ASRock Industrial

IMB-X1904
IMB-X1904-10G

User Manual

Version 1.0
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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.



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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CE

ASRockInd follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASRockInd product is in line with global environmental regulations. In addition, ASRockInd disclose the relevant information based on regulation requirements.



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.

Button Battery Safety Notice

⚠WARNING

- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**.
- **KEEP** new and used batteries **OUT OF REACH of CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.



- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Battery type: CR2032
- Battery voltage: 3V
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- This product contains an irreplaceable battery.
- This icon indicates that a swallowed button battery can cause serious injury or death. Please keep batteries out of sight or reach of children.

Contents

Chapter 1 Introduction **1**

1.1 Package Contents 1

1.2 Specifications 2

1.3 Motherboard Layout 6

1.4 I/O Panel 9

1.5 Block Diagram 11

Chapter 2 Installation **13**

2.1 Screw Holes 13

2.2 Pre-installation Precautions 13

2.3 Installing the CPU and Heatsink 14

2.4 Installation of Memory Modules (RDIMM/RDIMM-3DS) 20

2.5 Expansion Slots 22

2.6 Jumpers Setup 24

2.7 Onboard Headers and Connectors 27

Chapter 3 UEFI SETUP UTILITY **36**

3.1 Introduction 36

3.1.1 Entering BIOS Setup 36

3.1.2 UEFI Menu Bar 37

3.1.3 Navigation Keys 38

3.2 Main Screen 39

3.3 Advanced Screen 40

3.3.1 CPU Configuration 41
3.3.2 Chipset Configuration 43
3.3.3 Storage Configuration 45
3.3.4 NVMe Configuration 46
3.3.5 Super IO Configuration 47
3.3.6 AMT Configuration 48
3.3.7 ACPI Configuration 50
3.3.8 USB Configuration 51
3.3.9 Trusted Computing 52
3.4 Hardware Health Event Monitoring Screen 55
3.5 Security Screen 57
3.6 Boot Screen 59
3.7 Exit Screen 60

Chapter 1 Introduction

Thank you for purchasing ASRockInd ***IMB-X1904 / IMB-X1904-10G*** 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. You may find the latest CPU support lists on ASRockInd website as well.

ASRockInd website https://www.asrockind.com/IMB-X1904

https://www.asrockind.com/IMB-X1904-10G

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 ***IMB-X1904 / IMB-X1904-10G*** Motherboard EATX (12-in x 11.7-in x 1.6-in, 30.5 cm x 29.7 cm x 4.0 cm)

- Gift Package:
  2 x SATA Cable
  1 x LGA4710 E2A Carrier
  1 x LGA4710 E2B Carrier
  1 x I/O Shield
  2 x SCREW M3*2.5

- Bulk Package:
  1 x LGA4710 E2A Carrier
  1 x LGA4710 E2B Carrier
  1 x I/O Shield
  2 x SCREW M3*2.5

1.2 Specifications

IMB-X1904

Form Factor	Dimensions	EATX (12-in x 11.7-in x 1.6-in, 30.5 cm x 29.7 cm x 4.0 cm)
Processor System	CPU	Intel® Xeon® 600 Processors
	Chipset	Intel® W890
	Socket	LGA4710
	BIOS	AMI SPI 256 Mbit
Memory	Technology	Quad Channel ECC DDR5 6400 MHz (1DPC), 5200 MHz (2DPC)
	Capacity	2TB
	Socket	8 x 288-pin RDIMM/RDIMM-3DS
Graphics	VGA	1 x VGA from Silicon Motion SM750 Max resolution up to 1920 x 1200@60Hz
Expansion Slot	PCIe	PCIE7: PCIe Gen5 x16 PCIE6: PCIe Gen5 x16 PCIE5: PCIe Gen5 x16 (supported with Expert SKU) PCIE4: PCIe Gen5 x16 PCIE3: PCIe Gen5 x16 (supported with Expert SKU) PCIE2: PCIe Gen5 x8 PCIE1: PCIe Gen5 x16
	MCIO	2 x MCIO with PCIe Gen4 x8 (supported with Expert SKU)
Audio	Interface	Realtek ALC897, High Definition Audio. Line-in, Line-out, Mic-in
Ethernet	Controller/ Speed	LAN1: Intel® I210AT with 10/100/1000 Mbps LAN2: Intel® I219LM with 10/100/1000 Mbps, supports vPro
	Controller	2 x RJ-45
Rear I/O	VGA	1
	Ethernet	2 x 1 Gigabit LAN
	USB	4 x USB 3.2 Gen2
	Audio	3 (Line-In/Line-Out/Mic-In)
	COM	COM1 (RS-232)

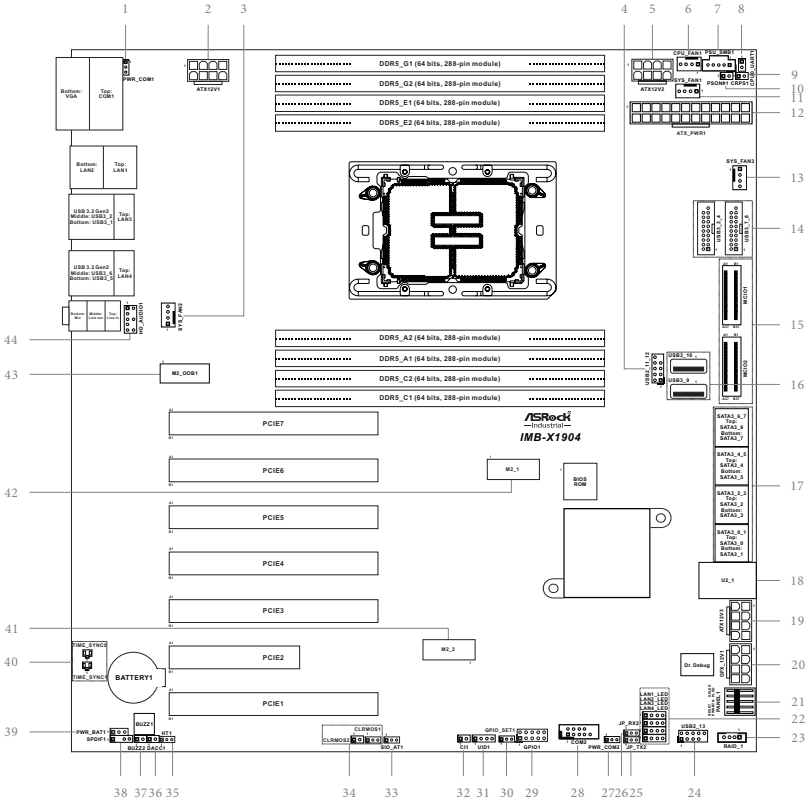
Internal Connector	USB	2 x USB 3.2 Gen1 (vertical connector) 4 x USB 3.2 Gen1 (2 x USB 3.2 header) 3 x USB 2.0 (2 x 2.54 pitch header)
	COM	COM2 (RS-232)
	GPIO	4 x DI + 4 x DO
	OOB Header	1 *Recommend using AI-M2-OOB module to support OOB function.
	Others	2 x TGPIO (2 x 1-pin header)
Storage	M.2	1 x M.2 (Key M, 2242/2280/3052/25110) with PCIe Gen5 x4 for SSD 1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD
	U.2	1 x U.2 with PCIe Gen4 x4
	SATA	8 x SATA3
	RAID	Intel® SATA RAID 0/1/5/10
Security	TPM	TPM 2.0 onboard IC
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255sec
Power Requirements	Input PWR	1 x 24-pin ATX PWR connector 3 x 8-pin ATX 12V PWR connector 1 x (6+2)-pin PCIE 12V PWR connector
	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 Temperature	-20°C ~ 70°C
	Storage Temperature	-40°C ~ 85°C
	Operating Humidity	5% ~ 90% (non-condensing)
	Storage Humidity	5% ~ 90% (non-condensing)

IMB-X1904-10G

Form Factor	Dimensions	EATX (12-in x 11.7-in x 1.6-in, 30.5 cm x 29.7 cm x 4.0 cm)
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	BIOS	AMI SPI 256 Mbit
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	Capacity	2TB
	Socket	8 x 288-pin RDIMM/RDIMM-3DS
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Expansion Slot	PCIe	PCIE7: PCIe Gen5 x16 PCIE6: PCIe Gen5 x16 PCIE5: PCIe Gen5 x16 (supported with Expert SKU) PCIE4: PCIe Gen5 x16 PCIE3: PCIe Gen5 x16 (supported with Expert SKU) PCIE2: PCIe Gen5 x8 PCIE1: PCIe Gen5 x16
	MCIO	2 x MCIO with PCIe Gen4 x8 (supported with Expert SKU)
Audio	Interface	Realtek ALC897, High Definition Audio. Line-in, Line-out, Mic-in
Ethernet	Controller/ Speed	LAN1: Intel® I210AT with 10/100/1000 Mbps LAN2: Intel® I219LM with 10/100/1000 Mbps, supports vPro LAN3: Intel® E610-XAT2 with 10/100/1000/2500/5000/10000 Mbps LAN4: Intel® E610-XAT2 with 10/100/1000/2500/5000/10000 Mbps
	Controller	4 x RJ-45
Rear I/O	VGA	1
	Ethernet	2 x 10 Gigabit LAN 2 x 1 Gigabit LAN
	USB	4 x USB 3.2 Gen2
	Audio	3 (Line-In/Line-Out/Mic-In)
	COM	COM1 (RS-232)

