ASRock Industrial

IMB-X1902
IMB-X1902-10G

User Manual

Version 1.1
Updated January 16, 2026

Version 1.0
Published November 27, 2025

Copyright Notice:

Disclaimer:

Specifications and information contained in this documentation are furnished for informational use only and subject to change without notice, and should not be constructed as a commitment by ASRockInd. ASRockInd assumes no responsibility for any errors or omissions that may appear in this documentation.

To the extent permitted by law, with respect to the contents of this documentation, ASRockInd does not provide warranty of any kind, either expressed or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose. In no event shall ASRockInd, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of data, interruption of business and the like), even if ASRockInd has been advised of the possibility of such damages arising from any defect or error in the documentation or product.

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.

The terms HDMI® and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

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"

AUSTRALIA ONLY

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage caused by our goods. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. If you require assistance please call ASRockInd Tel : +886-2-28965588 ext.123 (Standard International call charges apply)

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

Thank you for purchasing ASRockInd ***IMB-X1902 / IMB-X1902-10G*** 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-X1902

https://www.asrockind.com/IMB-X1902-10G

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-X1902 / IMB-X1902-10G*** Motherboard EATX (12-in x 11.7-in x 1.6-in, 30.5 cm x 29.7 cm x 4.0 cm)

1.2 Specifications

IMB-X1902

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® W-3500/3400 and W-2500/2400 Series Processors
	Chipset	Intel® W790
	Socket	LGA4677
	BIOS	AMI SPI 256 Mbit
Memory	Technology	Quad Channel ECC DDR5 4400/4800 MHz* *1DPC 4800 MHz Natively for Xeon® W9, Xeon® W7 and Xeon® W5 2DPC 4400 MHz Natively for Xeon® W9, Xeon® W7 and Xeon® W5 Supports 4400 MHz Natively for Xeon® W3, W5-3423 and W5-3433
	Capacity	2TB
	Socket	8 x 288-pin RDIMM/RDIMM-3DS
Graphics	VGA	Max resolution up to 1920x1200@60Hz
Expansion Slot	PCIe	PCIE1: PCIe Gen5 x16 PCIE2: PCIe Gen5 x16 PCIE3/PCIE4: single at Gen5 x16 (PCIE4); dual at Gen5 x8 (PCIE3) / x8 (PCIE4) PCIE5: PCIe Gen4 x4 PCIE6: PCIe Gen5 x16
	M.2	1 x M.2 (Key E, 2230) with PCIe Gen3 x1, USB 2.0 and CNVio/CNVio2 for Wireless 1 x M.2 (Key B, 3042/3052) with PCIe Gen3 x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G
	SIM Socket	1 x SIM socket connected to M.2 key B
Ethernet	Controller/ Speed	LAN1: Intel® I226LM with 10/100/1000/2500 Mbps, supports vPro LAN2: Intel® I226V with 10/100/1000/2500 Mbps
	Controller	2 x RJ-45
Rear I/O	VGA	1
	Ethernet	2 x 2.5 Gigabit LAN
	USB	5 x USB 3.2 Gen2 1 x USB 3.2 Gen2x2 (Type-C, 5V/3A)
	Serial Port	COM3 (RS-232) COM1, COM2 (RS-232/422/485)
	UID	1 x UID button with LED

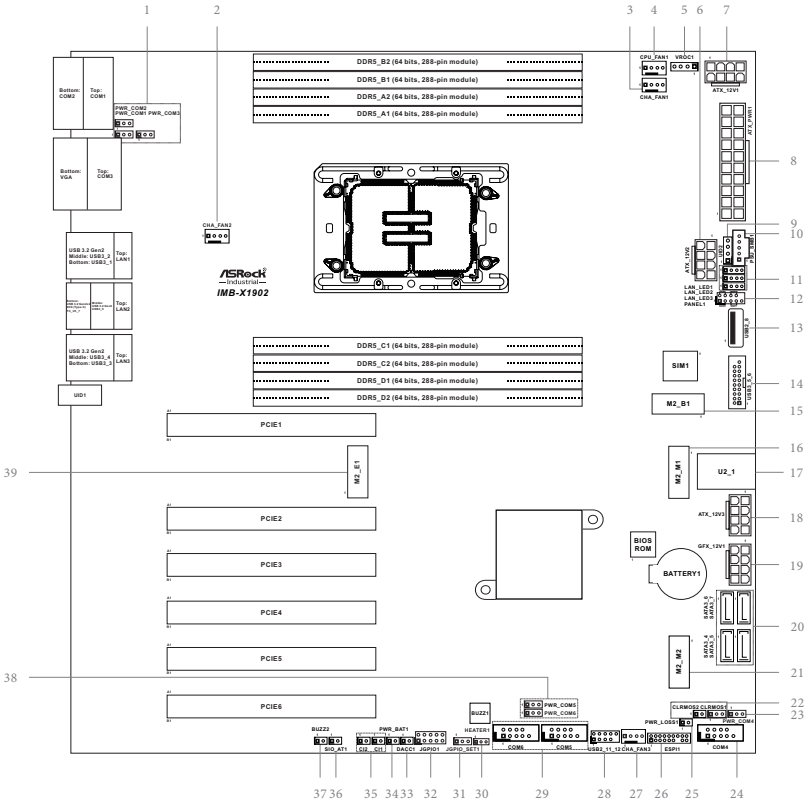
Internal Connector	USB	2 x USB 3.2 Gen1 (1 x USB 3.2 header) 2 x USB 2.0 (1 x 2.54 pitch header) 1 x USB 2.0 (vertical connector)
	COM	COM4, COM5, COM6 (RS-232)
	GPIO	4 x GPI, 4 x GPO
Storage	M.2	1 x M.2 (Key M, 2242/2280/25110) with PCIe Gen4 x4 and SATA3 for SSD 1 x M.2 (Key M, 2260/2280/25110) with PCIe Gen4 x4 for SSD
	U.2	1 x U.2 with PCIe Gen4 x4
	SATA	4 x SATA3, SATA3_4 shared with M.2 Key M1
	RAID	Intel® VMD RAID 0/1/5/10 **supported by identical interface (PCIE or SATA) PCIE interface: M.2 Key B + M.2 Key M1/2 or 2*M.2 Key M SATA interface: SATA port
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 2 x 8-pin 12V PWR connector 1 x 8-pin and 1 x (6+2)-pin 12V PWR connector for PCIe
	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-X1902-10G

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)
Processor System	CPU	Intel® Xeon® W-3500/3400 and W-2500/2400 Series Processors
	Chipset	Intel® W790
	Socket	LGA4677
	BIOS	AMI SPI 256 Mbit
Memory	Technology	Quad Channel ECC DDR5 4400/4800 MHz* *1DPC 4800 MHz Natively for Xeon® W9, Xeon® W7 and Xeon® W5 2DPC 4400 MHz Natively for Xeon® W9, Xeon® W7 and Xeon® W5 Supports 4400 MHz Natively for Xeon® W3, W5-3423 and W5-3433
	Capacity	2TB
	Socket	8 x 288-pin RDIMM/RDIMM-3DS
Graphics	VGA	Max resolution up to 1920x1200@60Hz
Expansion Slot	PCIe	PCIE1: PCIe Gen5 x16 PCIE2: PCIe Gen5 x16 PCIE3/PCIE4: single at Gen5 x16 (PCIE4); dual at Gen5 x8 (PCIE3) /x8 (PCIE4) PCIE5: PCIe Gen4 x4 PCIE6: PCIe Gen5 x16
	M.2	1 x M.2 (Key E, 2230) with PCIe Gen3 x1, USB 2.0 and CNVio/CNVio2 for Wireless 1 x M.2 (Key B, 3042/3052) with PCIe Gen3 x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G
	SIM Socket	1 x SIM socket connected to M.2 key B
Audio	Interface	Realtek ALC897 HD, High Definition Audio. Line-In, Line-Out, Mic-In
Ethernet	Controller/ Speed	LAN1: Intel® I226LM with 10/100/1000/2500 Mbps, supports vPro LAN2: Intel® I226V with 10/100/1000/2500 Mbps LAN3: Marvell AQC113 with 10/100/1000/2500/5000/10000 Mbps
	Controller	3 x RJ-45
Security	TPM	TPM 2.0 onboard IC
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255sec

Rear I/O	VGA	1
	Ethernet	1 x 10 Gigabit LAN 2 x 2.5 Gigabit LAN
	USB	5 x USB 3.2 Gen2 1 x USB 3.2 Gen2x2 (Type-C, 5V/3A)
	Serial Port	COM3 (RS-232) COM1, COM2 (RS-232/422/485)
	UID	1 x UID button with LED
Internal Connector	USB	2 x USB 3.2 Gen1 (1 x USB 3.2 header) 2 x USB 2.0 (1 x 2.54 pitch header) 1 x USB 2.0 (vertical connector)
	COM	COM4, COM5, COM6 (RS-232)
	GPIO	4 x GPI, 4 x GPO
Storage	M.2	1 x M.2 (Key M, 2242/2280/25110) with PCIe Gen4 x4 and SATA3 for SSD 1 x M.2 (Key M, 2260/2280/25110) with PCIe Gen4 x4 for SSD
	U.2	1 x U.2 with PCIe Gen4 x4
	SATA	4 x SATA3, SATA3_4 shared with M.2 Key M1
	RAID	Intel® VMD RAID 0/1/5/10 **supported by identical interface (PCIE or SATA) PCIE interface: M.2 Key B + M.2 Key M1/2 or 2*M.2 Key M SATA interface: SATA port
Power Requirements	Input PWR	1 x 24-pin ATX PWR connector 2 x 8-pin 12V PWR connector 1 x 8-pin and 1 x (6+2)-pin 12V PWR connector for PCIe
	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

