ASRock Industrial

# IMB-1715

## User Manual

Version 1.7

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HIGH-DEFINITION MULTIMEDIA INTERFACE

## WARNING

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

## CALIFORNIA, USA ONLY

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

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

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

## 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.

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# Chapter 1 Introduction

Thank you for purchasing ASRockInd ***IMB-1715*** 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-1715*
*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-1715*** Motherboard (ATX (12-in x 9.6-in x 1.81-in, 30.5 cm x 24.4 cmx 4.61 cm))

**Gift Package:**
2 x SATA Data Cable
1 x I/O Shield
4 x SCREW M3*2.5, D=5

**Bulk Package:**
1 x I/O Shield
4 x SCREW M3*2, D=5

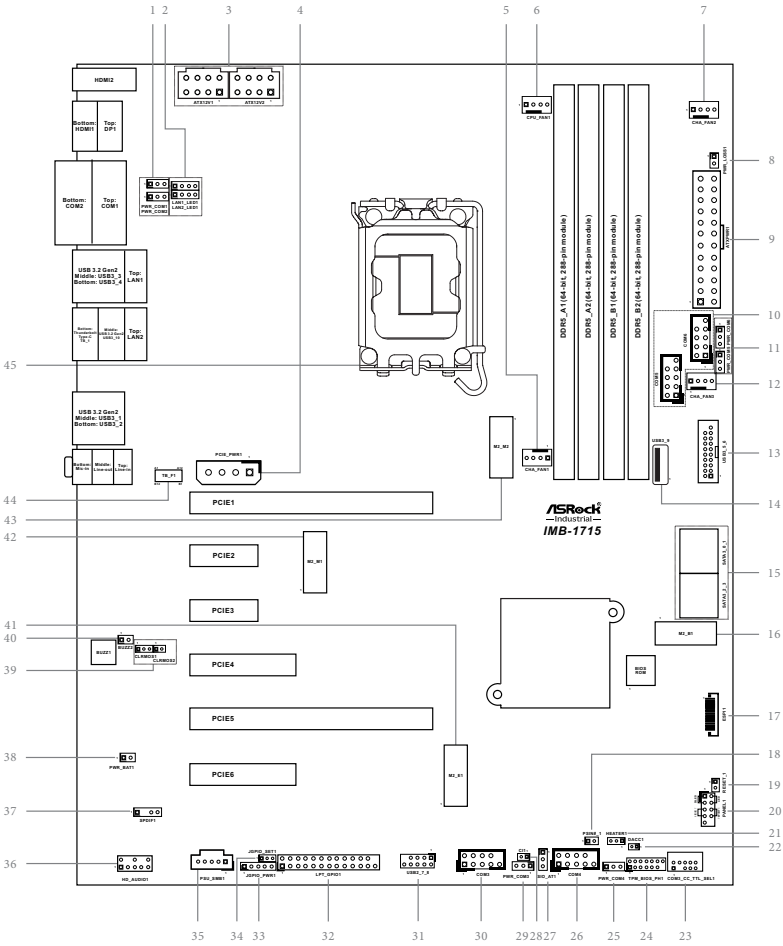
**Option:**
2 x DIMM BRACKET
*Please contact regional Sales for this inquiry.

## 1.2 Specifications

| | | |
|---|---|---|
| **Form Factor** | Dimensions | ATX (12-in x 9.6-in x 1.81-in, 30.5 cm x 24.4 cmx 4.61 cm) |
| **Processor System** | CPU | Intel® Core™ Ultra Series 2 Processors (Arrow Lake-S), up to 125W<br>*Supports with a maximum power limit up to 252W |
| | Chipset | Q870 |
| | Socket | LGA1851 |
| | BIOS | AMI SPI 256 Mbit |
| **Expansion Slot** | PCIe | 2 x PCIe Gen5 Slots (PCIE1/PCIE5: single at x16 (PCIE1); dual at x8 (PCIE1) / x8 (PCIE5)) (PCIE1: Support Riser cadr x8/x8)<br>2 x PCIe x4 (Gen4)<br>2 x PCIe x1 (Gen4)<br>Supports ASRock Rack PAUL Card (IPMI function) |
| | M.2 | 1 x M.2 (Key E, 2230) with PCIe Gen4 x1, USB 2.0 and CNVio/CNVio2 for Wireless<br>1 x M.2 (Key B, 3042/3052) with PCIe Gen4 x1, USB 2.0 |
| **Memory** | Technology | Dual Channel DDR5 6400/5600 MHz |
| | Capacity | 256GB (64GB per DIMM) |
| | Socket | 4 x 288-pin Long-DIMM |
| **Graphics** | Controller | Intel® X$^{e}$ LPG Graphics |
| | HDMI | HDMI 2.1<br>Max resolution up to 7680x4320@60Hz |
| | DisplayPort | DisplayPort 2.1/1.4a, DP++<br>Max resolution up to 4096x2160@60Hz |
| | MultiDisplay | Quad display (Included 2 outputs from Type-C) |
| **Ethernet** | Controller/ Speed | LAN1: Intel® I219LM with 10/100/1000 Mbps, supports vPro<br>LAN2: Intel® I210AT with10/100/1000Mbps |
| | Connector | 2 x RJ-45 |
| **Rear I/O** | HDMI | 2 x HDMI 2.1 |
| | DisplayPort | 1 x DP 1.4a++ |
| | Ethernet | 2 x 1 Gigabit LAN |
| | USB | 5 x USB 3.2 Gen2<br>1 x USB4/Thunderbolt™4 (5V/3A, supports DP 2.1 display output)<br>* For Thunderbolt support, please refer to support list. |
| | Audio | 3 (Mic-in/Line-in/Line-out) |
| | COM | COM1, COM2 (RS-232/422/485) |

| | | |
|---|---|---|
| **Audio** | Interface | Realtek ALC897 HD, High Definition Audio.<br>Line-In, Line-Out, Mic-In |
| **Internal Connector** | USB | 2 x USB 3.2 Gen1 (1 x USB 3.2 header)<br>1 x USB 3.2 Gen2 vertical connector<br>2 x USB 2.0 (1 x USB2 header)<br>1 x USB4/Thunderbolt™4 (5V/3A, supports DP 2.1 display output)<br>* For Thunderbolt support, please refer to support list. |
| | COM | COM3 (RS-232/TTL 5V/ccTalk, switch by Jumper setting)<br>COM4, COM5, COM6 (RS-232) |
| | Parallel | 1 (shared with GPIO) |
| | GPIO | 8 x GPI, 8 x GPO (shared with LPT header) |
| **Storage** | M.2 | 1 x M.2 (Key M, 2242/2280/22110/25110) with PCIe Gen5 x4 for SSD<br>1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD |
| | SATA | 4 x SATA3 (6Gb/s) |
| | RAID | Intel® VMD RAID 0/1/5/10<br>**supported by identical interface (PCIE or SATA)<br>PCIE interface: 2 x M.2 Key M<br>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, ...255 sec |
| **Power Requirements** | Input PWR | ATX PWR (24+8+8-pin) |
| | Power On | AT/ATX Supported<br>- AT: Directly PWR on as power input ready<br>- 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

