



SBC-250

User Manual

Version 1.3

Updated August 2, 2023

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Version 1.0

Published November 2022

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**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.**

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Chapter 1: Introduction

Thank you for purchasing ASRockInd **SBC-250** 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/>

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/support/index.asp>

1.1 Package Contents

ASRockInd **SBC-250** Motherboard (3.5"SBC (5.8-in x 4-in x 0.87-in, 14.7 cm x 10.2 cm x 2.20 cm))

ASRockInd **SBC-250** Jumper Setting Instruction

Gift Package:

1 x SINK FOR SBC-250

3 x SCREW M2*2, D=5

2 x COM Cable

1 x SATA Data Cable

1 x SATA Power Cable

1 x DC-in Cable

Bulk Package:

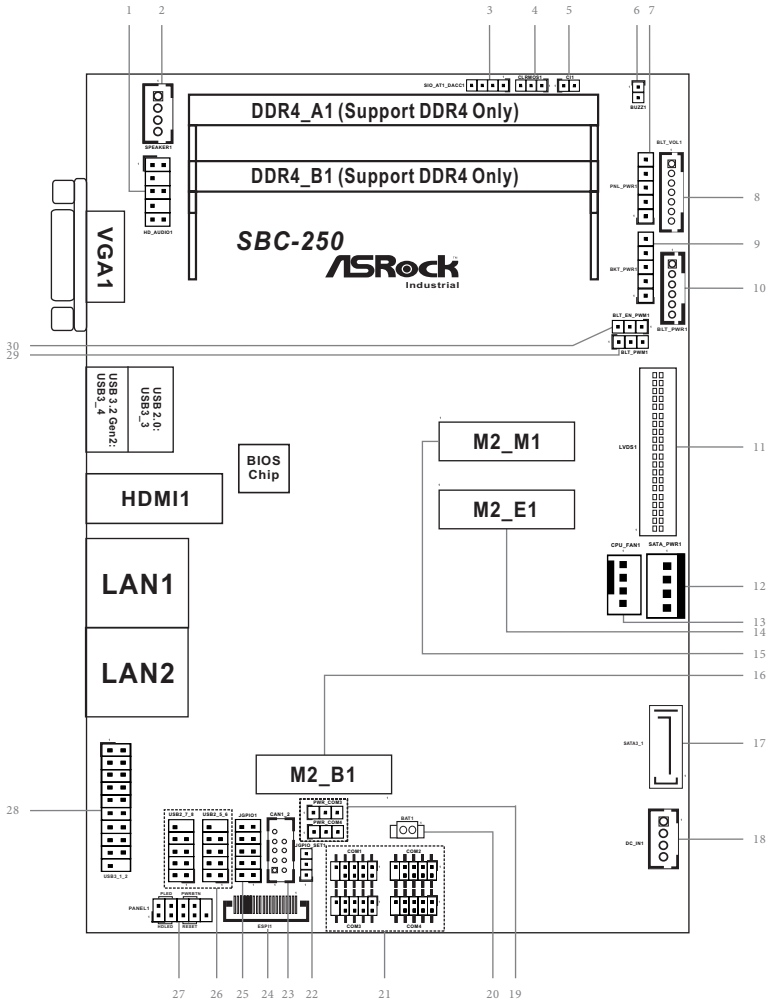
3 x SCREW M2*2, D=5

1.2 Specifications

| | | |
|-------------------------|------------------|--|
| Form Factor | Dimensions | 3.5" SBC (5.8-in x 4-in x 0.87-in, 14.7 cm x 10.2 cm x 2.20 cm) |
| Processor System | CPU | Intel® Elkhart Lake SoC Processors SBC-250J (J6412, QC, Max Speed Up to 2.6GHz, 10W) SBC-250D (J6426, QC, Max Speed Up to 3.0GHz, 10W) SBC-250L (N6210, DC, Max Speed Up to 2.6GHz, 6.5W) SBC-250N (N6415, QC, Max Speed Up to 3.0GHz, 6.5W) |
| | Chipset | SoC |
| | BIOS | AMI SPI 256 Mbit |
| | Technology | Dual Channel DDR4 3200 MHz |
| Memory | Capacity | 32GB (16GB per DIMM) |
| | Socket | 2 x 260-pin SO-DIMM |
| | Controller | Intel® Gen 11 Graphics |
| Graphics | HDMI | HDMI 2.0b Max resolution up to 4096x2160@60Hz |
| | VGA | Max resolution up to 1920x1200 |
| | LVDS | Dual channel 24 bit up to 1920x1200@60Hz (Connector shared with eDP) |
| | eDP | Max resolution up to 1920x1080@60Hz (Connector shared with LVDS) |
| | MultiDisplay | Triple display |
| Expansion Slot | M.2 | 1 x M.2 (Key B, 3042/3052) with PCIe x1/USB 3.2, USB 2.0 and SIM for 4G/5G 1 x M.2 (Key E, 2230) with PCIe x1 and USB 2.0 for Wireless |
| | SIM Socket | 1 x SIM socket connected to M.2 key B |
| Audio | Interface | Realtek ALC233/256 HD, High Definition Audio |
| Ethernet | Controller/Speed | LAN1: Intel® I225LM/I225V with 10/100/1000/2500 Mbps LAN2: Intel® I225LM/I225V with 10/100/1000/2500 Mbps |
| | Connector | 2 x RJ-45 |