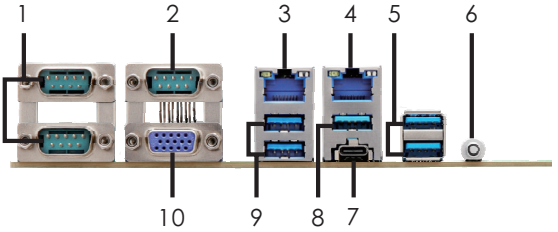


1 : COM Port PWR Setting Jumpers
PWR_COM1 (For COM Port1)
PWR_COM2 (For COM Port2)
PWR_COM3 (For COM Port3)
2 : Chassis FAN Connector (+12V) (CHA_FAN2)
3 : Chassis FAN Connector (+12V) (CHA_FAN1)
4 : CPU FAN Connector (+12V) (CPU_FAN1)
5 : VROC1 (Virtual RAID On CPU Header)
6 : 8-pin ATX 12V Power Connector (ATX_12V2)
7 : 8-pin ATX 12V Power Connector (ATX_12V1)
8 : 24-pin ATX Power Input Connector (ATXPWR1)
9 : UID button header (UID2)
10 : PSU_SMB1
11 : LAN LED Headers
LAN_LED1 (For LAN1 Port)
LAN_LED2 (For LAN2 Port)
LAN_LED3 (For LAN3 Port) (Supported with IMB-X1902-10G)
12 : System Panel Header (PANEL1)
13 : USB 2.0 Header (Vertical Type-A) (USB2_8)
14 : USB 3.2 Gen1 Header (USB3_5_6)
15 : M.2 Key-B Socket (M2_B1)
16 : M.2 Key-M Socket (M2_M1)
17 : U2_1
18 : 8-pin ATX 12V Power Connector (ATX_12V3)
19 : GFX_12V1
20 : SATA3 Connectors (SATA3_4~SATA3_7)
21 : M.2 Key-M Socket (M2_M2)
22 : Clear CMOS Headers (CLRMOS1, CLRMOS2)
23 : COM Port PWR Setting Jumper
PWR_COM4 (For COM Port4)
24 : COM Port Headers (COM4) (RS-232)
25 : PWR LOSS Jumper (PWR_LOSS1)
26 : ESPI Header (ESPI1)
27 : Chassis FAN Connector (+12V) (CHA_FAN3)
28 : USB 2.0 Header (USB2_11_12)
29 : COM Port Headers (COM5, COM6) (RS-232)
30 : HEATER1 Header (HEATER1) (Preheat function)
31 : Digital Input/Output Default Value Setting (JGPIO_SET1)
32 : Digital Input/Output Pin Header (JGPIO1)
33 : DACC1
34 : PWR_BAT1

35 : Chassis Intrusion Headers (CI1, CI2)
36 : ATX/AT Mode Jumper (SIO_AT1)
37 : Buzzer Header (BUZZ2)
38 : COM Port PWR Setting Jumpers
PWR_COM5 (For COM Port5)
PWR_COM6 (For COM Port6)
39 : M.2 Key-E Socket (M2_E1)

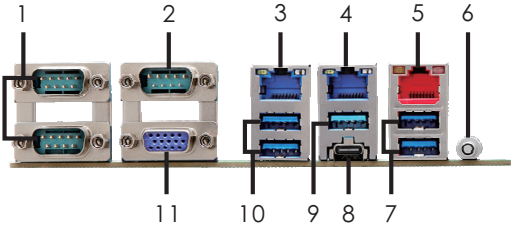
1.4 I/O Panel

IMB-X1902



1 COM Ports (RS232/422/485)*
Top : COM1
Bottom : COM2
2 COM Ports (RS232) (COM3)
3 RJ45 LAN Port (LAN1)** (supports vPro)
4 RJ45 LAN Port (LAN2)**
5 USB 3.2 Gen2 Ports
Top : USB3_4
Bottom : USB3_3
6 UID1***
7 USB 3.2 Gen2x2 20G Type-C Port (TC_U3_7)
8 USB 3.2 Gen2 Port (USB3_9)
9 USB 3.2 Gen2 Ports
Top : USB3_2
Bottom : USB3_1
10 D-Sub Port (VGA1)

IMB-X1902-10G



1 COM Ports (RS232/422/485)*
Top : COM1
Bottom : COM2
2 COM Ports (RS232) (COM3)
3 RJ45 LAN Port (LAN1)** (supports vPro)
4 RJ45 LAN Port (LAN2)**
5 RJ45 LAN Port (LAN3)****
6 UID1***
7 USB 3.2 Gen2 Ports
Top : USB3_4
Bottom : USB3_3
8 USB 3.2 Gen2x2 20G Type-C Port (TC_U3_7)
9 USB 3.2 Gen2 Port (USB3_9)
10 USB 3.2 Gen2 Ports
Top : USB3_2
Bottom : USB3_1
11 D-Sub Port (VGA1)

* This motherboard supports RS232/422/485 on COM1, 2 ports. Please refer to the table below for the pin definition. In addition, COM1, 2 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration.

COM1, 2 Ports Pin Definition

Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	PWR	PWR	PWR

COM3 Port Pin Definition

Pin	RS232
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	PWR

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

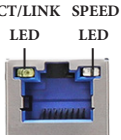
LAN1, 2 Ports LED Indications

Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

SPEED LED

Status	Description
Off	10Mbps/100Mbps connection
Orange	1Gbps connection
Green	2.5Gbps connection



LAN1

LAN2

UID1

*** With the UID button, You are able to locate the server you're working on from behind a rack of servers. When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be turned on. Press the UID button again to turn off the indicator.