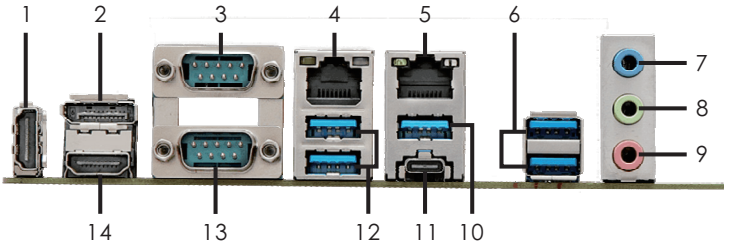


1 : COM Port PWR Setting Jumpers
PWR_COM1 (For COM Port1)
PWR_COM2 (For COM Port2)
2 : LAN LED Headers
LAN1_LED1 (For LAN1 Port)
LAN2_LED1 (For LAN2 Port)
3 : 8-pin ATX 12V Power Connectors (ATX12V1, ATX12V2)
4 : PCIe Power Connector (PCIE_PWR1)
5 : Chassis FAN Connector (+12V) (CHA_FAN1)
6 : CPU FAN Connector (+12V) (CPU_FAN1)
7 : Chassis FAN Connector (+12V) (CHA_FAN2)
8 : PWR LOSS Header (PWR_LOSS1)
9 : 24-pin ATX Power Input Connector (ATXPWR1)
10 : COM Port Header (RS232) (COM5, COM6)
11 : COM Port PWR Setting Jumpers
PWR_COM5 (For COM Port5)
PWR_COM6 (For COM Port6)
12 : Chassis FAN Connector (+12V) (CHA_FAN3)
13 : USB 3.2 Gen1 Header (USB3_5_6)
14 : USB 3.0 Type-A Port (Vertical) (USB3_9)
15 : SATA3 Connectors (SATA3_0~SATA3_3)
16 : M.2 Key-B Socket (M2_B1)
17 : ESPI Header (ESPI1)
18 : PSIN#_1
19 : RESET_1
20 : System Panel Header (PANEL1)
21 : HEATER1 Header (HEATER1) (Preheat function)
22 : DACC1
23 : COM3_CC_TTL_SEL1
24 : TPM_BIOS_PH1
25 : COM Port PWR Setting Jumper
PWR_COM4 (For COM Port4)
26 : COM Port Header (RS232) (COM4)
27 : ATX/AT Mode Jumper (SIO_AT1)
28 : Chassis Intrusion Header (CI1)
29 : COM Port PWR Setting Jumper
PWR_COM3 (For COM Port3)
30 : COM Port Header (RS232) (COM3)
31 : USB 2.0 Header (USB2_7_8)
32 : Printer Port/GPIO Header (LPT_GPIO1)
33 : Digital Input/Output Power Select (JGPIOPWR) (JGPIO_PWR1)

34 : Digital Input/Output Default Value Setting (JGPIO_SET1)
35 : PSU_SMB1
36 : Front Panel Audio Header (HD_AUDIO1)
37 : SPDIF Header (SPDIF1)
38 : PWR_BAT1
39 : Clear CMOS Headers (CLRMOS1, CLRMOS2)
40 : Buzzer Header (BUZZ2)
41 : M.2 Key-E Socket (M2_E1)
42 : M.2 Key-M Socket (M2_M1)
43 : M.2 Key-M Socket (M2_M2)
44 : Thunderbolt Type-C Port (TB_F1)
45 : LGA1851 RL-ILM

*Use the CPU cooler with a minimum of 35lb of stastic compressive load for the LGA1851 RL-ILM (Reduced Load Independent Loading Mechnaism) socket.

## 1.4 I/O Panel




1 HDMI Port (HDMI2)
2 DisplayPort (DP1)
3 COM Port (COM1) (RS232/422/485)*
4 RJ45 LAN Port (LAN1)** (supports vPro)
5 RJ45 LAN Port (LAN2)**
6 USB 3.2 Gen2 Ports (USB3_1_2)
7 Audio Jack: Blue - Line-in
8 Audio Jack: Green - Line Out
9 Audio Jack: Pink - Mic-in
10 USB 3.2 Gen2 Port (USB3_10)
11 Thunderbolt Type-C Port (TB_1)
12 USB 3.2 Gen2 Ports (USB3_3_4)
13 COM Port (COM2) (RS232/422/485)*
14 HDMI Port (HDMI1)

* 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. You may refer to our user manual for details.

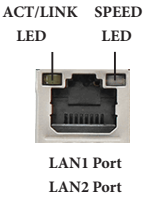
**COM1, 2 Ports Pin Definition**

| 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 |

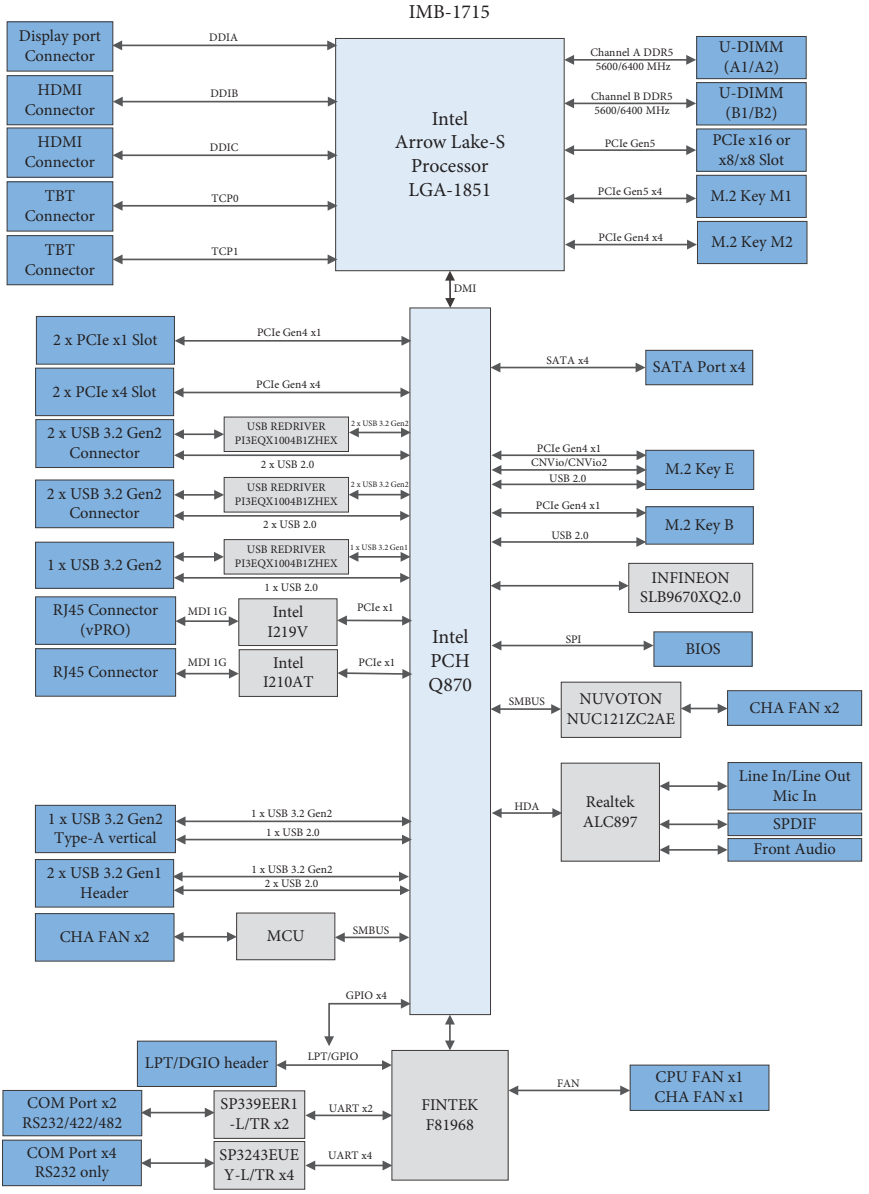
** There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.

