

USER'S MANUAL

RCO-3200 Series

Advanced Fanless Embedded System



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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2018/12/27

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. Premio Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of Premio Inc.

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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 by 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 Premio Inc. website at www.premioinc.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-3200 Series Embedded System	1
2	Utility DVD Driver	1
3	Wall Mount Kit	1
4	Accessory Kit	1
5	DVI to VGA Adapter	1

Ordering Information

Model No.	Product Description
RCO-3200-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN
RCO-3200-4L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 6x LAN
RCO-3200-4P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x PoE
RCO-3200-4L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 LAN
RCO-3200-4P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 PoE
RCO-3200-8L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 10x LAN
RCO-3200-8P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 8x PoE
RCO-3200-8L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 8x M12 LAN
RCO-3200-8P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 8x M12 PoE
RCO-3211E-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 1x PCIe Slot
RCO-3211E-4L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 6x LAN, 1x PCIe Slot
RCO-3211E-4P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x PoE, 1x PCIe Slot
RCO-3211E-4L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 LAN, 1x PCIe Slot
RCO-3211E-4P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 PoE, 1x PCIe Slot

Ordering Information

Model No.	Product Description
RCO-3211P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 1x PCI Slot
RCO-3211P-4L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 6x LAN, 1x PCI Slot
RCO-3211P-4P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x PoE, 1x PCI Slot
RCO-3211P-4L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 LAN, 1x PCI Slot
RCO-3211P-4P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 PoE, 1x PCI Slot
RCO-3222EE-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 2x PCIe Slot
RCO-3222EE-4L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 6x LAN, 2x PCIe Slot
RCO-3222EE-4P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x PoE, 2x PCIe Slot
RCO-3222EE-4L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 LAN, 2x PCIe Slot
RCO-3222EE-4P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 PoE, 2x PCIe Slot
RCO-3222PP-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 2x PCI Slot
RCO-3222PP-4L-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 6x LAN, 2x PCI Slot
RCO-3222PP-4P-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x PoE, 2x PCI Slot
RCO-3222PP-4L-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 LAN, 2x PCI Slot
RCO-3122PP-4P-M12-N4200	Advanced Fanless Embedded System with Intel® Pentium® Processor N4200, 2x LAN, 4x M12 PoE, 2x PCI Slot

Optional Accessories

Model No.	Product Description
1-E09A06007	Adapter AC/DC 12V 5A 60W with 3pin Terminal Block Plug 5.0mm Pitch
1-E09A12002	Adapter AC/DC 24V 5A 120W with 3pin Terminal Block Plug 5.0mm Pitch
SFICBL022	Power Cord, 3-pin US Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm

Chapter 1

Product Introductions

1.1 Overview

Based on Intel® Pentium® N4200 (2.5GHz) Quad Core processor, RCO-3200 series is an extreme features integration, outstanding system performance, versatile I/O connections, and rugged reliability fanless embedded systems. It offers modularize expansion I/O, rich connectivity interfaces, wide range (9~50V) DC power input, and high reliability even operating in temperature extremes (-40°C ~ +70°C).

Featuring with completely cable-less designed, high functional, one-piece housing design, and anti-vibration, RCO-3200 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-3200 series are safety system for all industrial applications.

RCO-3200 Series

RCO-3211 Series

RCO-3222 Series



1.1.1 Key Features

- Intel® Pentium® N4200 (2.5GHz) Quad Core processor
- 1x DDR3L SO-DIMM Max. up to 8GB (un-buffered)
- Triple Independent Display from 1x DVI-I and 1x DisplayPort
- 2x Intel® GbE Port, Support Wake-on-LAN and PXE [RCO-3200, RCO-3211E(P), and RCO-3222EE(PP) Only]
- 6x Intel® GbE Port, Support Wake-on-LAN and PXE [RCO-3200-4L, RCO-3200-4L-M12, RCO-3211E(P)-4L, RCO-3211E(P)-4L-M12, RCO-3222EE(PP)-4L, and RCO-3222EE(PP)-4L-M12 Only]
- 10x Intel® GbE Port, Support Wake-on-LAN and PXE (RCO-3200-8L Only)
- 6x Intel® GbE Port with 4x PoE Function, Support Wake-on-LAN, 2x Support PXE [RCO-3200-4P, RCO-3200-4P-M12, RCO-3211E(P)-4P, RCO-3211E(P)-4P-M12, RCO-3222EE(PP)-4P, and RCO-3222EE(PP)-4P-M12 Only]
- 2x USB 3.0, 2x USB 2.0
- 6x RS232/422/485 Port
- 8x Isolated DI, 8x Isolated DO
- 1x Removable 2.5" SATA HDD Bay and 1x Internal 2.5" SATA SSD/HDD Bay
- 1x mSATA (Shared by 1x Mini-PCIe Socket and 1x SATA) and 2x SIM Card Socket
- 9~48VDC Power Input, support AT/ATX Mode
- 2x Mini-PCIe Socket for Wi-Fi, GSM, or I/O Expansion
- 1x PCIe x4 (1-lane) Expansion (RCO-3211E Series Only)
- 1x PCI Expansion (RCO-3211P Series Only)
- 2x PCIe x4 (1-lane) Expansion (RCO-3222EE Series Only)
- 2x PCI Expansion (RCO-3222PP Series Only)
- Power Ignition Sensing
- Remote Power On/Off Switch/

1.2 Hardware Specification

Processor System

- Intel® Pentium® N4200 Quad Core Processor, 2.5 GHz with 128Mbit SPI BIOS.

Memory

- 1x 204-Pin DDR3L-1600 / 1867MHz SO-DIMM (unbuffered and non-ECC), max. up to 8GB

Display

Triple Display

- 1x DVI-D and 1x VGA (w/ Optional Split Cable)
- 1x DVI-D and 1x DisplayPort
- 1x DisplayPort and 1x VGA

Expansion

- RCO-3211E Series:** 1x PCIe x4 (1-lane)
- RCO-3311P Series:** 1x PCI
- RCO-3322EE Series :** 2x PCIe x4 (1-lane)
- RCO-3322PP Series:** 2x PCI
- 2x Full-size Mini PCIe Socket for Wi-Fi / GSM / Expansion Module
- 1x Universal I/O Bracket [RCO-3211E-4L(4P), RCO-3211E-4L(4P)-M12, RCO-3211P-4L(4P), RCO-3211P-4L(4P)-M12, RCO-3222EE-4L(4P), RCO-3222EE-4L(4P)-M12, RCO-3222PP-4L(4P), and RCO-3222PP-4L(4P)-M12 Only]
- 2x Universal I/O Bracket (RCO-3200, RCO-3211E, RCO-3211P, RCO-3222EE, and RCO-3222PP Only)

Ethernet

- 2x Intel® i210-AT GbE LAN Port, Support Wake-on-LAN and PXE [RCO-3200, RCO-3211E(P), RCO-3222EE(PP) Only]
- 6x Intel® i210-AT GbE LAN Port, LAN1 and LAN2 Support Wake-on-LAN [RCO-3200-4L, RCO-3200-4L-M12, RCO-3211E(P)-4L, RCO-3211E(P)-4L-M12, RCO-3222EE(PP)-4L, and RCO-3222EE(PP)-4L-M12 Only]
- 10x Intel® i210-AT GbE LAN Port, LAN1 and LAN2 Support Wake-on-LAN [RCO-3200-8L and RCO-3200-8L-M12 Only]
- 4x 802.3at Compliant PoE Port, The Maximum DC Power Delivery on Each PoE is 25.5W [RCO-3200-4P, RCO-3200-4P-M12, RCO-3211E(P)-4P, RCO-3211E(P)-4P-M12, RCO-3222EE(PP)-4P, and RCO-3222EE(PP)-4P-M12 Only]
- 8x 802.3at Compliant PoE Port, The Maximum DC Power Delivery on Each PoE is 10W (RCO-3200-8P and RCO-3200-8P-M12 Only)

Audio

- Codec: Realtek ALC888S
- 1x Mic-in and 1x Line-out

Watchdog Timer

- Software Programmable Supports 1~255 sec. System Reset

Storage

- 1x Removable 2.5" SATA HDD Bay
- 1x Internal 2.5" SATA HDD Bay
- 1x CFast Socket
- 1x mSATA Socket (Shared by 1x Mini-PCIe and SATA)
- 2x External SIM Card Socket

I/O Ports

- 2x USB 3.0 Port
- 2x USB 2.0 Port
- 8 Isolated DI and 8 Isolated DO Port
- 2x DB9 Flow Control for COM1~2, Support RS232/422/485 with Auto Flow Control
- 4x Internal connector for COM3~6, Support RS232/422/485 with Auto Flow Control
- 4x Antenna Hole
- 1x Power Switch
- 1x AT/ATX Switch
- 1x Remote Power on/off Connector

Digital Input & Output

- 8x Digital Input (Source Type)
 - Input Voltage (Dry Contact):
 - Logic 0: Close to GND
 - Logic 1: Open
 - Input Voltage:
 - Logic 0: 3V max.
 - Logic 1: 5V min. (DI to COM-)
- 8x Digital Output
 - Supply Voltage: 5~30VDC
 - Sink Current: 200 mA Max. Per Channel

Power

- Support AT, ATX Mode
- 1x 3-pin Terminal Block Connector with Power Input 9~50VDC
- Power Ignition Sensing
- 1x Optional AC/DC 12V/5A, 60W Power Adapter
- 1x Optional AC/DC 24V/5A, 120W Power Adapter [RCO-3200-4P, RCO-3200-4P-M12, RCO-3200-8P, RCO-3200-8P-M12, RCO-3211E(P)-4P, RCO-3211E(P)-4P-M12, RCO-3222EE(PP)-4P, and RCO-3222EE(PP)-4P-M12 Series Only]

Environment

- Operating Temperature: Ambient with Air Flow: -40°C to 70°C (with Industrial Grade Peripherals)
- Storage Temperature: -40°C to 85°C
- Relative humidity: 10%~95% (non-condensing)

Physical

- RCO-3200 Series**
 - ✓ Dimension (WxDxH, mm): 185 x 197 x 57.4 mm
 - ✓ Weight: 1.93 kg ~ 2.35 kg
- RCO-3211 Series**
 - ✓ Dimension (WxDxH, mm): 185 x 197 x 84.9 mm
 - ✓ Weight: 2.43 kg ~ 2.79 kg
- RCO-3222 Series**
 - ✓ Dimension (WxDxH, mm): 185 x 197 x 104.9 mm
 - ✓ Weight: 2.83 kg ~ 3.38 kg
- Construction: Extruded Aluminum with Heavy Duty Metal
- Mounting: Wall/ DIN-Rail Mounting

Operating System

- Windows® 10
- Linux kernel 4.x

Certifications

- CE / FCC Class A

1.3 System I/O

1.3.1 RCO-3200

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

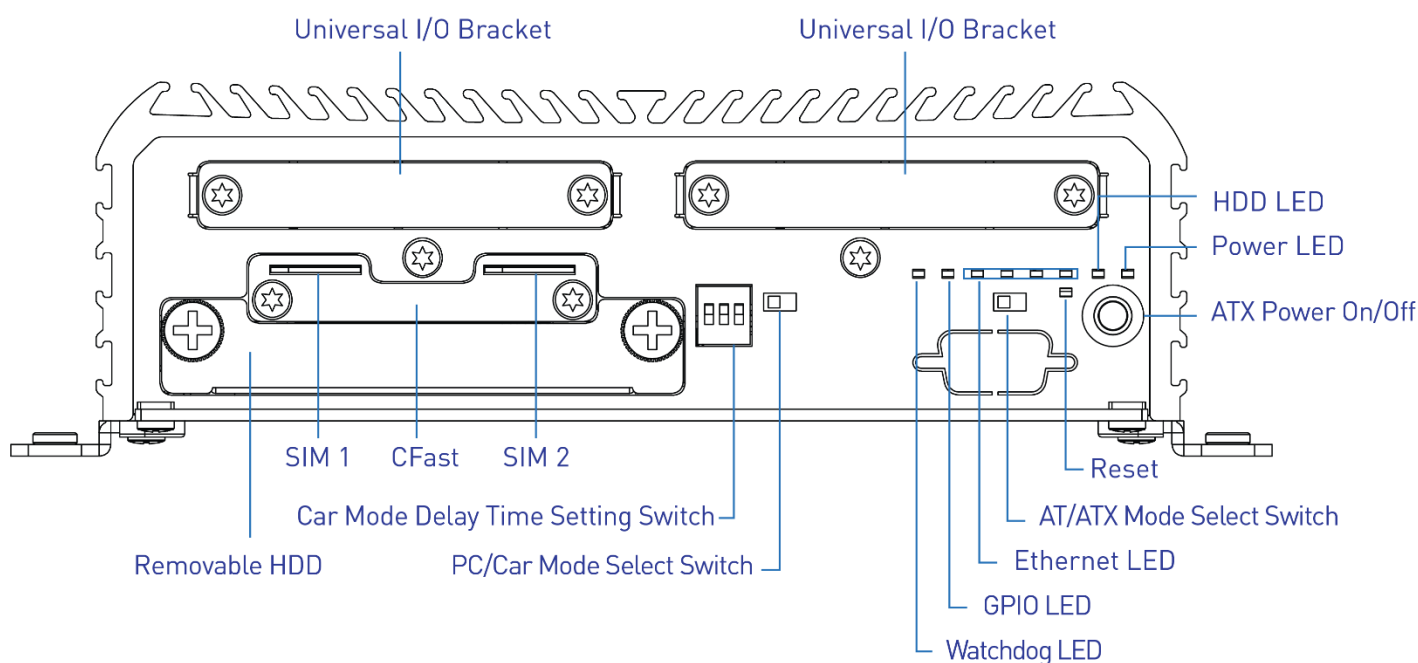
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

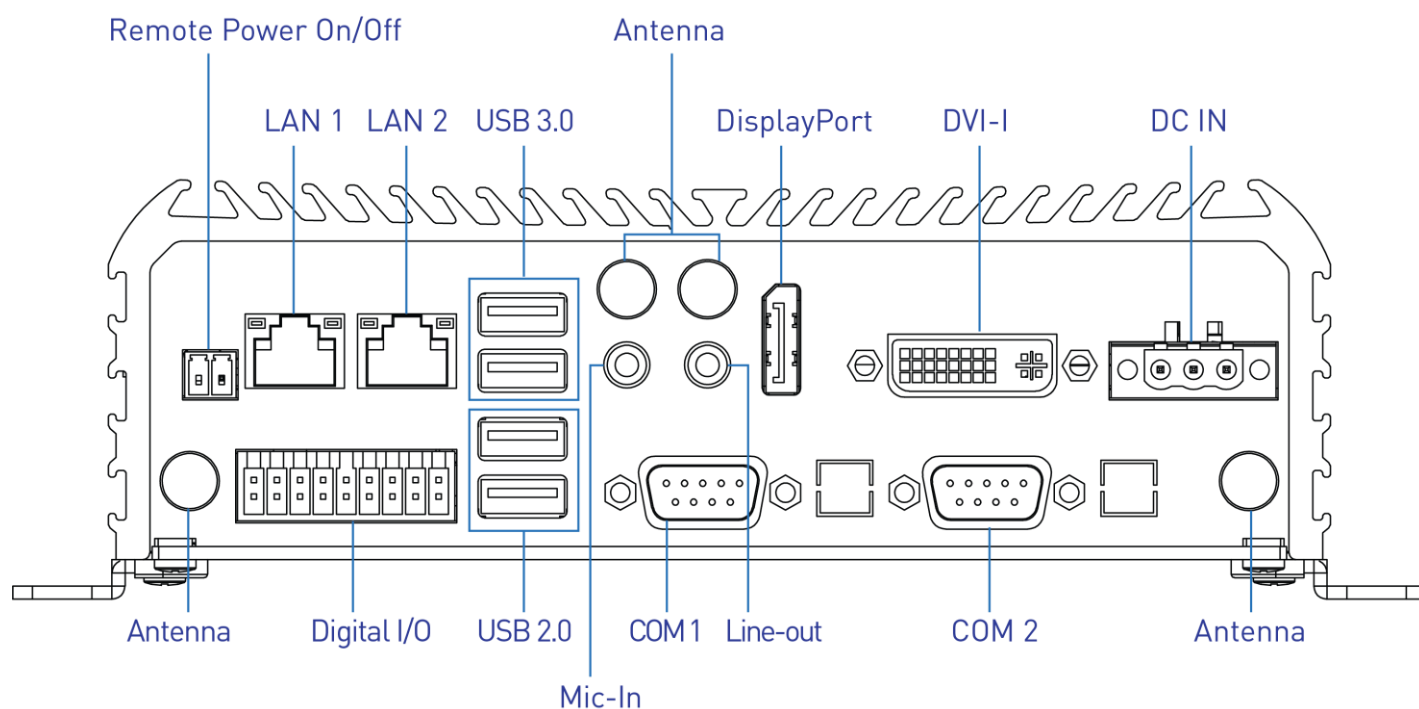
COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

Antenna hole

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



1.3.2 RCO-3200-4L(P)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

LAN port

Used to connect the system to a local area network (RCO-3200-4L Only)

PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3200-4P Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

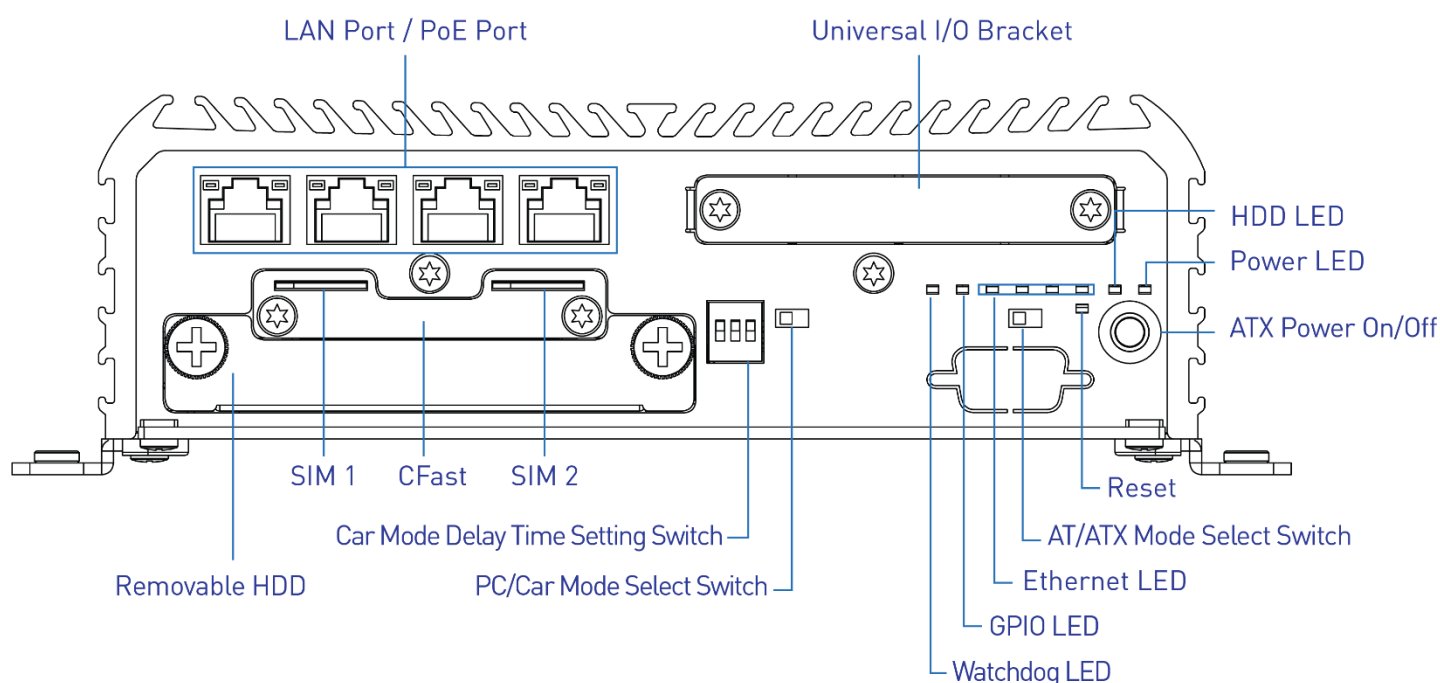
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

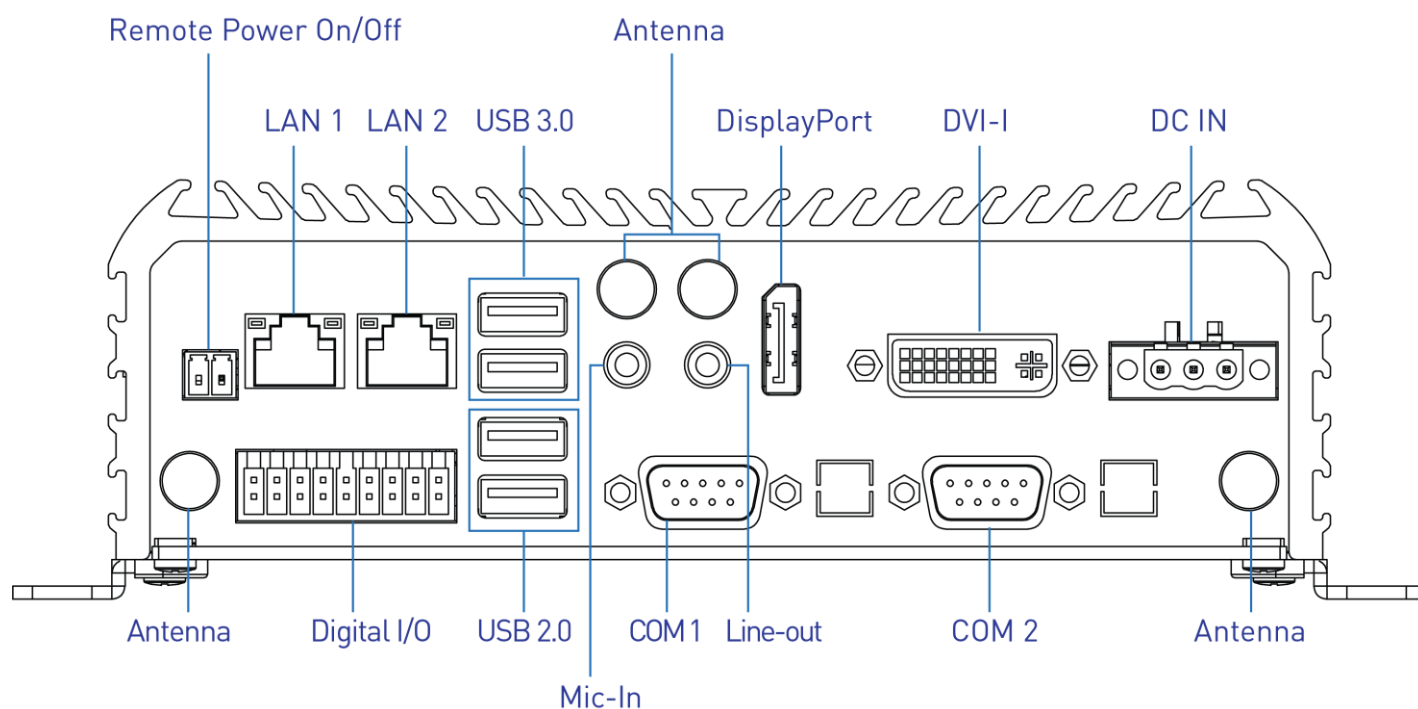
COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

Antenna hole

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



1.3.3 RCO-3200-4L(P)-M12

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

M12 LAN Port

Used to connect the system to a local area network (RCO-3200-4L-M12 Only)

M12 PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3200-4P-M12 Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

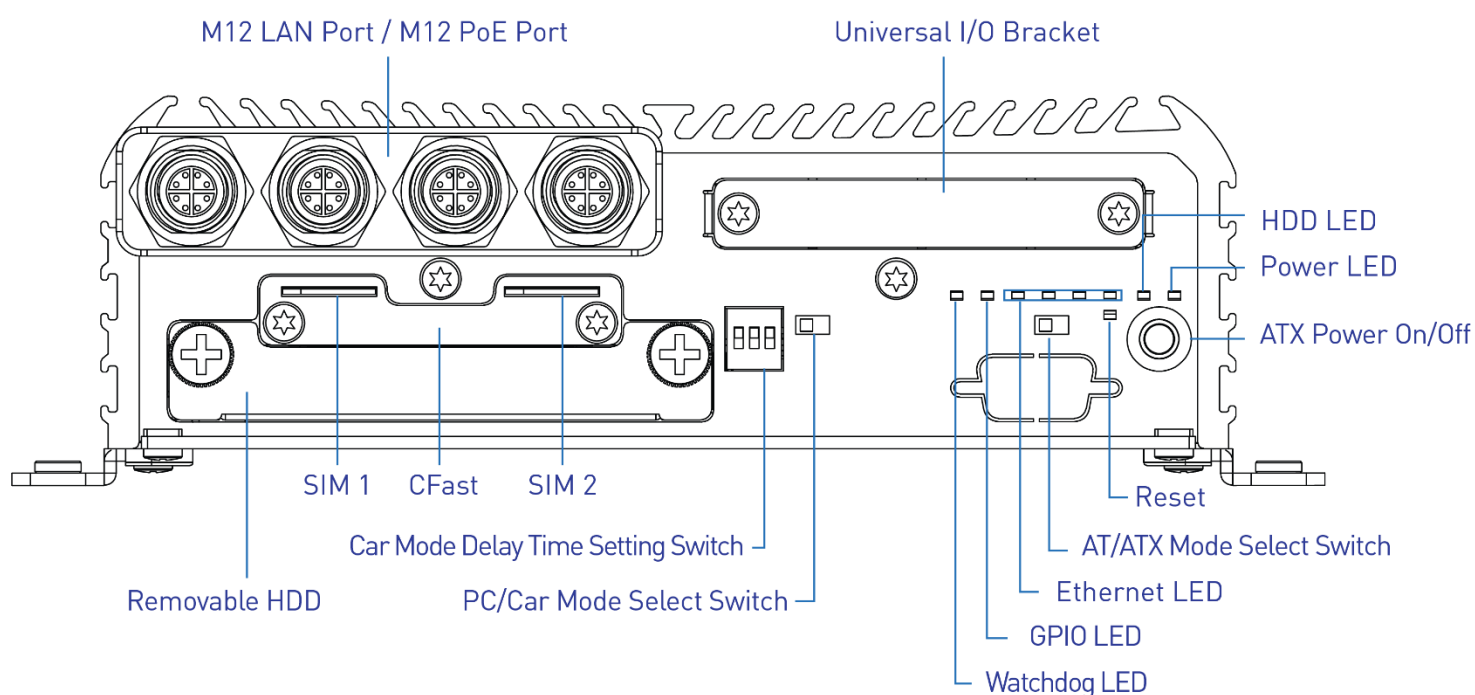
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

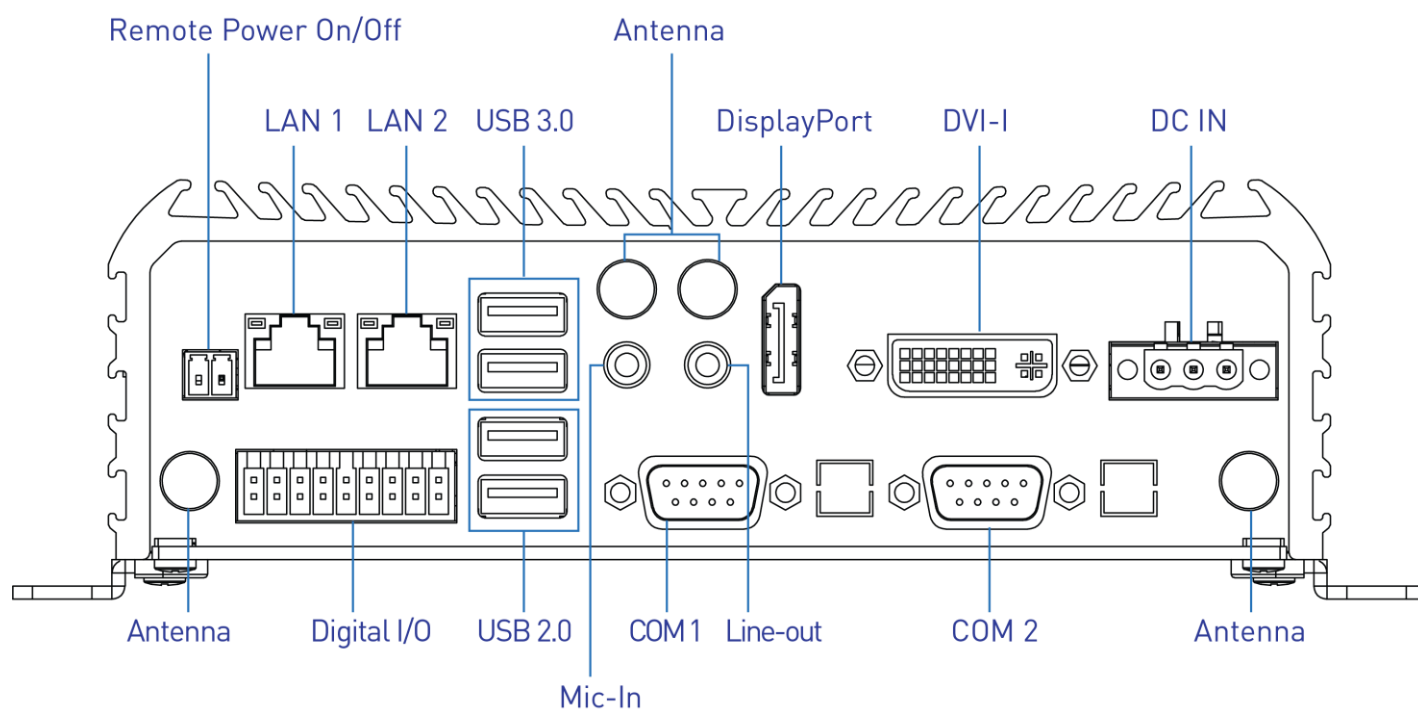
COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