| | | |
|---------------------------|--------------------|---|
| Rear I/O | HDMI | 1 x HDMI 2.0b |
| | VGA | 1 |
| | Ethernet | 2 x 2.5 Gigabit LAN |
| | USB | 1 x USB 3.2 Gen2, 1 x USB 2.0 |
| Internal Connector | USB | 1 x USB 3.2 Gen1 (1 x USB 3.1 header) 1 x USB 2.0 (1 x USB 3.1 header) 4 x USB 2.0 (2 x 2.54 pitch header) |
| | COM | COM1, COM2, COM4 (RS-232) COM3 (RS-232/422/485) |
| | GPIO | 4 x GPI, 4 x GPO |
| | LVDS | 1 (Connector with LVDS/eDP signal, switch by BIOS) |
| | TPM | TPM 2.0 onboard IC |
| | SATA PWR Output | 1 |
| | Speaker Header | 1 |
| Storage | M.2 | 1 x M.2 (Key M, 2242/2260/2280) with PCIe x1 for SSD |
| | SATA | 1 x SATA3 (6Gb/s) |
| Watchdog Timer | Output | Output from super I/O to drag RESETCON# |
| | Interval | 256 Segments, 0,1,2...255 Sec |
| Power Requirements | Input PWR | 9~36V DC-In with 4-pin wafer PWR |
| | Power On | AT/ATX Supported AT: Directly PWR on as power input ready ATX: Press button to PWR on after power input ready |
| Environment | Operating Temp | 0°C ~ 70°C |
| | Storage Temp | -40° C ~ 85° C |
| | Operating Humidity | 5% ~ 90% |
| | Storage Humidity | 5% ~ 90% |

1.3 Motherboard Layout

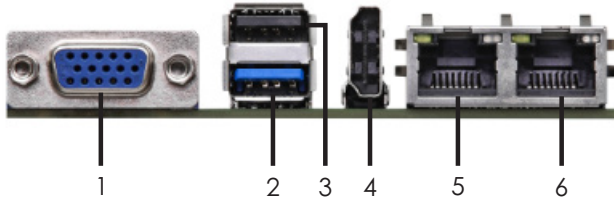


-
- 1 : Front Panel Audio Header (HD_AUDIO1)
 - 2 : 2W Audio AMP Output Wafer (SPEAKER1)
 - 3 : SIO_AT1_DACC1
 - 4 : Clear CMOS Header (CLRMOS1)
 - 5 : Chassis Intrusion Header (CI1)
 - 6 : 2-Pin Buzzer Header (BUZZ1)
 - 7 : Panel Power Selection (LCD_VCC) (PNL_PWR1)
 - 8 : Backlight Control (BLT_VOL1)
 - 9 : Backlight Power Select (LCD_BLT_VCC) (BKT_PWR1)
 - 10 : Inverter Power Control Wafer (BLT_PWR1)
 - 11 : LVDS Panel Connector (LVDS1)
 - 12 : SATA Power Output Connector (SATA_PWR1)
 - 13 : CPU FAN Connector (+12V) (CPU_FAN1)
 - 14 : M.2 Key-E Socket (M2_E1)
 - 15 : M.2 Key-M Socket (M2_M1)
 - 16 : M.2 Key-B Socket (M2_B1)
 - 17 : SATA3 Connector (SATA3_1)
 - 18 : 4-pin DC-in PWR Connector (Input +9V~+36V) (DC_IN1)
 - 19 : COM Port Pin9 PWR Setting Jumpers
 - PWR_COM3 (For COM Port3)
 - PWR_COM4 (For COM Port4)
 - 20 : Battery Connector (BAT1)
 - 21 : Internal COM Port Headers
 - COM3 (RS232/422/485)
 - COM1, 2, 4 (RS232)
 - 22 : GPIO Default Setting (JGPIO_SET1)
 - 23 : CAN1_2 Connector (Only supported With SBC-250N/SBC-250D)
 - 24 : ESPI Connector (ESPI1)
 - 25 : Digital Input/Output Pin Header (JGPIO1)
 - 26 : USB 2.0 Connectors (USB2_5_6, USB2_7_8)
 - 27 : System Panel Header (PANEL1)
 - 28 : USB 3.2 Gen1 Connector (USB3_1_2)
 - 29 : Brightness Control Mode (BLT_PWM1)
 - 30 : CON_LBKLT_EN and CON_LBKLT_CTL Voltage Level (BLT_EN_PWM1)

