

# ICS-1000 USER

Intel® Xeon® D-2800/D-2700 (Eddy Lake D)

Server-grade, Expandable, NVIDIA/AMD Full-length Graphics, DC/AC Options

# Manual

## Record of Revision

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| Version | Date       | Page | Description      | Remark |
|---------|------------|------|------------------|--------|
| 1.00    | 2025/06/12 | All  | Official Release |        |

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## Order Information

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| Part Number       | Description                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| ICS-1640-2876NT   | ICS-1640, onboard Intel® Xeon® D-2876NT, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 2 PCIe x16, 1 PCIe x8, 1 PCIe x2, DC Power Input   |
| ICS-1640A-2876NT  | ICS-1640, onboard Intel® Xeon® D-2876NT, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 2 PCIe x16, 1 PCIe x8, 1 PCIe x2, DC Power Input   |
| ICS-1660-2876NT   | ICS-1660, onboard Intel® Xeon® D-2876NT, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 5 PCIe x8, 1 PCIe x2, DC Power Input               |
| ICS-1660A-2876NT  | ICS-1660A, onboard Intel® Xeon® D-2876NT, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 5 PCIe x8, 1 PCIe x2, AC Power Input              |
| ICS-1640-2752TER  | ICS-1640, onboard Intel® Xeon® D-2752TER, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 2 PCIe x16, 1 PCIe x8, 1 PCIe x2, DC Power Input  |
| ICS-1640A-2752TER | ICS-1640A, onboard Intel® Xeon® D-2752TER, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 2 PCIe x16, 1 PCIe x8, 1 PCIe x2, AC Power Input |
| ICS-1660-2752TER  | ICS-1660, onboard Intel® Xeon® D-2752TER, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 5 PCIe x8, 1 PCIe x2, DC Power Input              |
| ICS-1660A-2752TER | ICS-1660A, onboard Intel® Xeon® D-2752TER, 2 10G SFP+ LAN, 4 GigE LAN, 2 SSD Tray, 5 PCIe x8, 1 PCIe x2, AC Power Input             |



## Optional Accessories

| Part Number        | Description                                                                   |
|--------------------|-------------------------------------------------------------------------------|
| DDR4 64G           | Certified DDR4 64GB 2933MHz RAM (RDIMM only)                                  |
| DDR4 32G           | Certified DDR4 32GB 2933MHz RAM                                               |
| DDR4 16G           | Certified DDR4 16GB 2933MHz RAM                                               |
| DDR4 8G            | Certified DDR4 8GB 2933MHz RAM                                                |
| PWS-1000W-24V      | 1000W, 24V, 90V AC to 264V AC Power Supply                                    |
| PWS-1500W-24V      | 1500W, 24V, 90V AC to 264V AC Power Supply                                    |
| PWS-3000W-24V      | 3000W, 24V, 90V AC to 264V AC Power Supply                                    |
| TMK2-20P-100       | Terminal Block 20-pin to Terminal Block 20-pin Cable, 100cm                   |
| TMK2-20P-500       | Terminal Block 20-pin to Terminal Block 20-pin Cable, 500cm                   |
| TMB-TMBK-20P       | Terminal Board with One 20-pin Terminal Block Connector and DIN-Rail Mounting |
| M.2 Storage Module | M.2 Key M/Key B Storage Module                                                |
| 5G Module          | 5G Module with Antenna                                                        |
| 4G Module          | 4G/GPS Module with Antenna                                                    |
| WiFi & Bluetooth   | WiFi & Bluetooth Module with Antenna                                          |

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# 1

## GENERAL INTRODUCTION

### 1.1 Overview

The Vecow ICS-1000 is a server-grade AI computing system powered by the Intel® Xeon® D-2800/D-2700 processors. It supports up to 512GB of DDR4 2933 MHz UDIMM/RDIMM memory, delivering robust performance for data-intensive applications.

Designed for scalability, the ICS-1000 accommodates up to six PCIe expansion slots and supports a maximum power budget of 1800W for dual-slot, full-length graphics cards—ideal for AI training and inference workloads.

The front panel features a comprehensive array of I/O interfaces, including two 10G SFP+ ports for high-speed fiber-optic connectivity, two USB 3.0 ports for vision applications, four COM ports (RS-232/422/485), and 16 isolated digital I/O ports for robotic control.

Engineered for industrial environments, the ICS-1000 supports a wide operating temperature range of -25°C to 45°C and flexible power inputs (DC 16V–50V or AC 220V). It also includes Out-of-Band (OOB) remote management capabilities, enabling real-time monitoring, control, and updates for edge deployments.

## 1.2 Features

- Server-level Platform : Intel® Xeon® D-2800/D-2700 Processor (Eddy Lake D)
- Max 1800W power budget supports dual 900W NVIDIA® or AMD 2-slot full-length graphics card
- Flexible Power Input Design with SW Ignition Control : DC 16V to 50V or AC 220V
- 2 10G SFP+, 4 GigE LAN, 4 USB, 16-bit Isolated DIO
- Max 6 PCIe expansions : PCIe 4.0 x16, PCIe x8, PCIe x2
- Multiple 5G/WiFi 6/4G/LTE/GPRS/UMTS, 2 Front-access 2.5" SSD/HDD Tray
- Supports Intel® vPro, Intel® QAT (QuickAssist Technology), and TPM 2.0
- Optional supports TSN and Intel® TCC
- Fully supports OpenVINO™ Toolkit for optimized performance

## 1.3 Product Specification

### 1.3.1 Specifications of ICS-1640

| System           |                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor        | <ul style="list-style-type: none"> <li>• 16-core Intel® Xeon® D-2876NT Processor (Eddy Lake D HCC)</li> <li>• 12-core Intel® Xeon® D-2752TER Processor (Ice Lake D HCC)</li> </ul> |
| BIOS             | AMI                                                                                                                                                                                |
| SIO              | IT8786E                                                                                                                                                                            |
| Memory           | 8 DDR4 UDIMM/RDIMM 2933MHz, up to 512GB (ECC support by UDIMM only)                                                                                                                |
| OS               | Windows 10, Windows Server, Linux                                                                                                                                                  |
| I/O Interface    |                                                                                                                                                                                    |
| Serial           | 4 COM RS-232/422/485                                                                                                                                                               |
| USB              | <ul style="list-style-type: none"> <li>• 2 USB 3.0 Type-A</li> <li>• 2 USB 2.0 Type-A</li> </ul>                                                                                   |
| Isolated DIO     | 16 Isolated DIO : 8 DI, 8 DO                                                                                                                                                       |
| Display          | VGA : Up to 1920 x 1080 @60Hz                                                                                                                                                      |
| LED              | Power, HDD, Wireless, OOB                                                                                                                                                          |
| SIM Card         | 1 External Nano SIM Card Socket                                                                                                                                                    |
| Expansion        |                                                                                                                                                                                    |
| PCIe             | 4 PCIe x16 slots with 2 PCIe 4.0 x16, 1 PCIe x8, 1 PCIe x2 signal                                                                                                                  |
| M.2              | <ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3.0)</li> <li>• 1 M.2 Key E Socket (2230, PCIe x1)</li> </ul>                             |
| Storage          |                                                                                                                                                                                    |
| SATA             | 2 SATA III (6Gbps) support software RAID 0, 1                                                                                                                                      |
| M.2              | 1 M.2 Key M Socket (2280/22110, PCIe x2/SATA)                                                                                                                                      |
| Storage Device   | 2 Front-access 2.5" SSD/HDD Tray                                                                                                                                                   |
| Ethernet         |                                                                                                                                                                                    |
| LAN 1 to LAN 4   | Intel® I350 GigE LAN                                                                                                                                                               |
| LAN 5 to LAN 6   | 10G SFP+ LAN by Intel® Xeon® SoC (OS Windows Server support only)                                                                                                                  |
| Power            |                                                                                                                                                                                    |
| Input Voltage    | DC 16V to 50V                                                                                                                                                                      |
| Power Interface  | 4-pin Terminal Block : V+, V+, V-, V-                                                                                                                                              |
| Ignition Control | 16-mode Software Ignition Control                                                                                                                                                  |
| Remote Switch    | 3-pin Terminal Block                                                                                                                                                               |