Antenna hole

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



1.3.4 RCO-3200-8L(P)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

LAN port

Used to connect the system to a local area network (RCO-3200-8L Only)

PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3200-8P Only)

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

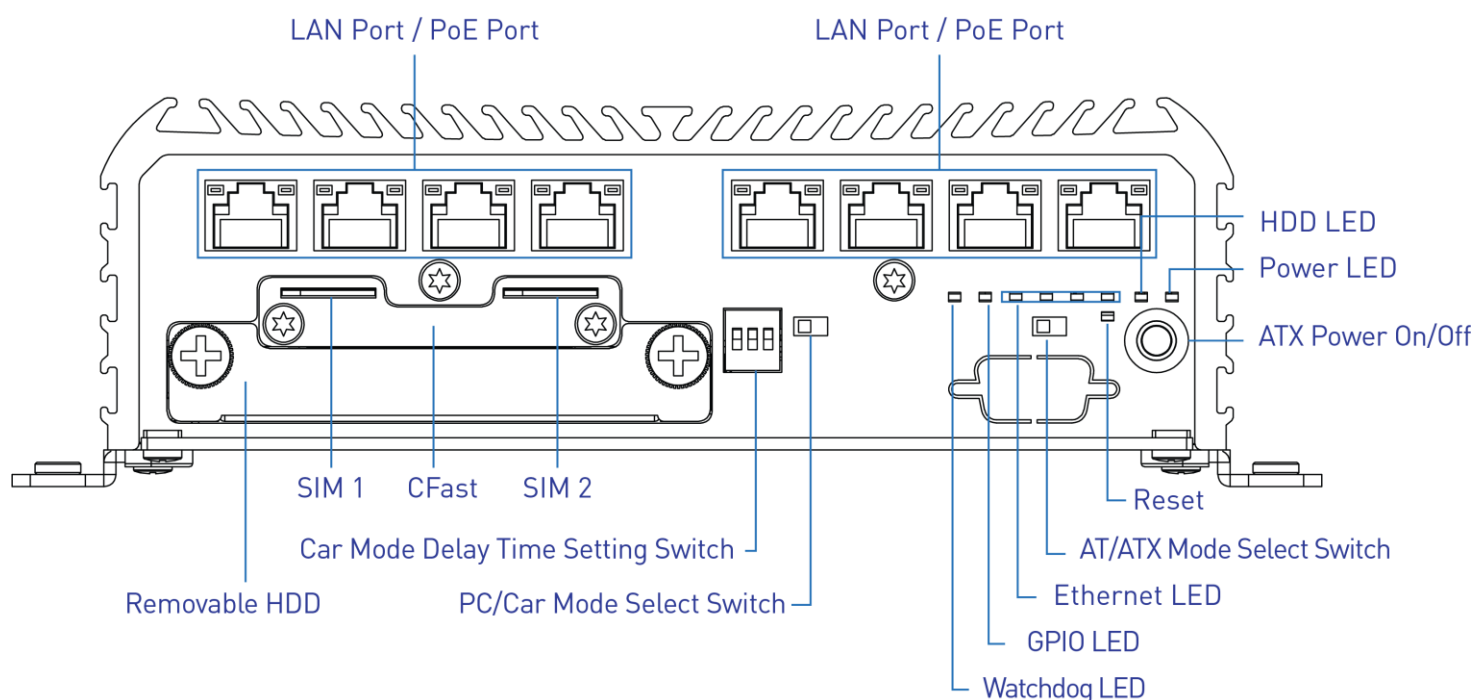
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

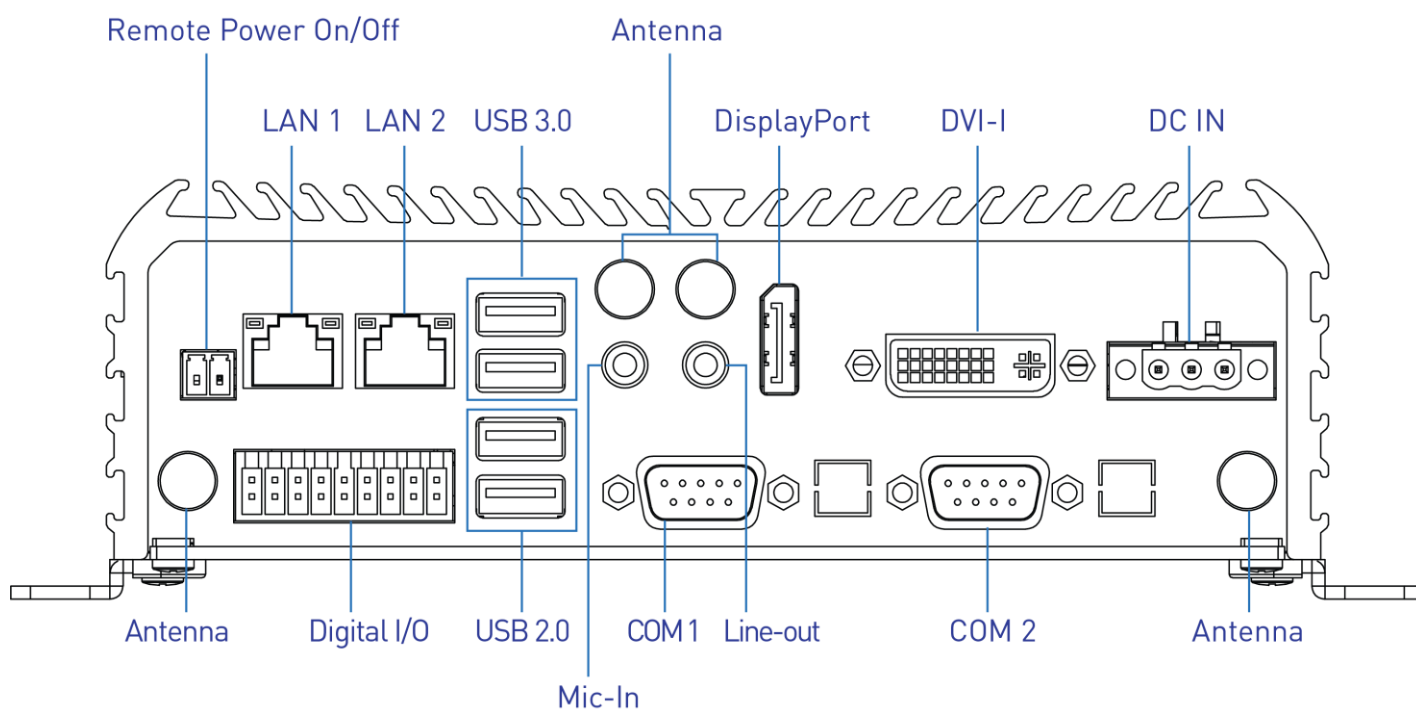
COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

Antenna hole

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



1.3.5 RCO-3200-8L(P)-M12

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

M12 LAN Port

Used to connect the system to a local area network (RCO-3200-8L-M12 Only)

M12 PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3200-8P-M12 Only)

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

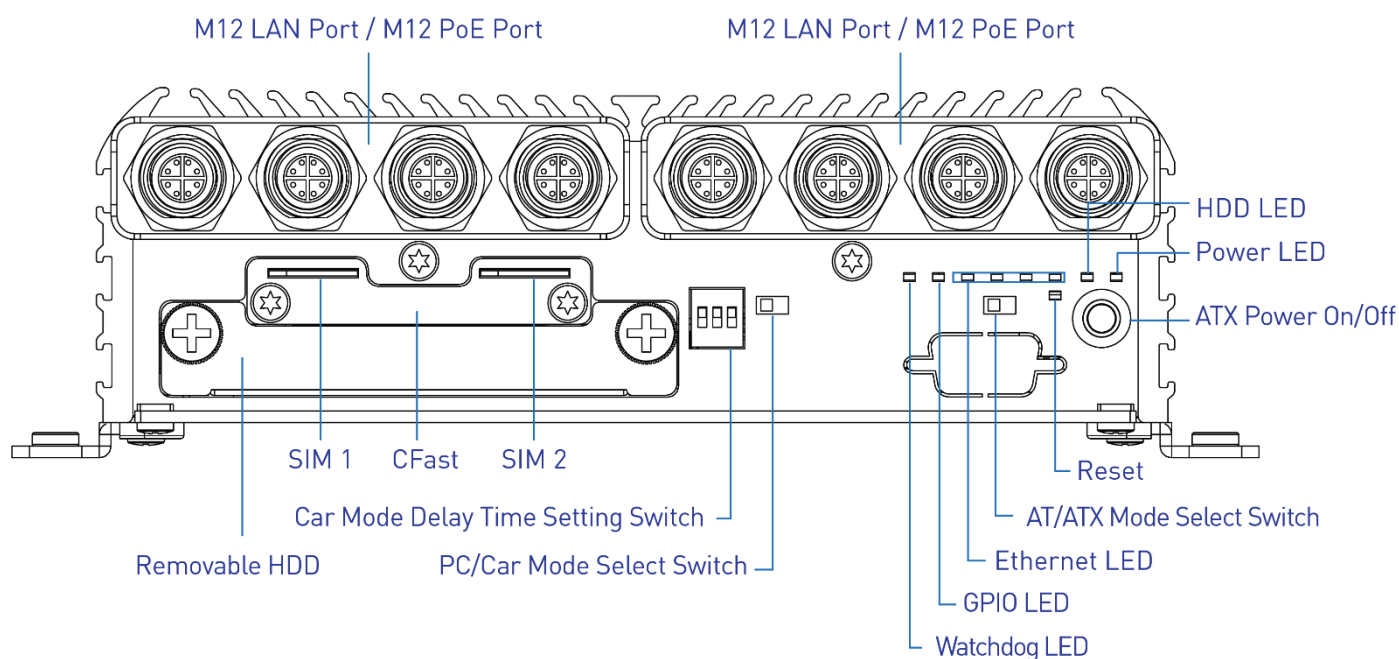
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

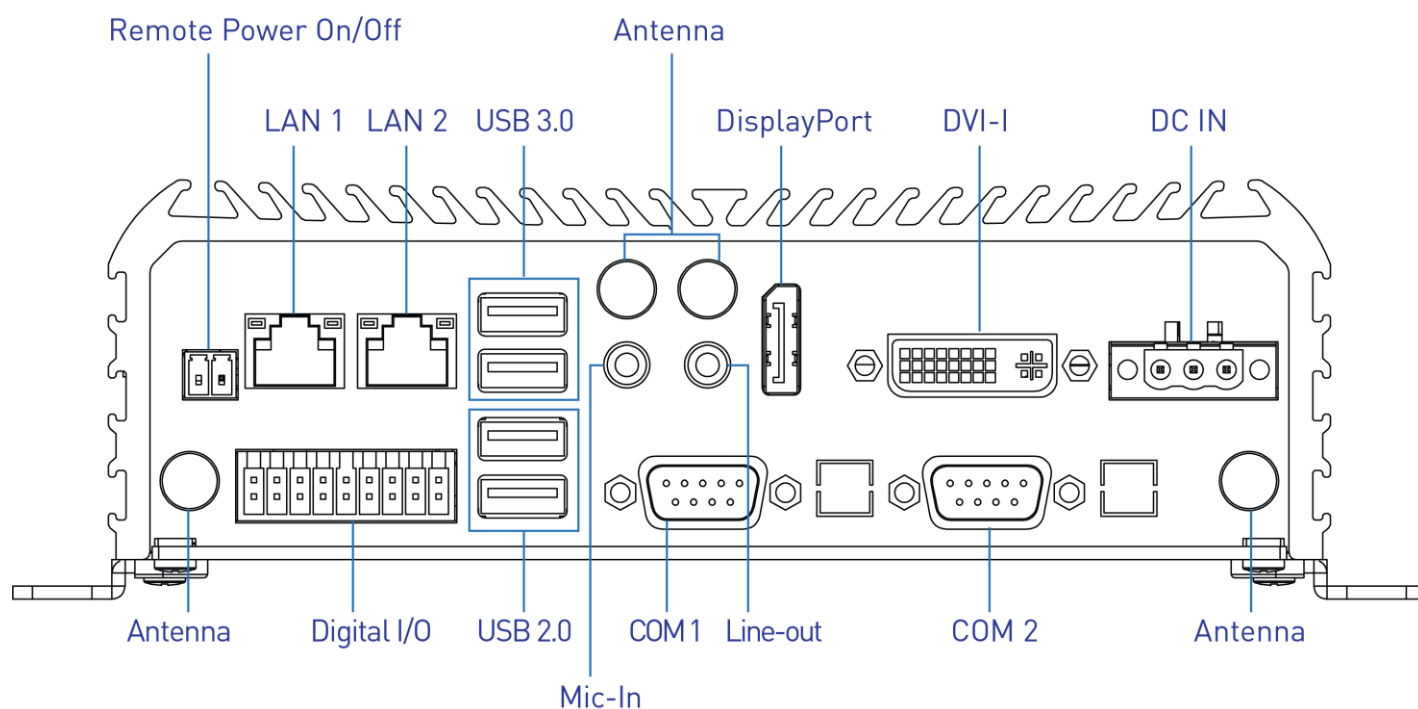
COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

Antenna hole

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



1.3.6 RCO-3211E(P)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

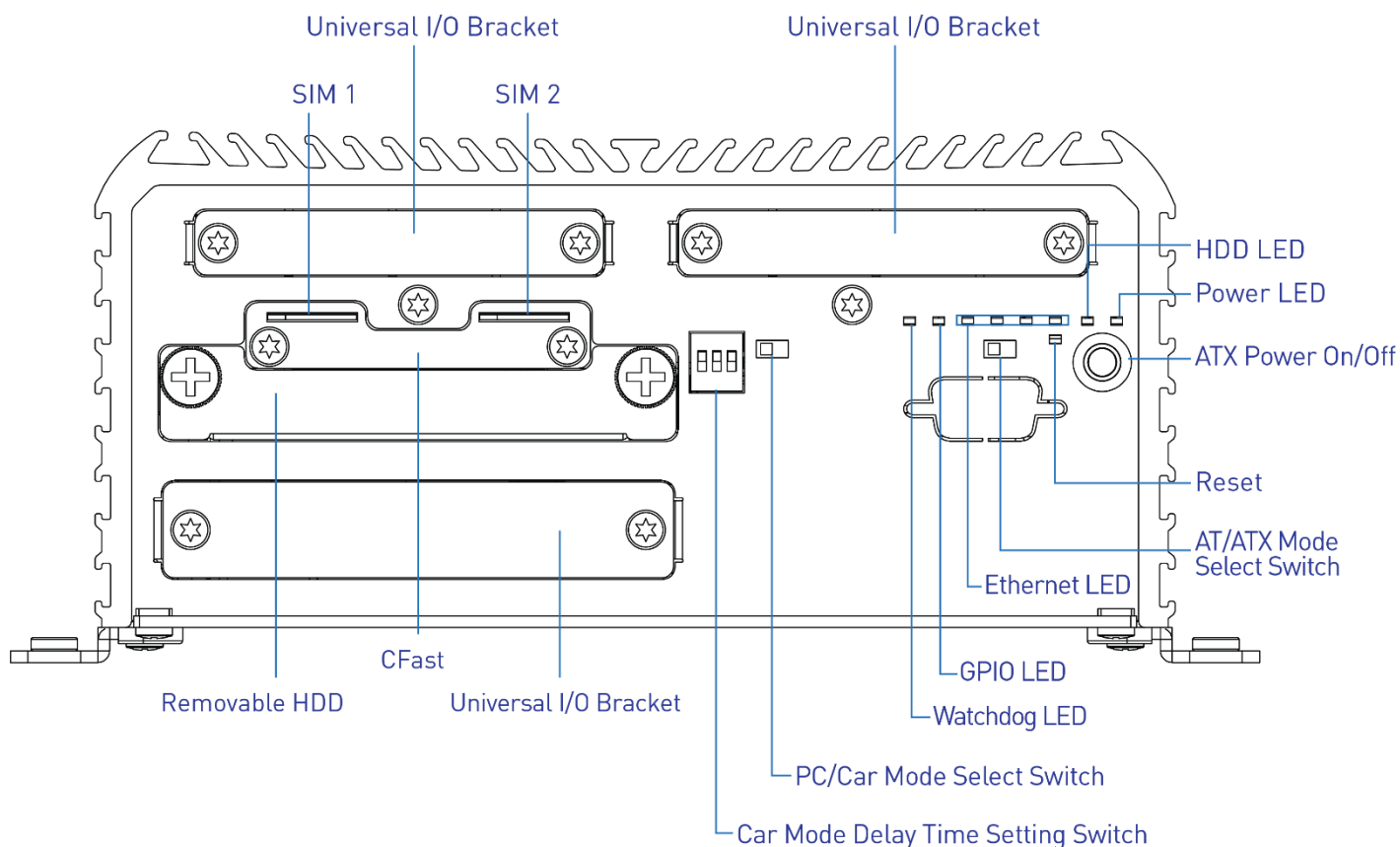
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

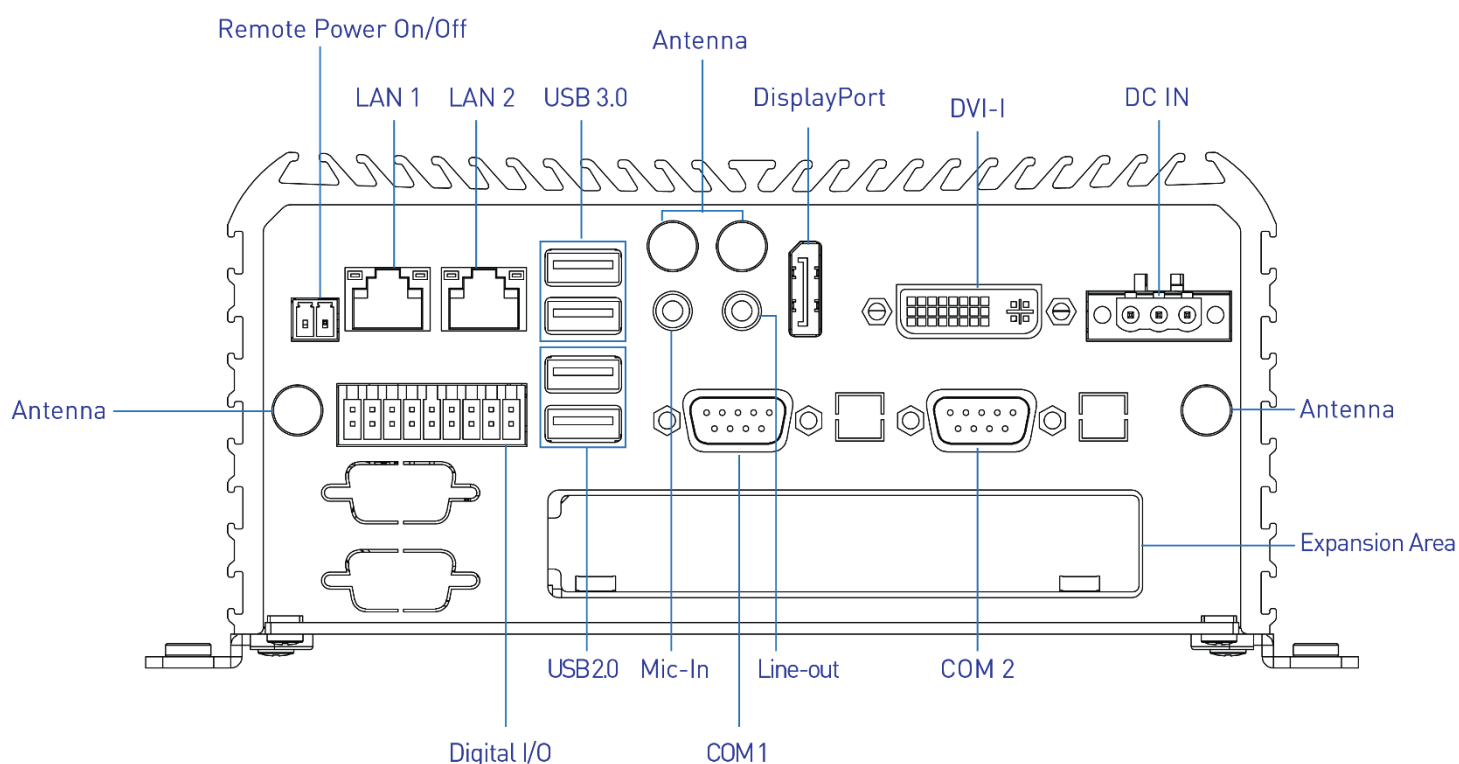
Expansion Area

Used to plug PCIe Card (RCO-3211E Only)

Used to plug PCI Card (RCO-3211P Only)

Antenna hole

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



1.3.7 RCO-3211E-4L(P) / RCO-3211P-4L(P)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

LAN port

Used to connect the system to a local area network (RCO-3211E/P-4L Only)

PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3211E/P-4P Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

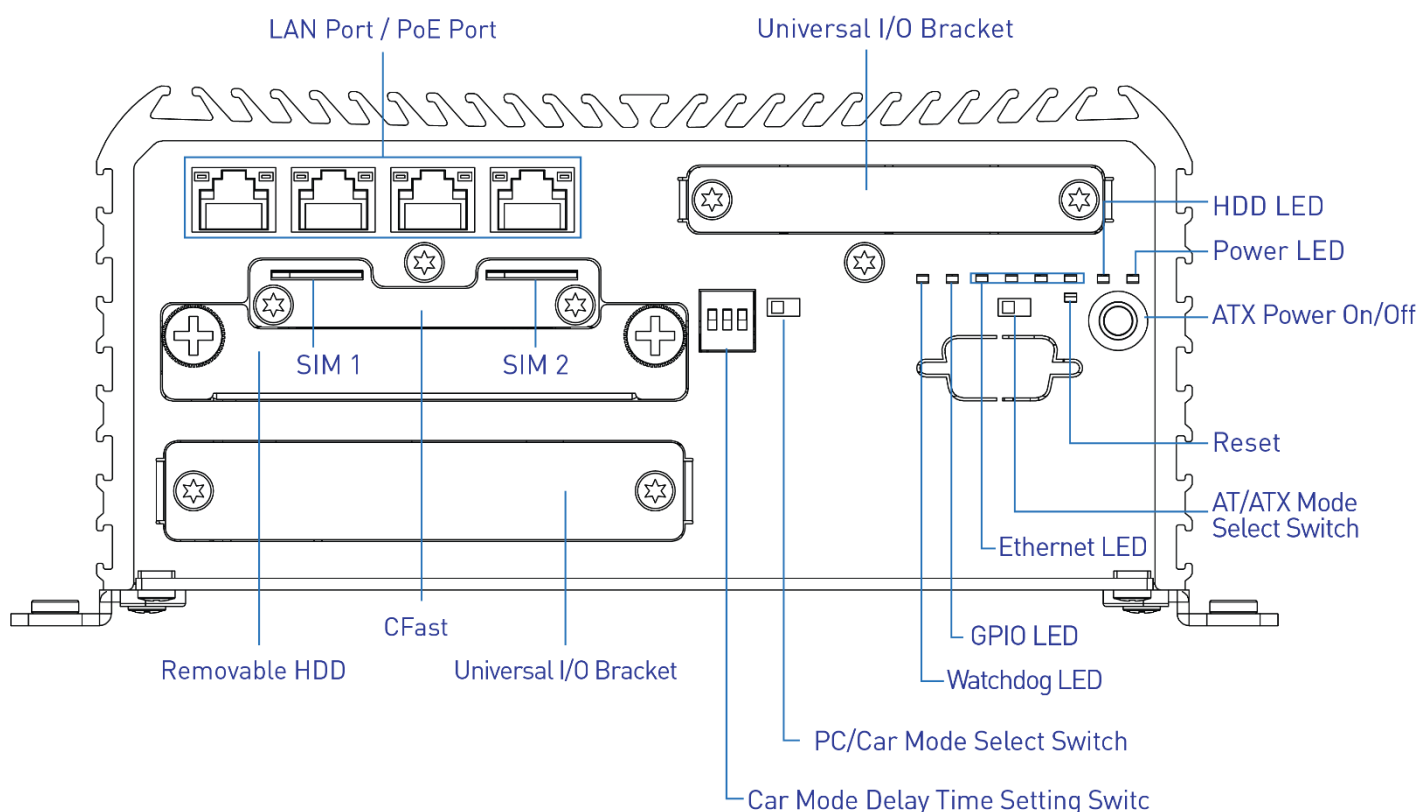
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

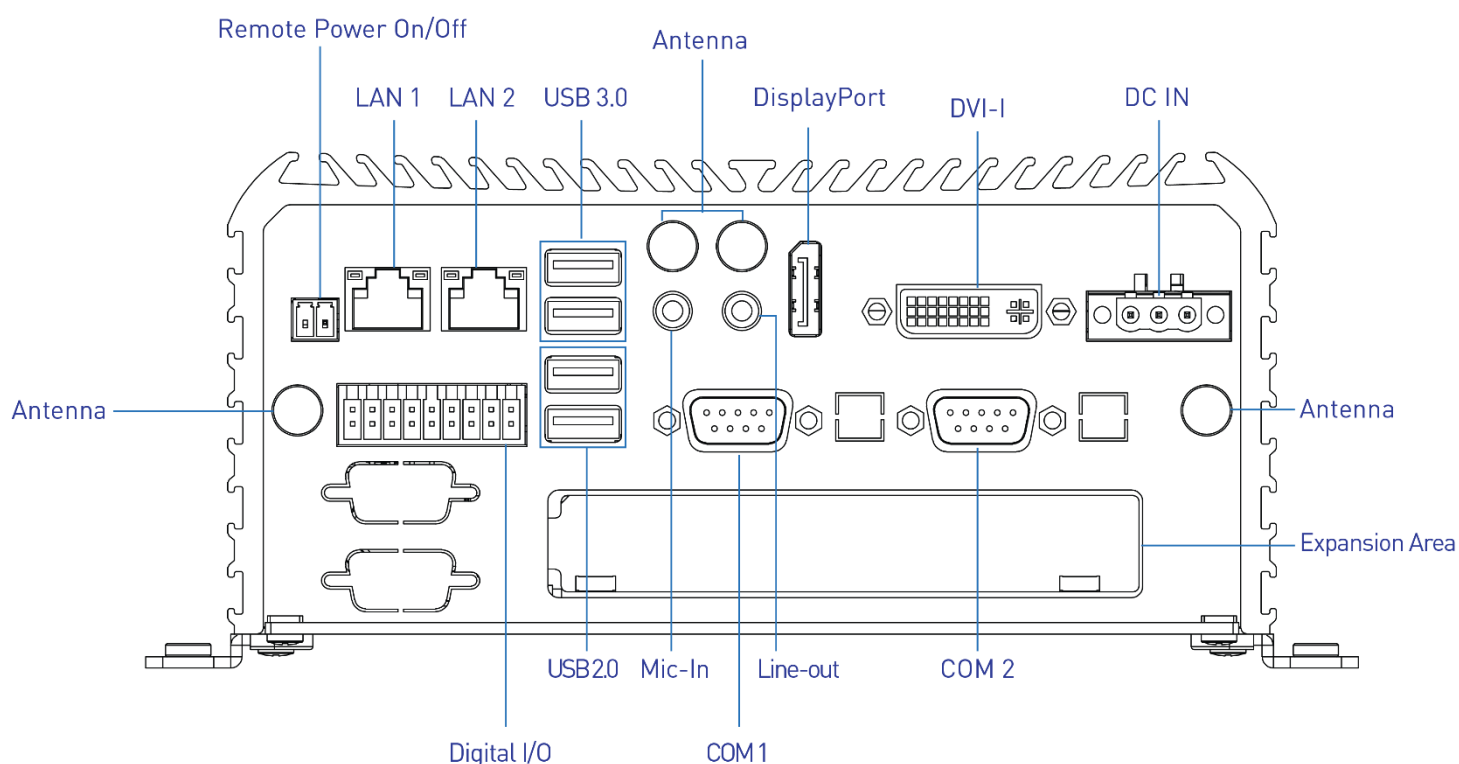
Expansion Area

Used to plug PCIe Card (RCO-3211E-4L/4P Only)

Used to plug PCI Card (RCO-3211P-4L/4P Only)

Antenna hole

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



1.3.8 RCO-3211E-4L(P)-M12 / RCO-3211P-4L(P)-M12

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

M12 LAN Port

Used to connect the system to a local area network (RCO-3211E/P-4L-M12 Only)

M12 PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3211E/P-4P-M12 Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