Internal Connector	USB	2 x USB 3.2 Gen1 (vertical connector) 4 x USB 3.2 Gen1 (2 x USB 3.2 header) 3 x USB 2.0 (2 x 2.54 pitch header)
	COM	COM2 (RS-232)
	GPIO	4 x DI + 4 x DO
	OOB Header	1 *Recommend using AI-M2-OOB module to support OOB function.
	Others	2 x TGPIO (2 x 1-pin header)
Storage	M.2	1 x M.2 (Key M, 2242/2280/3052/25110) with PCIe Gen5 x4 for SSD 1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD
	U.2	1 x U.2 with PCIe Gen4 x4
	SATA	8 x SATA3
	RAID	Intel® SATA RAID 0/1/5/10
Security	TPM	TPM 2.0 onboard IC
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255sec
Power Requirements	Input PWR	1 x 24-pin ATX PWR connector 3 x 8-pin ATX 12V PWR connector 1 x (6+2)-pin PCIE 12V PWR connector
	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 Temperature	-20°C ~ 70°C
	Storage Temperature	-40°C ~ 85°C
	Operating Humidity	5% ~ 90% (non-condensing)
	Storage Humidity	5% ~ 90% (non-condensing)

1.3 Motherboard Layout

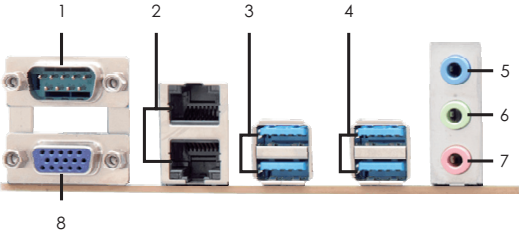


1 : COM Port PWR Setting Jumper
PWR_COM1 (For COM Port1)
2 : 8-pin ATX 12V Power Connector (ATX12V1)
3 : SYS FAN Connector (SYS_FAN2)
4 : USB 2.0 Header (USB2_11_12)
5 : 8-pin ATX 12V Power Connector (ATX12V2)
6 : CPU FAN Connector (CPU_FAN1)
7 : PSU_SMB1
8 : CPU0_UART1
9 : CRPS1
10 : PSON#1
11 : SYS FAN Connector (SYS_FAN1)
12 : 24-pin ATX Power Input Connector (ATXPWR1)
13 : SYS FAN Connector (SYS_FAN3)
14 : USB 3.2 Gen1 Headers (USB3_3_4, USB3_7_8)
15 : MCIO Connectors (MCIO1, MCIO2)
16 : USB 3.2 Gen1 Header (Vertical Type-A) (USB3_9, USB3_10)
17 : SATA3 Connectors (SATA3_0~SATA7)
18 : U2_1
19 : 8-pin ATX 12V Power Connector (ATX12V3)
20 : 8-pin ATX_PCIE Power Connector (GFX_12V1)
21 : System Panel Header (PANEL1)
22 : LAN LED Headers (LAN1_LED, LAN2_LED, LAN3_LED, LAN4_LED)
23 : RAID KEY (RAID_1)
24 : USB 2.0 Header (USB2_13)
25 : JP_TX2
26 : JP_RX2
27 : COM Port PWR Setting Jumper
PWR_COM2 (For COM Port2)
28 : COM Port Header (COM2) (RS232)
29 : Digital Input/Output Pin Header (GPIO1)
30 : Digital Input/Output Default Value Setting (GPIO_SET1)
31 : UID1
32 : Chassis Intrusion Header (CI1)
33 : ATX/AT Mode Jumper (SIO_AT1)
34 : Clear CMOS Headers (CLRMOS1, CLRMOS2)
35 : HEATER1 Header (HT1) (Preheat function)
36 : DACC1
37 : Buzzer Header (BUZZ2)
38 : SPDIF Header (SPDIF1)
39 : PWR_BAT1

40 : TIME SYNC Headers (TIME SYNC0, TIME SYNC1)
41 : M.2 Key-M Socket (M2_2)
42 : M.2 Key-M Socket (M2_1)
43 : M2_OOB1
44 : Front Panel Audio Header (HD_AUDIO1)

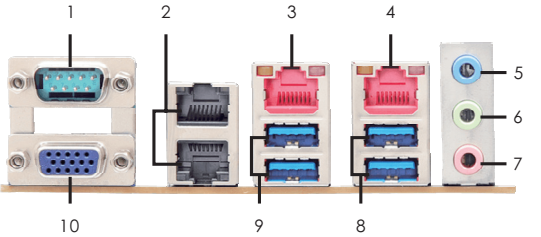
1.4 I/O Panel

IMB-X1904



1 COM Port (COM1) (RS232)
2 Top : RJ45 1GbE LAN Port (LAN1)*
Bottom: RJ45 1GbE LAN Port (LAN2)* (support vPro)
3 Top : USB 3.2 Gen2 Port (USB3_2)
Bottom: USB 3.2 Gen2 Port (USB3_1)
4 Top: USB 3.2 Gen2 Port (USB3_6)
Bottom: USB 3.2 Gen2 Port (USB3_5)
5 Audio Jack: Blue: Line in
6 Audio Jack: Green: Line out
7 Audio Jack: Pink: Mic
8 D-Sub Port (VGA1)

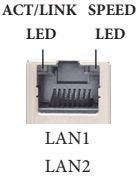
IMB-X1904-10G



1 COM Port (COM1) (RS232)
2 Top : RJ45 1GbE LAN Port (LAN1)*
Bottom: RJ45 1GbE LAN Port (LAN2)* (support vPro)
3 RJ45 10GbELAN Port (LAN3)**
4 RJ45 10GbELAN Port (LAN4)**
5 Audio Jack: Blue: Line in
6 Audio Jack: Green: Line out
7 Audio Jack: Pink: Mic
8 Top: USB 3.2 Gen2 Port (USB3_6)
Bottom: USB 3.2 Gen2 Port (USB3_5)
9 Top : USB 3.2 Gen2 Port (USB3_2)
Bottom: USB 3.2 Gen2 Port (USB3_1)
10 D-Sub Port (VGA1)

* There are two LEDs next to the LAN1, 2 ports. Please refer to the table below for the LAN1, 2 ports LED indications.

LAN1, 2 Ports LED Indications

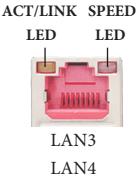


Activity/Link LED	
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED	
Status	Description
Off	10Mbps connection
Orange	100Mbps connection
Green	1Gbps connection

** There are two LEDs next to the LAN3, 4 ports. Please refer to the table below for the LAN3, 4 ports LED indications.

LAN3, 4 Ports LED Indications

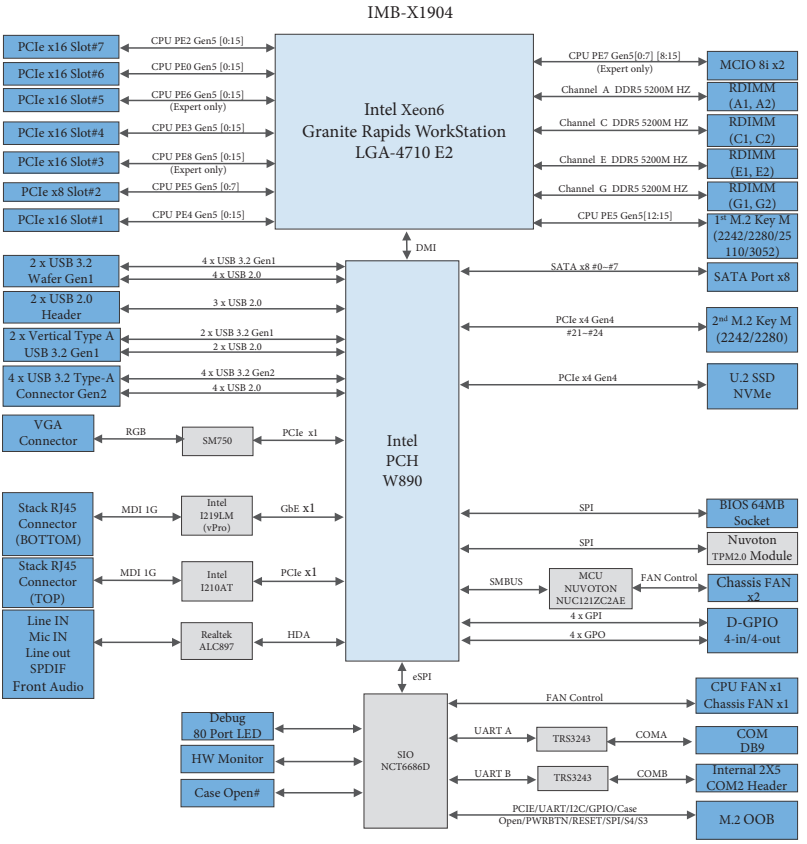


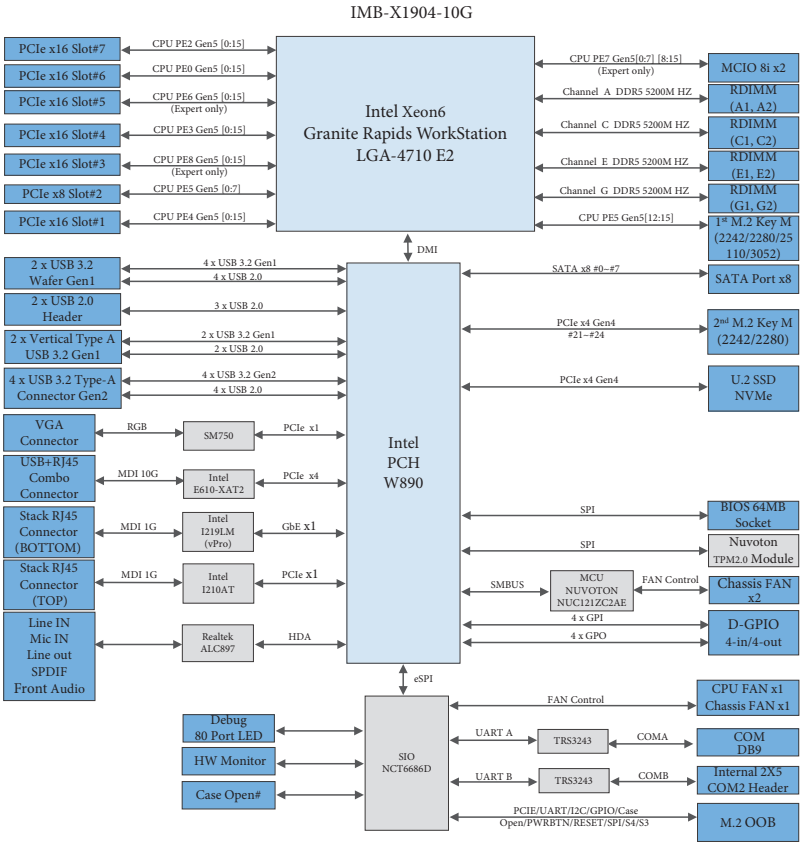
Activity/Link LED	
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED	
Status	Description
Orange	10Mbps/100Mbps/1Gbps/2.5Gbps/ 5Gbps connection
Green	10Gbps connection

