Neousys Technology Inc.

POC-200 Series

Ultra-compact Atom™ Bay Trail-I

Fanless Embedded Controller with PoE and USB 3.0

User's Manual

Rev. A1.1

Published Sep 24th, 2014

Date	Description	Version
2014/09/24	Modify 5V TTL GPIO Pin Define, Page 21,75	A1.1

Contents

Declaimer

This manual is intended to be used as a practical and informative guide only and is subject to change without prior notice. It does not represent commitment from Neousys Technology Inc. Neousys shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of the product or documentation, nor for any infringements upon the rights of third parties, which may result from such use.

Declaration of Conformity

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

Copyright and Trademarks

This document contains proprietary information protected by copyright. All rights are reserved. No part of this document may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Company/product names mentioned herein are used for identification purposes only and are trademarks and/or registered trademarks of their respective companies.

Chapter 1 Introduction

1.1 Overview

POC-200 series is a breakthrough of Neousys' ultra-compact controller series. Inheriting the concept of favorable POC-100, POC-200 series further incorporates greater computing power and more versatile functions in its 3.5" HDD footprint.

The new Intel® Atom™ Bay Trail-I platform brings a leaping for both arithmetic and graphics performance. With Atom™ E3845 quad-core processor, POC-200 can deliver more than 200% performance over previous D525/D2550 platform. It also feature comprehensive I/O interfaces to make use of the advance of computing power. Two Gigabit Ethernet and three USB 3.0 ports are integrated so you can connect GigE/USB3 cameras for vision applications. Its IEEE 802.3at PoE option is capable to supply 25.5W each port to power you IP camera for surveillance applications. POC-200 series also features up to four COM ports and digital I/O for general-purpose industrial applications.

Size is another attractive feature of POC-200. Its 6"x4" footprint makes installation of POC-200 extremely easy. And its -30°C to 70°C operating temperature eliminates the restriction for deployment environment. Neousys provides derivative models with different CPU and I/O configuration so you can always find a fit POC-200 for your application.

1.2 Product Specification

1.2.1 Specification of POC-200

System Core	
Processor	Intel® Atom™ E3845 1.91 GHz quad-core processor
Graphics	Integrated Intel® HD Graphics
Memory	1x SODIMM socket for DDR3L-1333, up to 8GB
Panel I/O Interface	
Ethernet	2x Gigabit Ethernet ports by Intel® I210 GbE controller
PoE	IEEE 802.3at PoE PSE (25.5W each GbE port))
Video Port	1x DVI-I connector for both analog RGB and DVI/HDMI outputs, supporting up to 2560 x 1600 resolution
Serial Port	2x software-programmable RS-232/422/485 (COM1 & COM3) 2x RS-232 (COM2 & COM4)
USB	1x USB 3.0 port via native USB3 controller 2x USB 3.0 ports via Renasas uPD720202 USB3 host controller 1x USB 2.0 port
Audio	1x Speaker-out
DIO	4-CH isolated DI + 4-CH isolated DO
Internal I/O Interface	
Mini-PCIe	1x mini PCI Express slot with USIM socket
Storage Interface	
SATA HDD	1x internal SATA port for 2.5" HDD/SSD
Power Supply	
DC Input	Built-in 8~35 VDC DC input
Input Connector	2-pin pluggable terminal block for DC input
Power Consumption	Typical: 7.68W (0.32A@24V) Full-loading: 13.44W (0.56A@24V)*
Mechanical	
Dimension	149mm (W) x 105 mm (H) x 58 mm (D)
Weight	1.1 kg (with one 2.5" SATA HDD)
Mounting	Wall-mount (Standard) DIN-rail mount (Optional)
Environmental	
Operating Temperature	-30°C ~ 70°C with SSD, 100% CPU loading **/*** -10°C ~ 60°C with HDD, 100% CPU loading **/***

Storage Temperature	-40°C ~85°C
Humidity	10%~90% , non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, w/o add-on card, according to
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, w/o add-on card, according to IEC60068-2-27)
EMC	CE/FCC Class A, according to EN 55022 & EN 55024

* Full-loading power consumption is measured with 2GB DDR3 memory and one 2.5" SATA HDD installed under the following conditions:
   - 100% loading for Atom E3845 CPU
   - 100% loading for 3D graphics
   - 100% loading for GbE port

** The 100% CPU loading is applied using Passmark® BurnInTest™ v7.0. For detail testing criteria, please contact Neousys Technology

*** For sub-zero operating temperature, wide-temperature DDR3-L and wide-temperature HDD/SSD are required.

1.2.2 Specification of POC-210

System Core	
Processor	Intel® Atom™ E3845 1.91 GHz quad-core processor
Graphics	Integrated Intel® HD Graphics
Memory	1x SODIMM socket for DDR3L-1333, up to 8GB
Panel I/O Interface	
Ethernet	2x Gigabit Ethernet ports by Intel® I210 GbE controller
PoE	N/A
Video Port	1x DVI-I connector for both analog RGB and DVI/HDMI outputs, supporting up to 2560 x 1600 resolution
Serial Port	2x software-programmable RS-232/422/485 (COM1 & COM3) 2x RS-232 (COM2 & COM4)
USB	1x USB 3.0 port via native USB3 controller 2x USB 3.0 ports via Renasas uPD720202 USB3 host controller 1x USB 2.0 port
Audio	1x Speaker-out
DIO	4-CH 5V TTL DI + 4-CH 5V TTL DO
Internal I/O Interface	
Mini-PCIe	1x mini PCI Express slot with USIM socket
Storage Interface	
SATA HDD	1x internal SATA port for 2.5" HDD/SSD
Power Supply	
DC Input	Built-in 8~35 VDC DC input

Input Connector	2-pin pluggable terminal block for DC input
Power Consumption	Typical: 7.68W (0.32A@24V)
	Full-loading: 13.44W (0.56A@24V)*
Mechanical	
Dimension	149mm (W) x 105 mm (H) x 58 mm (D)
Weight	1.1 kg (with one 2.5" SATA HDD)
Mounting	Wall-mount (Standard)
	DIN-rail mount (Optional)
Environmental	
Operating Temperature	-30°C ~ 70°C with SSD, 100% CPU loading **/***
	-10°C ~ 60°C with HDD, 100% CPU loading **/***
Storage Temperature	-40°C ~85°C
Humidity	10%~90% , non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, w/o add-on card, according to
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, w/o add-on card, according to IEC60068-2-27)
EMC	CE/FCC Class A, according to EN 55022 & EN 55024

Full-loading power consumption is measured with 2GB DDR3 memory and one 2.5" SATA HDD installed under the following conditions:
- *100% loading for Atom E3845 CPU*
- *100% loading for 3D graphics*
- *100% loading for GbE port*

** The 100% CPU loading is applied using Passmark® BurnInTest™ v7.0. For detail testing criteria, please contact Neousys Technology

*** For sub-zero operating temperature, wide-temperature DDR3-L and wide-temperature HDD/SSD are required.

1.2.3 Specification of POC-212

System Core	
Processor	Intel® Atom™ E3845 1.91 GHz quad-core processor
Graphics	Integrated Intel® HD Graphics
Memory	1x SODIMM socket for DDR3L-1333, up to 8GB
Panel I/O Interface	
Ethernet	2x Gigabit Ethernet ports by Intel® I210 GbE controller
PoE	N/A
Video Port	1x DVI-I connector for both analog RGB and DVI/HDMI outputs, supporting up to 2560 x 1600 resolution
Serial Port	1x software-programmable RS-232/422/485 (COM1)
	1x RS-232 (COM2)

USB	1x USB 3.0 port via native USB3 controller
	2x USB 3.0 ports via Renasas uPD720202 USB3 host controller
	1x USB 2.0 port
Audio	1x Speaker-out
DIO	4-CH 5V TTL DI + 4-CH 5V TTL DO
Internal I/O Interface	
Mini-PCIe	1x mini PCI Express slot with USIM socket
Storage Interface	
SATA HDD	1x internal SATA port for 2.5" HDD/SSD
Power Supply	
DC Input	Built-in 8~35 VDC DC input
Input Connector	2-pin pluggable terminal block for DC input
Power Consumption	Typical: 7.68W (0.32A@24V)
	Full-loading: 13.44W (0.56A@24V)*
Mechanical	
Dimension	149mm (W) x 105 mm (H) x 54 mm (D)
Weight	1.1 kg (with one 2.5" SATA HDD)
Mounting	Wall-mount (Standard)
	DIN-rail mount (Optional)
Environmental	
Operating Temperature	-30°C ~ 70°C with SSD, 100% CPU loading **/***
	-10°C ~ 60°C with HDD, 100% CPU loading **/***
Storage Temperature	-40°C ~85°C
Humidity	10%~90% , non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, w/o add-on card, according to
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, w/o add-on card, according to IEC60068-2-27)
EMC	CE/FCC Class A, according to EN 55022 & EN 55024

* Full-loading power consumption is measured with 2GB DDR3 memory and one 2.5" SATA HDD installed under the
   following conditions:
-    100% loading for Atom E3845 CPU
-    100% loading for 3D graphics
-    100% loading for GbE port

** The 100% CPU loading is applied using Passmark® BurnInTest™ v7.0. For detail testing criteria, please contact

 Neousys Technology

*** For sub-zero operating temperature, wide-temperature DDR3-L and wide-temperature HDD/SSD are required.

1.2.4 Specification of POC-222

System Core	
Processor	Intel® Atom™ E3825 1.33 GHz dual-core processor
Graphics	Integrated Intel® HD Graphics
Memory	1x SODIMM socket for DDR3L-1067, up to 4GB
Panel I/O Interface	
Ethernet	2x Gigabit Ethernet ports by Intel® I210 GbE controller
PoE	N/A
Video Port	1x DVI-I connector for both analog RGB and DVI/HDMI outputs, supporting up to 2560 x 1600 resolution
Serial Port	1x software-programmable RS-232/422/485 (COM1) 1x RS-232 (COM2)
USB	1x USB 3.0 port via native USB3 controller 2x USB 3.0 ports via Renasas uPD720202 USB3 host controller 1x USB 2.0 port
Audio	1x Speaker-out
DIO	4-CH 5V TTL DI + 4-CH 5V TTL DO
Internal I/O Interface	
Mini-PCIe	1x mini PCI Express slot with USIM socket
Storage Interface	
SATA HDD	1x internal SATA port for 2.5" HDD/SSD
Power Supply	
DC Input	Built-in 8~35 VDC DC input
Input Connector	2-pin pluggable terminal block for DC input
Power Consumption	Typical: 7.27W (0.30A@24V) Full-loading: 9.60W (0.40A@24V)*
Mechanical	
Dimension	149mm (W) x 105 mm (H) x 54 mm (D)
Weight	1.1 kg (with one 2.5" SATA HDD)
Mounting	Wall-mount (Standard) DIN-rail mount (Optional)
Environmental	
Operating Temperature	-30°C ~ 70°C with SSD, 100% CPU loading **/*** -10°C ~ 60°C with HDD, 100% CPU loading **/***
Storage Temperature	-40°C ~85°C
Humidity	10%~90% , non-condensing

Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, w/o add-on card, according to
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, w/o add-on card, according to IEC60068-2-27)
EMC	CE/FCC Class A, according to EN 55022 & EN 55024

Full-loading power consumption is measured with 2GB DDR3 memory and one 2.5" SATA HDD installed under the following conditions:

- *100% loading for Atom E3845 CPU*
- *100% loading for 3D graphics*
- *100% loading for GbE port*

*** The 100% CPU loading is applied using Passmark® BurnInTest™ v7.0. For detail testing criteria, please contact*

Neousys Technology

*** For sub-zero operating temperature, wide-temperature DDR3-L and wide-temperature HDD/SSD are required.*

Chapter 2 Getting Started

2.1 Unpacking your POC-200

When you receive the package of POC-200 series, please check immediately if the package contains all the items listed in the following table. If any item is missing or damaged, please contact your local dealer or Neousys Technology Inc. for further assistance.

Item	Description	Qty
1	POC-200/210/212/222 ultra-compact fanless controller (According to the configuration you order, your POC-200 may contain DDR3L module or SATA HDD. Please verify these items if necessary.)	1
2	Specialized DVI-to-VGA adapter for POC-200	1
3	2-pin pluggable terminal block	1
4	Neousys Drivers & Utilities DVD	1
5	Screw package	1

2.2 Front Panel I/O Functions

On POC-200 series, we design general-purpose I/O functions on the front panel so you can easily access them. In this section, we'll illustrate each I/O function on the front panel.

2.2.1 Power Button

The power button is a non-latched switch for ATX mode on/off operation. To turn on the POC-200, press the power button and the PWR LED on the center-top side is lighted up. To turn off the POC-200, you can either issue a shutdown command in OS, or just simply press the power button. In case of system halts, you can press and hold the power button for 5 seconds to compulsorily shut down the system. Please note that a 5 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 5 seconds to initiate another power-on operation).

2.2.2 Reset Button

The reset button is used to manually reset the system in case of any abnormal condition. To avoid unexpected operation, the reset button is hidden behind the front panel. You need to use a pin-like object to push the reset button.

2.2.3 LED Indicators
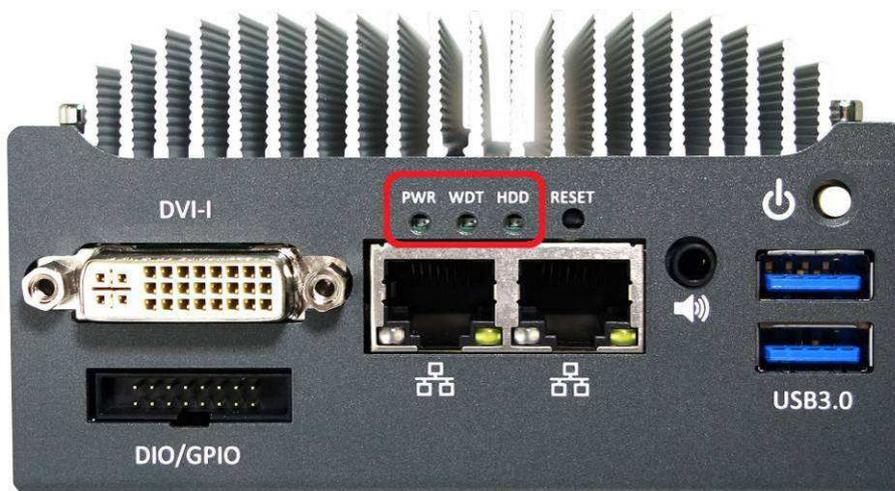
There are three LED indicators on the front panel: PWR, WDT and HDD. The descriptions of these three LED are listed in the following table.

Indicator	Color	Description
PWR	Green	Power indictor, lighted-up when system is on, off when system is off.
WDT	Yellow	Watchdog timer indicator, flashing when watchdog timer is started.
HDD	Red	Hard drive indicator, flashing when SATA hard drive is active.

2.2.4 USB 3.0 Connectors

There are totally three USB 3.0 ports and one USB 2.0 port on POC-200 series. Two of three USB 3.0 ports are located on the front panel. They are implemented via a Renasas uPD720202 USB3 host controller. By BIOS default, these USB ports are operated in xHCI (eXtensible Host Control Interface) mode and are compatible to USB 3.0, USB 2.0, USB 1.1 and USB 1.0 devices. Legacy USB support on these ports is provided only when "xHCI Mode" option in BIOS is configured as "Smart Auto".

To utilize USB 3.0 function in Windows, you need to install corresponding driver for Renasas uPD720202 USB3.0 controller. Please refer to section 4.3 for information of driver installation.

2.2.5 Speaker-out Jack

POC-200 series provides speaker-out function using Intel® High Definition Audio (built-in in ICH8-M) and Realtek ALC262 codec. An audio jack is located on the front panel. To utilize

the speaker-out function in Windows, you need to install corresponding drivers for both Intel® ICH8-M chipset and Realtek ALC262 codec. Please refer to section 4.3 for information of driver installation.

2.2.6 Gigabit Ethernet Ports

POC-200 series offers two Gigabit Ethernet ports using Intel® I210 GbE controller. When plugging in the Ethernet cable, you can tell the Ethernet status and speed from the LED indicators on the RJ45 connector as following:

Active/Link LED

LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

| LED Color	Status	Description
Green or Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

To utilize the GbE port in Windows, you need to install corresponding driver for Intel® I210 GbE controller. Please refer to 4.3 for information of driver installation.

2.2.7 IEEE 802.3at PoE PSE (POC-200 Only)
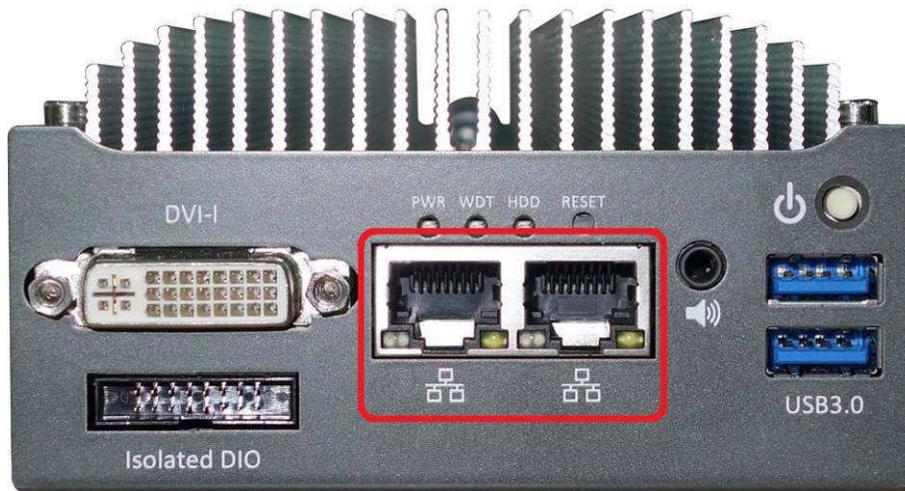
PoE, or Power over Ethernet, is a technology to supply electrical power along with data on a standard CAT-5/CAT-6 Ethernet cable. Two Gigabit Ethernet ports on POC-200 support IEEE 802.3at PoE PSE (Power Sourcing Equipment) function. Each PoE port can deliver 25.5 W of power to a PoE PD (Powered Device), such as a PoE IP camera or a PoE WIFI AP. PoE defines a mechanism to automatically detect the device connected and determine whether to dispatch power. This makes PoE port 100% compatible with traditional Ethernet devices thus you can use these ports to connect PoE or non-PoE devices.