**LAN1 and LAN2 Ports LED Indications**

| Activity/Link LED | | SPEED LED | |
|---|---|---|---|
| Status | Description | Status | Description |
| Off | No Link | Off | 10Mbps connection |
| Blinking | Data Activity | Orange | 100Mbps connection |
| On | Link | Green | 1Gbps connection |



## 1.5 Block Diagram



# Chapter 2 Installation

This is a ATX (12-in x 9.6-in x 1.81-in, 30.5 cm x 24.4 cmx 4.61 cm) form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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

## 2.1 Screw Holes

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

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

## 2.2 Pre-installation Precautions

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

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

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

## 2.3 Installation of Memory Modules (DIMM)

***IMB-1715*** provides four 288-pin DDR5 (Double Data Rate 5) LONG-DIMM slots, and supports Dual Channel Memory Technology.

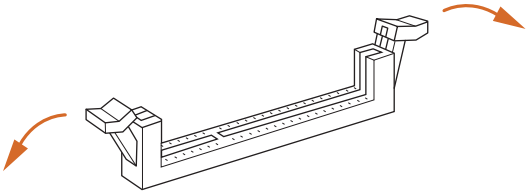
1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one memory module installed.*
3. *It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory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

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

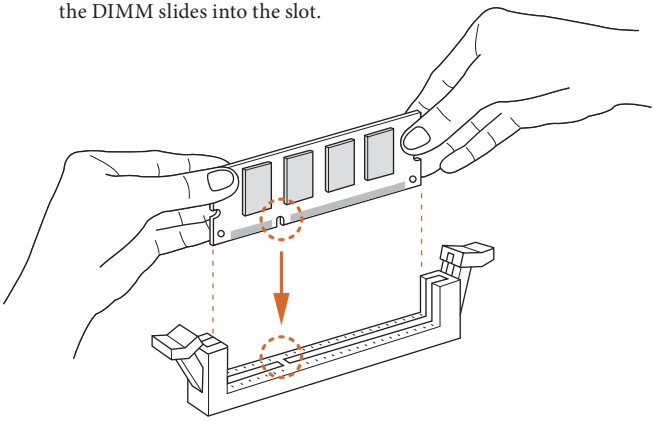
### Recommended Memory Configuration

| Priority | DDR5_A1 | DDR5_A2 | DDR5_B1 | DDR5_B2 |
|---|---|---|---|---|
| 1 | | Populated | | Populated |
| 2 | Populated | Populated | Populated | Populated |

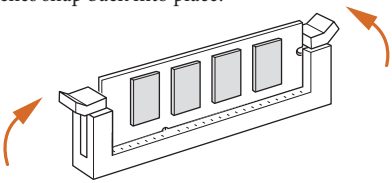
1 Open the DIMM slot latches.



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



3 The latches snap back into place.



## 2.4 Expansion Slots

There are seven PCI Express slots and four M.2 sockets on this motherboard.

**PCIE slots:** PCIE1 (PCIe 5.0 x16 slot) is used for PCI Express cards at x16 or x8 lane width, and supports x8/x8 riser card configurations.
PCIE2 (PCIE 4.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE3 (PCIE 4.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE4 (PCIE 4.0 x4 slot) is used for PCI Express x4 lane width cards.
PCIE5 (PCIe 5.0 x16 slot) is used for PCI Express cards at x8 lane width when both PCIE1 and PCIE5 are populated.
PCIE6 (PCIE 4.0 x4 slot) is used for PCI Express x4 lane width cards.

**M.2 sockets:** 1 x M.2 (Key E, 2230) with PCIe Gen4 x1, USB 2.0 and CNVio/CNVio2 for Wireless
1 x M.2 (Key B, 3042/3052) with PCIe Gen4 x1, USB 2.0
1 x M.2 (Key M, 2242/2280/22110/25110) with PCIe Gen5 x4 for SSD
1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 ofr SSD

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 | NA | NA | 10 |
| 11 | NA | NA | 12 |
| 13 | NA | NA | 14 |
| 15 | NA | NA | 16 |
| 17 | NA | GND | 18 |
| 19 | NA | NA | 20 |
| 21 | NA | NA | 22 |
| 23 | NA | | |
| | | | |
| | | NA | 32 |
| 33 | GND | NA | 34 |
| 35 | PETp | NA | 36 |
| 37 | PETn | NA | 38 |
| 39 | GND | NA | 40 |
| 41 | PERp | NA | 42 |
| 43 | PERn | NA | 44 |
| 45 | GND | NA | 46 |
| 47 | PEFCLKp | NA | 48 |
| 49 | PEFCLKn | NA | 50 |
| 51 | GND | PERST0# | 52 |
| 53 | CLKREQ# | W_DISABLE1# | 54 |
| 55 | NA | W_DISABLE2# | 56 |
| 57 | GND | SMB_DATA | 58 |
| 59 | NA | SMB_CLK | 60 |
| 61 | NA | NA | 62 |
| 63 | GND | NA | 64 |
| 65 | NA | NA | 66 |
| 67 | NA | NA | 68 |
| 69 | GND | NA | 70 |
| 71 | NA | +3.3V | 72 |
| 73 | NA | +3.3V | 74 |
| 75 | GND | | |

M.2 Key-B Socket
(M2_B1)

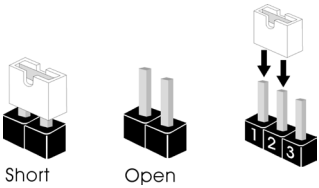
| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | NA | +3.3V | 2 |
| 3 | GND | +3.3V | 4 |
| 5 | GND | FuLL_Card_Power_off | 6 |
| 7 | USB_D+ | W_DISABLE | 8 |
| 9 | USB_D- | NA | 10 |
| 11 | GND | | |
| | | | |
| | | NA | 20 |
| 21 | GND | NA | 22 |
| 23 | NA | NA | 24 |
| 25 | NA | NA | 26 |
| 27 | GND | NA | 28 |
| 29 | NA | UIM_RESET | 30 |
| 31 | NA | UIM_CLK | 32 |
| 33 | GND | UIM_DATA | 34 |
| 35 | NA | UIM_PWR | 36 |
| 37 | NA | 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 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 | 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 | USB_D+ | 34 |
| 35 | PETn1 | USB_D- | 36 |
| 37 | PETp1 | GND | 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 | | |

## 2.5 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))
(3-pin PWR_COM2 (For COM Port2))
(see p. 4, No. 1)

PWR_COM1, 2, 4

(3-pin PWR_COM5 (For COM Port5))
(3-pin PWR_COM6 (For COM Port6))
(see p. 4, No. 11)

(3-pin PWR_COM4 (For COM Port4))
(see p. 4, No. 25)

PWR_COM5~6

(3-pin PWR_COM3 (For COM Port3))
(see p. 4, No. 29)

PWR_COM3

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

### PWR LOSS Header

(2-pin PWR_LOSS1)
(see p. 4, No. 8)

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

### DACC1

(2-pin DACC1)
(see p. 4 No. 22)

| Setting | Description |
|---|---|
| Open | No ACC |
| Short | ACC (Default) |

Auto clear CMOS when system boot improperly.

