USER'S MANUAL

RCO-1000-EHL Series
Compact Fanless Embedded System

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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2022/11/22

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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.
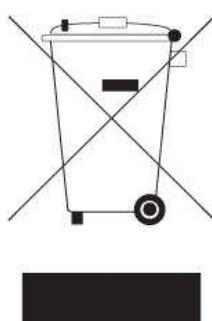
Safety Precautions

Before installing and using the equipment, please read the following precautions:

● Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.

● The power outlet shall be installed near the equipment and shall be easily accessible.

● Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge

● of power could ruin sensitive components. Make sure the equipment is properly grounded.

● When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.

● Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

● Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

● Avoid the dusty, humidity and temperature extremes.

● Do not place heavy objects on the equipment.

● If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.

● The storage temperature shall be above -40°C and below 85°C.

● The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

● If one of the following situation arises, get the equipment checked be service personnel:

  • The power cord or plug is damaged.

  • Liquid has penetrated into the equipment.

  • The equipment has been exposed to moisture.

  • The equipment does not work well or it cannot work according the user's manual.

  • The equipment has been dropped and damaged.

  • The equipment has obvious signs of breakage.

Technical Support and Assistance

1. Visit the C&T Solution Inc website at https://www.candtsolution.com where you can find the latest information about the product.

2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:

    - Model name and serial number

    - Description of your peripheral attachments

    - Description of your software (operating system, version, application software, etc.)

    - A complete description of the problem

    - The exact wording of any error messages

Conventions Used in this Manual

	WARNING	This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.
	CAUTION	This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.
	NOTE	This indication provides additional information to complete a task easily.

Package Contents

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	RCO-1000-EHL Series Embedded System	1
2	Wall Mount KIT	1
3	Accessory Kit	1

Ordering Information

- **RCO-1000-EHL-10 Series**

Model No.	Product Description
RCO-1000-EHL-X6425E-10	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 2x COM, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-10A	Compact fanless embedded system with Intel x6425E CPU, 3x DP, 2x COM, DIO, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-10B	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 4x COM, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-10U	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 2x COM, 4x USB, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-10H	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 1x HDMI, 2x COM, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-10G	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 2x COM, 1x 2.5" SATA HDD Bay, Power Ignition

- **RCO-1000-EHL-20 Series**

Model No.	Product Description
RCO-1000-EHL-X6425E-20C	Compact fanless embedded system with Intel x6425E CPU, 3x DP, 2x COM, DIO, 1x 2.5" SATA HDD Bay
RCO-1000-EHL-X6425E-20D	Compact fanless embedded system with Intel x6425E CPU, 2x DP, 4x COM, 1x 2.5" SATA HDD Bay

- **RCO-1000-EHL-30 Series**

Model No.	Product Description
RCO-1000-EHL-X6425E-30C	Compact fanless embedded system with Intel x6425E CPU, 3x DP, 2x COM, DIO, 1x 2.5" SATA HDD Bay

Optional Accessories

Model No.	Product Description
1-E09A06008	Adapter AC/DC 12V 5A 60W with 3pin Terminal Block Plug 5.0mm Pitch
1-TPCD00005	Power Cord, 3-pin US Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm
3-SIDE-0002	RCO-1000-EHL-10 Series Side Mount Kit
3-SIDE-0003	RCO-1000-EHL-20 Series Side Mount Kit
3-SIDE-0004	RCO-1000-EHL-30 Series Side Mount Kit
3-VESA-0003	RCO-1000 Series VESA Mount Kit
3-DINR-0004	DIN-Rail-2 Mount Kit

Chapter 1

Product Introductions

1.1 Overview

Based on Intel® Atom™ x6425E Quad Core processor, RCO-1000-EHL series is a high variety and diversity fanless embedded system. It offers modularize expansion I/O, rich connectivity interfaces, wide range (9~36V) DC power input, and high reliability even operating in temperature extremes (-40℃ up to 70℃).

Featuring with completely cable-less designed, high functional, one-piece housing design, and anti-vibration, RCO-1000-EHL series are ruggedized systems that can operate in harsh environments and easy to install and maintain. A build in over voltage protection (OVP), over current protection (OCP), reserve voltage protection, and wide range DC power input makes RCO-1000-EHL series are safety system for all industrial applications.

- **RCO-1000-EHL-10**
- **RCO-1000-EHL-10A**
- **RCO-1000-EHL-10B**
- **RCO-1000-EHL-10U**
- **RCO-1000-EHL-10H**
- **RCO-1000-EHL-10G**

- **RCO-1000-EHL-20**
- **RCO-1000-EHL-20C**
- **RCO-1000-EHL-20D**

- **RCO-1000-EHL-30C**

Model No.	Rear Panel	Front Panel
RCO-1000-EHL-10		
RCO-1000-EHL-10A Expanslon Modules: 1x DP Port and 1x DIO (4in/4out, Isolated)		
RCO-1000-EHL-10B Expanslon Modules: 2x COM Ports		
RCO-1000-EHL-10U Expanslon Modules: 4x USB Ports		
RCO-1000-EHL-10H Expanslon Modules: 1x HDMI Port		
RCO-1000-EHL-10G (Power Ignition)		

Model No.	Rear Panel	Front Panel
RCO-1000-EHL-20		
RCO-1000-EHL-20C Expanslon Modules: 2x COM Ports, 1x DP Port and 1x DIO (4in/4out, Isolated)		
RCO-1000-EHL-20D Expanslon Modules: 4x COM Ports		

Model No.	Rear Panel	Front Panel
RCO-1000-EHL-30C Expanslon Modules: 4x COM Ports, 1x DP Port and 1x DIO (4in/4out, Isolated)		

1.1.1 Key Features

- Support Intel Atom™ Processor
- 1x 260-pin DDR4 SODIMM. Max. up to 32GB
- Dual Independent Display by 2x Display Port
- 2x Intel® GbE supporting Wake-on-LAN and PXE
- 1x 2.5" SATA HDD Bay, 1x mSATA,
- 1x M.2 (B Key, 2242/3042/3052, Support 4G/5G)
- 1x Full-size mini PCIe for communication or expansion modules
- 2x RS-232/422/485, 3x USB 3.2 Gen2, 1x USB 2.0
- 9 to 36VDC Wide Range Power Input Supporting AT/ATX Mode
- Wide Operating Temperature -40°C up to 70°C
- TPM 2.0 Supported
- Up to 5x Universal Expansion Slots
- UL Listed

1.2 Hardware Specification

System	
Processor **Supports 11th Gen Intel® Atom® Processors X Series (Elkhart Lake)** • **Intel® Embedded Series:** Intel® Atom® Processor x6425E, Quad Core, 1.5 MB Cache, 2.0 GHz, 12W TDP	
System Chipset	SoC integrated
LAN Chipset	• 1 GbE1: Intel I210 (Support Wake-on-LAN and PXE) • 2.5 GbE2: Intel I225 (Support Wake-on-LAN and PXE)
Audio Codec	Realtek ALC888S
System Memory	1x 260-Pin DDR4 2400/2667/3200MT/s SODIMM. Max. up to 32GB
Graphics	Intel® UHD Graphics
BIOS	AMI 256Mbit SPI BIOS
Watchdog	Software Programmable Supports 1~255 sec. System Reset
TPM	TPM 2.0

Display	
DisplayPort	2x DisplayPort 1.4, DP++ (4096 x 2160@60Hz)
Multiple Display	Dual Display

Storage	
SSD/HDD	1x Internal 2.5" SATA HDD Bay (support H=9.5 mm)
mSATA	1x mSATA (shared by 1x Mini PCI Express)
M.2	1x M.2 (B Key, 2242/3042/3052, PCIex 1 + USB 3.2 Gen2, Support 4G/5G Module)
SIM Socket	2x External SIM socket

Operating System	
Windows	Windows 10
Linux	Linux kernel

Expansion	
Mini PCI Express	1x Full-size Mini PCIe
Expansion Modules	Optional: • 2-port COM module with Super I/O Chipset • 4-Port USB module with USB hub • 1-Port DP 1.4 and DIO (4 in / 4 out, Isolated) • 1-Port HDMI 2.0

I/O	
COM	2x RS-232/422/485
USB	3x USB 3.2 Gen 2 (10 Gbps), 1x USB 2.0
LAN	2x RJ45 (2.5 & 1 GbE)
Audio	1x Mic-in, 1x Line-out
CAN	2x CAN 2.0 A/B 2-pin Internal header
Universal I/O Bracket	RCO-1000-EHL-10： 1x Universal I/O Bracket (By mini PCIe interface, C&T Proprietary Module) RCO-1000-EHL-20： 3x Universal I/O Bracket (By mini PCIe interface, C&T Proprietary Module) RCO-1000-EHL-30： 5x Universal I/O Bracket (By mini PCIe interface, C&T Proprietary Module)
Others	5x WiFi Antenna Holes 1x Power Switch, 1x AT/ATX Switch, 1x Remote Power On/Off 1x Internal CMOS Battery Cable 1x 4-PIN FAN Connector

Power

Power Mode	AT, ATX
Power Supply Voltage	9~36VDC
Power Ignition Sensing	Adjustable power ignition management can be achieved through BIOS and optional daughter board.
Power Connector	3-pin Terminal Block
Power Adaptor	Optional AC/DC 12V/5A, 60W
Power Protection	OVP (Over Voltage Protection) OCP (Over Current Protection) Reverse Protection

Environment

Operating Temp.	-40°C to 70°C
Storage Temp.	-40°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Vibration	• With SSD: 5 Grms, 5 - 500 Hz, 0.5 hr/axis • With HDD: 1 Grms, 5 - 500 Hz, 0.5 hr/axis
Shock	With SSD: 50G, half sine, 11ms
Standards / Certification	UL, CE, FCC Class A

Physical

Construction	Extruded Aluminum with Heavy Duty Metal
Dimension	• RCO-1000-EHL-10： 150 (W) x 105 (D) x 49 (H) mm • RCO-1000-EHL-20： 150 (W) x 105 (D) x 66 (H) mm • RCO-1000-EHL-30： 150 (W) x 105 (D) x 83 (H) mm
Weight	• RCO-1000-EHL-10：0.9 kg RCO-1000-EHL-20：1.0 kg • RCO-1000-EHL-30：1.2 kg
Mounting	• Wall Mounting • SIDE/VESA/DIN-Rail Mounting (Optional)

1.3 System I/O
1.3.1 RCO-1000-EHL-10

Front Panel

- **ATX power on/off switch**
  Press to power-on or power-off the system

- **AT/ATX mode select switch**
  Used to select AT or ATX power mode

- **Power LED**
  Indicates the power status of the system

- **HDD LED**
  Indicates the status of the hard drive

- **Wachdog LED**
  Indicates the watchdog status of the system

- **USB 3.2 Gen 2**
  Used to connect USB 3.2 device

- **USB 2.0 port**
  Used to connect USB 2.0 device

- **SIM card**
  Used to insert a SIM card

- **LAN port**
  Used to connect the system to a local area network

- **Line-out**
  Used to connect a speaker

- **Mic-in**
  Used to connect a microphone

- **Remote power on/off**
  Used to plug a power on/off with terminal block

- **Reset Hole**
  Used to reset the system

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

Front Panel

1.3.1 RCO-1000-EHL-10

Rear Panel

- **DC IN**
  Used to plug a DC power input with terminal block

- **DisplayPort**
  Used to connect a DisplayPort monitor

- **COM port**
  COM1 ~ COM2 support RS232/422/485 serial device

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

- **Expandable I/O bracket**
  Used to customized I/O output
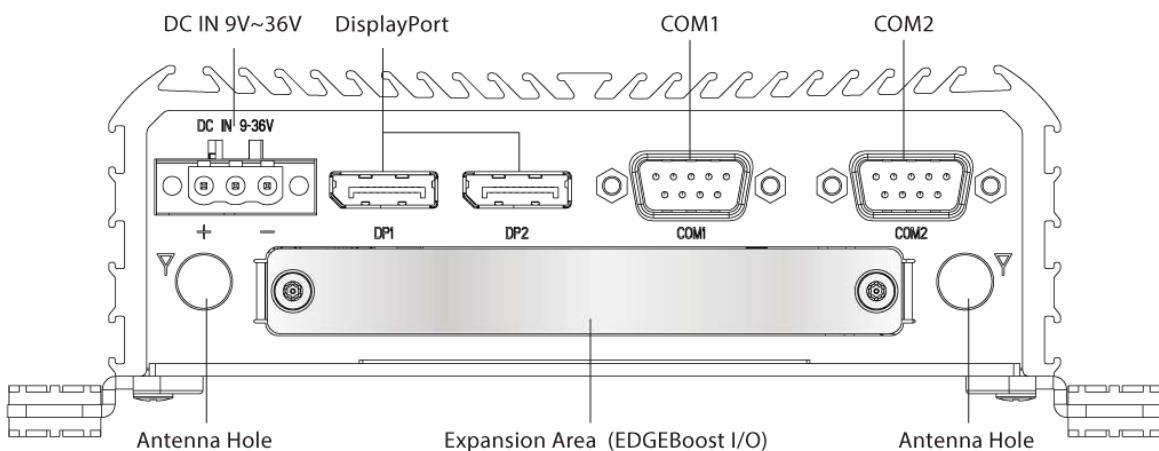
Rear Panel

Available Expansion Module Options for Rear Panel
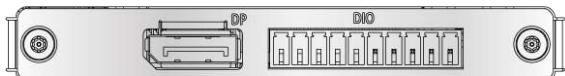
- 1x DP Port and 1x DIO (4 in / 4 out, Isolated)
- 1x HDMI Port
- 4x USB Ports
- 2x COM Ports

1.3.2 RCO-1000-EHL-20

Front Panel

- **ATX power on/off switch**
  Press to power-on or power-off the system

- **AT/ATX mode select switch**
  Used to select AT or ATX power mode

- **Power LED**
  Indicates the power status of the system

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- **Wachdog LED**
  Indicates the watchdog status of the system

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  Used to connect USB 3.2 device

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  Used to connect USB 2.0 device

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  Used to connect a speaker

- **Mic-in**
  Used to connect a microphone

- **Remote power on/off**
  Used to plug a power on/off with terminal block

- **Reset Hole**
  Used to reset the system

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

Front Panel

1.3.2 RCO-1000-EHL-20

Rear Panel

- **DC IN**
  Used to plug a DC power input with terminal block

- **DisplayPort**
  Used to connect a DisplayPort monitor

- **COM port**
  COM1 ~ COM2 support RS232/422/485 serial device

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

- **Expandable I/O bracket**
  Used to customized I/O output
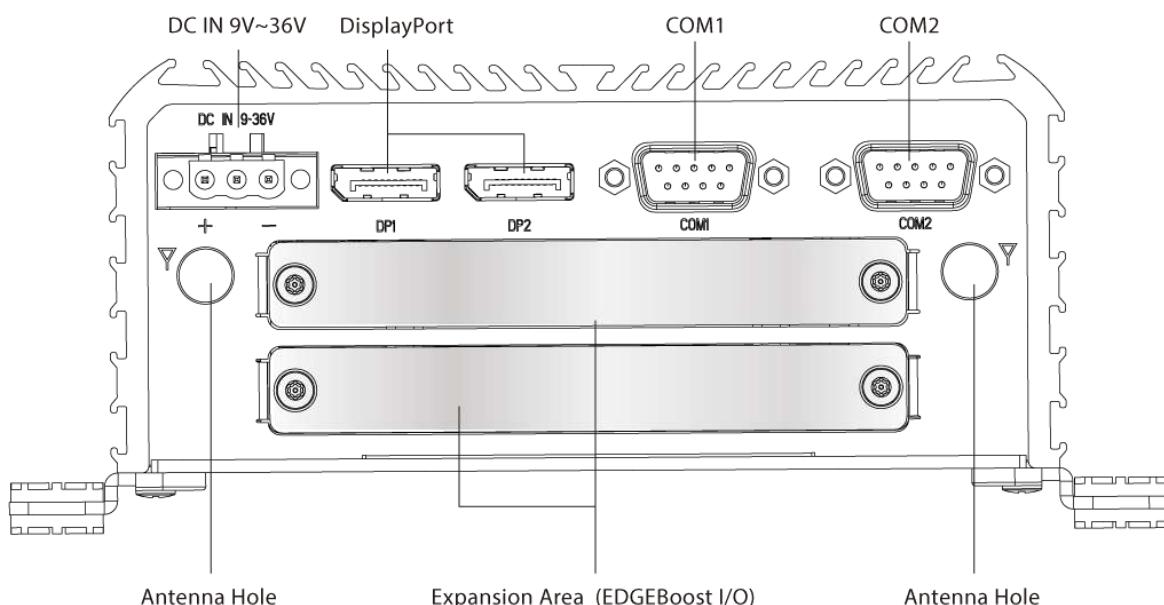
Rear Panel