Indicates the status of the LAN active

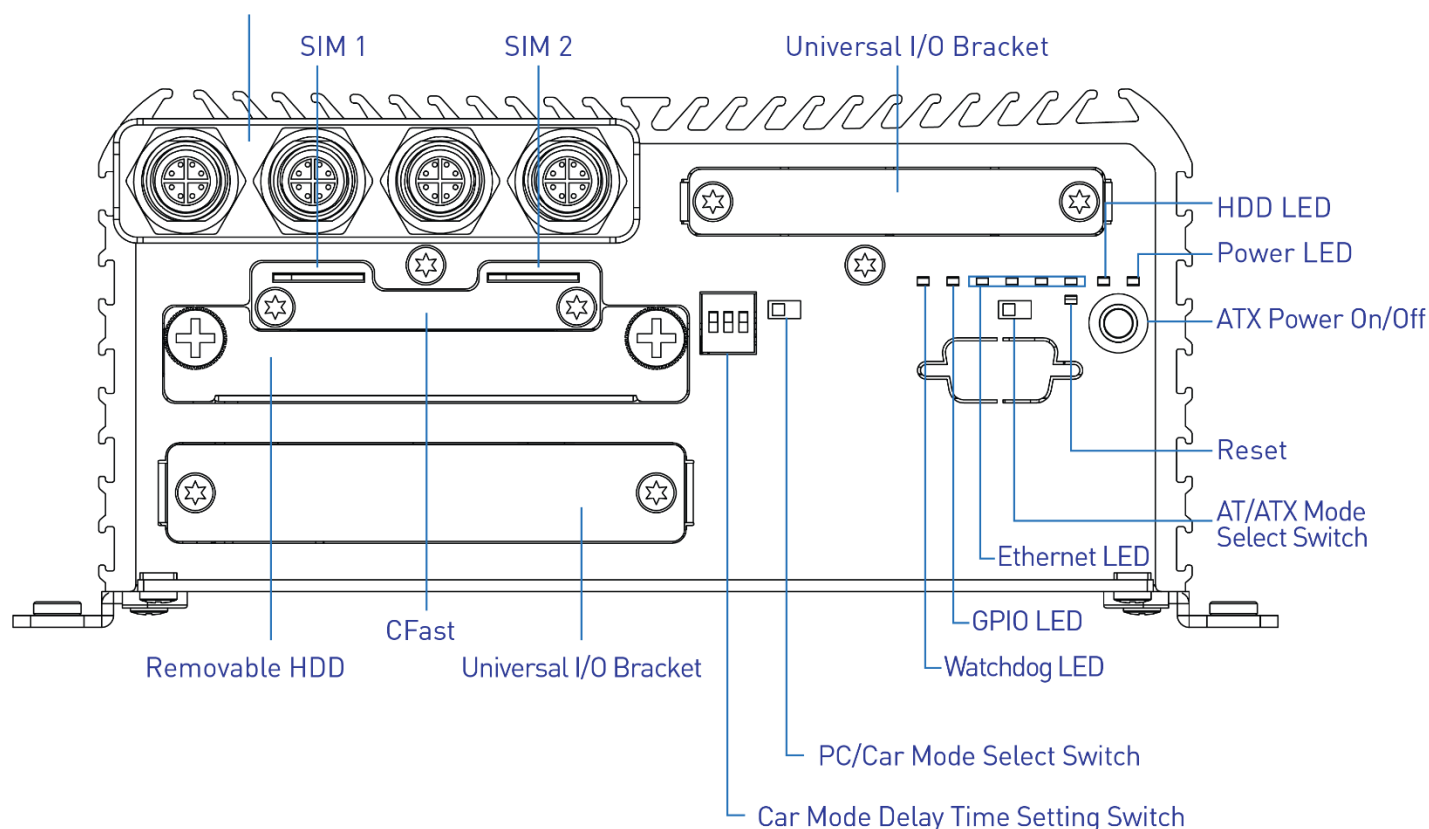
GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active

M12 LAN Port / M12 PoE Port



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

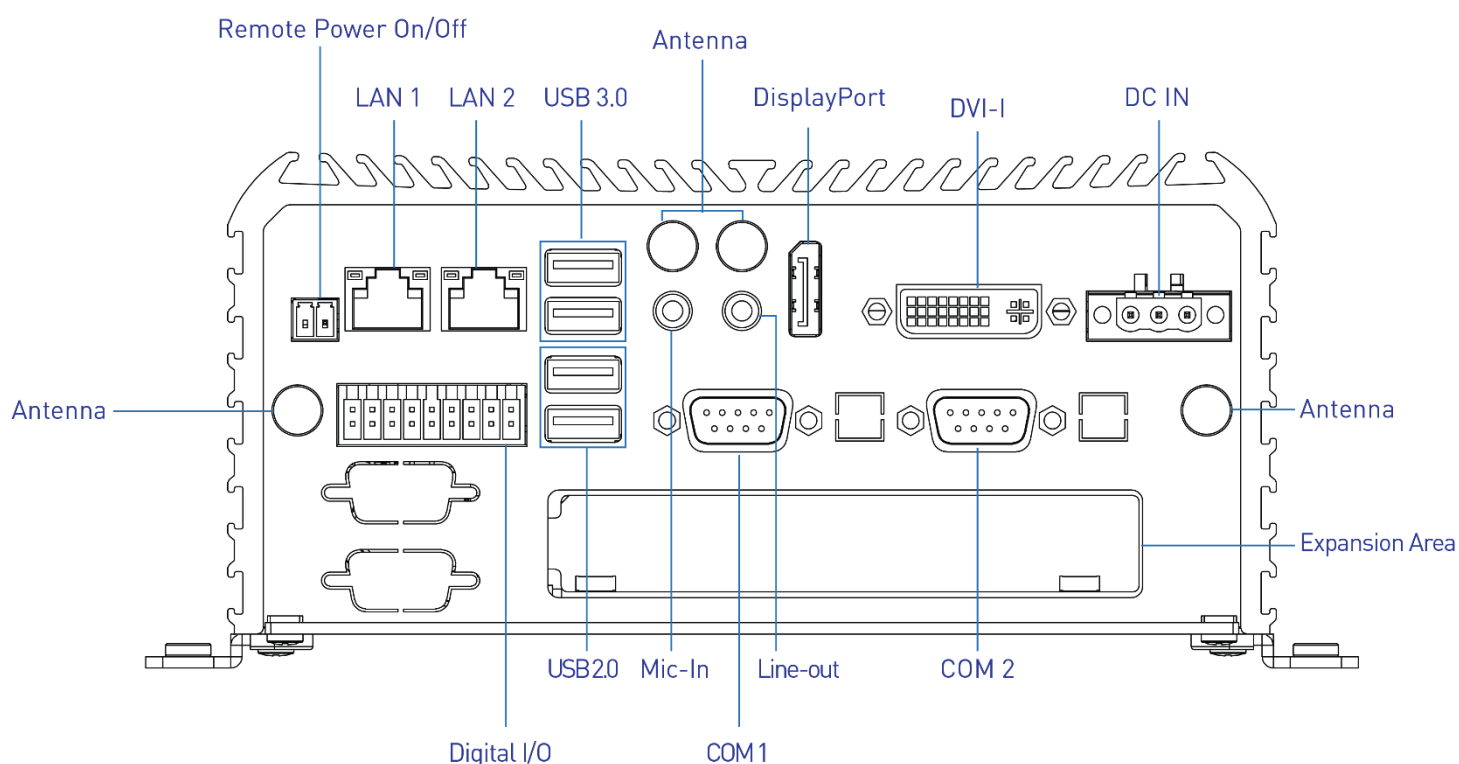
Expansion Area

Used to plug PCIe Card (RCO-3211E-4L/4P-M12 Only)

Used to plug PCI Card (RCO-3211P-4L/4P-M12 Only)

Antenna hole

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



1.3.9 RCO-3222EE(PP)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

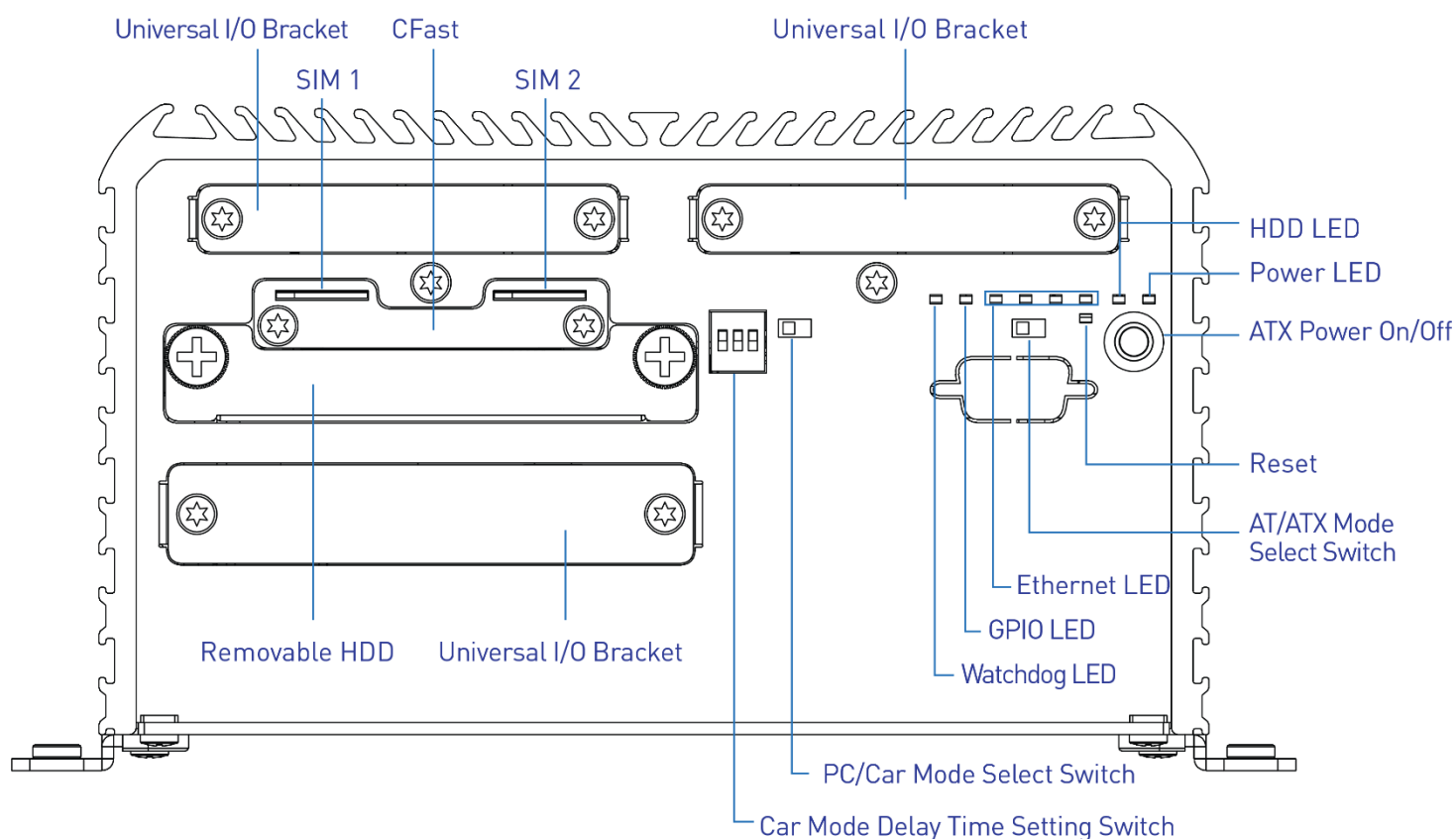
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

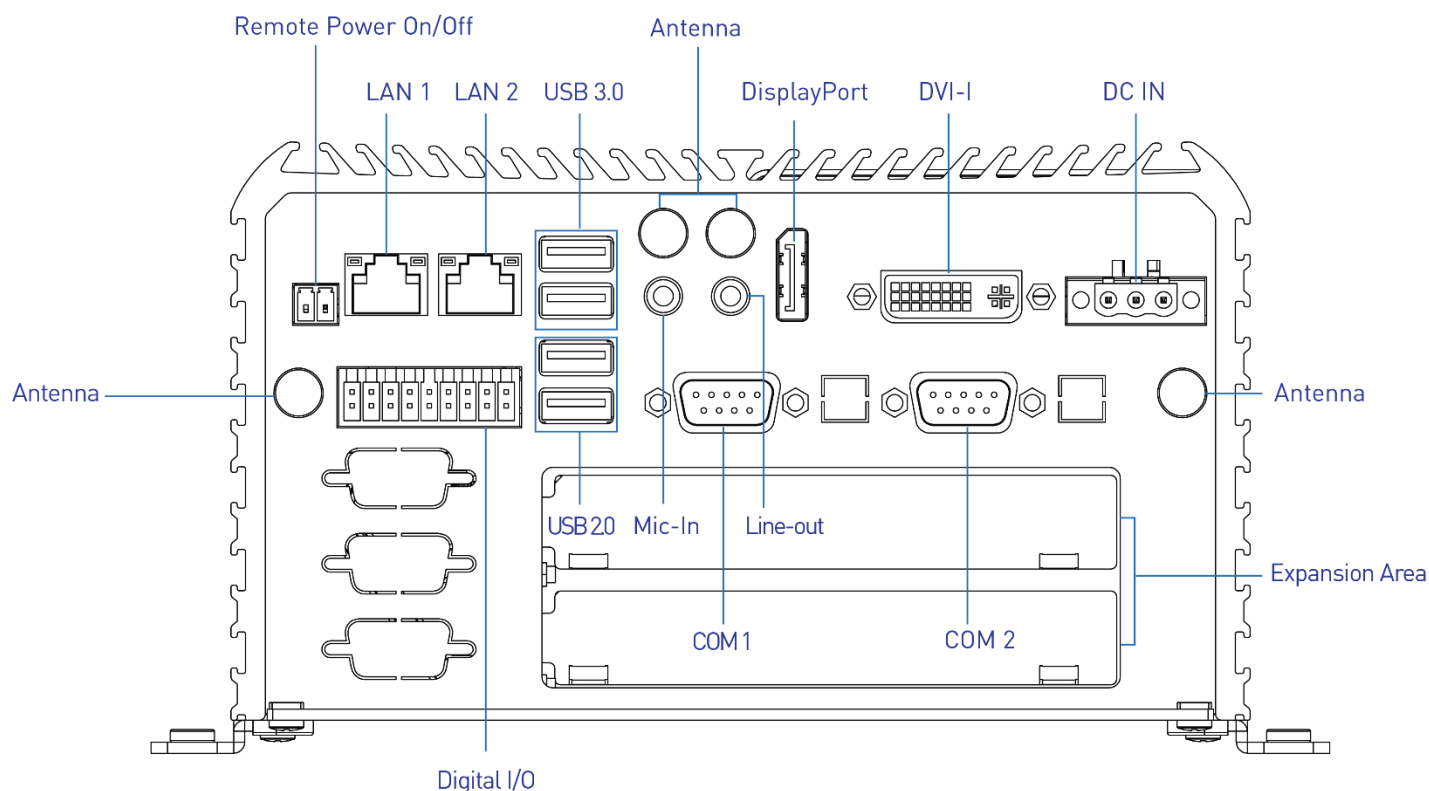
Expansion Area

Used to plug PCIe Card (RCO-3222EE Only)

Used to plug PCI Card (RCO-3222PP Only)

Antenna hole

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



1.3.10 RCO-3222EE-4L(P) / RCO-3222PP-4L(P)

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

LAN port

Used to connect the system to a local area network (RCO-3222EE/PP-4L Only)

PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3222EE/PP-4P Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

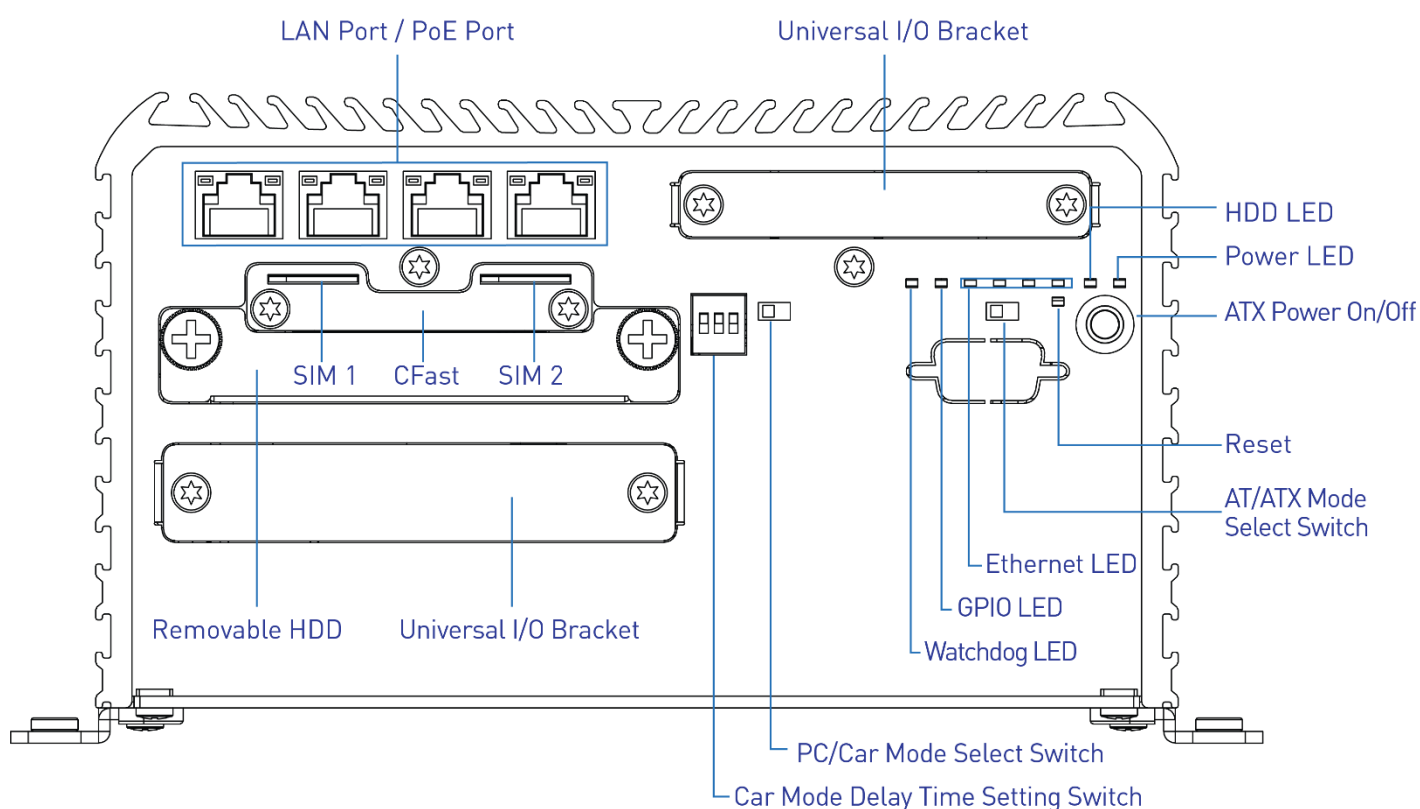
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

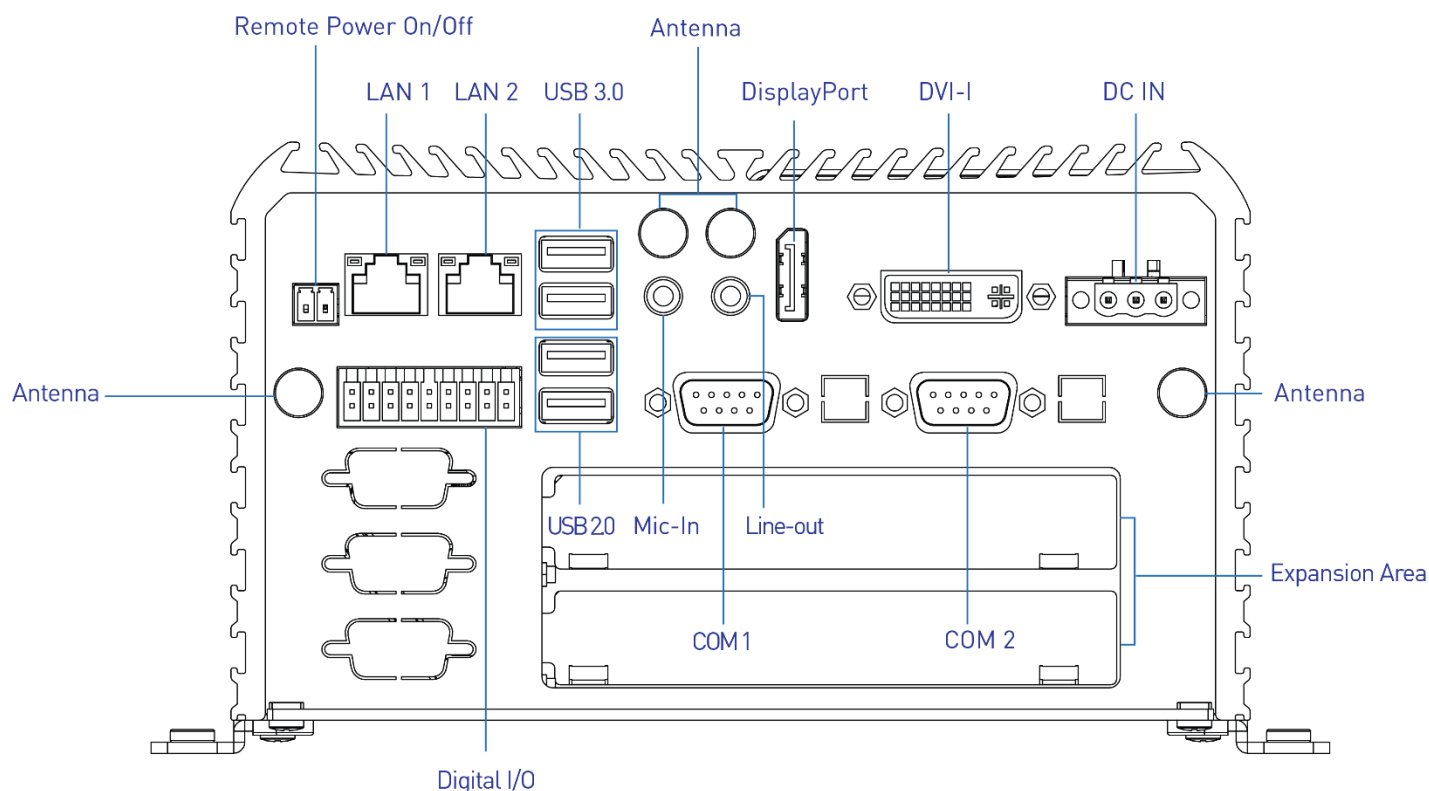
Expansion Area

Used to plug PCIe Card (RCO-3222EE-4L/4P Only)

Used to plug PCI Card (RCO-3222PP-4L/4P Only)

Antenna hole

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



1.3.11 RCO-3222EE-4L(P)-M12 / RCO-3222PP-4L(P)-M12

Front Panel

Power on/off switch

Press to power-on or power-off the system

Reset switch

Press to reset the system

AT/ATX mode select switch

Used to select AT or ATX power mode

PC/Car mode select switch

Used to select PC or Car mode

Delay time select switch

Used to select car mode PC turn off delay time

CFast Socket

Used to insert CFast card

SIM card

Used to insert SIM card

M12 LAN Port

Used to connect the system to a local area network (RCO-3222EE/PP-4L-M12 Only)

M12 PoE Port

Used to connect the system to a local area network with power over Ethernet (RCO-3222EE/PP-4P-M12 Only)

Universal I/O Bracket

Used to customized I/O output

HDD port

Removable 2.5" SATA HDD Area

Power LED

Indicates the power status of the system

HDD LED

Indicates the status of the hard drive

Ethernet LEDs

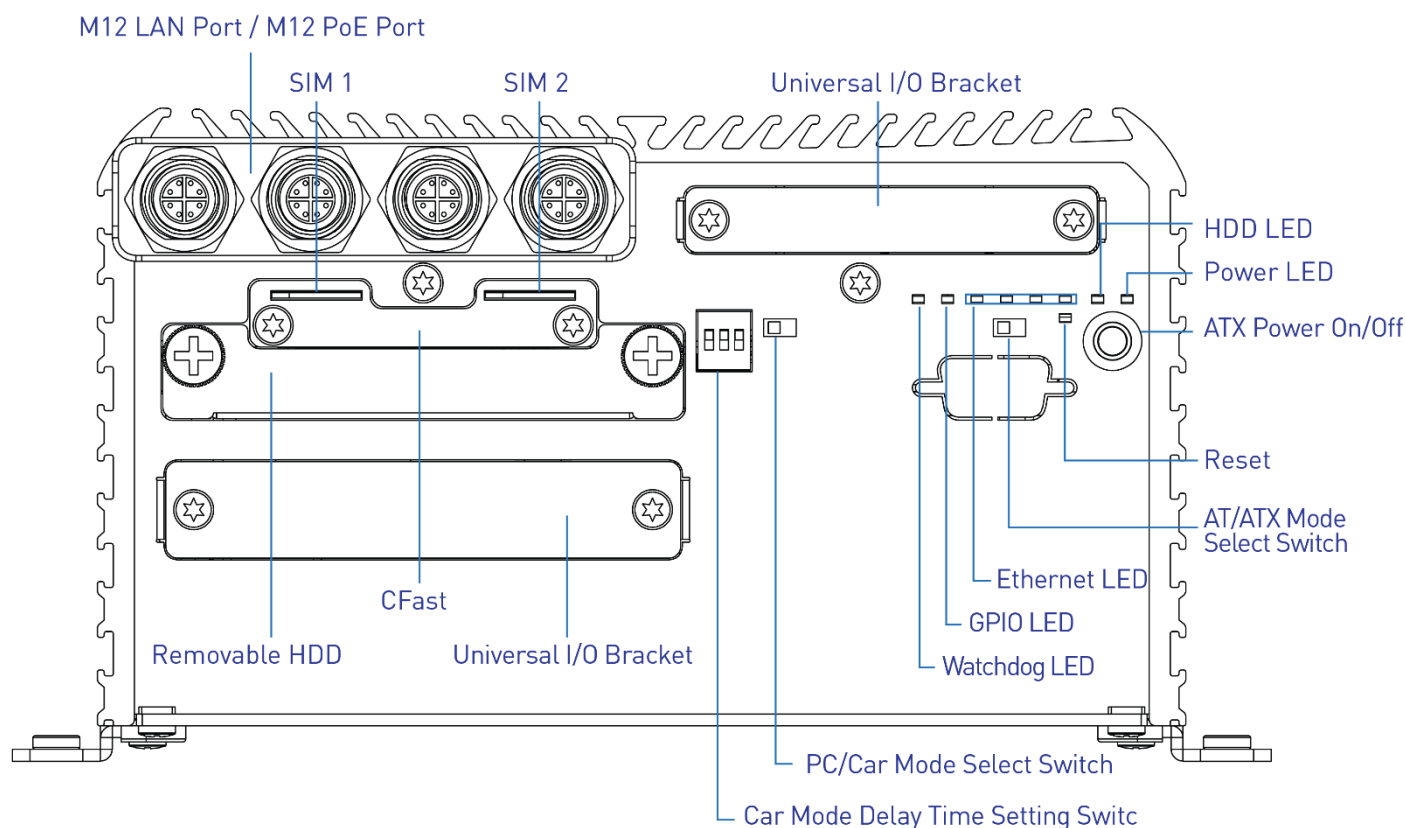
Indicates the status of the LAN active

GPIO LED

Indicates the status of the customer define

Watchdog LED

Indicates the status of the watchdog active



Rear Panel

DC IN

Used to plug a DC power input with terminal block

DVI-I port

Used to connect a DVI monitor or connect optional split cable for dual display mode

DisplayPort

Used to connect a DisplayPort monitor

Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

USB 3.0 port

Used to connect USB 3.0/2.0/1.1 device

USB 2.0 port

Used to connect USB 2.0/1.1 device

LAN port

Used to connect the system to a local area network

Remote Power on/off Terminal Block

Used to plug a remote power on/off terminal block

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Digital I/O Terminal Block

The Digital I/O terminal block supports 8 digital input and 8 digital output

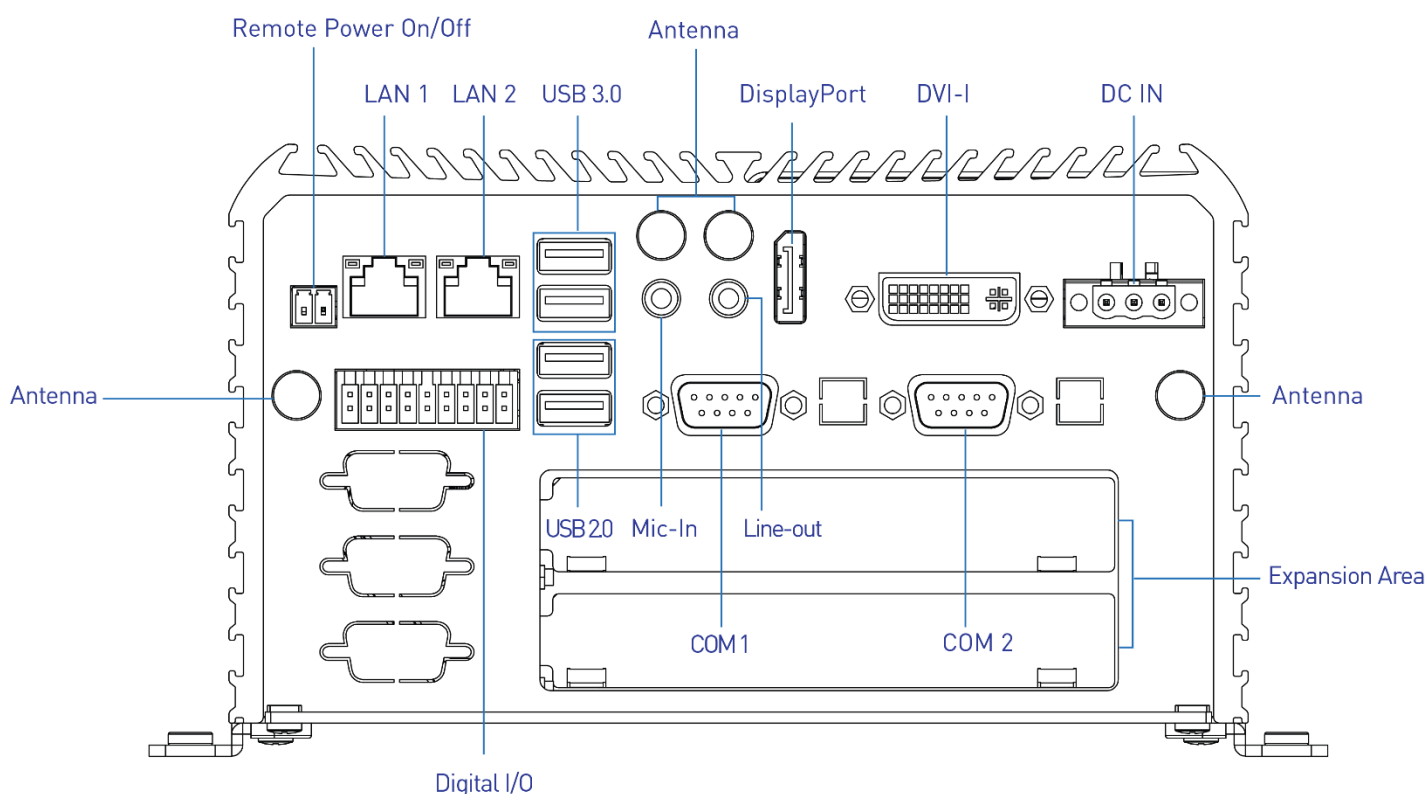
Expansion Area

Used to plug PCIe Card (RCO-3222EE-4L/4P-M12 Only)