2.2.8 DVI-I Connector
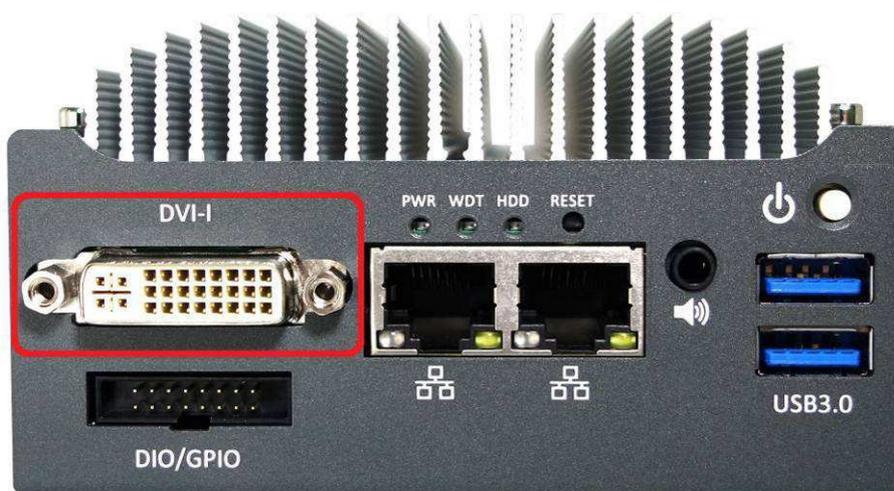
POC-200 series features a DVI-I connector on its front panel to output both VGA and DVI/HDMI signals. The DVI/HDMI and VGA outputs are directly driven by integrated Intel HD Graphics engine and support up to 2560 x 1600 resolution.

For VGA monitor, Neousys offers a specialized DVI-to-VGA adapter as an accessory shipped with POC-200 series. This adapter supports VGA DDC signals and thus eliminates compatibility issues with VGA monitors. Or you can use a DVI-I to VGA+DVI-D Y-cable to support two independent display outputs.
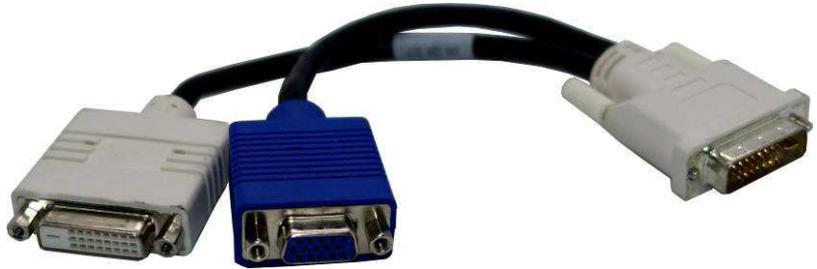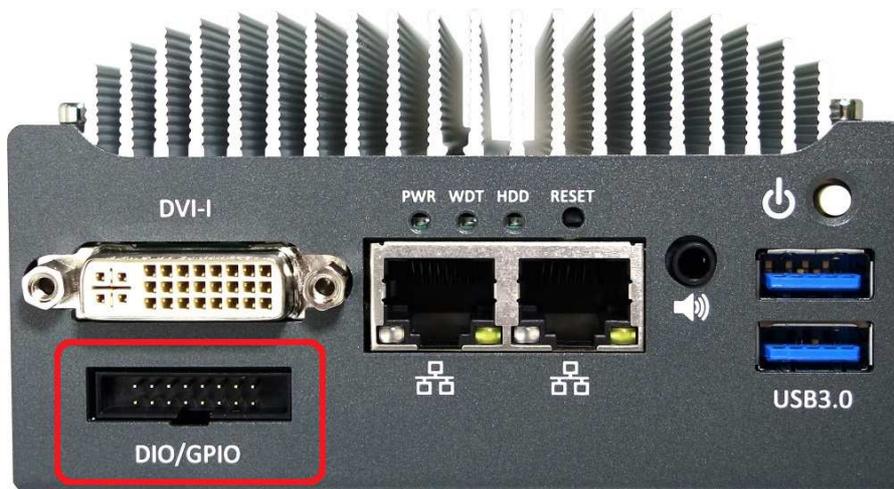

DVI-to-VGA Adapter   **DVI-I to VGA+DVI-D Y-Cable**

To have best graphics performance in Windows, you need to install corresponding graphics driver. Please refer to section 4.3 for information of driver installation.

2.2.9 DIO Connector

2.2.9.1 Isolated DIO on POC-200

POC-200 integrates 2500Vrms isolated DIO function for extending application range. This feature provides 4 channels of isolated digital input and 4 channels of isolated digital output via a 16-pin box-header connector. The following table describes the pin definition of isolated DIO connector.

Pin Definition

Pin#	Definition	I/O	Description
1	ISO_5V	O	Isolate 5V power supply
2	VDD	I	DO voltage source input for inductive load
3	DI_0	I	Digital input channel 0
4	VDD	I	DO voltage source input for inductive load
5	DI_1	I	Digital input channel 1
6	DO_0	O	Digital output channel 0
7	DI_GND	-	Digital input GND
8	DO_1	O	Digital output channel 1
9	DI_2	I	Digital input channel 2
10	DO_GND	-	Digital output GND
11	DI_3	I	Digital input channel 3
12	DO_2	O	Digital output channel 2
13	DI_GND	-	Digital input GND
14	DO_3	O	Digital output channel 3
15	DI_GND	-	Digital input signal
16	DO_GND	-	Digital output GND

Electrical Characteristics

Parameeter	Description	Min	Typ	Max	
DO Channel [0:3]					
V_DO	DO output voltage			24	V
I_DO	DO current limit		100	250	mA
DI Channel [0:3]					
V_DI High	Input voltage High	5		24	V
V_DI Low	Input voltage Low	0		1.5	V
I_DI	Input current			20	mA
Voltage ISO_5V					
V_ISO5V	Voltage	4.75	5	5.25	V

I_ISO5V	Current		200	mA
Input Parameter				
Resistor	Input resistor		2.4	Kohm
Isolated voltage			2500	V rms

2.2.9.2 5V TTL GPIO on POC-210/POC-212/POC-222
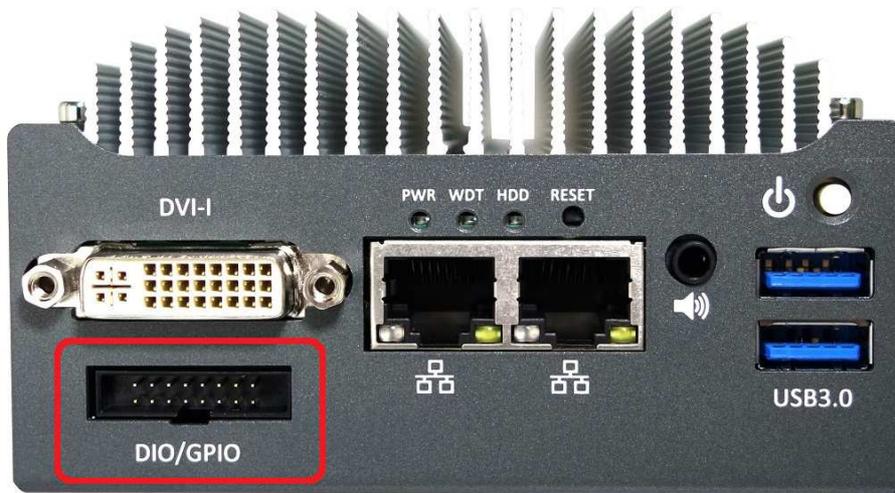
POC-210/212/222 offers 8-CH 5V TTL GPIO for general-purpose usage. By default, these channels are configured as 4 channels of digital input and 4 channels of digital output. The following table describes the pin definition of isolated DIO connector.

Pin Definition

Pin#	Definition	I/O	Description
1	N.C	-	No connection
2	N.C	-	No connection
3	DI_0	I	Digital input channel 0
4	N.C.	-	No connection
5	DI_1	I	Digital input channel 1
6	DO_0	O	Digital output channel 0
7	N.C.	-	No connection

8	DO_1	O	Digital output channel 1
9	DI_2	I	Digital input channel 2
10	D_GND	GND	Digital GND
11	DI_3	I	Digital input channel 3
12	DO_2	O	Digital output channel 2
13	N.C.	-	No connection
14	DO_3	O	Digital output channel 3
15	N.C.	-	No connection
16	D_GND	GND	Digital GND

2.3 Back Panel I/O Functions

To fit more general application requirements, POC-200 series offers more I/O functions on its back panel. In this section, we'll illustrate each I/O function on the back panel.

2.3.1 USB3.0 Connectors

There are totally three USB 3.0 ports and one USB 2.0 port on POC-200 series. One of three USB 3.0 ports is located on the back panel. This USB 3.0 port is implemented via native xHCI controller inside Bay Trail SoC. By BIOS default, this USB port is operated in xHCI (eXtensible Host Control Interface) mode and is compatible to USB 3.0, USB 2.0, USB 1.1 and USB 1.0 devices.

To utilize USB 3.0 function in Windows, you need to install corresponding USB3 driver for Bay Trail SoC. Please refer to section 4.3 for information of driver installation.

2.3.2 USB2.0 Connectors

In addition to three USB 3.0 ports, POC-200 series provides another USB 2.0 port on its back panel. By BIOS default, these USB 2.0 ports are operated in EHCI (Enhanced Host Control Interface) mode and are compatible with USB 2.0, USB 1.1 and USB 1.0 devices. Legacy USB support is provided so you can use USB keyboard/mouse in DOS environment.

2.3.3 COM Ports on POC-212/222

POC-212 and POC-222 provide two COM ports via two 9-pin D-Sub male connectors on the back panel for communicating with external devices. They are implemented using industrial-grade ITE8783 Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate.

COM1 is a software-selectable RS-232/422/485 port and COM2 supports RS-232 only. The operation mode of COM1 can be set in BIOS setup utility (refer to section 4.1.1 for detail). The following table describes the pin definition of COM ports.
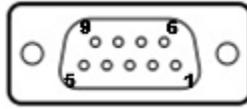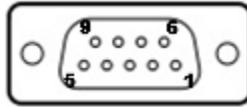
Pin#	COM1			COM2
	RS-232 Mode	**RS-422 Mode**	**RS-485 Mode (Two-wire 485)**	**RS-232 Mode**
1	DCD			DCD
2	RX	422 TXD+	485 TXD+/RXD+	RX
3	TX	422 RXD+		TX
4	DTR	422 RXD-		DTR
5	GND	GND	GND	GND
6	DSR			DSR
7	RTS			RTS
8	CTS	422 TXD-	485 TXD-/RXD-	CTS
9	RI			RI

2.3.4 COM Ports on POC-200/210

POC-200 and POC-210 provide four COM ports via four 9-pin D-Sub male connectors on the back panel for communicating with external devices. They are implemented using industrial-grade ITE8783 Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate.

COM1/COM3 are software-selectable RS-232/422/485 ports and COM2/COM4 support RS-232 only. The operation mode of COM1/COM3 can be set in BIOS setup utility (refer to section 4.1.1/4.1.2 for detail). The following table describes the pin definition of COM ports.

Pin#	COM1/COM3			COM2/COM4
	RS-232 Mode	RS-422 Mode	RS-485 Mode (Two-wire 485)	RS-232 Mode
1	DCD			DCD
2	RX	422 TXD+	485 TXD+/RXD+	RX
3	TX	422 RXD+		TX
4	DTR	422 RXD-		DTR
5	GND	GND	GND	GND
6	DSR			DSR
7	RTS			RTS
8	CTS	422 TXD-	485 TXD-/RXD-	CTS
9	RI			RI

2.3.5 2-Pin Terminal Block for DC Input

POC-200 series features a pluggable terminal block for direct DC wiring. The 2-pin pluggable terminal block on the back panel is fit for field usage where DC power is usually provided. It accepts a wide range of DC power input from 8 to 35V. And the screw clamping connection of terminal block gives a very reliable way for wiring the DC power. The following table describes the pin definition of the pluggable terminal block. For detail information of connecting DC power, please refer to section 3.6.
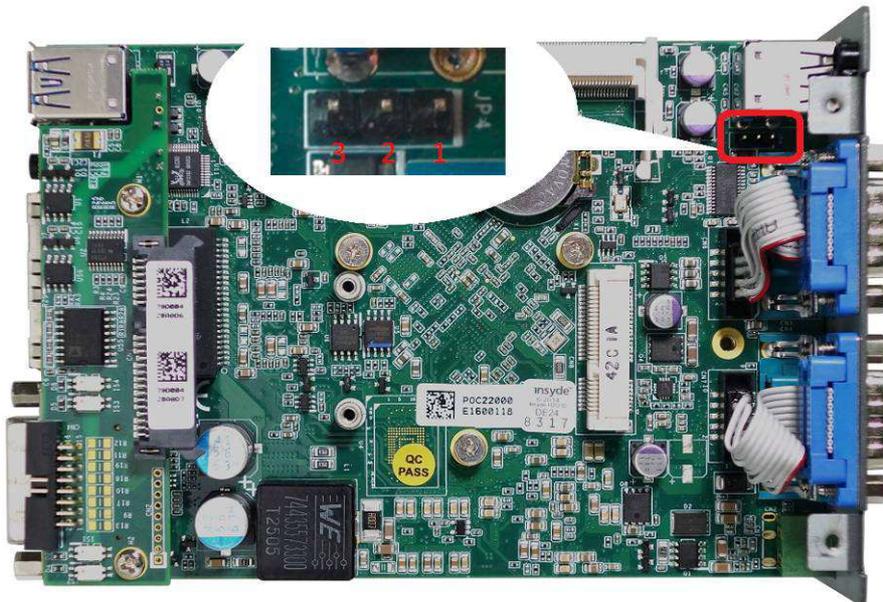
Pin	Description
V+	Positive polarity of DC power input (8 ~ 35V).
V-	Negative polarity of DC power input (usually power ground).

Caution

Please make sure the voltage and polarity of DC power is correct before you connect it to POC-200.

Supplying a voltage over 35V will damage the system..

2.4 Internal I/O Functions

2.4.1 Remote On/Off Control

The remote on/off control function allows users to turn on or turn off the system remotely by connecting an external switch. This function is provided via a 1x3 pins, 2.0mm pitch pin header.
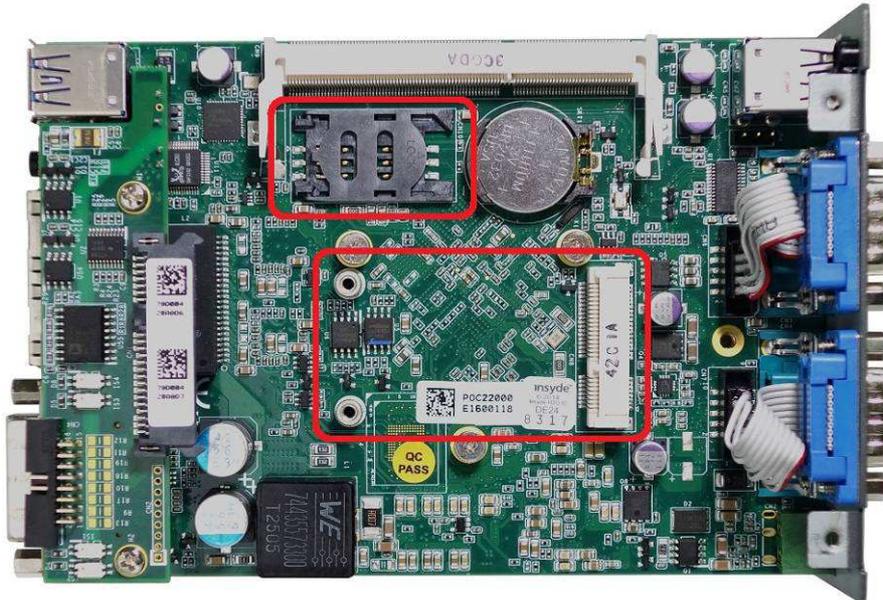
Both AT-mode and ATX-mode on/off control are supported. For detail information of using remote on/off control function, please refer to section 3.7.2/3.7.3.

Switch Connection for AT/ATX Mode Remote On/Off Control
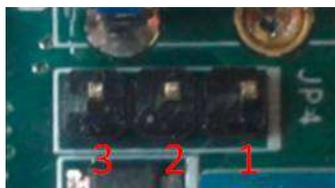
Mode	Jumper Setting
AT	
ATX	

2.4.2 Mini PCI Express Connector and SIM Socket

POC-200 series provides an on-board Mini PCI Express socket with SIM card support. There are plenty of off-the-shelf mini-PCIe modules with versatile capabilities. By installing a mini-PCIe module, your system can have expanded features such as WIFI, 3G, GPS, RAID and etc. In addition, the SIM card support makes it possible to connect your system to Internet in wide territory through telecom operator's GPRS/3G network.

2.4.3 DDR3L SODIMM Socket
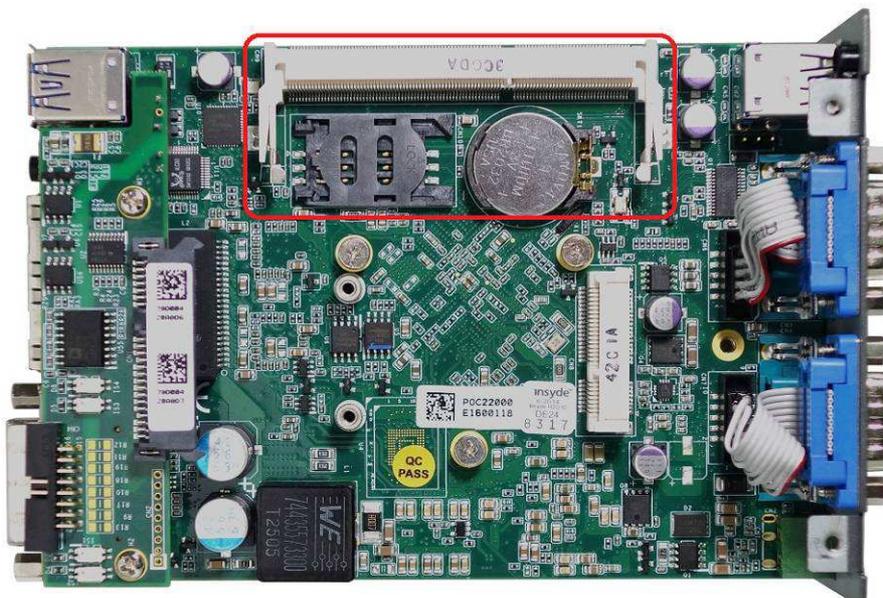
POC-200 series provides one 204-pin, SODIMM socket for memory installation. It supports a maximal 8GB capacity by installing one low-voltage 1.35V DDR3L-1333 SODIMM modules. For information of installing DDR3L memory modules, please refer to section 3.2 for detail.

