3

Chapter 3 UEFI SETUP UTILITY

3.1 Introduction

ASRock Industrial UEFI (Unified Extensible Firmware Interface) is a BIOS utility which offers tweak-friendly options in an advanced viewing interface. The UEFI system works with a USB mouse and offers users a faster, sleeker experience.

This BIOS utility can perform the Power-On Self-Test (POST) during system startup, record hardware parameters of the system, load operating system, and so on. The battery on the motherboard supplies the power needed to the CMOS when the system power is turned off, and the values configured in the UEFI utility are kept in the CMOS.

Please note that inadequate BIOS settings may cause system instability, mulfunction or boot failure. We strongly recommend that you do not alter the UEFI default configurations or change the settings only with the assistance of a trained service person.

If the system becomes unstable or fails to boot after you change the setting, try to clear the CMOS values and reset the board to default values. See your motherboard manual for instructions.

3.1.1 Entering BIOS Setup

You may run the UEFI SETUP UTILITY by pressing <F2> or <Delete> right after you power on the computer; otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

This setup guide explains how to use the UEFI SETUP UTILITY to configure all the supported system. The screenshots in this manual are for reference only. UEFI Settings and options may vary owing to different BIOS release versions or CPU installed. Please refer to the actual BIOS version of the motherboard you purchased for detailed screens, settings and options.

3.1.2 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
Advanced	For advanced system configurations
H/W Monitor	Displays current hardware status
Security	For security settings
Boot	For configuring boot settings and boot priority
Exit	Exit the current screen or the UEFI Setup Utility

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions for reference purpose only, and may vary from the latest BIOS and do not exactly match what you see on your screen.

3.1.3 Navigation Keys

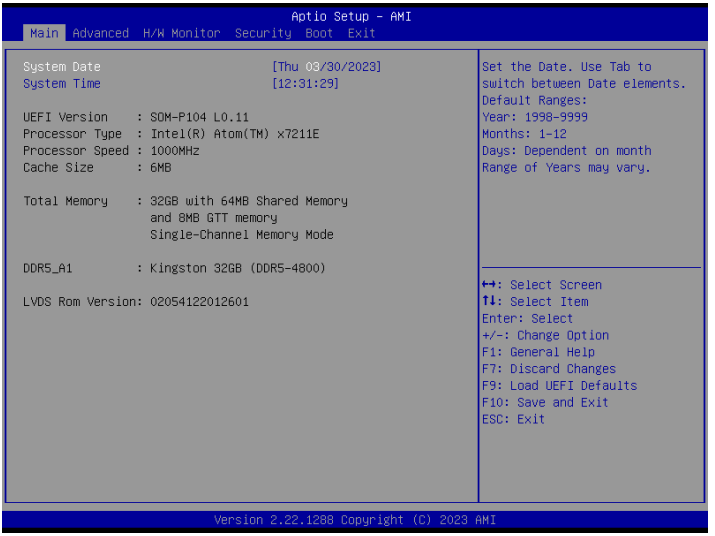
Use < ← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
+ / -	To change option for the selected items
<Tab>	Switch to next function
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

3.2 Main Screen (Advanced Mode)

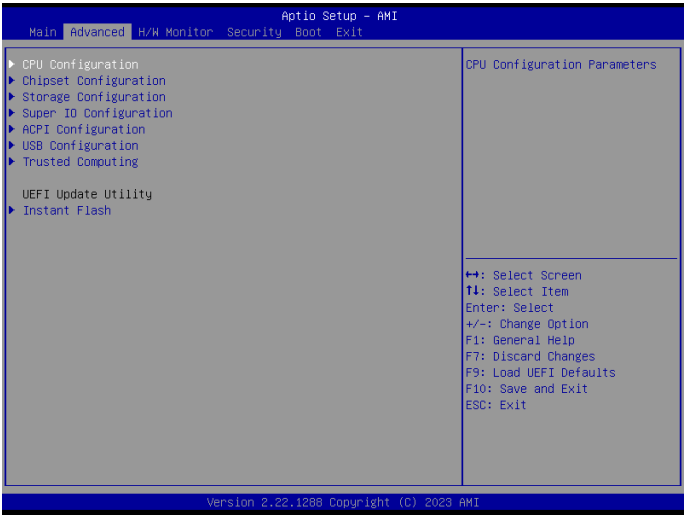
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.