Backside :

SIM Socket (SIM1)



1.4 I/O Panel



- | | | | |
|---|---------------------------|---|-------------------|
| 1 | VGA Port (VGA1) | 4 | HDMI Port (HDMI1) |
| 2 | USB3.2 Gen2 Port (USB3_4) | 5 | LAN Port (LAN1)* |
| 3 | USB2.0 Port (USB3_3) | 6 | LAN Port (LAN2)* |

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

LAN Port LED Indications

| Activity/Link LED | | SPEED LED | | ACT/LINK LED | SPEED LED |
|-------------------|---------------|-----------|---------------------------|---|---|
| Status | Description | Status | Description |  |  |
| Off | No Link | Off | 10Mbps/100Mbps connection | | |
| Blinking | Data Activity | Orange | 1Gbps connection | | |
| On | Link | Green | 2.5Gbps connection | | |

Chapter 2: Installation

This is a 3.5" SBC (5.8-in x 4-in x 0.87-in, 14.7 cm x 10.2 cm x 2.20 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.)**

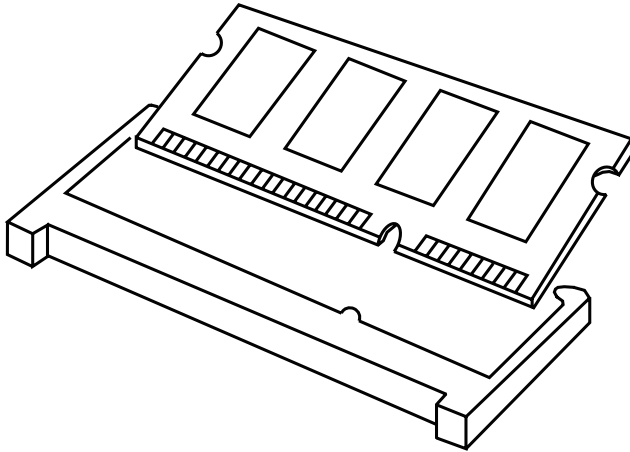


Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installation of Memory Modules (SO-DIMM)

SBC-250 provides two 260-pin DDR4 (Double Data Rate 4) SO-DIMM slots.

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



1. The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at incorrect orientation.
2. Please do not intermix different voltage SO-DIMMs on this motherboard.

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

2.4 Expansion Slots (M.2 and SIM Sockets)

There are 3 M.2 and 1 SIM sockets on this motherboard.

SIM Socket (SIM1):

SIM socket connected to M.2 key B.

M.2 Key-M Socket (M2_M1):

M.2 (Key M, 2242/2260/2280) with PCIe x1 for SSD.

M.2 Key-B Socket (M2_B1):

M.2 (Key B, 3042/3052) with PCIe x1/USB 3.2 and USB 2.0 and SIM for 4G/5G.

M.2 Key-E Socket (M2_E1):

M.2 (Key E, 2230) with PCIe x1 and USB 2.0 for Wireless.

M2_M1

| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | GND | +3.3V | 2 |
| 3 | GND | +3.3V | 4 |
| 5 | NA | NA | 6 |
| 7 | NA | NA | 8 |
| 9 | GND | SATA_LED | 10 |
| 11 | NA | +3.3V | 12 |
| 13 | NA | +3.3V | 14 |
| 15 | GND | +3.3V | 16 |
| 17 | NA | +3.3V | 18 |
| 19 | NA | NA | 20 |
| 21 | GND | NA | 22 |
| 23 | NA | NA | 24 |
| 25 | NA | NA | 26 |
| 27 | GND | NA | 28 |
| 29 | NA | NA | 30 |
| 31 | NA | NA | 32 |
| 33 | GND | NA | 34 |
| 35 | NA | NA | 36 |
| 37 | NA | DEVSLP | 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 |
| | | | |
| | | | |
| 67 | NA | NA | 68 |
| 69 | PEDET | +3.3V | 70 |
| 71 | GND | +3.3V | 72 |
| 73 | GND | +3.3V | 74 |
| 75 | GND | | |

M2_B1

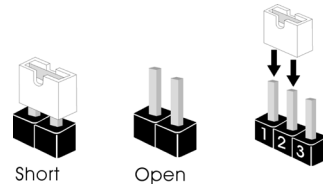
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|---------------------|-----|
| 1 | NA | +3.3V | 2 |
| 3 | GND | +3.3V | 4 |
| 5 | GND | FuLL_Card_Power_off | 6 |
| 7 | USB_D+ | W_DISABLE | 8 |
| 9 | USB_D- | WWAN_LED# | 10 |
| 11 | GND | | |
| | | | |
| | | NA | 20 |
| 21 | GND | NA | 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 | +3.3V | 74 |

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 | GND | NA | 14 |
| 15 | NA | NA | 16 |
| 17 | NA | GND | 18 |
| 19 | GND | NA | 20 |
| 21 | NA | NA | 22 |
| 23 | NA | | 24 |
| | | | 26 |
| | | 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 | SUSCLK | 50 |
| 51 | GND | PERST0# | 52 |
| 53 | NA | NA | 54 |
| 55 | NA | NA | 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 | | |

2.5 Jumpers Setup

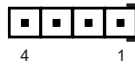
The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short.” If no jumper cap is placed on pins, the jumper is “Open.” The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.