Note

Please make sure you're installing a 1.35V DDR3L SODIMM module to POC-200. Installing a 1.5V DDR3 SODIMM will cause system failed to boot.

2.4.4 SATA Connector
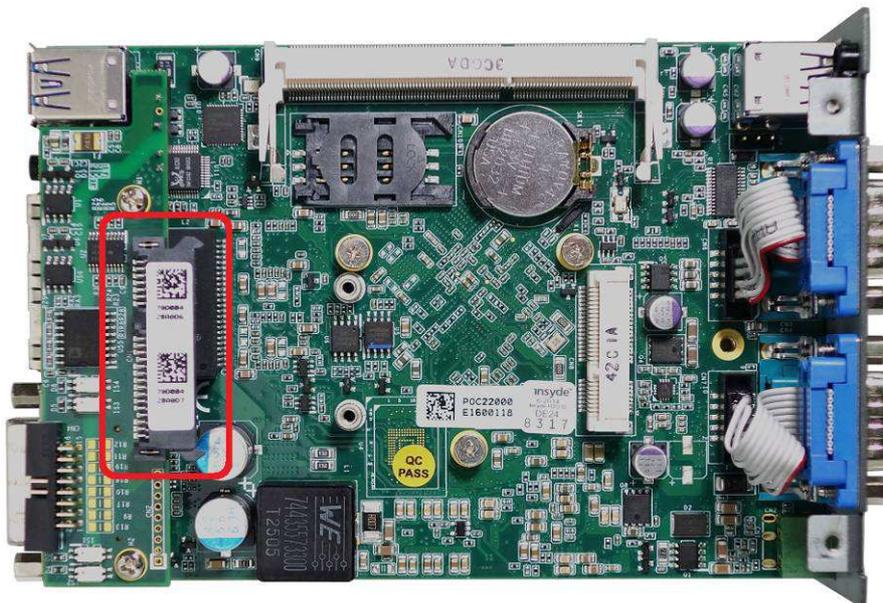
POC-200 series provides one SATA port to accommodate a 2.5" SATA hard drive inside it. The SATA port is located on the daughter board via a 22-pin SATA connector. With the HDD bracket shipped with POC-200 series, you can directly mount a 2.5" HDD or SSD to this port. For information of installing a HDD/SSD to SATA port, please refer to section 3.3 for detail.
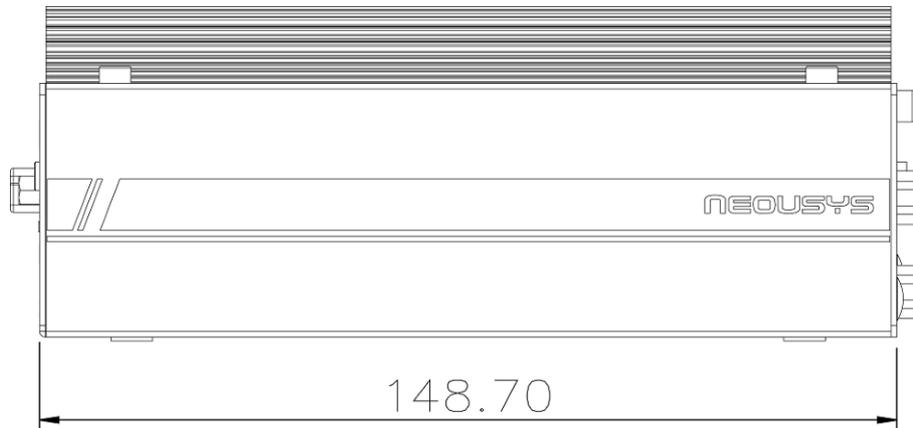
2.5 POC-200/210 Mechanical Dimension

2.5.1 Top View

122.60

94.50
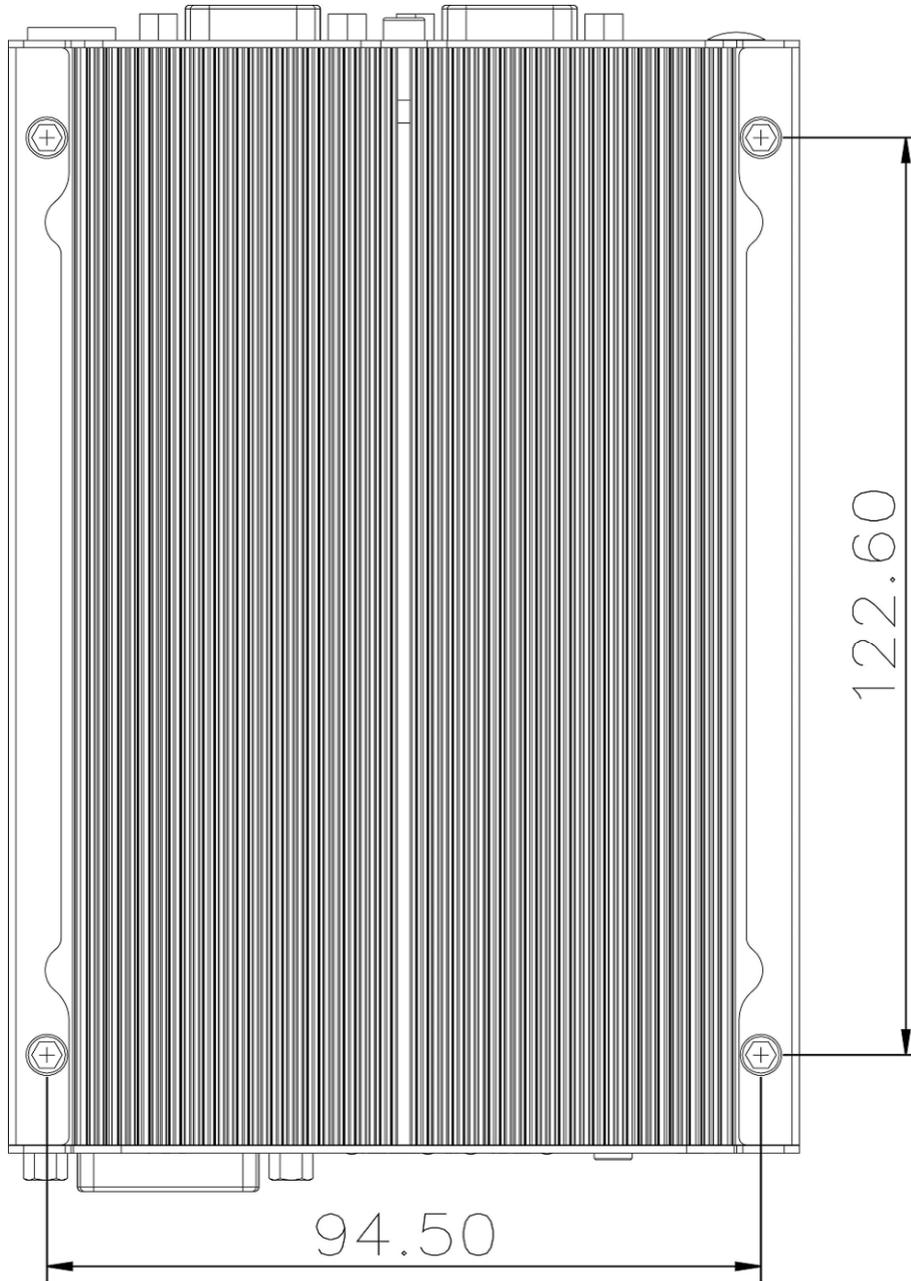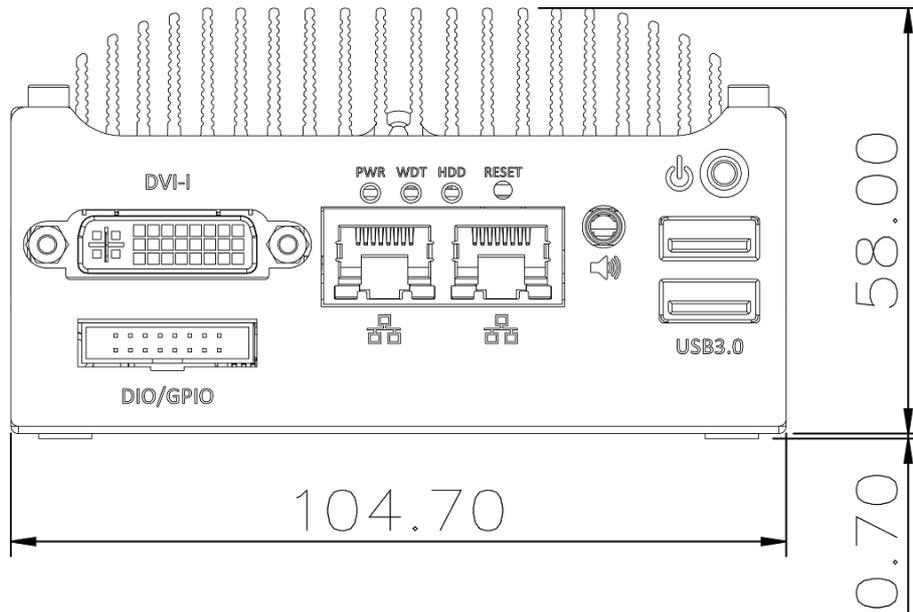
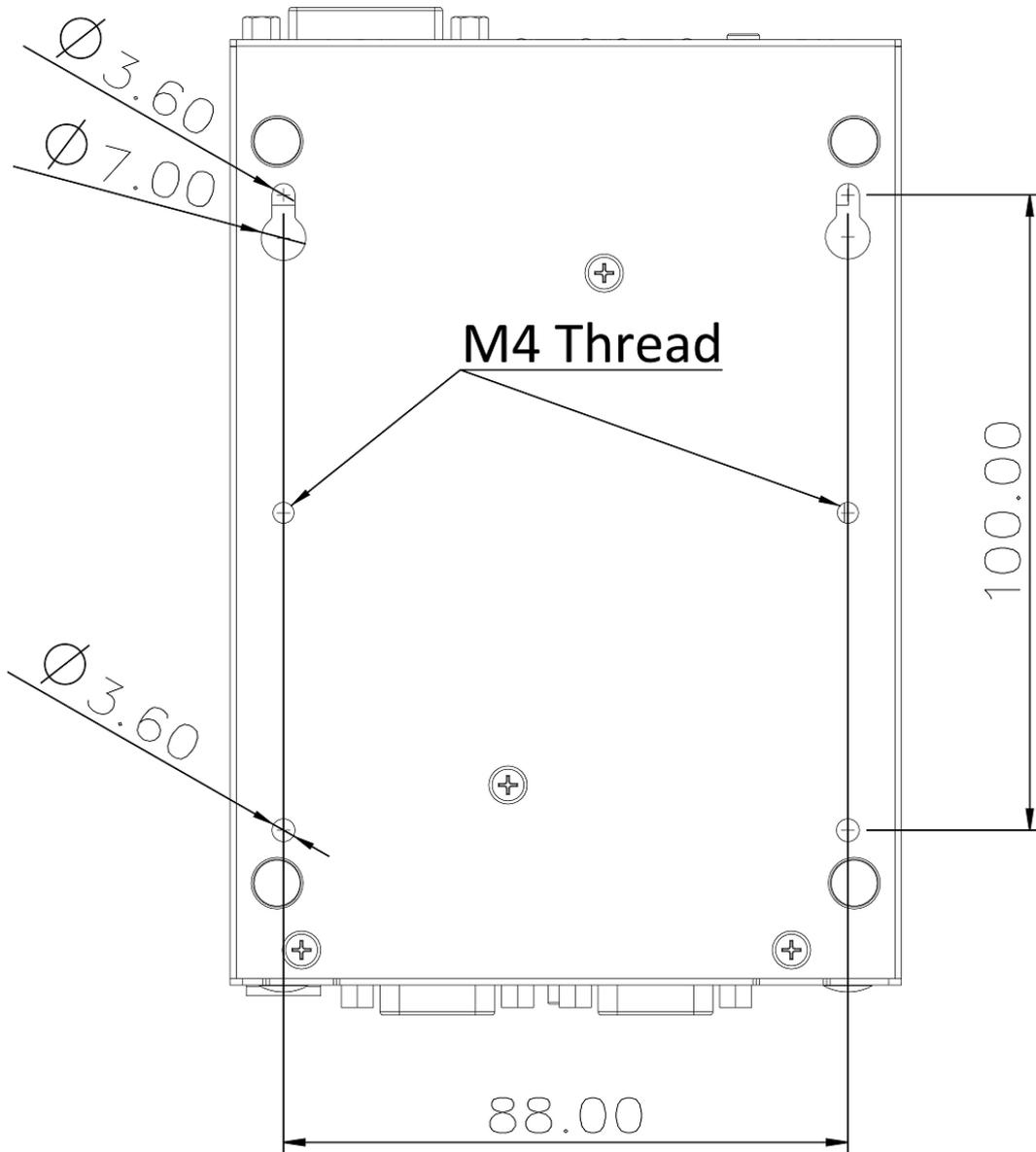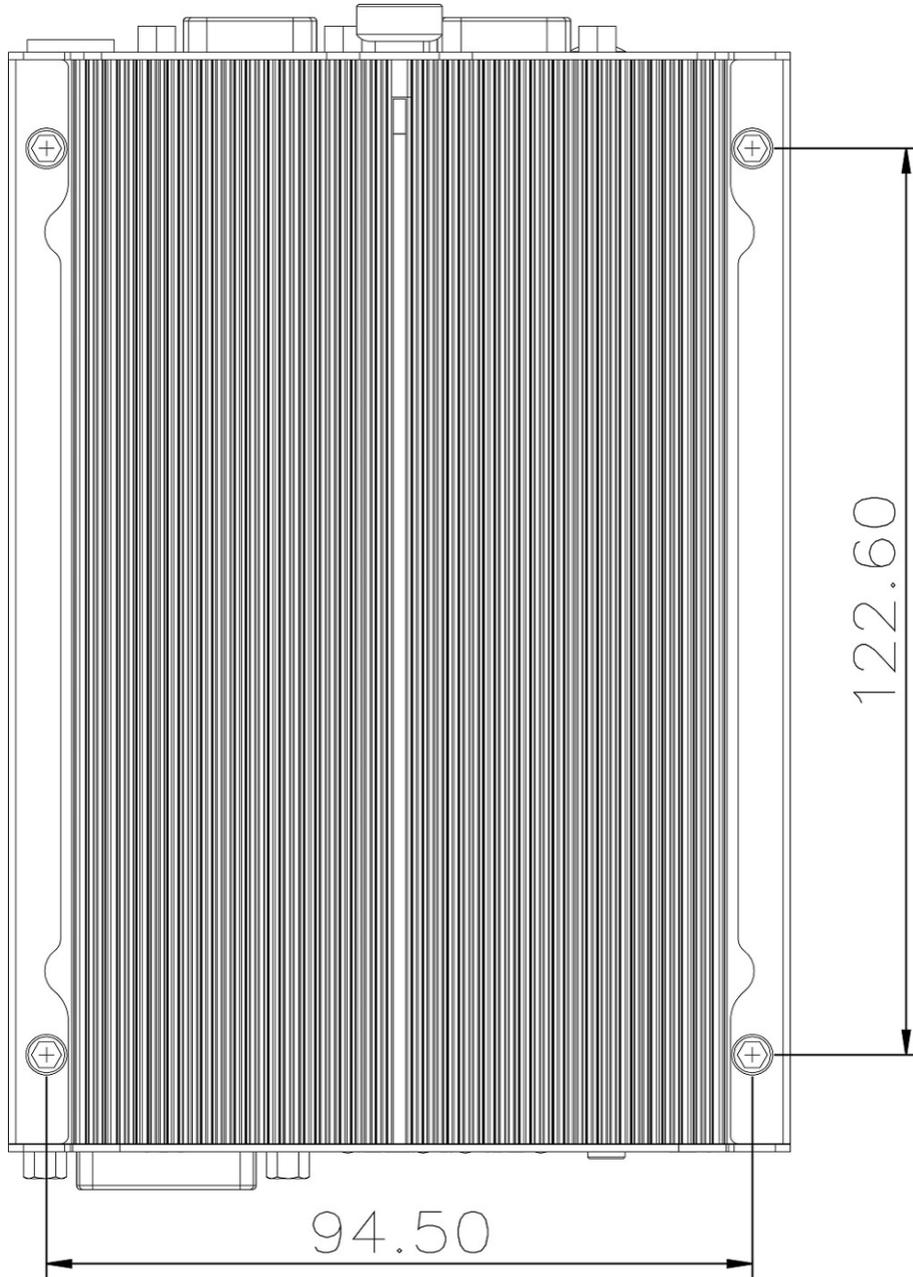## 2.5.2 Front View