Available Expansion Module Options for Rear Panel
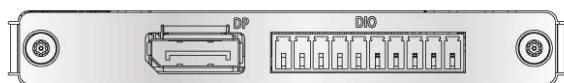
- 1x DP Port and 1x DIO (4 in / 4 out, Isolated)
  (Support 1x Universal Slot Only)

- 1x HDMI Port
  (Support 1x Universal Slot Only)

- 4x USB Ports
  (Support 1x Universal Slot Only)

- 2x COM Ports
  (Support 2x Universal Slot Only)

1.3.3 RCO-1000-EHL-30

Front Panel

- **ATX power on/off switch**
  Press to power-on or power-off the system

- **AT/ATX mode select switch**
  Used to select AT or ATX power mode

- **Power LED**
  Indicates the power status of the system

- **HDD LED**
  Indicates the status of the hard drive

- **Wachdog LED**
  Indicates the watchdog status of the system

- **USB 3.2 Gen 2**
  Used to connect USB 3.2 device

- **USB 2.0 port**
  Used to connect USB 2.0 device

- **SIM card**
  Used to insert a SIM card

- **LAN port**
  Used to connect the system to a local area network

- **Line-out**
  Used to connect a speaker

- **Mic-in**
  Used to connect a microphone

- **Remote power on/off**
  Used to plug a power on/off with terminal block

- **Reset Hole**
  Used to reset the system

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

Front Panel

1.3.3 RCO-1000-EHL-30

Rear Panel

- **DC IN**
  Used to plug a DC power input with terminal block

- **DisplayPort**
  Used to connect a DisplayPort monitor

- **COM port**
  COM1 ~ COM2 support RS232/422/485 serial device

- **Antenna hole**
  Used to connect an antenna for optional Mini-PCIe WiFi module

- **Expandable I/O bracket**
  Used to customized I/O output
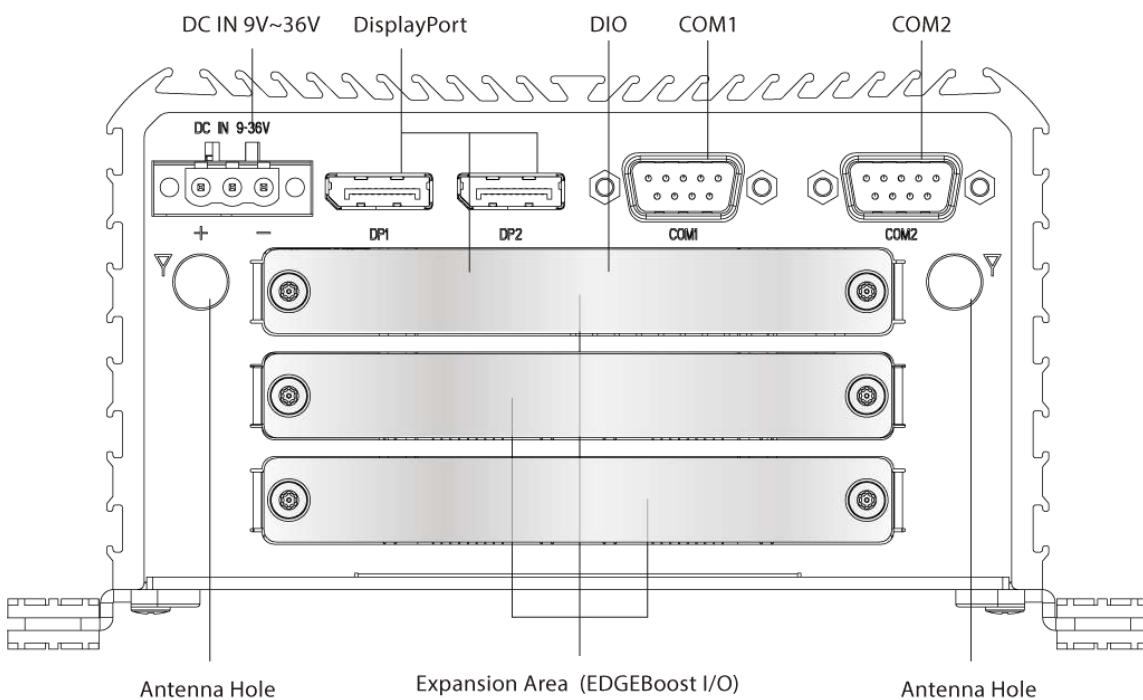
Rear Panel

Available Expansion Module Options for Rear Panel

- 1x DP Port and 1x DIO (4 in / 4 out, Isolated)
  (Support 1x Universal Slot Only)

- 4x USB Ports
  (Support 1x Universal Slot Only)

- 1x HDMI Port
  (Support 1x Universal Slot Only)
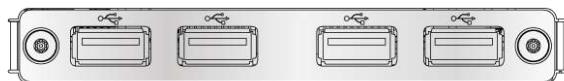
- 2x COM Ports
  (Support 2x Universal Slot Only)