3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.

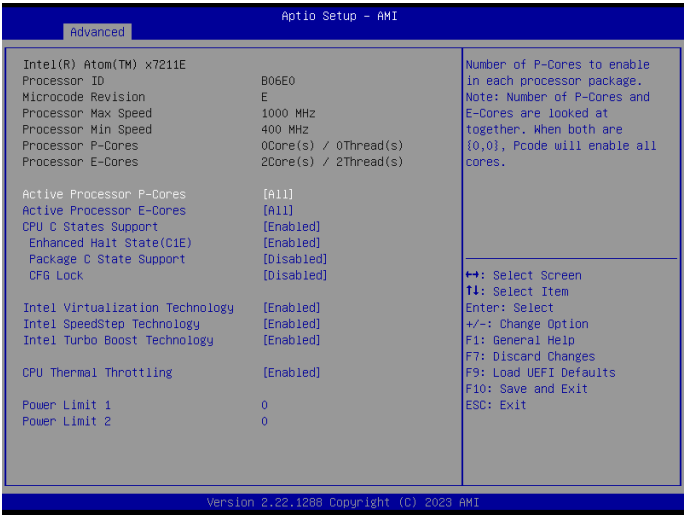


Setting wrong values in this section may cause the system to malfunction.

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, and then you can update your UEFI in only a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

3.3.1 CPU Configuration



Active Processor P-Cores

This allows you to select the number of cores to enable in each processor package.

Active Processor E-Cores

This allows you to select the number of E-Cores to enable in each processor package. NOTE: Number of P-Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

CPU C States Support

This allows you to enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Configuration options: [Enabled] [Disabled]

Enhanced Halt State (C1E)

The option allows you to enable Enhanced Halt State (C1E) for lower power consumption.

Configuration options: [Enabled] [Disabled]

Package C State Support

The option allows you to enable CPU, PCIe, Memory, Graphics C State Support for power saving.

CFG Lock

The option allows you to enable or disable the CFG Lock.

Configuration options: [Enabled] [Disabled]

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Configuration options: [Enabled] [Disabled]

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology is set to [Disabled] and Intel Turbo Boost Technology is set to [Enabled].

Configuration options: [Enabled] [Disabled].

If you install Windows® 10 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state. The default value is [Enabled].

Configuration options: [Enabled] [Disabled]

CPU Thermal Throttling

CPU Thermal Throttling allows you to enable CPU internal thermal control mechanisms to keep the CPU from overheating.

Configuration options: [Enabled] [Disabled]

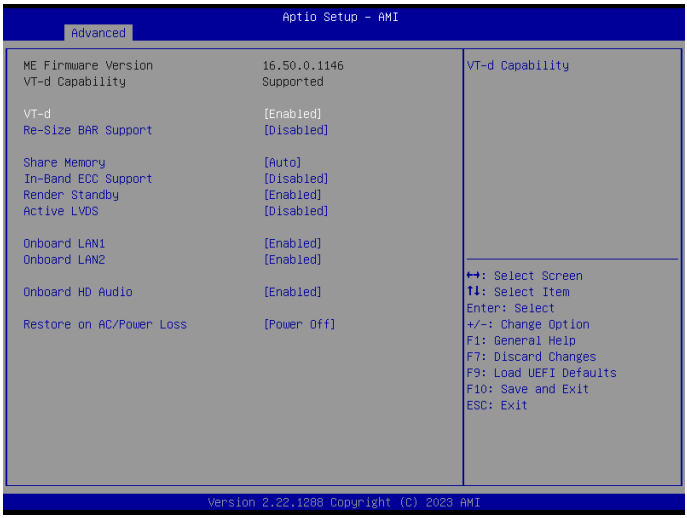
Power Limit 1

"Power Limit 1 in Milli Watts. BIOS will round to the nearest 1/8W when programming. 0 = no custom override. For 12.50W, enter 12500. Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR). Other SKUs: This value must be between Min Power Limit and Processor Base Power (TDP) Limit. If value is 0, BIOS will program Processor Base Power (TDP) value."