2.5.3 Side View

2.5.4 Bottom View

2.6 POC-212/222 Mechanical Dimension

2.6.1 Top View

2.6.2 Front View
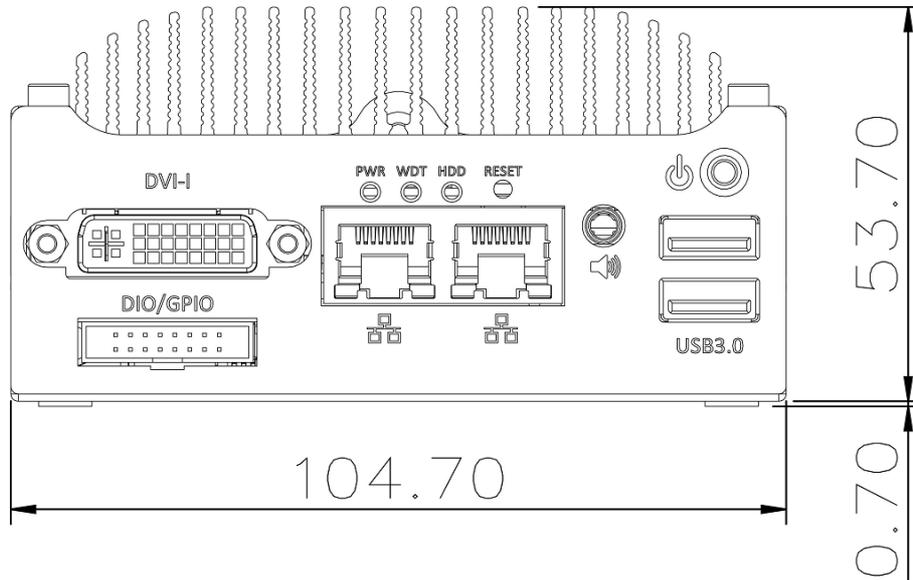
2.6.3 Side View
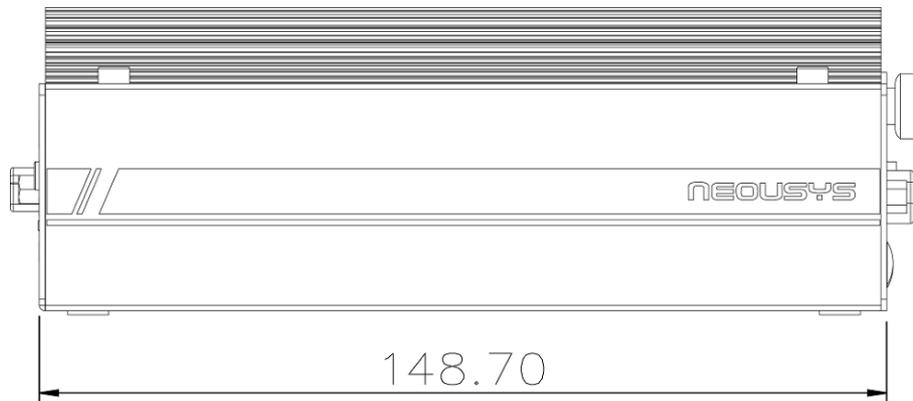
2.6.4 Bottom View
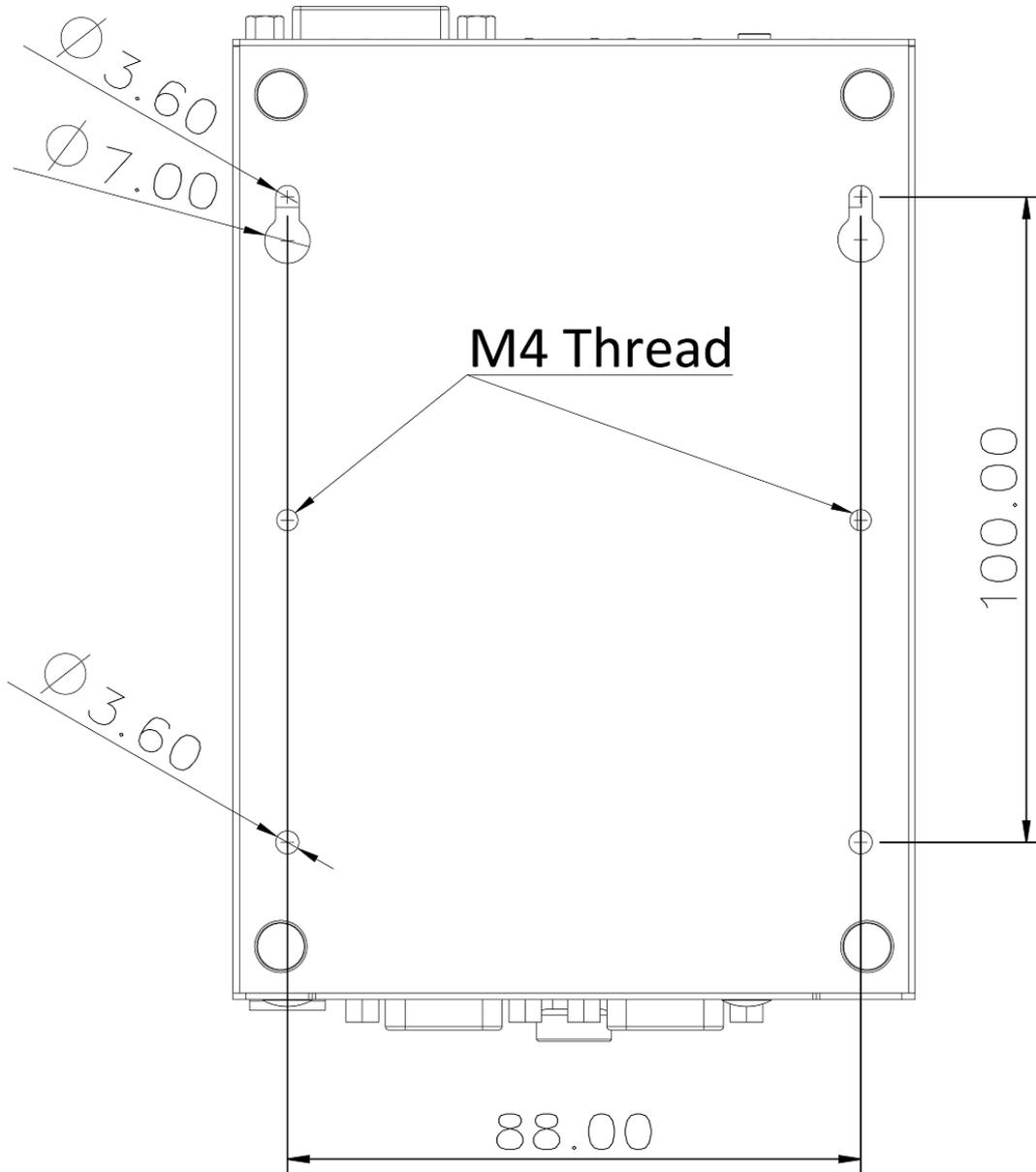
Chapter 3 Getting Start

In this chapter, we'll illustrate how to disassemble your POC-200 and install peripheral devices. Please note that the procedures might be varied for different POC-200 models. Please follow the correct procedures to prevent any damage on your POC-200 series.

3.1 Dissemble your POC-200 Series

3.1.1 Dissemble POC-200/210

1. Unscrew 4 hex bolts on the top of the heat sink.

2. Unscrew four M3 F-head screws on the bottom side.
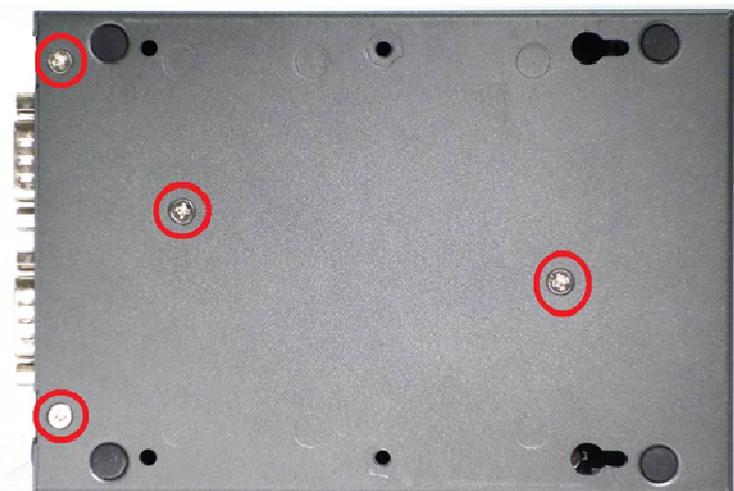
3. Gently slide out the assembly of case and you can see the case and the HDD bracket.

3.1.2 Dissemble POC-212/222

1. Unscrew the hand screw on the back panel.

2. Pull the 2.5" HDD bracket out of POC-212/222.
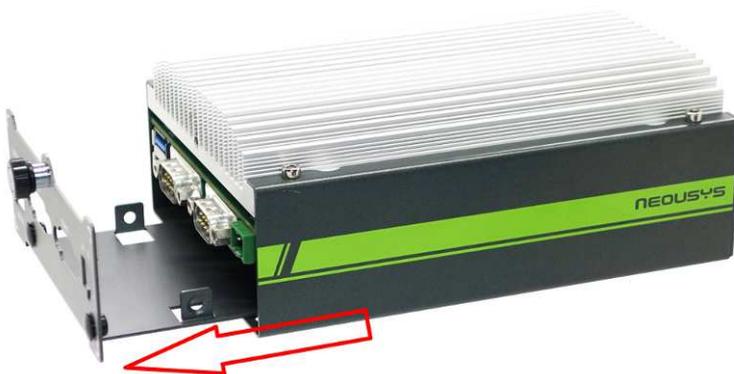
3. Unscrew 4 hex bolts on the top of the heat sink.

4. Gently slide out the assembly of case.

3.2 Install a DDR3L SODIMM Module

Note

Please make sure you're installing a 1.35V DDR3L SODIMM module on POC-200. Installing a 1.5V DDR3 SODIMM will cause system failed to boot.

1. Follow the steps in section 3.1.1 (POC-200/210) or section 3.1.2 (POC-212/222) to dissemble your POC-200 series. You can see the DDR3L socket exposed.
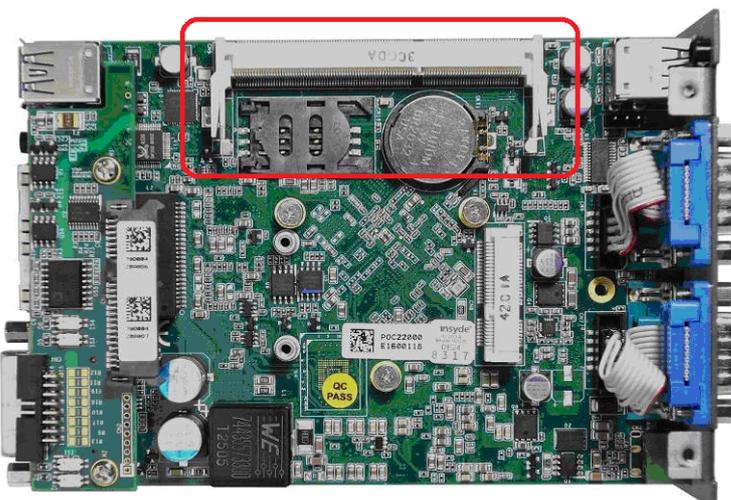
2. Tile the DDR3L SODIMM module and insert it to the SODIMM socket. As it's firmly contacted with socket connectors, press it down until the clamps of the socket snap into the latching position of SODIMM module.

3.3 Install a 2.5" HDD/SSD

The SATA port of POC-200 series is located on the daughter board via a 22-pin SATA connector. POC-200/210 and POC-212/222 feature different design of HDD mounting bracket. To install a 2.5" HDD/SSD to your POC-200 series, please follow the steps listed below.

3.3.1 Install a 2.5" HDD/SSD on POC-200/210

1. Follow the steps in section 3.1.1 to dissemble your POC-200/210. You can get the HDD bracket from the chassis assembly.

2. Remove the protective firm from the thermal pad on the HDD bracket.
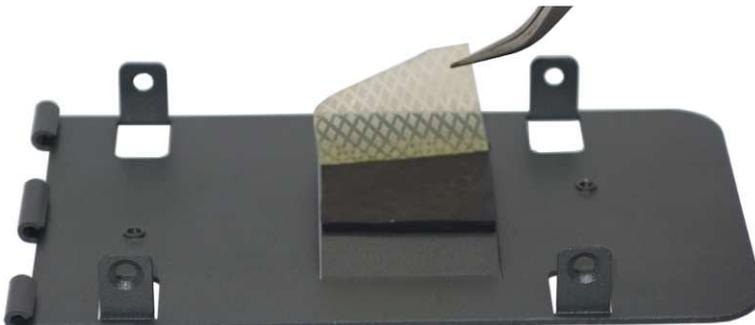
3. Get four M3 F-head screws from the accessory box. Attach the HDD/SSD to the bracket using four M3 F-head screws.

(Another two screws are on the opposite side)

4. Gently slide the HDD assembly into the SATA connector till they're firmly connected.

5. Carefully push back the case and fix the chassis assembly using four M4 F-head screws.

3.3.2 Install a 2.5" HDD/SSD on POC-212/222

1.   Loose the hand screw and pull out the HDD bracket.

2.   Remove the protect firm from the thermal pad on the HDD bracket.
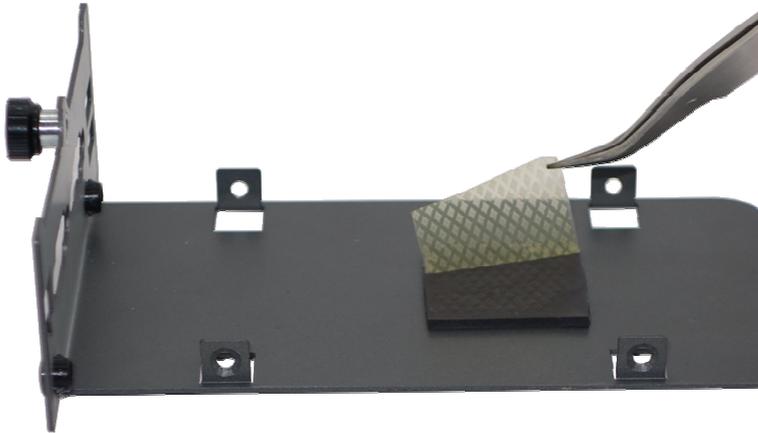
3.   Get four M3 F-head screws from the accessory box. Attach the HDD/SSD to the bracket using four M3 F-head screws.

     (Another two screws are on the opposite side)

4.   Gently slide the HDD assembly into the SATA connector till they're firmly connected.

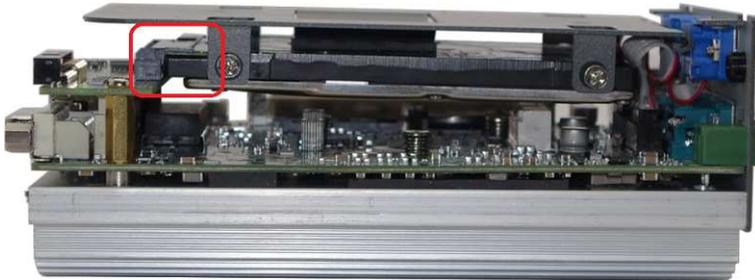5. Fasten the hand screw of POC-212/POC-222.

3.4 Install a Mini-PCIe Module

POC-200 series provides one mini-PCIe connector with SIM socket to accommodate versatile mini-PCIe modules (e.g. 3G/4G/WIFI/GPS) for further function expansion. In this section, we'll demonstrate how to install a mini-PCIe WIFI module and attach an antenna to your POC-200 series. Please note that the mini-PCIe WIFI module, cable and antenna are not part of POC-200 series and may be different according to your system configuration.

3.4.1 Install a Mini-PCIe Module on POC-200/POC-210

1. Follow the steps in section 3.1.1 to dissemble your POC-200/210. You can see the mini-PCIe connector exposed.
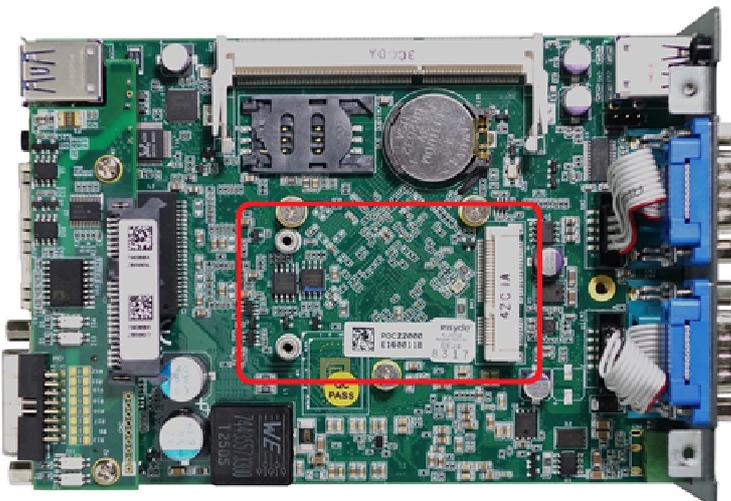
2. Tilt the mini-PCIe WIFI module and insert it to the mini-PCIe port. And fix the WIFI module with two M2.5 P-head screws.
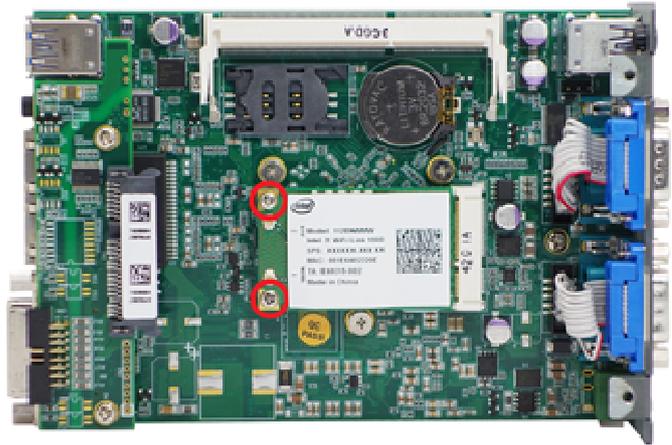
3. Attach the IPEX-to-SMA cable to the WIFI module and fix the SMA connector (on the IPEX-to-SMA cable) to back panel.
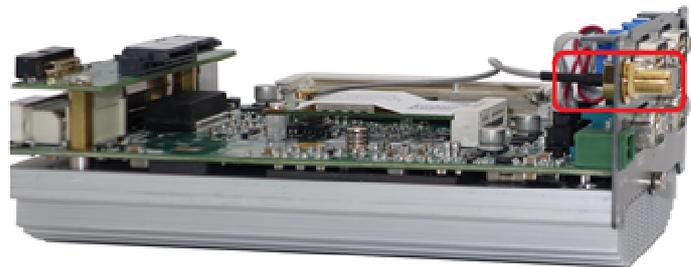
4. Carefully push back the case and fix the chassis/HDD assembly using four M4 F-head screws.
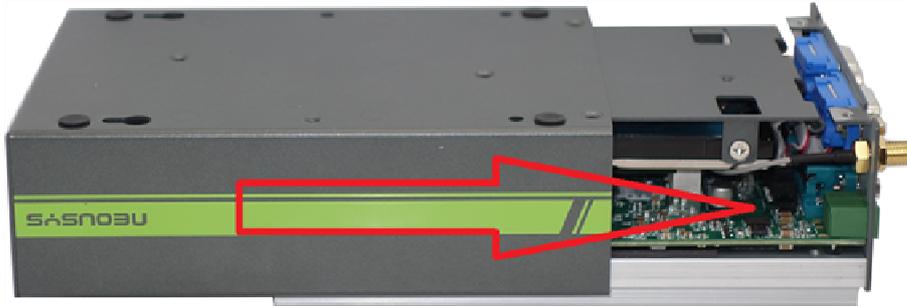
5. Attach the WIFI antenna to the SMA connector.