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

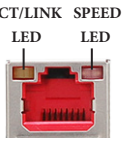
LAN3 Port LED Indications

Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

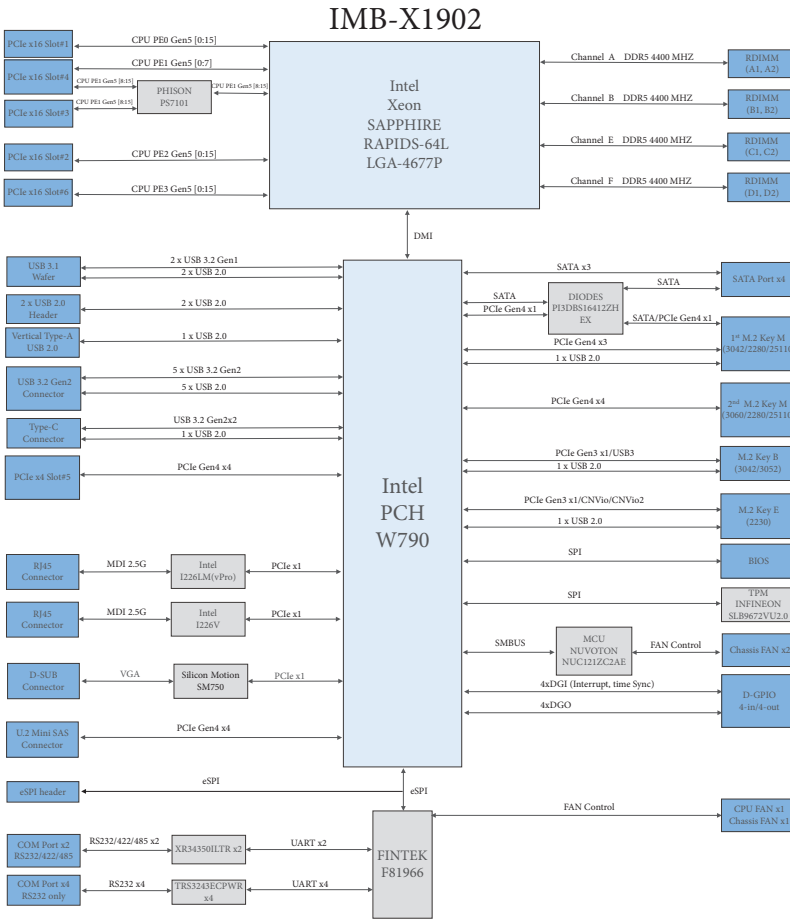
SPEED LED

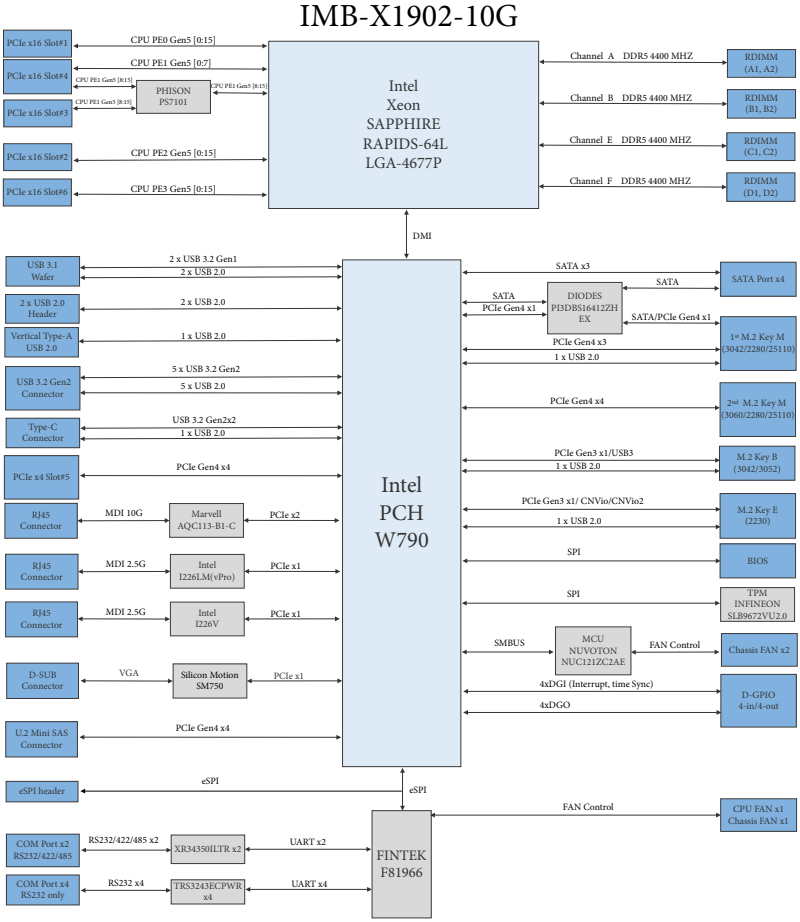
Status	Description
Orange	10Mbps/100Mbps/1Gbps/2.5Gbps/5Gbps connection
Green	10Gbps connection



1.5 Block Diagram

IMB-X1902




IMB-X1902-10G
PCIe x16 Slot#1
PCIe x16 Slot#4
PCIe x16 Slot#3
PCIe x16 Slot#2
PCIe x16 Slot#6
CPU PE0 Gen5 [0:15]
CPU PE1 Gen5 [0:7]
CPU PE1 Gen5 [8:15]
PHISON PS7101
CPU PE1 Gen5 [8:15]
CPU PE1 Gen5 [8:15]
CPU PE2 Gen5 [0:15]
CPU PE3 Gen5 [0:15]
Intel Xeon SAPPHIRE RAPIDS-64L LGA-4677P
Channel A DDR5 4400 MHZ
Channel B DDR5 4400 MHZ
Channel E DDR5 4400 MHZ
Channel F DDR5 4400 MHZ
RDIMM (A1, A2)
RDIMM (B1, B2)
RDIMM (C1, C2)
RDIMM (D1, D2)
DMI
Intel PCH W790
USB 3.1 Wafer
2 x USB 2.0 Header
Vertical Type-A USB 2.0
USB 3.2 Gen2 Connector
Type-C Connector
PCIe x4 Slot#5
RJ45 Connector
RJ45 Connector
RJ45 Connector
D-SUB Connector
U.2 Mini SAS Connector
2 x USB 3.2 Gen1
2 x USB 2.0
2 x USB 2.0
1 x USB 2.0
5 x USB 3.2 Gen2
5 x USB 2.0
USB 3.2 Gen2x2
1 x USB 2.0
PCIe Gen4 x4
MDI 10G
Marvell AQC113-B1-C
PCIe x2
MDI 2.5G
Intel I226LM(vPro)
PCIe x1
MDI 2.5G
Intel I226V
PCIe x1
VGA
Silicon Motion SM750
PCIe x1
PCIe Gen4 x4
SATA x3
SATA Port x4
SATA
PCIe Gen4 x1
DIODES PI3DBS16412ZHEX
SATA/PCIe Gen4 x1
PCIe Gen4 x3
1st M.2 Key M (3042/2280/25110)
1 x USB 2.0
PCIe Gen4 x4
2nd M.2 Key M (3060/2280/25110)
PCIe Gen3 x1/USB3
M.2 Key B (3042/3052)
1 x USB 2.0
PCIe Gen3 x1/ CNVio/CNVio2
M.2 Key E (2230)
1 x USB 2.0
SPI
BIOS
SPI
TPM INFINEON SLB9672VU2.0
SMBUS
MCU NUVOTON NUC121ZC2AE
FAN Control
Chassis FAN x2
4xDGI (Interrupt, time Sync)
4xDGO
D-GPIO 4-in/4-out
eSPI header
eSPI
eSPI
FAN Control
CPU FAN x1
Chassis FAN x1
FINTEK F81966
COM Port x2 RS232/422/485
COM Port x4 RS232 only
RS232/422/485 x2
XR34350ILTR x2
UART x2
RS232 x4
TRS3243ECPWR x4
UART x4

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.

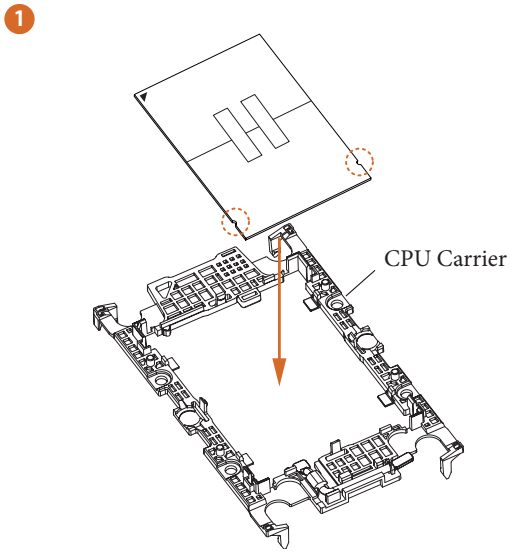
1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before 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.

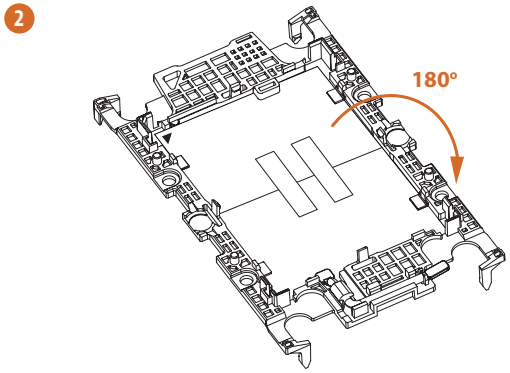
2.3 Installing the CPU and Heatsink

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

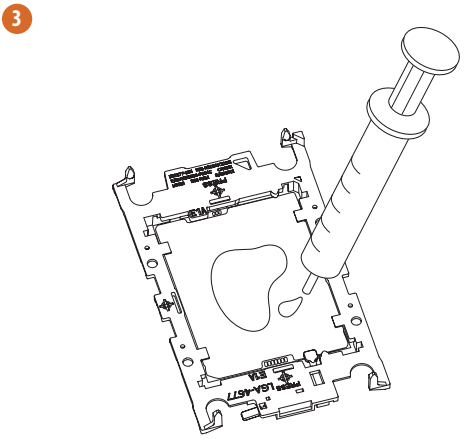
1. Align the CPU with the two guiding notches on the CPU carrier. Gently lower the CPU into the carrier until it is securely seated.



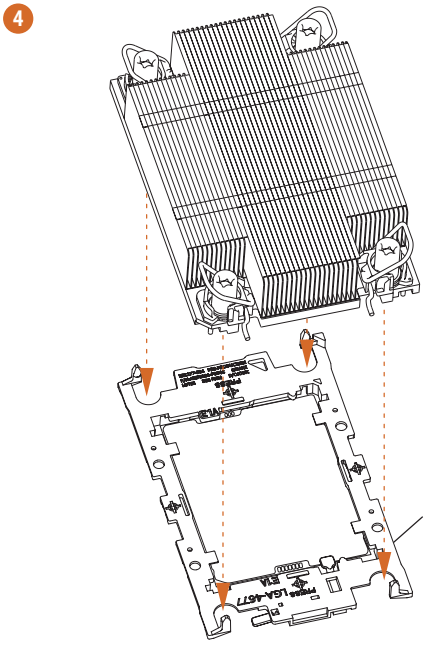
2. Rotate the CPU carrier 180 degrees to expose its bottom side in preparation for thermal interface application.