| <b>Out-of-Band Management</b> |                                                                               |
|-------------------------------|-------------------------------------------------------------------------------|
| MCU                           | Nuvoton NUC980                                                                |
| Interface                     | OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector                                |
| Remote Management             | Support Remote Power ON/OFF, Reset and Power Cycling                          |
| <b>Others</b>                 |                                                                               |
| TPM                           | Infineon SLB9670 supports TPM 2.0, SPI interface                              |
| Watchdog Timer                | Reset : 1 to 255 sec./min. per step                                           |
| Smart Management              | Wake on LAN, PXE supported                                                    |
| HW Monitor                    | Monitoring temperature, voltages. Auto throttling control when CPU overheats. |
| <b>Mechanical</b>             |                                                                               |
| Dimension (W x D x H)         | 243.5mm x 271.3mm x 390.0mm (9.58" x 10.68" x 15.35")                         |
| Weight                        | 10.2kg (22.48lb)                                                              |
| Mounting                      | Wallmount by mounting bracket                                                 |
| <b>Environment</b>            |                                                                               |
| Operating Temperature         | -25°C to 45°C (-13°F to 113°F)                                                |
| Storage Temperature           | -40°C to 85°C (-40°F to 185°F)                                                |
| Humidity                      | 5% to 95% Humidity, non-condensing                                            |
| Relative Humidity             | 95% @45°C                                                                     |
| Vibration                     | MIL-STD-810G method 514.6, Category 4                                         |
| Shock                         | MIL-STD-810G method 516.6, Procedure I                                        |
| EMC                           | CE, FCC, EN50155, EN50121-3-2                                                 |

### 1.3.2 Specifications of ICS-1640A

| System           |                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor        | <ul style="list-style-type: none"> <li>• 16-core Intel® Xeon® D-2876NT Processor (Eddy Lake D HCC)</li> <li>• 12-core Intel® Xeon® D-2752TER Processor (Ice Lake D HCC)</li> </ul> |
| BIOS             | AMI                                                                                                                                                                                |
| SIO              | IT8786E                                                                                                                                                                            |
| Memory           | 8 DDR4 UDIMM/RDIMM 2933MHz, up to 512GB (ECC support by UDIMM only)                                                                                                                |
| OS               | Windows 10, Windows Server, Linux                                                                                                                                                  |
| I/O Interface    |                                                                                                                                                                                    |
| Serial           | 4 COM RS-232/422/485                                                                                                                                                               |
| USB              | <ul style="list-style-type: none"> <li>• 2 USB 3.0 Type-A</li> <li>• 2 USB 2.0 Type-A</li> </ul>                                                                                   |
| Isolated DIO     | 16 Isolated DIO : 8 DI, 8 DO                                                                                                                                                       |
| Display          | VGA : Up to 1920 x 1080 @60Hz                                                                                                                                                      |
| LED              | Power, HDD, Wireless, OOB                                                                                                                                                          |
| SIM Card         | 1 External Nano SIM Card Socket                                                                                                                                                    |
| Expansion        |                                                                                                                                                                                    |
| PCIe             | 4 PCIe x16 slots with 2 PCIe 4.0 x16, 1 PCIe x8, 1 PCIe x2 signal                                                                                                                  |
| M.2              | <ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3.0)</li> <li>• 1 M.2 Key E Socket (2230, PCIe x1)</li> </ul>                             |
| Storage          |                                                                                                                                                                                    |
| SATA             | 2 SATA III (6Gbps) support software RAID 0, 1                                                                                                                                      |
| M.2              | 1 M.2 Key M Socket (2280/22110, PCIe x2/SATA)                                                                                                                                      |
| Storage Device   | 2 Front-access 2.5" SSD/HDD Tray                                                                                                                                                   |
| Ethernet         |                                                                                                                                                                                    |
| LAN 1 to LAN 4   | Intel® I350 GigE LAN                                                                                                                                                               |
| LAN 5 to LAN 6   | 10G SFP+ LAN by Intel® Xeon® SoC (OS Windows Server support only)                                                                                                                  |
| Power            |                                                                                                                                                                                    |
| Input Voltage    | AC 90V to 240V                                                                                                                                                                     |
| Power Interface  | 3-pin C14-type AC Plug                                                                                                                                                             |
| Ignition Control | 16-mode Software Ignition Control                                                                                                                                                  |
| Remote Switch    | 3-pin Terminal Block                                                                                                                                                               |



| <b>Out-of-Band Management</b> |                                                                               |
|-------------------------------|-------------------------------------------------------------------------------|
| MCU                           | Nuvoton NUC980                                                                |
| Interface                     | OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector                                |
| Remote Management             | Support Remote Power ON/OFF, Reset and Power Cycling                          |
| <b>Others</b>                 |                                                                               |
| TPM                           | Infineon SLB9670 supports TPM 2.0, SPI interface                              |
| Watchdog Timer                | Reset : 1 to 255 sec./min. per step                                           |
| Smart Management              | Wake on LAN, PXE supported                                                    |
| HW Monitor                    | Monitoring temperature, voltages. Auto throttling control when CPU overheats. |
| <b>Mechanical</b>             |                                                                               |
| Dimension (W x D x H)         | 243.5mm x 271.3mm x 390.0mm (9.58" x 10.68" x 15.35")                         |
| Weight                        | 10.2kg (22.48lb)                                                              |
| Mounting                      | Wallmount by mounting bracket                                                 |
| <b>Environment</b>            |                                                                               |
| Operating Temperature         | -5°C to 45°C (23°F to 113°F)                                                  |
| Storage Temperature           | -20°C to 85°C (-4°F to 185°F)                                                 |
| Humidity                      | 5% to 95% Humidity, non-condensing                                            |
| Relative Humidity             | 95% @45°C                                                                     |
| Vibration                     | MIL-STD-810G method 514.6, Category 4                                         |
| Shock                         | MIL-STD-810G method 516.6, Procedure I                                        |
| EMC                           | CE, FCC, EN50155, EN50121-3-2                                                 |

### 1.3.3 Specifications of ICS-1660

| System                 |                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor              | <ul style="list-style-type: none"> <li>16-core Intel® Xeon® D-2876NT Processor (Eddy Lake D HCC)</li> <li>12-core Intel® Xeon® D-2752TER Processor (Ice Lake D HCC)</li> </ul> |
| BIOS                   | AMI                                                                                                                                                                            |
| SIO                    | IT8786E                                                                                                                                                                        |
| Memory                 | 8 DDR4 UDIMM/RDIMM 2933MHz, up to 512GB (ECC support by UDIMM only)                                                                                                            |
| OS                     | Windows 10, Windows Server, Linux                                                                                                                                              |
| I/O Interface          |                                                                                                                                                                                |
| Serial                 | 4 COM RS-232/422/485                                                                                                                                                           |
| USB                    | <ul style="list-style-type: none"> <li>2 USB 3.0 Type-A</li> <li>2 USB 2.0 Type-A</li> </ul>                                                                                   |
| Isolated DIO           | 16 Isolated DIO : 8 DI, 8 DO                                                                                                                                                   |
| Display                | VGA : Up to 1920 x 1080 @60Hz                                                                                                                                                  |
| LED                    | Power, HDD, Wireless, OOB                                                                                                                                                      |
| SIM Card               | 1 External Nano SIM Card Socket                                                                                                                                                |
| Expansion              |                                                                                                                                                                                |
| PCIe                   | 6 PCIe x16 slots with 4 PCIe 4.0 x8, 1 PCIe x8, 1 PCIe x2 signal                                                                                                               |
| M.2                    | <ul style="list-style-type: none"> <li>1 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3.0)</li> <li>1 M.2 Key E Socket (2230, PCIe x1)</li> </ul>                             |
| Storage                |                                                                                                                                                                                |
| SATA                   | 2 SATA III (6Gbps) support software RAID 0, 1                                                                                                                                  |
| M.2                    | 1 M.2 Key M Socket (2280/22110, PCIe x2/SATA)                                                                                                                                  |
| Storage Device         | 2 Front-access 2.5" SSD/HDD Tray                                                                                                                                               |
| Ethernet               |                                                                                                                                                                                |
| LAN 1 to LAN 4         | Intel® I350 GigE LAN                                                                                                                                                           |
| LAN 5 to LAN 6         | 10G SFP+ LAN by Intel® Xeon® SoC (OS Windows Server support only)                                                                                                              |
| Power                  |                                                                                                                                                                                |
| Input Voltage          | DC 16V to 50V                                                                                                                                                                  |
| Power Interface        | 4-pin Terminal Block : V+, V+, V-, V-                                                                                                                                          |
| Ignition Control       | 16-mode Software Ignition Control                                                                                                                                              |
| Remote Switch          | 3-pin Terminal Block                                                                                                                                                           |
| Out-of-Band Management |                                                                                                                                                                                |
| MCU                    | Nuvoton NUC980                                                                                                                                                                 |
| Interface              | OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector                                                                                                                                 |
| Remote Management      | Support Remote Power ON/OFF, Reset and Power Cycling                                                                                                                           |