3.4.2 Install a Mini-PCIe Module on POC-212/222

1. Follow the steps in section 3.1.2 to dissemble your POC-212/222. You can see the mini-PCIe connector exposed.
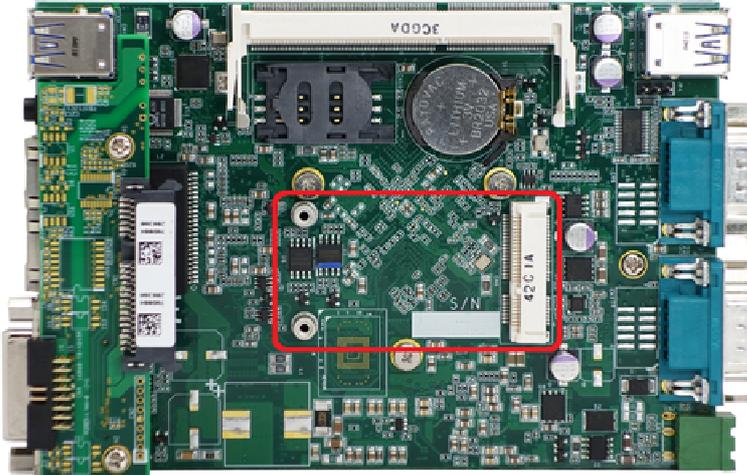
2. Tilt the mini-PCIe WIFI module and insert it to the mini-PCIe port. And fix the WIFI module with two M2.5 P-head screws.
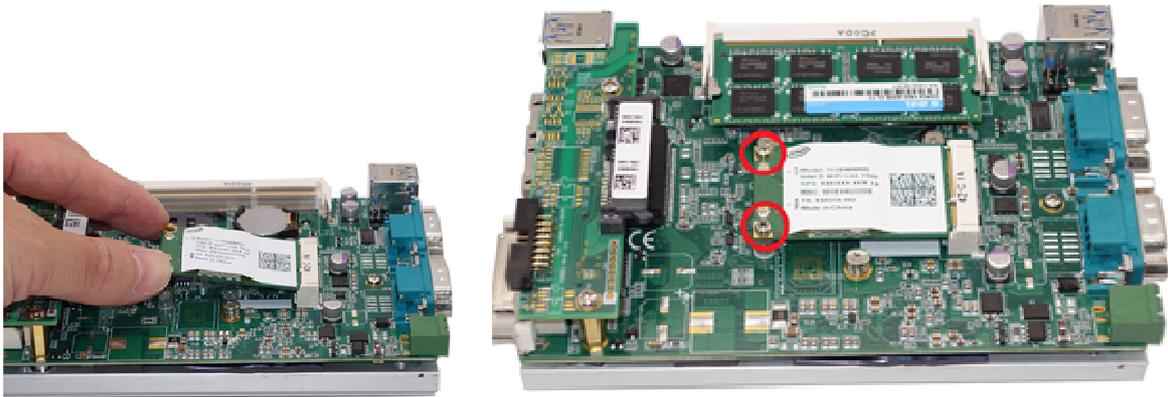
3. Attach the IPEX connector of the IPEX-to-SMA cable to the WIFI module.

4. Carefully push back the case and fix the chassis with heat-sink using four hex bolts.
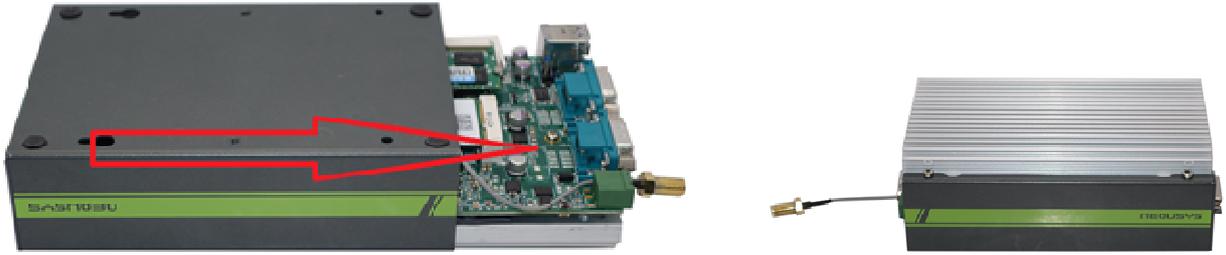
5. Fix the SMA connector of the IPEX-to-SMA cable to back panel.

6. Attach the WIFI antenna to the SMA connector.

3.5 Mount your POC-200 Series

POC-200 series provides versatile ways of mounting. The chassis itself is designed to be used as a mounting bracket, which can mounted inside-out or outside-in. Neousys also offers the option of DIN-rail mounting clip so you can mount POC-200 on a DIN rail. To mount your POC-200, please refer to the information listed below.

3.5.1 Suspend your POC-200 on the Wall

You can take advantage of two keyhole-shaped holes on the bottom side of the chassis to suspend your POC-200 on the wall. With two pre-installed screws (88 mm pitch) on the wall, you can easily suspend or displace the POC-200. This way of mounting is only suitable for a steady environment without shock and vibration.
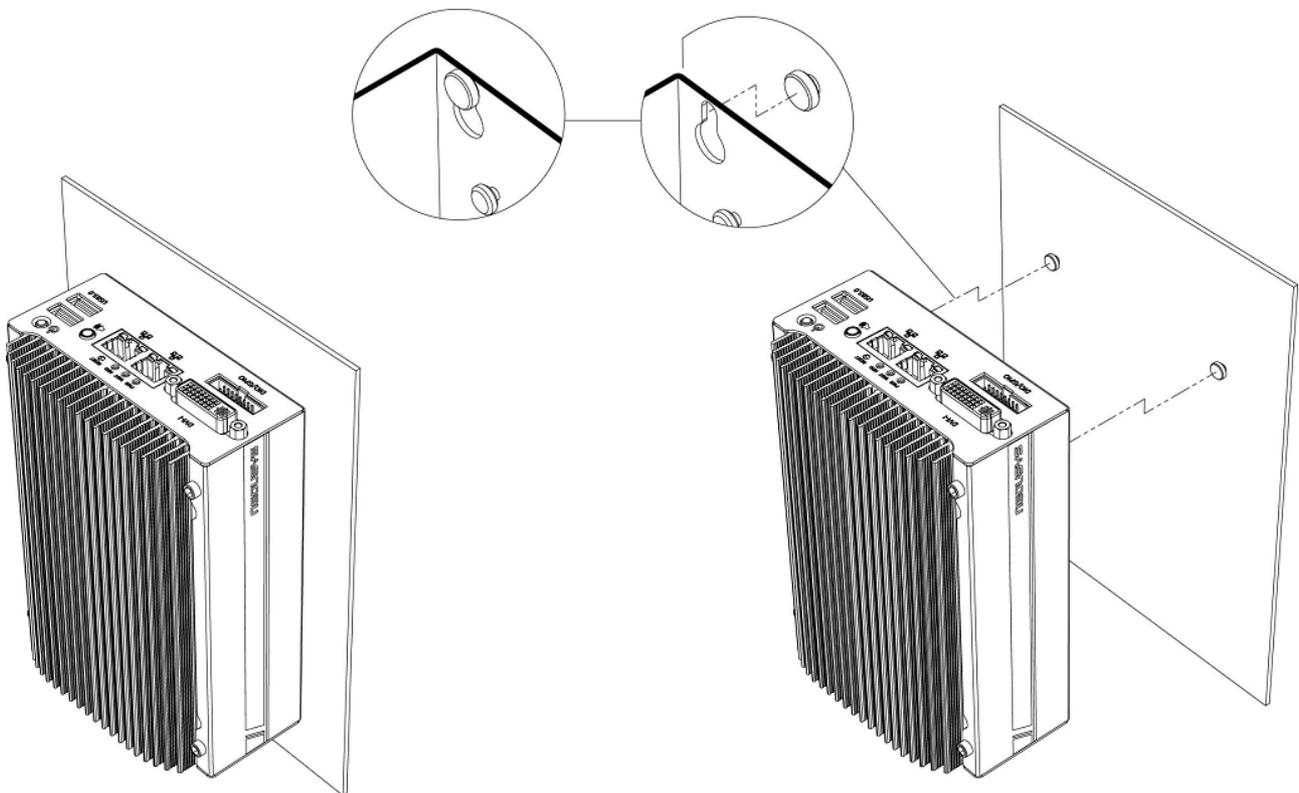
3.5.2 Mount your POC-200 Outside-in on a Surface

There are two nuts with M4x0.7 thread on the bottom side of POC-200 so you can fix it outside-in using two M4 screws. This is convenient if you want to deploy POC-200 in a restricted space where inside-out mounting is not applicable.

M4 Screws(2X)
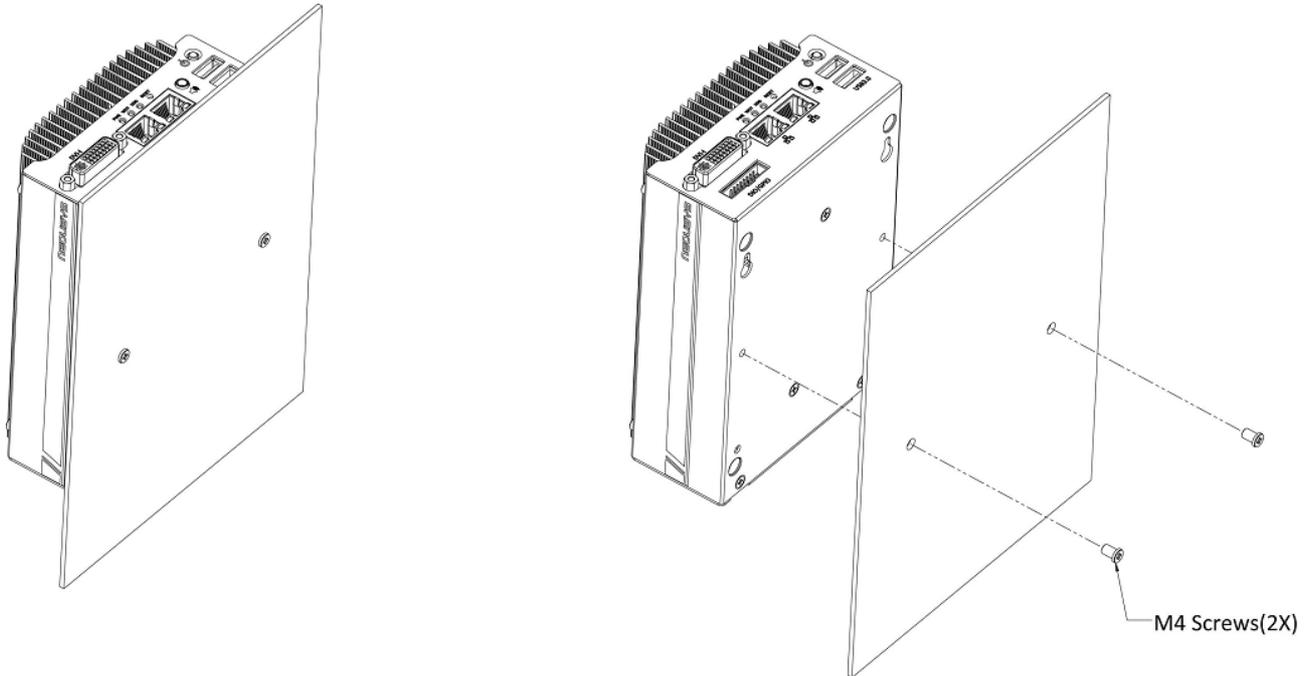
3.5.3 Mount your POC-212/222 Inside-out on a Surface

For POC-212/222, you can take advantage of four mounting holes on the bottom side to fix your POC-212/222 inside-out on a surface. To do this, you need to remove its chassis from the PCBA/heat-sink assembly first. Please follow the steps listed in section 3.1.2, and then you can use the chassis as the mounting bracket. Once you fix the chassis inside-out on a surface, you can slide the assembly of PCBA/heat-sink assembly back into the chassis. Fix it with hex bolts and the POC-212/222 is firmly mounted on a surface.
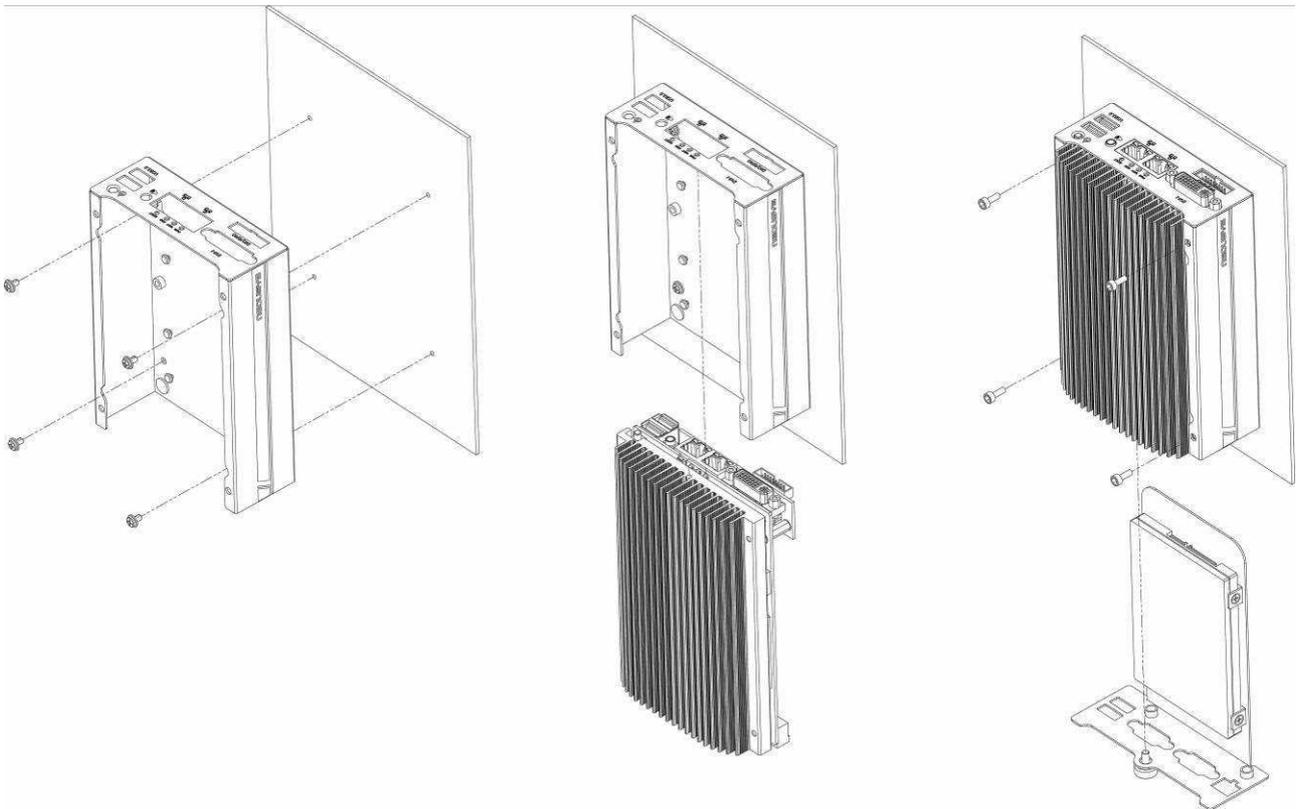
3.5.4 Mount your POC-200 on the DIN Rail

Neousys also provides the option of the DIN-rail mounting clip. With the mounting clip, you can fix POC-200 on a DIN rail. This option can be useful if you want to deploy POC-200 inside an equipment cabinet where DIN rail is available.
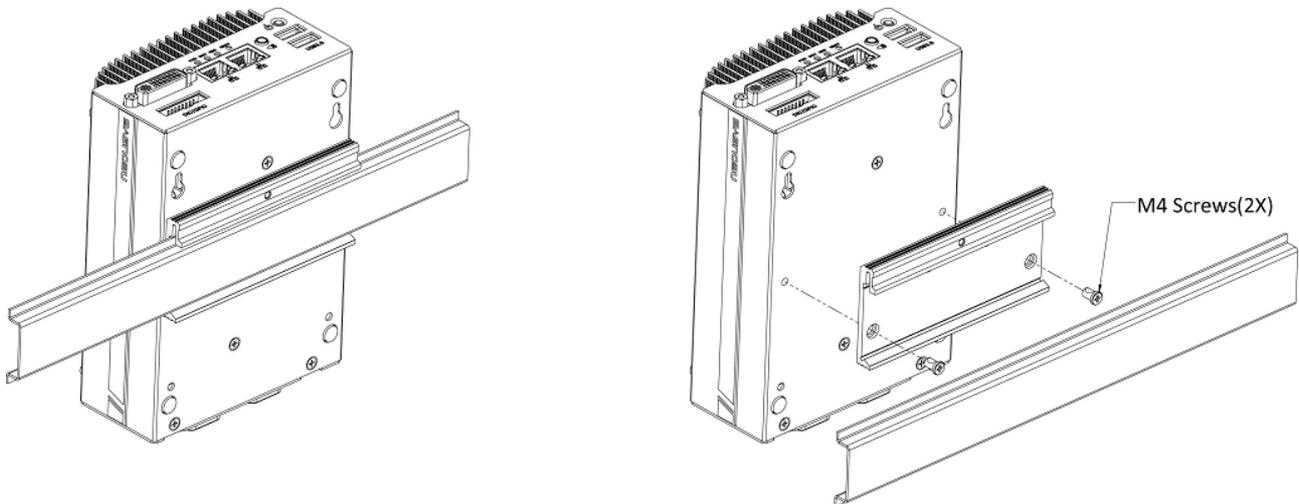
3.6 Connect DC power to you POC-200

POC-200 series uses a 2-pin pluggable terminal block to accept 8~35V DC power input. It provides the way for directly wiring the DC power. To connect DC power via the 2-pin pluggable terminal block, please follow the steps listed below.