1.5 Block Diagram

IMB-X1904




IMB-X1904-10G
PCIe x16 Slot#7
PCIe x16 Slot#6
PCIe x16 Slot#5
PCIe x16 Slot#4
PCIe x16 Slot#3
PCIe x8 Slot#2
PCIe x16 Slot#1
CPU PE2 Gen5 [0:15]
CPU PE0 Gen5 [0:15]
CPU PE6 Gen5 [0:15] (Expert only)
CPU PE3 Gen5 [0:15]
CPU PE8 Gen5 [0:15] (Expert only)
CPU PE5 Gen5 [0:7]
CPU PE4 Gen5 [0:15]
Intel Xeon6
Granite Rapids WorkStation
LGA-4710 E2
CPU PE7 Gen5[0:7] [8:15] (Expert only)
Channel A DDR5 5200M HZ
Channel C DDR5 5200M HZ
Channel E DDR5 5200M HZ
Channel G DDR5 5200M HZ
CPU PE5 Gen5[12:15]
MCIO 8i x2
RDIMM (A1, A2)
RDIMM (C1, C2)
RDIMM (E1, E2)
RDIMM (G1, G2)
1st M.2 Key M (2242/2280/25 110/3052)
DMI
2 x USB 3.2 Wafer Gen1
2 x USB 2.0 Header
2 x Vertical Type A USB 3.2 Gen1
4 x USB 3.2 Type-A Connector Gen2
4 x USB 3.2 Gen1
4 x USB 2.0
3 x USB 2.0
2 x USB 3.2 Gen1
2 x USB 2.0
4 x USB 3.2 Gen2
4 x USB 2.0
Intel PCH W890
SATA x8 #0~#7
SATA Port x8
PCIe x4 Gen4 #21~#24
2nd M.2 Key M (2242/2280)
PCIe x4 Gen4
U.2 SSD NVMe
VGA Connector
USB+RJ45 Combo Connector
Stack RJ45 Connector (BOTTOM)
Stack RJ45 Connector (TOP)
Line IN
Mic IN
Line out
SPDIF
Front Audio
RGB
MDI 10G
MDI 1G
MDI 1G
SM750
Intel E610-XAT2
Intel I219LM (vPro)
Intel I210AT
Realtek ALC897
PCIe x1
PCIe x4
GbE x1
PCIe x1
HDA
SPI
SPI
BIOS 64MB Socket
Nuvoton TPM2.0 Module
SMBUS
MCU NUVOTON NUC121ZC2AE
FAN Control
Chassis FAN x2
4 x GPI
4 x GPO
D-GPIO 4-in/4-out
eSPI
Debug 80 Port LED
HW Monitor
Case Open#
SIO NCT6686D
FAN Control
CPU FAN x1
Chassis FAN x1
UART A
TRS3243
COMA
COM DB9
UART B
TRS3243
COMB
Internal 2X5 COM2 Header
PCIE/UART/I2C/GPIO/Case Open/PWRBTN/RESET/SPI/S4/S3
M.2 OOB

Chapter 2 Installation

This is a EATX (12-in x 11.7-in x 1.6-in, 30.5 cm x 29.7 cm x 4.0 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.

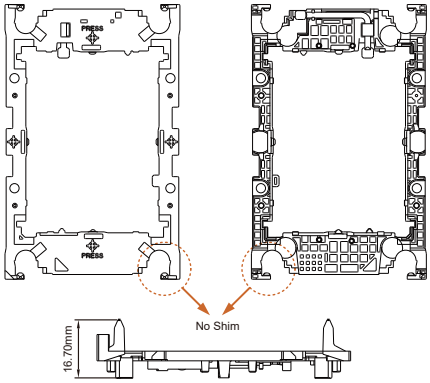
2.3 Installing the CPU and Heatsink

1. *Unplug all power cables before installing the CPU.*
2. *Illustration in this documentation are examples only.*

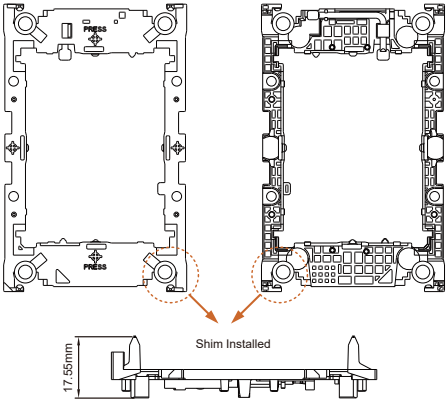
Carrier Used

Carrier Type	Xeon® SP XCC	Xeon® SP HCC/LCC/HDCC
Carrier Code	E2A	E2B
Shim	No	Yes
Carrier Height	16.70mm	17.55mm

XCC Carrier

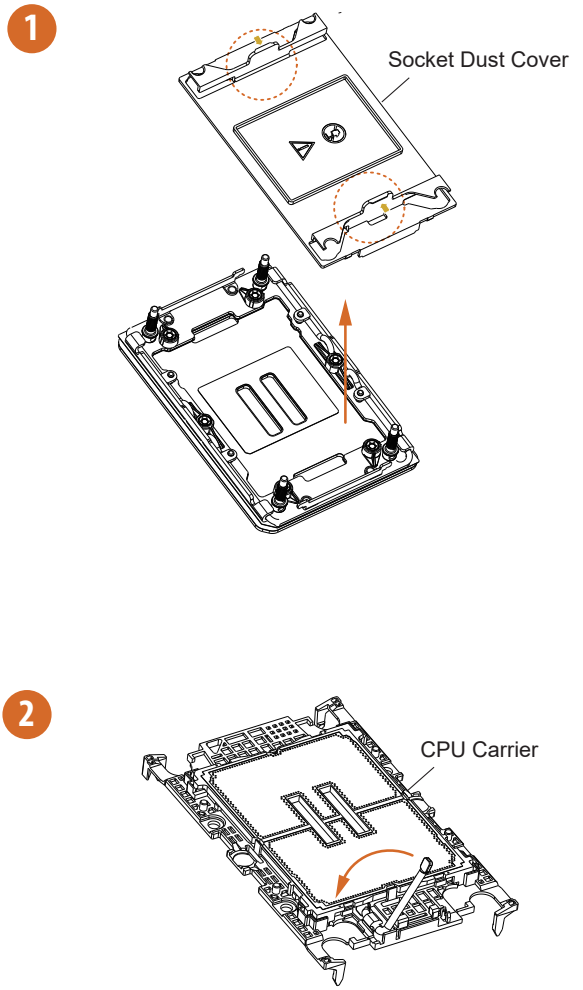


HCC/LCC/HDCC Carrier

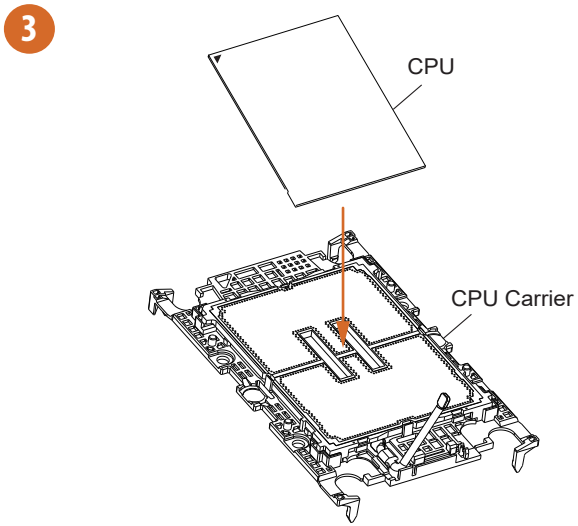


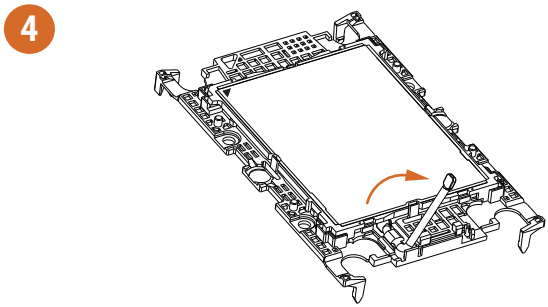
We recommend using the CPU Installation tool to avoid CPU pin-bent problem.

1. 2. Remove the CPU socket cover and open the socket lever.



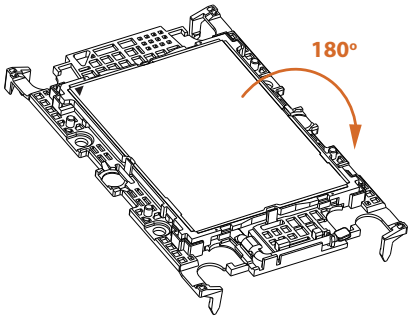
3. 4. Align and install the processor on the carrier and make sure the arrow is located in the correct direction. Close the socket lever.



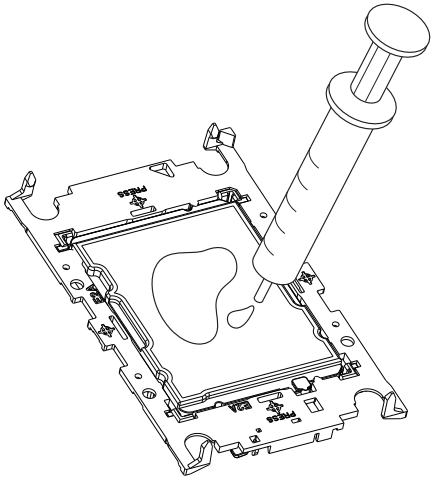


5. 6. Carefully flip the carrier assembly. Apply a thermal paste.