| <b>Others</b>            |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| TPM                      | Infineon SLB9670 supports TPM 2.0, SPI interface                              |
| Watchdog Timer           | Reset : 1 to 255 sec./min. per step                                           |
| Smart Management         | Wake on LAN, PXE supported                                                    |
| HW Monitor               | Monitoring temperature, voltages. Auto throttling control when CPU overheats. |
| <b>Mechanical</b>        |                                                                               |
| Dimension<br>(W x D x H) | 243.5mm x 271.3mm x 390.0mm (9.58" x 10.68" x 15.35")                         |
| Weight                   | 10.2kg (22.48lb)                                                              |
| Mounting                 | Wallmount by mounting bracket                                                 |
| <b>Environment</b>       |                                                                               |
| Operating Temperature    | -25°C to 45°C (-13°F to 113°F)                                                |
| Storage Temperature      | -40°C to 85°C (-40°F to 185°F)                                                |
| Humidity                 | 5% to 95% Humidity, non-condensing                                            |
| Relative Humidity        | 95% @45°C                                                                     |
| Vibration                | MIL-STD-810G method 514.6, Category 4                                         |
| Shock                    | MIL-STD-810G method 516.6, Procedure I                                        |
| EMC                      | CE, FCC, EN50155, EN50121-3-2                                                 |

### 1.3.4 Specifications of ICS-1660A

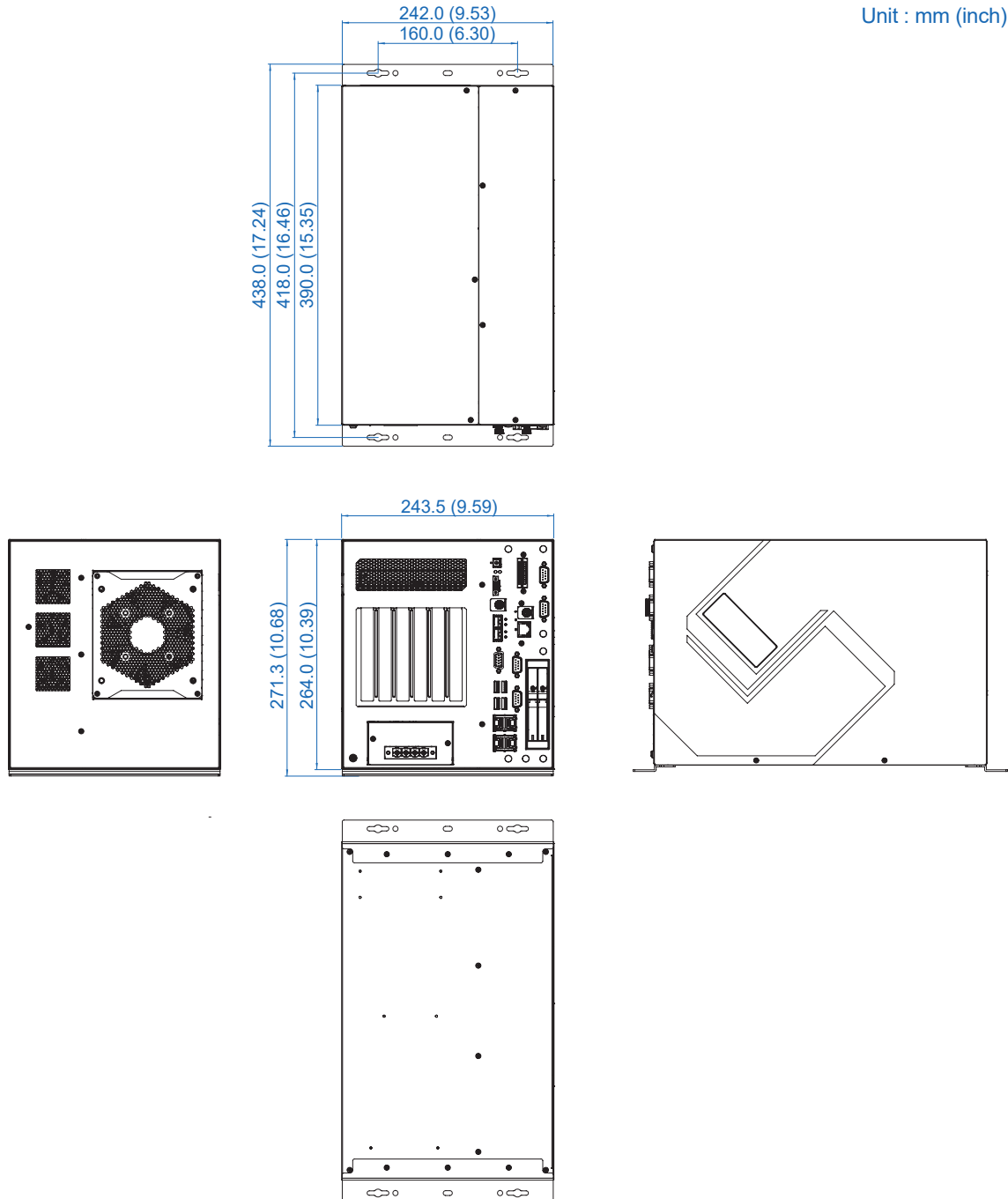
| System                 |                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor              | <ul style="list-style-type: none"> <li>16-core Intel® Xeon® D-2876NT Processor (Eddy Lake D HCC)</li> <li>12-core Intel® Xeon® D-2752TER Processor (Ice Lake D HCC)</li> </ul> |
| BIOS                   | AMI                                                                                                                                                                            |
| SIO                    | IT8786E                                                                                                                                                                        |
| Memory                 | 8 DDR4 UDIMM/RDIMM 2933MHz, up to 512GB (ECC support by UDIMM only)                                                                                                            |
| OS                     | Windows 10, Windows Server, Linux                                                                                                                                              |
| I/O Interface          |                                                                                                                                                                                |
| Serial                 | 4 COM RS-232/422/485                                                                                                                                                           |
| USB                    | <ul style="list-style-type: none"> <li>2 USB 3.0 Type-A</li> <li>2 USB 2.0 Type-A</li> </ul>                                                                                   |
| Isolated DIO           | 16 Isolated DIO : 8 DI, 8 DO                                                                                                                                                   |
| Display                | VGA : Up to 1920 x 1080 @60Hz                                                                                                                                                  |
| LED                    | Power, HDD, Wireless, OOB                                                                                                                                                      |
| SIM Card               | 1 External Nano SIM Card Socket                                                                                                                                                |
| Expansion              |                                                                                                                                                                                |
| PCIe                   | 6 PCIe x16 slots with 4 PCIe 4.0 x8, 1 PCIe x8, 1 PCIe x2 signal                                                                                                               |
| M.2                    | <ul style="list-style-type: none"> <li>1 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3.0)</li> <li>1 M.2 Key E Socket (2230, PCIe x1)</li> </ul>                             |
| Storage                |                                                                                                                                                                                |
| SATA                   | 2 SATA III (6Gbps) support software RAID 0, 1                                                                                                                                  |
| M.2                    | 1 M.2 Key M Socket (2280/22110, PCIe x2/SATA)                                                                                                                                  |
| Storage Device         | 2 Front-access 2.5" SSD/HDD Tray                                                                                                                                               |
| Ethernet               |                                                                                                                                                                                |
| LAN 1 to LAN 4         | Intel® I350 GigE LAN                                                                                                                                                           |
| LAN 5 to LAN 6         | 10G SFP+ LAN by Intel® Xeon® SoC (OS Windows Server support only)                                                                                                              |
| Power                  |                                                                                                                                                                                |
| Input Voltage          | AC 90V to 240V                                                                                                                                                                 |
| Power Interface        | 3-pin C14-type AC Plug                                                                                                                                                         |
| Ignition Control       | 16-mode Software Ignition Control                                                                                                                                              |
| Remote Switch          | 3-pin Terminal Block                                                                                                                                                           |
| Out-of-Band Management |                                                                                                                                                                                |
| MCU                    | Nuvoton NUC980                                                                                                                                                                 |
| Interface              | OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector                                                                                                                                 |
| Remote Management      | Support Remote Power ON/OFF, Reset and Power Cycling                                                                                                                           |