1. Make sure the external DC power supply is power off or disconnected before wiring.
2. Get the 2-pin pluggable terminal block from the accessory box. The terminal block fits the wires with a gauge of 12~24 AWG.
3. Carefully identify the positive and negative contacts of your DC power supply and pluggable terminal block. The polarities between DC power supply and terminal block must be positive (+) to positive (+) and negative (-) to negative (-).
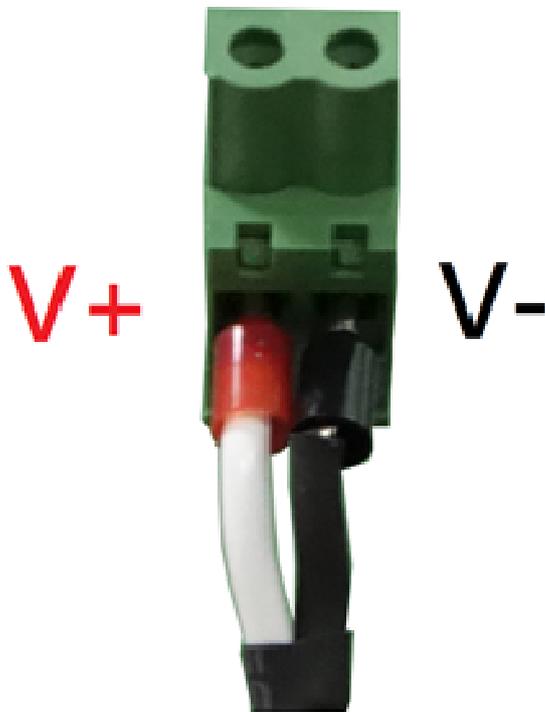
4. Find the 2-pin power plug on the PCBA which accepts the terminal block. It's located on the right-side of back panel.

5. Push the terminal block to the power plug till it's firmly attached. Now you can supply the DC power and operate your POC-200.

Caution

1. *POC-200 accepts 8~35 VDC when using terminal block for DC input. Please make sure the voltage and polarity of DC power is correct before you connect it to POC-200. Supplying a voltage over 35V will damage the system.*

3.7 Power on your POC-200

For better flexibility of operation, POC-200 series provides four alternatives to power on your POC-200. You can turn on your POC-200 by pressing the power button, using an external latched or non-latched on/off switch, or by sending a special LAN packet. In this section, we'll illustrate these four ways to power on your POC-200.

3.7.1 To Power on POC-200 Using the Power Button

This is the simplest way to turn on your POC-200. The power button on the front panel is a non-latched switch and behaves the ATX-mode on/off control. As DC power is connected, push the power button will turn on the system as well as the PWR LED indicator. Push the button when system is on will turn off the system. If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), push the power button causes a pre-defined system behavior, such as shutdown or hibernation.

3.7.2 To Power on POC-200 Using an Latched Switch (AT-mode)

For an application which places POC-200 inside a cabinet, it's useful to control the on/off of the system using an external switch. POC-200 series provides an on-board connector (for detail, please refer to section 2.4.1) for connecting a latched/non-latched switch and behaves either AT-mode or ATX-mode power on/off control.

When using the AT-mode on/off control, you need a latched switch. The external latched switch controls the feed-in of DC power. When the switch is closed, the DC power is break-off. When it's opened, the DC power is feed-in. To power on POC-200 using an external latched switch (AT-mode), please follow the steps listed below.

1. Prepare a latched switch with a 2-pin, 2.0mm pitch connector.
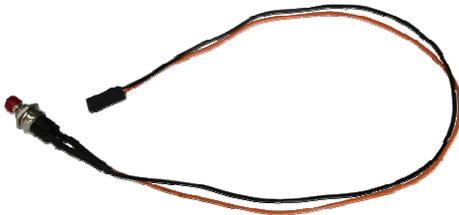
2. Connect the latched switch to the pin#1 and pin#2 of the on-board 1x3 pins, 2.0mm pitch pin header (polarity is negligible).
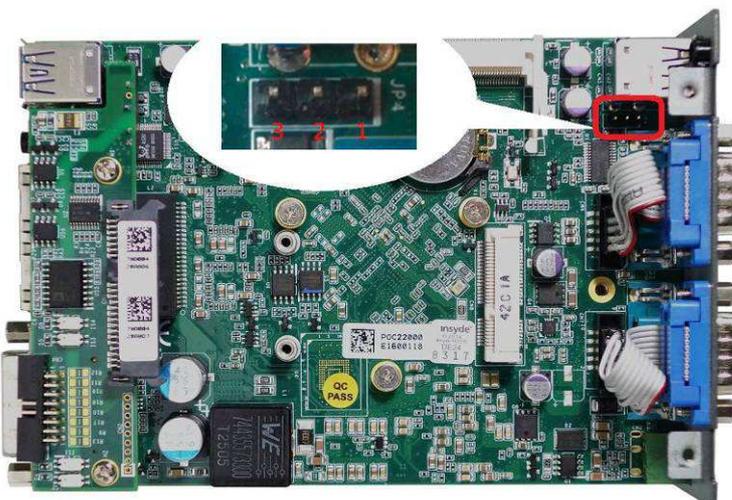
Mode	Jumper Setting
AT	
ATX	
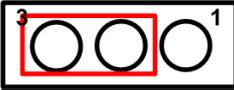
3. When the latched switch is closed, the DC power is break off and system is turn off. When the latched switch is opened, the DC power is feed-in, and, with the correct setting of "**Power On after Power Failure**" BIOS option, the system is turn on.

3.7.3 To Power on POC-200 Using an Non-latched Switch (ATX-mode)

For an application which places POC-200 inside a cabinet, it's useful to control the on/off of the system using an external switch. POC-200 series provides an on-board 3-pin wafer connector (for detail, please refer to section 2.4.1) for connecting a latched/non-latched switch and behaves either AT-mode or ATX-mode power on/off control.
When using the ATX-mode on/off control, you need a non-latch switch. The external non-latched switch acts exactly the same as the power button on the front panel. To power on POC-200 using an external non-latched switch (ATX-mode), please follow the steps listed below.

1. Prepare a non-latched switch with a 2-pin, 2.0mm pitch connector.
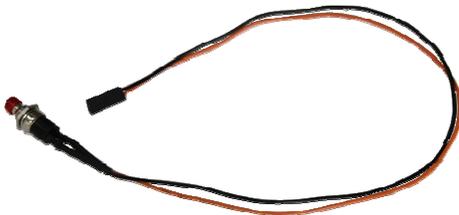
2. Connect the non-latched switch to the pin#2 and pin#3 of the on-board 1x3 pins, 2.0mm pitch pin header (polarity is negligible).
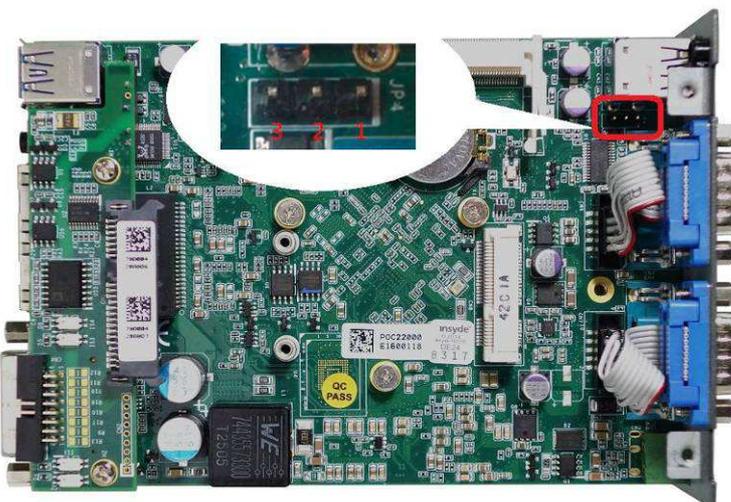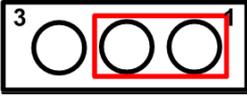
Mode	Jumper Setting
AT	
ATX	
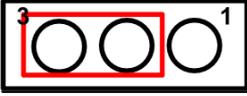
3. Push the non-latched switch will turn on the system (the PWR LED indicator on the front panel is on at the same time). Push the non-latched switch when system is on will turn off the system. If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), push the power button causes a pre-defined system behavior, such as shutdown or hibernation.


3.7.4 To Power on POC-200 Using Wake-on-LAN Function

Wake-on-LAN (WOL) is a mechanism to wake up a computer system from a S3 (standby), S4 (Hibernate) or S5 (system off with standby power) state via issuing Subnet Directed Broadcasts (SDB) or a magic packet. POC-200 series implements the Wake-on-LAN function for its first GbE port.

To enable WOL function and power on you POC-200, please follow the steps listed below.

1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Enter the **[Power]** menu. And configure the **[Wake On LAN]** option as **[Enabled]**. This setting enables the Wake-on-LAN function for POC-200 series. Please refer to section 4.1.5 for the instruction of configuring this BIOS option.
3. In Windows 7 system, identify the Local Area Connection of corresponding Intel® I210 Gigabit Controller and click the **Configure** button.
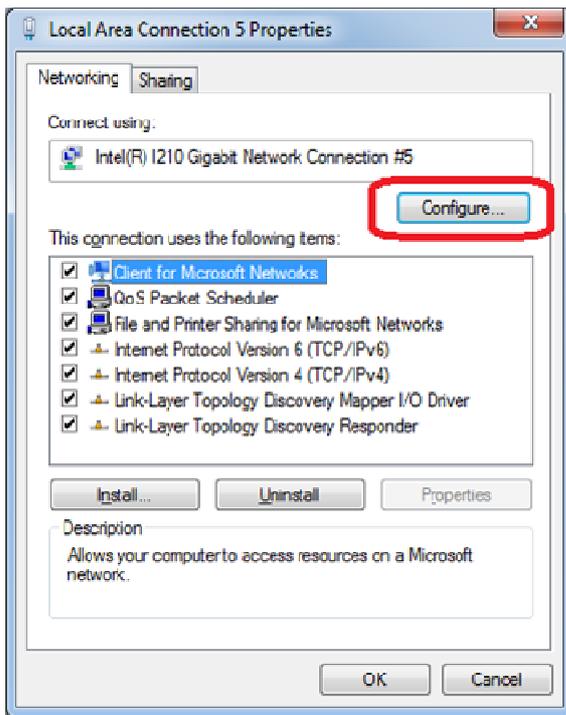
4. Click the **Power Management** tag, and check the following two options accordingly
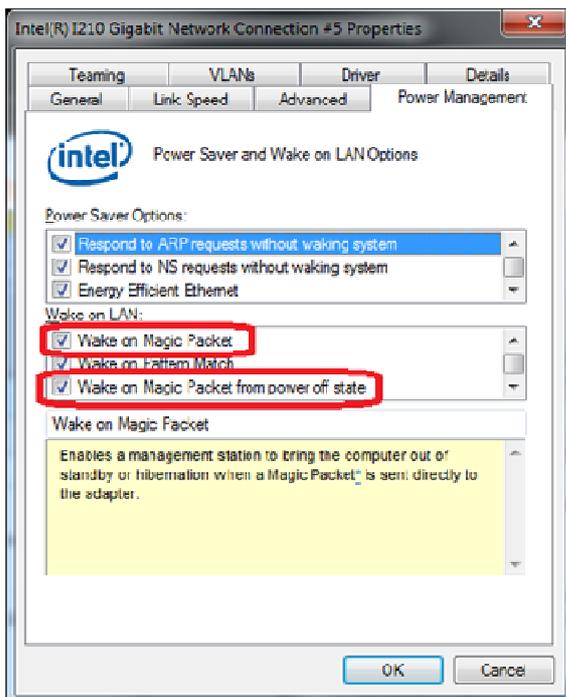
- **Wake on Magic Packet**
  POC-200 can wake from S3 or S4 state when receiving a magic packet. The magic packet is a broadcast frame containing anywhere within its payload 6 bytes of all 255 (FF FF FF FF FF FF in hexadecimal), followed by sixteen repetitions of the target computer's 48-bit MAC address.

For example, NIC's 48-bit MAC Address is 78h D0h 04h 0Ah 0Bh 0Ch

DESTINATION SOURCE MISC

FF FF FF FF FF FF

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

MISC   CRC

There are some free tools available on Internet that can be used to send a magic packet. Please refer to the following link to understand more about Magic Packet.

http://en.wikipedia.org/wiki/Wake-on-LAN

● **Wake on Magic Packet from power off state**
When checking this option, POC-200 can wake from S5 (system off with standby power) state when receiving a magic packet.

Chapter 4 BIOS and Driver

4.1 BIOS Settings

POC-200 series is shipped with factory-default BIOS settings cautiously programmed for best performance and compatibility. In this section, we'll illustrate some of BIOS settings you may need to modify. Please always make sure you understand the effect of change before you proceed with any modification.

To Enter BIOS setup:
When POC-200 is booting up, press F2 to enter BIOS setup utility. Use following keys to edit/change BIOS options.

Keys	Function
F1	Help
↑↓←→	Select Item
F5/F6	Change Values
F9	Load Setup Defaults
Esc	Exit
Enter	Select -> SubMenu
F10	Save and Exit

4.1.1 COM1 Operation Mode

COM1 of POC-200 series supports RS-232 (full-duplex), RS-422 (full-duplex) and RS-485 (half-duplex) mode. You can set the COM1 operating mode via BIOS settings. Another option in BIOS called "*Slew Rate*" defines how sharp the rising/falling edge is for the output signal of COM1. For long-distance RS-422/485 transmission, you may set the "*Slew Rate*" option as "High" to improve signal quality. For RS-422/485 communication, the "*RS-422/485 Termination*" option determines whether to enable/disable internal termination of RS-422/485 transceiver according to your wiring configuration (e.g. with or without external termination).

To set COM1 operating mode:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Advanced]** → **[Peripheral Configuration]**.
3. Set the **[Set COM1 as]** option to a proper mode for COM1 of your POC-200.
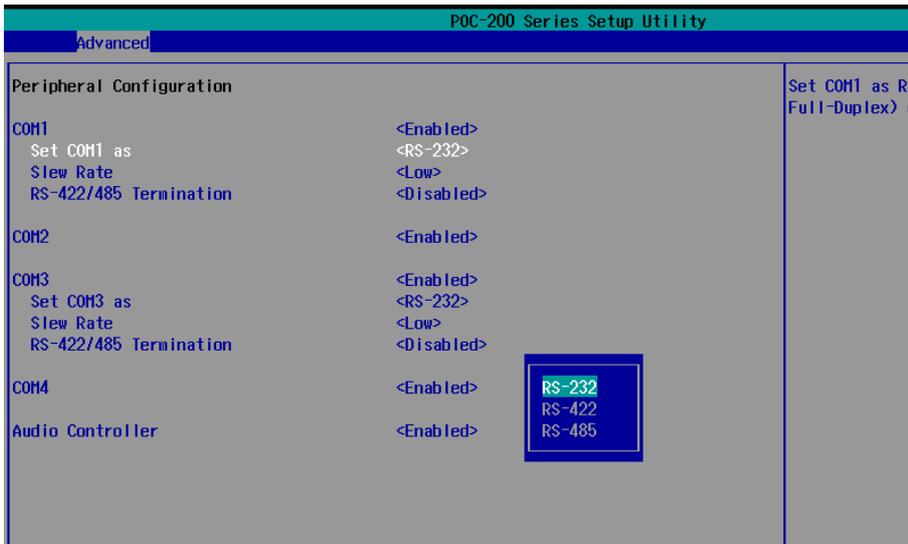
4.1.2 COM3 Operation Mode (POC-200/210 Only)

POC-200/210 features four COM ports. COM3 also supports RS-232 (full-duplex), RS-422 (full-duplex) and RS-485 (half-duplex) mode. You can set the COM3 operating mode via BIOS settings. Another option in BIOS called "*Slew Rate*" defines how sharp the rising/falling edge is for the output signal of COM3. For long-distance RS-422/485 transmission, you may set the "*Slew Rate*" option as "High" to improve signal quality. For RS-422/485 communication, the "*RS-422/485 Termination*" option determines whether to enable/disable internal termination of RS-422/485 transceiver according to your wiring configuration (e.g. with or without external termination).

To set COM3 operating mode:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Advanced] → [Peripheral Configuration]**.
3. Set the **[Set COM3 as]** option to a proper mode for COM3 of your POC-200.
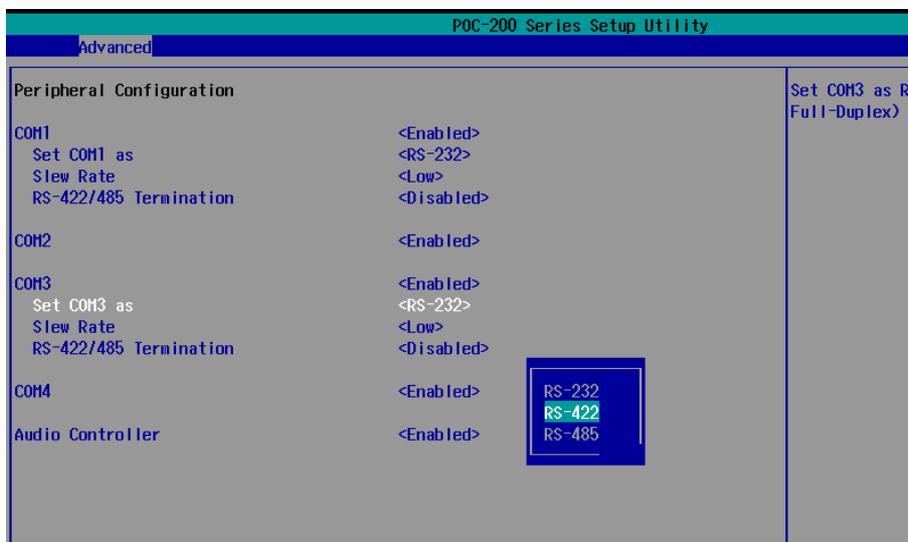
4.1.3 Chipset SATA Mode

The SATA controller of POC-200 series supports two modes of operations, **IDE** and **AHCI** mode. **IDE** mode configures SATA controller to access SATA interface in legacy IDE mode, and is compatible with most storage devices. **AHCI** mode, which exposes SATA's advanced capabilities such as hot swapping and native command queuing, can deliver better performance for disk read/write. As POC-200 series no longer supports Windows XP, we highly recommend you to set "*Chipset SATA Mode*" to "AHCI" for better system performance.