SIO_AT1_DACC1

(4-pin SIO_AT1_DACC1)

(see p. 8, No. 3)



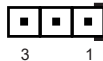
| Setting | Description |
|-----------|--------------------|
| 1-2 Short | AT Mode |
| 1-2 Open | ATX Mode (Default) |
| 3-4 Short | ACC (Default) |
| 3-4 Open | No ACC |

Note: Auto clear CMOS when system boot improperly.

Clear CMOS Header

(3-pin CLRMOS1)

(see p. 8, No. 4)



| Setting | Description |
|---------|---------------------|
| 1-2 | Clear CMOS |
| 2-3 | Auto Clear (PWR ON) |

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 pin1 and pin2 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 ser default profile will be cleared only if the CMOS battery is removed.

CLRMOS1 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 CLRMOS1.

Chassis Intrusion Header

(2-pin Cl1)

(see p. 8, No. 5)



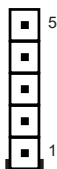
| Setting | Description |
|---------|------------------|
| Open | Normal (Default) |
| Short | Active Case Open |

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.

Panel Power Selection (LCD_VCC)

(5-pin PNL_PWR1)

(see p. 8, No. 7)



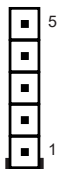
| Setting | Description |
|---------|---------------|
| 1-2 | +3V (Default) |
| 2-3 | +5V |
| 3-4 | +5V |
| 4-5 | +12V |

Use this header to set up the VDD power of the LVDS connector.

Backlight Power Select (LCD_BLT_VCC)

(5-pin BKT_PWR1)

(see p. 8, No. 9)



| Setting | Description |
|---------|----------------------------|
| 1-2 | LCD_BLT_VCC: +5V (Default) |
| 2-3 | LCD_BLT_VCC: +12V |
| 4-5 | LCD_BLT_VCC: DC_IN |

Use this header to set up the backlight power of the LVDS connector.

COM Port Pin 9 PWR Setting Headers

(3-pin PWR_COM3~4 (For COM Port3~4))

(see p. 8, No. 19)



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

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

GPIO Default Setting

(3-pin JGPIO_SET1)

(see p. 8, No. 22)



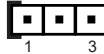
| Setting | Description |
|---------|---------------------|
| 1-2 | Pull-High (Default) |
| 2-3 | Pull-Low |

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.

Brightness Control Mode

(3-pin BLT_PWM1)

(see p. 8, No. 29)



| Setting | Description |
|---------|--|
| 1-2 | From eDP PWM to CON_LBKLT_CTL |
| 2-3 | From LVDS PWM to CON_LBKLT_CTL (Default) |

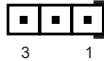
Note: Please set to 1-2 when adjusting brightness by Brightness Control bar under OS.

Please set to 2-3 when adjusting brightness by BLT_VOL1.

CON_LBKLT_EN and CON_LBKLT_CTL

(3-pin BLT_EN_PWM1)

(see p. 8, No. 30)



| Setting | Description |
|---------|--------------------|
| 1-2 | 5V Level (Default) |
| 2-3 | 3V Level |

2.6 Onboard Headers and Connectors

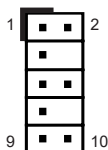


Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Front Panel Audio Header

(8-pin HD_AUDIO1)

(see p. 8, No. 1)



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

This is line out/microphone interface for front panel audio cable that allows jack detection, convenient connection and control of audio devices.

2W Audio AMP Output Wafer

(4-pin SPEAKER1)

(see p. 8, No. 2)



| Pin | Signal Name |
|-----|-------------|
| 1 | SPK L- |
| 2 | SPK L+ |
| 3 | SPK R+ |
| 4 | SPK R- |

Buzzer Header

(2-pin BUZZ1)

(see p. 8, No. 6)



| Pin | Signal Name |
|-----|-------------|
| 1 | Buzz+ |
| 2 | Buzz- |

This header provides additional external Buzzer to boot up debugging.