1.4 Mechanical Dimensions

1.4.1 RCO-1000-EHL-10

Unit: mm
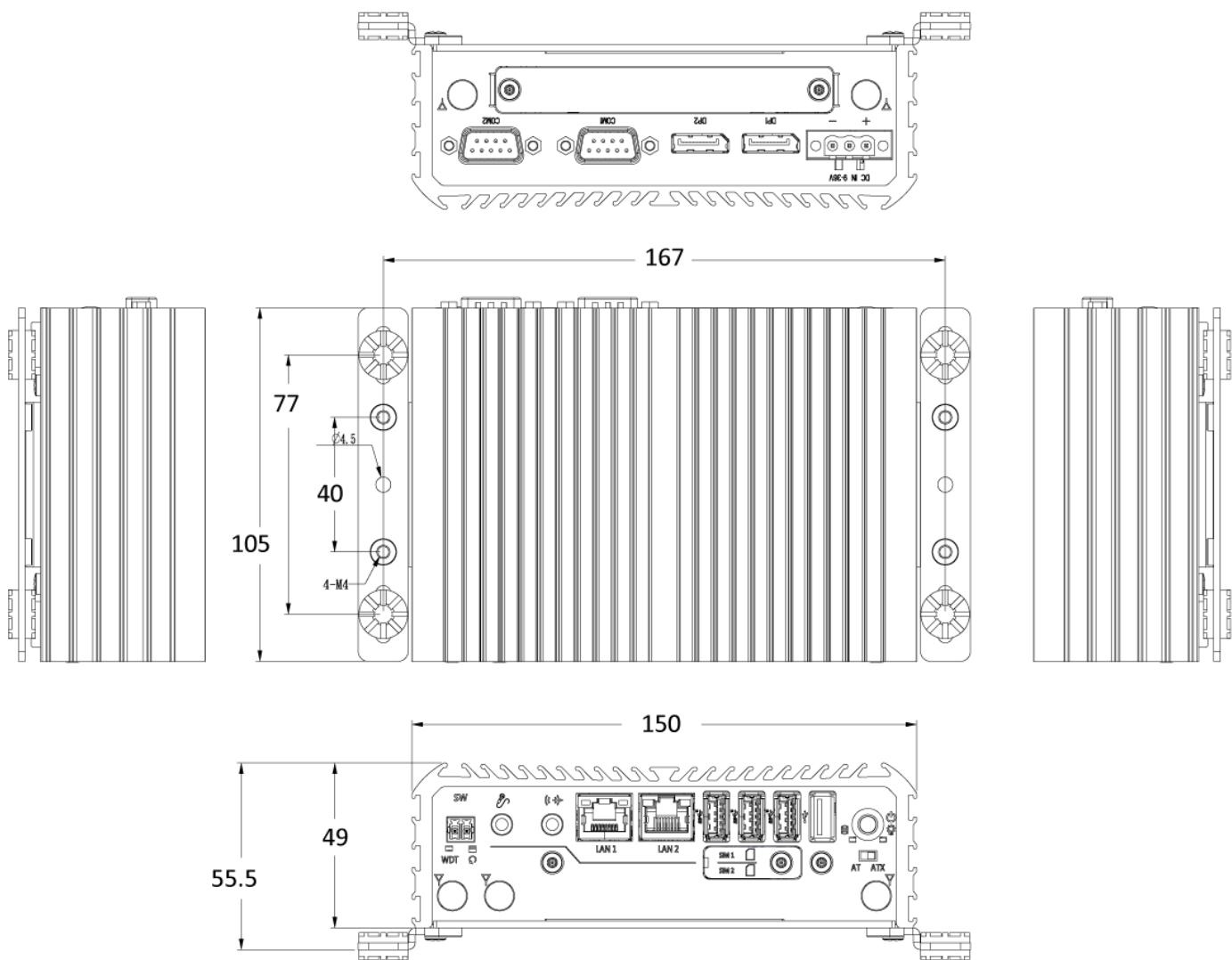
1.4.2 RCO-1000-EHL-20

Unit: mm
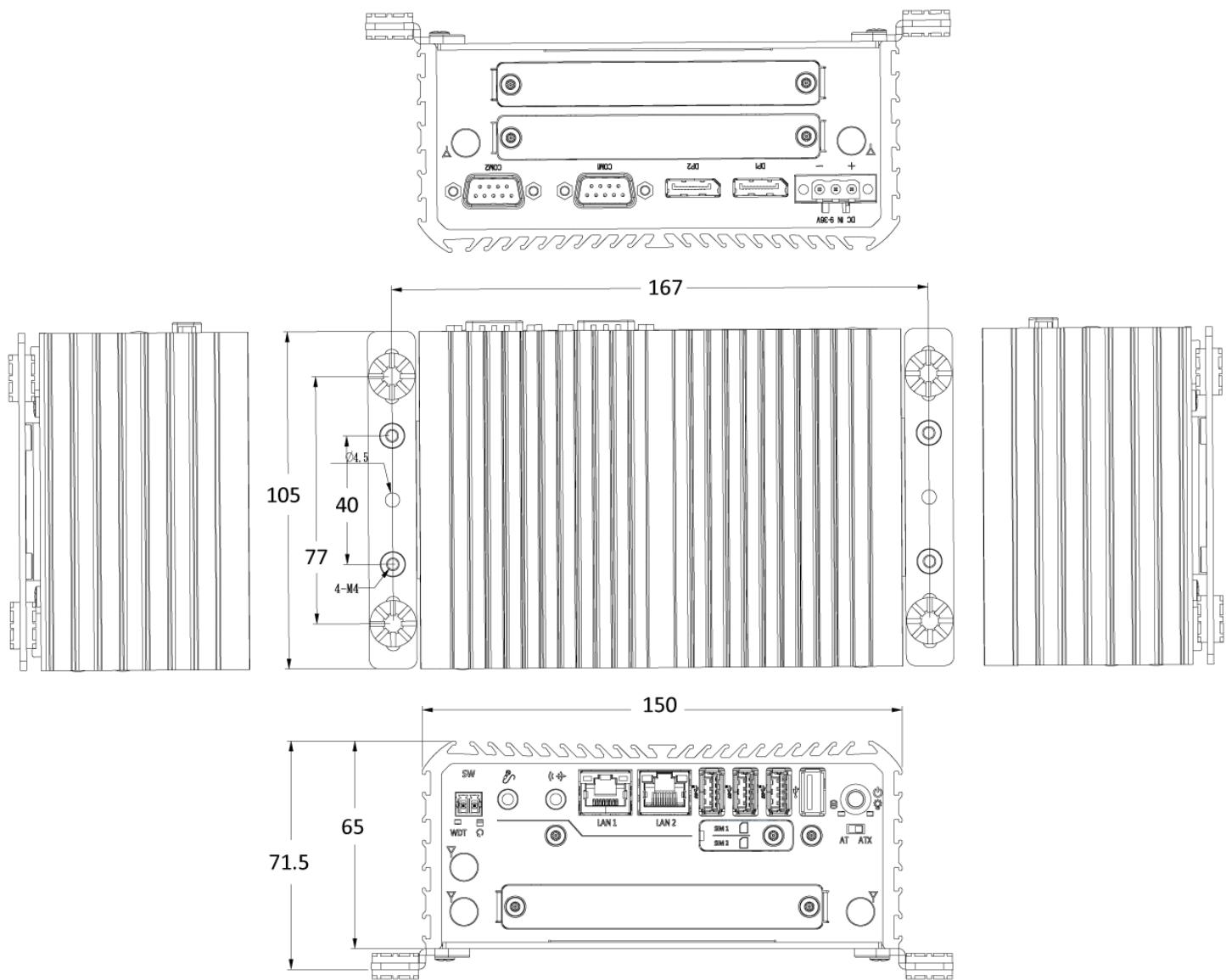
1.4.3 RCO-1000-EHL-30

Unit: mm
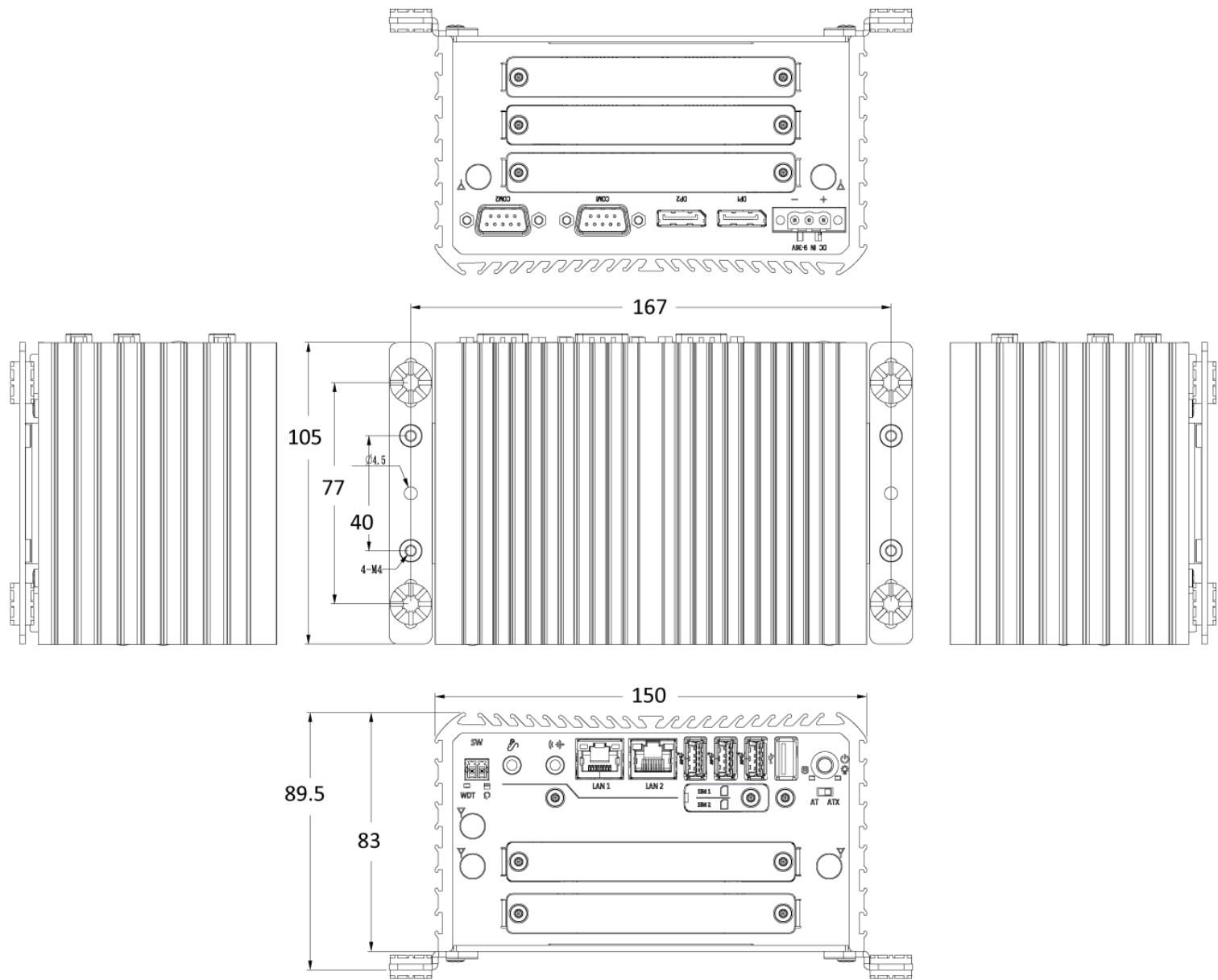
Chapter 2

Switches and Connectors

2.1 Switch and Connector Locations

2.1.1 Top View

PWR_SW2

MIC_IN1

LINE_OUT1

LAN1

LAN2

USB3_1

USB3_2

USB3_3

USB2_1

HDD_LED1

PWR_SW1

PWR_LED1

JP1

SODIMM1

COM2

COM1

DP2

DP1

DC_IN1

2.1.2 Bottom View

SATA1

AT_ATX1

BTB_FH1

MPCIE1

M.2_KB1

RESET1

RST_LED1

CAN1　　FAN

CAN2
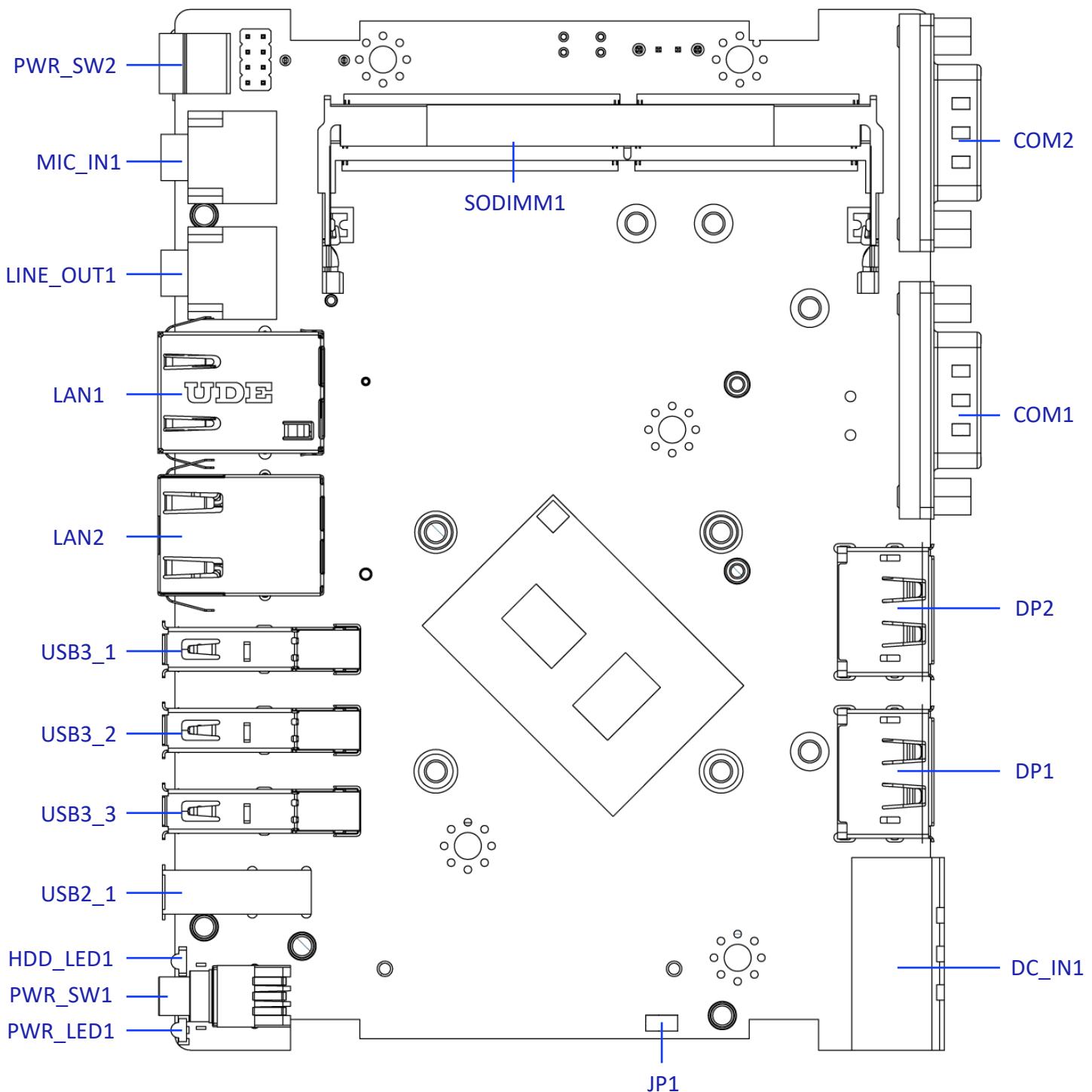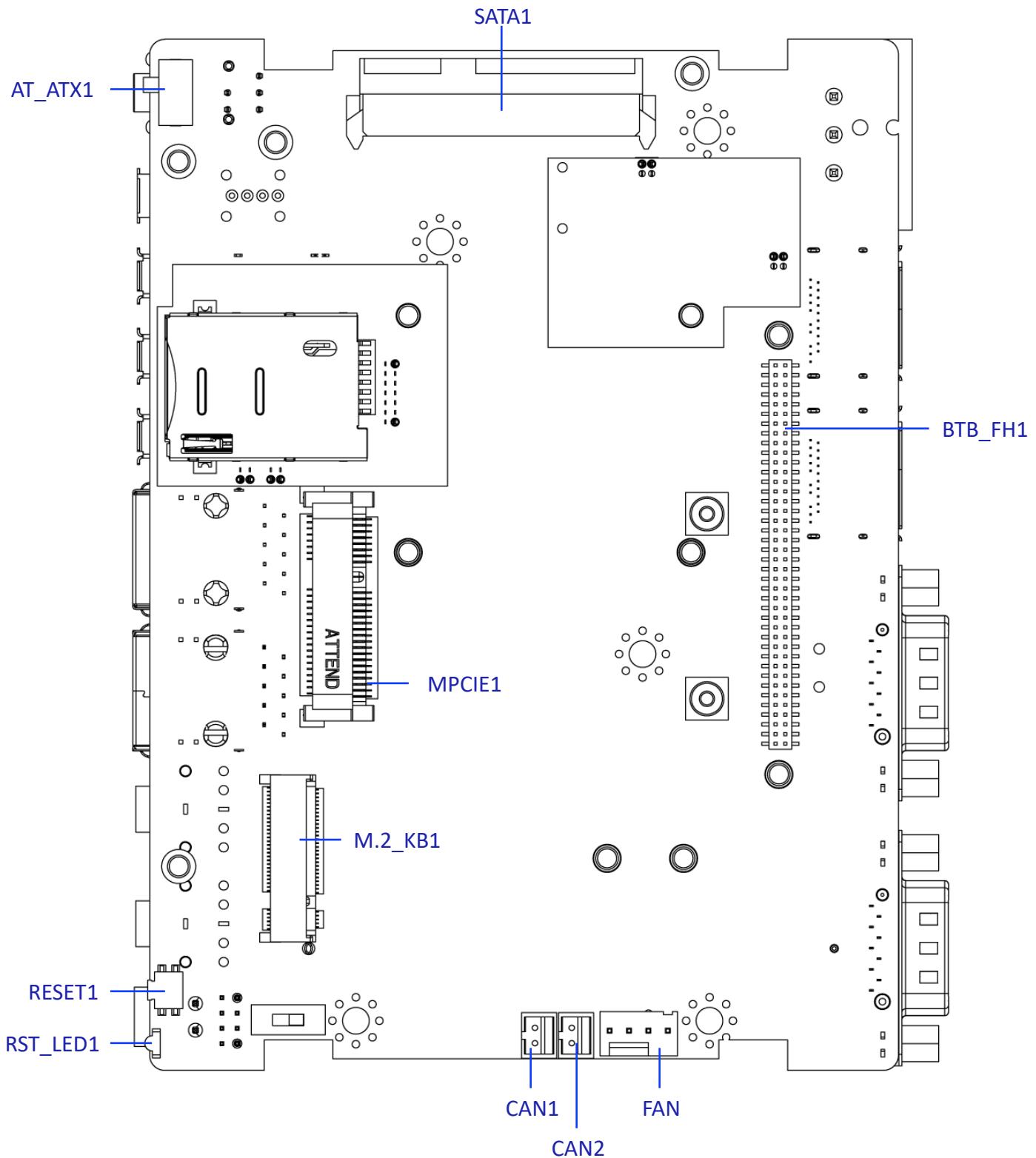
2.1.3 Daughter board view

SW1
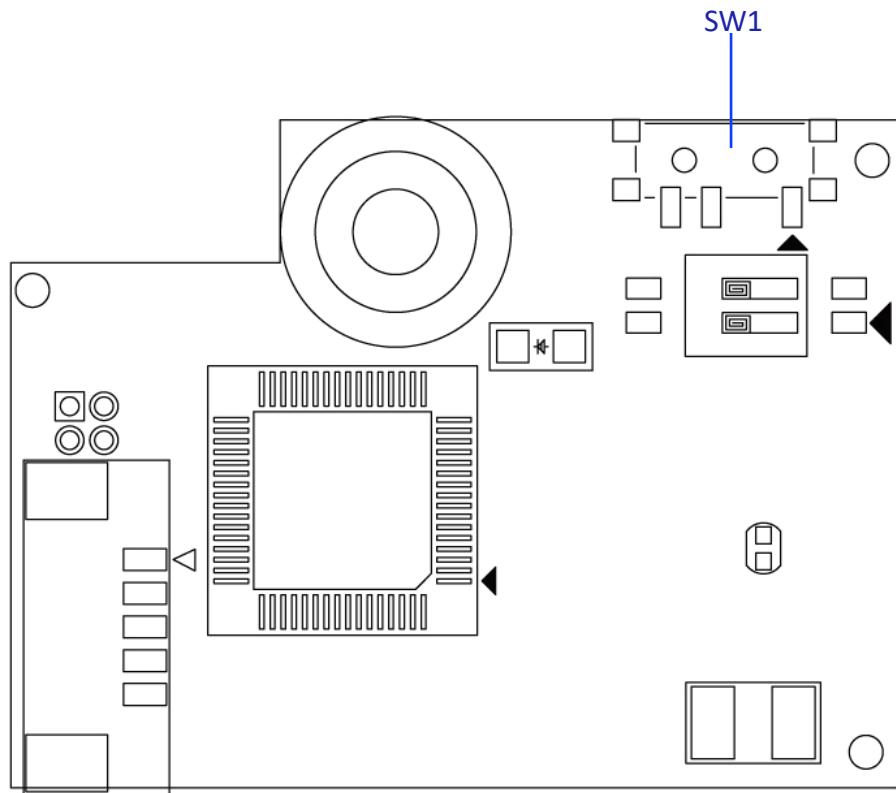
2.2 Connector / Switch Definition

List of Connector / Switch

Connector Location	Definition
DC_IN1	3-pin DC +9~36V Power Input Connector
PWR_SW1	Power Switch
PWR_SW2	Remote Power Switch
DP1 - 2	Display Port
COM1 - 2	RS232 / RS422 / RS485 Connector
USB2_1	USB2.0 Port
USB3_1 - 3	USB 3.2 Gen 2 Port
LAN1	1G bit/s LAN Port
LAN2	2.5G bit/s LAN Port
MIC_IN1	Mic-in Jack
LINE_OUT1	LINE-OUT Jack
PWR_LED1	Power LED Status
HDD_LED1	HDD Access LED Status
AT_ATX1	AT / ATX Power Mode Switch
SATA1	SATA with Power Connector
FAN	Smart FAN Connector
CAN1 - 2	CAN Bus Connector
MPCIE1	Mini PCI-Express Socket
M.2_KB1	M.2 B-Key Socket
RESET1	Reset Switch
RST_LED1	Reset LED Status
SIM1, SIM2	SIM Card Socket
DIO1	4DI/DO Connector
CN1 - 2	RS232 / RS422 / RS485 Connector
SW1	PC mode / CAR mode select

2.3 Switches Definitions

2.3.1 DC Power Input Connector (+9~36V)

DC_IN1
Connector Type: Terminal Block 1X3 3-pin, 5.0mm pitch

Switch	Definition
1	9~36 VIN
3	GND
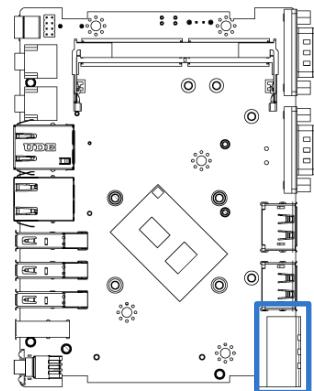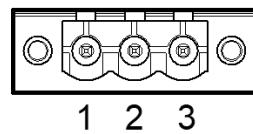
2.3.2 Power Button

PWR_SW1

Pin	Definition	Pin	Definition
1	NC	4	GND
2	Power Button	5	NC
3	NC	6	GND
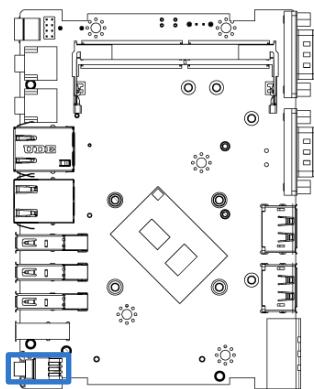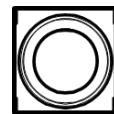
2.3.3 Remote Power Switch

PWR_SW2
Connector Type: Terminal Block 1X2 2-pin, 3.5mm pitch

Pin	Definition
1	Power Button
2	GND
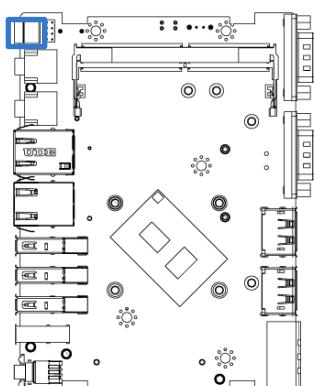
2.3.4 DisplayPort Connector
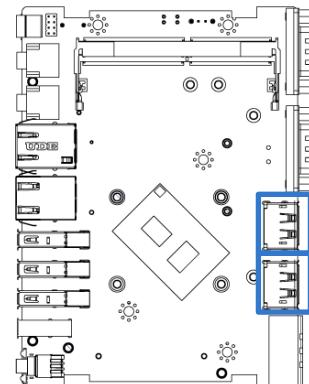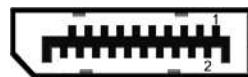
DP1-2

Pin	Definition	Pin	Definition
1	DP_LANE0_P	11	GND
2	GND	12	DP_LANE3_N
3	DP_LANE0_N	13	GND
4	DP_LANE1_P	14	GND
5	GND	15	DP_AUX_P
6	DP_LANE1_N	16	GND
7	DP_LANE2_P	17	DP_AUX_N
8	GND	18	DP_HPD
9	DP_LANE2_N	19	GND
10	DP_LANE3_P	20	DP_PWR

2.3.5 RS232 / RS422 / RS485 Connector
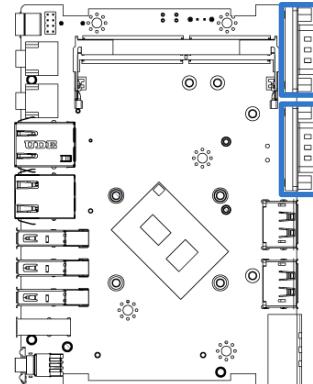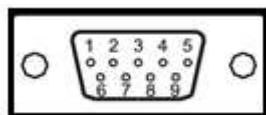
COM1-2
Connector Type: 9-pin D-Sub

Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD2	TX2-	DATA2-
2	RxD2	TX2+	DATA2+
3	TxD2	RX2+	
4	DTR2	RX2-	
5	GND		
6	DSR2		
7	RTS2		
8	CTS2		
9	RI2		