## ATX/AT Mode Jumper

(2-pin SIO_AT1)

(see p. 4, No. 27)

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

## Chassis Intrusion Header

(see p. 4, No. 28)

(2-pin CI1)

| 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.

## Digital Input/Output Power Select (JGPIOPWR)

(5-pin JGPIO_PWR1)

(see p. 4, No. 33)

| Setting | Description |
|---|---|
| 1-2 | +12V |
| 2-3 | +5V (Default) |
| 3-4 | +5V |
| 4-5 | GND |

## Digital Input/Output Default Value Setting

(3-pin JGPIO_SET1)

(see p. 4, No. 34)

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

## PWR_BAT1

(2-pin PWR_BAT1)

(see p. 4, No. 38)

| Setting | Description |
|---|---|
| Open | Normal (Default) |
| Short | Charge Battery |

Only supported by chargeable battery.

## Clear CMOS Jumpers

(3-pin CLRMOS1)

(see p. 4, No. 39)

CLRMOS1

| 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 date, time and user default profile will be cleared only if the CMOS battery is removed.

(3-pin CLRMOS2)
(see p. 4, No. 39)

CLRMOS2

| 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 is 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, and then use a jumper cap to short the pins on CLRMOS2.

## 2.6 Onboard Headers and Connectors

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

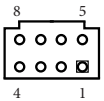
### LAN LED Headers

(LAN1_LED1 (For LAN1 Port))
(LAN2_LED1 (For LAN2 Port))
(see p. 4, No. 2)

| Pin | Signal Name |
|---|---|
| 1 | LILEDP |
| 2 | LED_LNK#_ACT |
| 3 | LED_1000# |
| 4 | LED_2500# |

### 8-pin ATX 12V Power Connector

(8-pin ATX12V1, ATX12V2)
(see p. 4, No. 3)

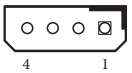



| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | GND | ATX12V | 2 |
| 3 | GND | ATX12V | 4 |
| 5 | GND | ATX12V | 6 |
| 7 | GND | ATX12V | 8 |

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

### PCIe Power Connector

(4-pin PCIE_PWR1)
(see p. 4, No. 4)




| Pin | Signal Name |
|---|---|
| 1 | NA |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

The connector provides additional power for PCIe slot devices.

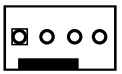
### Chassis FAN Connectors (+12V)

(4-pin CHA_FAN1)
(see p. 4, No. 5)

CHA_FAN1

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

(4-pin CHA_FAN2)
(see p. 4, No. 7)




CHA_FAN2

(4-pin CHA_FAN3)
(see p. 4, No. 12)

CHA_FAN3

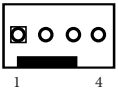
*Though this motherboard provides 4-Pin chassis fan (Quiet Fan) support, the 3-Pin chassis fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin chassis fan to the chassis fan connector on this motherboard, please connect it to Pin 1-3.*

---

## CPU Fan Connector (+12V)

(4-pin CPU_FAN1)

(see p. 4, No. 6)




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

Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

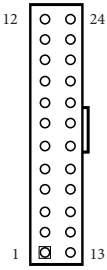
*Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.*

---

## 24-pin ATX Power Input Connector

(24-pin ATXPWR1)

(see p. 4, No. 9)




| 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 |

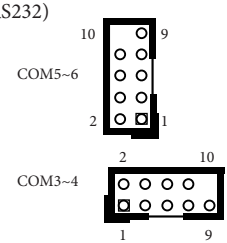
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, plug it along Pin 1 and Pin 13.

## COM Port Headers (RS232)

(9-pin COM5~6)
(see p. 4, No. 10)

(9-pin COM4)
(see p. 4, No. 26)

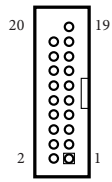
(9-pin COM3)
(see p. 4, No. 30)




| 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 |

## USB 3.2 Gen1 Header

(19-pin USB3_5_6)
(see p. 4, No. 13)

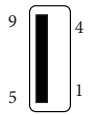



| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | DUMMY | IntA_PA_D+ | 2 |
| 3 | IntA_PB_D+ | IntA_PA_D- | 4 |
| 5 | IntA_PB_D- | GND | 6 |
| 7 | GND | IntA_PA_SSTX+ | 8 |
| 9 | IntA_PB_SSTX+ | IntA_PA_SSTX- | 10 |
| 11 | IntA_PB_SSTX- | GND | 12 |
| 13 | GND | IntA_PA_SSRX+ | 14 |
| 15 | IntA_PB_SSRX+ | IntA_PA_SSRX- | 16 |
| 17 | IntA_PB_SSRX- | Vbus | 18 |
| 19 | Vbus | | 20 |

There is one USB 3.2 Gen1 header on this motherboard.

## USB 3.0 Type-A Port (Vertical)

(9-pin USB3_9)
(see p. 4, No. 14)




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

There is one USB 3.0 Type-A Port on this motherboard.

## SATA3 Connectors

(9-pin SATA3_0~SATA3_3)
(see p. 4, No. 15)

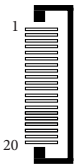
| Pin | Signal Name |
|---|---|
| 1 | GND |
| 2 | SATA-A+ |
| 3 | SATA-A- |
| 4 | GND |
| 5 | SATA-B- |
| 6 | SATA-B+ |
| 7 | GND |

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

## ESPI Header (ESPI1)

(20-pin ESPI1)

(see p. 4, No. 17)




| Pin | Signal Name |
|---|---|
| 1 | GND |
| 2 | ESPI_CLK |
| 3 | GND |
| 4 | ESPI_CS# |
| 5 | ESPI_RESET# |
| 6 | GND |
| 7 | +3V |
| 8 | ESPI_CS#1 |
| 9 | PLTRST# |
| 10 | COM_RST# |
| 11 | ESPI_IO0 |
| 12 | ESPI_IO1 |
| 13 | ESPI_IO2 |
| 14 | ESPI_IO3 |
| 15 | ALERT#1 |
| 16 | +3VSB |
| 17 | Internal Use |
| 18 | +5VSB |
| 19 | ESPI_ALERT# |
| 20 | GND |

---

## PSIN#_1

(2-pin PSIN#_1)

(see p. 4, No. 18)

| Setting | Description |
|---|---|
| Open | PSIN# |
| Short | GND |

For ASRock Rack PAUL card connection.

---

## RESET_1

(2-pin RESET_1)

(see p. 4 No. 19)

| Setting | Description |
|---|---|
| Open | RESET# |
| Short | GND |

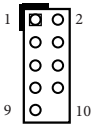
For ASRock Rack PAUL card connection.