Used to plug PCI Card (RCO-3211PP-4L/4P-M12 Only)

Antenna hole

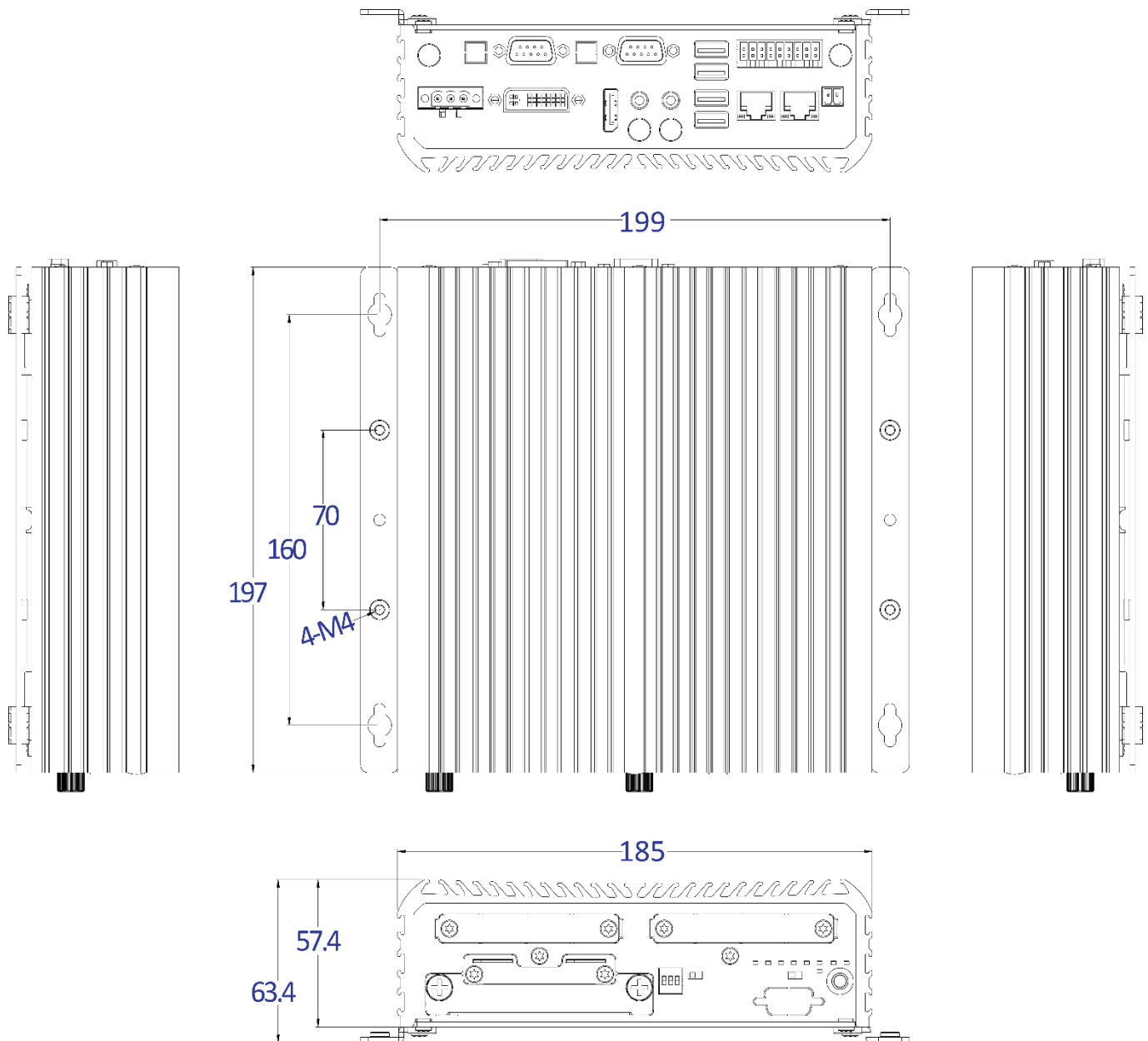
Used to connect an antenna for optional Mini-PCIe WiFi module



1.4 Mechanical Dimensions

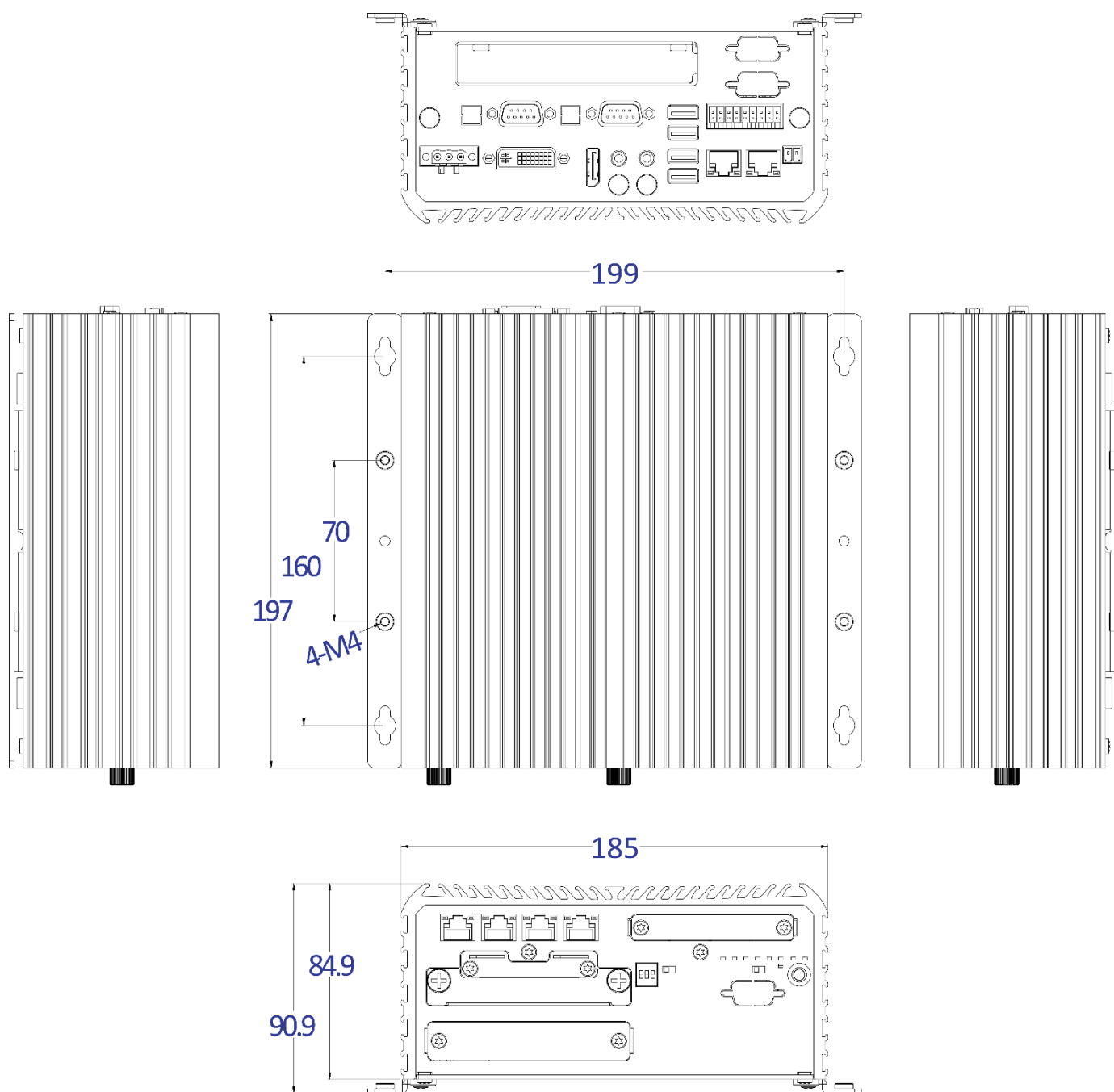
1.4.1 RCO-3200 / RCO-3200-4L(P) / RCO-3200-4L(P)-M12 / RCO-3200-8L(P) / RCO-3200-8L(P)-M12

Unit: mm



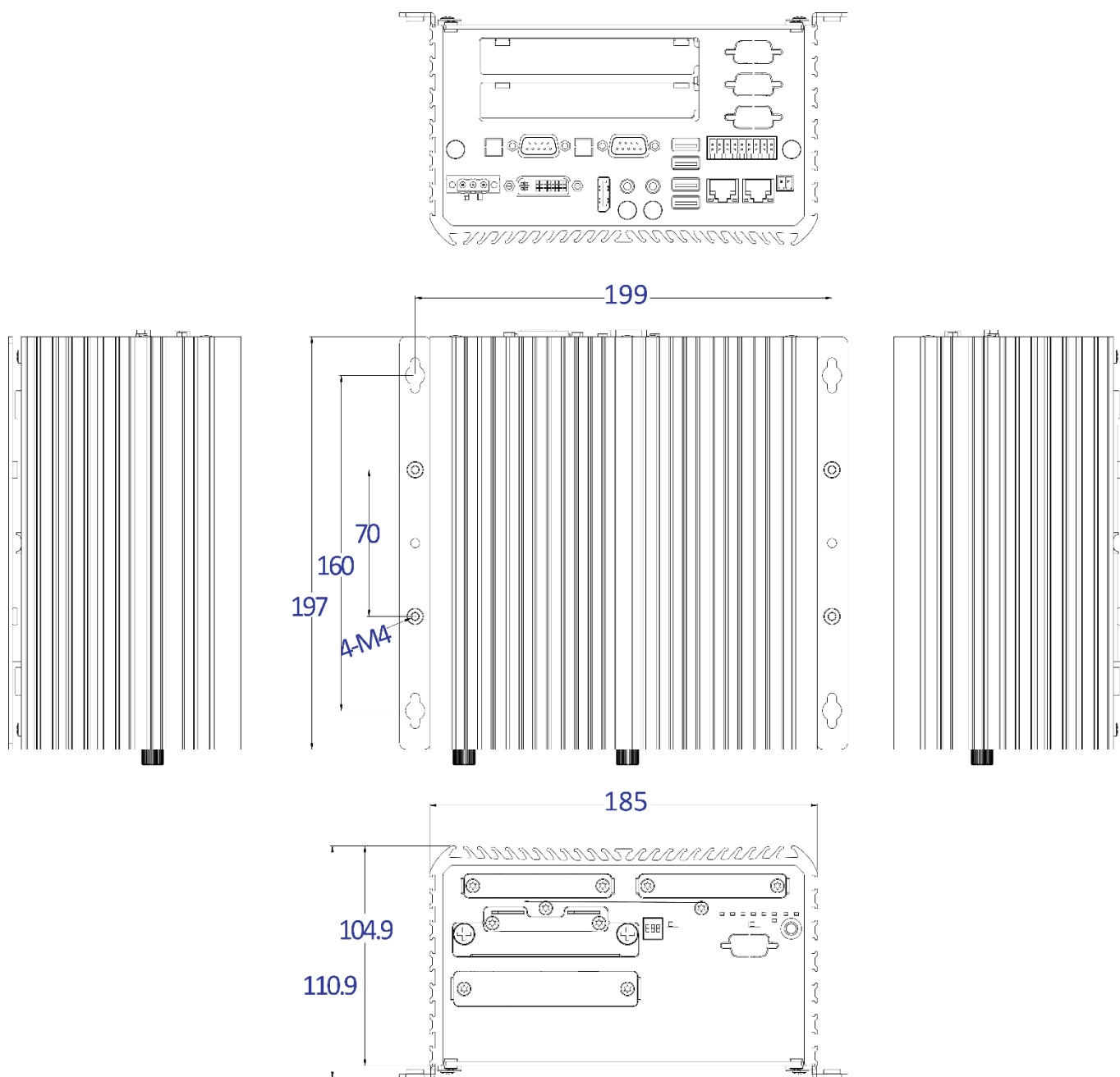
1.4.2 RCO-3211E(P) / RCO-3211E(P)-4L(P) / RCO-3211E(P)-4L(P)-M12

Unit: mm



1.4.3 RCO-3222EE(PP) / RCO-3222EE(PP)-4L(P) / RCO-3222EE(PP)-4L(P)-M12

Unit: mm

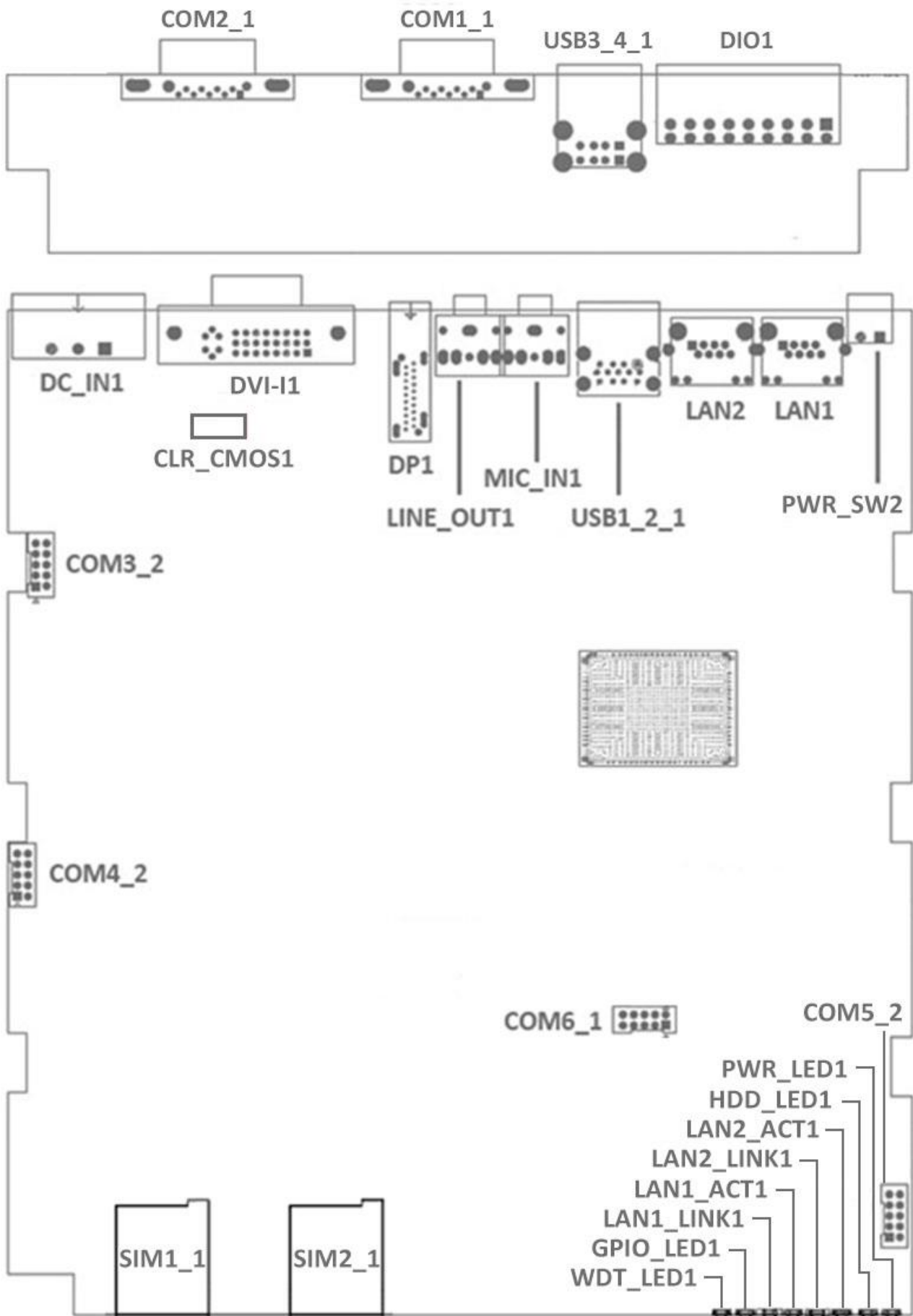


Chapter 2

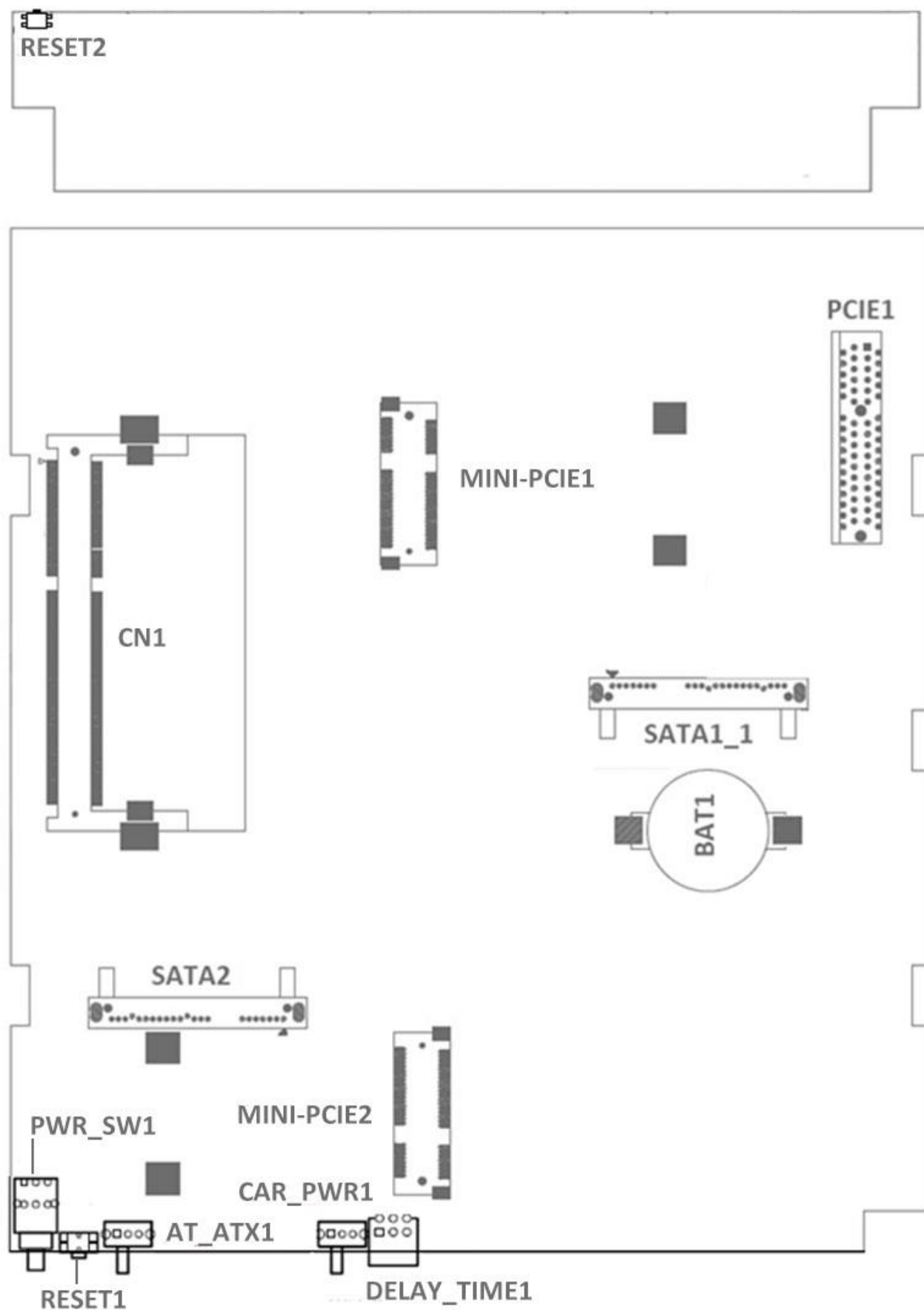
Switches and Connectors

2.1 Switch and Connector Locations

2.1.1 Top View



2.1.2 Bottom View



2.2 Connector / Switch Definition

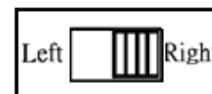
List of Connector / Switch

Connector Location	Definition
AT_ATX1	AT / ATX Power Mode Switch
CLR_CMOS1	Clear BIOS Switch
CAR_PWR1	PC / Car Mode Switch
DELAY_TIME1	Car mode PC turn off delay time
CFAST1_1	CFast Socket
PWR_SW1	Power Switch
RESET1	Reset Switch
USB1_2_1	USB 3.0 Port
USB3_4_1	USB 2.0 Port
SIM1_1, SIM2_1	SIM Card Socket
COM1_1, COM2_1	RS232 / RS422 / RS485 Connector
COM3_2, COM4_2, COM5_2, COM6_1	RS232 / RS422 / RS485 Connector
LAN1, LAN2	LAN Port
LAN3, LAN4, LAN5, LAN6, LAN7, LAN8, LAN9, LAN10	LAN Port / M12 LAN Port
DC_IN1	3-pin DC 9~50V Power Input Connector
DVI-I1	DVI-I Connector
DP1	DisplayPort Connector
LINE_OUT1	Line-out Jack
MIC_IN1	Mic-in Jack
DIO1	8DI / 8DO Connector
PWR_SW2	Remote Power Switch
MINI-PCIE1	Mini PCI-Express / mSATA Socket
MINI-PCIE2	Mini PCI-Express Socket
SATA1_1, SATA2	SATA with Power Connector
PCIE1	PCI-Express X4 Slot (1-lane)
PWR_LED1	Power LED Status
HDD_LED1	HDD Access LED Status
LAN1_LINK1, LAN2_LINK1	LAN Link LED
LAN1_ACT1, LAN2_ACT1	LAN Active LED
GPIO_LED1	GPIO LED Status
WDT_LED1	Watchdog LED Status

2.3 Switches Definitions

AT_ATX1: AT / ATX Power Mode Switch

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



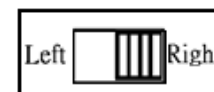
CLR_CMOS1: Clear BIOS Switch

Switch	Definition
Off	Normal Status (Default)
ON	Clear BIOS



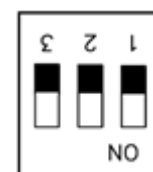
CAR_PWR1: PC / Car Mode Switch

Switch	Definition
1-2 (Right)	PC Power Mode (Default)
2-3 (Left)	Power Ignition Mode



DELAY_TIME1: Power off delay time setup Switch

Switch 1 / 2 / 3	Definition
ON / ON / ON	3 sec. (Default Shutdown Timer by O.S)
ON / ON / OFF	1 min.
ON / OFF / ON	5 min.
ON / OFF / OFF	10 min.
OFF / ON / ON	30 min.
OFF / ON / OFF	1 hour
OFF / OFF / ON	2 hour



Step of Setting Power Ignition

Step 1:

To select power ignition by PC/CAR switch.

Step 2:

To configure the power off delay time, please check the Delay Time Setting Options in advance.

Step 3:

To connect the power and ignition power

Step 3

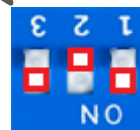
Switch 1 / 2 / 3	Power off delay time
ON / ON / ON	3 second
ON / ON / OFF	1 minute
ON / OFF / ON	5 minutes
ON / OFF / OFF	10 minutes
OFF / ON / ON	30 minutes
OFF / ON / OFF	1 hour
OFF / OFF / ON	2 hours

Step 1

Pin 1-2 (Right): PC Mode

Pin 2-3 (Left): Power Ignition Mode

CAR PC



Step 3

To connect the battery power and ignition signal



Example: Delay Time Setting for 5 minutes

1. If delay time set as "5 minutes"



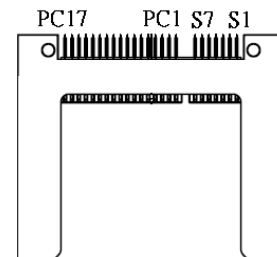
2. The system will shut down 5 minutes later after turning off the vehicle.



2.4 Connectors Definitions

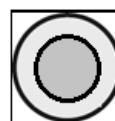
CFAST1_1: CFast Socket

Pin	Definition	Pin	Definition	Pin	Definition
S1	GND	PC1	NC	PC10	NC
S2	SATA_TXP1	PC2	GND	PC11	NC
S3	SATA_TXN1	PC3	NC	PC12	NC
S4	GND	PC4	NC	PC13	+3.3V
S5	SATA_RXN1	PC5	NC	PC14	+3.3V
S6	SATA_RXP1	PC6	NC	PC15	GND
S7	GND	PC7	GND	PC16	GND
		PC8	NC	PC17	NC
		PC9	NC		



PWR_SW1: Power Button

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



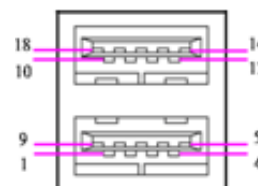
RESET1 : Reset Button

Pin	Definition
1	RESET
2	GND



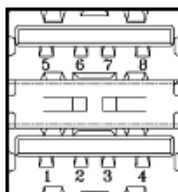
USB1_2_1: USB3.0 Connector, Type A

Pin	Definition	Pin	Definition
1	+5V	10	+5V
2	USB2_D0-	11	USB2_D1-
3	USB2_D0+	12	USB2_D1+
4	GND	13	GND
5	USB3_RX0-		USB3_RX1-
6	USB3_RX0+		USB3_RX1+
7	GND		GND
8	USB3_TX0-		USB3_TX1-
9	USB3_TX0+		USB3_TX1+

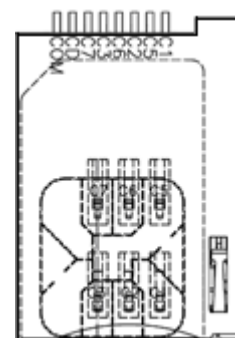


USB3_4_1: USB2.0 Connector, Type A

Pin	USB3_4_1 Definition
1	+5V
2	USB2_D2-
3	USB2_D2+
4	GND
5	+5V
6	USB2_D3-
7	USB2_D3+
8	GND

**SIM1_1, SIM2_1 : SIM Card Socket**

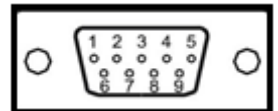
Pin	Definition	Pin	Definition
C1	UIM_PWR	C6	UIM_VPP
C2	UIM_RESET	C7	UIM_DATA
C3	UIM_CLK	CD	NC
C5	GND	COM	GND



COM1_1: RS232 / RS422 / RS485 Connector

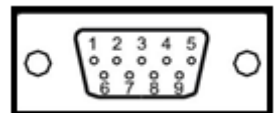
Connector Type: 9-pin D-Sub

Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD1	TX1-	DATA1-
2	RXD1	TX1+	DATA1+
3	TXD1	RX1+	
4	DTR1	RX1-	
5	GND	GND	GND
6	DSR1		
7	RTS1		
8	CTS1		
9	RI1		

**COM2_1: RS232 / RS422 / RS485 Connector**

Connector Type: 9-pin D-Sub

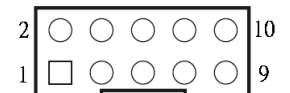
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD2	TX2-	DATA2-
2	RXD2	TX2+	DATA2+
3	TXD2	RX2+	
4	DTR2	RX2-	
5	GND	GND	GND
6	DSR2		
7	RTS2		
8	CTS2		
9	RI2		



COM3_2 : RS232 / RS422 / RS485 Connector

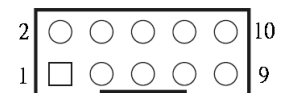
Connector Type: 2X5 10-pin box header, 2.54mm pitch

COM3_1			
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD3	TX3-	DATA3-
2	RXD3	TX3+	DATA3+
3	TXD3	RX3+	
4	DTR3	RX3-	
5	GND	GND	GND
6	DSR3		
7	RTS3		
8	CTS3		
9	RI3		

**COM4_2 : RS232 / RS422 / RS485 Connector**

Connector Type: 2X5 10-pin box header, 2.54mm pitch

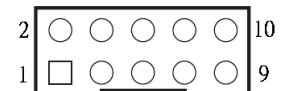
COM4_1			
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD4	TX4-	DATA4-
2	RXD4	TX4+	DATA4+
3	TXD4	RX4+	
4	DTR4	RX4-	
5	GND	GND	GND
6	DSR4		
7	RTS4		
8	CTS4		
9	RI4		



COM5_2 : RS232 / RS422 / RS485 Connector

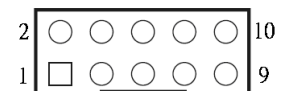
Connector Type: 2X5 10-pin box header, 2.54mm pitch

COM3_1			
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD5	TX5-	DATA5-
2	RXD5	TX5+	DATA5+
3	TXD5	RX5+	
4	DTR5	RX5-	
5	GND	GND	GND
6	DSR5		
7	RTS5		
8	CTS5		
9	RI5		

**COM6_1 : RS232 / RS422 / RS485 Connector**

Connector Type: 2X5 10-pin box header, 2.54mm pitch

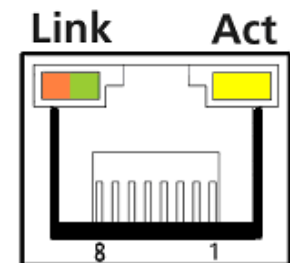
COM4_1			
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD6	TX6-	DATA6-
2	RxD6	TX6+	DATA6+
3	TxD6	RX6+	
4	DTR6	RX6-	
5	GND	GND	GND
6	DSR6		
7	RTS6		
8	CTS6		
9	RI6		



LAN1, LAN2: RJ45 with LEDs Port

Connector Type: RJ45 Connector

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



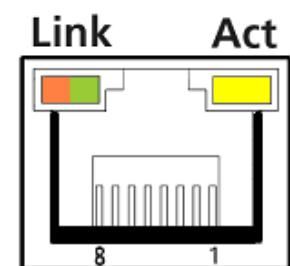
Pin	Definition	Pin	Definition
1	LAN2_MDI0P	5	LAN2_MDI2N
2	LAN2_MDI0N	6	LAN2_MDI1N
3	LAN2_MDI1P	7	LAN2_MDI3P
4	LAN2_MDI2P	8	LAN2_MDI3N