| <b>Others</b>         |                                                                               |
|-----------------------|-------------------------------------------------------------------------------|
| TPM                   | Infineon SLB9670 supports TPM 2.0, SPI interface                              |
| Watchdog Timer        | Reset : 1 to 255 sec./min. per step                                           |
| Smart Management      | Wake on LAN, PXE supported                                                    |
| HW Monitor            | Monitoring temperature, voltages. Auto throttling control when CPU overheats. |
| <b>Mechanical</b>     |                                                                               |
| Dimension (W x D x H) | 243.5mm x 271.3mm x 390.0mm (9.58" x 10.68" x 15.35")                         |
| Weight                | 10.2kg (22.48lb)                                                              |
| Mounting              | Wallmount by mounting bracket                                                 |
| <b>Environment</b>    |                                                                               |
| Operating Temperature | -5°C to 45°C (23°F to 113°F)                                                  |
| Storage Temperature   | -20°C to 85°C (-4°F to 185°F)                                                 |
| Humidity              | 5% to 95% Humidity, non-condensing                                            |
| Relative Humidity     | 95% @45°C                                                                     |
| Vibration             | MIL-STD-810G method 514.6, Category 4                                         |
| Shock                 | MIL-STD-810G method 516.6, Procedure I                                        |
| EMC                   | CE, FCC, EN50155, EN50121-3-2                                                 |

## 1.4 Mechanical Dimension

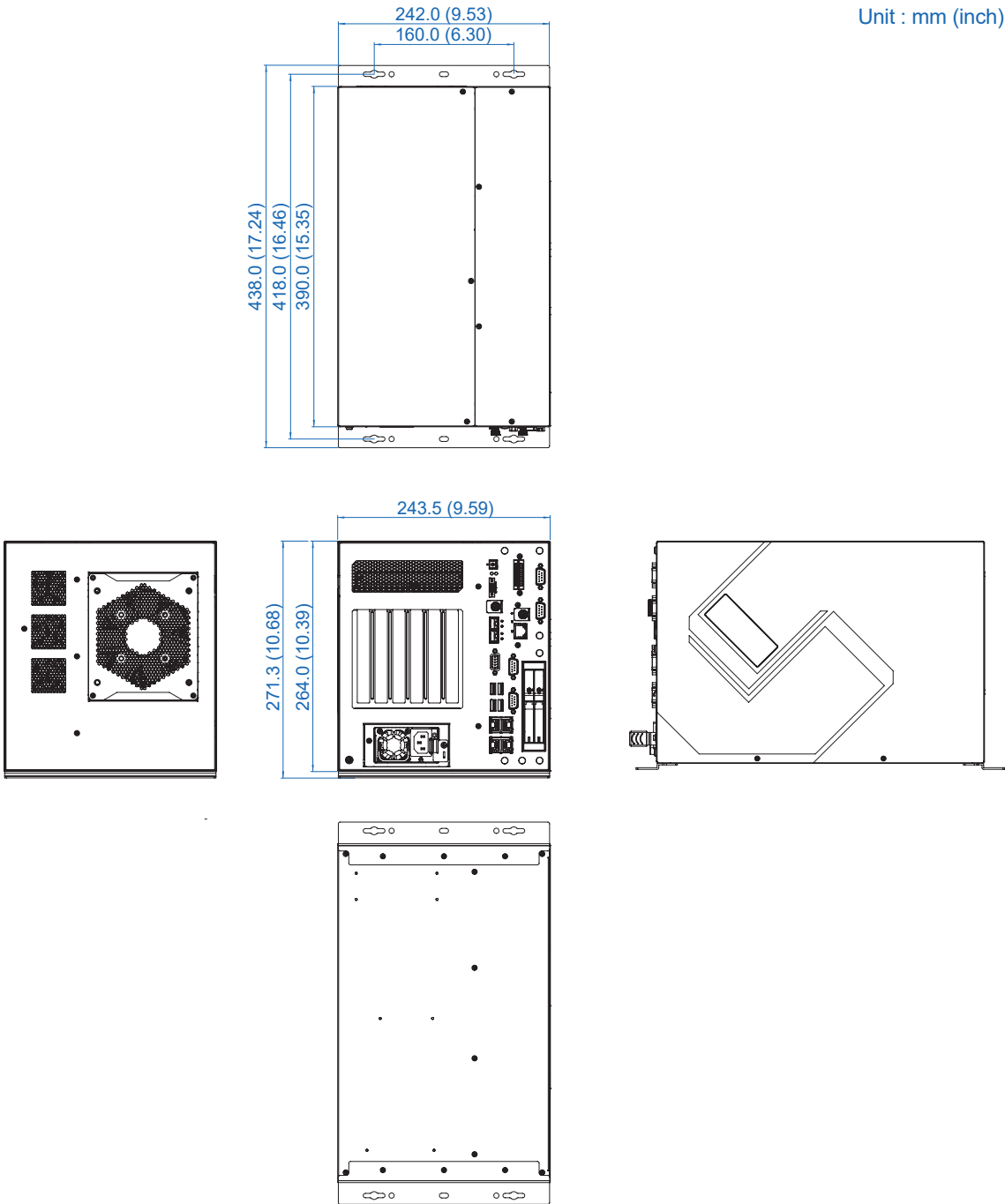
### 1.4.1 Dimensions of ICS-1000

Unit : mm (inch)



1.4.2 Dimensions of ICS-1000A

Unit : mm (inch)



# 2

## GETTING TO KNOW YOUR ICS-1000

### 2.1 Packing List

#### 2.1.1 ICS-1000 Packing List

| Item | Description                                                                                                                                                                    | Qty |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1    | ICS-1000 AI Computing System<br>(According to the configuration you order, the ICS-1000 series may contain SSD/HDD and DDR4 U/R-DIMM. Please verify these items if necessary.) | 1   |

| Item | Description                    | Outlook                                                                             | Usage              | P/N            | Qty |
|------|--------------------------------|-------------------------------------------------------------------------------------|--------------------|----------------|-----|
| 1    | Flat head_ M3x5L_ Black_ Nylok |  | Wall mount bracket | 53-M004950-310 | 6   |
| 2    | PHILLIPS M3x4L, Ni+Ny          |  | M.2 socket         | 53-2426204-80B | 4   |
| 3    | Terminal block 3-pin (3.5mm)   |  | Switch             | 51-2211R03-S1A | 1   |
| 4    | Terminal block 20-pin (2.54mm) |  | Isolated DIO/GPIO  | 51-2112R20-S1D | 1   |
| 5    | Terminal block 4-pin (10.16mm) |  | DC-in              | 51-2711R04-S1Q | 1   |
| 6    | Key                            |  | SSD/HDD tray       | N/A            | 2   |
| 7    | Wall Mount Bracket             |  | Wall Mount Bracket | 62-03P1499-04A | 2   |