---

## System Panel Header

(9-pin PANEL1)

(see p. 4, No. 20)




| 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 system 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 assignments are matched correctly.

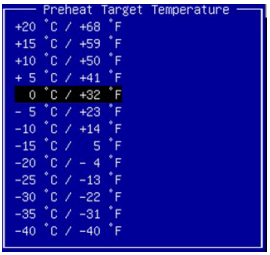
---

## HEATER1 Header

(3-pin HEATER1)
(see p. 4, No. 21)

| Pin | Signal Name |
|---|---|
| 1 | Heater_PWR (5V/1A) |
| 2 | GND |
| 3 | NTC (Negative Temperature Coefficient) thermistors |

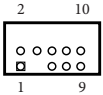
* The 10k Ohm NTC thermistors is suggested.
* Deep mode is not supported when the preheat function is enabled.
Refer to the following Preheat Targer Temperature list.



## COM3_CC_TTL_SEL1

(9-pin COM3_CC_TTL_SEL1)

(see p. 4, No. 23)




| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | +5V | GND | 2 |
| 3 | | NA | 4 |
| 5 | TTXD_3_TTL | RRXD_3_TTL | 6 |
| 7 | TTXD_3 | RRXD_3 | 8 |
| 9 | TTXD_3_RS232 | RRXD_3_RS232 | 10 |

COM_CC_TTL_SEL1:79

MINI_JUMPER

COM_CC_TTL_SEL1:80

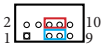
MINI_JUMPER

Open: CCTALK function

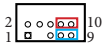
- Supported by CCTALK Card (optional)

https://www.asrockind.com/UART-CCTALK

5-7 + 6-8 : TTL function




7-9 + 8-10 : COM (RS232) (Default)

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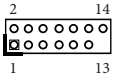
## TPM_BIOS_PH1

(13-pin TPM_BIOS_PH1)

(see p. 4, No. 24)



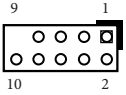

| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | SPI_DQ2_ | SPI_DQ3 | 2 |
| 3 | SPI0_CS0# | +3.3V | 4 |
| 5 | SPI0_MISO | IPMI_SPI_TPM_ PRSNT# | 6 |
| 7 | RSMRST# | SPI0_CLK | 8 |
| 9 | GND | SPI0_MOSI | 10 |
| 11 | SPI_TPM_CS# | IPMI_PCIE_RST_BU | 12 |
| | | IPMI_SPI_TPM_ PIRQ_ | 14 |

---

## USB 2.0 Header

(9-pin USB2_7_8)

(see p. 4, No. 31)




| 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 |

There is one USB 2.0 header on this motherboard. This USB 2.0 header can support two USB 2.0 ports.

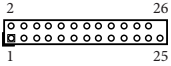
For ASRock Rack PAUL Card or standard USB 2.0 device connection (mutually exclusive).

---

## Printer Port/GPIO Header

(25-pin LPT_GPIO1)

(see p. 4, No. 32)




Printer Port

| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | STB# | AFD# | 2 |
| 3 | SPD0 | ERROR# | 4 |
| 5 | SPD1 | PINIT# | 6 |
| 7 | SPD2 | SLIN# | 8 |
| 9 | SPD3 | GND | 10 |
| 11 | SPD4 | GND | 12 |
| 13 | SPD5 | GND | 14 |
| 15 | SPD6 | GND | 16 |
| 17 | SPD7 | GND | 18 |
| 19 | ACK# | GND | 20 |
| 21 | BUSY | GND | 22 |
| 23 | PE | GND | 24 |
| 25 | SLCT | | 26 |

GPIO

| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| 1 | SIO_GP77 | SIO_GP76 | 2 |
| 3 | SIO_GP80 | SIO_GP75 | 4 |
| 5 | SIO_GP81 | SIO_GP74 | 6 |
| 7 | SIO_GP82 | SIO_GP73 | 8 |
| 9 | SIO_GP83 | JGPIOPWR | 10 |
| 11 | SIO_GP84 | JGPIOPWR | 12 |
| 13 | SIO_GP85 | GND | 14 |
| 15 | SIO_GP86 | GND | 16 |
| 17 | SIO_GP87/GPP_H23 | GND | 18 |
| 19 | SIO_G72/GPP_I10 | GND | 20 |
| 21 | SIO_G71/GPP_E5 | GND | 22 |
| 23 | SIO_G70/GPP_E6 | GND | 24 |
| 25 | NA | NC | 26 |

If you want to use the printer port function, please short pin4 and pin5 on Digital Input/Output Power Select (JGPIO_PWR1).

| Parameter | Range |
|---|---|
| GPIO input Low voltage | Max: 0.8V |
| GPIO input High voltage | Min: 2.5V |
| GPIO output Low voltage | Max: 0.4V |
| GPIO output High voltage | Min: 2.85V |
| Note:<br>Max. load per GPI/O pin: 3mA<br>Current Max. 1A per power pin | |

---

PSU_SMB1

(5-pin PSU_SMB1)

(see p. 4, No. 35)

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

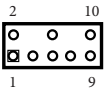
The SMBus connector is for power supply unit.

---

Front Panel Audio Header

(8-pin HD_AUDIO1)

(see p. 4, No. 36)




| 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 |

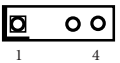
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

---

SPDIF Header

(3-pin SPDIF1)

(see p. 4, No. 37)




| 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.

## Buzzer Header

(2-pin BUZZ2)

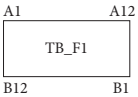
(see p. 4, No. 40)

| Pin | Signal Name |
|---|---|
| 1 | +5V |
| 2 | BUZZ_LOW |

## Thunderbolt Type-C Port

(24-pin TB-F1)

(see p. 4, No. 44)




| Pin | Signal Name | Signal Name | Pin |
|---|---|---|---|
| A1 | GND | GND | B12 |
| A2 | SSTXp1 | SSRXp1 | B11 |
| A3 | SSTXn1 | SSRXn1 | B10 |
| A4 | VBUS | VBUS | B9 |
| A5 | CC1 | SBU2 | B8 |
| A6 | Dp1 | Dn2 | B7 |
| A7 | Dn1 | Dp2 | B6 |
| A8 | SBU1 | CC2 | B5 |
| A9 | VBUS | VBUS | B4 |
| A10 | SSRXn2 | SSTXn2 | B3 |
| A11 | SSRXp2 | SSTXp2 | B2 |
| A12 | GND | GND | B1 |

# Chapter 3 UEFI SETUP UTILITY

## 3.1 Introduction

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

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

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

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

### 3.1.1 Entering BIOS Setup

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

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

## 3.1.2 UEFI Menu Bar

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

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

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

### 3.1.3 Navigation Keys

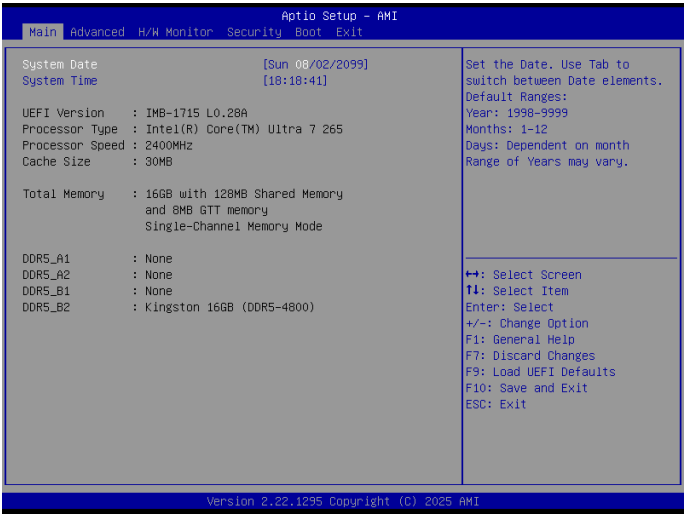
Use <← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