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		

LAN3, LAN4, LAN5, LAN6, LAN7, LAN8, LAN9, LAN10: RJ45 with LEDs Port

Connector Type: RJ45 Connector

Pin	LAN3~LAN6 Definition	Pin	LAN3~LAN6 Definition
1	LAN_MDI0P	5	LAN_MDI2N
2	LAN_MDI0N	6	LAN_MDI1N
3	LAN_MDI1P	7	LAN_MDI3P
4	LAN_MDI2P	8	LAN_MDI3N

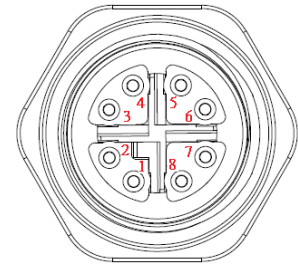


Link LED Status	LAN3~LAN6 Definition	Act LED Status	LAN3~LAN6 Definition
Steady Orange	1Gbps Network Link	Blinking Yellow	Data Activity
Steady Green	100Mbps Network Link	Off	No Activity
Off	10Mbps Network Link		

LAN3, LAN4, LAN5, LAN6, LAN7, LAN8, LAN9, LAN10: M12 Lan Port

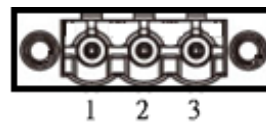
Connector Type: M12 X-code Female Connector

Pin	LAN3~LAN6 Definition	Pin	LAN3~LAN6 Definition
1	LAN_MDI0P	5	LAN_MDI3N
2	LAN_MDI0N	6	LAN_MDI3N
3	LAN_MDI1P	7	LAN_MDI2P
4	LAN_MDI1N	8	LAN_MDI2N

**DC_IN1: DC Power Input Connector (+9~50V)**

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

Pin	Definition
1	+9~50VIN
2	Power Ignition
3	GND

**DVI-I1: DVI-I Connector**

Pin	Definition	Pin	Definition
1	DVI_TX2-	16	DVI Hot Plug Detect
2	DVI_TX2+	17	DVI_TX0-
3	GND	18	DVI_TX0+
4	NC	19	GND
5	NC	20	VGA_DDC_CLOCK
6	DVI_DDC_CLOCK	21	VGA_DDC_DATA
7	DVI_DDC_DATA	22	GND
8	VGA_VSYNC	23	DVI_TXCLK+
9	DVI_TX1-	24	DVI_TXCLK-
10	DVI_TX1+	C1	VGA_RED
11	GND	C2	VGA_GREEN
12	NC	C3	VGA_BLUE
13	NC	C4	VGA_HSYNC
14	+5V	C5	GND
15	GND		



DP1: DisplayPort Connector

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

**LINE_OUT1 : Line-out Jack (Green)**

Connector Type: 5-pin Phone Jack

Pin	Definition
1	GND
2	OUT_R
3	NC
4	GND
5	OUT_L

**MIC_IN1: Microphone Jack (Pink)**

Connector Type: 5-pin Phone Jack

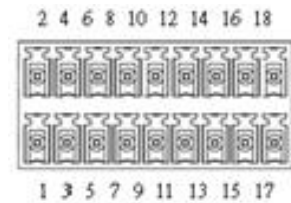
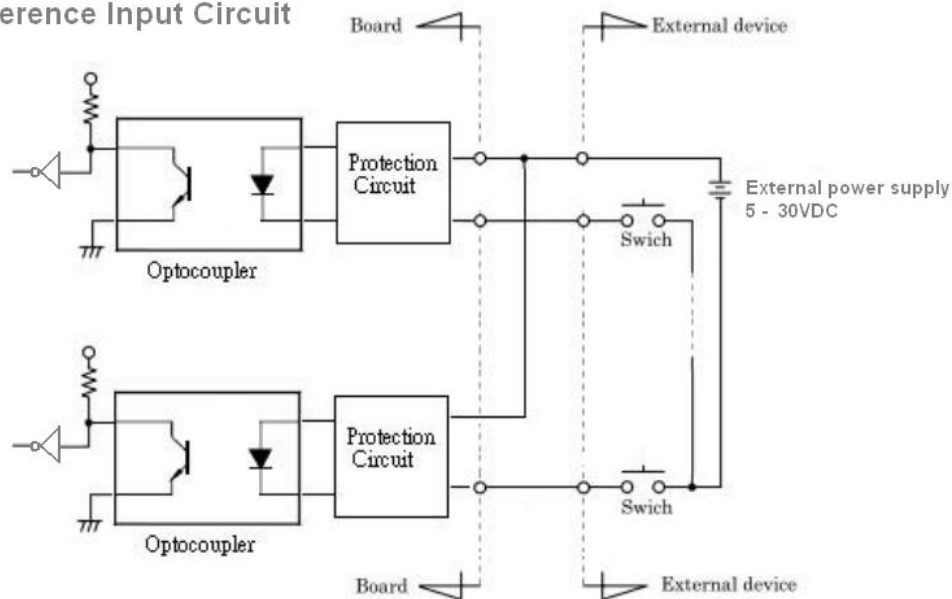
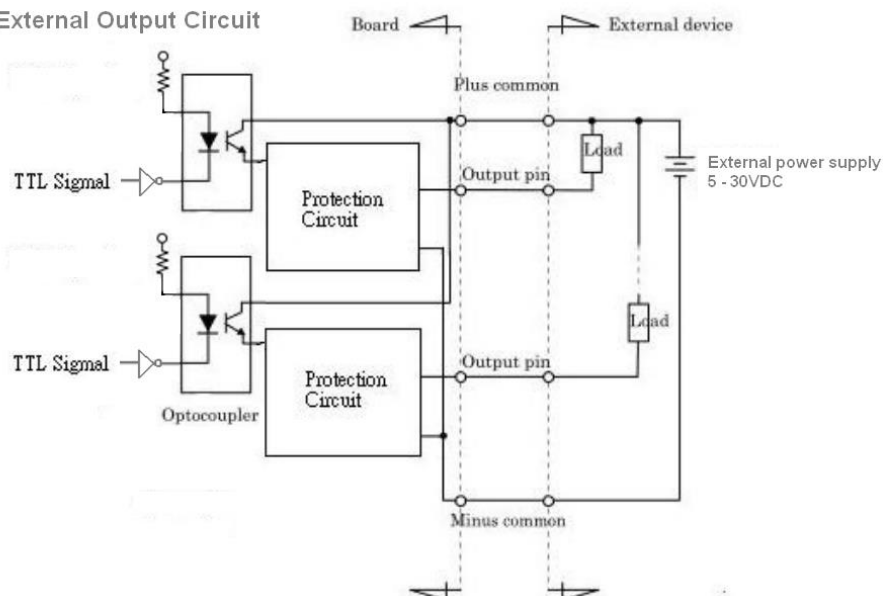
Pin	Definition
1	GND
2	MIC_R
3	NC
4	GND
5	MIC_L

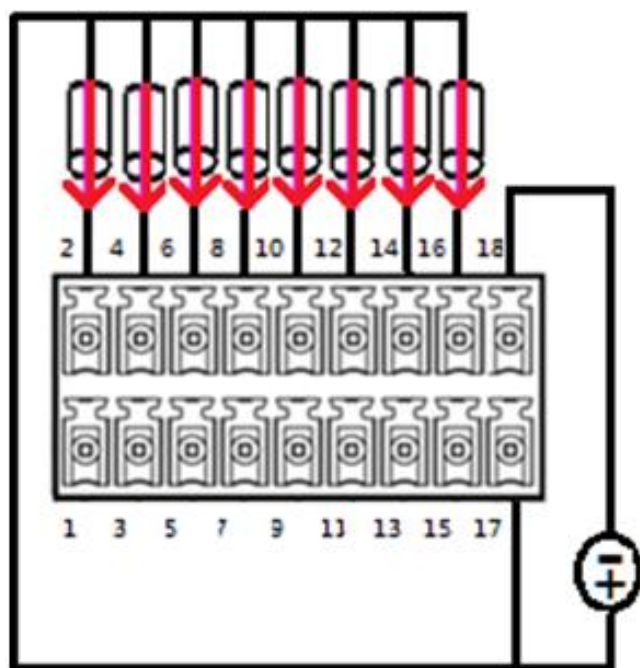
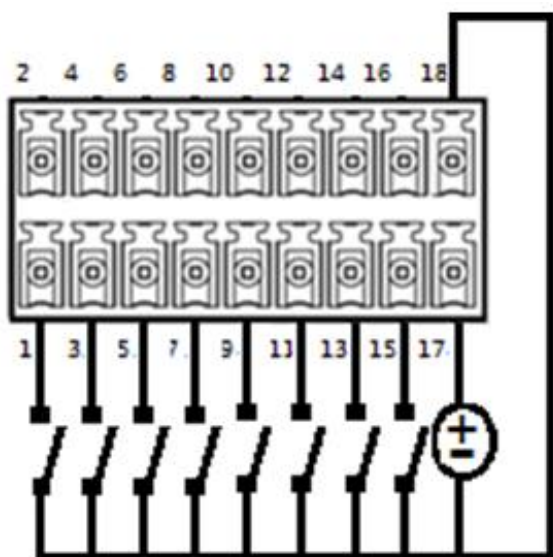


DIO1: Digital Input / Output Connector

Connector Type: Terminal Block 2X9 18-pin, 3.5mm pitch

Pin	Definition	Pin	Definition
1	DI1	2	DO1
3	DI2	4	DO2
5	DI3	6	DO3
7	DI4	8	DO4
9	DI5	10	DO5
11	DI6	12	DO6
13	DI7	14	DO7
15	DI8	16	DO8
17	External DC INPUT	18	External GND

**Reference Input Circuit****External Output Circuit**

**PWR_SW2 : Remote Power Switch**

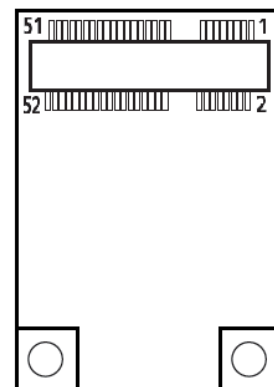
Connector Type: Terminal Block 1X2 2-pin, 3.5mm pitch

Pin	Definition
1	Power Button
2	GND

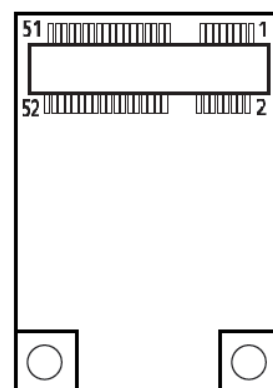


MINIPCIE1: Mini PCI-Express / mSATA Socket

Pin	Definition	Pin	Definition	Pin	Definition
1	WAKE#	19	NC	37	GND
2	+3.3V	20	+3.3V	38	USB_D5+
3	NC	21	GND	39	+3.3V
4	GND	22	PCIE_RST#	40	GND
5	NC	23	PCIE_RXN3 (SATA_RXN1)	41	+3.3V
6	+1.5V	24	+3.3V	42	NC
7	CLKREQ3#	25	PCIE_RXP3 (SATA_RXP1)	43	GND
8	USIM1_VCC	26	GND	44	NC
9	GND	27	GND	45	NC
10	USIM1_DATA	28	+1.5V	46	NC
11	PCIE_CLKN3	29	GND	47	NC
12	USIM1_CLK	30	SMB_CLK	48	+1.5V
13	PCIE_CLKP3	31	PCIE_TXN3 (SATA_TXN1)	49	NC
14	USIM1_RST	32	SMB_DATA	50	GND
15	GND	33	PCIE_TXP3 (SATA_TXP1)	51	NC
16	USIM1_VPP	34	GND	52	+3.3V
17	NC	35	GND		
18	GND	36	USB_D5-		

**MINIPCIE2: Mini PCI-Express**

Pin	Definition	Pin	Definition	Pin	Definition
1	WAKE#	19	NC	37	GND
2	+3.3V	20	+3.3V	38	USB_D6+
3	NC	21	GND	39	+3.3V
4	GND	22	MINIPCIE_RST#	40	GND
5	NC	23	PCIE_RXN4	41	+3.3V
6	+1.5V	24	+3.3V	42	NC
7	CLKREQ4#	25	PCIE_RXP4	43	GND
8	USIM2_VCC	26	GND	44	NC
9	GND	27	GND	45	NC
10	USIM2_DATA	28	+1.5V	46	NC
11	PCIE_CLKN4	29	GND	47	NC
12	USIM2_CLK	30	SMB_CLK	48	+1.5V
13	PCIE_CLKP4	31	PCIE_TXN4	49	NC
14	USIM2_RST	32	SMB_DATA	50	GND
15	GND	33	PCIE_TXP4	51	NC
16	USIM2_VPP	34	GND	52	+3.3V
17	NC	35	GND		
18	GND	36	USB_D6-		



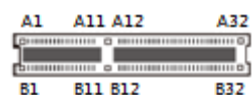
SATA1_1, SATA2: SATA with Power Connector

Pin	SATA1_1 Definition	Pin	SATA1_1 Definition	Pin	SATA2 Definition	Pin	SATA2 Definition
1	GND	12	GND	1	GND	12	GND
2	SATA_TXP0	13	GND	2	SATA_TXP1	13	GND
3	SATA_TXN0	14	+5V	3	SATA_TXN1	14	+5V
4	GND	15	+5V	4	GND	15	+5V
5	SATA_RXN0	16	+5V	5	SATA_RXN1	16	+5V
6	SATA_RXP0	17	GND	6	SATA_RXP1	17	GND
7	GND	18	GND	7	GND	18	GND
8	+3.3V	19	GND	8	+3.3V	19	GND
9	+3.3V	20	+12V	9	+3.3V	20	+12V
10	+3.3V	21	+12V	10	+3.3V	21	+12V
11	GND	22	+12V	11	GND	22	+12V

**PCIE1: PCI-Express X4 Socket (1-lane)**

Connector Type: PCI-Express X4 Slot

Pin	Definition	Pin	Definition	Pin	Definition	Pin	Definition
A1	PCIE_PRSENT1	A17	PCIE_RXN4	B1	+12V	B17	PRSNT2_1
A2	+12V	A18	GND	B2	+12V	B18	GND
A3	+12V	A19		B3	+12V	B19	
A4	GND	A20		B4	GND	B20	
A5	NC	A21		B5	SMB_CLK	B21	
A6	NC	A22		B6	SMB_DATA	B22	
A7	NC	A23		B7	GND	B23	
A8	NC	A24		B8	+3.3V	B24	
A9	+3.3V	A25		B9	NC	B25	
A10	+3.3V	A26		B10	+3.3VSB	B26	
A11	PCIE_RESET#	A27		B11	PCIE_WAKE#	B27	
A12	GND	A28		B12	NC	B28	
A13	PCIE_CLKP	A29		B13	GND	B29	
A14	PCIE_CLKN	A30		B14	PCIE_TXP4	B30	
A15	GND	A31		B15	PCIE_TXN4	B31	
A16	PCIE_RXP4	A32		B16	GND	B32	



PWR_LED1: Power LED Status

Pin	Definition
1	POWER LED+
2	POWER LED-

**HDD_LED1: HDD Access LED Status**

Pin	Definition
1	HDD LED+
2	HDD LED-

**LAN1_LINK1, LAN2_LINK1 : LAN Link LED Status**

Pin	Definition
1	LINK LED+
2	LINK LED-100Mbps-
3	LINK LED 100Mbps-

**LAN1_ACT1, LAN2_ACT1 : LAN Active LED Status**

Pin	Definition
1	ACTIVE LED+
2	ACTIVE LED-

**GPIO_LED1: GPIO LED Status**

Pin	Definition
1	GPIO LED+
2	GPIO LED-

**WDT_LED1: Watchdog LED Status**

Pin	Definition
1	WATCHDOG LED+
2	WATCHDOG LED-



Chapter 3

System Setup

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

**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.

3.2 Removing chassis bottom cover

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

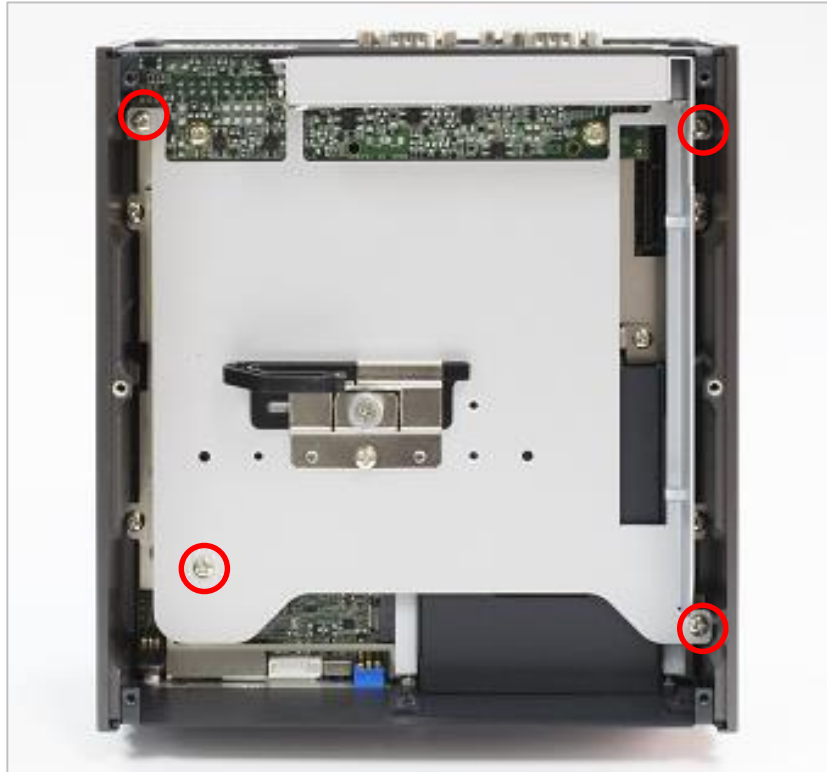


2. Now you can remove the bottom cover.

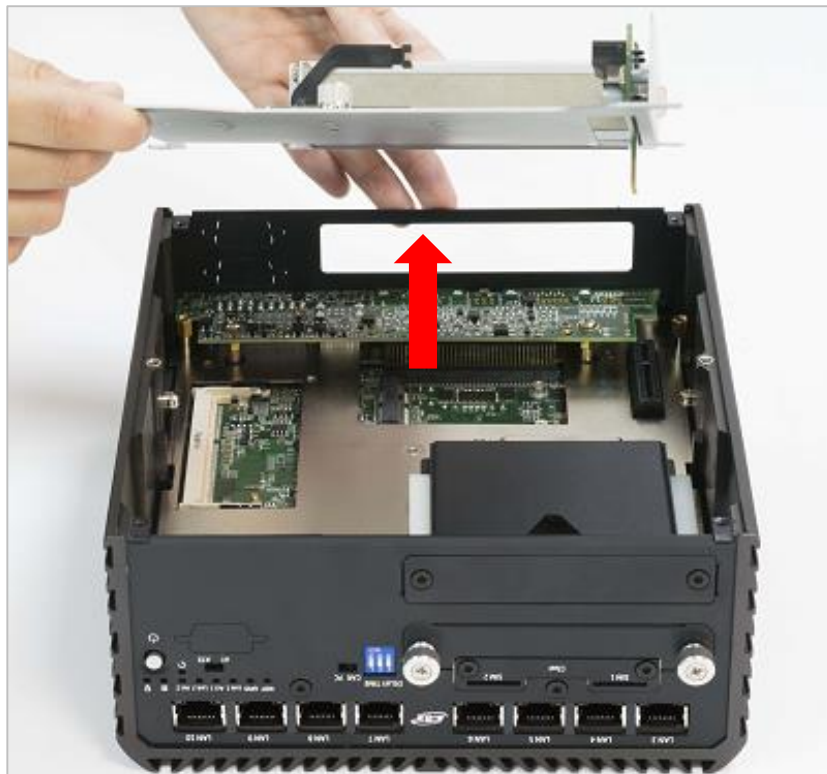


3.3 Removing PCIe/PCI expansion module

1. This step only applies to RCO-3211 and RCO-3222 series, which is equipped with PCIe/PCI expansion module. The following steps use RCO-3222 as example.
2. Unscrew four screws (M3x5L) circled below.

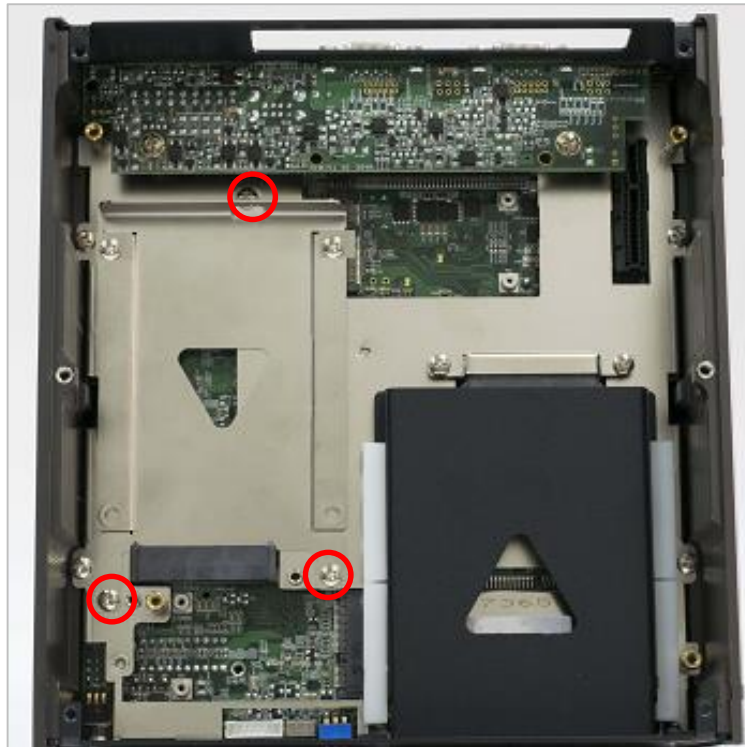


3. Now you can remove the PCIe/PCI expansion module.

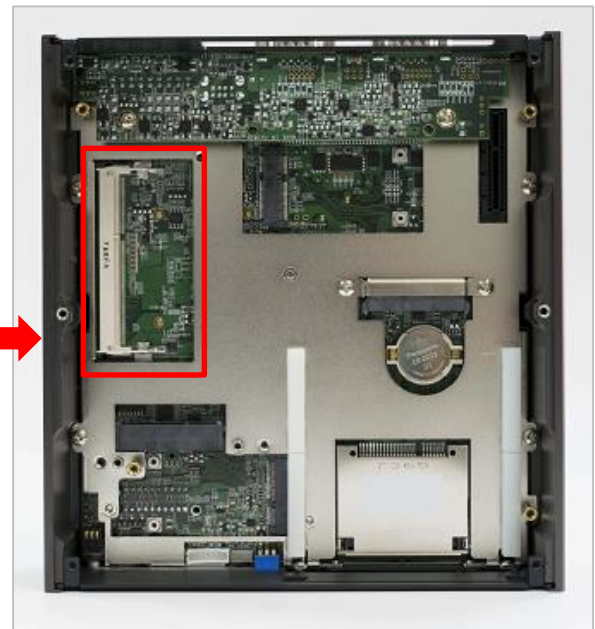
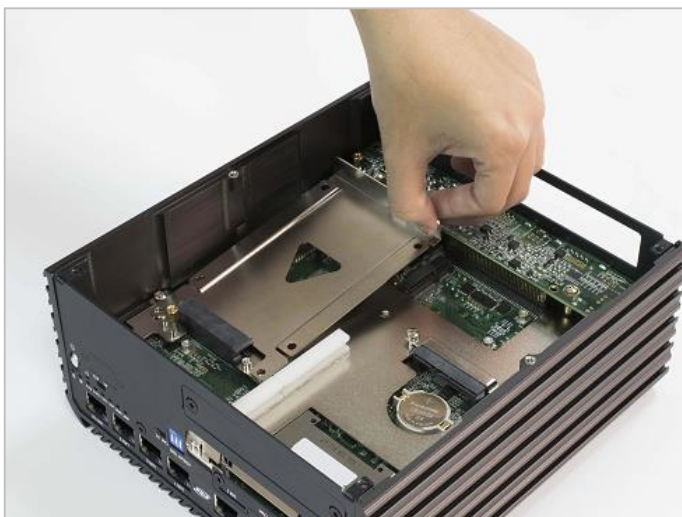


3.4 Installing SODIMM

1. Unscrew the below three screws to remove the HDD bracket.



2. After removing internal SATA HDD bracket, you will be able to access the memory slot.



3. Insert memory module from 45 degree direction.

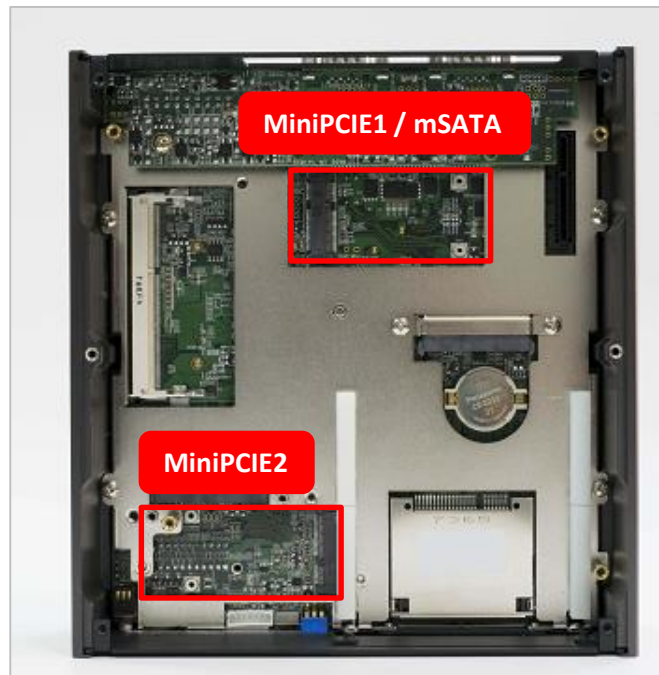


4. Press the memory module vertically downward until you hear the “click” sound. Make sure the memory module is firmly in place.



3.5 Installing mini PCIe card / mSATA

1. Two mini PCIe slots are available for RCO-3200 series. MiniPCIE1 supports mSATA.



2. Insert mini PCIe card or mSATA module from 45 degree direction.

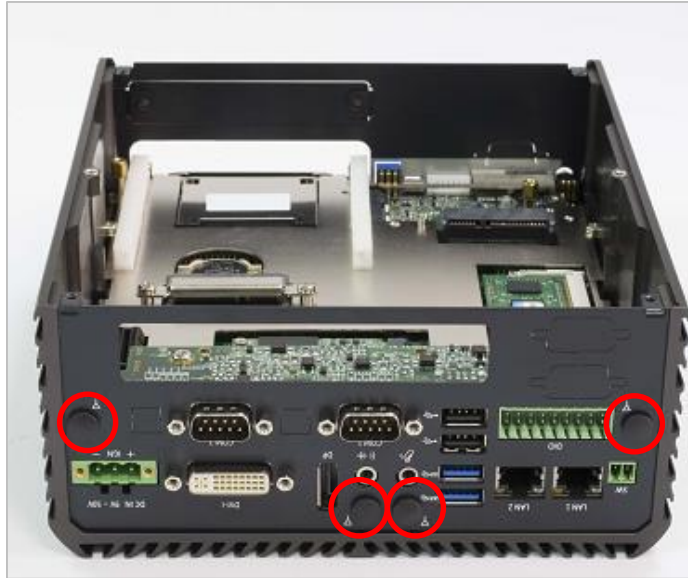


3. Press the mini PCIe card or mSATA module down and lock it with two screws (M2x3.7L).



3.6 Installing antenna

1. Four antenna holes are available for RCO-3200 series on the rear panel.



2. Remove antenna hole cover on the system panel.



3. Have antenna jack penetrate through the hole.



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



5. Assemble the antenna and antenna jack together.

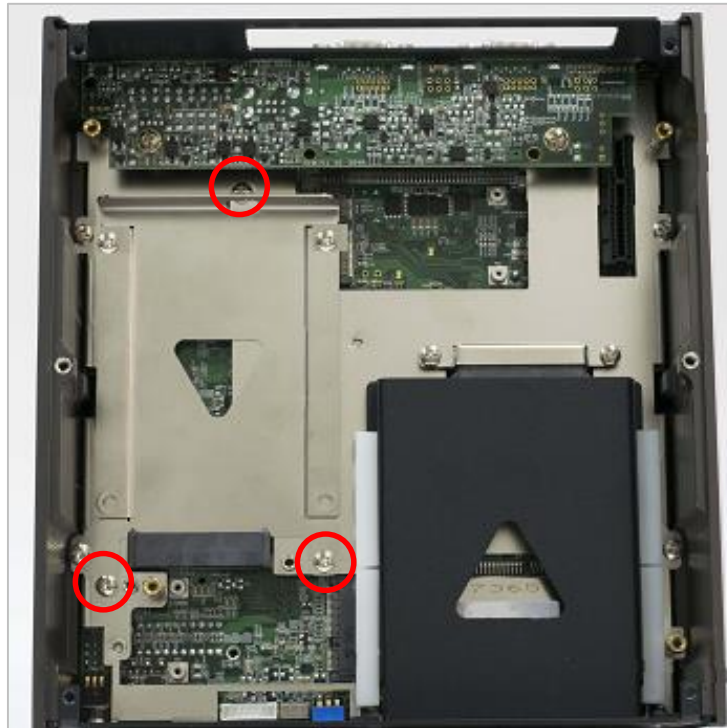


6. Attach the RF connector at the cable-end onto the communication module.

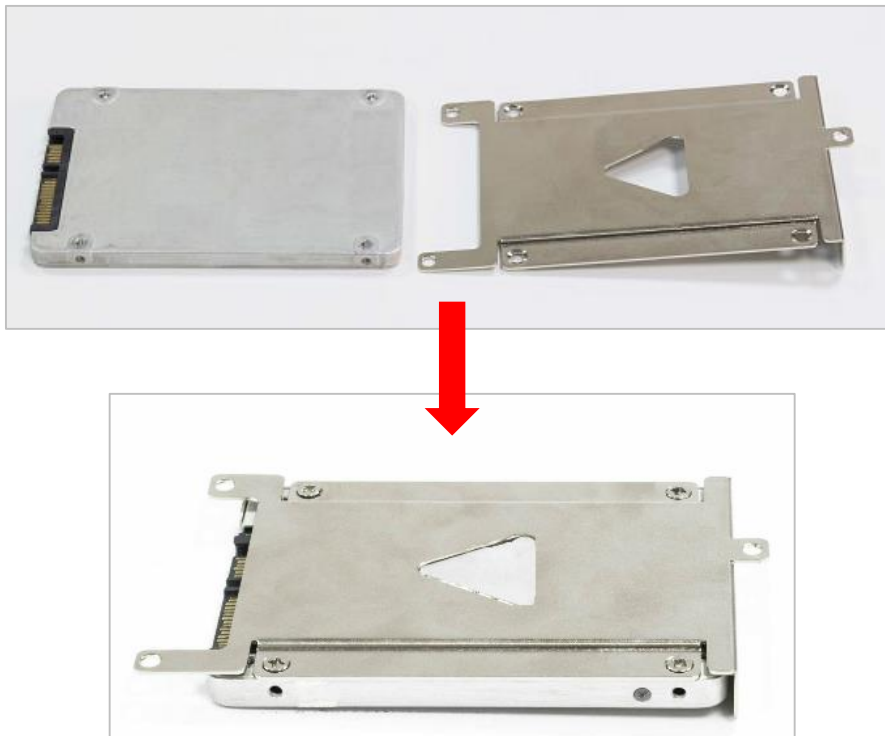


3.7 Installing HDD on internal SATA HDD bay

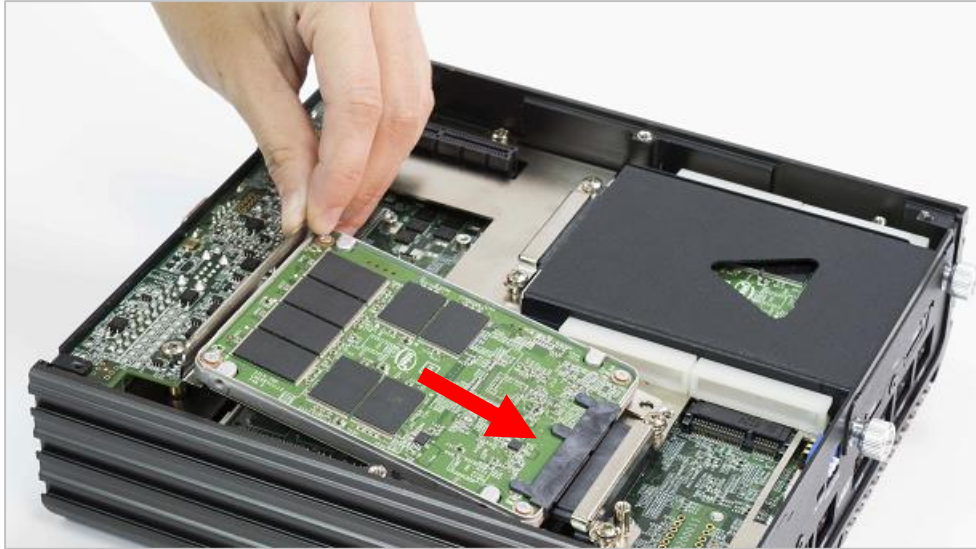
1. Unscrew the below three screws (M3x5L) to remove the internal SATA HDD bay.