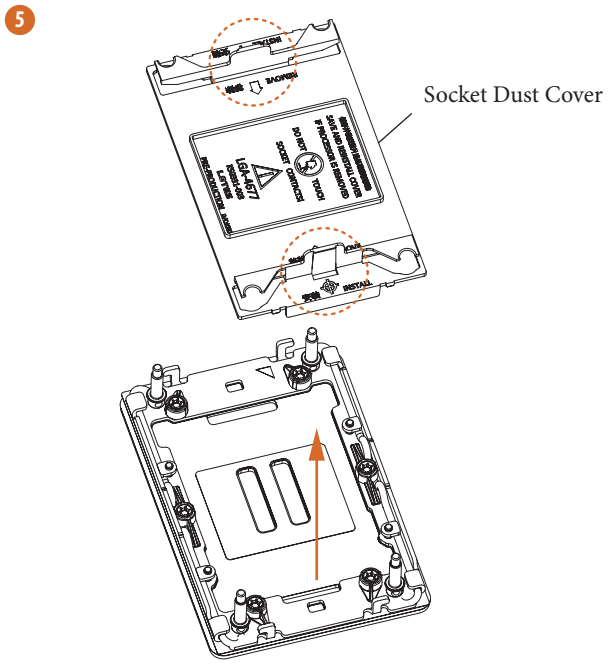
3. Apply an appropriate amount of thermal interface material to the center of the CPU carrier, covering the area above the processor die.



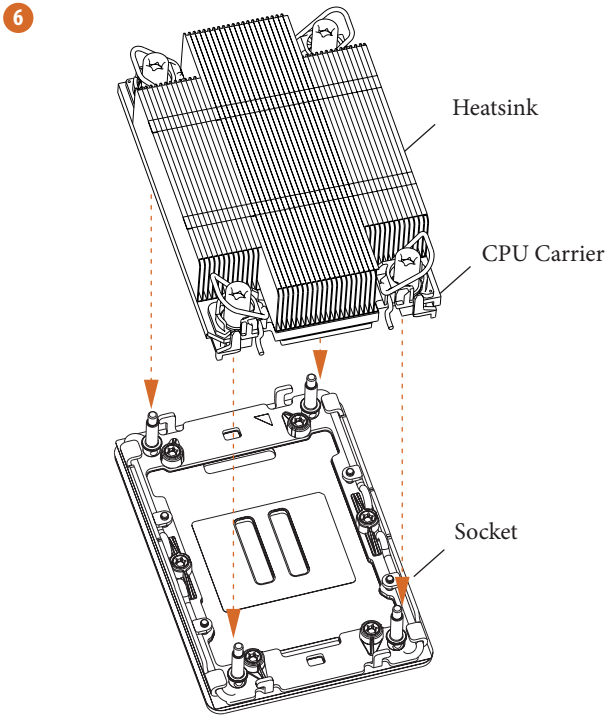
4. Align the heatsink with the CPU carrier and gently press it down to ensure proper contact with the thermal interface material.



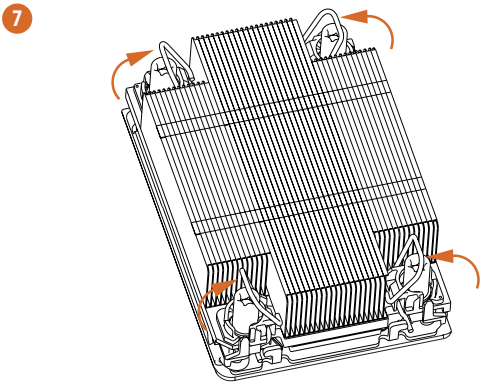
5. Press and lift the socket dust cover at the indicated tabs to expose the CPU socket. Avoid touching the socket contacts.



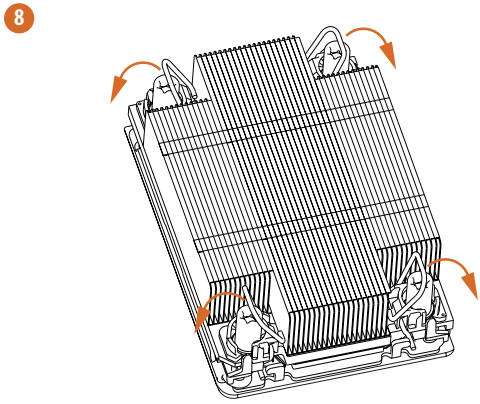
6. Align the CPU carrier and heatsink assembly with the four guide pins on the socket, then lower it gently into place.



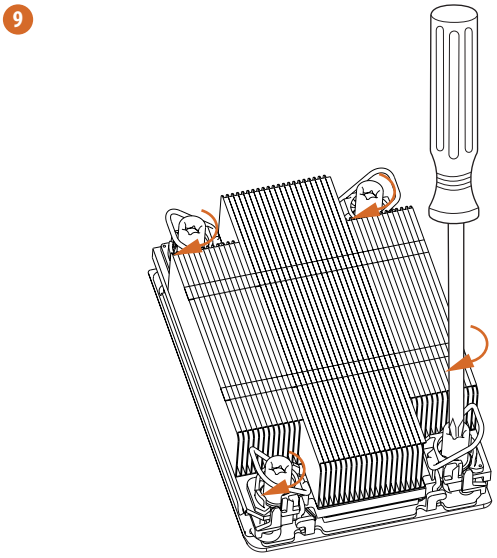
7. Push the four latch levers outward to unlock the retention mechanism.



8. Push down all four latch levers until they click into place and the heatsink is firmly secured.



9. Using a T30 screwdriver, tighten the four screws in a diagonal pattern. Apply torque within the recommended range of 6–12 in-lb.



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

IMB-X1902 / IMB-X1902-10G provides eight 288-pin DDR5 (Double Data Rate 5) RDIMM/ RDIMM-3DS slots.

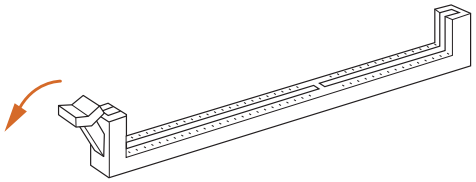
1. *For quad channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.*
2. *It is unable to activate Quad Channel Memory Technology with only three memory module installed.*
3. *It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory 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.

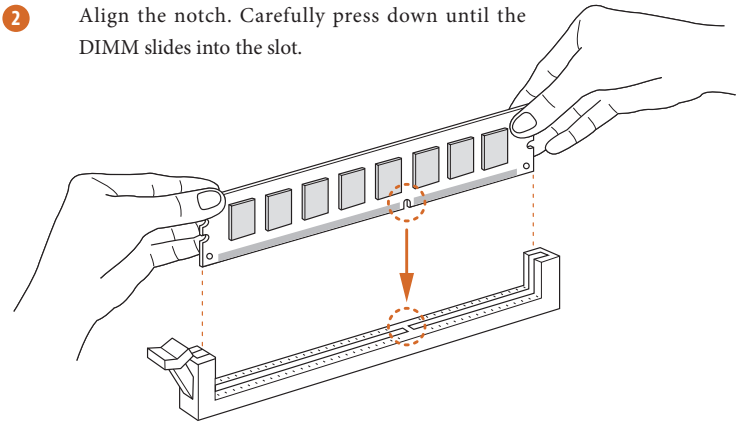
Recommended Memory Configuration

	A1	A2	B1	B2	C1	C2	D1	D2
1 DIMM		V						
2 DIMMs		V		V				
4 DIMMs		V		V		V		V
8 DIMMs	V	V	V	V	V	V	V	V

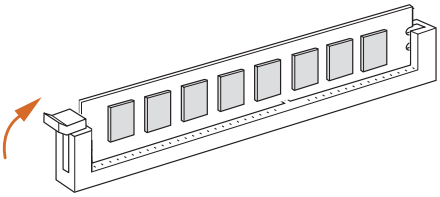
1 Open the DIMM slot latch.



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 six PCI Express slots, four M.2 sockets and one SIM socket on this motherboard.

PCIE slot: PCIE1 (PCIE 5.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE2 (PCIE 5.0 x16 slot) is used for PCI Express x16 lane width cards.
PCIE3/PCIE4 slots:
When a single PCI Express card is installed in PCIE4, it operates at PCIe 5.0 x16 mode.
When two PCI Express cards are installed in PCIE3 and PCIE4, both slots operate at PCIe 5.0 x8 mode.
PCIE5 (PCIE 4.0 x4 slot) is used for PCI Express x4 lane width cards.
PCIE6 (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	x16	x16	CPU
PCIE3	5.0	x16	x0/x8	CPU
PCIE4	5.0	x16	x16/x8	CPU
PCIE5	4.0	x16	x4	PCH
PCIE6	5.0	x16	X16	CPU

M.2 sockets: 1 x M.2 (Key E, 2230) with PCIe Gen3 x1, USB 2.0 and CNVio/CNVio2 for Wireless
1 x M.2 (Key B, 3042/3052) with PCIe Gen3 x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G
1 x M.2 (Key M, 2242/2280/25110) with PCIe Gen4 x4 and SATA3 for SSD
1 x M.2 (Key M, 2260/2280/25110) with PCIe Gen4 x4 for SSD

SIM socket: 1 x SIM socket connected to M.2 key B

M.2 Key-E Socket
(M2_E1)

Pin	Signal Name	Signal Name	Pin
1	GND	+3.3V	2
3	USB_D+	+3.3V	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	NA	20
21	CNV_WGR_CLK-	CNV_BRI_RSP	22
23	CNV_WGR_CLK+		
		CNV_RGI_DT	32
33	GND	CNV_RGI_RSP	34
35	PETp	CNV_BRI_DT	36
37	PETn	CL_RST_N	38
39	GND	CL_DATA	40
41	PERp	CL_CLK	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	PERST0#	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-	+3.3V	72
73	CNV_WT_CLK+	+3.3V	74
75	GND		