5

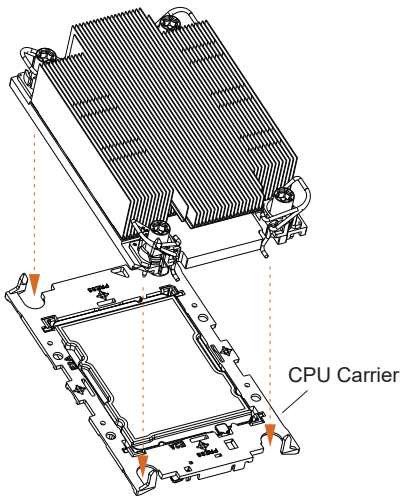


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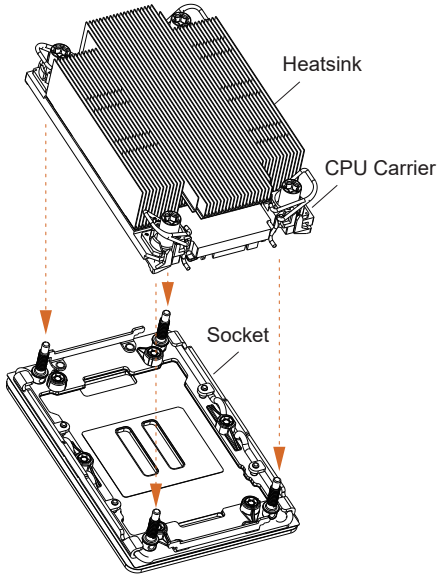


7. 8. Install the heatsink to the CPU carrier. Then install the heatsink and CPU carrier to the socket.

7

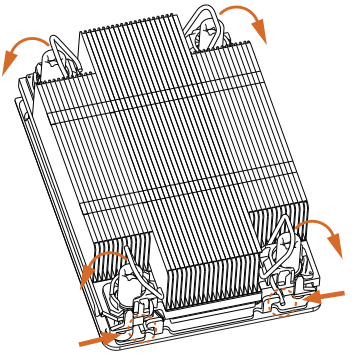


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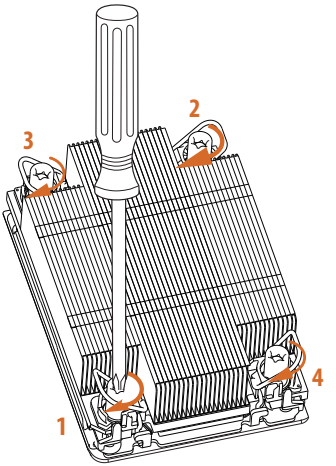


9. 10. Tighten the corner fasteners. Secure the heastink to the motherboard with a crewdriver.

9



10



Set the torque wrench to 6-12 in-lb.
One fourth a turn each time.

Tighten the screws in a sequential order 1 > 2 > 3 > 4.
Loosen the screws in a reverse order.

2.4 Installation of Memory Modules (RDIMM/RDIMM-3DS)

IMB-X1904 / IMB-X1904-10G provides eight 288-pin DDR5 (Double Data Rate 5) RDIMM/ RDIMM-3DS slots.

1. *For Quad 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 Quad Channel Memory Technology with only three 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.*

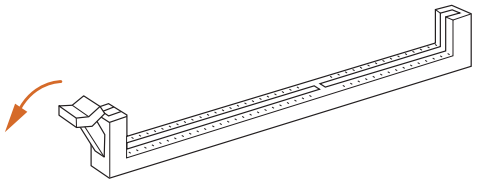
The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot in the incorrect orientation.

Recommended Memory Configuration

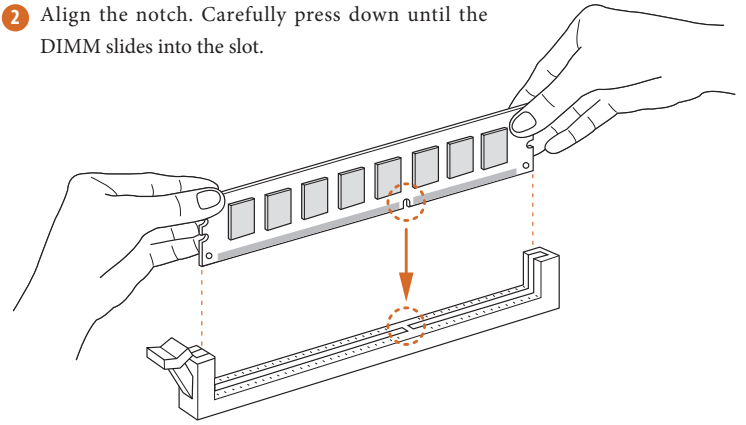
DIMM Card	G1	G2	E1	E2	A2	A1	C2	C1
1 DIMM			V			V		
2 DIMMs	V		V			V		V
4 DIMMs	V		V			V		V
8 DIMMs	V	V	V	V	V	V	V	V

* The symbol "V" indicates the slot is populated.

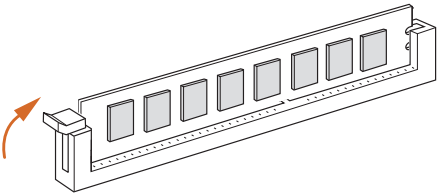
1 Open the DIMM slot latch.



2 Align the notch. Carefully press down until the DIMM slides into the slot.



3 The latch snaps back into place.



2.5 Expansion Slots

There are seven PCI Express slots, two MCIO slots and two M.2 sockets on this motherboard.

PCIE slot: PCIE1 (PCIe 5.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE2 (PCIe 5.0 x8 slot) is used for PCI Express x8 lane width cards.
PCIE3 (PCIe 5.0 x16 slot, supported with Expert SKU) is used for PCI Express x16 lane width cards.
PCIE4 (PCIe 5.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE5 (PCIe 5.0 x16 slot, supported with Expert SKU) is used for PCI Express x16 lane width cards.
PCIE6 (PCIe 5.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE7 (PCIe 5.0 x16 slot) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE1	5.0	x16	x16	CPU
PCIE2	5.0	x8	x8	CPU
PCIE3	5.0	x16	x16	CPU, Supported with Expert SKU
PCIE4	5.0	x16	x16	CPU
PCIE5	5.0	x16	x16	CPU, Supported with Expert SKU
PCIE6	5.0	x16	x16	CPU
PCIE7	5.0	x16	x16	CPU

MCIO slots: 2 x MCIO (PCIe 4.0 x8) slots are available and supported on Expert SKU only.

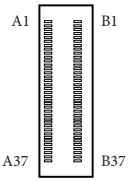
M.2 sockets: 1 x M.2 (Key M, 2242/2280/3052/25110) with PCIe Gen5 x4 for SSD
1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD

M.2 Key-M Sockets
(M2_M1, M2_M2)

Pin	Signal Name	Signal Name	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	PERn3	NA	6
7	PERp3	NA	8
9	GND	LED#	10
11	PETn3	+3.3V	12
13	PETp3	+3.3V	14
15	GND	+3.3V	16
17	PERn2	+3.3V	18
19	PERp2	NA	20
21	GND	NA	22
23	PETn2	NA	24
25	PETp2	NA	26
27	GND	NA	28
29	PERn1	NA	30
31	PERp1	NA	32
33	GND	NA	34
35	PETn1	NA	36
37	PETp1	NA	38
39	GND	SMB_CLK	40
41	PERn0	SMB_DATA	42
43	PERp0	NA	44
45	GND	NA	46
47	PETn0	NA	48
49	PETP0	PERST#	50
51	GND	CLKREQ#	52
53	PEFCLKn	NA	54
55	PEFCLKp	NA	56
57	GND	NA	58
67	NA	SUSCLK	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

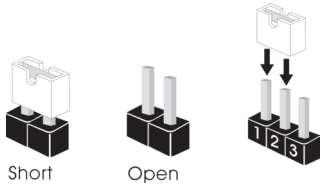
MCIO Connectors
(MCIO1, MCIO2)

Pin	Signal Name	Signal Name	Pin
A1	GND	GND	B1
A2	RX 0+	TX 0+	B2
A3	RX 0-	TX 0-	B3
A4	GND	GND	B4
A5	RX 1+	TX 1+	B5
A6	RX 1-	TX 1-	B6
A7	GND	GND	B7
A8	NA	SMB_CLK	B8
A9	WAKE#	SMB_DATA	B9
A10	GND	GND	B10
A11	CLK1+	PERST1	B11
A12	CLK1-	PRSNT1	B12
A13	GND	GND	B13
A14	RX 2+	TX 2+	B14
A15	RX 2-	TX 2-	B15
A16	GND	GND	B16
A17	RX 3+	TX 3+	B17
A18	RX 3-	TX 3-	B18
A19	GND	GND	B19
A20	RX 4+	TX 4+	B20
A21	RX 4-	TX 4-	B21
A22	GND	GND	B22
A23	RX 5+	TX 5+	B23
A24	RX 5-	TX 5-	B24
A25	GND	GND	B25
A26	NA	SMB_CLK	B26
A27	WAKE#	SMB_DATA	B27
A28	GND	GND	B28
A29	CLK2+	PERST2	B29
A30	CLK2-	PRSNT2	B30
A31	GND	GND	B31
A32	RX 6+	TX 6+	B32
A33	RX 6-	TX 6-	B33
A34	GND	GND	B34
A35	RX 7+	TX 7+	B35
A36	RX 7-	TX 7-	B36
A37	GND	GND	B37



2.6 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short." If no jumper cap is placed on pins, the jumper is "Open." The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



COM Port Pin9 PWR Setting Jumpers

(3-pin PWR_COM1 (For COM Port1)
(see p. 6, No. 1)



(3-pin PWR_COM2 (For COM Port2)
(see p. 6, No. 27)



Setting	Description
Open	+0V
1-2	+5V (Default)
2-3	+12V

Use the jumpers to set the power for COM port pin 9.