Backlight Control

(7-pin BLT_VOL1)

(see p. 8, No. 8)



| Pin | Signal Name |
|-----|-------------|
| 1 | GP_C22 |
| 2 | GP_C23 |
| 3 | PWRDN |
| 4 | GPIO_BLT_UP |
| 5 | GPIO_BLT_DW |
| 6 | GND |
| 7 | GND |

Backlight Power Connector

(6-pin BLT_PWR1)

(see p. 8, No. 10)



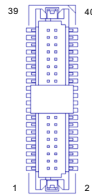
| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | GND |
| 3 | BL CTL |
| 4 | BL EN |
| 5 | LCD_BLT_VCC |
| 6 | LCD_BLT_VCC |

LVDS Panel Connector

(40-pin LVDS1)

(see p. 8, No. 11)

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



• eDP by pass mode pin definition:

| Pin | Signal Name | Signal Name | Pin |
|-----|---------------|--------------|-----|
| 1 | LCD_VCC | LCD_VCC | 2 |
| 3 | N/A | N/A | 4 |
| 5 | N/A | N/A | 6 |
| 7 | N/A | GND | 8 |
| 9 | EDP_TX1# | EDP_TX1 | 10 |
| 11 | GND | EDP_TX0# | 12 |
| 13 | EDP_TX0 | GND | 14 |
| 15 | N/A | N/A | 16 |
| 17 | GND | EDP_AUXN | 18 |
| 19 | EDP_AUXP | GND | 20 |
| 21 | N/A | N/A | 22 |
| 23 | GND | N/A | 24 |
| 25 | N/A | GND | 26 |
| 27 | N/A | N/A | 28 |
| 29 | DPLVDD_EN | N/A | 30 |
| 31 | N/A | GND | 32 |
| 33 | N/A | N/A | 34 |
| 35 | GND | CON_LBKLT_EN | 36 |
| 37 | CON_LBKLT_CTL | LCD_BLT_VCC | 38 |
| 39 | LCD_BLT_VCC | LCD_BLT_VCC | 40 |

SATA Power Output Connector

(4-pin SATA_PWR1)

(see p. 8, No. 12)



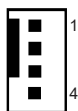
| Pin | Signal Name |
|-----|-------------|
| 1 | +5V |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

Please connect a SATA power cable to this connector.

CPU Fan Connector (+12V)

(4-pin CPU_FAN1)

(see p. 8, No. 13)



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

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



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.

SATA3 Connector

(7-pin SATA3_1)

(see p. 8, No. 17)



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

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

DC-In PWR Connector (Input +9V~+36V)

(4-pin DC-IN1)

(see p. 8, No. 18)



| Pin | Signal Name |
|-----|-------------|
| 1 | GND |
| 2 | DC Input |
| 3 | DC Input |
| 4 | GND |

Please connect a DC +9V~+36V power supply to this connector.

Battery Connector

(BAT1)

(see p. 8, No. 20)



| Pin | Signal Name |
|-----|-------------|
| 1 | +BAT |
| 2 | GND |

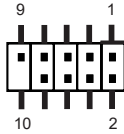
Internal COM Port Headers (RS232/422/485)

COM3 (RS232/422/485)*

COM1, 2, 4 (RS232)

(9-pin COM1~4)

(see p. 8, No. 21)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | DDCD#1 | RRXD1 | 2 |
| 3 | TTXD1 | DDTR#1 | 4 |
| 5 | GND | DDSR#1 | 6 |
| 7 | RRTS#1 | CCTS#1 | 8 |
| 9 | RRI#1 | | 10 |

There are four 2.54mm-pitch COM port headers (COM1~COM4), with COM3 port supporting RS232/422/485, and with COM1, 2, 4 ports supporting RS232. The maximum current for per port is 1A, and the power supply of pin 9 is either 5V or 12V. Use COM Port PWR Setting Jumper to set the power for COM port pin 9.



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

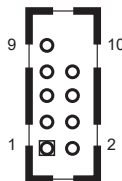
COM3 Port Pin Definition

| Pin | RS232 | RS422 | RS485 |
|-----|------------------------------|------------------------------|------------------------------|
| 1 | DCD | TX- | RTX- |
| 2 | RXD | TX+ | RTX+ |
| 3 | TXD | RX+ | N/A |
| 4 | DTR | RX- | N/A |
| 5 | GND | GND | GND |
| 6 | DSR | N/A | N/A |
| 7 | RTS | N/A | N/A |
| 8 | CTS | N/A | N/A |
| 9 | COM1, 2: RRI COM3, 4: PWR | COM1, 2: RRI COM3, 4: PWR | COM1, 2: RRI COM3, 4: PWR |

CAN1_2 Connector

(10-pin CAN1_2)

(see p. 8, No. 23)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | +3VSB | +3VSB | 2 |
| 3 | CAN1_TX0 | CAN2_TX0 | 4 |
| 5 | CAN1_RX0 | CAN2_RX0 | 6 |
| 7 | GND | GND | 8 |
| 9 | GPIO | NC | 10 |

Note: Only supported with SBC-250N/SBC-250D.