M.2 Key-B Socket
(M2_B1)

Pin	Signal Name	Signal Name	Pin
1	NA	+3.3V	2
3	GND	+3.3V	4
5	GND	FuLL_Card_Power_off	6
7	USB_D+	W_DISABLE	8
9	USB_D-	WWAN_LED#	10
11	GND		
		NA	20
21	GND	NA	22
23	NA	NA	24
25	NA	NA	26
27	GND	NA	28
29	USB3_RX-	UIM_RESET	30
31	USB3_RX+	UIM_CLK	32
33	GND	UIM_DATA	34
35	USB3_TX-	UIM_PWR	36
37	USB3_TX+	NA	38
39	GND	NA	40
41	PERn0	NA	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
59	NA	NA	60
61	NA	NA	62
63	NA	NA	64
65	NA	NA	66
67	NA	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	NA		

M.2 Key-M Socket
(M2_M1)

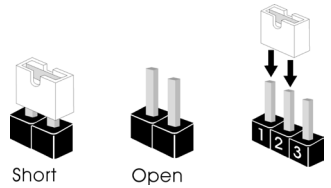
Pin	Signal Name	Signal Name	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	PERn3	NA	6
7	PERp3	NA	8
9	GND	SATA_LED	10
11	PETn3	+3.3V	12
13	PETp3	+3.3V	14
15	GND	+3.3V	16
17	PERn2	+3.3V	18
19	PERp2	NA	20
21	GND	NA	22
23	PETn2	NA	24
25	PETp2	NA	26
27	GND	NA	28
29	PERn1	NA	30
31	PERp1	GND	32
33	GND	LP+13	34
35	PETn1	LP-13	36
37	PETp1	GND	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	NA	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-M Socket
(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	SATA_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	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

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), PWR_COM2 (For COM Port2), PWR_COM3 (For COM Port3))
(see p. 6, No. 1)

(3-pin PWR_COM4 (For COM Port4)
(see p. 6, No. 23)

(3-pin PWR_COM5 (For COM Port5), PWR_COM6 (For COM Port6))
(see p. 6, No. 38)

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

The maximum current for per port is 1A, and the power supply is either 0V/5V/12V. Use the jumpers to set the power for COM port pin 9.

Clear CMOS Headers

(3-pin CLRMOS1)
(see p. 6, No. 22)

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. 22)

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.

PWR Loss Header

(2-pin PWR_LOSS1)

(see p. 6, No. 25)

Setting	Description
Open	No Power Loss
Short	Power Loss (Default)

This header provides ATX power supply ATX+5VSB dummy load for quick power loss.

Digital Input/Output Default Value Setting

(3-pin JGPIO_SET1)

(see p. 6, No. 31)

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.

DACC Jumper

(2-pin DACC1)

(see p. 6, No. 33)

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. 34)

Setting	Description
Open	Normal (Default)
Short	Charge Battery*

*Only supported by chargeable battery.

Chassis Intrusion Headers

(2-pin CI1)

(see p. 6, No. 35)

1 2

(2-pin CI2)

(see p. 6, No. 35)

1 2

CI1

Setting	Description
Open	Normal (Default)
Short	Active Case Open

CI2

Setting	Description
Open	Active Case Open
Short	Normal (Default)

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. 36)

1 2

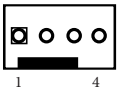
Setting	Description
Open	ATX Mode (Default)
Short	AT Mode

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!

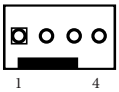
Chassis FAN Connector (+12V)

(4-pin CHA_FAN2)
(see p. 6, No. 2)

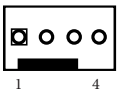


Pin	Signal Name
1	GND
2	+12V
3	CHA_FAN_SPEED
4	FAN_SPEED_CONTROL

(4-pin CHA_FAN1)
(see p. 6, No. 3)



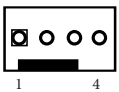
(4-pin CHA_FAN3)
(see p. 6, No. 27)



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

CPU FAN Connector (+12V)

(4-pin CPU_FAN1)
(see p. 6, No. 4)



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

The board offers three 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.

Virtual RAID On CPU Header

(4-pin VROC1)
(see p. 6, No. 5)

Pin	Signal Name
1	VROC RAID KEY
2	GND
3	+3VSB
4	GND

8-pin ATX 12V Power Connectors

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

ATX_12V2

ATX_12V1
ATX_12V2

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

(8-pin ATX_12V1)
(see p. 6, No. 7)

ATX_12V1

(8-pin ATX_12V3)
(see p. 6, No. 18)

ATX_12V3

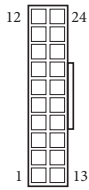
ATX_12V3

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

24-pin ATX Power Input Connector

(24-pin ATXPWR1)
(see p. 6, No. 8)



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	ATX+5VSB	+5V	21
10	+12V	+5V	22
11	+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.

UID button header

(4-pin UID2)
(see p. 6, No. 9)

Pin	Signal Name
1	UID_LED+
2	UID_LED-
3	UID_BTN#
4	GND

PSU_SMB1

(5-pin PSU_SMB1)

(see p. 6, No. 10)

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

The SMBus connector is for power supply unit.

LAN LED Headers

(4-pin LAN_LED1 (For LAN1 Port),
LAN_LED2 (For LAN2 Port))

(see p. 6, No. 11)

Pin	Signal Name
1	LED_ACT+
2	LED_ACT-
3	LED_1000-/LED_2500+
4	LED_1000+/LED_2500+

(4-pin LAN_LED3 (For LAN3 Port),
(Supported with IMB-X1902-10G),

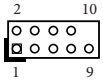
(see p. 6, No. 11)

Pin	Signal Name
1	LED_ACT+
2	LED_ACT-
3	LED_2500-/LED_10000+
4	LED_2500+/LED_10000-

System Panel Header

(9-pin PANEL1)

(see p. 6, No. 12)



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

USB 2.0 Header (Vertical Type-A)

(4-pin USB2_8)

(see p. 6, No. 13)

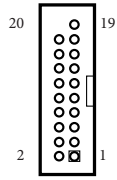
Pin	Signal Name
1	USB_PWR
2	P-
3	P+
4	GND

The board provides one internal Type-A USB 2.0 connector. The maximum current per port is 0.5A.

USB 3.2 Gen1 Header

(19-pin USB3_5_6)

(see p. 6, No. 14)



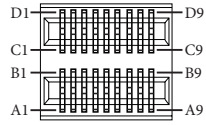
Pin	Signal Name	Signal Name	Pin
1	ID	IntA_P0_D+	2
3	IntA_P1_D+	IntA_P0_D-	4
5	IntA_P1_D-	GND	6
7	GND	IntA_P0_SSTX+	8
9	IntA_P1_SSTX+	IntA_P0_SSTX-	10
11	IntA_P1_SSTX-	GND	12
13	GND	IntA_P0_SSRX+	14
15	IntA_P1_SSRX+	IntA_P0_SSRX-	16
17	IntA_P1_SSRX-	Vbus	18
19	Vbus		20

There is one USB 3.2 Gen1 connector on this motherboard. This header can support two USB 3.2 Gen1 ports with maximum power current 0.9A per port.

U2_1

(36-pin U2_1)

(see p. 6, No. 17)



Pin	Signal Name	Signal Name	Pin
A1	PCH_CLK_13	U2_RST#	B1
A2	PCH_CLK_13#	NA	B2
A3	GND	GND	B3
A4	PCIE14_RXP	PCIE13_RXP	B4
A5	PCIE14_RXN	PCIE13_RXN	B5
A6	GND	GND	B6
A7	PCIE16_RXP	PCIE15_RXP	B7
A8	PCIE16_RXN	PCIE15_RXN	B8
A9	GND	GND	B9

Pin	Signal Name	Signal Name	Pin
C1	U2_LED_R	NA	D1
C2	NA	NA	D2
C3	GND	GND	D3
C4	PCIE14_TXP	PCIE13_TXP	D4
C5	PCIE14_TXN	PCIE13_TXN	D5
C6	GND	GND	D6
C7	PCIE16_TXP	PCIE15_TXP	D7
C8	PCIE16_TXN	PCIE15_TXN	D8
C9	GND	GND	D9

8-pin PCIE 12V Power Connector

(8-pin GFX_12V1)

(see p. 6, No. 19)

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

SATA3 Connectors

(7-pin SATA3_4~SATA3_7)

(see p. 6, No. 20)

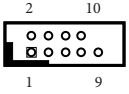
Pin	Signal Name
1	GND
2	SATA-A+
3	SATA-A-
4	GND
5	SATA-B-
6	SATA-B+
7	GND

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.

COM Port Headers (RS232)

(9-pin COM4)

(see p. 6, No. 24)



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

(9-pin COM5, COM6)

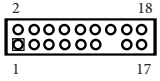
(see p. 6, No. 29)

There are three 2.54mm-pitch internal COM port headers (COM4~COM6) 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.