To set Chipset SATA mode:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Advanced]** → **[SATA Configuration]**.
3. Set the **[Chipset SATA Mode]** option to a proper mode for your POC-200.

```
                        POC-200 Series Setup Utility
      Advanced

SATA Configuration

SATA Controller                    <Enabled>
Chipset SATA Mode                  <AHCI>
SATA Speed                         <Gen2>

▶Internal SATA          [SATA SSD          ]



                                    IDE
                                    AHCI
```
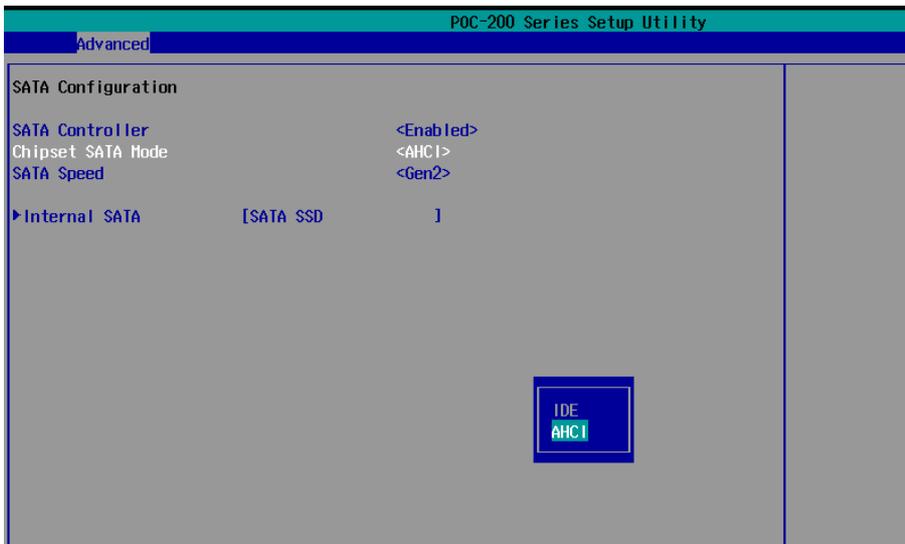
4.1.4 C-States and Max C-States

C-States is a power-saving technique implemented in modern Intel processors. It shuts down the clock signals and power for idle logic units inside the CPU to save the energy consumed. The trade-off, however, is a longer latency for CPU to wake up and be 100% operational. Depending on your application, you can configure these options to have higher performance (disable "C-States") or lower power-consumption (enable "C-States" and set "Max C-States" to C6/C7).

To set C-States and Enhanced C-States:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Power]** → **[Advanced CPU Control]**.

3. Enable/disable the **[C-States]** option according to your application.

4. Configure the **[Max C-States]** option according to your application.

```
                         POC-200 Series Setup Utility
                  Power
Advanced CPU Control                                   Enable process
                                                       (C-States).
Use XD Capability                 <Enabled>
Limit CPUID Max value             <Disabled>
AESNI Feature                     <Enabled>
DTS                               <Enabled>
Active Processor Cores            <ALL>

P-States(IST)                     <Enabled>
Boot Performance Mode             <Max Performance>
Turbo Mode                        <Auto>
Force CPU speed                   <Disabled>
C-States                          <Enabled>
Max C-States                      <C6>
                                       Disabled
                                       Enabled
```
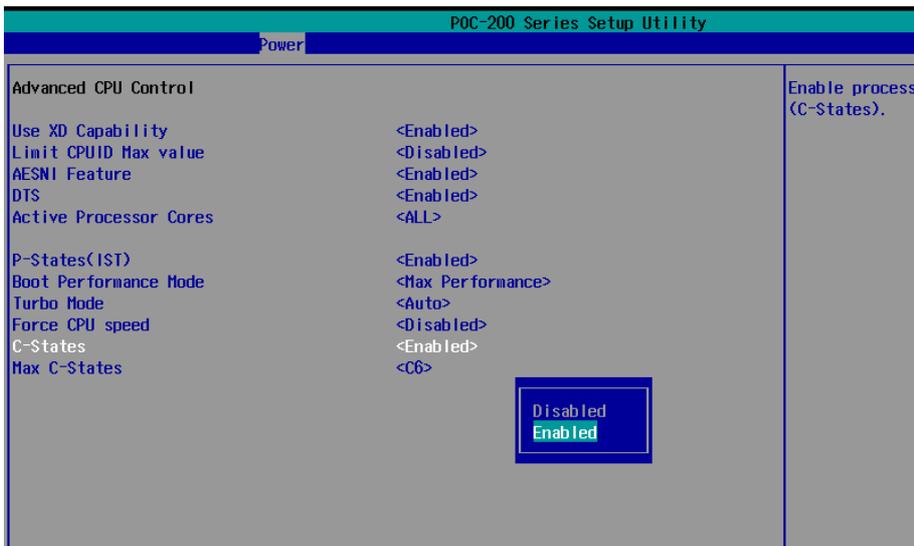
4.1.5 Wake-on-LAN Option

Wake-on-LAN (WOL) is a mechanism which allows you to turn on your POC-200 via Ethernet connection. To utilize Wake-on-LAN function, you have to enable this option first in BIOS settings. Please refer to section 3.7.4 for instructions of using WOL function.

To enable/disable "Wake on LAN" option:

1. When POC-200 boots up, press F2 to enter BIOS setup utility.

2. Go to **[Power]**.

3. Enable/disable the **[Wake on LAN]** option according to your application.

```
                         POC-200 Series Setup Utility
   Main  Advanced  Security  Power  Boot  Exit

 ▶Advanced CPU Control                                  Determines the
                                                        system power i
 Wake on LAN                       <Disabled>           Management Ena
 Power On after Power Failure      <S5 - Power Off>




                                       Disabled
                                       Enabled
```
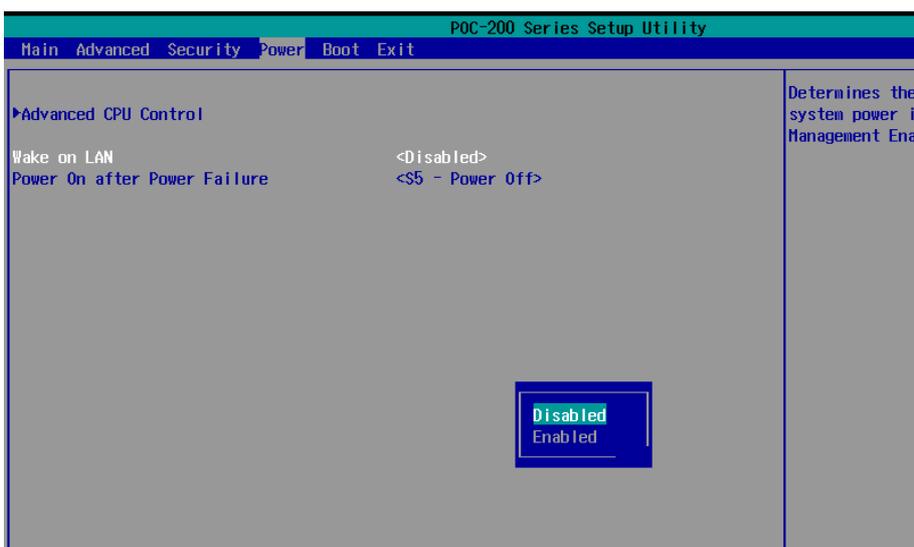
4.1.6 Power On after Power Failure Option

This option defines the behavior of POC-200 series when DC power is supplied.

Value	Description
S0 – Power On	System is powered on when DC power is supplied.
S5 – Power Off	System is kept in off state when DC power is supplied.

When you want to use the AT-mode remote on/off control function, you have to set this option to "S0 – Power On". Please refer to section 3.7.2 for instructions of using AT-mode remote on/off control function.

To set "Power On after Power Failure" option:

1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Power]**.
3. Set the **[Power On after Power Failure]** option to a proper value for your POC-200.

```
                         POC-200 Series Setup Utility
   Main  Advanced  Security  Power  Boot  Exit
                                                            Specify what s
                                                             re-applied af
  ▶Advanced CPU Control                                      state).

  Wake on LAN                        <Disabled>
  Power On after Power Failure       <S5 - Power Off>




                                    ┌─────────────────┐
                                    │ S0 - Power On    │
                                    │ S5 - Power Off   │
                                    └─────────────────┘
```
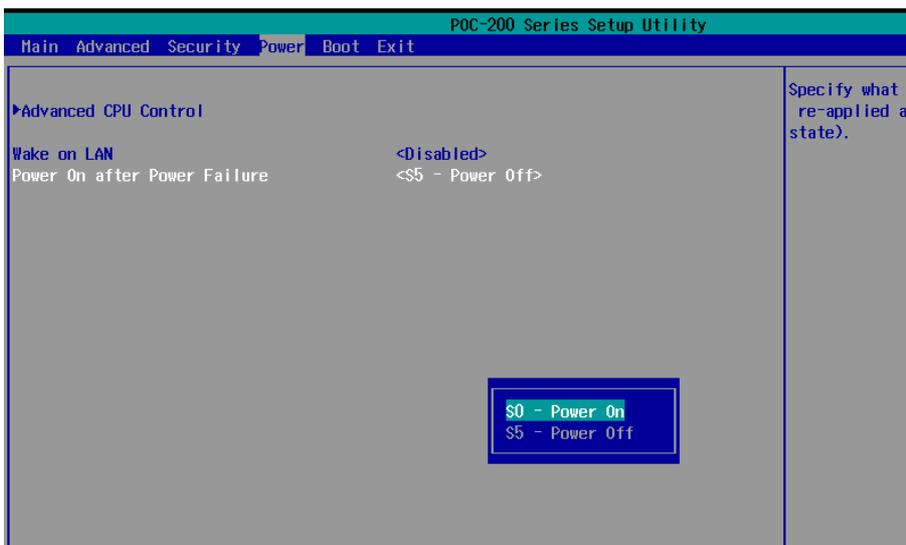
4.1.7 Watchdog Timer for Booting

The BIOS of POC-200 series has a useful feature which allows users to use the watchdog timer to secure the booting process. You can specify the timeout value for watchdog timer. Once the watchdog timer expires, the BIOS issues a reset command to initiate another booting process. You can also set the behavior of how to stop the watchdog timer. There are two options in BIOS menu, "*Automatically after POST*" and "*Manually after Entering OS*". When "*Automatically after POST*" is selected, the BIOS automatically stop the watchdog timer after POST (Power-On Self Test) OK. When "*Manually after Entering OS*" is selected, it's user's responsibility to stop the watchdog timer when entering OS. This

guarantees the system can always boot to OS, otherwise another booting process will be initiated. For information about programming watchdog timer, please refer to **Appendix A Using W Watchdog Timer and DIO**.

To set the watchdog timer for boot in BIOS:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Boot]** menu.
3. Disable or select timeout value for **[WDT for Booting]** option.
4. Once you give a timeout value, the **[WDT Stop Option]** option appears. You can select either *"Automatically after POST"* or *"Manually after Entering OS"*.
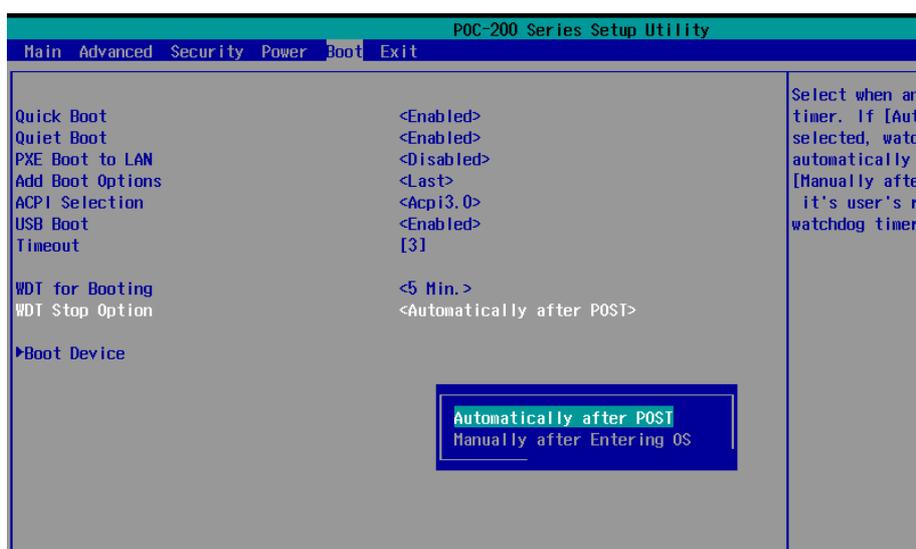
4.1.8 Select a Boot Device

When you have multiple bootable devices connected to your POC-200 (i.e. HDD, USB flash disk, USB DVD-drive), you may need to select one of them as the first boot device. There are two ways to select the device. You can either, press F12 when system boots up to go to Boot Manager and then select one of the devices, or select the boot device in BIOS settings.

To select a boot device in BIOS:
1. When POC-200 boots up, press F2 to enter BIOS setup utility.
2. Go to **[Boot] → [Boot Device]**.
3. The **[Boot Menu]** option determines whether to list all bootable devices connected to your POC-200 according to device or device type. The default order of boot device type is
    ● Hard Disk Drive
    ● USB
    ● CD/DVD-ROM Driver

- Floppy Drive
- Others

You can use F5/F6 or +/- to change the boot order of devices or device types.

```
                          POC-200 Series Setup Utility
                   Boot

 Boot Device Priority                                    List the boot
                                                          device.
 Boot Menu                        <By Device>

 SATA SSD
 SanDisk Extreme
```
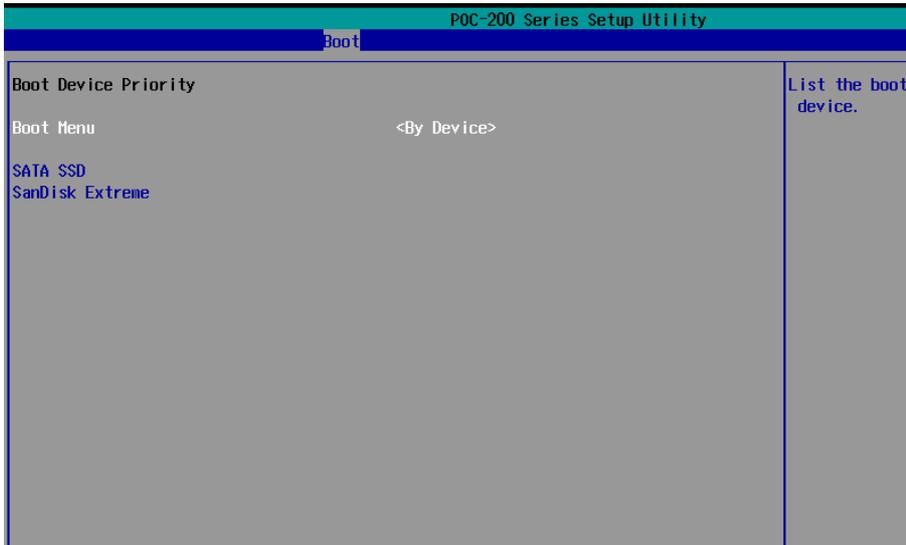
4.2 Operating System Support

POC-200 series supports most operating system developed for Intel® x86 architecture. The following list contains the operating systems which have been tested in Neousys Technology Inc.

- Microsoft Window 7 32-bit
- Microsoft Window 7 64-bit
- Microsoft Window 8/8.1 32-bit
- Microsoft Window 8/8.1 64-bit
- Ubuntu 14.04 or later version

For Linux system, user may need to manually compile and install the driver for Intel I210 GbE controller if the driver is not embedded in kernel. You can visit Intel website for further information.

Neousys will keep this list updated as we continuously test other operating systems with POC-200 series. Please contact us for the latest OS support list.

4.3 Driver Installation

Neousys Technology Inc. provides a very convenient utility in "Drivers & Utilities DVD" to allow the "One-Click" driver installation. This utility automatically detects your Windows operating system and installs all necessary drivers to your POC-200 series with just one mouse click.

4.3.1 Install All Drivers Using "One-Click" Driver Installation

1. Insert the "Drivers & Utilities DVD" into a USB DVD-drive attached to your POC-200. A setup utility launches and the following dialog appears.

2. Click on the **"Automatic Driver Installation"**. The setup utility will automatically detect your Windows operating system and install all necessary drivers. According to different versions of Windows, the installation process takes about 6~8 minutes. Once driver installation is done, the setup utility reboots your Windows and your system works normally afterward.

4.3.2 Install Drivers Manually

You can also manually install each driver for POC-200 series. Please refer to the following information about installing drivers for different operating system.

Windows 7 32-bit

The recommended driver installation sequence is

1. Chipset driver (x:\Driver_Pool\Chipset_Vlv\Win7_8_ALL\SetupChipset.exe)
2. Graphics driver (x:\ Driver_Pool\Graphics_Vlv_EMGD\Win7_32\Setup.exe)
3. Audio driver (x:\Driver_Pool\Audio_ALC262\Win7_8_ALL\Setup.exe)
4. LAN driver
   (x:\Driver_Pool\GbE_I210\Win7_8_32\APPS\PROSETDX\Win32\DxSetup.exe)
5. USB 3.0 driver (x:\USB3_Vlv\Win7_ALL\Setup.exe)
6. Renasas USB3 driver (x:\Driver_Pool\USB3_Renasas\Win_ALL\Setup.exe)

Windows 7 64-bit

The recommended driver installation sequence is

1. Chipset driver (x:\Driver_Pool\Chipset_Vlv\Win7_8_ALL\SetupChipset.exe)
2. Graphics driver (x:\Driver_Pool\Graphics_Vlv_EMGD\Win7_64\Setup.exe)
3. Audio driver (x:\Driver_Pool\Audio_ALC262\Win7_8_ALL\Setup.exe)
4. LAN driver
   (x:\Driver_Pool\GbE_I210\Win7_8_64\APPS\PROSETDX\Winx64\DxSetup.exe)
5. USB 3.0 driver (x:\Driver_Pool\USB3_Vlv\Win7_ALL\Setup.exe)
6. Renasas USB3 driver (x:\Driver_Pool\USB3_Renasas\Win_ALL\Setup.exe)

Windows 8/8.1 32-bit

The recommended driver installation sequence is

1. Chipset driver (x:\Driver_Pool\Chipset_Vlv\Win7_8_ALL\SetupChipset.exe)
2. Graphics driver (x:\Driver_Pool\Graphics_3rd_i7_Vlv\Win7_8_32\Setup.exe)
3. Audio driver (x:\Driver_Pool\Audio_ALC262\Win7_8_ALL\Setup.exe)
4. LAN driver
   (x:\Driver_Pool\GbE_I210\Win7_8_32\APPS\PROSETDX\Win32\DxSetup.exe)
5. TXE driver (x:\Driver_Pool\TXE_Vlv\Win8_ALL\SetupTXE.exe)

Windows 8/8.1 64-bit

The recommended driver installation sequence is

1. Chipset driver (x:\Driver_Pool\Chipset_Vlv\Win7_8_ALL\SetupChipset.exe)
2. Graphics driver (x:\Driver_Pool\Graphics_3rd_i7_Vlv\Win7_8_64\Setup.exe)
3. Audio driver (x:\Driver_Pool\Audio_ALC262\Win7_8_ALL\Setup.exe)

4. LAN driver
    (x:\Driver_Pool\GbE_I210\Win7_8_64\APPS\PROSETDX\Winx64\DxSetup.exe)
5. TXE driver (x:\Driver_Pool\TXE_Vlv\Win8_ALL\SetupTXE.exe)

Appendix A Using Watchdog Timer and DIO

POC-200 series provides watchdog (WDT) timer function to ensure reliable system operation. WDT is a hardware mechanism to reset the system if the watchdog timer is expired. Users can start WDT and keep resetting the timer to make sure the system or program is running flawlessly. Otherwise, the system shall be reset. POC-200 series also supports isolated DIO (POC-200) or 5V TTL GPIO (POC-210/212/222) for extended range of applications. DIO on POC-200 series supports standard polling mode I/O access. Users can read or write DIO channel(s) in their applications.