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

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

## 3.2 Main Screen

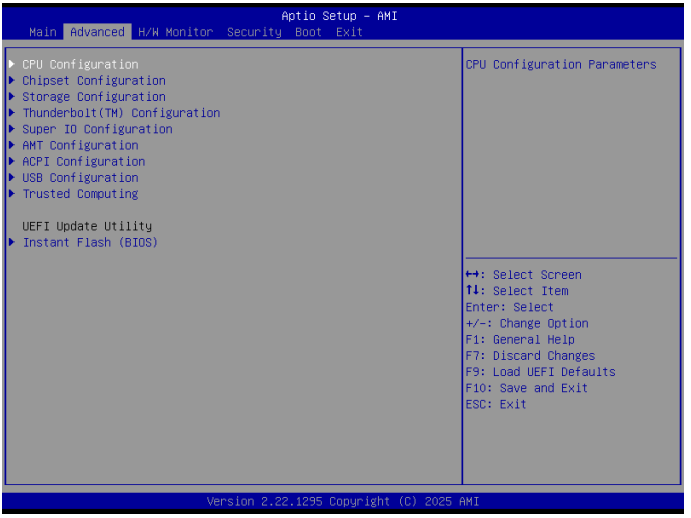
When you enter the UEFI Setup Utility, the Main screen will appear and display the system overview.




*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, Thunderbolt (TM) Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.

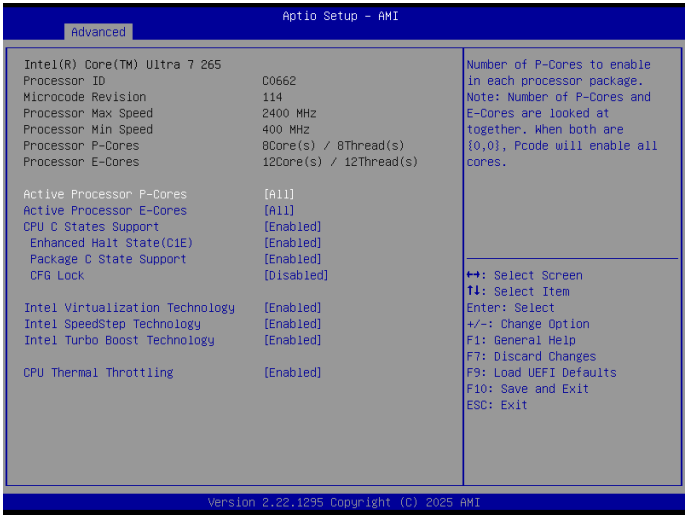



*Setting wrong values in this section may cause the system to malfunction.*

### Instant Flash (BIOS)

Instant Flash (BIOS) 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 (BIOS) utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes..

## 3.3.1 CPU Configuration




### Active Processor P-Cores

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

### Active Processor E-Cores

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

### CPU C States Support

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

Configuration options: [Enabled] [Disabled]

### Enhanced Halt State (C1E)

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

Configuration options: [Enabled] [Disabled]

### Package C State Support

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

## CFG Lock

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

Configuration options: [Enabled] [Disabled]

## Intel Virtualization Technology

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

Configuration options: [Enabled] [Disabled]

## Intel SpeedStep Technology

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

Configuration options: [Enabled] [Disabled].

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

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

## Intel Turbo Boost Technology

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

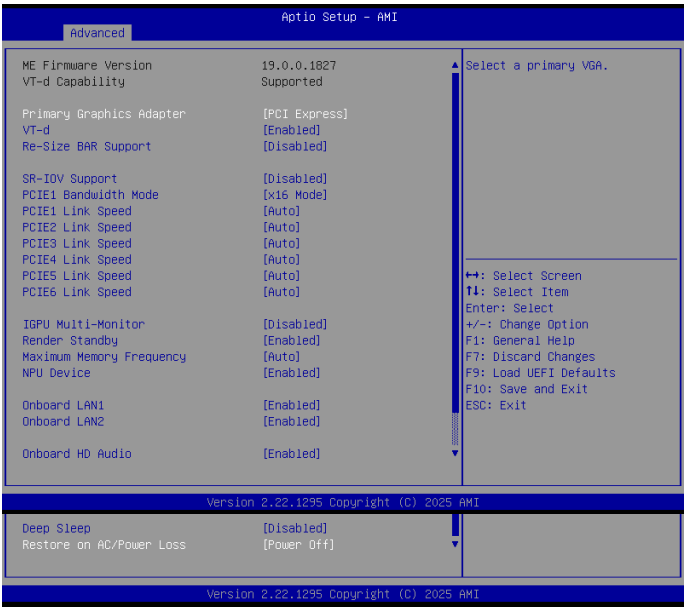
Configuration options: [Enabled] [Disabled]

## CPU Thermal Throttling

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

Configuration options: [Enabled] [Disabled]

## 3.3.2 Chipset Configuration




### Primary Graphics Adapter

The option allows you to select a primary VGA.

Configuration options: [Onboard] [PCI Express] (Options vary when you have installed a graphics card on your motherboard.)

### 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]

## PCIE1 Bandwidth Mode

Select PCIE1 Bandwidth. Select [PCIE5] when using PCIE5 slot. Select [x8 / x8 Mode] when using Riser card on PCIE1 slot. (PCIE5 slot will be disabled.)

## 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] (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] (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] [Gen5] (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] (Options vary depending on your motherboard.)

## IGPU Multi-Monitor

Select [Disabled] to disable the integrated graphics when an external graphics card is installed. Select [Enabled] to keep the integrated graphics enabled at all times.

Configuration options: [Enabled] [Disabled]

## Render Standby

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

## Maximum Memory Frequency

Selections in Mhz.

## NPU Device

This allows you to enable or disable NPU (Neural Processing Unit) Device.

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. Set this item to [Auto] to enable the onboard HD and automatically disable it when a sound card is installed.

Configuration options: [Enabled] [Disabled]

## 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.

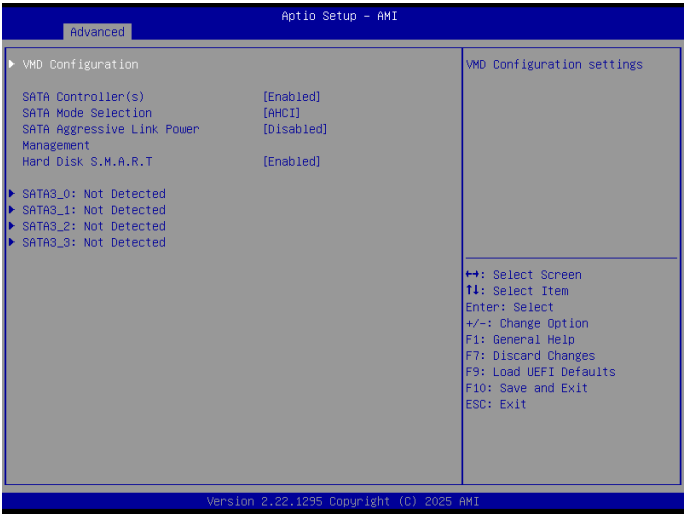
## Restore on AC/Power Loss

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

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

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

## 3.3.3 Storage Configuration




### VMD Configuration

This item allows you to enable or disable the Intel VMD support function.