JP_TX2

(3-pin JP_TX2)
(see p. 6, No. 25)



Setting	Description
1-2	TX to COM2 (Default)
2-3	TX to M2_OOB1

JP_RX2

(3-pin JP_RX2)
(see p. 6, No. 26)



Setting	Description
1-2	RX to COM2 (Default)
2-3	RX to M2_OOB1

Digital Input/Output Default Value Setting

(3-pin JGPIO_SET1)
(see p. 6, No. 30)



Setting	Description
1-2	Pull-High (Default)
2-3	Pull-Low

The header is used for GPIO default value setting for either pull high or pull low. Pulling the header to a high/low value means the voltage is anchored to VCC/GND, in a stable, non-floating state.

Chassis Intrusion Headers

(2-pin CI1)

(see p. 6, No. 32)



Setting	Description
Open	Normal (Default)
Short	Active Case Open

This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

ATX/AT Mode Jumper

(2-pin SIO_AT1)

(see p. 6, No. 33)



Setting	Description
1-2	AT Mode
2-3	ATX Mode (Default)

Clear CMOS Headers

(3-pin CLRMOS1)

(see p. 6, No. 34)



Setting	Description
1-2	Normal (Default)
2-3	Clear CMOS

NOTE: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, and time will be cleared only if the CMOS battery is removed.

(2-pin CLRMOS2)

(see p. 6, No. 34)



Setting	Description
Open	Normal (Default)
Short	Auto Clear CMOS (Power off)

Note: CLRMOS2 allows you to clear the data in CMOS automatically when AC power on. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, then use a jumper cap to short the pins on CLRMOS2.

DACC Jumper

(2-pin DACC1)

(see p. 6, No. 36)



Setting	Description
Open	No ACC
Short	ACC (Default)

Auto clear CMOS when system boot improperly.

PWR_BAT1

(2-pin PWR_BAT1)

(see p. 6, No. 39)



Setting	Description
1-2	Normal (Default)
2-3	Charge Battery*

*Only supported by chargeable battery.

2.7 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 of the motherboard!

8-pin ATX 12V Power Connectors

(8-pin ATX_12V1)
(see p. 6, No. 2)

(8-pin ATX_12V2)
(see p. 6, No. 5)



ATX_12V1
ATX_12V2

(8-pin ATX_12V3)
(see p. 6, No. 19)



ATX_12V3

Pin	Signal Name	Signal Name	Pin
1	GND	ATX12V	5
2	GND	ATX12V	6
3	GND	ATX12V	7
4	GND	ATX12V	8

This motherboard provides three 8-pin ATX 12V power connectors. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.

SYS FAN Connector (+12V)

(4-pin SYS_FAN2)
(see p. 6, No. 3)



SYS_FAN2

(4-pin SYS_FAN1)
(see p. 6, No. 11)



SYS_FAN1

(4-pin SYS_FAN3)
(see p. 6, No. 13)



SYS_FAN3

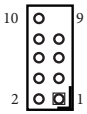
Pin	Signal Name
1	GND
2	SYS_FAN_VOUT
3	SYS_FAN_IN
4	SYS_FAN_PWMOUT

The board offers three 4-pin system fan (Smart Fan) connectors which are compatible with 3-pin system fan. If you connect a 3-pin system fan to the system fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

USB 2.0 Headers

(9-pin USB2_11_12)

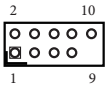
(see p. 6, No. 4)



Pin	Signal Name	Signal Name	Pin
1	USB_PWR	USB_PWR	2
3	USB2 D-	USB2 D-	4
5	USB2 D+	USB2 D+	6
7	GND	GND	8
9		NA	10

(9-pin USB2_13)

(see p. 6, No. 24)



Pin	Signal Name	Signal Name	Pin
1	USB_PWR	NA	2
3	USB2 D-	NA	4
5	USB2 D+	NA	6
7	GND	NA	8
9		NA	10

The board provides two internal USB 2.0 connectors. The USB2_11_12 header can support two USB 2.0 ports.

CPU FAN Connector (+12V)

(4-pin CPU_FAN1)

(see p. 6, No. 6)



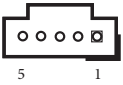
Pin	Signal Name
1	GND
2	+12V
3	CPU_FAN_SPEED
4	FAN_SPEED_CONTROL

The board offers one 4-pin CPU fan (Smart Fan) connectors which are compatible with 3-pin CPU fan. If you connect a 3-pin CPU fan to the CPU fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

PSU_SMB1

(5-pin PSU_SMB1)

(see p. 6, No. 7)



Pin	Signal Name
1	SMB_CLK
2	SMB_DATA
3	SMB_ALERT#
4	GND
5	+3V

The SMBus connector is for power supply unit.

CPU0_UART

(2-pin CPU0_UART)

(see p. 6, No. 8)



Pin	Signal Name
1	CPU0_UART_TXD_LVC3
2	CPU0_UART_RXD_LVC3

CRPS1

(2-pin CRPS1)

(see p. 6, No. 9)



Pin	Signal Name
1	ATX+5VSB
2	GND

PSON#1

(2-pin PSON#1)

(see p. 6, No. 10)

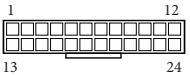


Pin	Signal Name
1	PSON#
2	GND

24-pin ATX Power Input Connector

(24-pin ATXPWR1)

(see p. 6, No. 12)



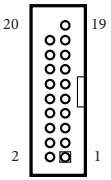
Pin	Signal Name	Signal Name	Pin
1	+3V	+3V	13
2	+3V	-12V	14
3	GND	GND	15
4	+5V	PSON#	16
5	GND	GND	17
6	+5V	GND	18
7	GND	GND	19
8	PWROK_PS	NA	20
9	+5VSB	+5V	21
10	ATX_24pin_ +12V	+5V	22
11	ATX_24pin_ +12V	+5V	23
12	+3V	GND	24

This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

USB 3.2 Gen1 Headers

(19-pin USB3_3_4, USB3_7_8)

(see p. 6, No. 14)



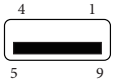
Pin	Signal Name	Signal Name	Pin
1	NA	USB2 D+	2
3	USB2 D+	USB2 D-	4
5	USB2 D-	GND	6
7	GND	SSTX+	8
9	SSTX+	SSTX-	10
11	SSTX-	GND	12
13	GND	SSRX+	14
15	SSRX+	SSRX-	16
17	SSRX-	USB_PWR	18
19	USB_PWR		20

There are two USB 3.2 Gen1 headers on this motherboard. Each header can support two USB 3.2 Gen1 ports with maximum power current 0.9A per port.

USB 3.2 Gen1 Headers (Vertical Type-A)

(9-pin USB3_9, USB3_10)

(see p. 6, No. 16)



Pin	Signal Name
1	USB_PWR
2	USB2 D-
3	USB2 D+
4	GND
5	SSRX-
6	SSRX+
7	GND
8	SSTX-
9	SSTX+

The board provides two internal USB 3.2 Gen1 vertical Type-A connectors. The maximum current per port is 0.9A.

SATA3 Connectors

(7-pin SATA3_0~SATA7)

(see p. 6, No. 17)



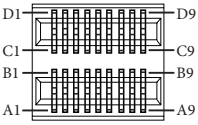
Pin	Signal Name
1	GND
2	SATA-A+
3	SATA-A-
4	GND
5	SATA-B-
6	SATA-B+
7	GND

The Serial ATA3 (SATA3) connector supports SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

U2_1

(36-pin U2_1)

(see p. 6, No. 18)



Pin	Signal Name	Signal Name	Pin
A1	PCIE CLK+	U2_RST#	B1
A2	PCIE CLK-	NA	B2
A3	GND	GND	B3
A4	RX1+	RX0+	B4
A5	RX1-	RX0-	B5
A6	GND	GND	B6
A7	RX3+	RX2+	B7
A8	RX3-	RX2-	B8
A9	GND	GND	B9

Pin	Signal Name	Signal Name	Pin
C1	LED#	NA	D1
C2	NA	NA	D2
C3	GND	GND	D3
C4	TX1+	TX0+	D4
C5	TX1-	TX0-	D5
C6	GND	GND	D6
C7	TX3+	TX2+	D7
C8	TX3-	TX2-	D8
C9	GND	GND	D9

8-pin ATX_PCIE Power Connector

(8-pin GFX_12V1)

(see p. 6, No. 20)



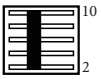
Pin	Signal Name	Signal Name	Pin
1	PCIE_+12V	GND	2
3	PCIE_+12V	GND	4
5	PCIE_+12V	GND	6
7	GND	GND	8

This motherboard provides one 8-pin ATX_PCIE power connectors. To use a 4-pin ATX_ PCIE power supply, please plug it along Pin 1 and Pin 2.

System Panel Header

(9-pin PANEL1)

(see p. 6, No. 21)



Top view



Front-facing view

Pin	Signal Name	Signal Name	Pin
1		GND	2
3	GND	RESET#	4
5	PWRBTN#	GND	6
7	PLED-	HDLED-	8
9	PLED+	HDLED+	10

This header accommodates several system front panel functions.

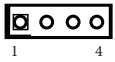
Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

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 sys-tem is in S1 sleep state. The LED is off when the system is in S3/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 assign-ments are matched correctly.

LAN LED Headers

(4-pin LAN1_LED (For LAN1 Port),
LAN2_LED (For LAN2 Port),
LAN3_LED (For LAN3 Port),
LAN4_LED (For LAN4 Port))
(see p. 6, No. 22)



LAN1_LED:

Pin	Signal Name
1	+3V_AUX
2	ALED1_ACT
3	ALED0_100
4	ALED2_1000

LAN2_LED:

Pin	Signal Name
1	+V3P3_LAN_JVL
2	LAN2_ACT
3	LAN2_100
4	LAN2_1000

NOTE: LAN3_LED and LAN4_LED are supported only on the IMB-X1904-10G motherboard.