ESPI Connector

(20-pin ESPI1)
(see p. 8, No. 24)

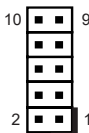


| Pin | Signal Name |
|-----|---------------|
| 1 | GND |
| 2 | C_ESPI_CLK |
| 3 | GND |
| 4 | C_ESPI_CS# |
| 5 | DEBUG_RESET |
| 6 | GND |
| 7 | +3V |
| 8 | GND |
| 9 | SMB_CLK_MAIN |
| 10 | SMB_DATA_MAIN |
| 11 | C_ESPI_IO0 |
| 12 | C_ESPI_IO1 |
| 13 | C_ESPI_IO2 |
| 14 | C_ESPI_IO3 |
| 15 | GND |
| 16 | +3VSB |
| 17 | N/A |
| 18 | N/A |
| 19 | C_ESPI_ALERT# |
| 20 | GND |

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

Digital Input/Output Pin Header

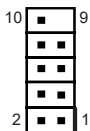
(10-pin JGPIO1)
(see p. 8, No. 25)



| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | SIO_GP34 | PMC_TGPIO0 | 2 |
| 3 | SIO_GP35 | GP_D01 | 4 |
| 5 | SIO_GP36 | GP_D02 | 6 |
| 7 | SIO_GP37 | GP_D03 | 8 |
| 9 | JGPIO_PWR | GND | 10 |

USB 2.0 Connectors

(9-pin USB2_5_6, USB2_7_8)
(see p. 8, No. 26)

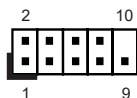


| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|-------------|-----|
| 1 | USB_PWR | USB_PWR | 2 |
| 3 | -A | -B | 4 |
| 5 | +A | +B | 6 |
| 7 | GND | GND | 8 |
| 9 | | DUMMY | 10 |

There is two USB 2.0 connector on this motherboard.

System Panel Header

(9-pin PANEL1)
(see p. 8, No. 27)



| 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 S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):

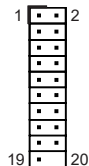
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

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

USB 3.2 Gen1 Connector

(19-pin USB3_1_2)

(see p. 8, No. 28)



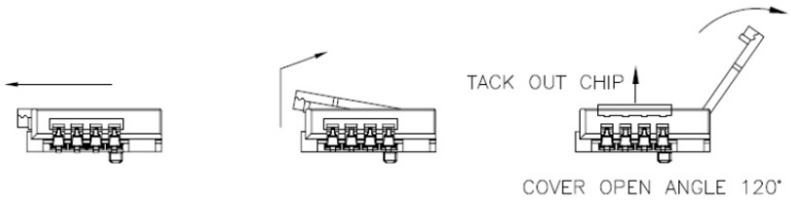
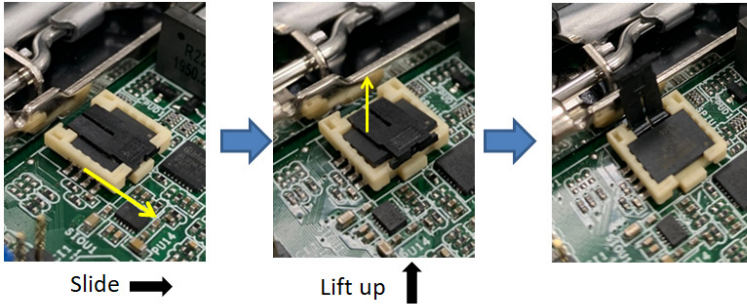
| Pin | Signal Name | Signal Name | Pin |
|-----|-------------|---------------|-----|
| 1 | DUMMY | IntA_PA_D+ | 2 |
| 3 | IntA_PB_D+ | IntA_PA_D- | 4 |
| 5 | IntA_PB_D- | GND | 6 |
| 7 | GND | IntA_PA_SSTX+ | 8 |
| 9 | DUMMY | IntA_PA_SSTX- | 10 |
| 11 | DUMMY | GND | 12 |
| 13 | GND | IntA_PA_SSRX+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

Note: USB3_1 port supports USB 2.0 & USB 3.2 Gen1.

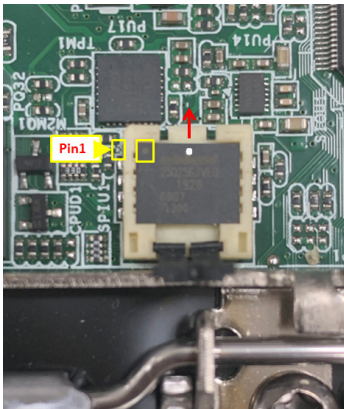
USB3_2 port supports USB 2.0 only.

There is one USB 3.2 Gen1 connector on this motherboard. This connector supports one USB 3.2 Gen1 port and one USB 2.0 port with maximum power current 0.9A per port.

2.7 Installation of ROM Socket



- Do not apply force to the actuator cover after ic inserted.
- Do not apply force to actuator cover when it is opening over 120 degree, Otherwise, the actuator cover may be broken.



- The yellow dot (Pin1) on the ROM must be installed at pin1 position of the socket (white arrow area).
 - Make sure the white dot on the ROM is installed outwards of the socket.
 - For further details of how to install ROM, please refer to ASRI website.
- Warning:** If the installation does not follow as the picture, then it may cause severe damage to chipset & MB.