2.3.6 USB2.0 Connector, Type A

USB2_1

Pin	Definition
1	+5V
2	USB2_D2-
3	USB2_D2+
4	GND
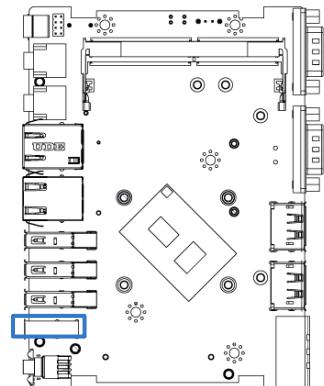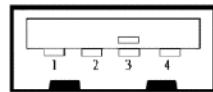
2.3.7 USB 3.2 Connector, Type A

USB3_1-3

Pin	Definition	Pin	Definition
1	+5V	6	USB3_RX+
2	USB2_DATA1-	7	GND
3	USB2_DATA1+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		
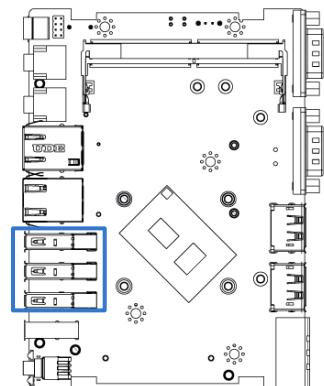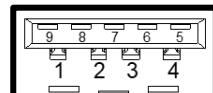
2.3.8 RJ45 with LEDs Port

LAN1

Pin	Definition	Pin	Definition
1	LAN1_MDI0P	5	LAN1_MDI2N
2	LAN1_MDI0N	6	LAN1_MDI1N
3	LAN1_MDI1P	7	LAN1_MDI3P
4	LAN1_MDI2P	8	LAN1_MDI3N
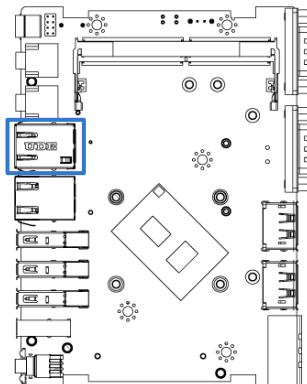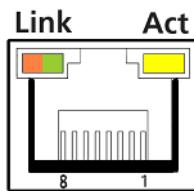
Link LED Status	Definition	Act LED Status	Definition
Steady Orange	1Gbps Network Link	Blinking Yellow	Data Activity
Steady Green	100Mbps Network Link	Off	No Activity
Off	10Mbps Network Link		

LAN2

Pin	Definition	Pin	Definition
1	LAN1_MDI0P	5	LAN1_MDI2N
2	LAN1_MDI0N	6	LAN1_MDI1N
3	LAN1_MDI1P	7	LAN1_MDI3P
4	LAN1_MDI2P	8	LAN1_MDI3N
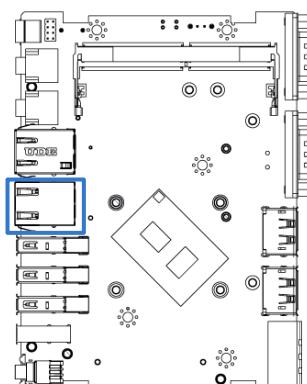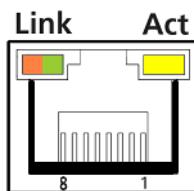
Link LED Status	Definition	Act LED Status	Definition
Steady Orange	1Gbps Network Link	Blinking Yellow	Data Activity
Steady Green	2.5Gbps Network Link	Off	No Activity
Off	10Mbps Network Link		

2.3.9 Microphone Jack (Pink)

MIC_IN1
Connector Type: 5-pin Phone Jack

Pin	Definition
1	GND
2	MIC_R
3	NC
4	GND
5	MIC_L
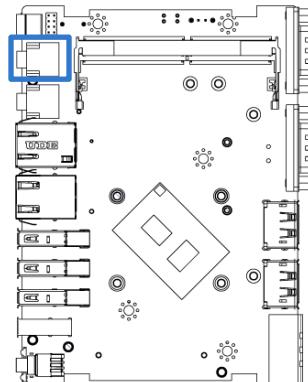
2.3.10 Line-out Jack (Green)

LINE_OUT1
Connector Type: 5-pin Phone Jack

Pin	Definition
1	GND
2	OUT_R
3	NC
4	GND
5	OUT_L
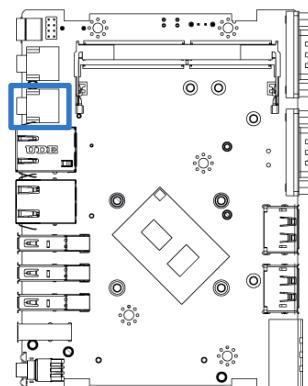
PWR_LED1: Power LED Status

Pin	Definition
1	POWER LED+
2	POWER LED-

RESET1 : Reset Button

Pin	Definition
1	RESET
2	GND

HDD_LED1: HDD Access LED Status

Pin	Definition
1	HDD LED+
2	HDD LED-

RST_LED1: Power LED Status

Pin	Definition
1	RST LED
2	RST LED

2.3.11 AT / ATX Power Mode Switch
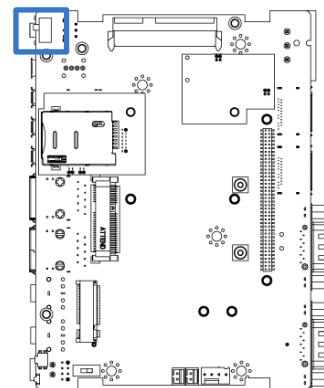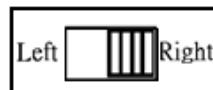
AT_ATX1

Switch	Definition
1-2 (Right)	ATX Power Mode（Default）
2-3 (Left)	AT Power Mode

2.3.12 SATA with Power Connector
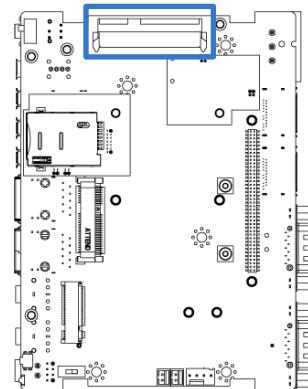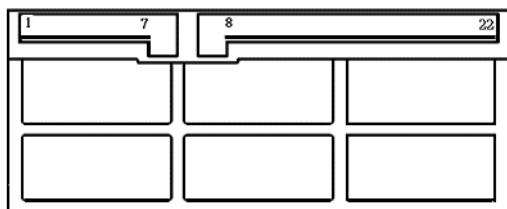
SATA1

Pin	Definition	Pin	Definition
1	GND	12	GND
2	SATA_TXP1	13	GND
3	SATA_TXN1	14	+5V
4	GND	15	+5V
5	SATA_RXN1	16	+5V
6	SATA_RXP1	17	GND
7	GND	18	GND
8	+3.3V	19	GND
9	+3.3V	20	+12V
10	+3.3V	21	+12V
11	GND	22	+12V

2.3.13 Smart FAN Connector

FAN

Pin	Definition
1	GND
2	+12V
3	FANIN
4	FANCTL
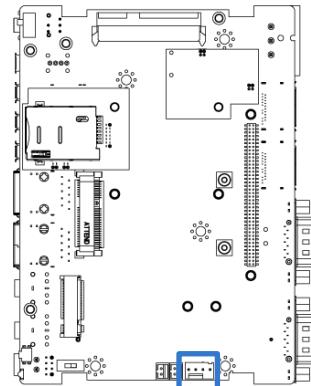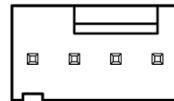
2.3.14 CAN Bus Connector

CAN 1-2

Pin	Definition
1	CAN_L
2	CAN_H
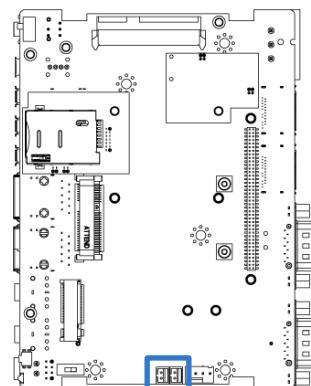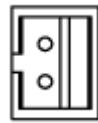
2.3.15 Mini PCI-Express / mSATA Socket
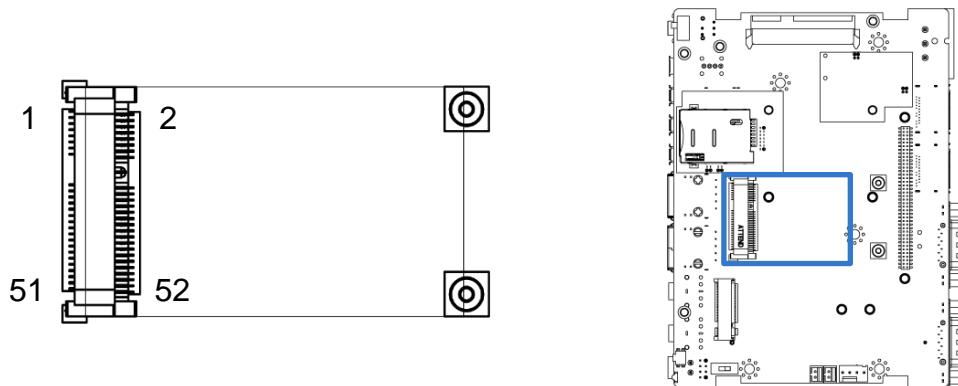
MPCIE1

Pin	Definition	Pin	Definition	Pin	Definition
1	WAKE#	19	NC	37	GND
2	+3.3V	20	+3.3V	38	USB_DP1
3	NC	21	GND	39	+3.3V
4	GND	22	MINIPCIE RST#	40	GND
5	NC	23	MINIPCIE_RXN1	41	+3.3V
6	+1.5V	24	+3.3V	42	NC
7	CLKREQ1#	25	MINIPCIE_RXP1	43	GND
8	USIM_VCC	26	GND	44	NC
9	GND	27	GND	45	NC
10	USIM_DATA	28	+1.5V	46	NC
11	MINIPCIE_CLKN1	29	GND	47	NC
12	USIM_CLK	30	SMB_CLK	48	+1.5V
13	MINIPCIE_CLKP1	31	MINIPCIE_TXN1	49	NC
14	USIM_RST	32	SMB_DATA	50	GND
15	GND	33	MINIPCIE_TXP1	51	NC
16	USIM_VPP	34	GND	52	+3.3V
17	NC	35	GND		
18	GND	36	USB_DN1		

2.3.16 M.2 B Key Socket
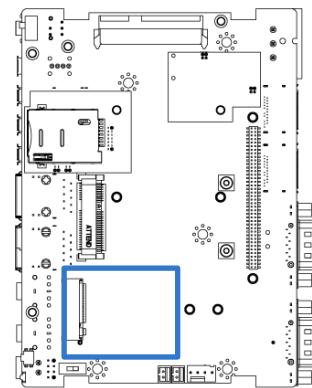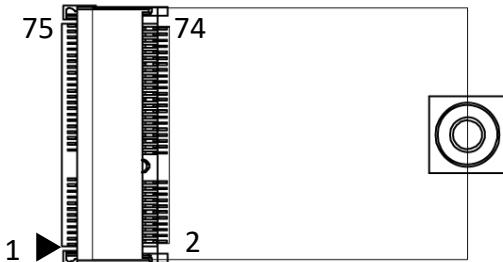
M2_KB1

Pin	Definition	Pin	Definition
1	+3.3V	2	+3.3V
3	GND	4	+3.3V
5	GND	6	+1.8S
7	USB2_D+	8	+3.3V
9	USB2_D-	10	NC
11	GND		
21	+3.3V	20	NC
23	NC	22	NC
25	NC	24	NC
27	GND	26	NC
29	USB_RxN0	28	NC
31	USB_RxP0	30	SIM_RST
33	GND	32	SIM_CLK
35	USB_TxN0	34	SIM_DATA
37	USB_TxP0	36	SIM_VDD
39	GND	38	NC
41	PCIE_RxN0	40	NC
43	PCIE_RxP0	42	NC
45	GND	44	NC
47	PCIE_TxN0	46	NC
49	PCIE_TxP0	48	NC
51	GND	50	PCIE_RST#
53	REFCLK1-	52	CLK_REQ#
55	REFCLK1+	54	PCIE_WAKE#
57	GND	56	NC
59	NC	58	NC
61	NC	60	NC
63	NC	62	NC
65	NC	64	NC
67	NC	66	NC
69	+3.3V	68	NC
71	GND	70	+3.3V
73	GND	72	+3.3V
75	+3.3V	74	+3.3V

2.3.17 SIM Card Socket
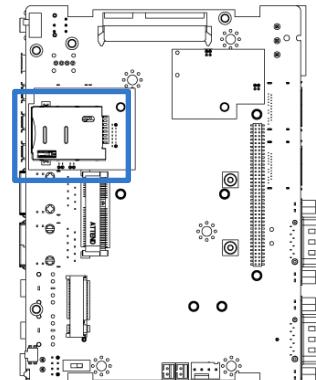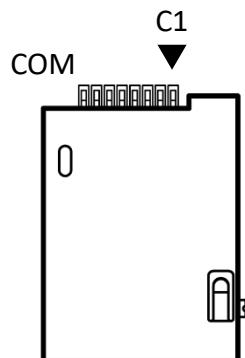
SIM1 - 2

Pin	Definition	Pin	Definition
C1	UIM_PWR	C6	UIM_VPP
C2	UIM_RESET	C7	UIM_DATA
C3	UIM_CLK	CD	NC
C5	GND	COM	GND

2.3.18 Digital Input / Output Connector

DIO1

Connector Type: Terminal Block 1X10 10-pin, 3.5mm pitch

Pin	Definition	Pin	Definition
1	DC INPUT	6	DO1
2	DI1	7	DO2
3	DI2	8	DO3
4	DI3	9	DO4
5	DI4	10	GND
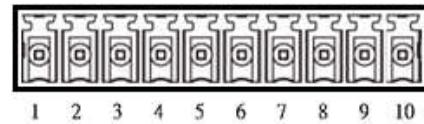
Reference Input Circuit
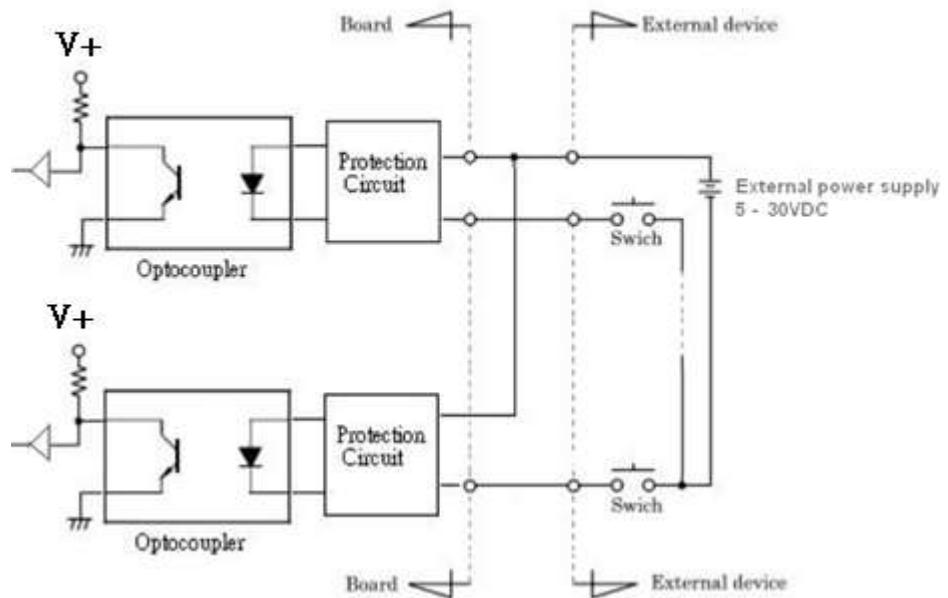
Digital Input Wiring
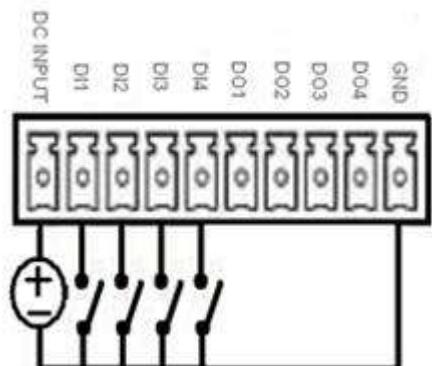
External Output Circuit
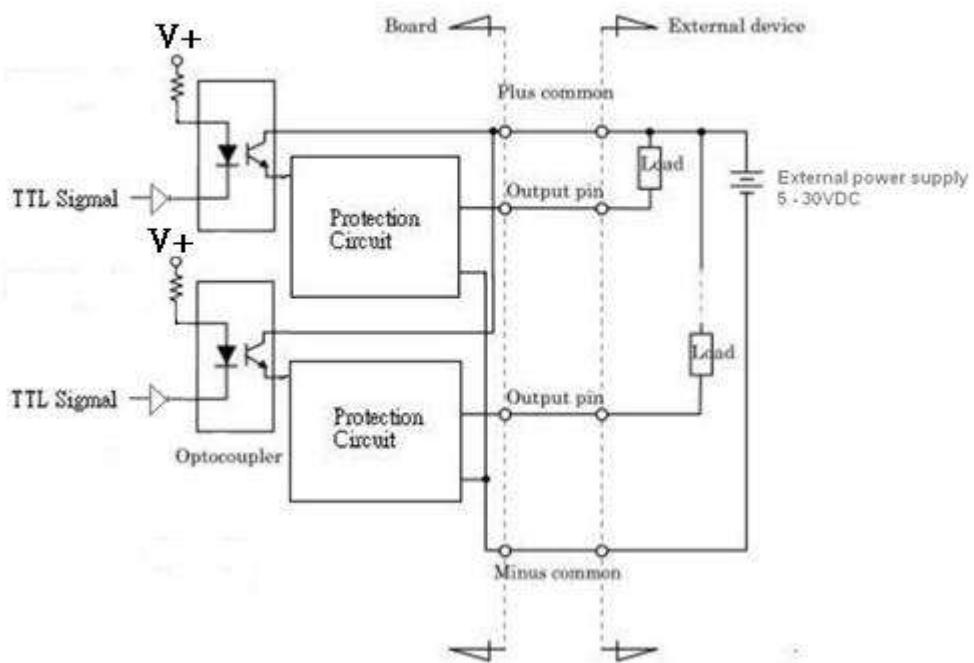
Digital Output Wiring
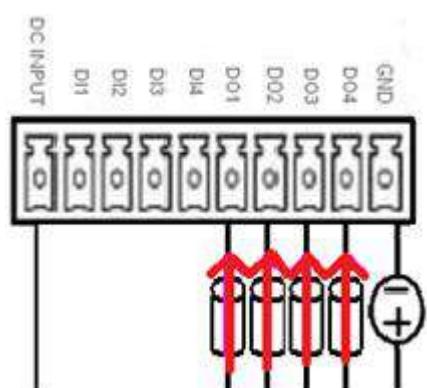
2.3.19 RS232 / RS422 / RS485 Connector