LAN3_LED:

Pin	Signal Name
1	+3V_AUX
2	E610_SDP02_ACT
3	E610_SDP01_Others
4	E610_SDP00_10G

LAN4_LED:

Pin	Signal Name
1	+3V_AUX
2	E610_SDP06_ACT
3	E610_SDP05_Others
4	E610_SDP04_10G

RAID KEY

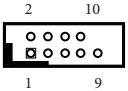
(4-pin RAID_1)
(see p. 6, No. 23)



Pin	Signal Name
1	GND
2	PU_RAID_PIN2
3	GND
4	FM_VROC_RAID_KEY_R

COM Port Header (RS232)

(9-pin COM2)
(see p. 6, No. 28)



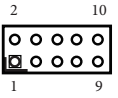
Pin	Signal Name	Signal Name	Pin
1	DDCD#	RRXD	2
3	TTXD	DDTR#	4
5	GND	DDSR#	6
7	RRTS#	CCTS#	8
9	PWR		10

There is one 2.54mm-pitch internal COM port header (COM2) supporting RS-232. The maximum current is 1A per port. The power supply of pin 9 is either 5V or 12V; use the COM Port Pin 9 PWR Setting Jumper to control it.

Digital Input/Output Pin Header

(10-pin GPIO1)

(see p. 6, No. 29)



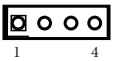
Pin	Signal Name	Signal Name	Pin
1	GPP_E04_DO1	GPP_I_05_DI1	2
3	GPP_E05_DO2	GPP_I_04_DI2	4
5	GPP_E06_DO3	GPP_I02_DI3	6
7	GPP_E07_DO4	GPP_I03_DI4	8
9	+3V_DIO	GND	10

Parameter	Range
GPIO input Low voltage	Max: 0.8V
GPIO input High voltage	Min: 2.4V
GPIO output Low voltage	Max: 0.9V
GPIO output High voltage	Min: 2.5V
Note: Max. load per GPI/O pin: 3mA Current Max. 1A per power pin.	

UID1

(4-pin UID1)

(see p. 6, No. 31)



Pin	Signal Name
1	+5VSB
2	LOCATORLED-
3	FM_UID_BTN_N
4	GND

HEATER Header (Preheat function)

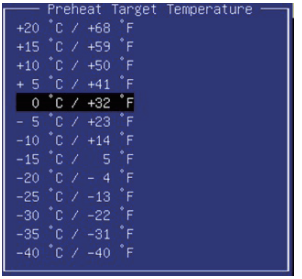
(3-pin HT1)

(see p. 6, No. 35)



Pin	Signal Name
1	Heater PWR (5V/1A)
2	GND
3	NTC (Negative Temperature Coefficient)thermistors

* The 10k Ohm NTC thermistors is suggested.
* Deep mode is not supported when the preheat function is enabled.
* Refer to the following Preheat Target Temperature list.
* Please set BIOS item to enable when using this function.



Buzzer Header

(2-pin BUZZ2)

(see p. 6, No. 37)



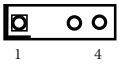
Pin	Signal Name
1	+5V
2	BUZZ

This header provides additional external Buzzer for boot up debugging.

SPDIF Header

(4-pin SPDIF1)

(see p. 6, No. 38)



Pin	Signal Name
1	+5V
2	
3	SPDIF OUT
4	GND

SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. Please connect the SPDIF connector of HDMI VGA card to this header.

TIME SYNC Headers

(3-pin TIME SYNC0, TIME SYNC1)

(see p. 6, No. 40)



Pin	Signal Name
1	TIMED_GPIO
2	GND
3	GND

M2_OOB1

(M2_OOB1)

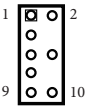
(see p. 6, No. 43)

Pin	Signal Name	Signal Name	Pin
1	GND	+3V_AUX	2
3	USB2_P14_DP_L	+3V_AUX	4
5	USB2_P14_DN_L	NA	6
7	GND	OOB_MOSI	8
9	NA	OOB_CS#	10
11	NA	OOB_SCLK	12
13	NA	OOB_MISO	14
15	NA	CPU0_OOB_SPI_SEL	16
17	NA	GPP_D20_DETECT	18
19	NA	NA	20
21	NA	OOB_TX	22
23	NA		
		OOB_RX	32
33	GND	NA	34
35	PCIE4_TXP_C	NA	36
37	PCIE4_TXN_C	NA	38
39	GND	SLP_S3#	40
41	PCIE4_RXP	RESETCON#	42
43	PCIE4_RXN	PWRBTN#	44
45	GND	CASEOPEN#	46
47	CLK_SRC7_DP	RTCRST#	48
49	CLK_SRC7_DN	GPP_D22_HEARTBEAT	50
51	GND	S_PLTRST#	52
53	GND	NA	54
55	NA	NA	56
57	GND	OOB_SMB_DATA	58
59	NA	OOB_SMB_CLK	60
61	NA	GPP_D23_MPU_RESET	62
63	GND	GPP_D21_BOOT_SOURCE	64
65	NA	NA	66
67	NA	NA	68
69	GND	NA	70
71	NA	+3V_AUX	72
73	NA	+3V_AUX	74
75	GND		

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p. 6, No. 44)



Pin	Signal Name	Signal Name	Pin
1	MIC2_L	GND	2
3	MIC2_R		4
5	OUT2_R	MIC_RET	6
7	J_SENSE		8
9	OUT2_L	OUT_RET	10

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, malfunction 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

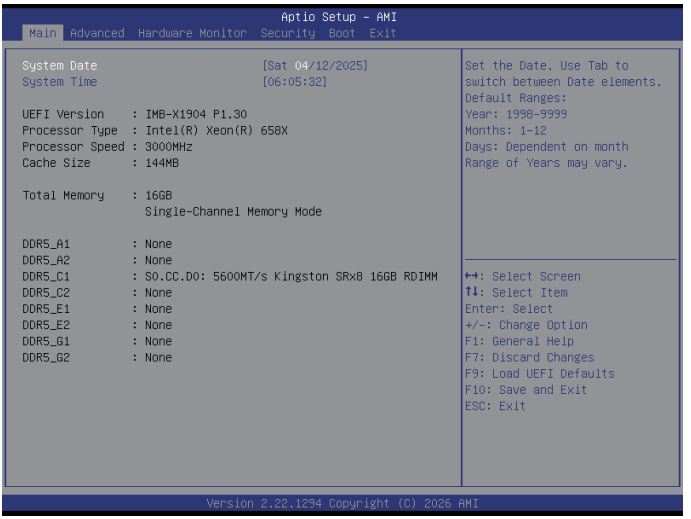
Use < ← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

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

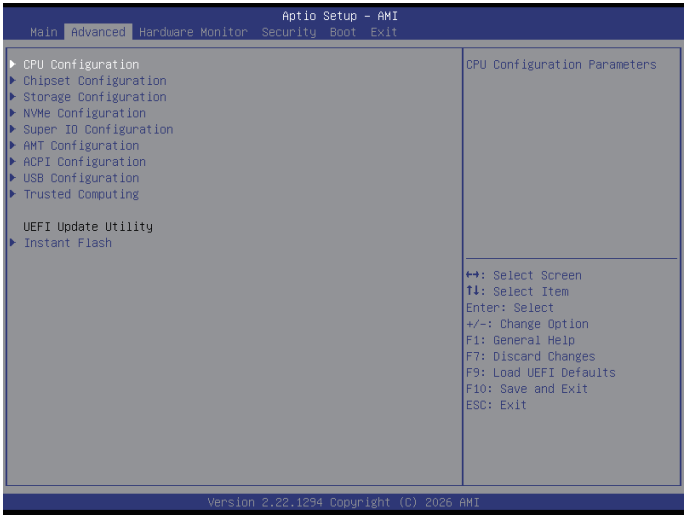
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



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., NVMe Configuration., Super IO Configuration., AMT Configuration., ACPI Configuration., USB Configuration, and Trusted Computing.

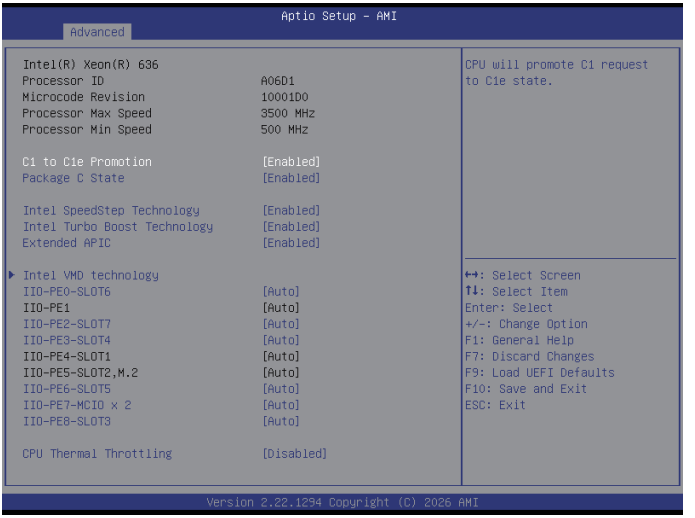


Setting wrong values in this section may cause the system to malfunction.

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 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



C1 to C1e Promotion

Allows you to enable Enhanced C1 State, when the CPU is idle, it not only stops executing instructions (C1 state), but also automatically reduces the CPU frequency and core voltage, further lowering power consumption and heat generation.

Configuration options: [Enabled] [Disabled]

Package C State

Allows you to enable CPU, PCIe, Memory, Graphics C State Support for power saving.

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® 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]

Extended APIC

Enable/disable extended APIC support.

Note: When enabled, VT-d & Interrupt Remapping will be automatically enabled.

Intel VMD technology

Intel VMD technology allows the processor to manage supported PCIe NVMe storage devices through a unified driver.