### SATA Controller(s)

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

Configuration options: [Enabled] [Disabled]

### SATA Mode Selection

AHCI supports new features that improve performance.

Configuration option: [AHCI]

### 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.

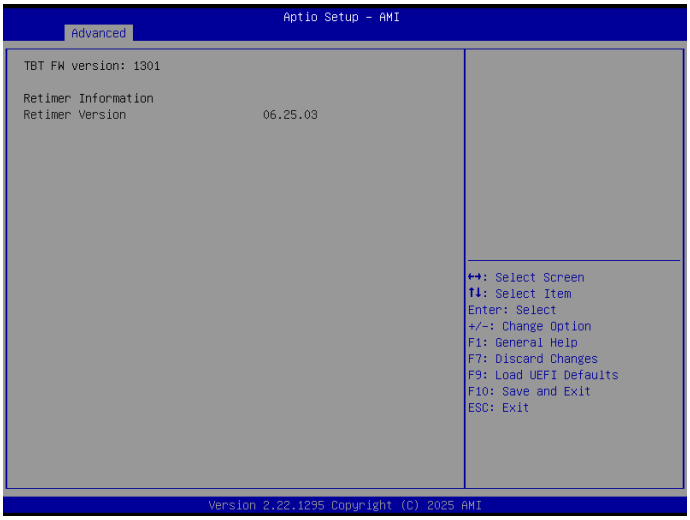
Configuration options: [Enabled] [Disabled]

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

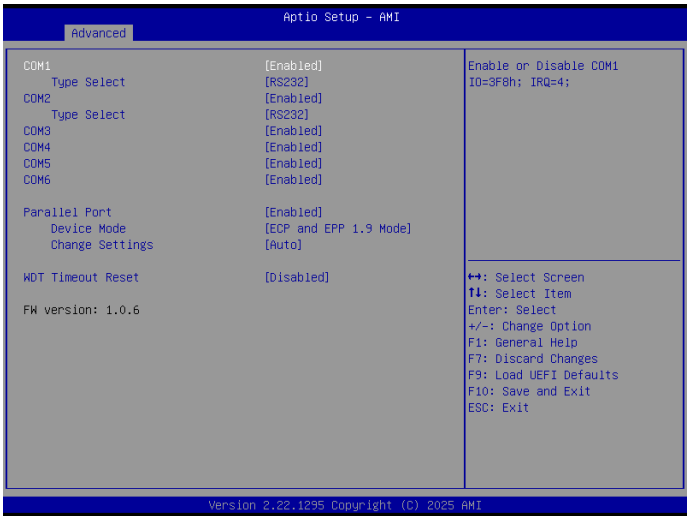
S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

## 3.3.4 Thunderbolt (TM) Configuration



## 3.3.5 Super IO Configuration




### COM1 Configuration

Use this to set parameters of COM1.

### Type Select

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

### COM2 Configuration

Use this to set parameters of COM2.

### Type Select

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

### COM3 Configuration

Use this to set parameters of COM3.

### COM4 Configuration

Use this to set parameters of COM4.

### COM5 Configuration

Use this to set parameters of COM5.

## COM6 Configuration

Use this to set parameters of COM6.

## Parellel Port

The option enables or disables the Parallel port.

## Device Mode

Select the device mode according to your connected device.

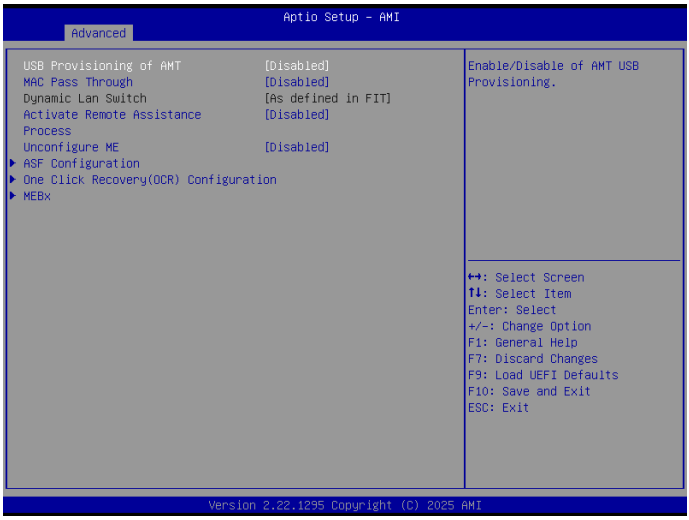
## Change Settings

Select the address of the Parallel port.

## WDT Timeout Reset

Use this to set the Watch Dog Timer.

## 3.3.6 AMT Configuration




### USB Provisioning of AMT

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

### MAC Pass Through

The option enables or disables MAC Pass Through function.

### Dynamic Lan Swtich

This allows switching AMT support from Integrated LAN to Discrete LAN.

### 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.

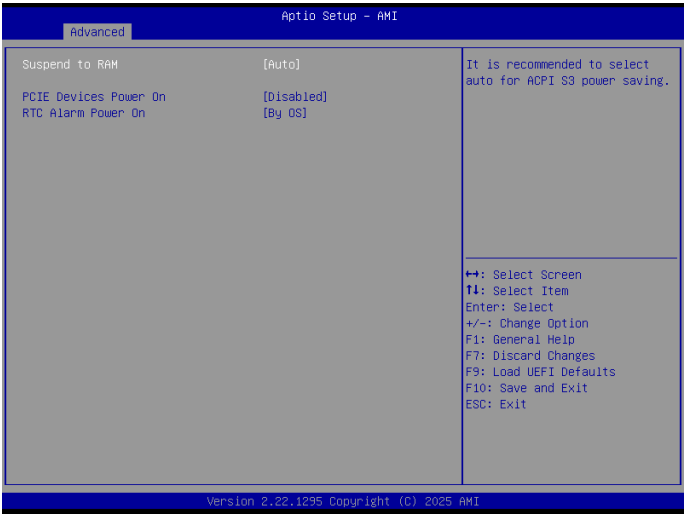
### One Click Recovery(OCR) Configuration

Configuration setting for One Click Recovery. This allows access for AMT to boot a recovery OS application.

## MEBx

This Formset contains forms for configuring MEBx.