CN1 – 2
Connector Type: 9-pin D-Sub

Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD3 (DCD5)	TX3- (TX5-)	DATA3- (DATA5-)
2	RxD3 (RxD5)	TX3+ (TX5+)	DATA3+ (DATA5+)
3	TxD3 (TxD5)	RX3+ (RX5+)	
4	DTR3 (DTR5)	RX3- (RX5-)	
5	GND		
6	DSR3 (DSR5)		
7	RTS3 (RTS5)		
8	CTS3 (CTS5)		
9	RI3 (RI5)		
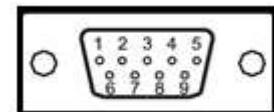
2.3.20 PC / CAR Mode Switch
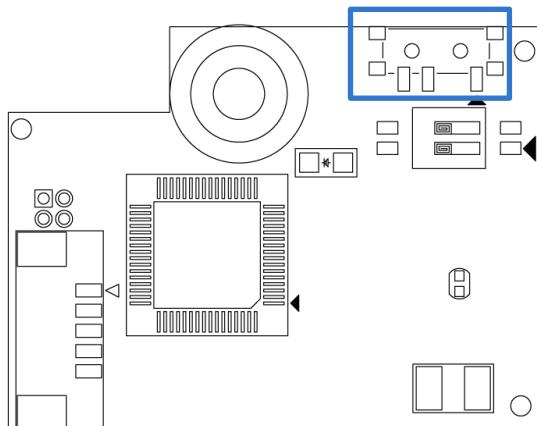
SW1

Pin	Definition
1-2	PC Mode
2-3	CAR Mode

Chapter 3
System Setup

3.1 Set torque force to 3.5 kgf-cm to execute all the screwing and unscrewing.

3.2 Removing the chassis bottom cover

WARNING

In order to prevent electric shock or system damage, before removing the chassis cover, must turn off power and disconnect the unit from power source.

1. Turn the system upside down. Unscrew the 4 screws (M3x5L) on the bottom cover.

2. Now you can remove the bottom cover.

3.3 Removing HDD bracket

1. Unscrew four screws (M3x5L) circled below.
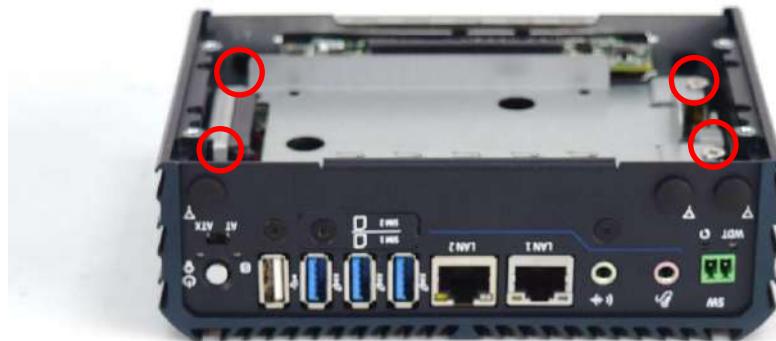
2. Now you can remove the HDD bracket.

3.4 Removing chassis top cover

1. Unscrew the three screws (M3x5L) and two copper stud (M3x11L) highlighted below.
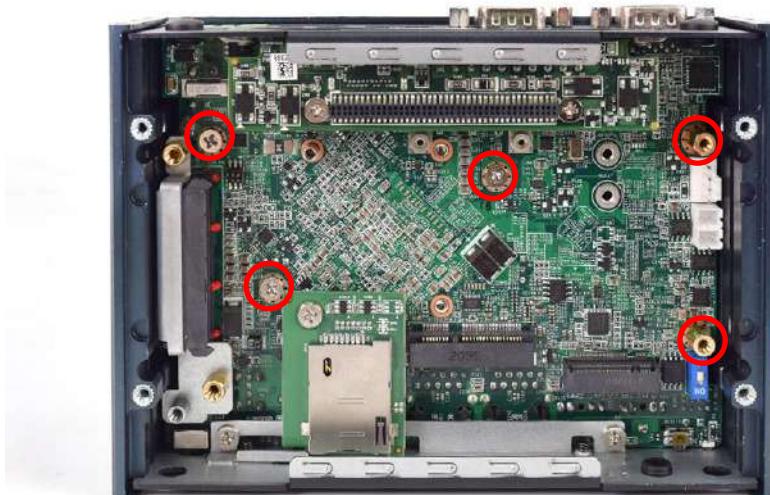
2. Hold the body of the system and lift it vertically away from the top cover.
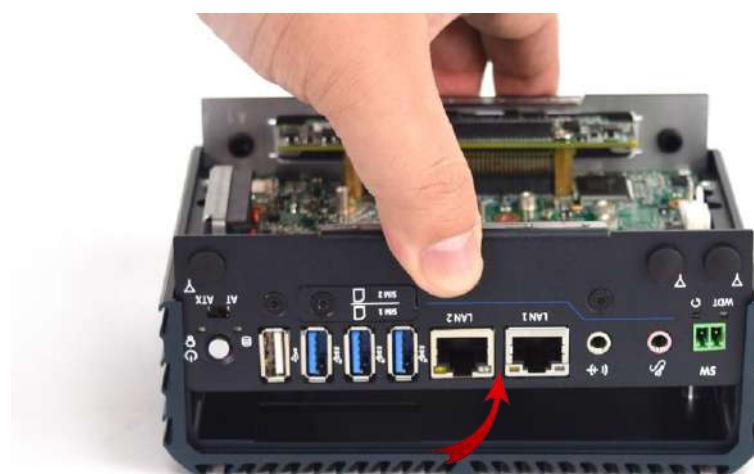
3. Top cover separated from the system body.

3.5 Installing SODIMM

1. Place the system body with SODIMM socket facing upward.

2. Insert memory module from 45 degree direction.
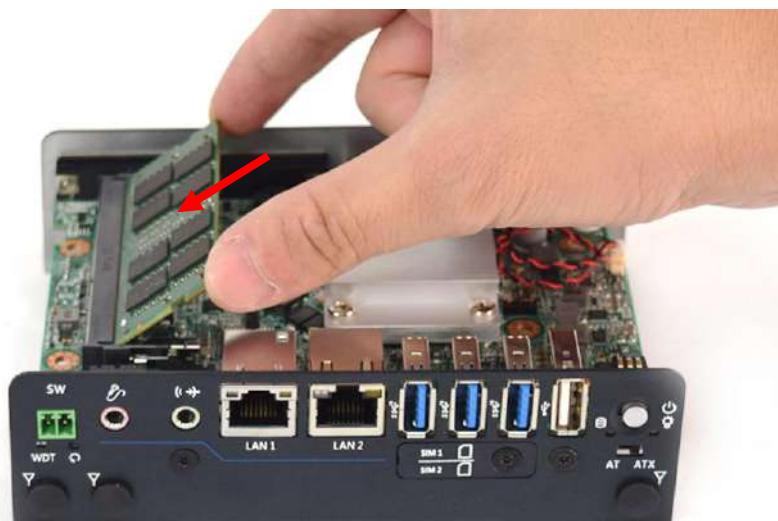
3. Press the memory module vertically downward until you hear the "click" sound. Make sure the memory module is firmly in place.
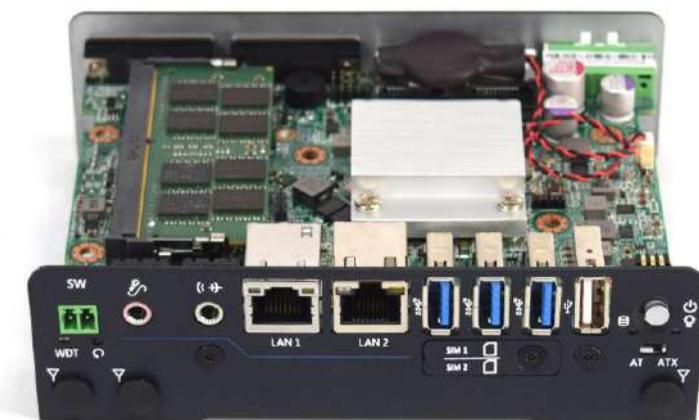
3.6 Installing Mini PCIe card / mSATA

1. Place the system body upside down so you can see the 2x mini card socket. Mini PCIe 2 (CN3) can support mSATA.

Mini PCIe 2 / mSATA

M.2 (B key)
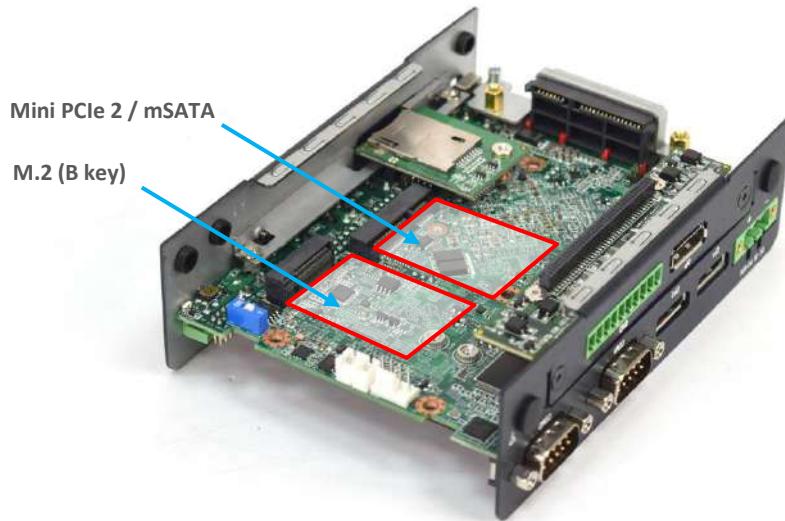
2. Insert mini PCIe card or mSATA module from 45 degree direction.

3. Press the mini PCIe card or mSATA module down and lock it with two screws (M2x3.7L).
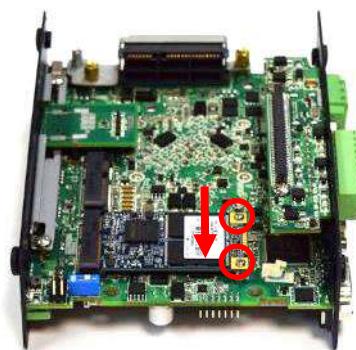
3.7 Installing antenna

1. Remove antenna hole cover on the system panel.

Front

Rear

2. Have antenna jack penetrate through the hole.

3. Put on washer and fasten the nut with antenna jack.

4. Assemble the antenna and antenna jack together.

5. Attach the RF connector at the cable-end onto the communication module.

3.8 Assemble chassis top cover

1. Place both top cover and system body upside down as shown below.

2. Ensure thermal pad is in place where the CPU is located or paste the thermal pad back on the CPU thermal block.
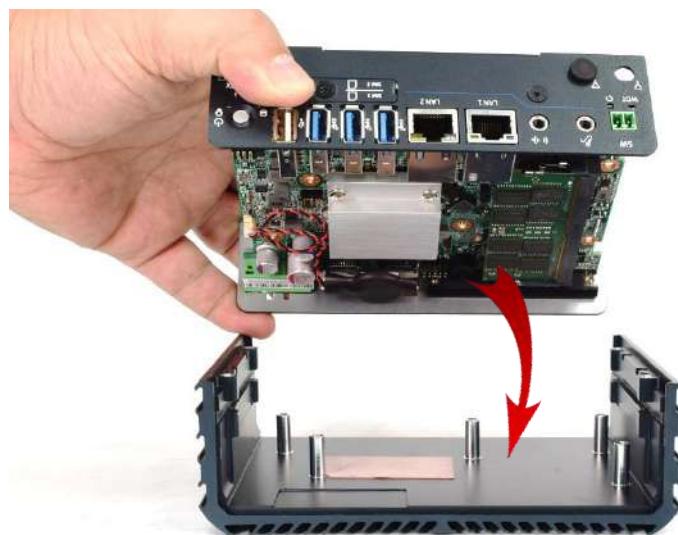
3. Put on washer and fasten the nut with antenna jack.