Choose PCIe Lane Bifurcation for Each Slot or Connector

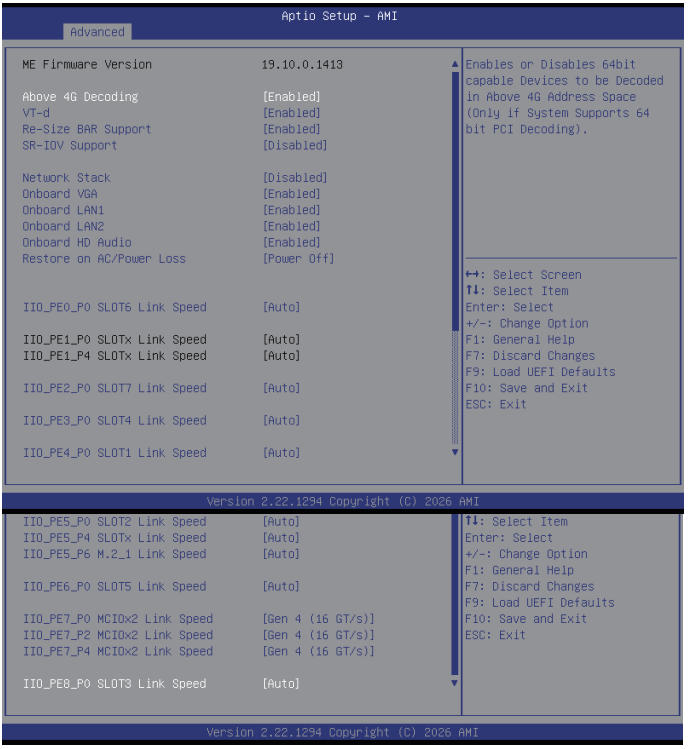
These options allow you to configure PCIe lane bifurcation for the following slots or connectors: IIO-PE0-SLOT6; IIO-PE1; IIO-PE2-SLOT7; IIO-PE3-SLOT4; IIO-PE4-SLOT1; IIO-PE5-SLOT2,M.2; IIO-PE6-SLOT5; IIO-PE7-MCIO x 2; and IIO-PE8-SLOT3.

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]

3.3.2 Chipset Configuration



Above 4G Decoding

The option allows you to enable or disable above 4G Memory Mapped IO decoding. This is disabled automatically when Aperture Size is set to 2048MB.

Configuration options: [Enabled] [Disabled]

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.

SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

Configuration options: [Enabled] [Disabled]

Network Stack

This allows you to enable network functionality inside the UEFI/BIOS environment before the operating system starts.

Configuration options: [Enabled] [Disabled]

Onboard VGA

Enable or disable the onboard VGA controller.

Configuration options: [Enabled] [Disabled]

Onboard LAN1

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

Onboard LAN2

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

Onboard HD Audio

Onboard HD Audio allows you to enable or disable the onboard HD audio controller.

Configuration options: [Enabled] [Disabled]

Restore on AC/Power Loss

Allows you to select the power state after a power failure.

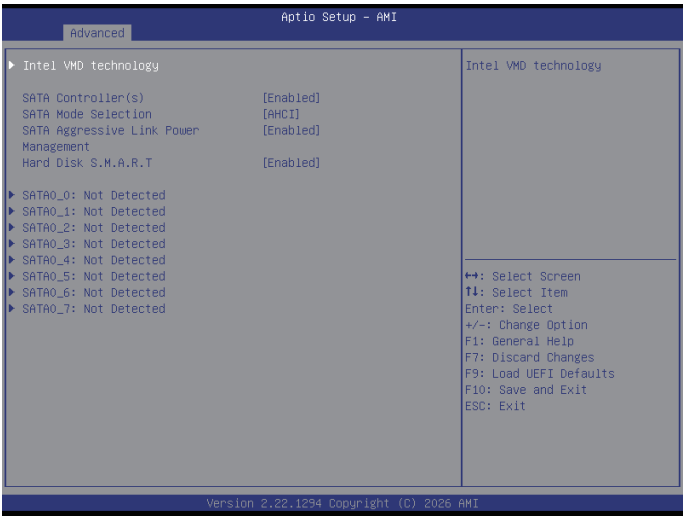
[Power Off] sets the power to remain off when the power recovers.

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

Choose Link Speed for this PCIe port

These options allow you to configure the PCIe link speed for the following ports: IIO_PE0_P0 SLOT6; IIO_PE1_P0 SLOTX; IIO_PE1_P4 SLOTX; IIO_PE2_P0 SLOT7; IIO_PE3_P0 SLOT4; IIO_PE4_P0 SLOT1; IIO_PE5_P0 SLOT2; IIO_PE5_P4 SLOTX; IIO_PE5_P6 M.2_1; IIO_PE6_P0 SLOT5; IIO_PE7_P0 MCIOx2; IIO_PE7_P2 MCIOx2; IIO_PE7_P4 MCIOx2; and IIO_PE8_P0 SLOT3.

3.3.3 Storage Configuration



Intel VMD technology

Use this item to enable or disable the Intel VMD support function.

SATA Controller(s)

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] [RAID]

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.

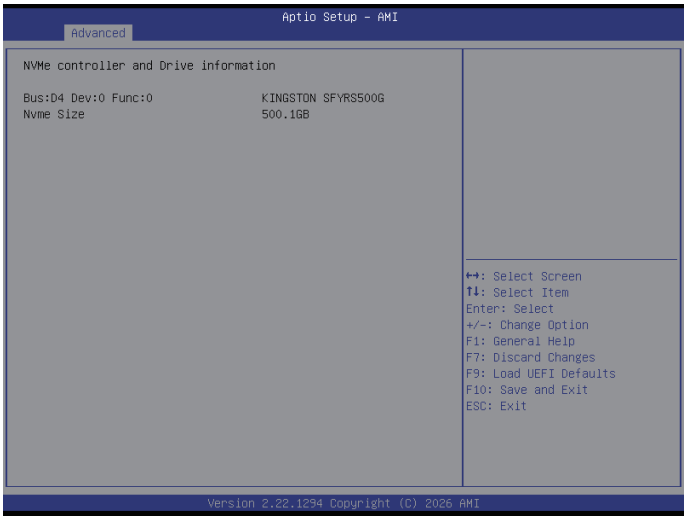
Configuration options: [Enabled] [Disabled]

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

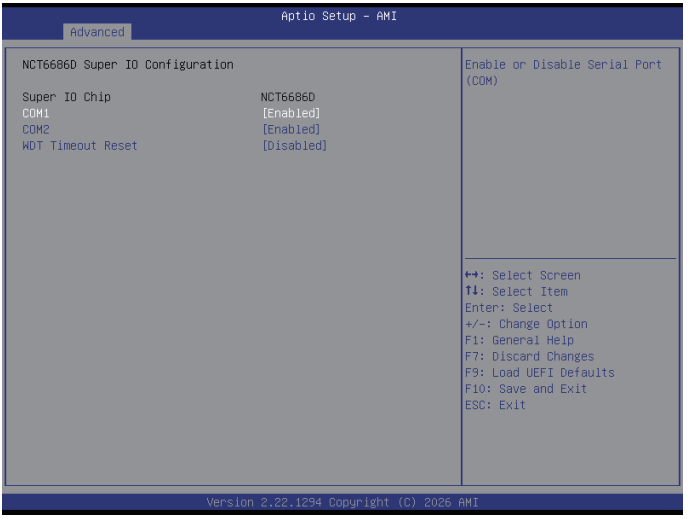
S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

3.3.4 NVMe Configuration



3.3.5 Super IO Configuration



COM1 Configuration

Use this item to set parameters of COM1.

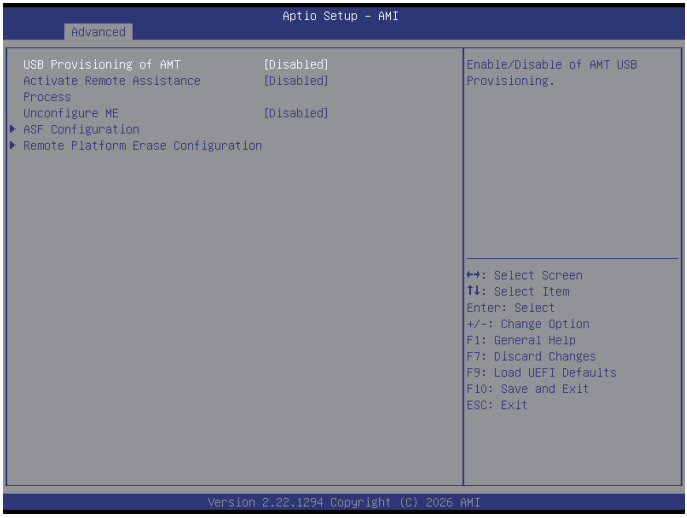
COM2 Configuration

Use this item to set parameters of COM2.

WDT Timeout Reset

Use this item to set the Watch Dog Timer.

3.3.6 AMT Configuration



USB Provisioning of AMT

Use this item to enable or disable AMT USB Provisioning. The default is [Disabled].

Activate Remote Assistance Process

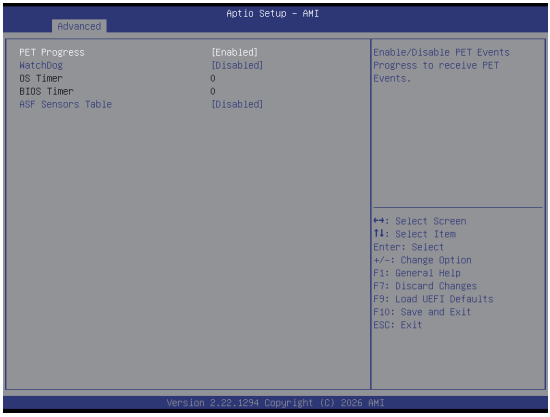
Trigger CIRA boot. The default is [Disabled].

Un-Configure ME

Un-Configure ME without password. The default is [Disabled].