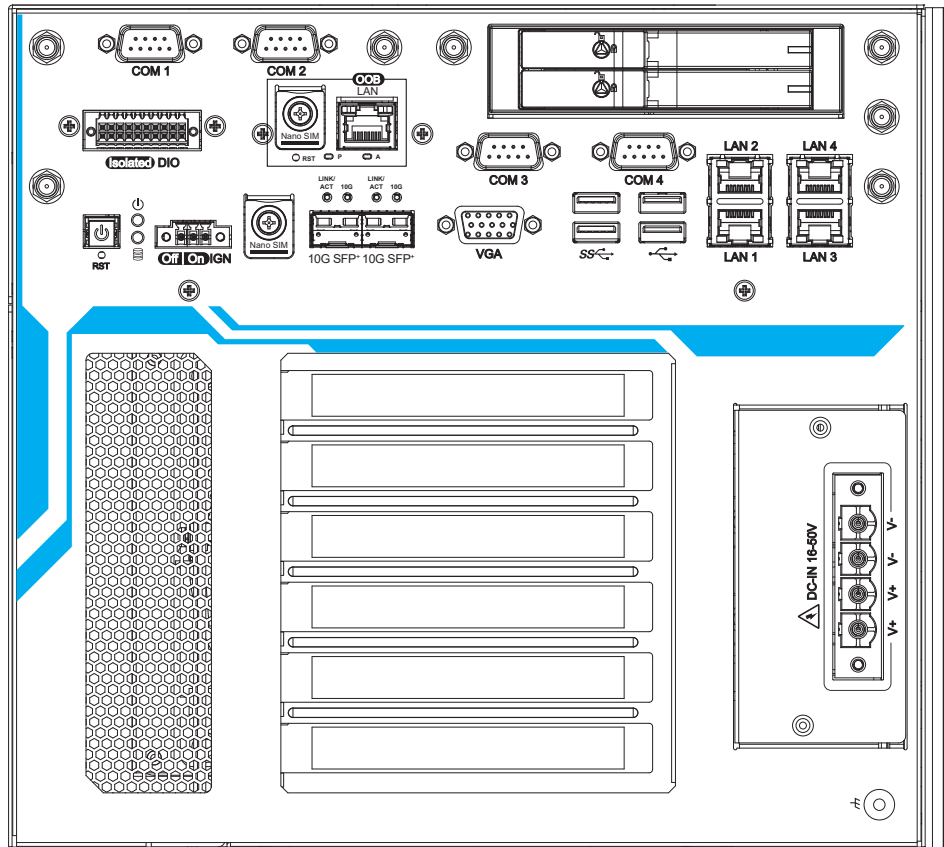
## 2.1.2 ICS-1000A Packing List

| Item | Description                                                                                                                                                                    | Qty |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1    | ICS-1000 AI Computing System<br>(According to the configuration you order, the ICS-1000 series may contain SSD/HDD and DDR4 U/R-DIMM. Please verify these items if necessary.) | 1   |

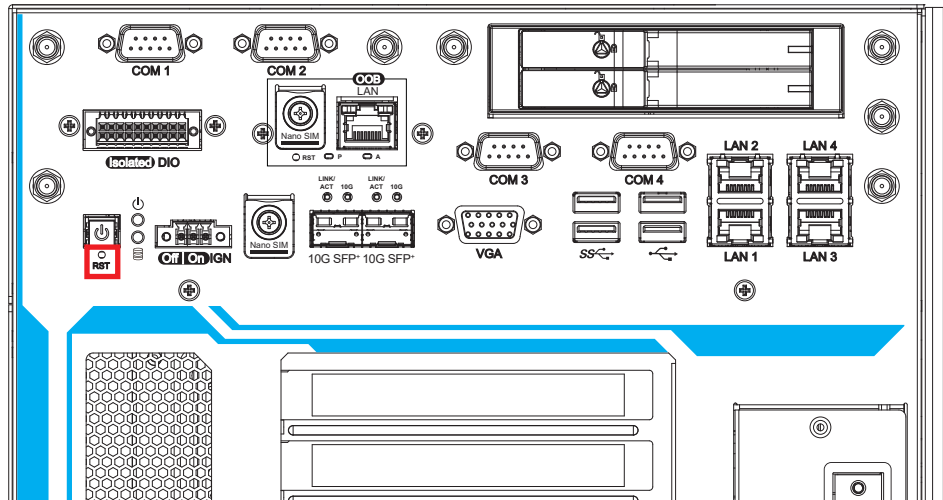
| Item | Description                    | Outlook                                                                             | Usage              | P/N            | Qty |
|------|--------------------------------|-------------------------------------------------------------------------------------|--------------------|----------------|-----|
| 1    | Flat head_ M3x5L_ Black_ Nylok |    | Wall mount bracket | 53-M004950-310 | 6   |
| 2    | PHILLIPS M3x4L, Ni+Ny          |    | M.2 socket         | 53-2426204-80B | 4   |
| 3    | Terminal block 3-pin (3.5mm)   |    | Switch             | 51-2211R03-S1A | 1   |
| 4    | Terminal block 20-pin (2.54mm) |   | Isolated DIO/GPIO  | 51-2112R20-S1D | 1   |
| 5    | Key                            |  | SSD/HDD tray       | N/A            | 2   |
| 6    | Wall Mount Bracket             |  | Wall Mount Bracket | 62-03P1499-04A | 2   |

## 2.2 Front Panel I/O Functions

In Vecow's ICS-1000 family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as USB3.0, USB2.0, SIM, OOB, LAN, 10G SFP+, COM Port, Isolated DIO, VGA, and any additional storage, are placed on the front panel.

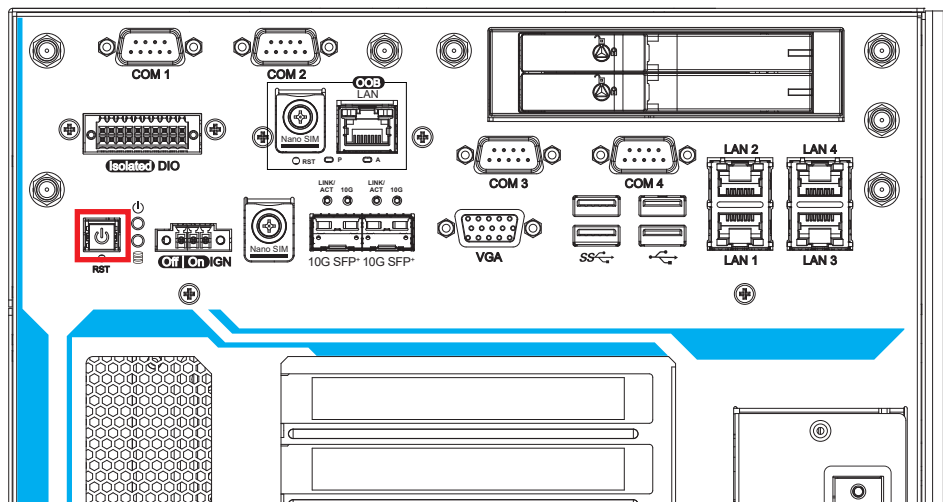


## 2.2.1 Reset Tact Switch



The item circled red is a hardware reset switch. Use this switch to reset the system without powering off the ICS-1000. Press and hold the reset switch for a few seconds, then reset will be enabled.