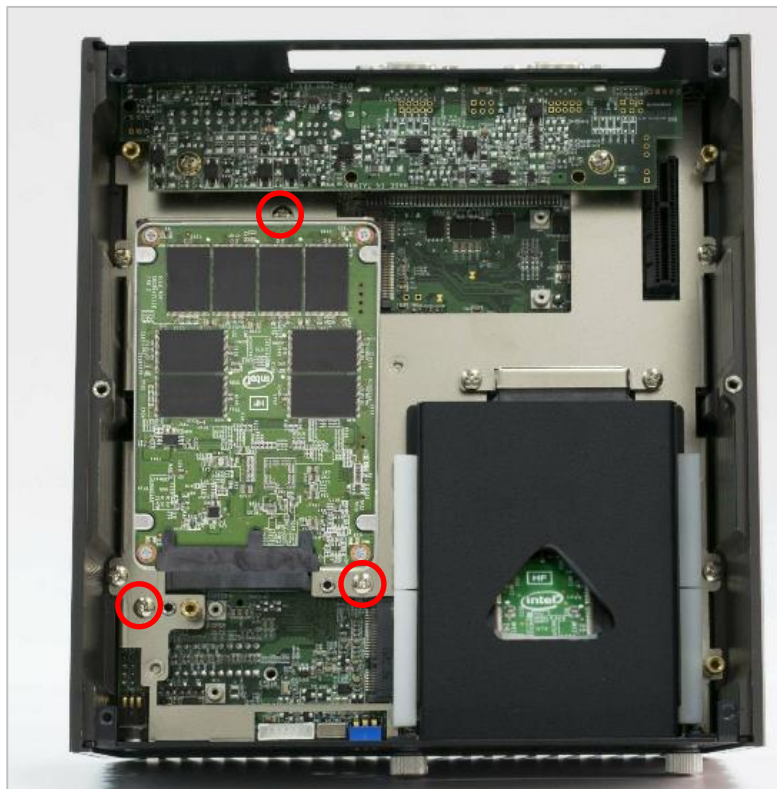
2. Lock the 2.5" HDD with HDD bracket using four screws (M3x4L).



3. Install the HDD bracket following the direction below.



4. Fasten the three screws to lock the internal HDD bracket.



3.8 Installing HDD on removable SATA HDD bay

1. Unscrew the two sun screws circled below to take out the removable SATA HDD bay.



2. Lock the 2.5" HDD with HDD bracket using four screws (M3x4L).

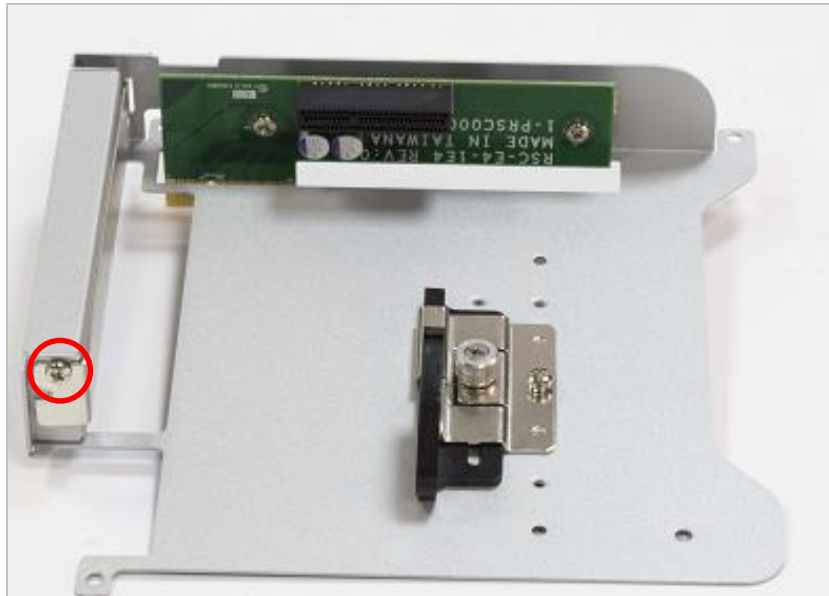


3. Slide the HDD bracket back and then fasten the sun screws.

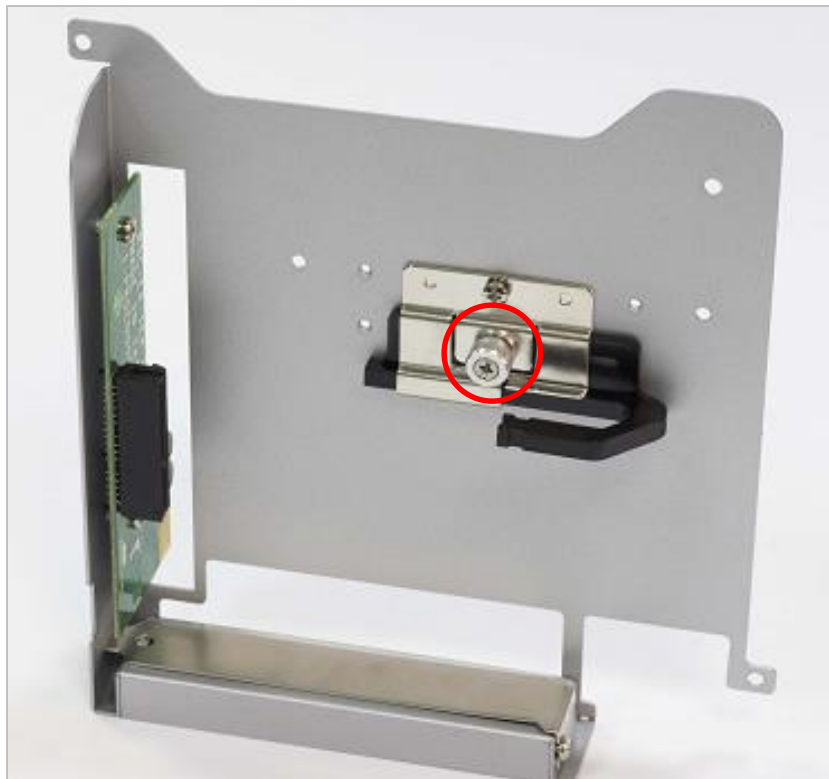


3.9 Installing PCIe/PCI expansion card

1. PCIe or PCI card with FHHL dimension is supported by RCO-3200 series.
2. Unscrew the screw (M3x5L) to remove the plane bracket.



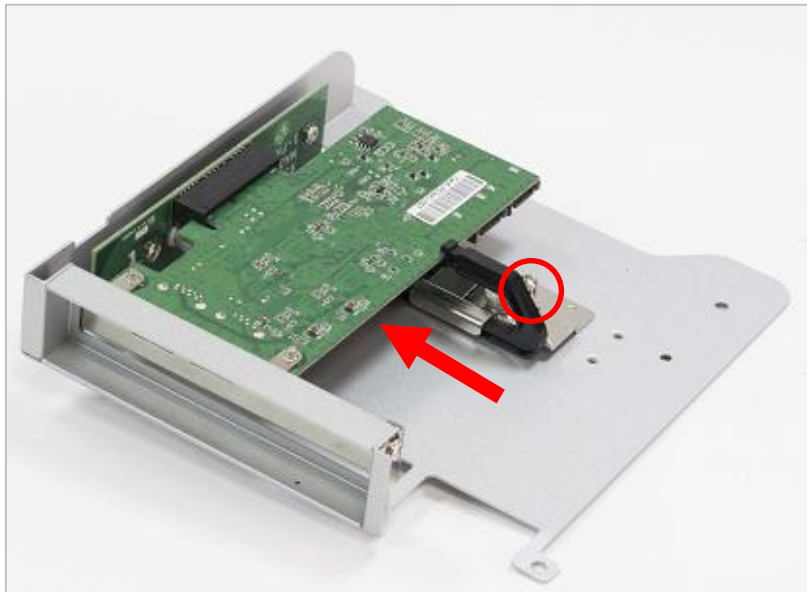
3. Loosen the sun screw (circled below) on the holder so the pairing arm can be adjustable.



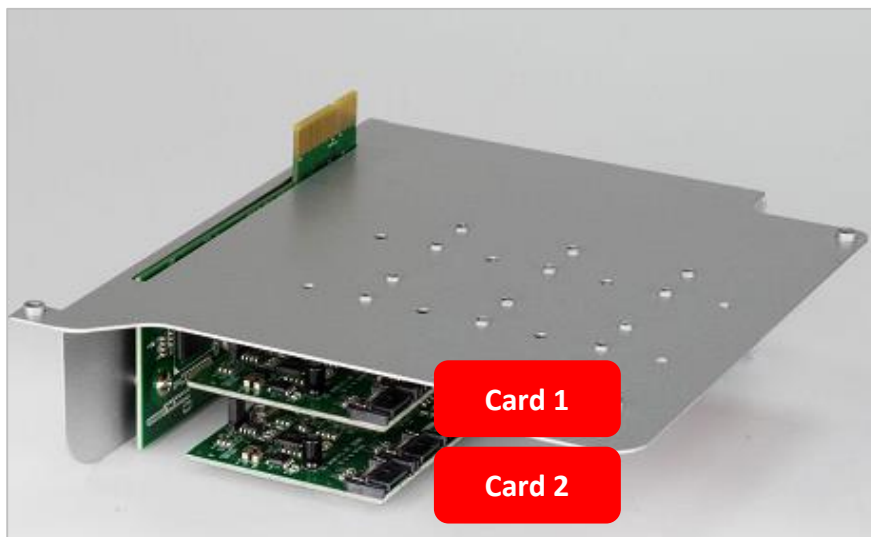
4. Install the PCIe/PCI card according to the below direction and ensure the gold finger is inserted into the slot. Then fasten the screw in the circle.



5. Adjust the arm until it holds the card firmly in place. Then fasten the sun screw on the holder.

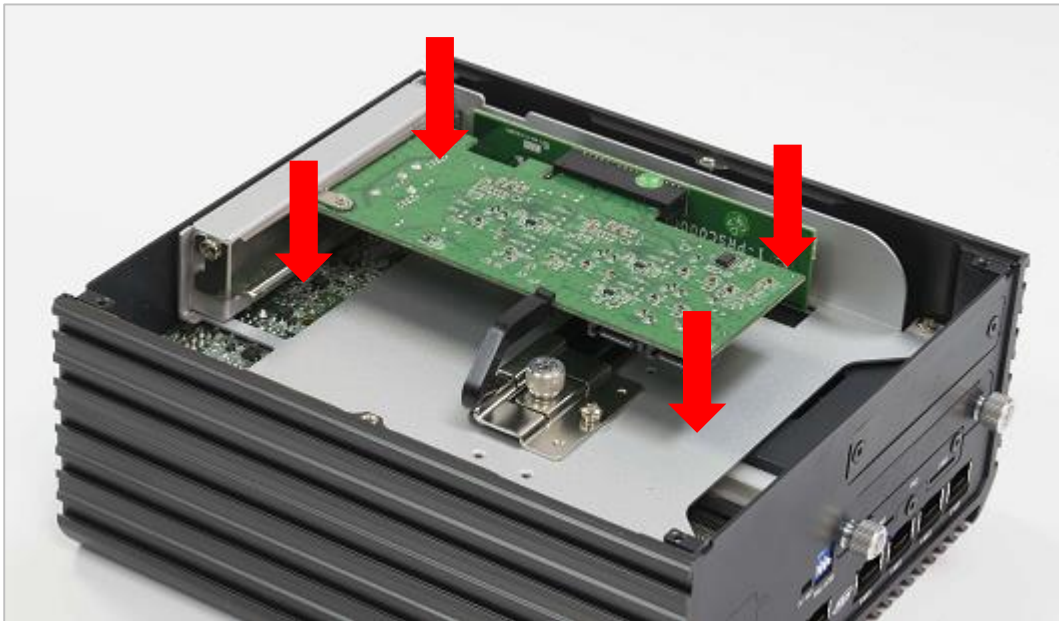


6. For RCO-3022 series, install the upper card (Card 1) first and then install the lower card (Card 2).

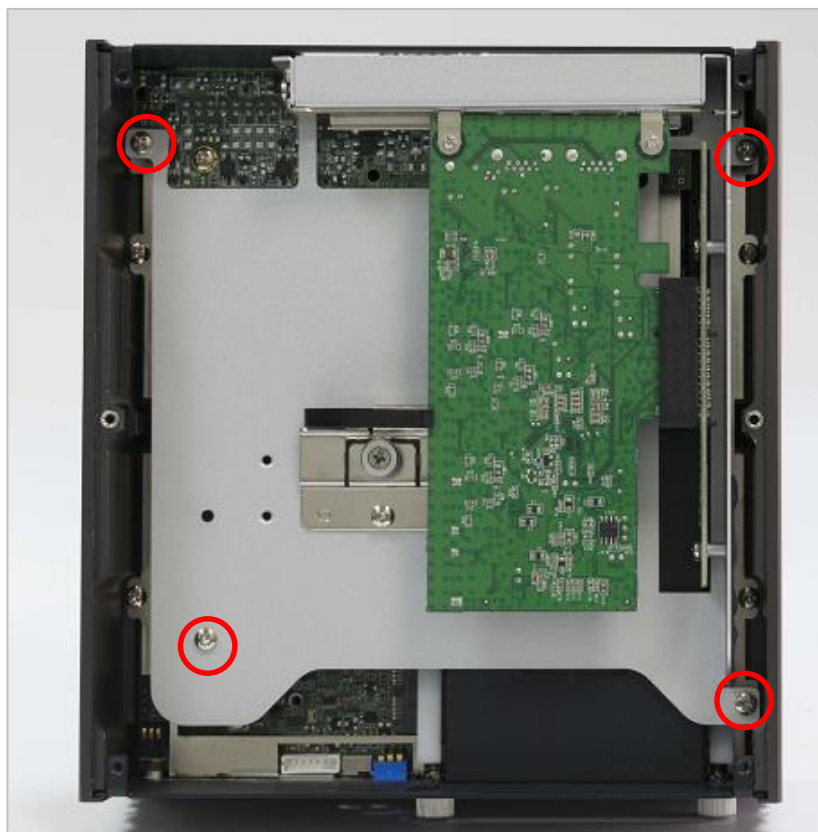


3.10 Assemble PCIe/PCI expansion module

1. Install the expansion module back in place and ensure the golden finger is inserted into the expansion slot.



2. Fasten the four screws (M3x5L) below.



3.11 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 six screws (M3x5L).



3.12 Assemble SIM card

1. Take out the removable SATA HDD bay in order to locate the SIM card slot.



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



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

SIM Card Socket Number	Matching Mini PCIe Slot
SIM 1	Mini PCIe 1 / mSATA (CN1)
SIM 2	Mini PCIe 2 (CN2)

4. To uninstall SIM card, simply press the installed SIM card and then the card will be pushed out.

3.13 Installing wall mount kit

1. Wall mount kit is available for RCO-3000 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).



3.14 Installing DIN rail holder

1. Din rail holder is available for RCO-3000 series as optional accessories.



2. Place the system upside down so you can see the bottom cover with two screw holes for din rail holder.



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 system BIOS software is stored on EEPROM. 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 or <F2> 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 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.



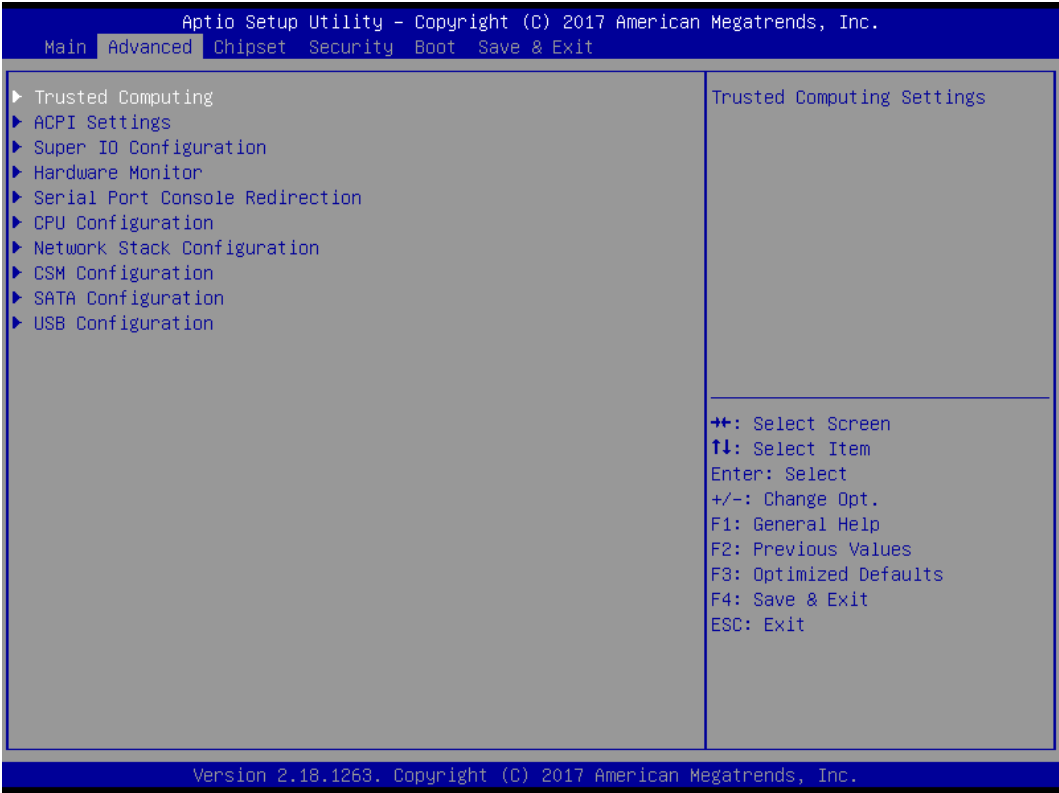
4.2.1 System Date

Set the system date. Please use <Tab> to switch between data elements.

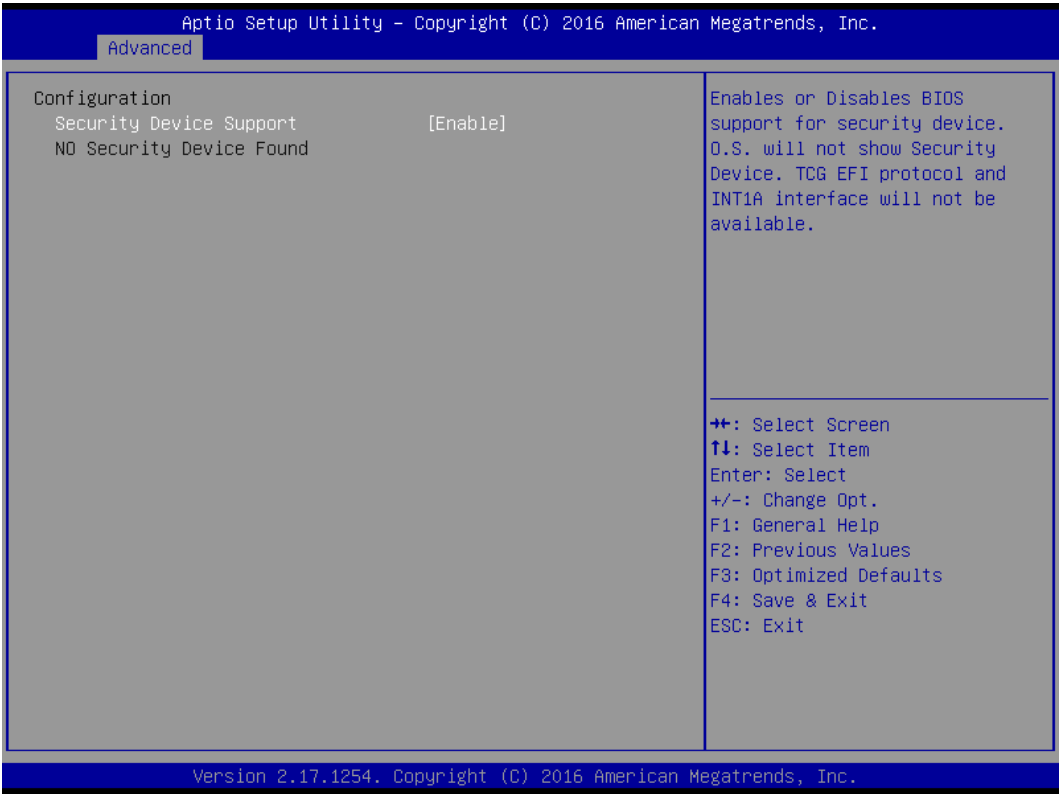
4.2.2 System Time

Set the system time. Please use <Tab> to switch between time elements.

4.3 Advanced Setup

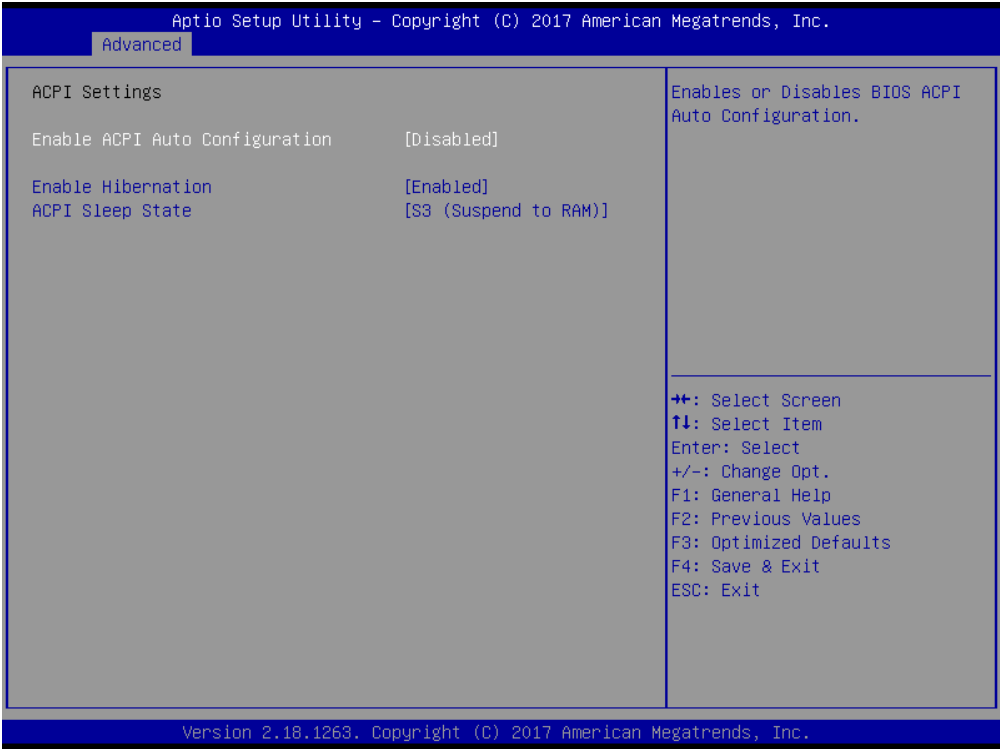


4.3.1 Trusted Computing (Optional)



- **Security Device Support**
Enable or disable TPM function

4.3.2 ACPI Settings



■ **Enable ACPI Auto Configuration**

This item allows you to enable or disable BIOS ACPI Auto Configuration.

■ **Enable Hibernation**

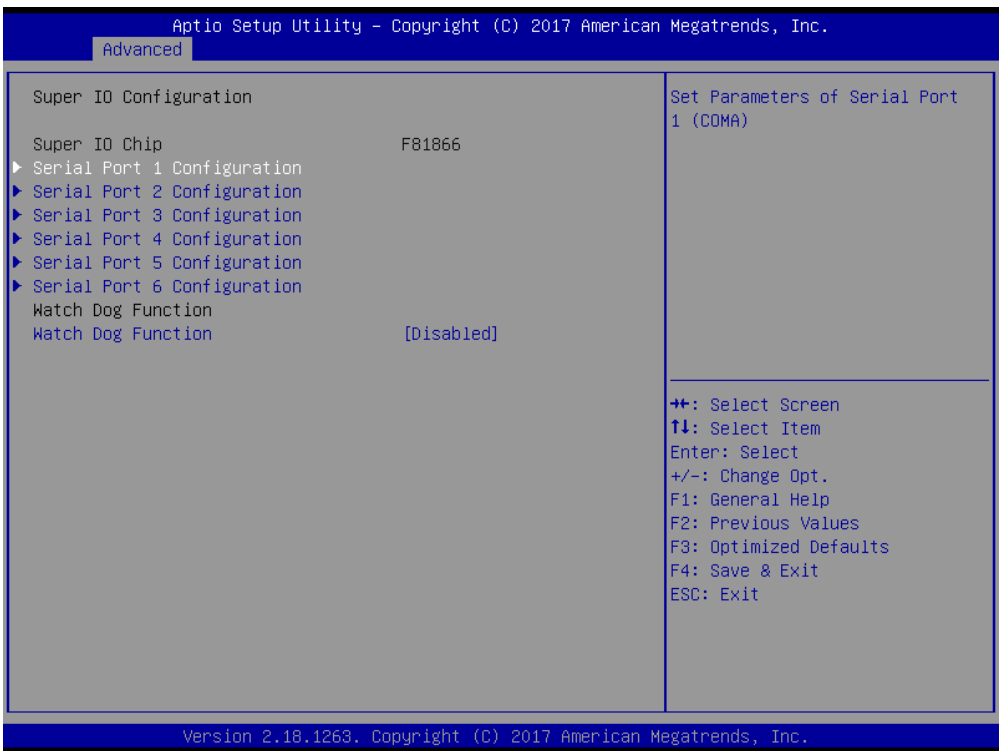
This item allows you to enable or disable system ability to hibernate.