Power Limit 2

"Power Limit 2 value in Milli Watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as 1.25*Processor Base Power (TDP). For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit."

3.3.2 Chipset Configuration



VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

Configuration options: [Enabled] [Disabled]

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR Support.

Share Memory

Share memory allows you to configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Configuration options: [Auto] [32M] [64M] [128M] [256M] [512M]
Options vary depending on the memory you use on your motherboard.

In-Band ECC Support

This allows you to enable or disable In-Band ECC.

Configuration options: [Enabled] [Disabled]

Render Standby

Power down the render unit when the GPU is idle for lower power consumption.

Configuration options: [Enabled] [Disabled]

Active LVDS

Use this to enable or disable the LVDS. The default value is [Disabled]. Set the item to [Enabled]. Then press <F10> to save the setting and restart the system. Now the default value of Active LVDS is changed to [Enabled] (F9 load default is also set to [Enabled]).

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Configuration options: [Enabled] [Disabled]

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

Configuration options: [Enabled] [Disabled]

Onboard HD Audio

This allows you to enable or disable the onboard HD audio.

Configuration options: [Enabled] [Disabled]

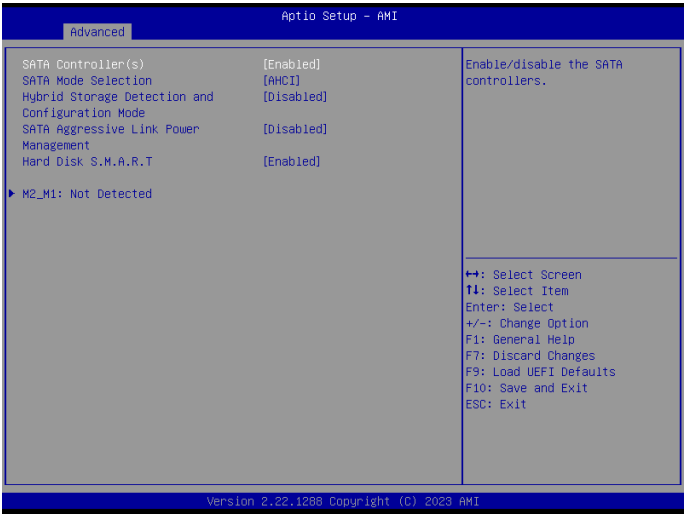
Restore on AC/Power Loss

The option allows you to select the power state after a power failure.

[Power Off] sets the power to remain off when the power recovers.

[Power On] sets the system to start to boot up when the power recovers.

3.3.3 Storage Configuration



SATA Controller(s)

The option allows you to enable or disable the SATA controllers.

Configuration options: [Enabled] [Disabled]

SATA Mode Selection

AHCI supports new features that improve performance.

Configuration option: [AHCI]

Hybrid Storage Detection and Configuration Mode

The option allows you to select Hybrid Storage Detection and Configuration Mode.

Configuration options: [Dynamic Configuration for Hybrid Storage Enable] [Disabled]

SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is supported only by AHCI mode.

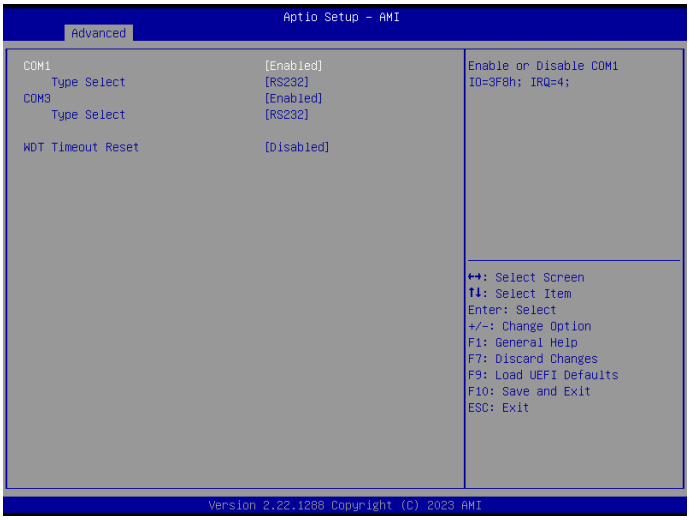
Configuration options: [Enabled] [Disabled]

Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

3.3.4 Super IO Configuration



COM1 Configuration

Use this to set parameters of COM1.