ESPI Header

(17-pin ESPI1)

(see p. 6, No. 26)



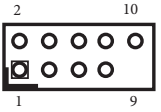
Pin	Signal Name	Signal Name	Pin
1	C_ESPI_CLK	GND	2
3	ESPI_CS0#	SMB_CLK_MAIN	4
5	C_ESPI_RST#	SMB_DATA_MAIN	6
7	ESPI_IO3	ESPI_IO2	8
9	+3V	ESPI_IO1	10
11	ESPI_IO0	GND	12
13	NA	NA	14
15	+3VSB	ESPI_ALERT#	16
17	GND	GND	18

The header is reserved for Port 80 code display and for debugging purposes.

USB 2.0 Header

(9-pin USB2_11_12)

(see p. 6, No. 28)



Pin	Signal Name	Signal Name	Pin
1	USB_PWR	USB_PWR	2
3	P-	P-	4
5	P+	P+	6
7	GND	GND	8
9		DUMMY	10

The board provides one internal USB 2.0 connector. The maximum current per port is 0.5A.

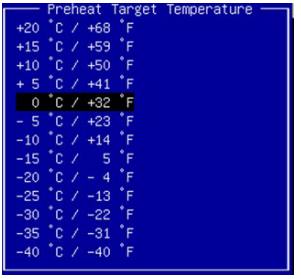
HEATER Header (Preheat function)

(3-pin HEATER1)

(see p. 6, No. 30)

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

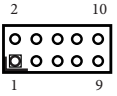
* The 10k Ohm NTC thermistors is suggested.
* Deep mode is not supported when the preheat function is enabled.
* Refer to the following Preheat Target Temperature list.
* Please set BIOS item to enable when using this function (see p. 51).



Digital Input/Output Pin Header

(10-pin JGPIO1)

(see p. 6, No. 32)



Pin	Signal Name	Signal Name	Pin
1	GPP_H19	GPP_H23	2
3	GPP_H20	GPP_I10	4
5	GPP_H21	GPP_E5	6
7	GPP_H17	GPP_E6	8
9	JGPIOPWR_R	GND	10

Parameter	Range
GPIO input Low voltage	Max: 0.8V
GPIO input High voltage	Low: 2V
GPIO output Low voltage	Max: 0.4V
GPIO output High voltage	Low: 2.4V
Note: Max. load per GPI/O pin: 12mA Current Max. 1A per power pin.	

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.

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

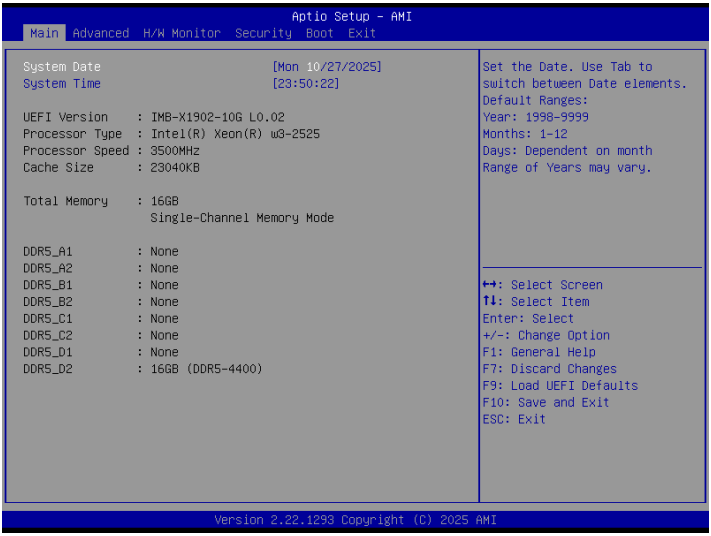
Use < ← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

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

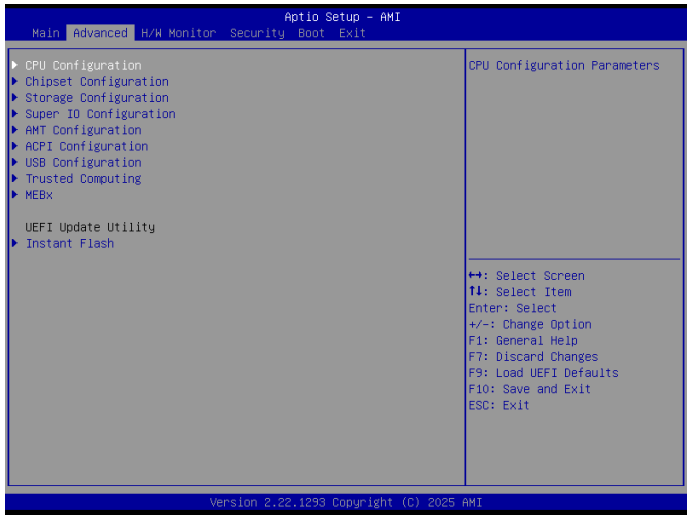
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.

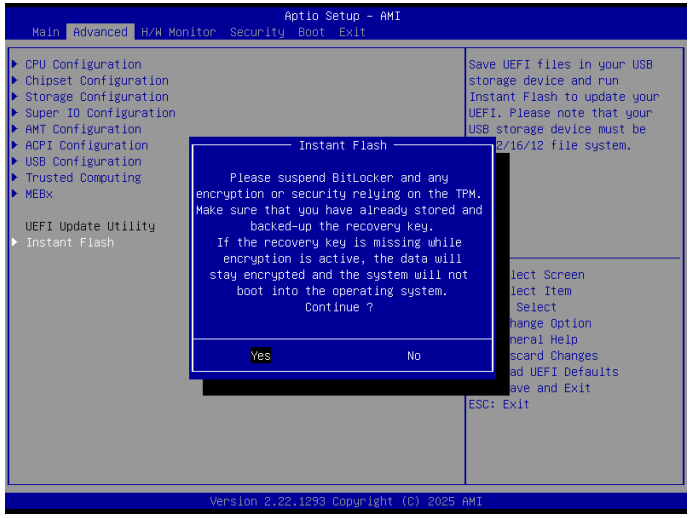


Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.

3.3 Advanced Screen

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



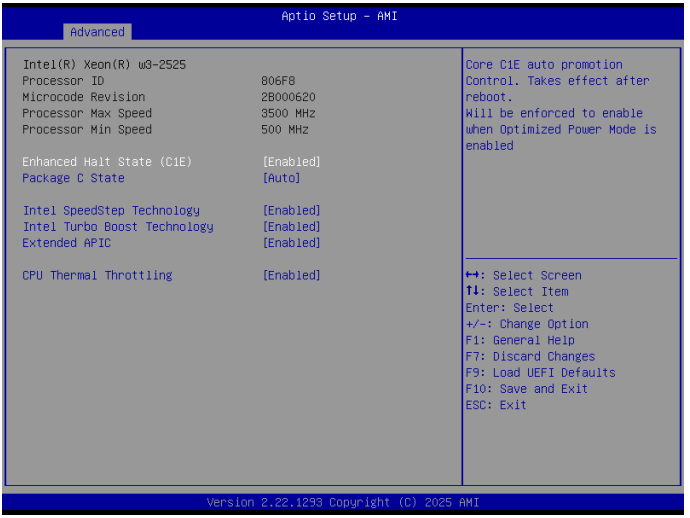


Setting wrong values in this section may cause the system to malfunction.

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



Enhanced Halt State (C1E)

Core C1E auto promotion control. Takes effect after reboot. Will be enforced to enable when Optimized Power Mode is enabled.

Package C State

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

Configuration options: [Auto] [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].

Configuration options: [Enabled] [Disabled].

If you install Windows® 10/11 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.

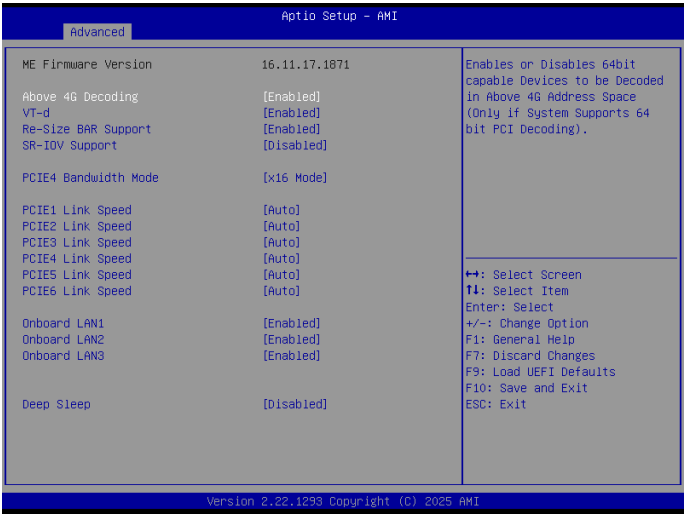
Note: When enabled, VT-d & Interrupt Remapping will be automatically enabled.

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]

PCIE4 Bandwidth Mode

Select PCIE4 Bandwidth. Select x8 / x8 Mode when using PCIE3 slot.

PCIE1 Link Speed

The option allows you to configure PCIE1 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] [Gen5] (Options vary depending on your motherboard.)

PCIE2 Link Speed

The option allows you to configure PCIE2 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] (Options vary depending on your motherboard.)

PCIE3 Link Speed

The option allows you to configure PCIE3 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] (Options vary depending on your motherboard.)

PCIE4 Link Speed

The option allows you to configure PCIE4 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] (Options vary depending on your motherboard.)