■ **ACPI Sleep State**

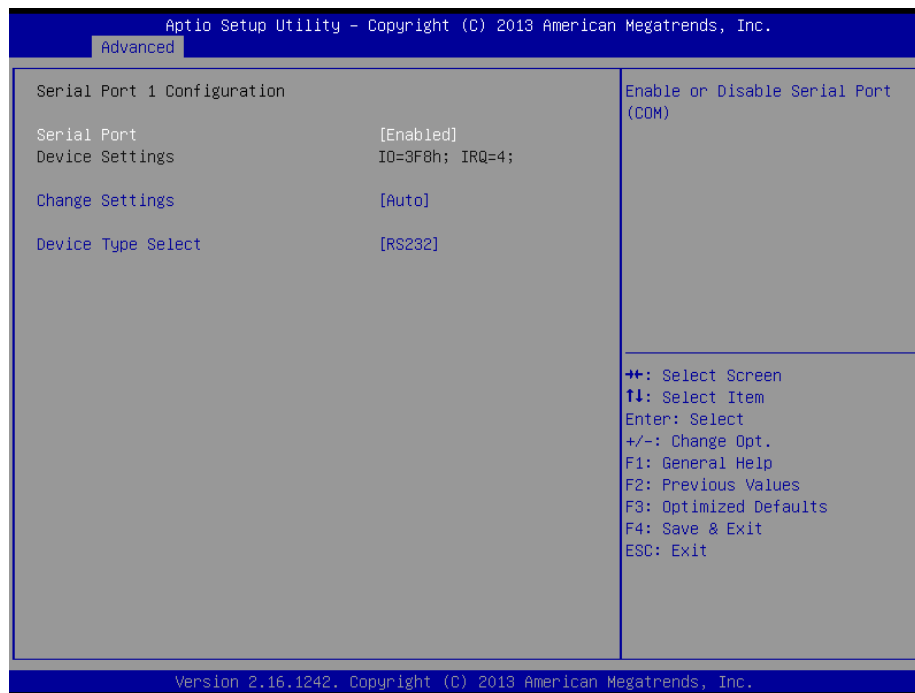
This item selects the highest ACPI sleep state the system will enter when the suspend button is pressed. Select <Suspend Disabled> or <S3 (Suspend to RAM)>.

4.3.3 Super IO Configuration

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



Serial Port 1 Configuration



- **Serial Port**

This item allows you to enable or disable serial port.

- **Change Settings**

This item allows you to change the address & IRQ settings of the specified serial port.

- **Device Type Select**

Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

Serial Port 2 Configuration



- **Serial Port**

This item allows you to enable or disable serial port.

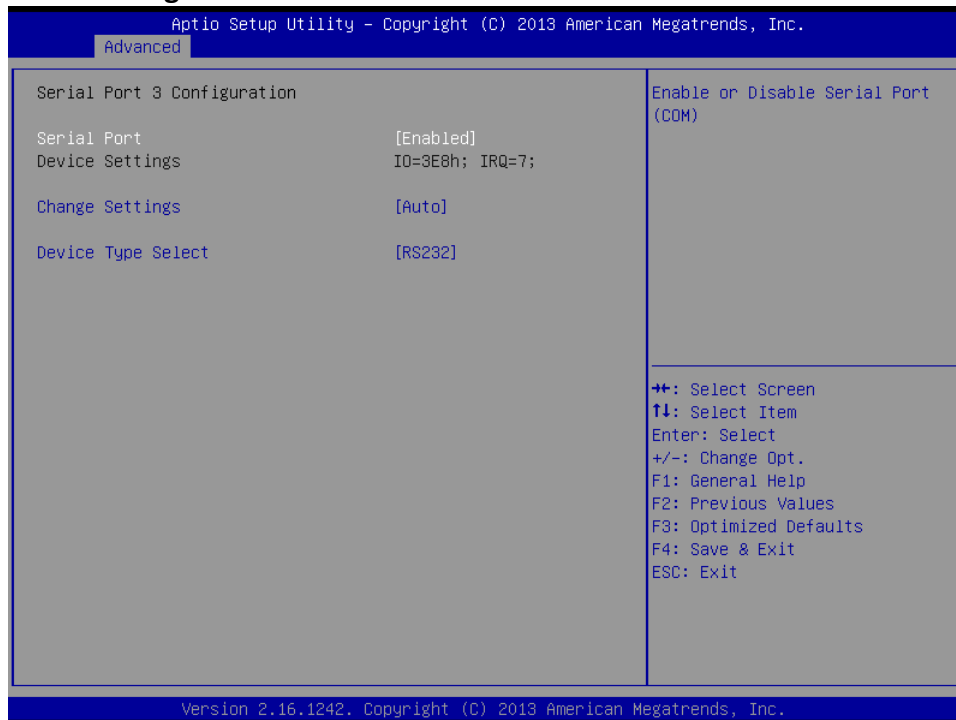
- **Change Settings**

This item allows you to change the address & IRQ settings of the specified serial port.

- **Device Type Select**

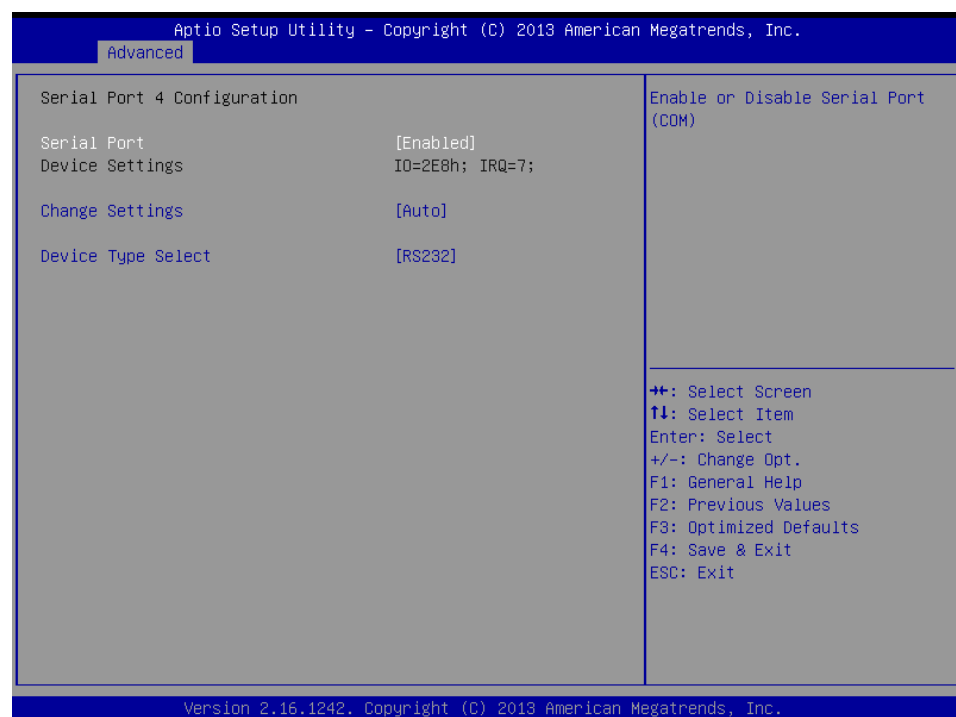
Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

Serial Port 3 Configuration



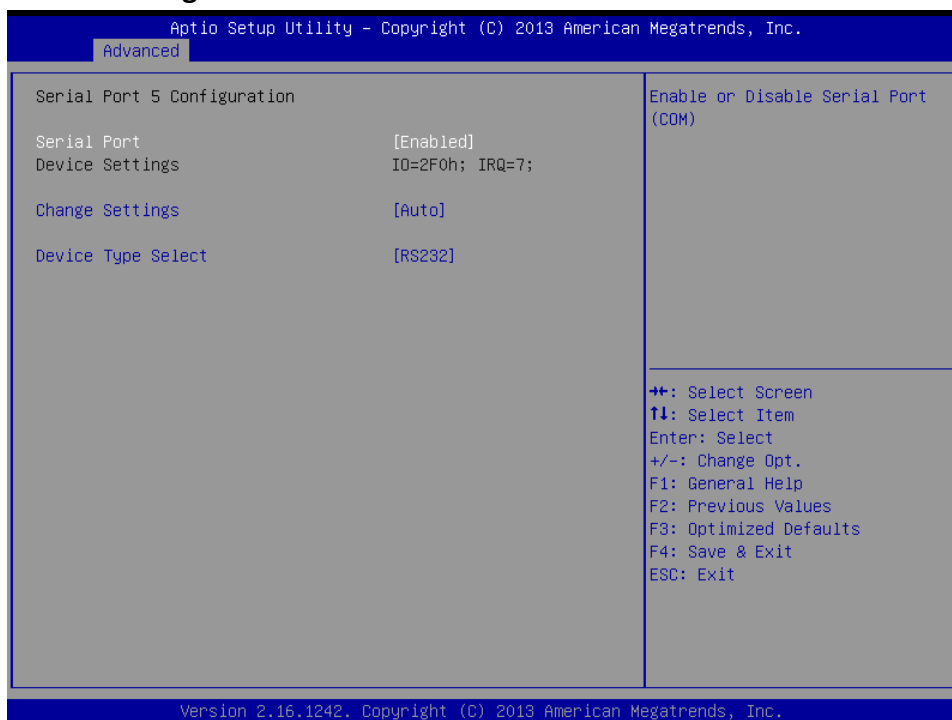
- **Serial Port**
This item allows you to enable or disable serial port.
- **Change Settings**
This item allows you to change the address & IRQ settings of the specified serial port.
- **Device Type Select**
Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

Serial Port 4 Configuration



- **Serial Port**
This item allows you to enable or disable serial port.
- **Change Settings**
This item allows you to change the address & IRQ settings of the specified serial port.
- **Device Type Select**
Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

Serial Port 5 Configuration



- **Serial Port**
This item allows you to enable or disable serial port.
- **Change Settings**
This item allows you to change the address & IRQ settings of the specified serial port.
- **Device Type Select**
Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

Serial Port 6 Configuration



- **Serial Port**
This item allows you to enable or disable serial port.
- **Change Settings**
This item allows you to change the address & IRQ settings of the specified serial port.
- **Device Type Select**
Change the Serial interface. Select <RS232> ,<RS422 Full Duplex> or <RS485 Half Duplex> interface.

■ Watch Dog Function

This setting allows you to setup the system watch-dog timer, a hardware timer that generates a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

● Watch Dog Timer Count Mode

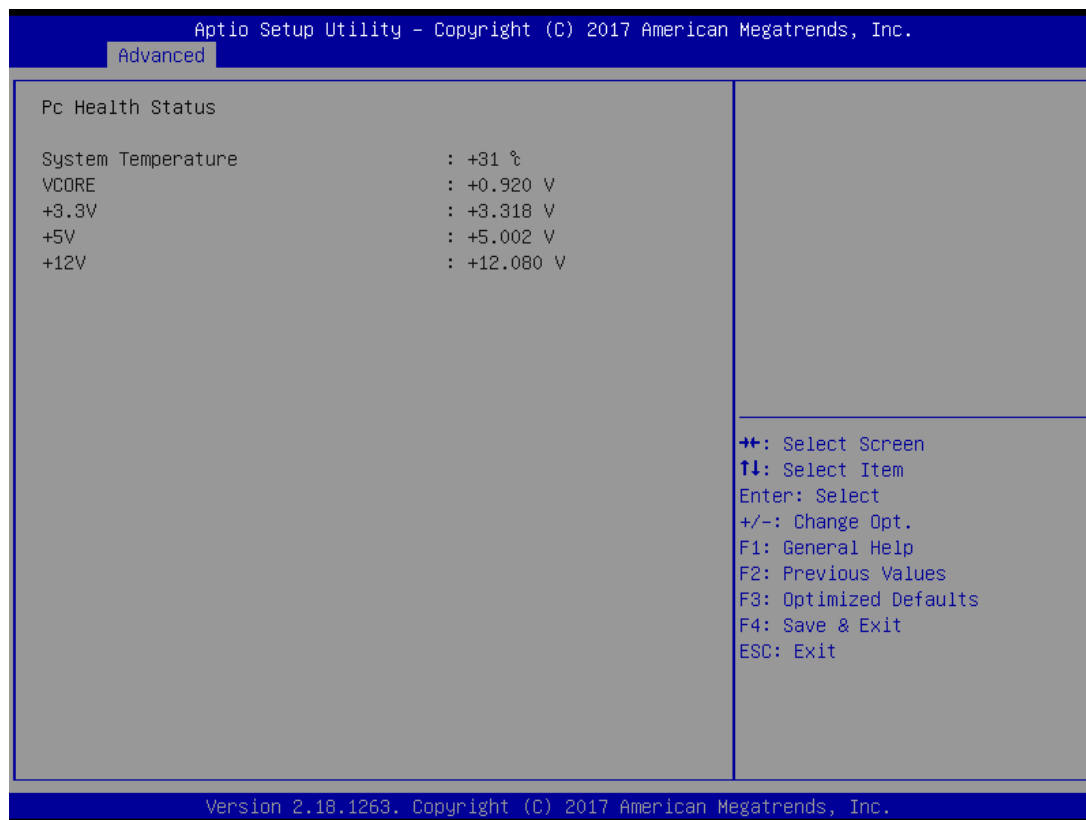
Change the Watch dog mode. Select <Second Mode> or <Minute Mode> mode.

● Watch Dog Timer Time Out Value

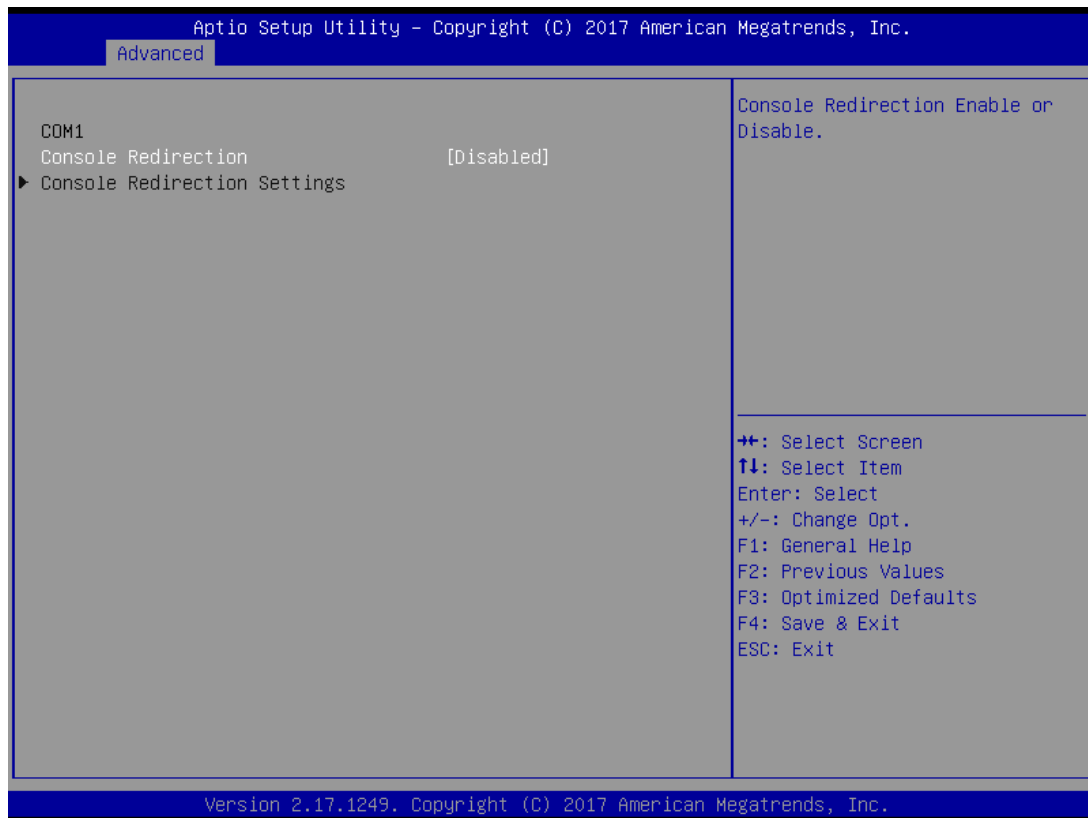
User can set a value in the range of 20 to 255.

4.3.4 Hardware Monitor

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



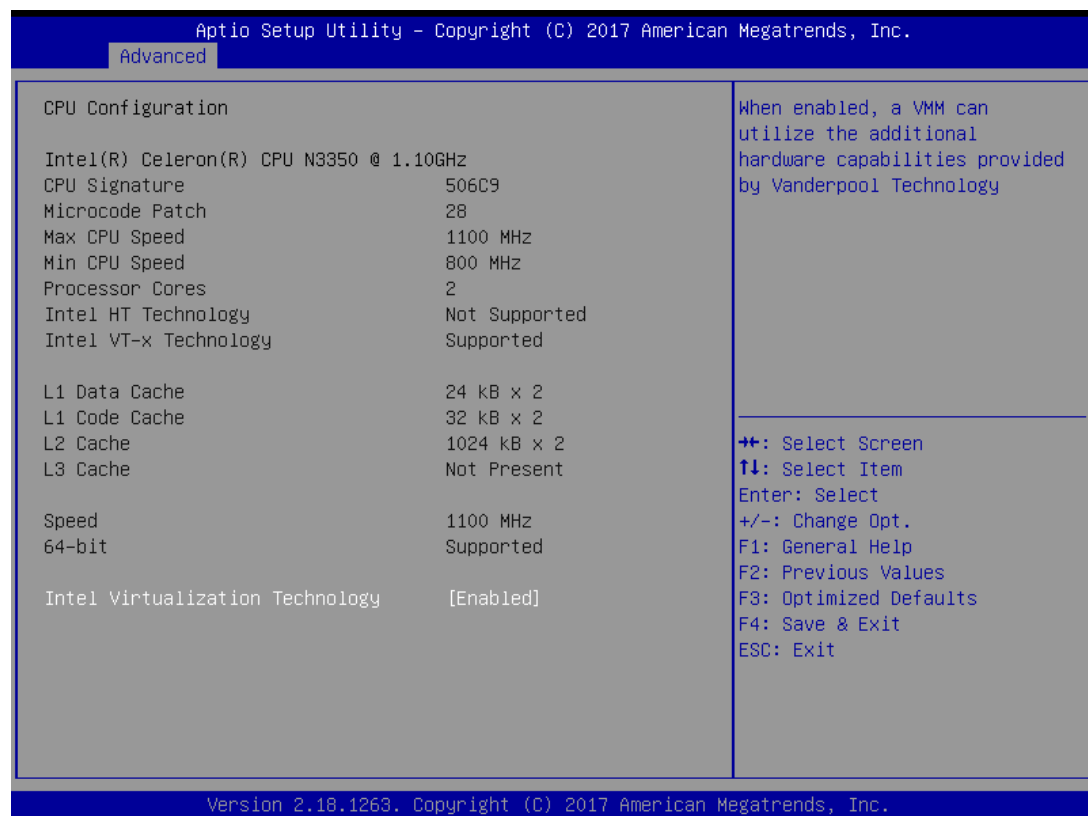
4.3.5 Serial Port Console Redirection



■ Console Redirection

These items allows you to enable or disable COM1 console redirection.

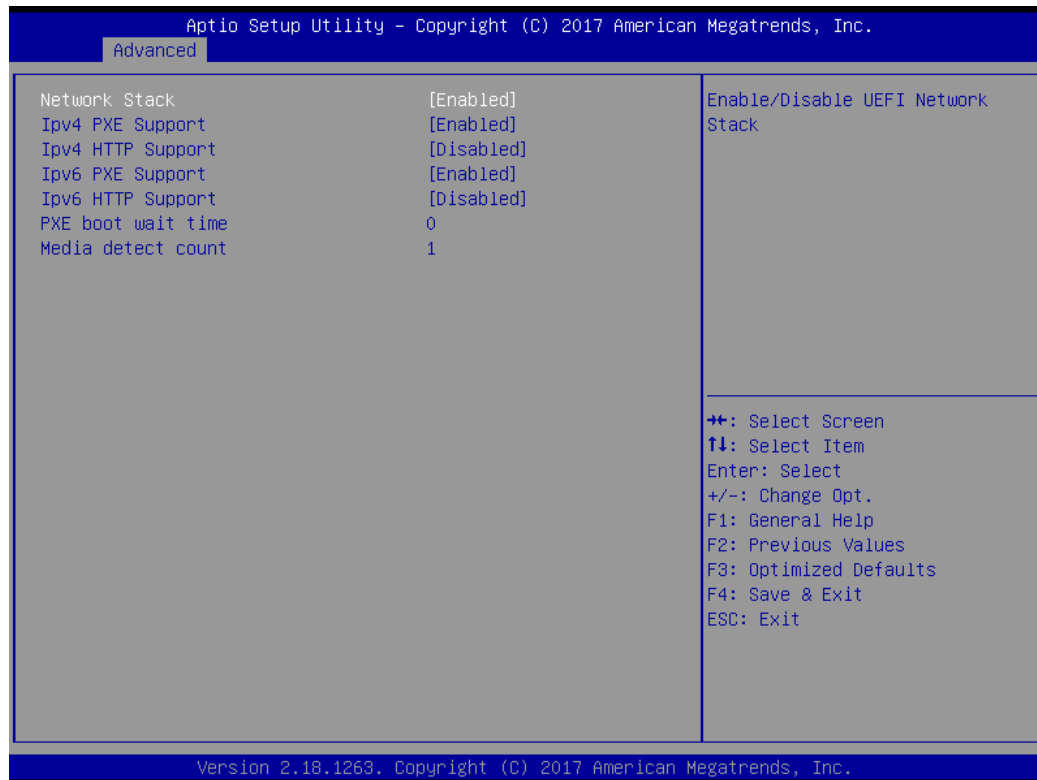
4.3.6 CPU Configuration



■ Intel Virtualization Technology

Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple Virtual systems.

4.3.7 Network Stack Configuration



■ Network Stack

This item allows you to enable or disable UEFI network stack.

● IPv4 PXE Support

This item allows you to enable or disable IPv4 PXE Support. This item is configurable only when Network Stack is enabled.

● IPv4 HTTP Support

This item allows you to enable or disable HTTP boot support for IPv4. This item is configurable only when Network Stack is enabled.

● Ipv6 PXE Support

This item allows you to enable or disable IPv6 PXE Support. This item is configurable only when Network Stack is enabled.

● IPv6 HTTP Support

This item allows you to enable or disable HTTP boot support for IPv4. This item is configurable only when Network Stack is enabled.

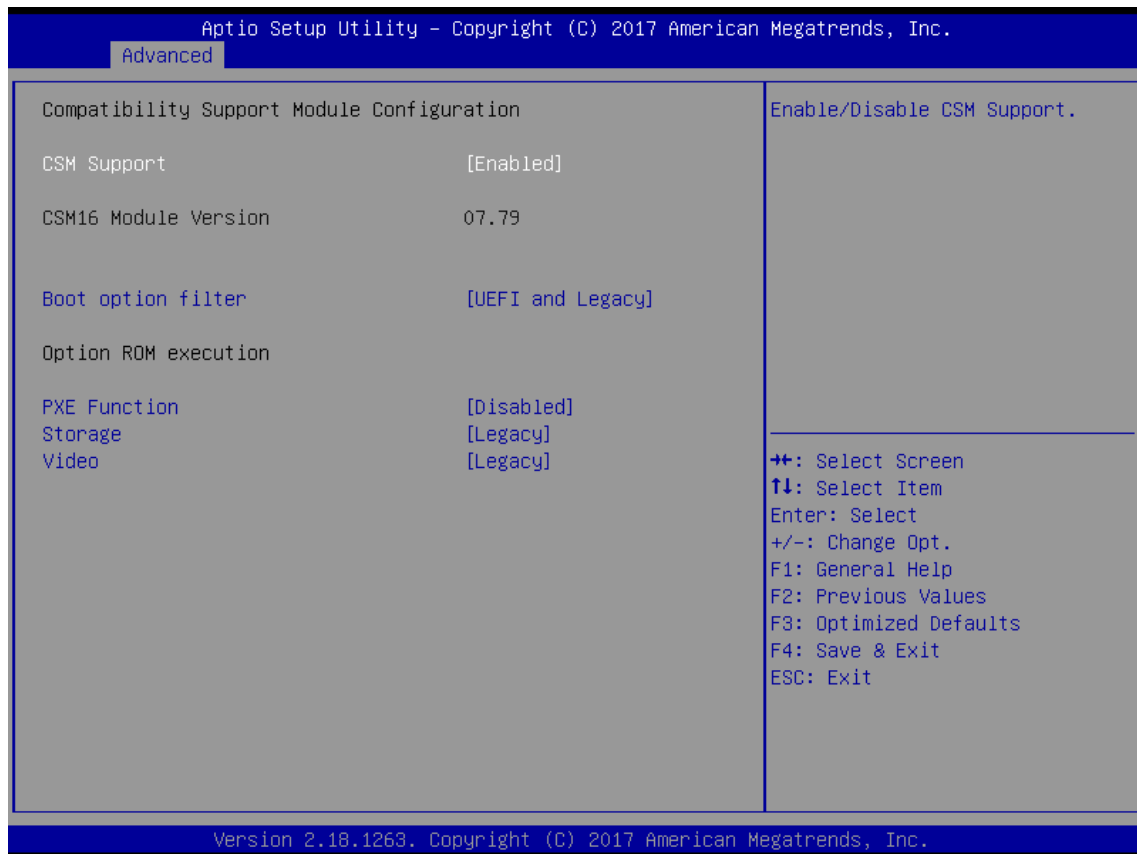
● PXE boot wait time

This item allows you to configure how long to wait before you can press to abort the PXE boot. This item is configurable only when Network Stack is enabled.

● Media detect count

This item allows you to set the number of times to check the presence of media. This item is configurable only when Network Stack is enabled.

4.3.8 CSM Configuration



■ CSM Support

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

■ Boot option filter

This item allows you to select which type of operating system to boot.

UEFI and Legacy: Allows booting from operating systems that support legacy option ROM or UEFI option ROM.

Legacy only: Allows booting from operating systems that only support legacy option ROM.

UEFI only: Allows booting from operating systems that only support UEFI option ROM.

This item is configurable only when CSM Support is set to Enabled.

■ PXE Function

This item allows you to enable or disable PXE function.

■ Storage

This setting allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

Do not launch: Disables option ROM.

UEFI only: Enables UEFI option ROM only.

Legacy only: Enables legacy option ROM only.

■ Video

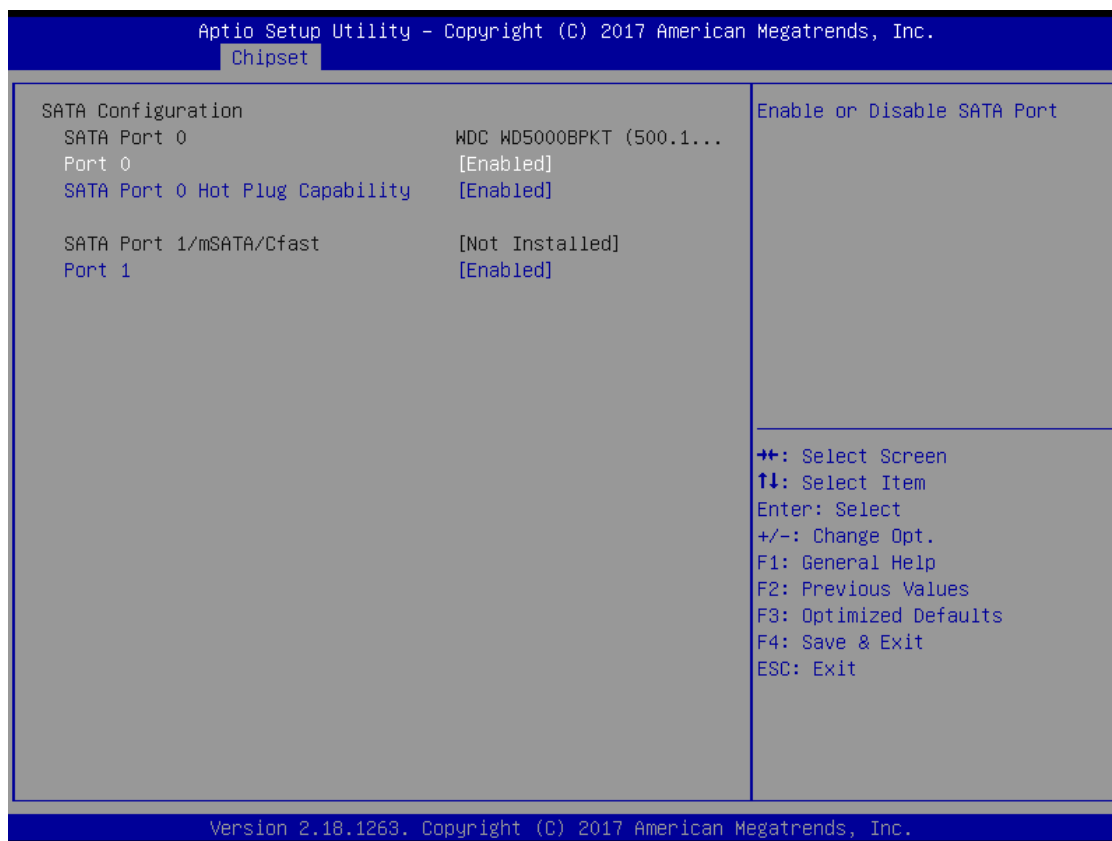
This item allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

Do not launch: Disables option ROM.

UEFI only: Enables UEFI option ROM only.

Legacy only: Enables legacy option ROM only.

4.3.9 SATA Configuration



■ SATA Port 0

This item allows you to enable or disable SATA Port 0.