Type Select

Use this to select COM1 port type: [RS232], [RS422] or [RS485].

COM3 Configuration

Use this to set parameters of COM3.

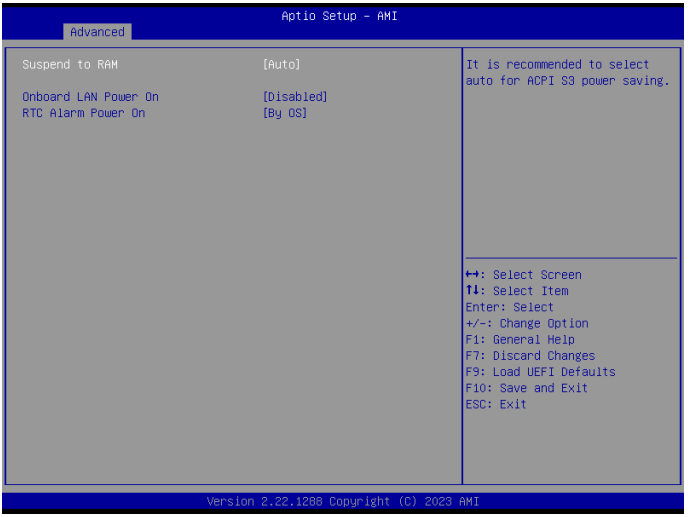
Type Select

Use this to select COM3 port type: [RS232], [RS422] or [RS485].

WDT Timeout Reset

Use this to set the Watch Dog Timer.

3.3.5 ACPI Configuration



Suspend to RAM

Suspend to RAM allows you to select [Disabled] for ACPI suspend type S1. It is recommended to select [Auto] for ACPI S3 power saving.

Configuration options: [Auto] [Disabled]

Onboard LAN Power On

Use this item to enable or disable onboard LAN to turn on the system from the power-soft-off mode.

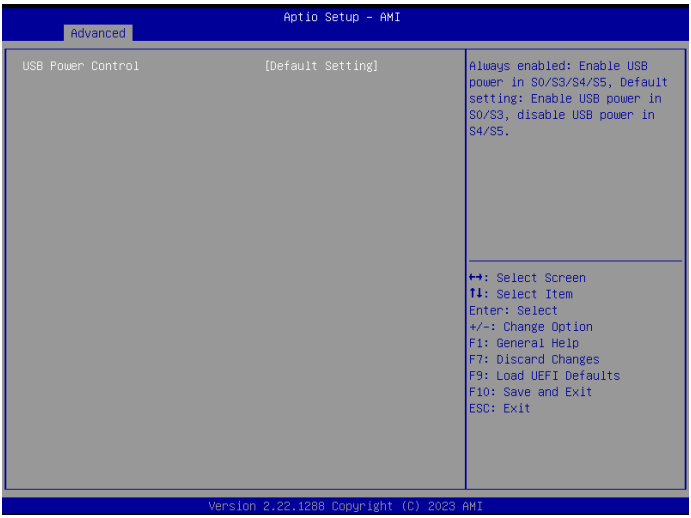
Configuration options: [Enabled] [Disabled]

RTC Alarm Power On

RTC Alarm Power On allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

Configuration options: [Enabled] [Disabled] [By OS]

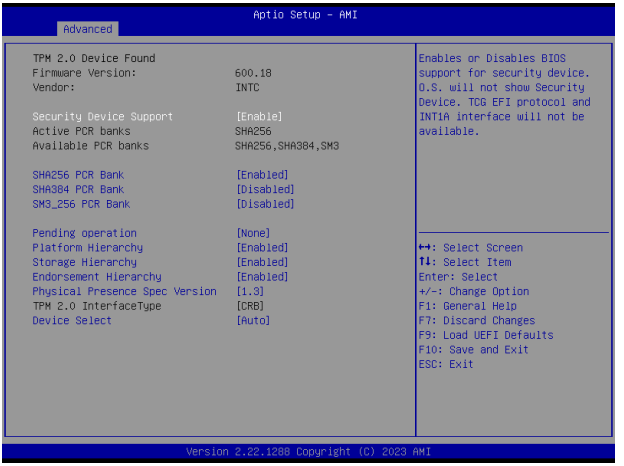
3.3.6 USB Configuration



USB Power Control

Use this option to control USB power.