PCIE5 Link Speed

The option allows you to configure PCIE5 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] (Options vary depending on your motherboard.)

PCIE6 Link Speed

The option allows you to configure PCIE6 Slot Link Speed. Auto mode is optimizing for overclocking.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4] (Options vary depending on your motherboard.)

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.

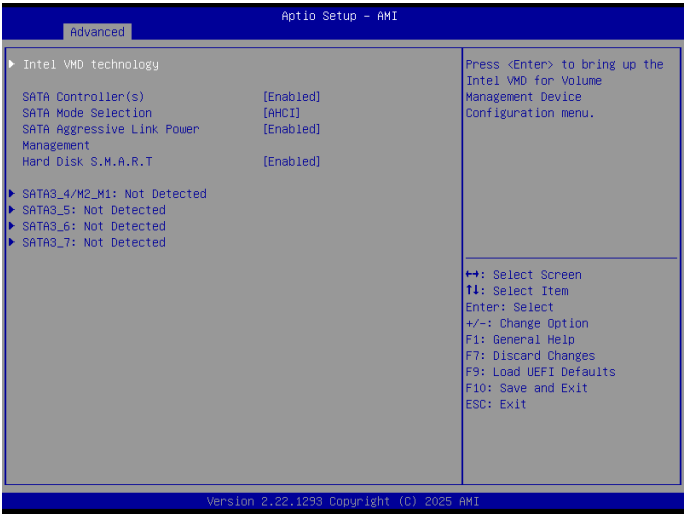
Onboard LAN3

This allows you to enable or disable the Onboard LAN3 feature.

Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down. We recommend disabling Deep Sleep for better system compatibility and stability.

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]

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.

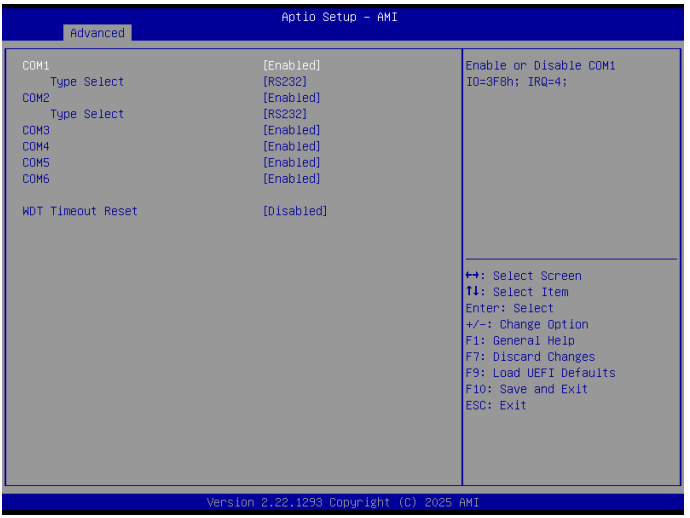
Configuration options: [Enabled] [Disabled]

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 item to set parameters of COM1.

Type Select

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

COM2 Configuration

Use this item to set parameters of COM2.

Type Select

Use this item to select COM2 port type: [RS232], [RS422] or [RS485].

COM3 Configuration

Use this item to set parameters of COM3.

COM4 Configuration

Use this item to set parameters of COM4.

COM5 Configuration

Use this item to set parameters of COM5.

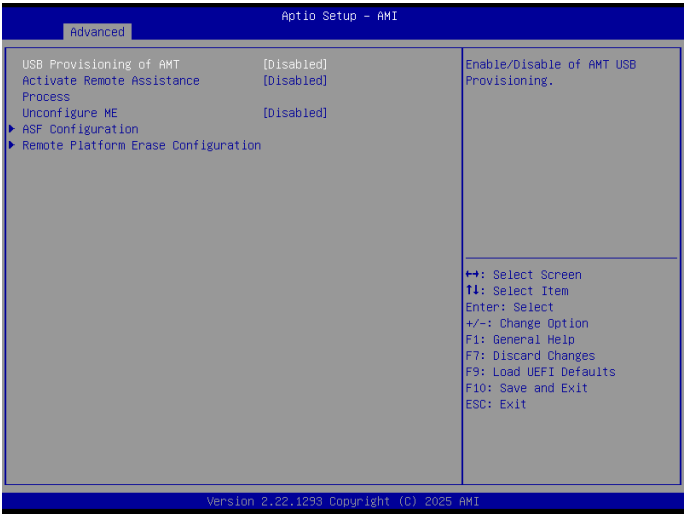
COM6 Configuration

Use this item to set parameters of COM6.

WDT Timeout Reset

Use this item to set the Watch Dog Timer.

3.3.5 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].

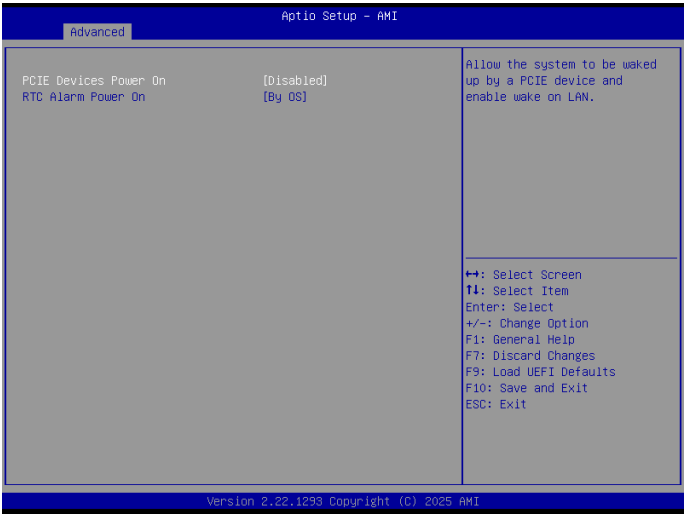
ASF Configuration

The option allows you to configure Alert Standard Format parameters.

Remote Platform Erase Configuration

Remote Platform Erase configuration menu.

3.3.6 ACPI Configuration



PCIE Devices Power On

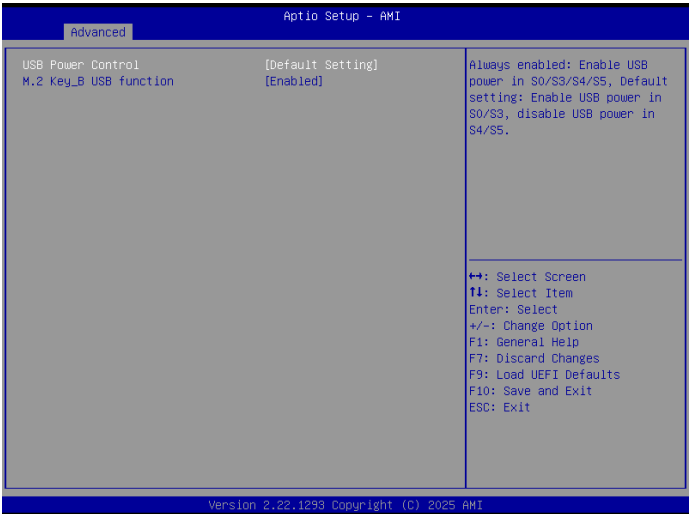
Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

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]

3.3.7 USB Configuration



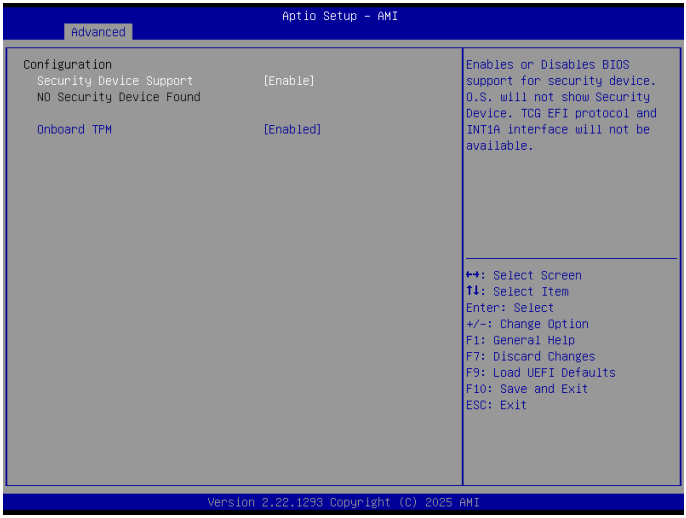
USB Power Control

Use this option to control USB power.

M.2 Key_B USB function

The item enables or disables M.2 Key_B USB function.