In this chapter, we'll illustrate how to use the WDT_DIO function library provided by Neousys to program the WDT and DIO functions.

Install WDT and DIO Library

The WDT_DIO function library is delivered in the form of a setup package. For POC-200 series, please use WDT_DIO_Setup_v2.0.4.exe or later revision. In prior to program WDT and DIO on POC-200 series, you should execute the setup program and install the library.
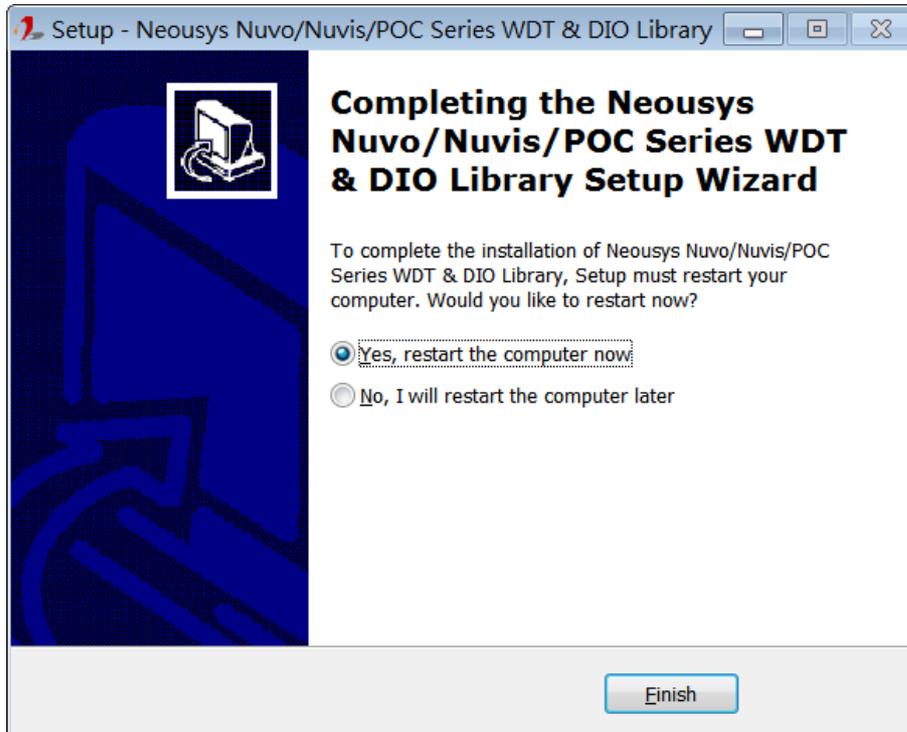
1. Execute **WDT_DIO_Setup.exe**. The following dialog appears.
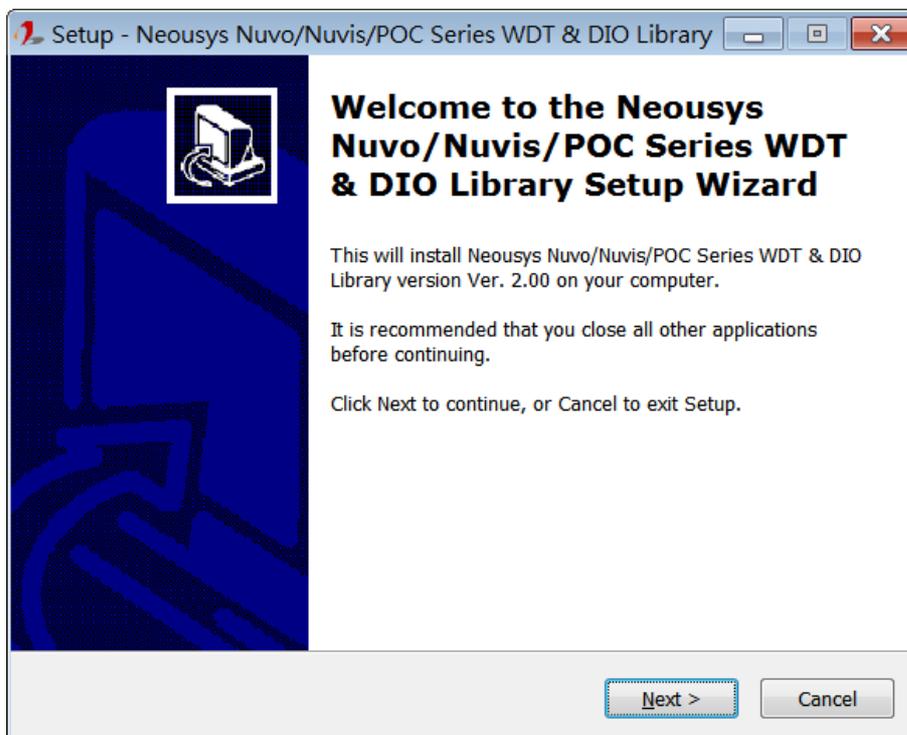
2. Click "Next >" and specify the directory of installing related files. The default directory is *C:\Neousys\WDT_DIO*.
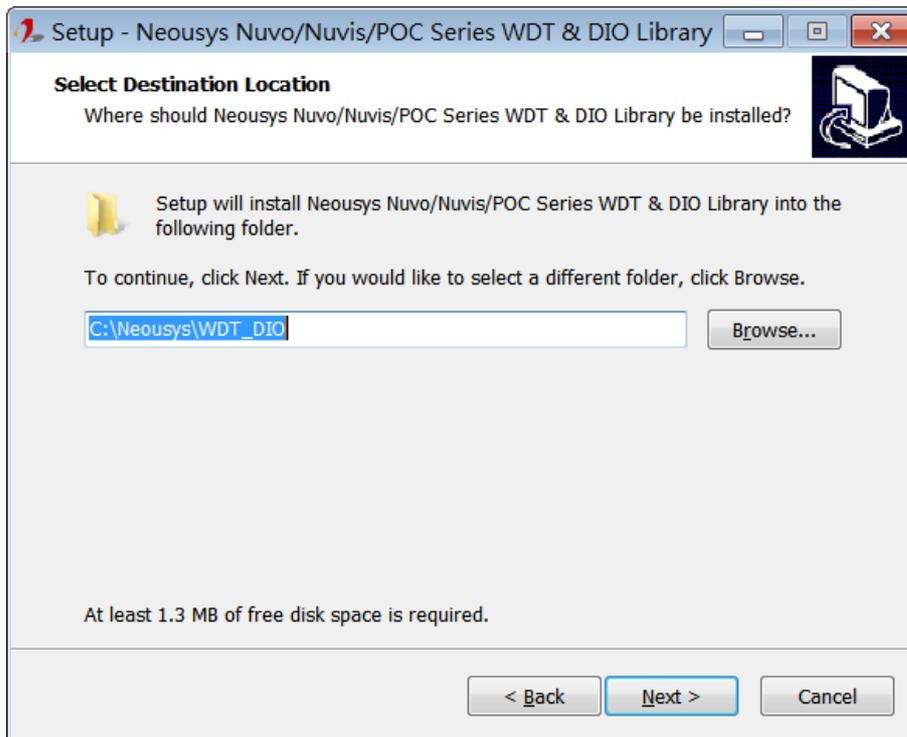
3. Once the installation is finished, a dialog appears to prompt you to reboot the system. The WDT & DIO library will take effect after system rebooting.

4. When you programming your WDT or DIO program, the related files are located in

- Header File: \Include
- Library File: \Lib
- Function Reference: \Manual
- Sample Code: \Sample\WDT_Demo (Watchdog Demo)

  \Sample\DIO_Demo (Polling I/O Demo)

  \Sample\COS_Demo (Change-of-State Interrupt Demo)

  \Sample\DTIO_Demo (DTIO Demo)

  \Sample\DTFO_Demo (Trigger Fan-out Demo)

  \Sample\PoE_Demo (PoE per-port Control Demo)

Using WDT Function

WDT Function Reference

InitWDT

Description

Initialize the WDT function. You should always invoke InitWDT() before set or start watchdog timer.

Parameter

None

Return Value

Returns TRUE if initialization successes, FALSE if initialization failed.

Usage

BOOL   bRet = InitWDT()

SetWDT

Description

Set timeout value and unit for watchdog timer. When InitWDT() is invoked, a default timeout value of 255 seconds is assigned.

Parameter

tick

WORD value to indicate timeout ticks.

tick should be a value of 1 ~ 16 if *unit* is 0 (minute)

tick should be a value of 6 ~ 1027 if *unit* is 1 (second)

unit

BYTE value (0 or 1) to indicate unit of timeout ticks.

0 : unit is minute

1 : unit is second

Return Value

If value of unit is correct (0 or 1), this function returns TRUE, otherwise FALSE.

Usage

WORD   tick=255;

BYTE   unit=1; //unit is second.

BOOL   bRet = SetWDT(tick, unit); //timeout value is 255 seconds

StartWDT

Description

Start countdown of WDT. When WDT is started, the WDT LED indicator starts to blink in a frequency of 1Hz. If no ResetWDT() or StopWDT is invoked before WDT is counted to 0, the WDT expires and system resets.

Parameter

None

Return Value

If the timeout value is given in correct format, this function returns TRUE, otherwise FALSE.

Usage

BOOL   bRet = StartWDT()

ResetWDT

Description

Reset the timeout value to the value given by SetWDT(). If no ResetWDT() or StopWDT is invoked before WDT is counted to 0, the WDT expires and system resets.

Parameter

None

Return Value

Always returns TRUE;

Usage

BOOL   bRet = ResetWDT()

StopWDT

Description

Stop the countdown of WDT. When WDT is stopped, the WDT LED indicator stops blinking.

**Parameter**

None

Return Value

Always returns TRUE;

**Usage**

BOOL   bRet = StopWDT()

Using DIO Function

Wiring for Isolated DIO (POC-200 Only)

POC-200 supports 4x isolated DI channels and 4x isolated DO channels. The isolated DI channels are implemented using photo-couplers with internally series-connected 2.4kΩ resistors. You need to provide a voltage to specify the logic high/low state. The input voltage for logic high is 5~24V, and the input voltage for logic low is 0~1.5V.
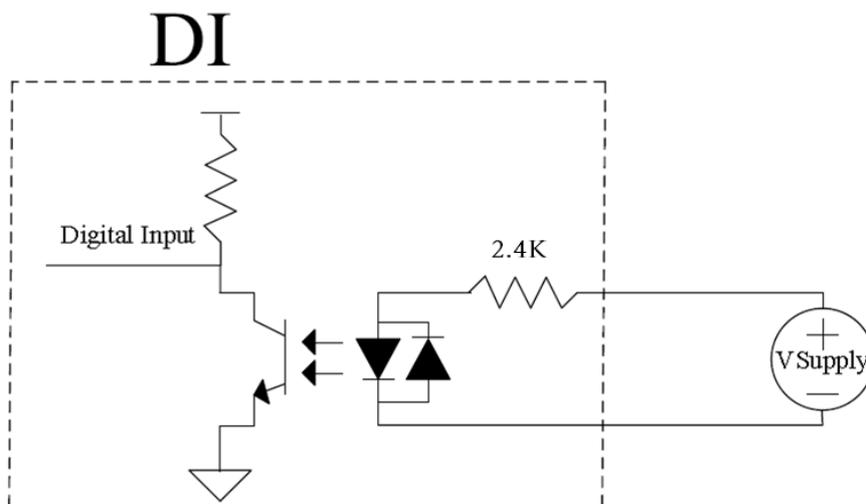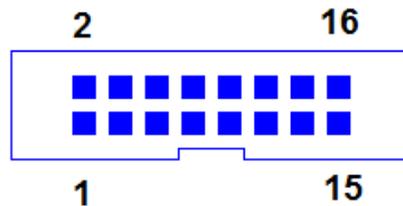

The isolated DO channels are implemented using Power MOSFET + Analog Device iCoupler® component. The DO channels are configured as NO (normally-open) configuration. When you turn on system, all DO channels have a deterministic state of logic 0 (circuit disconnected from GND return). When logic 1 is specified, MOSFET is activated

and GND return path is established. The isolated DO on POC-200 supports sinking current connection. The following diagrams are the suggested wiring for DO:
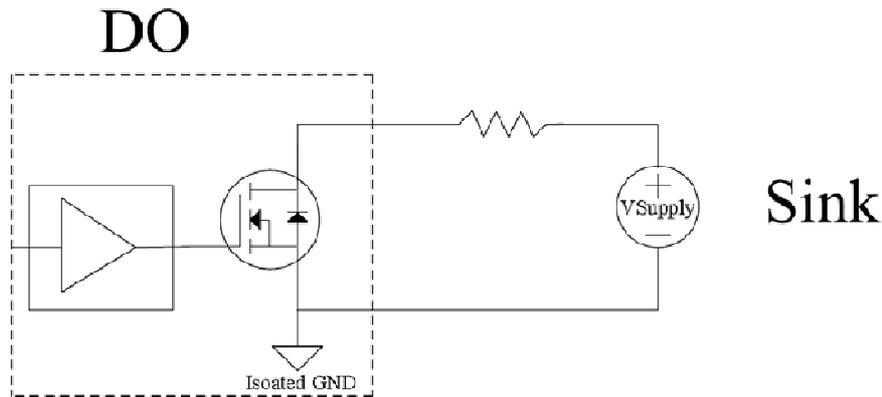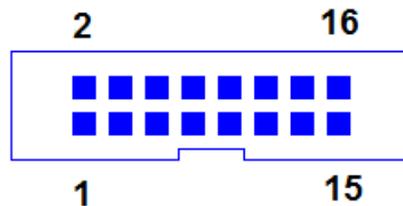

Pin Definition for Isolated DIO (POC-200 Only)

Pin Definition

Pin#	Definition	I/O	Description
1	ISO_5V	O	Isolate 5V power supply
2	VDD	I	DO voltage source input for inductive load
3	DI_0	I	Digital input channel 0
4	VDD	I	DO voltage source input for inductive load
5	DI_1	I	Digital input channel 1
6	DO_0	O	Digital output channel 0
7	DI_GND	-	Digital input GND
8	DO_1	O	Digital output channel 1
9	DI_2	I	Digital input channel 2
10	DO_GND	-	Digital output GND
11	DI_3	I	Digital input channel 3
12	DO_2	O	Digital output channel 2
13	DI_GND	-	Digital input GND
14	DO_3	O	Digital output channel 3
15	DI_GND	-	Digital input signal
16	DO_GND	-	Digital output GND

Pin Definition for 5V TTL GPIO (POC-210/212/222)

Pin Definition

Pin#	Definition	I/O	Description
1	N.C	-	No connection
2	N.C	-	No connection
3	DI_0	I	Digital input channel 0
4	N.C.	-	No connection
5	DI_1	I	Digital input channel 1
6	DO_0	O	Digital output channel 0
7	N.C.	-	No connection
8	DO_1	O	Digital output channel 1
9	DI_2	I	Digital input channel 2
10	D_GND	GND	Digital GND
11	DI_3	I	Digital input channel 3
12	DO_2	O	Digital output channel 2
13	N.C.	-	No connection
14	DO_3	O	Digital output channel 3
15	N.C.	-	No connection
16	D_GND	GND	Digital GND

DIO Function Reference

InitDIO

Description

Initialize the DIO function. You should always invoke InitDIO() before write/read any DIO port/channel.

Parameter

None

Return Value

Returns TRUE if initialization successes, FALSE if initialization failed.

Usage

BOOL   bRet = InitWDT()

DIReadLine

Description

Read a single channel of isolated digital input.

Parameter

ch

BYTE value specifies the DI channel to be read.

ch should be a value of 0 ~ 3.

Return Value

The status (TRUE or FALSE) of the specified DI channel.

Usage

BYTE   ch=3; //DI channel #3

BOOL   DIChValue = DIReadLine(ch); //read DI channel #3

DIReadPort

Description

Read the entire isolated digital input port (4 channels).

Parameter

None

Return Value

A WORD value indicates the status of DI port (4 DI channels).

Usage

WORD   DIPortValue = DIReadPort ();

DOWriteLine

Description

Write a single channel of isolated digital output.

Parameter

ch

BYTE value specifies the DO channel to be written.

ch should be a value of 0 ~ 3.

value

BOOL value (TRUE or FALSE) specifies the status of DO channel.

Return Value

None

Usage

BYTE   ch=3; //DI channel #3

BOOL   DOChValue=TRUE;

DOWriteLine(ch, DOChValue); //write DO channel #3 as TRUE

DOWritePort

Description

Write the entire isolated digital output port (4 channels).

Parameter

value

WORD value specifies the status of the DO port.

value should be a value of 0~15.

Return Value

None

Usage

WORD   DOPortValue=0x0C; //1100b

DOWritePort(DOPortValue); //write DO port as 1100b