Chapter 3: UEFI SETUP UTILITY

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, 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.



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.

3.1.1 UEFI Menu Bar

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

| | |
|--------------------|---|
| Main | To set up the system time/date information |
| Advanced | To set up the advanced UEFI features |
| H/W Monitor | To display current hardware status |
| Security | To set up the security features |
| Boot | To set up the default system device to locate and load the Operating System |
| Exit | To exit the current screen or the UEFI SETUP UTILITY |

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

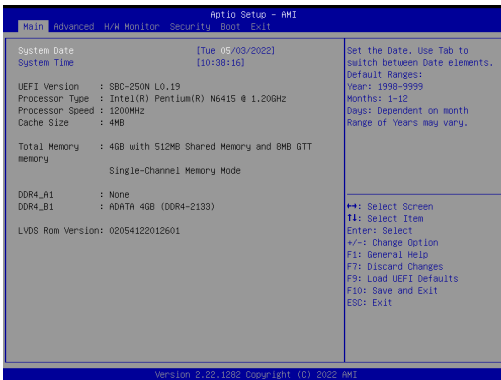
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

| Navigation Key(s) | Function Description |
|-------------------|---|
| ← / → | Moves cursor left or right to select Screens |
| ↑ / ↓ | Moves cursor up or down to select items |
| + / - | To change option for the selected items |
| <Enter> | To bring up the selected screen |
| <F1> | To display the General Help Screen |
| <F7> | Discard changes |
| <F9> | To load optimal default values for all the settings |
| <F10> | To save changes and exit the UEFI SETUP UTILITY |
| <F12> | Print screen |
| <ESC> | To jump to the Exit Screen or exit the current screen |

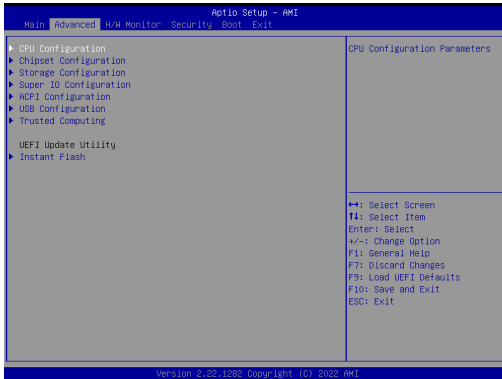
3.2 Main Screen

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



3.3 Advanced Screen

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

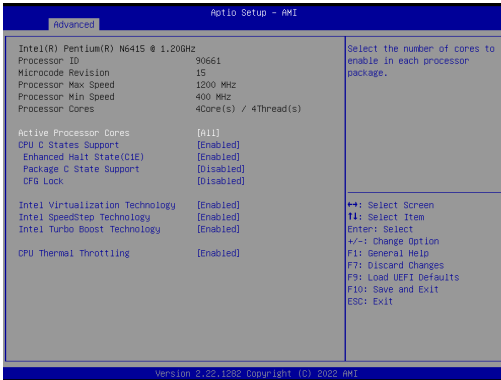


Setting wrong values in this section may cause the system to malfunction.

Instant Flash

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

3.3.1 CPU Configuration



Active Processor Cores

Select the number of cores to enable in each processor package.

CPU C States Support

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

Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

CFG Lock

This item allows you to disable or enable the CFG Lock.

Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS 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.

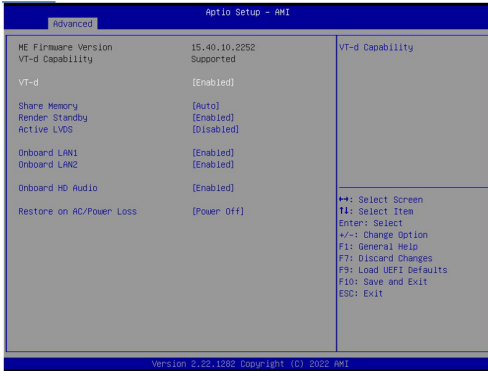
Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

3.3.2 Chipset Configuration



VT-d

Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Render Standby

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

Active LVDS

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

Change the setting from [Enable] to [Disable], and then press <F10> to save the setting and restart the system. Likewise, the default value of Active LVDS is changed to DISABLE (F9 load default is also set to DISABLE)

Panel Type Selection

Use this to select panel type. This item appears when you enable Active LVDS.



The default values of Active LVDS and Panel Type Selection will be changed only when the users manually adjust them. They will keep at the default values no matter you clear CMOS, use Instant Flash or press <F9>.