3.3.8 Trusted Computing



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

Security Device Support

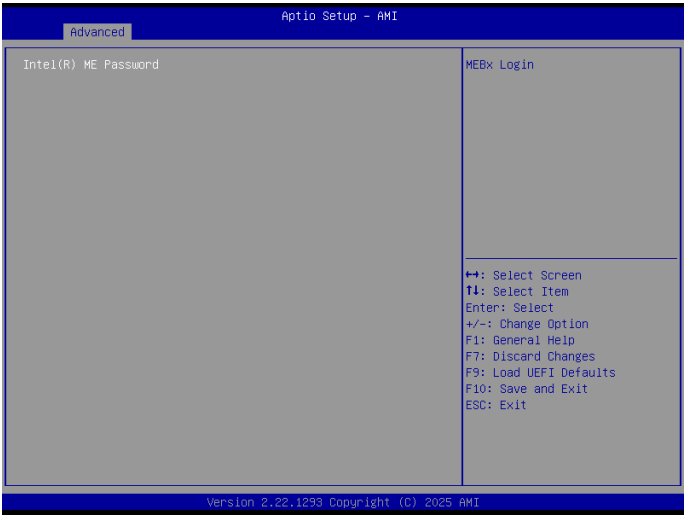
Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Configuration options: [Enabled] [Disabled]

Onboard TPM

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

3.3.9 MEBx

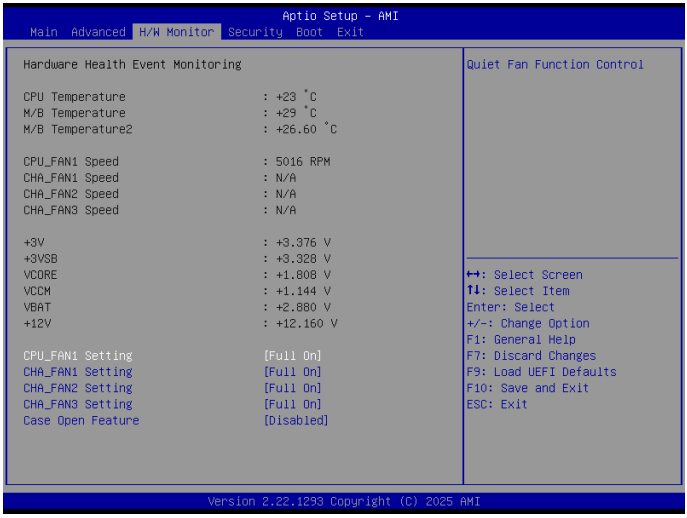


Intel(R) ME Password

MEBx Login.

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, chassis 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]

CHA_Fan 1 Setting

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

Configuration options: [Full On] [Automatic Mode]

CHA_Fan 2 Setting

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

Configuration options: [Full On] [Automatic Mode]

CHA_Fan 3 Setting

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

Configuration options: [Full On] [Automatic Mode]

Case Open Feature

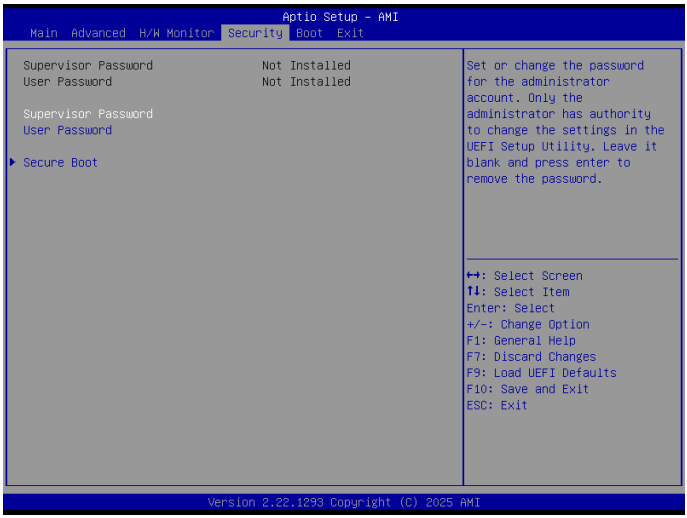
This item allows you to enable or disable case open detection feature. The default is value [Disabled].

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

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

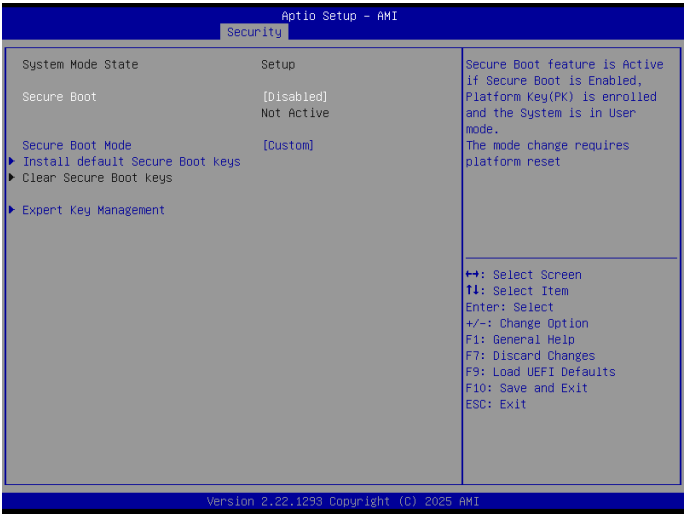
Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

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.



Secure Boot

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

Install Default Secure Boot Keys

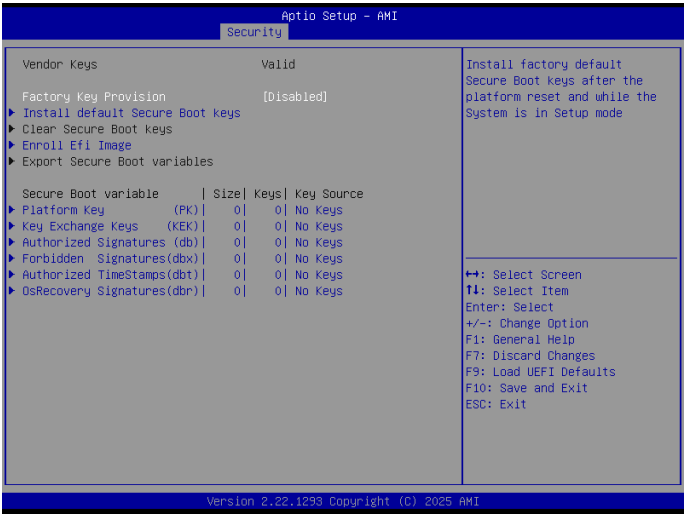
Please install default secure boot keys if it's the first time you use secure boot.

Clear Secure Boot Keys

This item appears only when you load the default Secure Boot keys. Use this item to clear all default Secure Boot keys.

Expert Key Management

Enables expert users to modify Secure Boot Policy variables without variable authentication.



Factory Key Provision

Allows you to install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

Install default Secure Boot Keys

Please install default secure boot keys if it's the first time you use secure boot.

Clear Secure Boot Keys

This item appears only when you load the default Secure Boot keys. Use this item to clear all default Secure Boot keys.

Enroll Efi Image

Allows Efi image to run in Secure Boot Mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Export Secure Boot variables

Allows you to copy NVRAM content of Secure Boot variables to files in a root folder on a file_system device.

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Key Exchange Keys

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Forbidden Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized TimeStamps

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

OsRecovery Signatures

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

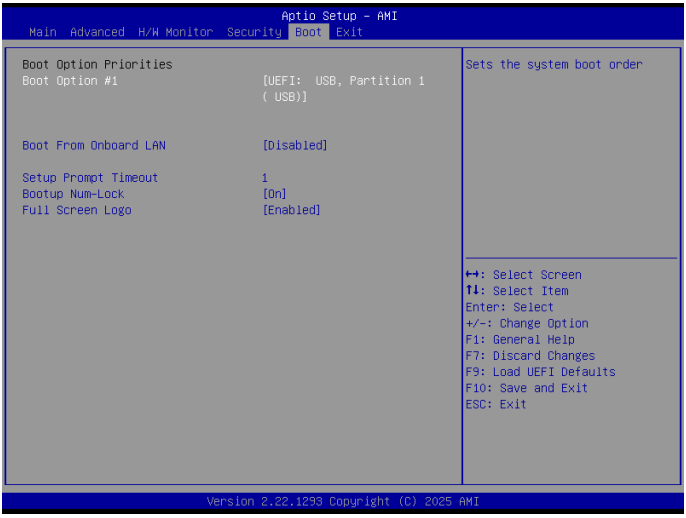
3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Intel(R) Platform Trust Technology

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.

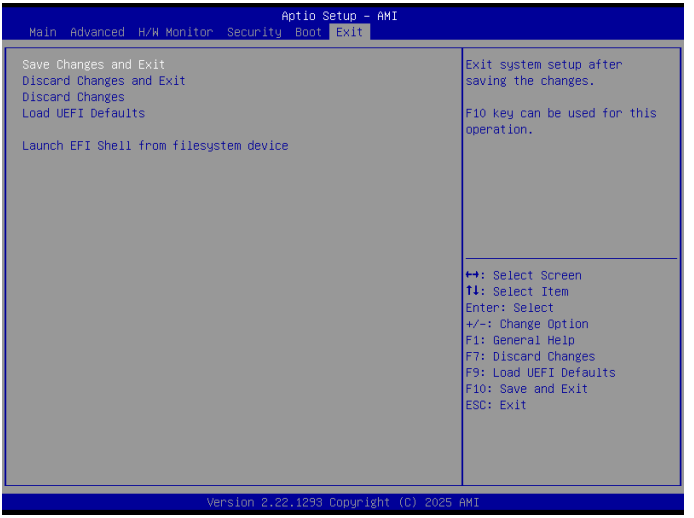
Configuration options: [On] [Off]

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.