## 2.2.2 Power Button



The power button is a non-latched switch with dual color LED indication. It indicates power statuses: S0, S3 and S5. More details on the LED indications are listed in the following chart:

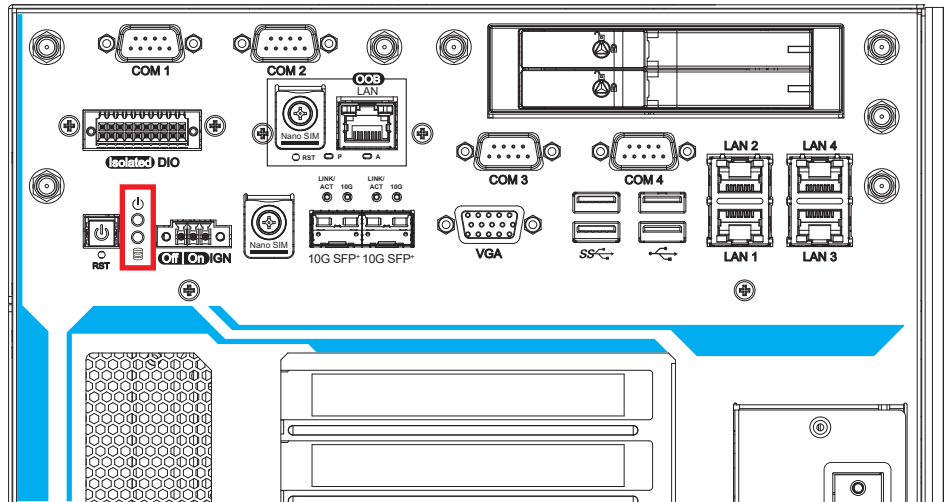
| LED Color    | Power Status | System Status                                 |
|--------------|--------------|-----------------------------------------------|
| Solid Blue   | S0           | System working                                |
| Solid Orange | S3, S5       | Suspend to RAM, System off with standby power |

To power on ICS-1000, press the power button which will light the blue LED.

To power off ICS-1000, you can either command shutdown by OS operation or simply press the power button. If system error appears, press and hold the power button for four seconds to shut down the machine directly.

Please do note that a four-second interval between each two power-on/power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for four seconds to initiate another power-on operation).

### 2.2.3 PWR & HDD LED Indicator

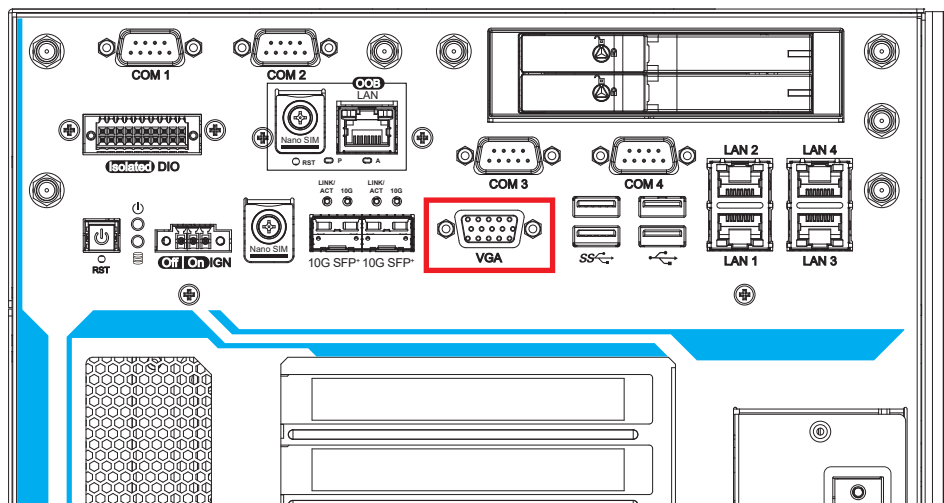


**Yellow-HDD LED :** A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

**Green-Power LED :** If the LED is solid green, it indicates that the system is powered on.

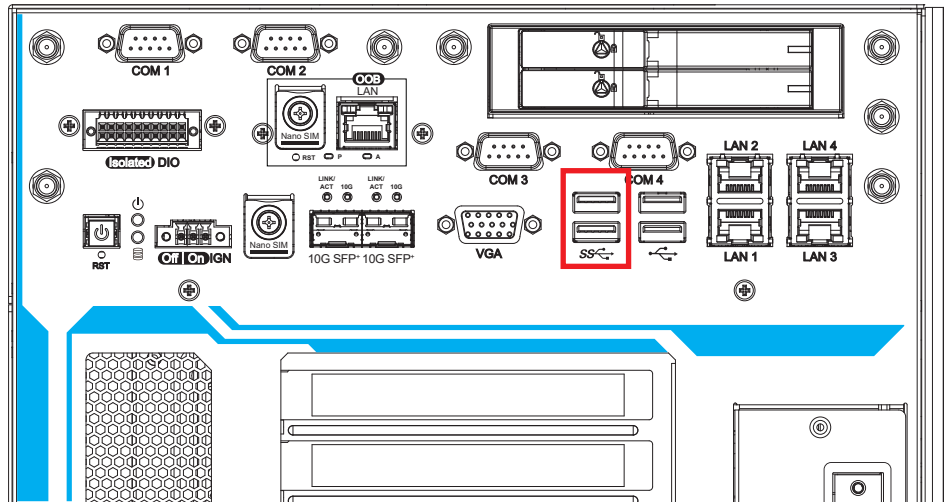
| LED Color | Indication | System Status                                                                                                                       |
|-----------|------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Yellow    | HDD        | <ul style="list-style-type: none"> <li>On/Off : Storage status, function or not.</li> <li>Twinkling : Data transferring.</li> </ul> |
| Green     | Power      | System power status (on/off)                                                                                                        |

### 2.2.4 VGA



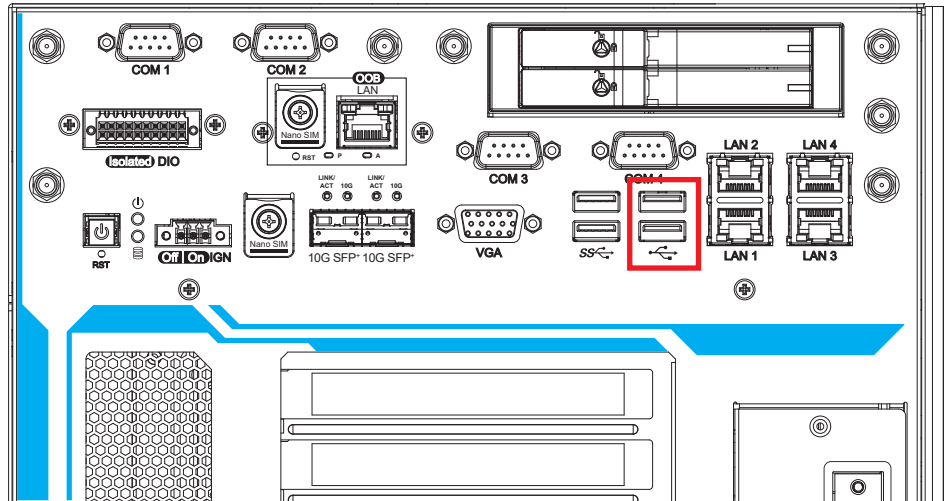
VGA connection supports up to 1920 x 1080 resolution at 60Hz.