## 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

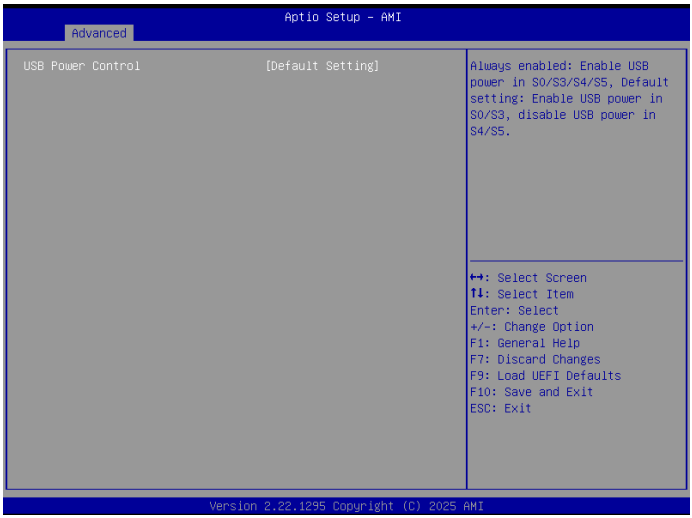
Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

### 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]

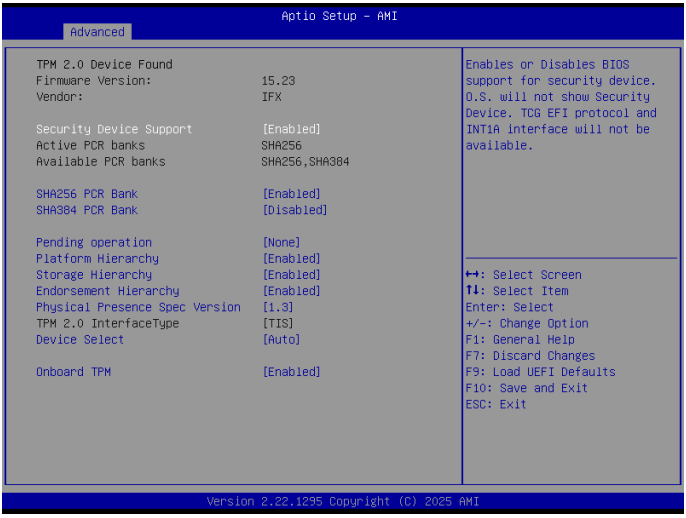
## 3.3.8 USB Configuration




### 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.

## 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.

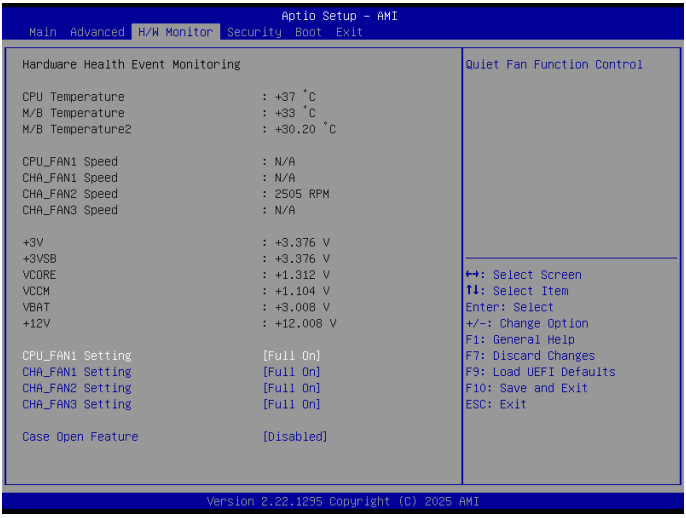
[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

## 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, 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] [Manual]

### CHA_Fan 3 Setting

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

Configuration options: [Full On] [Manual]

## Case Open Feature

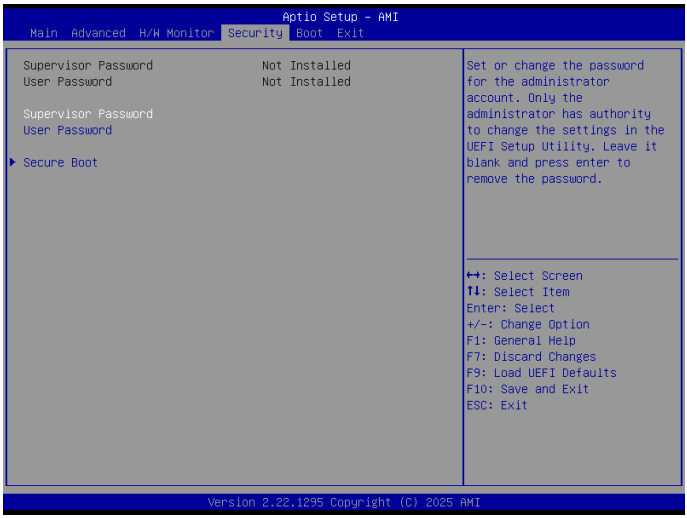
This item allows you to enable or disable case open detection feature. The default is value [Disabled].

## 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 the authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### User Password

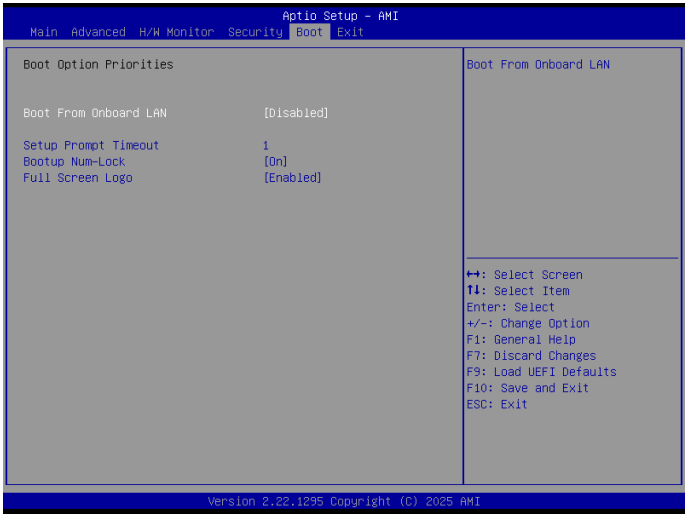
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### Secure Boot

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

## 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.

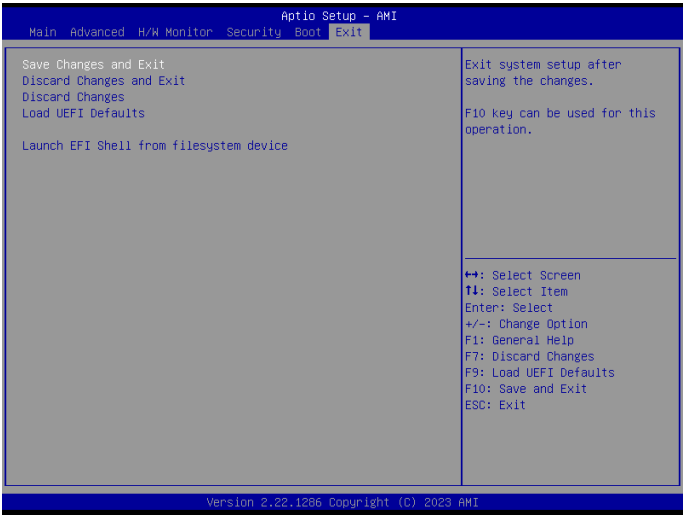
Configuration options: [On] [Off]

### 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. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

### Discard Changes and Exit

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

### Discard Changes

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

### Load UEFI Defaults

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

### Launch EFI Shell from filesystem device

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