4. Push the system body down until it is firmly in place.

5. Fasten the three screws (M3x5L) and two copper stud (M3x11L) to lock the system body
   with top cover.
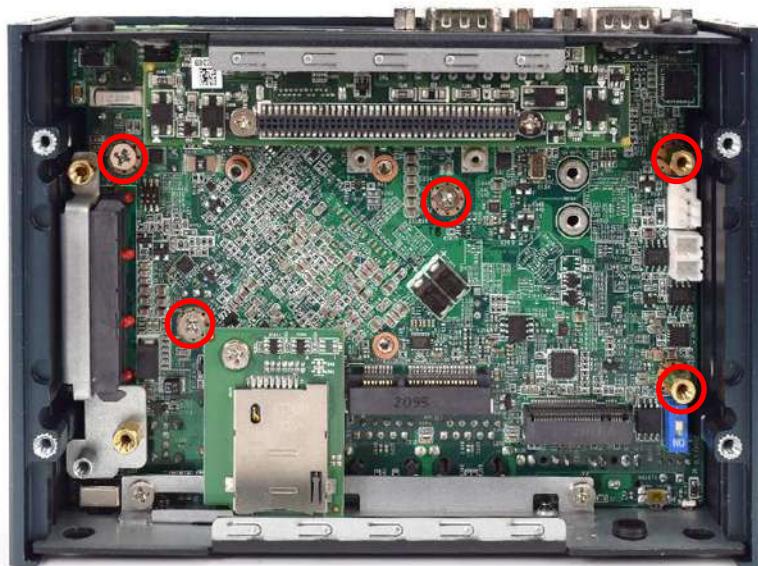
3.9 Installing SATA HDD

1. Lock the 2.5" HDD with HDD bracket using four screws (M3x4L).
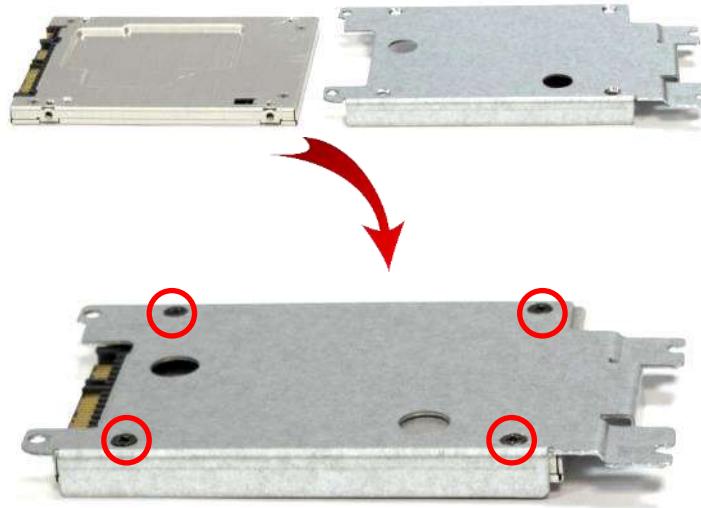
2. Slide the iron plate into the opening on top cover and then place the entire bracket down.
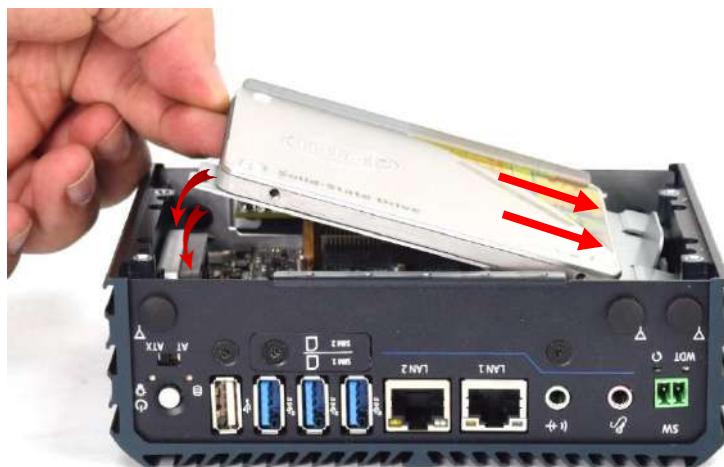
3. Press the entire bracket following the below direction so the SATA connector is firmly plugged into the HDD.
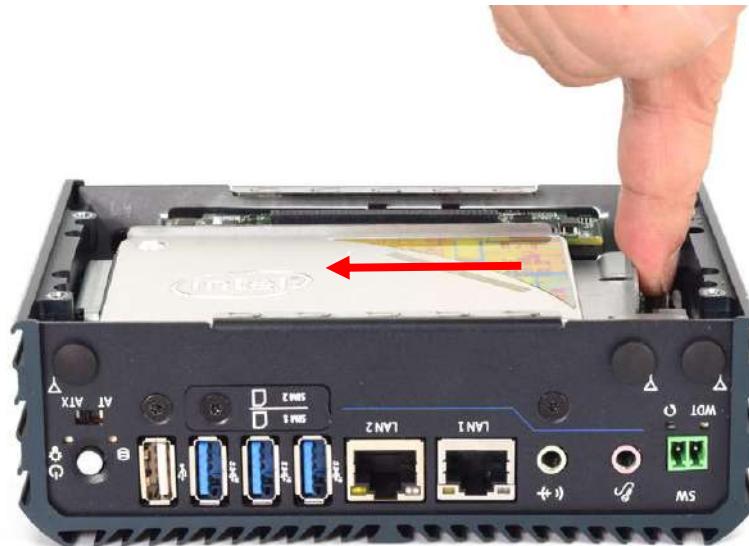
4. Fasten the four screws (M3x5L) to lock the HDD bracket in place.
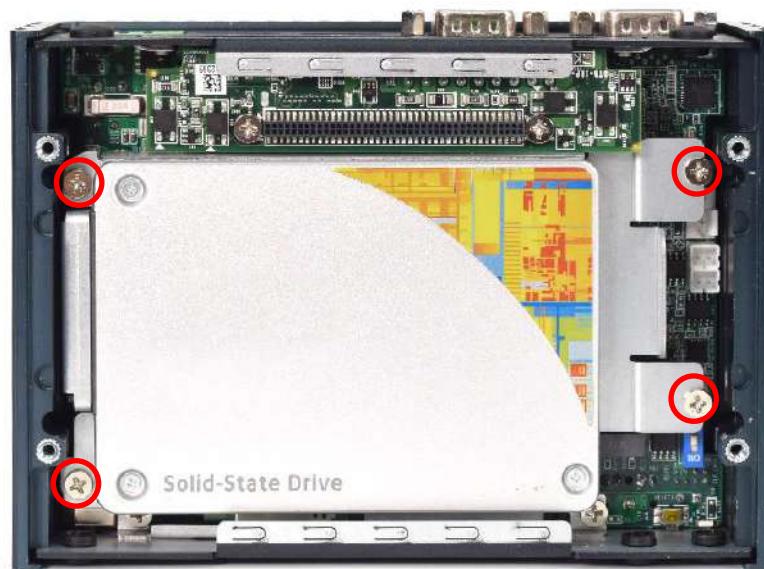
3.10 Assemble chassis bottom cover

1. Place the bottom cover according to the below direction and make sure the rail is facing inside the system.

2. Lock the bottom cover with the four screws (M3x5L).

3.11 Installing SIM card

1. SIM card socket is located on the front panel of the system. Unscrew one screw (M3x5L) to remove the SIM card socket cover.

2. Now you can insert SIM card into the socket.

SIM 1

SIM 2

3. Please note that the installation of SIM 1 and SIM 2 has to match the installation of mini PCIe sockets.

SIM Card Socket Number	Matching Mini PCIe Slot
SIM 1	M.2_KB1
SIM 2	Mini PCIe 1

M.2_KB1 to SIM 1 slot

Mini PCIe 1 to SIM 2 slot
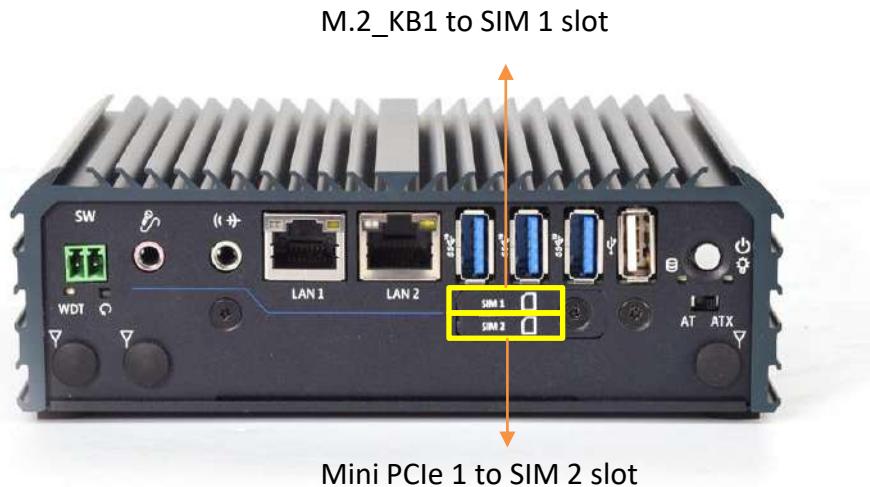
4. To uninstall SIM card, simply press the installed SIM card and then the card will be pushed out.

3.12 Installing wall mount kit

1. Wall mount kit is available for BCO-2000 series included in the standard package.

2. Place the system upside down so you can see the bottom cover. The highlighted screw holes below will be used.

3. Lock the wall mount kit with eight screws (M3x5L, Nylok).

3.13 Installing VESA mount kit

1. VESA mount kit is available for RCO-1000 series as optional accessories.

For Panel   For System

2. Place the system upside down so you can see the bottom cover. The highlighted screw holes below will be used.

3. Place the VESA mount kit (for system) on top of the system aligning the matching screw holes.

4. Lock the VESA mount kit (for system) with four screws (M3x8L, Nylok).

5. VESA mount kit (for panel) should be locked on the back of the panel with four screws.

6. Now the system can be hang in the back of the panel using the hooks.

3.14 Installing side mount kit

1. Side mount kit is available for RCO-1000 series as optional accessories.

2. Place the system upside down so you can see the bottom cover. The highlighted screw holes below will be used.

3. Place the side mount kit on top of the system aligning the matching screw holes.

4. Lock the side mount kit with four screws (M3x8L, Nylok).

3.15 Installing DIN rail holder

1. Din rail holder is available for RCO-1000 series as optional accessories.
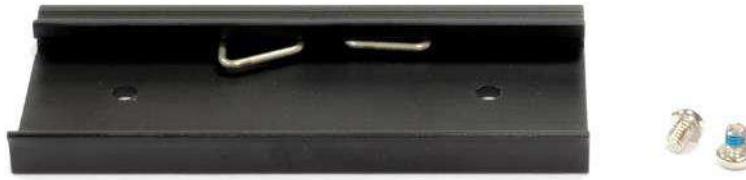
2. Place the system upside down so you can see the bottom cover. The highlighted screw holes below will be used.
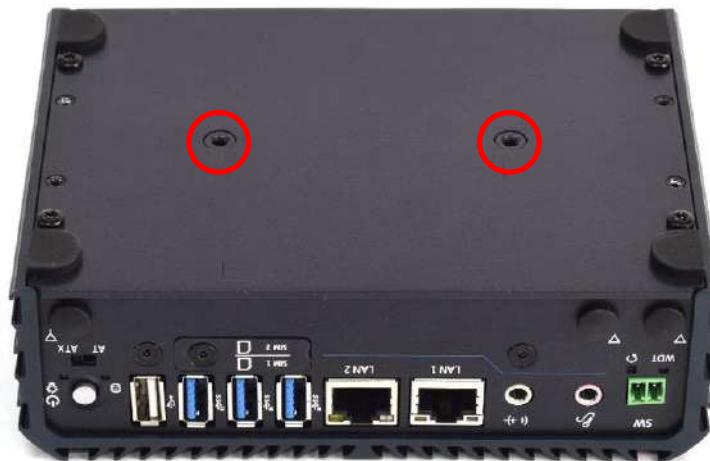
3. Place the din rail holder on top of the bottom cover and lock it with two screws (M4x5L, Nylok).

Chapter 4

BIOS Setup

4.1 BIOS Introduction

The BIOS provides an interface to modify the configuration. When the battery is removed, all the parameters will be reset.

BIOS Setup

Power on the embedded system and by pressing <Del> immediately allows you to enter the setup screens. If the message disappears before you respond and you still wish to enter the Setup, restart the system by turning it OFF and ON or pressing the RESET button.
You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys	
<→> <←>	Select Screen
<↑> <↓>	Select Item
<Enter>	Select
<Page Up/+>	Increases the numeric value or makes changes
<Page Down/->	Decreases the numeric value or makes changes
<F1>	General Help
<F2>	Previous Value
<F3>	Load Optimized Defaults
<F4>	Save Configuration and Exit
<Tab>	Select Setup Fields
<Esc>	Exit BIOS Setup

Main Setup

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

4.2 Main Setup

Press <Del> to enter BIOS CMOS Setup Utility. The Main setup screen is showed as following when the setup utility is entered. System Date/Time is set up in the Main Menu.

```
                              Aptio Setup - AMI
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                    Set the Date. Use Tab to
    BIOS Vendor                American Megatrends       switch between Date elements.
    Core Version               5.19                      Default Ranges:
    Compliancy                 UEFI 2.7; PI 1.6          Year: 1998-9999
    Project Version            R1EHOR01 x64              Months: 1-12
    Build Date and Time        10/27/2022 15:08:37      Days: Dependent on month
    Access Level               Administrator             Range of Years may vary.

    Compute Die Information
    Name                       ElkhartLake ULX
    Type                       Intel(R) Celeron(R)
                               N6211 @ 1.20GHz
    Microcode Revision         15
    Memory Information                                  →←: Select Screen
    Total Memory                4096 MB                 ↑↓: Select Item
    Memory Data Rate            2133 MTPS               Enter: Select
    ME FW Version              15.40.16.2485            +/-: Change Opt.
    ME Firmware SKU            Consumer SKU             F1: General Help
                                                        F2: Previous Values
    System Date                [Thu 01/14/2021]         F3: Optimized Defaults
    System Time                [00:09:11]               F4: Save & Exit
                                                        ESC: Exit



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```

■ **System Date**
Set the system date. Please use <Tab> to switch between data elements.

■ **System Time**
Set the system time. Please use <Tab> to switch between time elements.

4.3 Advanced Setup

```
                            Aptio Setup - AMI
    Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ CPU Configuration                          CPU Configuration Parameters
 ▶ PCH-FW Configuration
 ▶ SATA Configuration
 ▶ Trusted Computing
 ▶ ACPI Settings
 ▶ Super IO Configuration
 ▶ Hardware Monitor
 ▶ Power IGN Mode
 ▶ Serial Port Console Redirection
 ▶ USB Configuration
 ▶ Network Stack Configuration
 ▶ NVMe Configuration
                                             ──────────────────────────────
                                             ➔←: Select Screen
                                             ↑↓: Select Item
                                             Enter: Select
                                             +/-: Change Opt.
                                             F1: General Help
                                             F2: Previous Values
                                             F3: Optimized Defaults
                                             F4: Save & Exit
                                             ESC: Exit



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```

4.3.1 CPU Configuration

```
                              Aptio Setup - AMI
    Advanced

 CPU Configuration                                         When enabled, a VMM can
                                                           utilize the additional
 Type                         Intel Atom(R) x6425RE        hardware capabilities provided
                              Processor @ 1.90GHz          by Vanderpool Technology.
 ID                           0x90661
 Speed                        1900 MHz
 L1 Data Cache                32 KB x 4
 L1 Instruction Cache         32 KB x 4
 L2 Cache                     1536 KB x 4
 L3 Cache                     4 MB
 L4 Cache                     N/A
 VMX                          Supported
 SMX/TXT                      Not Supported

 Intel (VMX) Virtualization   [Enabled]                    ++: Select Screen
 Technology                                                ↑↓: Select Item
 Active Processor Cores       [All]                        Enter: Select
 C states                     [Enabled]                    +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



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```

Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled, Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Virtualization Technology.
Active Processor Cores	All**[Default]** 1 2 3	Number of cores to enable in each processor package.
C states	Disabled, Enabled**[Default]**	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

4.3.2 PCH-FW Configuration

```
                              Aptio Setup - AMI
        Advanced

    ME Firmware Version          15.40.16.2485
    ME Firmware Mode             Normal Mode
    ME Firmware SKU              Consumer SKU
    ME Firmware Status 1         0x90000255
    ME Firmware Status 2         0x32850106