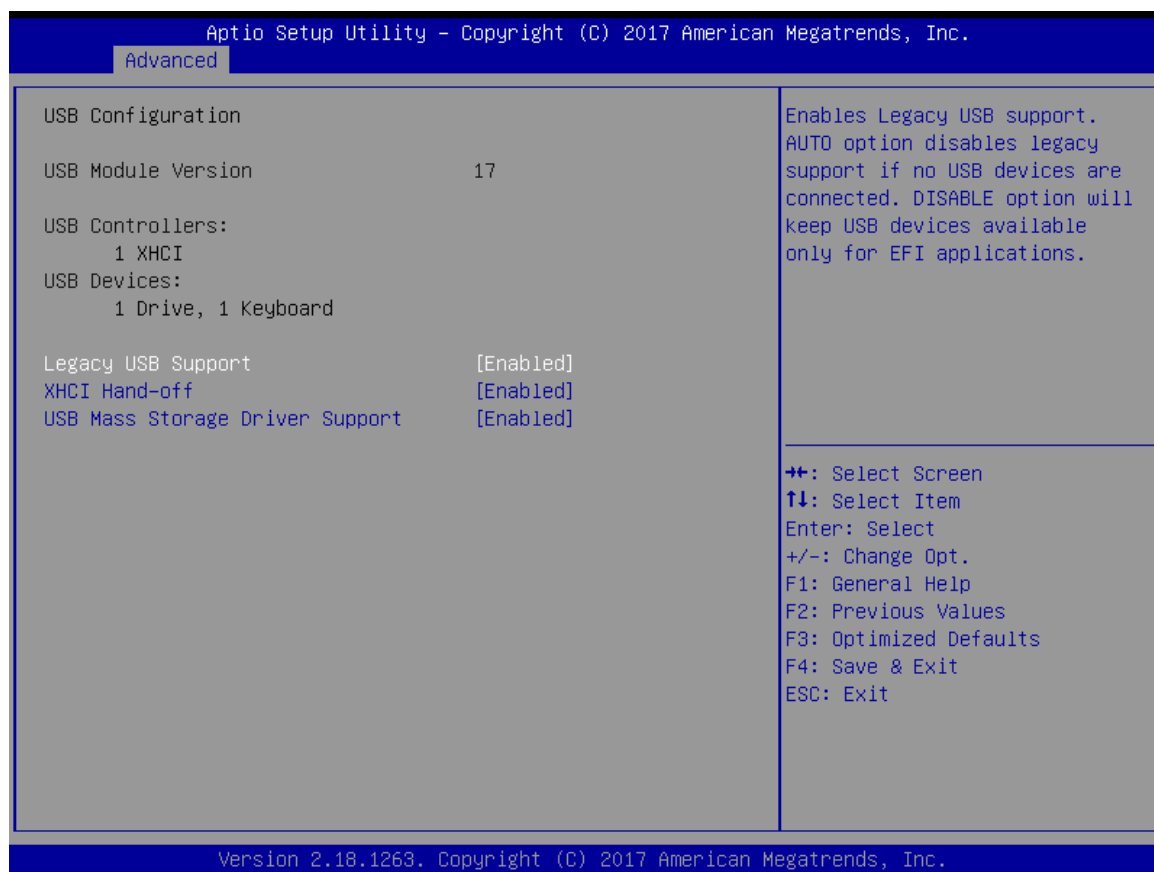
■ SATA Port 0 Hot Plug Capability

This item allows you to enable or disable SATA Port 0 hot plug function.

■ SATA Port 1/mSATA/CFast

This item allows you to enable or disable SATA Port 1.

4.3.10 USB Configuration



■ Legacy USB Support

Allows USB keyboard/ mouse to be used in MS-DOS.

■ XHCI Hand-off

Determines whether to enable XHCI (USB3.0) Hand-off feature for an operating system without XHCI (USB3.0) Hand-off support.

■ USB Mass Storage Driver Support

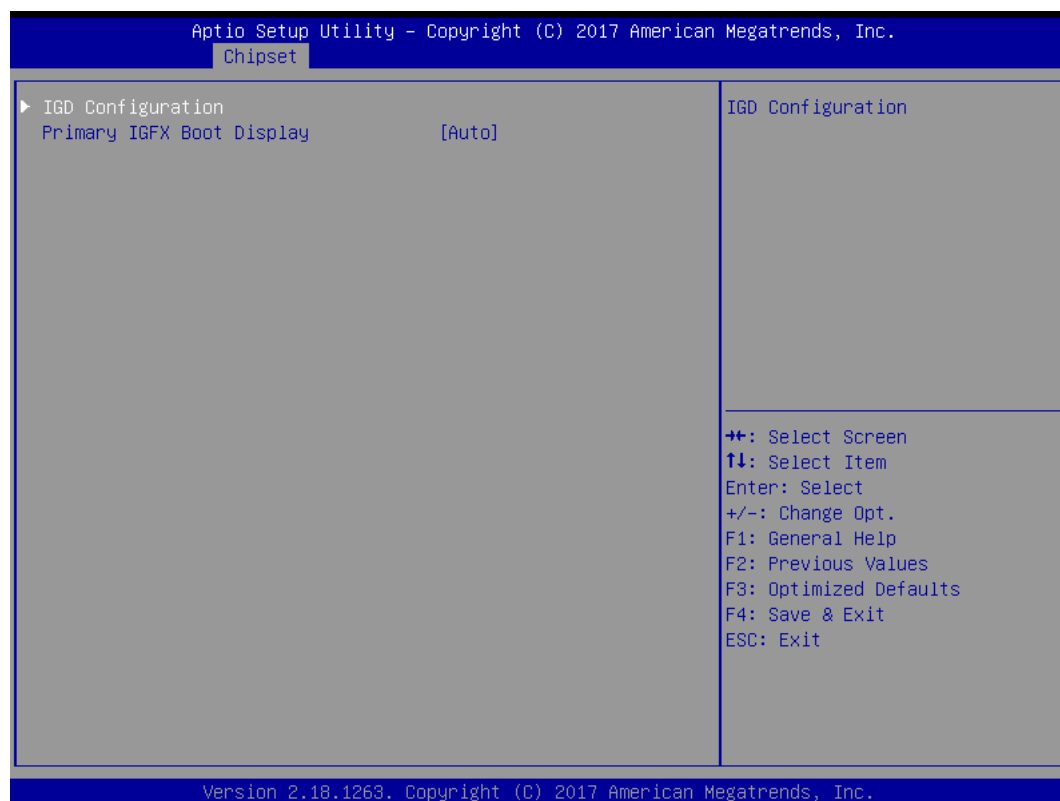
Enables or disables support for USB storage devices.

4.4 Chipset



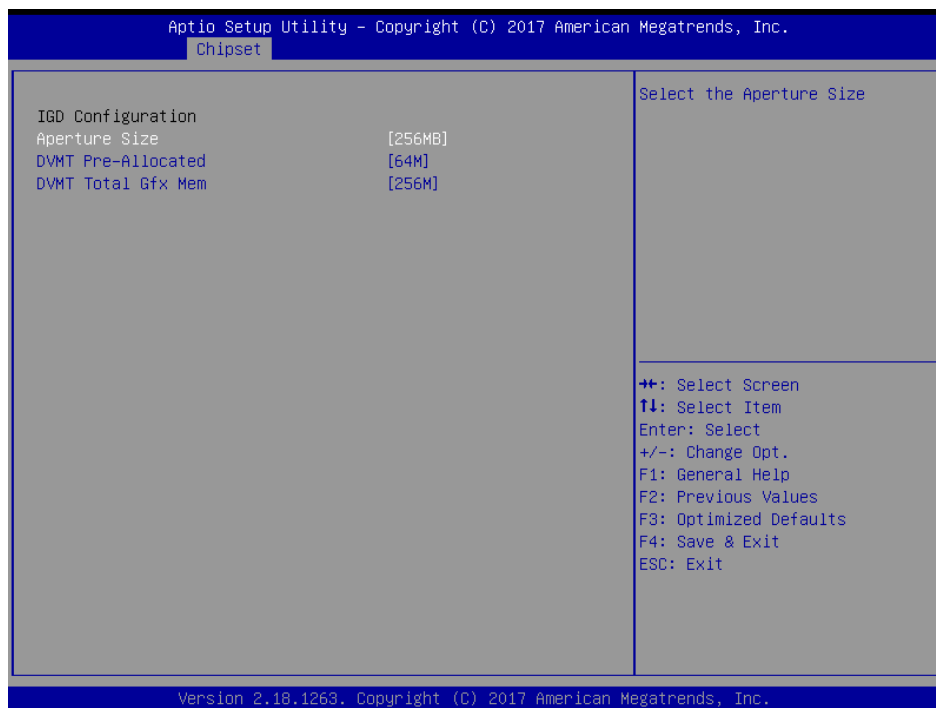
4.4.1 North Bridge

This section provides information on the installed memory size and memory/onboard graphics-related configuration options.



■ Intel IGD Configuration

This section provides onboard graphics-related configuration options.



- **Aperture Size**

This item selects the Aperture Size. Select <128MB>, <256MB> or <512MB>.

- **DVM T Pre-Allocated**

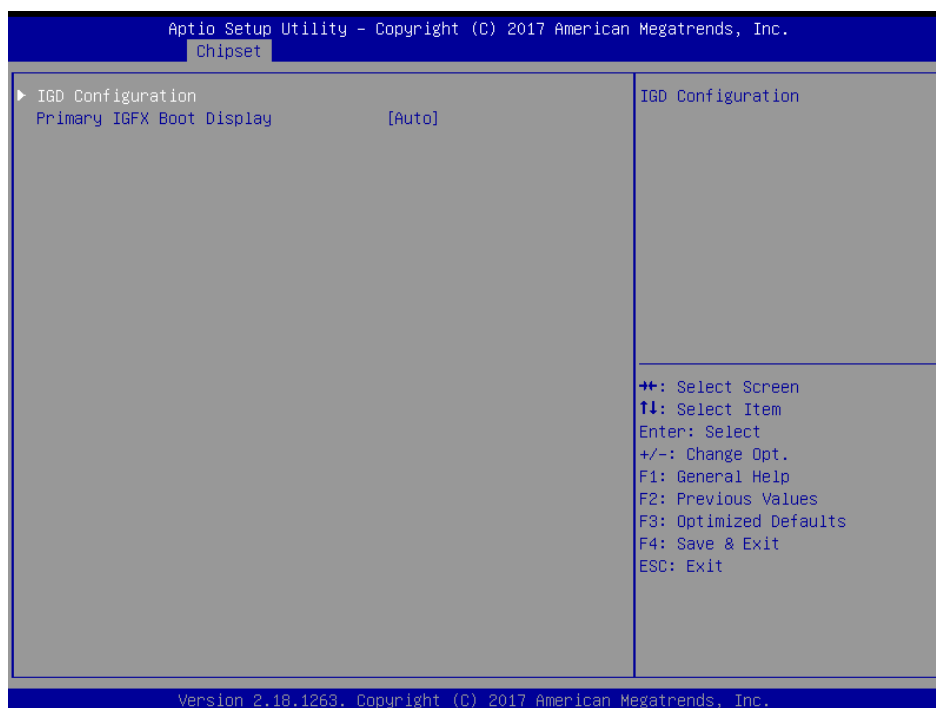
This item selects DVM T 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device. . Select <64M>, <96M>, <128M>, <160M>, <192M>, <224M>, <256M>, <288M>, <320M>, <352M>, <384M>, <416M>, <448M>, <480M> or <512M>.

- **DVM T Total Gfx Mem**

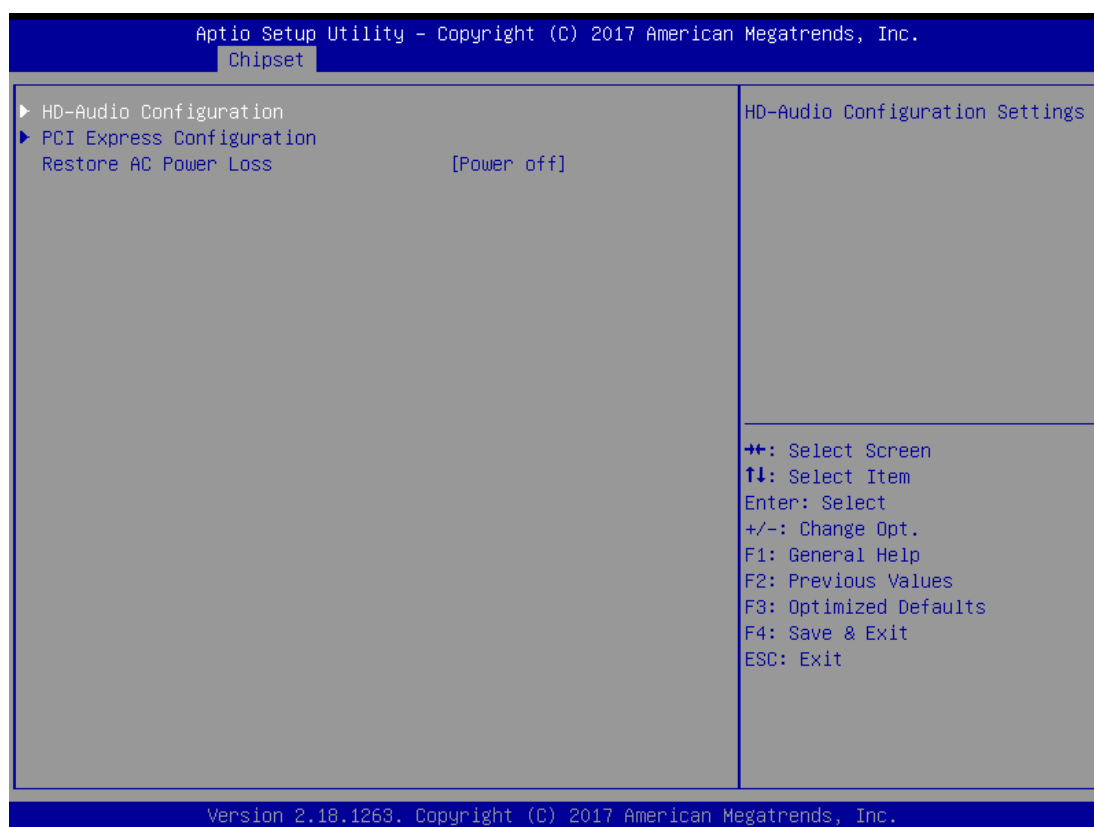
This item selects DVM T5.0 Total Graphic Memory size used by the Internal Graphics Device. Select <128MB>, <256MB> or <Max>.

■ Primary IGFX Boot Display

Change the primary IGFX boot display. Select <Auto>, <DP>, <VGA> or <DVI>.



4.4.2 South Bridge



■ HD-Audio Configuration

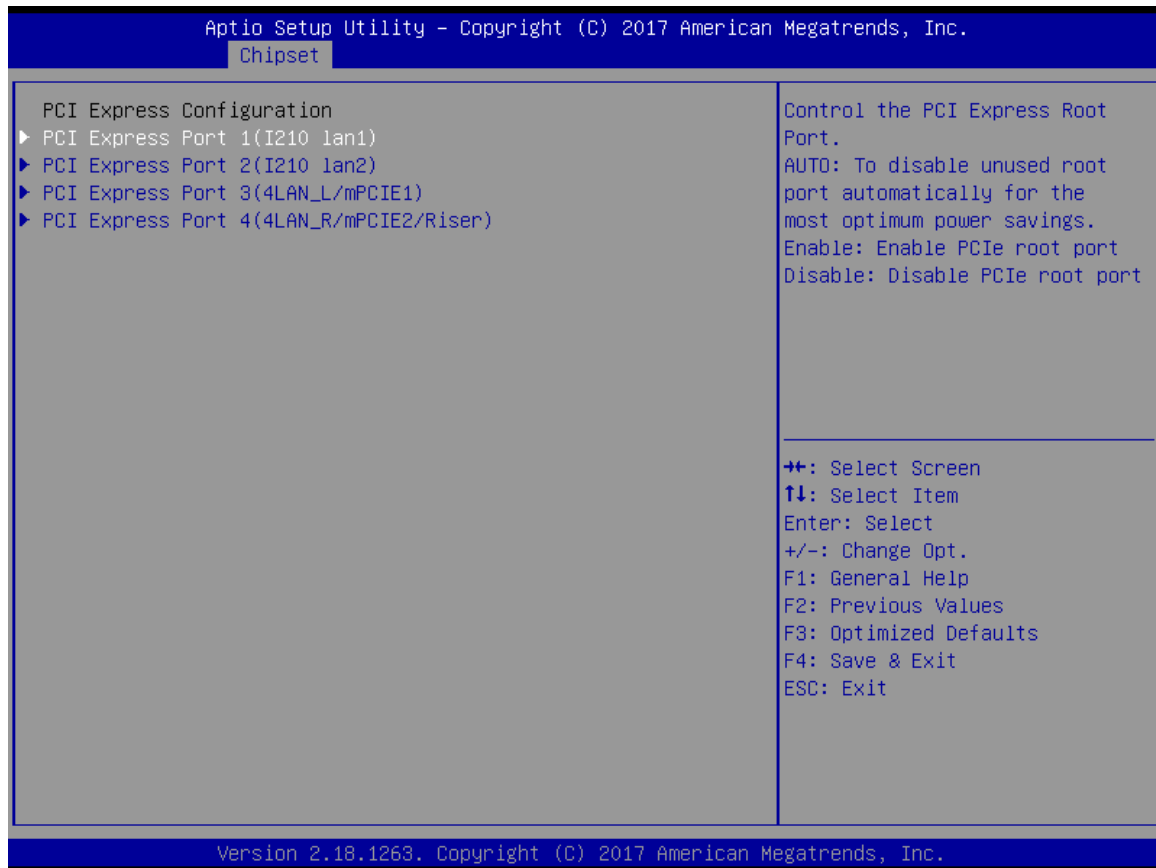
Control detection of the HD-Audio.

● HD-Audio Support

Enabled: HD-Audio will be unconditionally enabled.

Disabled: HD-Audio will be unconditionally disabled.

■ PCI Express Configuration



- **PCI Express Port 1 (I210 lan1)**

This item allows you to enable or disable PCI Express Port 1 (I210 lan1) in the Chipset.

- **Speed**

Change the PCIe Port Speed. Select <AUTO> ,<Gen 1> or <Gen 2>

- **PCI Express Port 2 (I210 lan2)**

This item allows you to enable or disable PCI Express Port 2 (I210 lan2) in the Chipset.

- **Speed**

Change the PCIe Port Speed. Select <AUTO> ,<Gen 1> or <Gen 2>

- **PCI Express Port 3 (4LAN_L/mPCIE1)**

This item allows you to enable or disable PCI Express Port 3 (4LAN_L/mPCIE1) in the Chipset.

- **Speed**

Change the PCIe Port Speed. Select <AUTO> ,<Gen 1> or <Gen 2>

- **PCI Express Port 4 (4LAN_R/mPCIE2/Riser)**

This item allows you to enable or disable PCI Express Port 4 ((4LAN_R/Mpcie2/Riser) in the Chipset.

- **Speed**

Change the PCIe Port Speed. Select <AUTO> ,<Gen 1> or <Gen 2>

■ Restore AC Power Loss

This item specifies whether your system will reboot after a power failure or interrupt occurs.

Available settings are:

Power Off: Leave the computer in the power off state.

Power On: Leave the computer in the power on state.

Last State: Restore the system to the previous status before power failure or interrupt occurred.

4.5 Security

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



4.5.1 Administrator Password

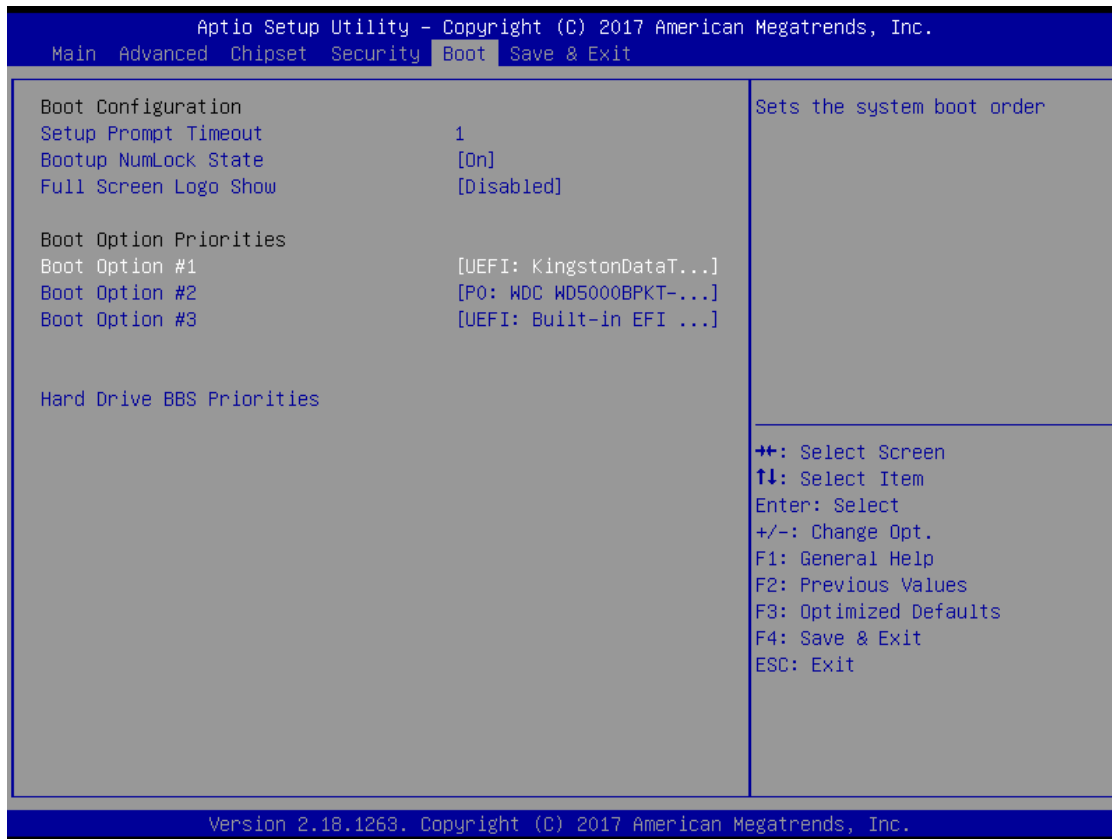
This item allows you to set Administrator Password.

4.5.2 User Password

This item allows you to set User Password.

4.6 Boot

This menu allows you to setup the system boot options.



4.6.1 Setup Prompt Timeout

This item sets number of seconds to wait for setup activation key.

4.6.2 Bootup NumLock State

This item selects the keyboard NumLock state. Select <On> or <Off>.

4.6.3 Full Screen Logo Show

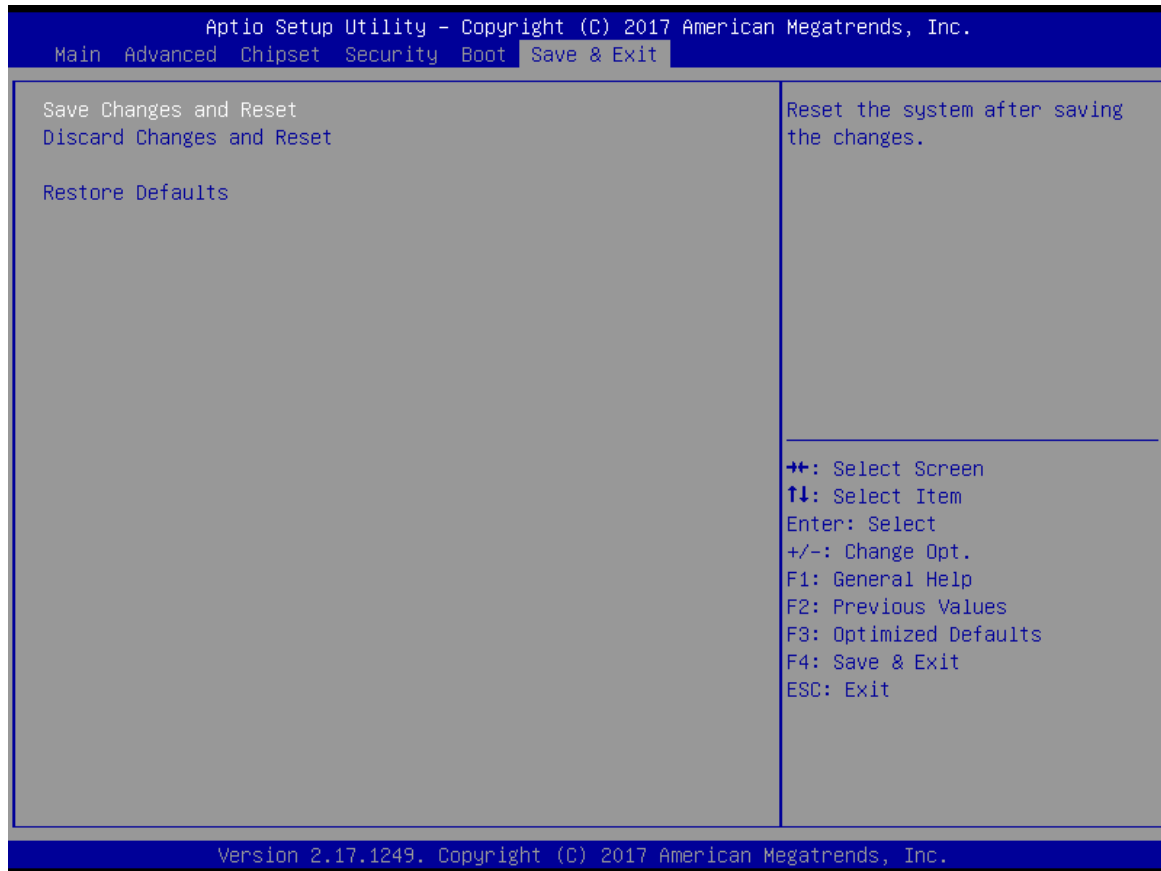
This item allows you to enable or disable Full Screen Logo Show function.

4.6.4 Boot Option Priorities

The items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

4.7 Save & Exit

This setting allows you to configure the boot settings.



4.7.1 Save Changes and Reset

This item allows you reset the system after saving the changes.

4.7.2 Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration.

4.7.3 Restore Defaults

This selection allows you to reload the BIOS when problem occurs during system booting sequence. These configurations are factory settings optimized for this system.

Appendix

WDT & GPIO

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

WDT Sample Code

```

SIO_INDEX_Port      equ 04Eh
SIO_DATA_Port equ    04Fh
SIO_UnLock_Value    equ 087h
SIO_Lock_Value equ    0AAh
WatchDog_LDN        equ 007h
WDT_UNIT            equ 60h ;60h=second, 68h=minute, 40h=Disabled Watchdog timer
WDT_Timer           equ 30 ;ex. 30 seconds

```

Sample code:

;Enable config mode

```

mov     dx, SIO_INDEX_Port
mov     al, SIO_UnLock_Value
out     dx, al
jmp     short $+2      ;lo_delay
jmp     short $+2      ;lo_delay
out     dx, al

```

;Change to WDT

```

mov     dx, SIO_INDEX_Port
mov     al, 07h
out     dx, al
mov     dx, SIO_DATA_Port
mov     al, WatchDog_LDN
out     dx, al

```

;Active WDT

```

mov     dx, SIO_INDEX_Port
mov     al, 30h
out     dx, al
mov     dx, SIO_DATA_Port
in      al, dx
or      al, 01h
out     dx, al

```

;set timer

```

mov     dx, SIO_INDEX_Port
mov     al, 0F6h
out     dx, al
mov     dx, SIO_DATA_Port
mov     al, WDT_Timer
out     dx, al

```

;set UINT

```

mov     dx, SIO_INDEX_Port
mov     al, 0F5h
out     dx, al
mov     dx, SIO_DATA_Port
mov     al, WDT_UNIT
out     dx, al

```

;enable reset

```

mov     dx, SIO_INDEX_Port
mov     al, 0Fah
out     dx, al
mov     dx, SIO_DATA_Port
in      al, dx
or      al, 01h
out     dx, al

```

;close config mode

```

mov     dx, SIO_INDEX_Port
mov     al, SIO_Lock_Value
out     dx, al

```

GPIO Sample Code

● GPI 0 ~ GPI 3

	GPI 0	GPI 1	GPI 2	GPI 3
IO Address	0xA03h	0xA03h	0xA03h	0xA03h
Bit	4	5	6	7
Sample code	#1			

● GPO 0 ~ GPO 3

	GPO 0	GPO 1	GPO 2	GPO 3
IO Address	0xA02h	0xA02h	0xA02h	0xA02h
Bit	0	1	2	3
Sample code	#2			

```

GPI_REG    equ 0A03h
GPO_REG    equ 0A02h
GPO_0      equ 00000001b

```

Sample Code:

#1 : Get GPI 0 status

; Get GPI 0 Pin Status Register

```

In      al, GPI_REG
;al bit4 = GPI 0 status

```

#2 : Set GPO 0 status to high

; Set GPO 0 Pin to High

```

mov     dx, GPO_REG
in      al, dx
or      al, GPO_0
out     dx, al
;al bit0 = GPO 0 status

```

● GPI 4 ~ GPI 7

	GPI 4	GPI 5	GPI 6	GPI 7
IO Address	0xA06h	0xA06h	0xA06h	0xA06h
Bit	0	1	2	3
Sample code	#3			

● GPO 4 ~ GPO 7

	GPO 4	GPO 5	GPO 6	GPO 7
IO Address	0xA06h	0xA07h	#5	0xA04h
Bit	4	7	0	7
Sample code	#4		#5	

```

GPI_REG    equ 0A06h
GPO_REG    equ 0A06h
GPO_4      equ 00010000b

```

Sample Code:

#3 : Get GPI 4 status

; Get GPI 4 Pin Status Register

```

In      al, GPI_REG
;al bit0 = GPI 4 status

```

#4 : Set GPO 4 status to high

; Set GPO 0 Pin to High

```

mov     dx, GPO_REG
in      al, dx
or      al, GPO_4
out     dx, al
;al bit4 = GPO 4 status

```

#5 : GPO 6 must be accessed by gpio configuration (IO address is protected)

Set GPO 6 status to high

```
SIO_INDEX_Port equ 04Eh
SIO_DATA_Port equ 04Fh
SIO_UnLock_Value equ 087h
SIO_Lock_Value equ 0AAh
SIO_LDN_GPIO equ 06h
GPO_REG equ 0d1h
GPO_6 equ 00000001b
```

; Enable config mode

```
mov dx, SIO_INDEX_Port
mov al, SIO_UnLock_Value
out dx, al
jmp short $+2 ;lo_delay
jmp short $+2 ;lo_delay
out dx, al
```

; Switch GPIO Configuration for SIO LDN 0x06

```
mov dx, SIO_INDEX_Port
mov al, 07h
out dx, al
mov dx, SIO_DATA_Port
mov al, SIO_LDN_GPIO
out dx, al
```

; Set GPO 6 Pin to High

```
mov dx, SIO_INDEX_Port
mov al, GPO_REG
out dx, al
mov dx, SIO_DATA_Port
in al, dx
or al, GPO_6
out dx, al
```

;al bit0 = GPO 6 status

; Exit SIO

```
mov dx, SIO_INDEX_Port
mov al, SIO_Lock_Value
out dx, al
```