ASF Configuration

The option allows you to configure Alert Standard Format parameters.

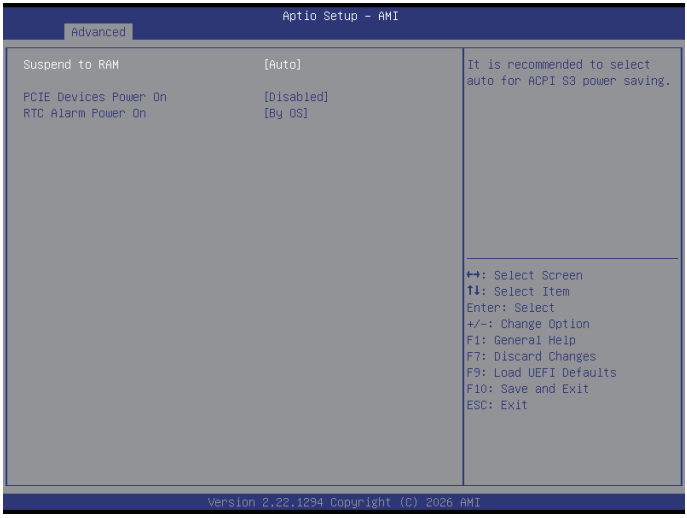


Remote Platform Erase Configuration

Remote Platform Erase configuration menu.



3.3.7 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]

PCIE Devices Power On

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

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]

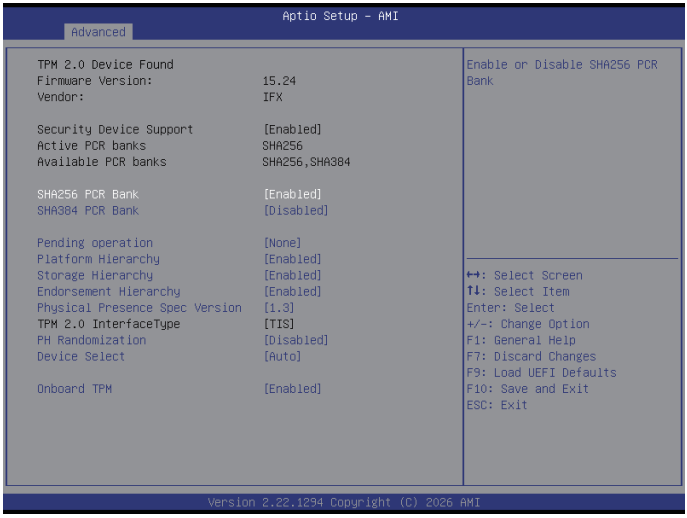
3.3.8 USB Configuration



USB Power Control

Use this option to control USB power.

3.3.9 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]

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.

PH Randomization

The item enables or disables Platform Hierarchy randomization.

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.

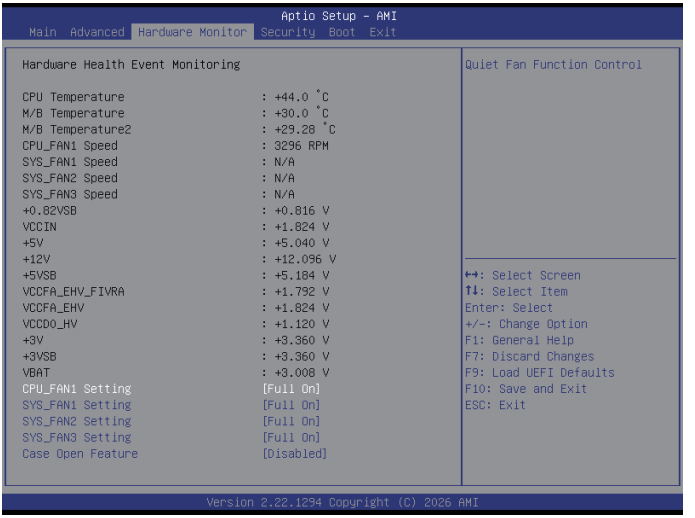
[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

Onboard TPM

The option enables or disables Intel PTT in ME. Disable this option to use discrete TPM Module.

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, SYS 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] [Customize]

SYS_Fan 1 Setting

This allows you to set SYS fan 1's speed. The default value is [Full On].

Configuration options: [Full On] [Customize]

SYS_Fan 2 Setting

This allows you to set SYS fan 2's speed. The default value is [Full On].

Configuration options: [Full On] [Customize]

SYS_Fan 3 Setting

This allows you to set SYS fan 3's speed. The default value is [Full On].

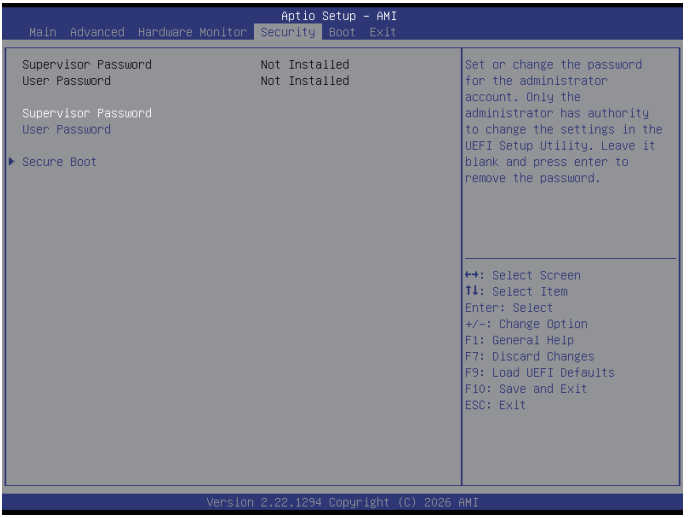
Configuration options: [Full On] [Customize]

Case Open Feature

This item allows you to enable or disable case open detection feature. The default is value [Disabled].

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

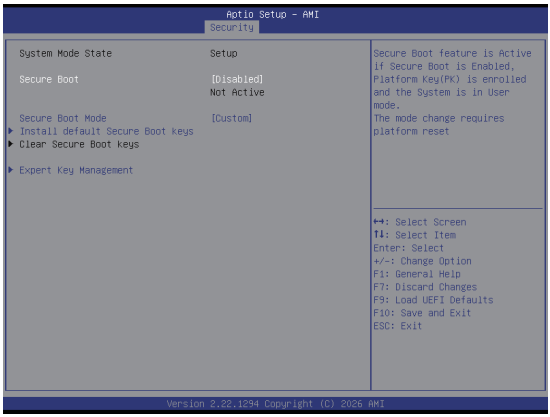
Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

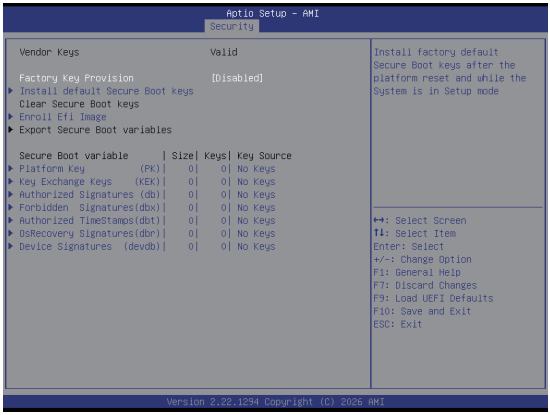
User Password

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

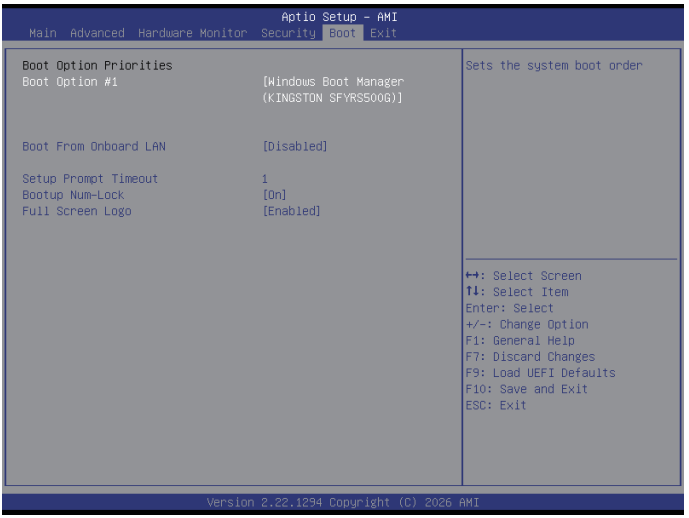
Press [Enter] to configure the Secure Boot Settings. The feature protects the system from unauthorized access and malwares during POST.


Aptio Setup – AMI
Security
System Mode State
Setup
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Install default Secure Boot keys
Clear Secure Boot keys
Expert Key Management
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode.
The mode change requires platform reset
↔: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Option
F1: General Help
F7: Discard Changes
F9: Load UEFI Defaults
F10: Save and Exit
ESC: Exit
Version 2.22.1294 Copyright (C) 2026 AMI


Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Disabled]
Install default Secure Boot keys
Clear Secure Boot keys
Enroll Efi Image
Export Secure Boot variables
Secure Boot variable | Size| Keys| Key Source
Platform Key (PK)| 0| 0| No Keys
Key Exchange Keys (KEK)| 0| 0| No Keys
Authorized Signatures (db)| 0| 0| No Keys
Forbidden Signatures(dbx)| 0| 0| No Keys
Authorized TimeStamps(dbt)| 0| 0| No Keys
OsRecovery Signatures(dbr)| 0| 0| No Keys
Device Signatures (devdb)| 0| 0| No Keys
Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode
↔: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Option
F1: General Help
F7: Discard Changes
F9: Load UEFI Defaults
F10: Save and Exit
ESC: Exit
Version 2.22.1294 Copyright (C) 2026 AMI

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 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 configures 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. Press <F10> key or 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. Press <ESC> key or 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. Press <F7> key or select [Yes] to discard all changes.

Load UEFI Defaults

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.