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



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```
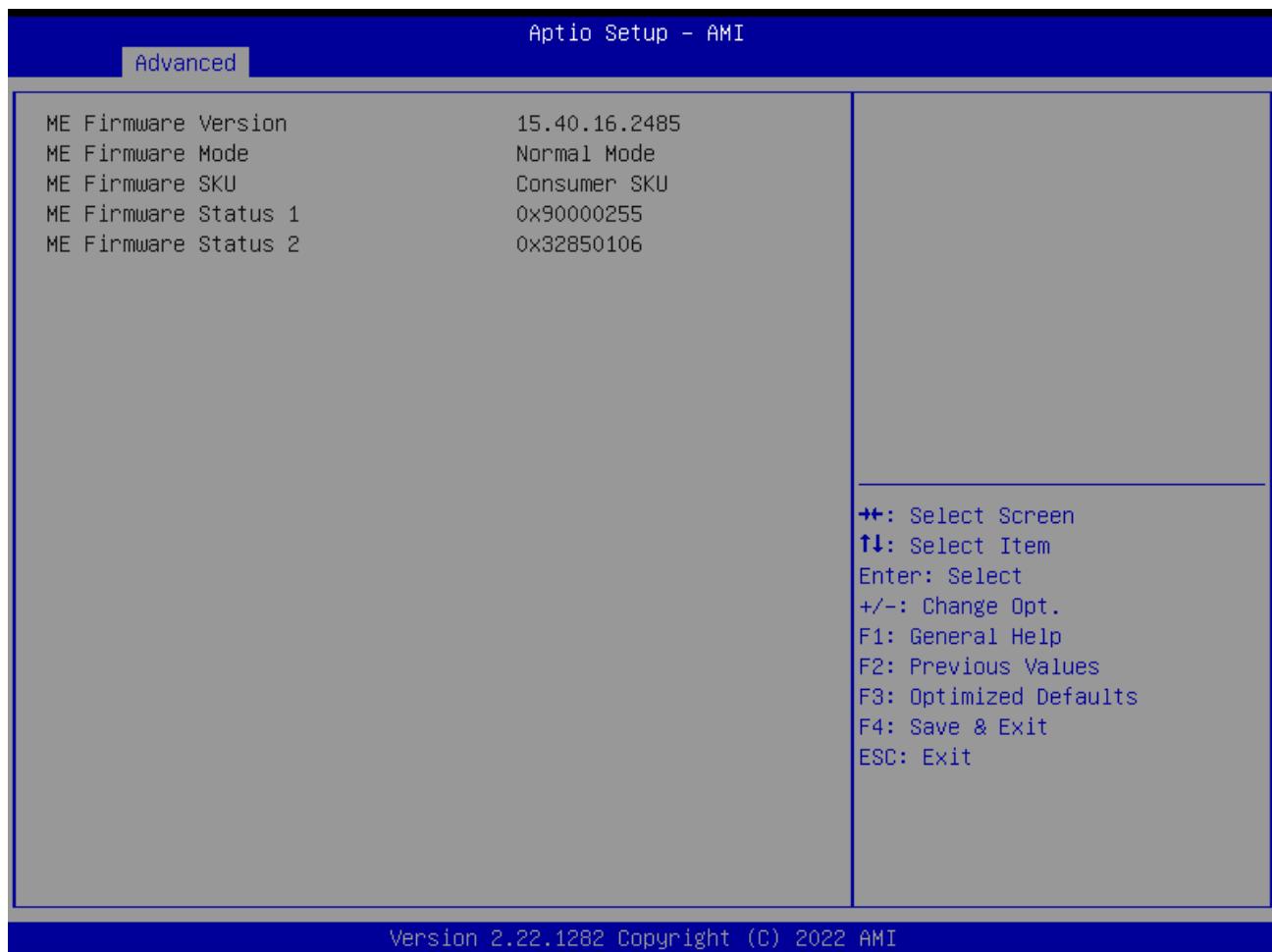
4.3.3 SATA and RST Configuration

```
                              Aptio Setup - AMI
    Chipset

SATA Configuration                                    Enable or Disable SATA Port

P0:Serial ATA Port (Mini-PCIE1)    Empty
   Software Preserve               Unknown
   Port 0                          [Enabled]
   SATA Device Type                [Hard Disk Drive]
P1:Serial ATA Port (SATA1)         Empty
   Software Preserve               Unknown
   Port 1                          [Enabled]
   SATA Device Type                [Hard Disk Drive]

                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

Item	Options	Description
Port0 ~1	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default] ,** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

4.3.4 Trusted Computing

```
                              Aptio Setup - AMI
   Advanced

   TPM 2.0 Device Found                           Enables or Disables BIOS
   Firmware Version:        7.85                   support for security device.
   Vendor:                  IFX                    O.S. will not show Security
                                                   Device. TCG EFI protocol and
   Security Device Support  [Enable]               INT1A interface will not be
   Active PCR banks         SHA256                 available.
   Available PCR banks      SHA256


   Pending operation        [None]

                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit



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```

Item	Options	Description
Security Device Support	Enabled**[Default]** , Disabled,	Enable/Disable BIOS support for security device. O.S. will not show Security Device.TCG EFI protocol and INT1A interface will not be available.
Pending operation	None**[Default]** , TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

4.3.5 ACPI Settings

```
                          Aptio Setup – AMI
  Advanced

 ACPI Settings                                        Enables or Disables System
                                                      ability to Hibernate (OS/S4
 Enable Hibernation              [Enabled]            Sleep State). This option may
 ACPI Sleep State               [S3 (Suspend to RAM)] not be effective with some
                                                      operating systems.




                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

Item	Options	Description
Enable Hibernation	Disabled , Enabled**[Default],**	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM**)[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEDN button is pressed.

4.3.6 Super IO Configuration

This setting allows you to select options for the Super IO Configuration, and change the value of the selected option.

```
                           Aptio Setup - AMI
   Advanced

  Super IO Configuration                              Set Parameters of Serial Port
                                                      1 (COMA)
  Super IO Chip
▶ Serial Port 1 Configuration
▶ Serial Port 2 Configuration
▶ Serial Port 3 Configuration
▶ Serial Port 4 Configuration
▶ Serial Port 5 Configuration
▶ Serial Port 6 Configuration
  Watch Dog Timer                 [Disabled]


                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).

Item	Options	Description
Watch Dog Timer	Disabled **[Default],** Enabled	Enabled or Disabled Watch Dog Timer function.
Watch Dog Timer Count Mode	Second Mode**[Default]**, Minute Mode	Select Second Mode or Minute Mode.
Watch Dog Timer Time out Value	20~255(Second)**[Default],** 1~255(Minute)	Watch Dog Timer Time out Value.

■ **Serial Port 1 Configuration**

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
       Advanced

     Serial Port 1 Configuration                                Enable or Disable Serial Port
                                                                (COM)
     Serial Port                          [Enabled]
     Device Settings                      IO=3F8h; IRQ=4;

     Change Settings                      [Auto]
     Device Type Select                   [RS232]






                                                                ⭢⭠: Select Screen
                                                                ⭡⭣: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F3: Optimized Defaults
                                                                F4: Save & Exit
                                                                ESC: Exit




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```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3F8h; IRQ=4; , IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default]**, UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

■ **Serial Port 2 Configuration**

```
         Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
     Advanced

 Serial Port 2 Configuration                                  Enable or Disable Serial Port
                                                              (COM)
 Serial Port                        [Enabled]
 Device Settings                    IO=2F8h; IRQ=3;

 Change Settings                    [Auto]
 Device Type Select                 [RS232]




                                                              ➔←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit




         Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2F8h; IRQ=3; , IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default],** UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

■ **Serial Port 3 Configuration**

```
              Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
        Advanced

   Serial Port 3 Configuration                                  Enable or Disable Serial Port
                                                                (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=3E8h; IRQ=7;

   Change Settings                    [Auto]
   Device Type Select                 [RS232]




                                                                →←: Select Screen
                                                                ↑↓: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F3: Optimized Defaults
                                                                F4: Save & Exit
                                                                ESC: Exit




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```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3E8h; IRQ=7; , IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default],** UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

■ **Serial Port 4 Configuration**

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
      Advanced

   Serial Port 4 Configuration                               Enable or Disable Serial Port
                                                             (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=2E8h; IRQ=7;

   Change Settings                    [Auto]
   Device Type Select                 [RS232]




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit




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```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2E8h; IRQ=7; , IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default],** UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

■ **Serial Port 5 Configuration**

```
                              Aptio Setup - AMI
    Advanced

  Serial Port 5 Configuration                        Enable or Disable Serial Port
                                                     (COM)
  Serial Port                      [Enabled]
  Device Settings                  IO=2F0h; IRQ=7;

  Change Settings                  [Auto]
  Device Type Select               [RS232]




                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



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```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2F0h; IRQ=7; , IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default]**, UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

■ **Serial Port 6 Configuration**

```
                              Aptio Setup - AMI
   ┌─────────┐
   │ Advanced│
   └─────────┘

   Serial Port 6 Configuration                          Enable or Disable Serial Port
                                                         (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=2E0h; IRQ=7;

   Change Settings                    [Auto]
   Device Type Select                 [RS232]



                                                         ▶◀: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit




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```

Item	Options	Description
Serial Port	Disabled, Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2E0h; IRQ=7; , IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; , IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12;, IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	This item allows you to change the address & IRQ settings of the specified serial port.
Device Type Select	UART 232**[Default],** UART 422, UART 485	Set the Serial Port to RS232 & RS422 & RS485
RS-485 Auto Flow Function	Disabled, Enabled**[Default]**	Enabled/Disabled RS485 Autoflow Function

4.3.7 Hardware Monitor

These items display the current status of all monitored hardware devices/ components such as voltages and temperatures.

```
                          Aptio Setup - AMI
   Advanced

  Pc Health Status                                Enable or Disable Smart Fan

  Smart Fan Function               [Enabled]
▶ Smart Fan Mode Configuration
  CPU Temperature(Tcase)           : +42 ℃
  Fan Speed                        : N/A
  VCORE                            : +1.656 V
  +5V                              : +5.045 V
  +3V3                             : +3.321 V
  +12                              : +12.672 V


                                                 ↔: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


                  Version 2.22.1282 Copyright (C) 2022 AMI
```
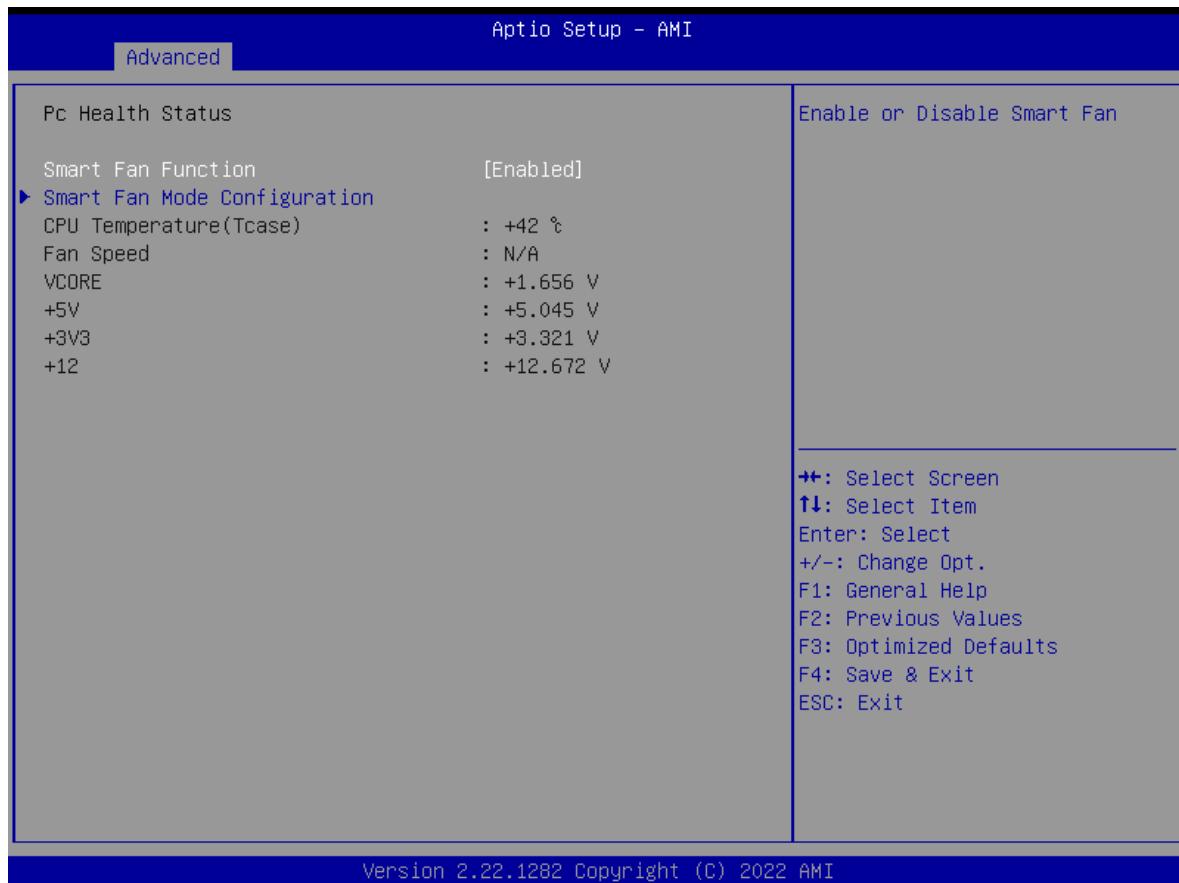
Item	Options	Description
Smart Fan Function	Disabled**[Default],** Enabled	Enabled or Disable Smart Fan

■ **Smart Fan Mode Configuration**

```
                                    Aptio Setup - AMI
     Advanced

  Smart Fan Mode Configuration                          Smart Fan  Mode Select

  Fan1 SmartFan Control              [Auto Duty-Cycle Mode]
  Temperature 1                      30
  Temperature 2                      40
  Temperature 3                      50
  Temperature 4                      60
  Duty Cycle 1                       50
  Duty Cycle 2                       60
  Duty Cycle 3                       70
  Duty Cycle 4                       85

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

                      Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Options	Description
Fan1 SmartFan Control	Manual Duty Mode, Auto Duty-Cycle Mode**[Default],**	Smart Fan Mode Select
Temperature 1~4	1~100	Auto fan speed control. SMART FAN IV
Duty Cycle 1~4	20~100	Auto fan speed control. SMART FAN IV

4.3.8 Power IGN Mode

```
                          Aptio Setup - AMI
    Advanced

Power Ignition Configuration                          Bypass: BIOS will not control
Ignition F/W Version           A1                     IGN Module, Write IGN: BIOS
PC/IGN State                   PC                      will write setting to IGN
                                                      module
Power On Delay                 Hour:0 Min:0 sec:10
Power Off Delay                Hour:0 Min:0 sec:3
Force Shutdown Delay           Hour:0 Min:1 sec:0

IGN Setting                    [Write IGN]
Power On Delay                 [10 Sec]
Power Off Delay                [3 Sec]

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



               Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Options	Description
IGN Setting	Bypass mode**[Default]** Write IGN	Bypass: BIOS will not control IGN Module, Write IGN: BIOS will write setting to IGN module
Power On Delay	10 Sec**[Default]** 20 Sec 30 Sec 40 Sec 50 Sec 1 Min Manual Mode	Power On Delay Select
Manual Mode	10 Sec**[Default]**	10~60 Sec
Power Off Delay	3 Sec**[Default]** , 1 Min, 5 Min, 10 Min, 30 Min, 1 Hour, 2 Hour, Manual Mode	Power Off Delay Select
Manual Mode	3 Sec**[Default]**	3~7200 Sec

4.3.9 Serial Port Console Redirection

```
          Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
    Advanced

  COM1                                                 Console Redirection Enable or
  Console Redirection              [Disabled]          Disable.
▶ Console Redirection Settings




                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

Item	Options	Description
Console Redirection	Disabled**[Default],** Enabled	These items allows you to enable or disable COM1 console redirection

4.3.10 USB Configuration

```
                          Aptio Setup - AMI
    Advanced

 USB Configuration                                 Enables Legacy USB support.
                                                   AUTO option disables legacy
 USB Module Version              25                support if no USB devices are
                                                   connected. DISABLE option will
 USB Controllers:                                  keep USB devices available
      1 XHCI                                        only for EFI applications.
 USB Devices:
      1 Drive, 1 Keyboard

 Legacy USB Support             [Enabled]
 XHCI Hand-off                  [Enabled]
 USB Mass Storage Driver Support [Enabled]

 USB hardware delays and time-outs:                →←: Select Screen
 USB transfer time-out          [20 sec]           ↑↓: Select Item
 Device reset time-out          [20 sec]           Enter: Select
 Device power-up delay          [Auto]             +/-: Change Opt.
                                                   F1: General Help
 Mass Storage Devices:                             F2: Previous Values
 TOSHIBA TransMemory PMAP       [Auto]             F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit


             Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Options	Description
Legacy USB Support	Enabled**[Default]** Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled**[Default]** Disabled	This is a workaround for OSew without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Disabled Enabled**[Default]**	Enable/Disable USB Mass Storage Driver Support.
USB transfer time-out	1 sec , 5 sec , 10 sec , 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec , 20 sec**[Default]** , 30 sec, 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.