## 2.2.5 USB3.0 Type-A Connector



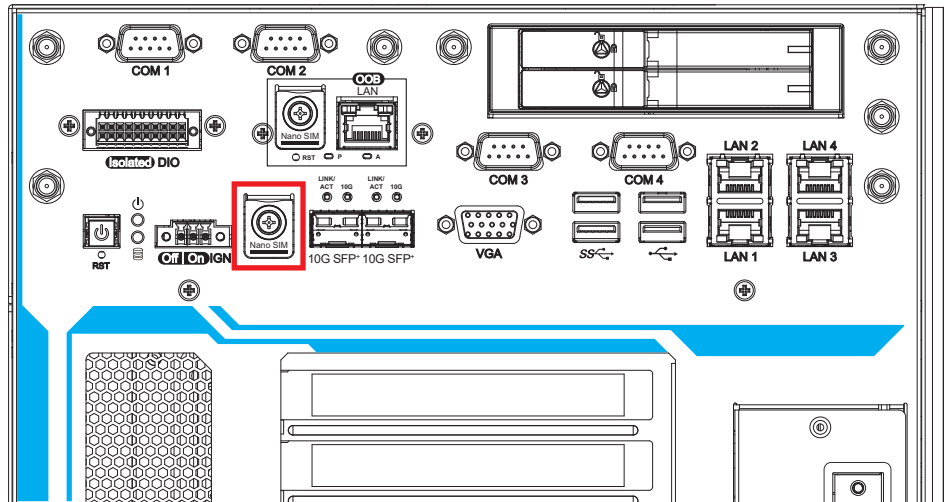
There are 2 USB 3.0 Type A connections available supporting up to 5GB per second data rate in the front side of ICS-1000 . It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

## 2.2.6 USB2.0 Type-A Connector



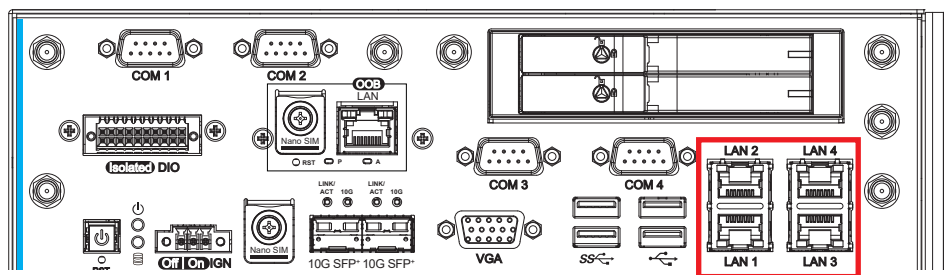
There are 2 USB 2.0 connections available supporting up to 480MB per second data rate.

## 2.2.7 Nano SIM



The Nano SIM card socket is support Push-Push type. Please make sure to unplug the system power before inserting the Nano SIM card.

## 2.2.8 10/100/1000 Mbps Ethernet Port



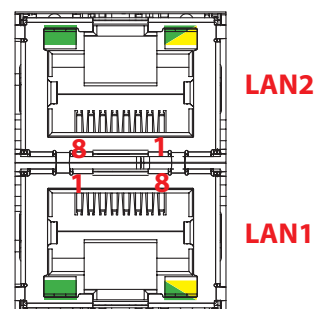
There are Four 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections in the front side. Which is powered by Intel i350 Ethernet engine. When both of LANs work in normal status, iAMT function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LANs support Wake on LAN and Pre-boot functions.

| LAN Port | Function           | Connector |
|----------|--------------------|-----------|
| LAN1     | RJ-45(10/100/1000) | LAN12     |
| LAN2     | RJ-45(10/100/1000) | LAN12     |
| LAN3     | RJ-45(10/100/1000) | LAN34     |
| LAN4     | RJ-45(10/100/1000) | LAN34     |

Using suitable RJ-45 cable, you can connect the ICS-1000 system to a computer or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both LAN 1 LAN 2 LAN 3 and LAN 4 support “Wake” on LAN functions. The pinouts of LAN 1 LAN 2 LAN 3 and LAN 4 are listed in the following chart:

| Pin No. | 10/100 Mbps | 1000Mbps |
|---------|-------------|----------|
| 1       | E_TX+       | MDI0_P   |
| 2       | E_TX-       | MDI0_N   |
| 3       | E_RX+       | MDI1_P   |
| 4       | ----        | MDI2_P   |
| 5       | ----        | MDI2_N   |
| 6       | E_RX-       | MDI1_N   |
| 7       | ----        | MDI3_P   |
| 8       | -----       | MDI3_N   |

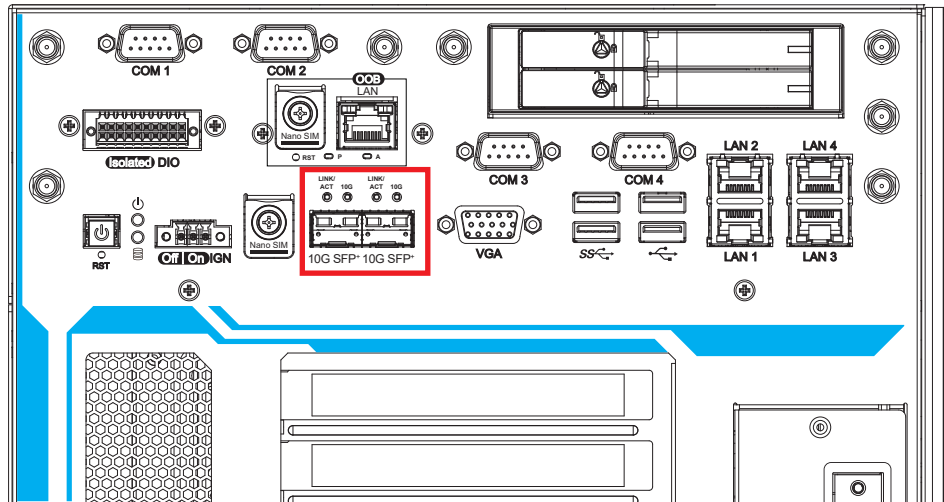
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection.



The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

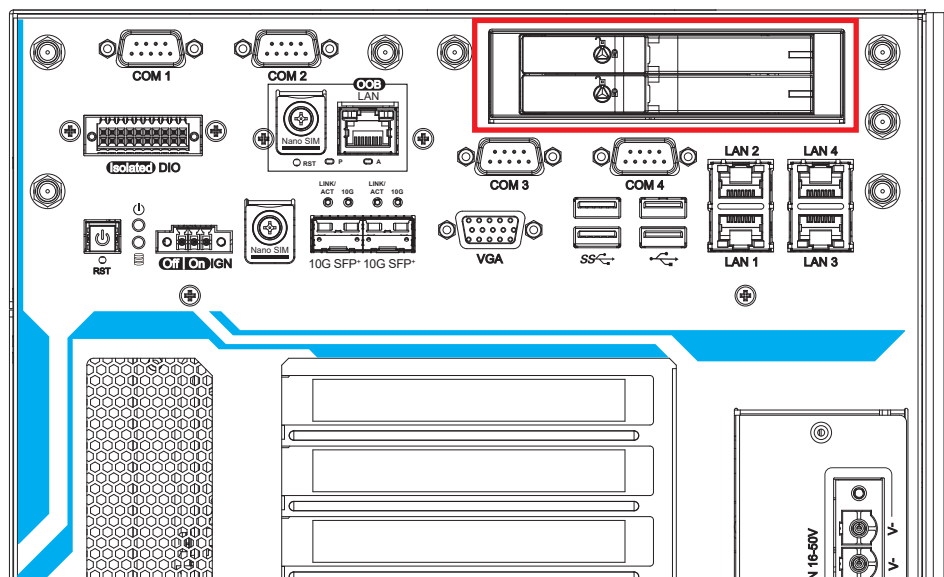
| LED Location | LED Color     | 10Mbps          | 100Mbps         | 1000Mbps        |
|--------------|---------------|-----------------|-----------------|-----------------|
| Right        | Green/ Orange | Off             | Solid Green     | Solid Orange    |
| Left         | Green         | Twinkling Green | Twinkling Green | Twinkling Green |

### 2.2.9 10G SFP+



There are two 10G SFP+ connections available supporting up to 10Gb per second data rate.