3.3.7 Trusted Computing



NOTE: Options vary depending on the version of your connected TPM module.

Security Device Support

Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Configuration options: [Enabled] [Disabled]

Active PCR banks

This item displays active PCR Banks.

Available PCR Banks

This item displays available PCR Banks.

SHA256 PCR Bank

SHA256 PCR Bank allows you to enable or disable SHA256 PCR Bank.

Configuration options: [Enabled] [Disabled]

SHA384 PCR Bank

SHA384 PCR Bank allows you to enable or disable SHA384 PCR Bank.

Configuration options: [Enabled] [Disabled]

SM3_256 PCR Bank

SM3_256 PCR Bank allows you to enable or disable SM3_256 PCR Bank.

Configuration options: [Enabled] [Disabled]

Pending Operation

Pending Operation allows you to schedule an Operation for the Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Configuration options: [None] [TPM Clear]

Platform Hierarchy

This item allows you to enable or disable Platform Hierarchy.

Configuration options: [Enabled] [Disabled]

Storage Hierarchy

This item allows you to enable or disable Storage Hierarchy.

Configuration options: [Enabled] [Disabled]

Endorsement Hierarchy

This item allows you to enable or disable Endorsement Hierarchy.

Configuration options: [Enabled] [Disabled]

Physical Presence Spec Version

Select this item to tell OS to support PPI spec version 1.2 or 1.3. Please note that some HCK tests might not support version 1.3.

Configuration options: [1.2] [1.3]

TPM 2.0 InterfaceType

This item allows you to view the Communication Interface to TPM 2.0 Device: CRB or ITS.

Device Select

This item allows you to select the TPM device to be supported.

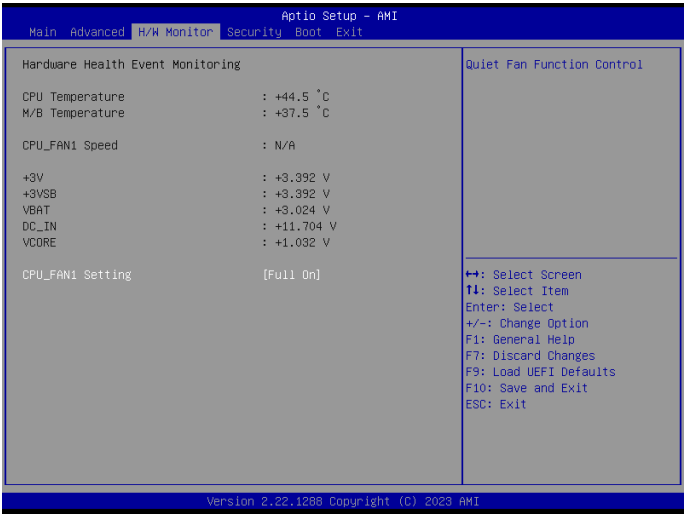
[TPM 1.2] restricts support to TPM 1.2 devices.

[TPM 2.0] restricts support to TPM 2.0 devices.

[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

3.4 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, and the critical voltage.



NOTE: Options vary depending on the features of your motherboard.

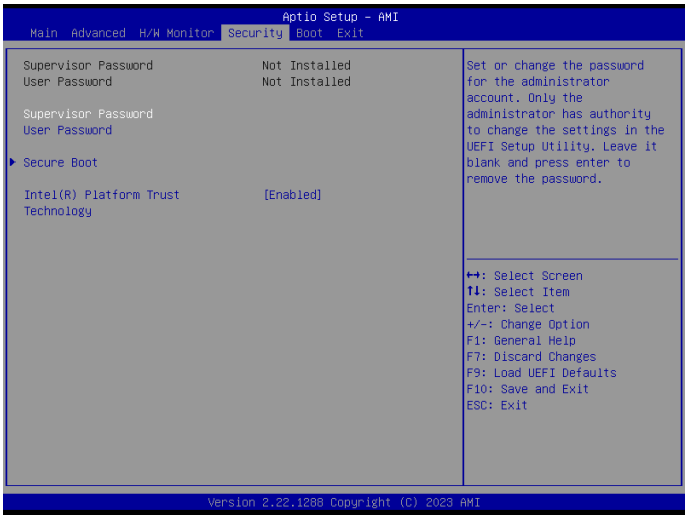
CPU_Fan 1 Setting

This item allows you to select a fan mode for CPU Fan 1. The default value is [Full On].