4.3.11 Network Stack Configuration

```
                              Aptio Setup — AMI
       Advanced

   Network Stack                    [Enabled]              Enable/Disable UEFI Network
   IPv4 PXE Support                 [Disabled]             Stack
   IPv6 PXE Support                 [Disabled]
   PXE boot wait time               0
   Media detect count               1




                                                          ➜←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/−: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit




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```

Item	Options	Description
Network Stack	Disabled**[Default]** , Enabled	Enable/Disable UEFI Network Stack.
IPv4 PXE Support	Disabled**[Default]** , Enabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv6 PXE Support	Disabled**[Default]** , Enabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
PXE boot wait time	0**[Default]**	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.
Media detect count	1**[Default]**	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

4.4 Chipset

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

```
          Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ System Agent (SA) Configuration               System Agent (SA) Parameters
 ▶ PCH-IO Configuration






                                                 ─────────────────────────────
                                                 �→←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit



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```

4.4.1 System Agent (SA) Configuration

```
                              Aptio Setup – AMI
       Chipset

 System Agent (SA) Configuration                    Memory Configuration Parameters

 VT-d                              Supported

 ▶ Memory Configuration
 ▶ Graphics Configuration
   VT-d                            [Enabled]
   Above 4GB MMIO BIOS assignment  [Enabled]

                                                    ←→: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```

Item	Options	Description
VT-d	Disabled, Enabled **[Default]**	VT-d capability.
Above 4GB MMIO BIOS assignment	Enabled**[Default]** , Disabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment\n\nThis is enabled automatically when Aperture Size is set to 2048MB.

■ **Memory Configuration**

```
                          Aptio Setup – AMI
      Chipset

Memory Configuration                                 Maximum Value of TOLUD.
                                                     Dynamic assignment would
Memory Data Rate              2133 MTPS              adjust TOLUD automatically
Memory Timings (tCL–tRCD–tRP–tRAS)  15-15-15-36      based on largest MMIO length
                                                     of installed graphic controller
Channel 0 Slot 0              Not Populated / Disabled
Max TOLUD                     [Dynamic]




                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit




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```

Item	Options	Description
Max TOLUD	Dynamic**[Default],** 1GB, 1.25GB, 1.5 GB, 1.75 GB, 2 GB, 2.25 GB, 2.5 GB,	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller

■ **Graphic Configuration**

```
                              Aptio Setup - AMI
                  Chipset

   Graphics Configuration                                  Select the GTT Size

   GTT Size                          [8MB]
   Aperture Size                     [256MB]
   PSMI SUPPORT                      [Disabled]
   DVMT Pre-Allocated                [60M]
   DVMT Total Gfx Mem                [256M]
   DDI2 Selection                    [DP]




                                                        ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit




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```
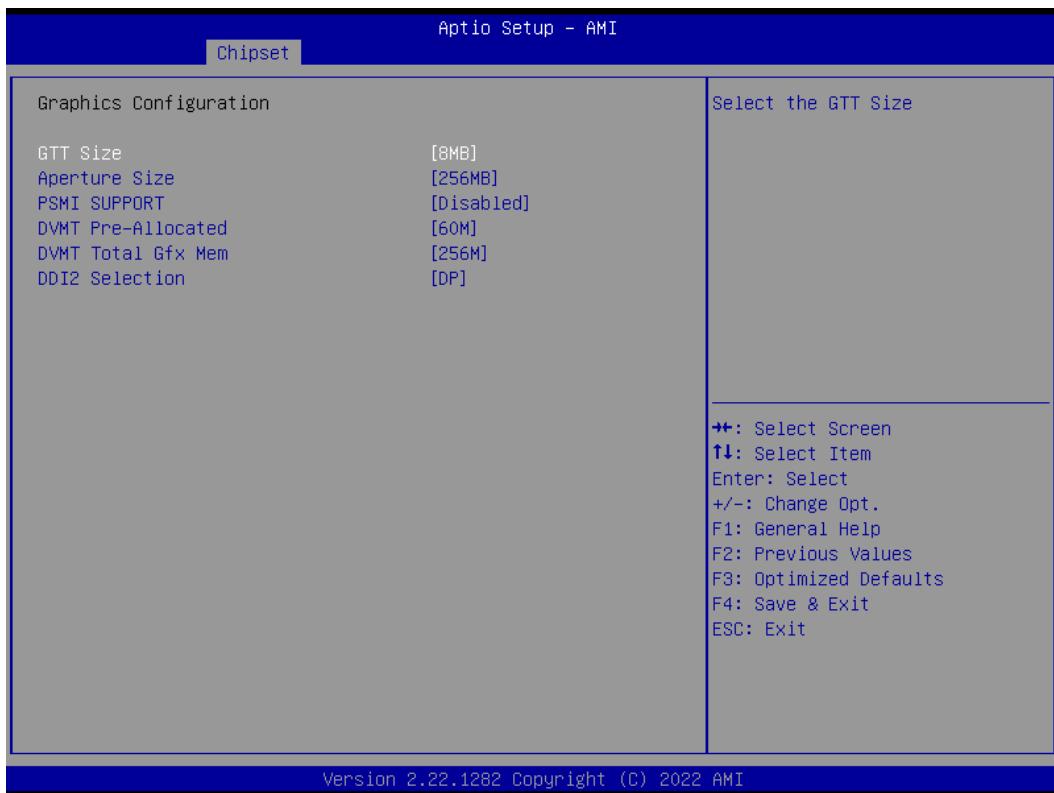
Item	Options	Description
GTT Size	2MB, 4MB, 8MB**[Default]**	Select the GTT Size .
Aperture Size	128MB, 256MB**[Default]** , 512MB, 1024MB	Select the Aperture Size. Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.
PSMI SUPPORT	Disabled **[Default]** , Enabled	PSMI Enable/Disable.
DVMT Pre-Allocated	32M,64M,96M,128M, 160M,4M, 8M,12M, 16M,20M,24M, 28M, 32M/F7,36M, 40M,44M, 48M,52M,56M, 60M**[Default]**	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	128M, 256M**[Default]** , MAX	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
DDI2 Selection	DP**[Default]** , HDMI	Selects DDI2 function: DP or HDMI

4.4.2 PCH-IO Configuration

```
                          Aptio Setup - AMI
  Chipset
 ─────────────────────────────────────────────────────────────────────────
  PCH-IO Configuration                              PCI Express Configuration
                                                    settings
 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ HD Audio Configuration

  Restore AC Power Loss              [Power Off]



                                                    ──────────────────────
                                                    ➔←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



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```

Item	Options	Description
Restore AC Power Loss	Power On, Power Off **[Default]**, Lase State	Specify what state to go to when power is re-applied after a power failure (G3 state).

■ **PCI Express Configuration**

```
                            Aptio Setup - AMI
  Chipset

  PCI Express Configuration                        PCI Express Root Port Settings.

▶ PCI Express Root Port 3(Mini-PCIe)
▶ PCI Express Root Port 4(M.2 B-key)
▶ PCI Express Root Port 5(I225)
▶ PCI Express Root Port 7(I210)




                                                   ▶◀: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit


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```

■ **PCI Express Root Port 3 /4 /5 /7**

```
                              Aptio Setup – AMI
      Chipset

   PCI Express Root Port 3          [Enabled]          Control the PCI Express Root
   ASPM                             [Disabled]         Port.
   PCIe Speed                       [Auto]

   ▶ Extra options




                                                       ←→: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



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```

Item	Options	Description
PCI Express Root Port 3 /4 /5 /7	Disabled, Enabled **[Default]**	Control the PCI Express Root Port.
ASPM	Disabled **[Default]** , L0s, L1, L0sL1, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State, AUTO - BIOS auto configure, DISABLE - Disables ASPM,
PCIe Speed	Auto**[Default]** , Gen1**,** Gen2, Gen3	Configure PCIe speed.
Detect Non-Compliance Device	Disabled **[Default]** , Enabled	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

■ **USB Configuration**

```
                        Aptio Setup – AMI
        Chipset

 USB Configuration                              Option to enable Compliance
                                                Mode. Default is to disable
 XHCI Compliance Mode          [Disabled]       Compliance Mode. Change to
                                                enabled for Compliance Mode
                                                testing.




                                                ➔←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit



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```

Item	Options	Description
XHCI Compliance mode	Disabled **[Default]** , Enabled	Option to enable Compliance Mode. Default is to disable Compliance Mode. Change to enabled for Compliance Mode testing.

■ **HD Audio Configuration**

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
            Chipset
   ─────────────────────────────────────────────────────────────────────────
    HD Audio Subsystem Configuration Settings              Control Detection of the
                                                           HD-Audio device.
    HD Audio                        [Enabled]              Disabled = HDA will be
                                                           unconditionally disabled
                                                           Enabled = HDA will be
                                                           unconditionally enabled.


                                                           ──────────────────────────
                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



   ─────────────────────────────────────────────────────────────────────────
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```

Item	Options	Description
HD Audio	Disabled, Enabled **[Default]**	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

4.5 Security

Security menu allow users to change administrator password and user password settings.

```
        Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

   Password Description                             Set Administrator Password

   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length              3
   Maximum length              20
                                                    →←: Select Screen
                                                    ↑↓: Select Item
   Administrator Password                           Enter: Select
   User Password                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
 ▶ Secure Boot                                      F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



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```

■ **Administrator Password**
This item allows you to set Administrator Password.

■ **User Password**
This item allows you to set User Password.

■ **Security Boot**

```
           Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
                    Security

   System Mode                  User                    Secure Boot feature is Active
                                                        if Secure Boot is Enabled,
   Secure Boot                  [Disabled]              Platform Key(PK) is enrolled
                                Not Active              and the System is in User mode.
                                                        The mode change requires
   Secure Boot Mode             [Custom]                platform reset
 ▶ Restore Factory Keys
 ▶ Reset To Setup Mode

 ▶ Key Management


                                                        ++: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Item	Options	Description
Secure Boot	Disabled **[Default]** , Enabled	Secure Boot feature is Active if Secure Boot is Enabled,Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard, Custom**[Default]**	Secure Boot mode options:Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

■ **Key Management**
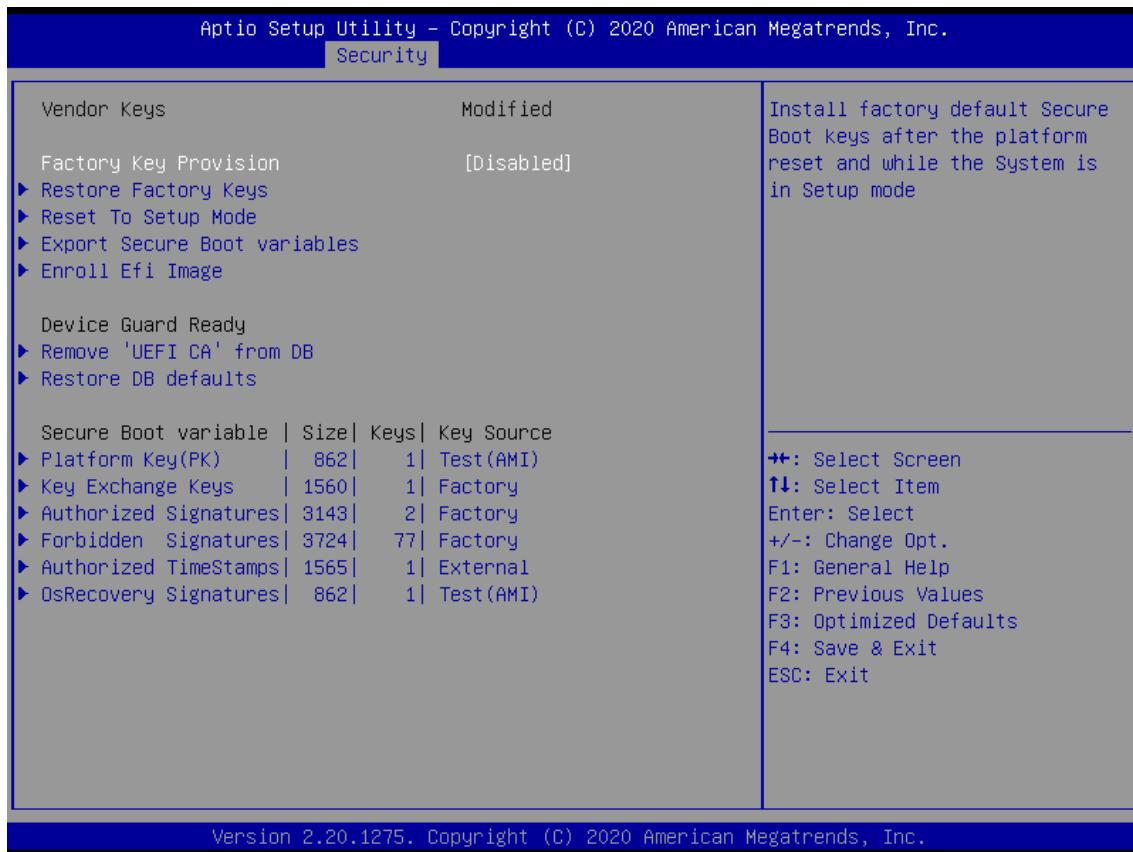
| Item	Options	Description
Factory Key Provision	Disabled **[Default]** , Enabled	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode

4.6 Boot

This menu allows you to setup the system boot options.

```
                          Aptio Setup - AMI
     Main  Advanced  Chipset  Security  Boot  Save & Exit

   Boot Configuration                                 Number of seconds to wait for
   Setup Prompt Timeout           1                   setup activation key.
   Bootup NumLock State           [On]                65535(0xFFFF) means indefinite
   Full Screen Logo Show          [Disabled]          waiting.

   Boot Option Priorities
   Boot Option #1                 [UEFI: TOSHIBA
                                  TransMemory PMAP,
                                  Partition 1 (TOSHIBA
                                  TransMemory PMAP)]

   Fast Boot                      [Disabled]

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

Item	Options	Description
Setup Prompt Timeout	1**[Default]**	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** , Off	Select the Keyboard NumLock state.
Full Screen Logo Show	Disabled**[Default]** , Enabled	Enables or disables Full Screen Logo Show option.
Fast Boot	Disabled**[Default]** , Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot Option #1		Set the system boot order.

4.7 Save & Exit

This setting allows users to configure the boot settings.

```
            Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

     Save Options                                      Reset the system after saving
     Save Changes and Reset                            the changes.
     Discard Changes and Reset

     Default Options
     Restore Defaults

     Boot Override
     UEFI: TOSHIBA TransMemory PMAP, Partition 1
     TOSHIBA TransMemory PMAP

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

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```

█ **Save Changes and Reset**
This item allows user to reset the system after saving the changes. This item allows user to reset the system after saving the changes.

█ **Discard Changes and Reset**
This item allows user to reset the system without saving any changes.

█ **Restore Defaults**
Use this item to restore /load default values for all the setup options.

Appendix

WDT & GPIO

This appendix provides the sample codes of WDT (Watch Dog Timer) and GPIO (General Purpose Input/ Output).

WDT Sample Code

<u>WDT Setting</u>

Psuedo Code

// IO Address 0xA16 is time value
// IO Address 0xA15 is WDT enable and configuration
Example, Set 0xA16=-0x03, 0xA15=0x31, it will reset after 3 seconds

#define TimePort   0xA16
#define TimeEnablePort 0xA15

WriteByte *(TimePort,0x*03*)*
WriteByte *(TimeEnablePort,*0x31*)*

GPIO Sample Code

GPIO Setting

IO_DO4	I/O 0xA02h Bit3
IO_DO3	I/O 0xA02h Bit2
IO_DO2	I/O 0xA02h Bit1
IO_DO1	I/O 0xA02h Bit0
IO_DI4	I/O 0xA03h Bit7
IO_DI3	I/O 0xA03h Bit6
IO_DI2	I/O 0xA03h Bit5
IO_DI1	I/O 0xA03h Bit4

The GPIO function is provided by SIO, and it can be accessed through its GPIO port. To access the GPIO register, write value to data port. The configuration on the RCO1000-EHL is described as below.

Psuedo Code
#define GPI_ADDR   0xA03h
#define GPO_ADDR 0xA02h

// 0xA03h is Pin Status(default 0xF5)(at IO_DI1(Bit4) ~ IO_DI4(Bit7))
ByteData = ReadByte (GPI_ADDR)   //Read current Pin Status

//Offset 0xA02h default setting is 0x5F (output pin set to output high) (at IO_DO1(Bit0) ~ IO_DO4(Bit3))
ByteData = 0x0F   //set IO_DO1~ IO_DO4 to high
WriteByte *(GPO_ADDR, ByteData)*