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

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

3.3.3 Storage Configuration



SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

SATA Mode Selection

Use this to select SATA mode. The default value is [AHCI Mode].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

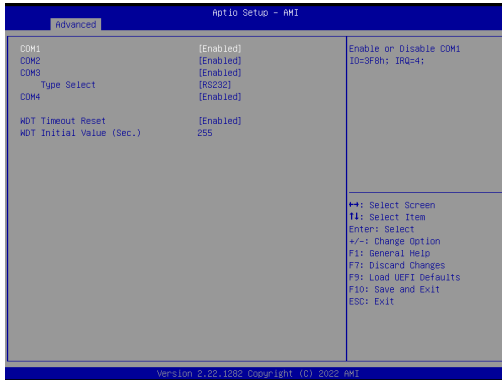
SATA Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

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

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

3.3.4 Super IO Configuration



COM1 Configuration

Use this to set parameters of COM1.

COM2 Configuration

Use this to set parameters of COM2.

COM3 Configuration

Use this to set parameters of COM3.

Type Select

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

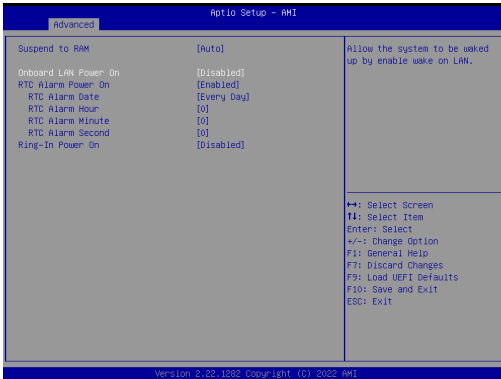
COM4 Configuration

Use this to set parameters of COM4.

WDT Timeout Reset

Use this to set the Watch Dog Timer.

3.3.5 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

Onboard LAN Power On

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

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

Ring In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode

3.3.6 USB Configuration



USB Power Control

Use this option to control USB power.

M.2 Key_B USB Configuration

Enable or disable M.2 Key_B USB Configuration.

3.3.7 Trusted Computing

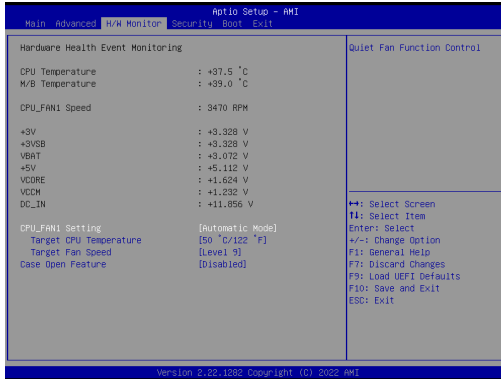


Security Device Support

Enable or disable BIOS support for security device.

3.4 Hardware Health Event Monitoring Screen

In this section, it 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.



CPU_FAN1 Setting

This allows you to set CPU fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

Case Open Feature

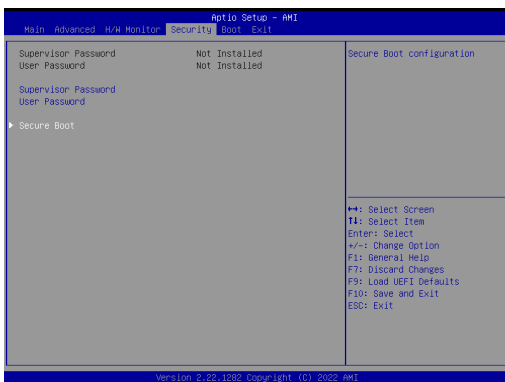
This allows you to enable or disable case open detection feature. The default is value [Disabled].

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, change or clear the supervisor/user password for the system.



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

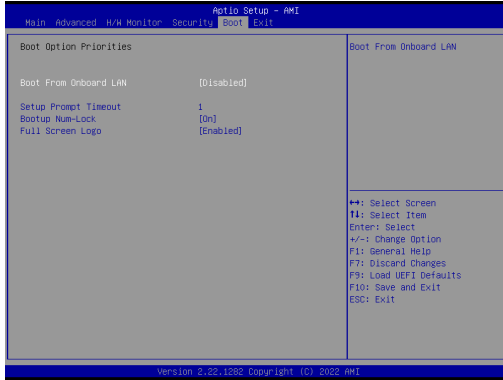
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Enable to support Windows 8.1 / 8 Secure Boot.

3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0XFFFF) means indefinite waiting.

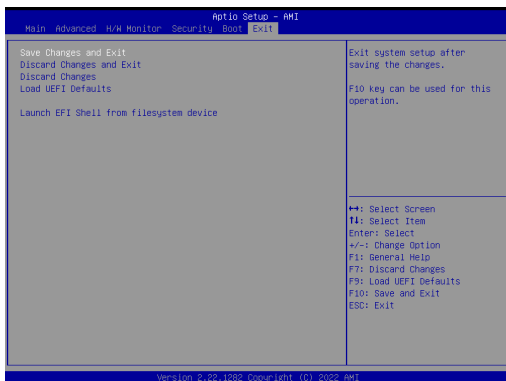
Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

3.7 Exit Screen



Save Changes and Exit

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

Discard Changes and Exit

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

Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.