Configuration options: [Full On] [Automatic Mode]

3.5 Security Screen

In this section you may set or change the supervisor/user password for the system. You may also clear the user password.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has the authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

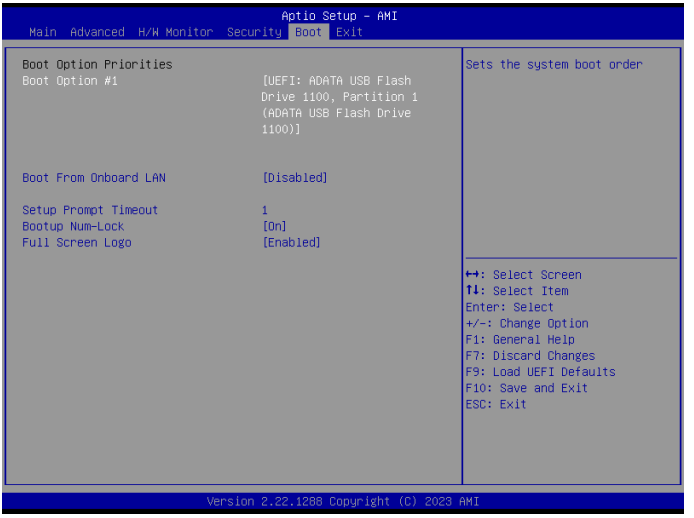
Press [Enter] to configure the Secure Boot Settings. The feature protects the system from unauthorized access and malwares during POST.

Intel(R) Platform Trust Technology

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

3.6 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

The item allows you to set the system boot order.

Boot From Onboard LAN

The item allows the system to be waked up by the onboard LAN.

Configuration options: [Enabled] [Disabled]

Setup Prompt Timeout

The item allows you to configure the number of seconds to wait for the UEFI setup utility.

Configuration options: [1] - [65535]

Bootup Num-Lock

The item allows you to select whether Num Lock should be turned on or off when the system boots up.

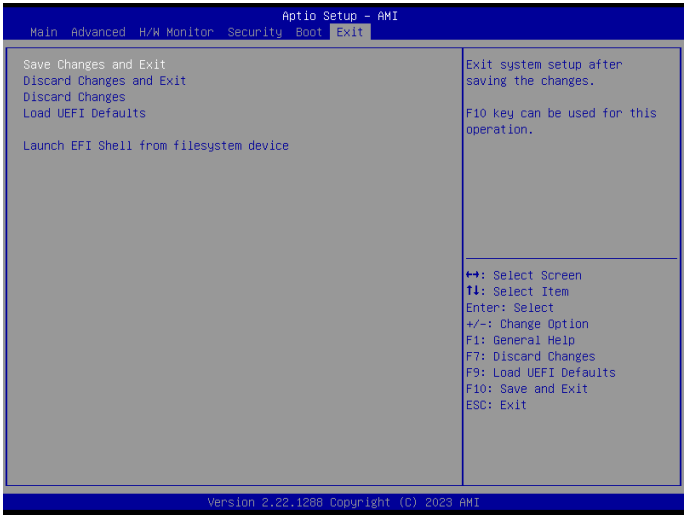
Configuration options: [On] [Off]

Full Screen Logo

[Enabled] Select this item to display the boot logo.

[Disabled] Select this item to show normal POST messages.

3.7 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message “Discard changes and exit setup?” will pop out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, the following message “Discard changes?” will pop out. Select [Yes] to discard all the changes.

Load UEFI Defaults

The item allows you to load UEFI default values for all options. The F9 key can be used for this operation.

Launch EFI Shell from filesystem device

The item allows you to copy shellx64.efi to the root directory to launch EFI Shell.