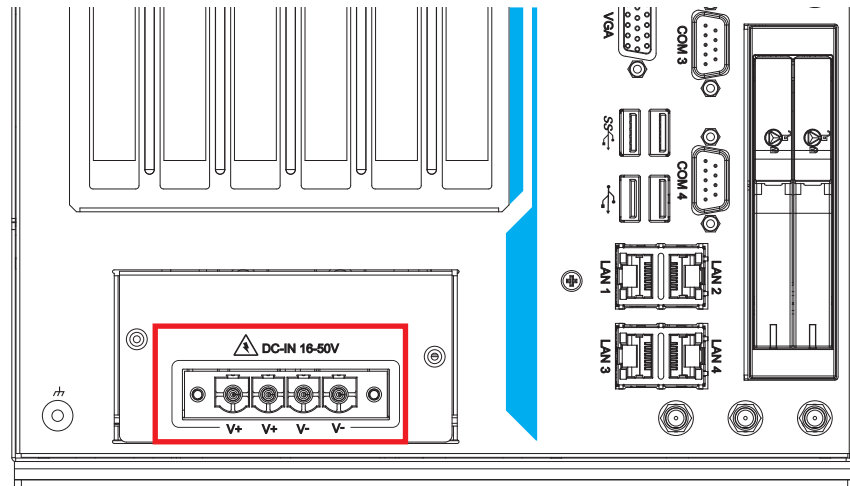
### 2.2.10 Front-access SSD/ HDD Tray



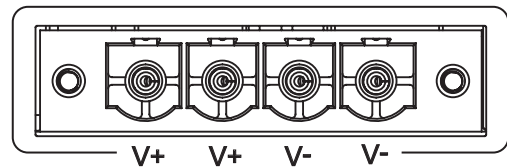
There are two front-access 2.5" SSD/HDD trays on the front side of ICS-1000. Press the trigger to open the SSD/HDD tray which has up to 8TB available.



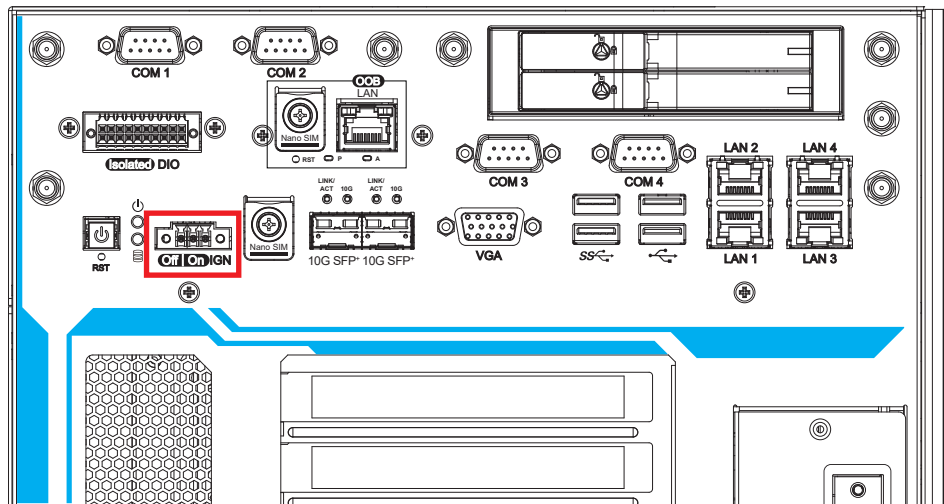
## 2.2.11 Power Terminal Block



ICS-1000 supports 16V to 50V DC power input.



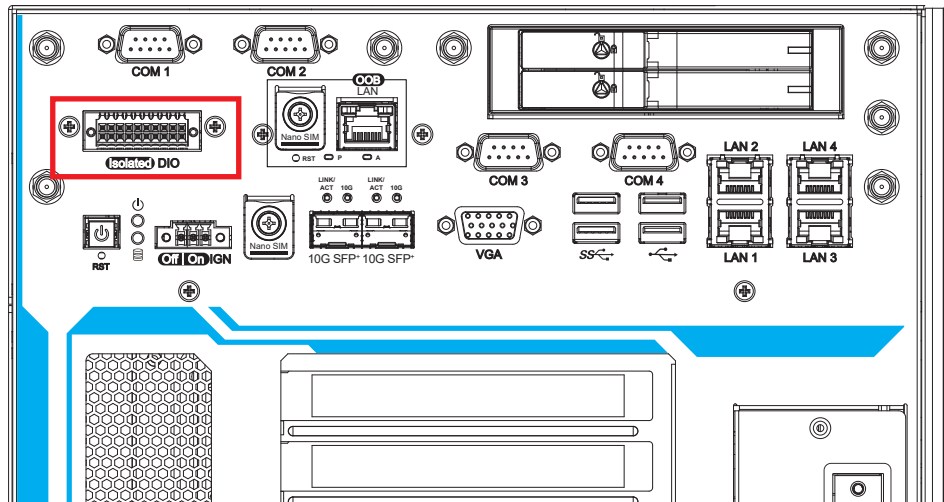
## 2.2.12 Remote Power On/Off Switch



It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

| Pin No. | Definition |
|---------|------------|
| 1       | IGNITION   |
| 2       | SW+        |
| 3       | SW-        |

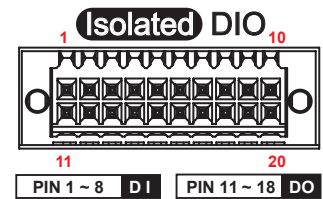
### 2.2.13 Isolated DIO



There is a 16-bit (8-bit DI, 8-bit DO) connectors in the front side. DI/DIO support NPN (sink) and PNP (Source) mode, Each DI channel is equipped with a photocoupler for isolated protection. Each DO with isolator chip, Config by a Jumper for each DIO connector.

DO Safety-Related Certifications :

- 4242-VPK Basic Isolation per DIN V VDE V 0884-10 and DIN EN 61010-1
- 3-KVRMS Isolation for 1 minute per UL 1577
- CSA Component Acceptance Notice 5A, IEC 60950-1 and IEC 61010-1 End Equipment Standards
- GB4943.1-2011 CQC Certified

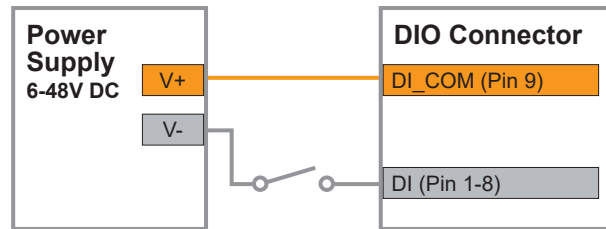


DIO1 Connectors pin out :

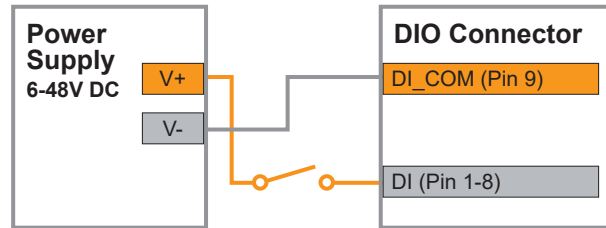
| Pin No. | Definition                                       | Mapping to SIO GPIO Function |
|---------|--------------------------------------------------|------------------------------|
| 1       | INPUT 0                                          | SIO_GPI80                    |
| 2       | INPUT 1                                          | SIO_GPI81                    |
| 3       | INPUT 2                                          | SIO_GPI82                    |
| 4       | INPUT 3                                          | SIO_GPI83                    |
| 5       | INPUT 4                                          | SIO_GPI84                    |
| 6       | INPUT 5                                          | SIO_GPI85                    |
| 7       | INPUT 6                                          | SIO_GPI86                    |
| 8       | INPUT 7                                          | SIO_GPI87                    |
| 9       | +VDI COM1                                        |                              |
| 10      | GND_ISO_DIO1                                     |                              |
| 11      | OUTPUT 0                                         | SIO_GPO70                    |
| 12      | OUTPUT 1                                         | SIO_GPO71                    |
| 13      | OUTPUT 2                                         | SIO_GPO72                    |
| 14      | OUTPUT 3                                         | SIO_GPO73                    |
| 15      | OUTPUT 4                                         | SIO_GPO74                    |
| 16      | OUTPUT 5                                         | SIO_GPO75                    |
| 17      | OUTPUT 6                                         | SIO_GPO76                    |
| 18      | OUTPUT 7                                         | SIO_GPO77                    |
| 19      | GND_ISO_DIO1                                     |                              |
| 20      | External 6-40VDC (NPN)<br>External 6-48VDC (PNP) |                              |

DI reference circuit :

Sink Mode  
(NPN)

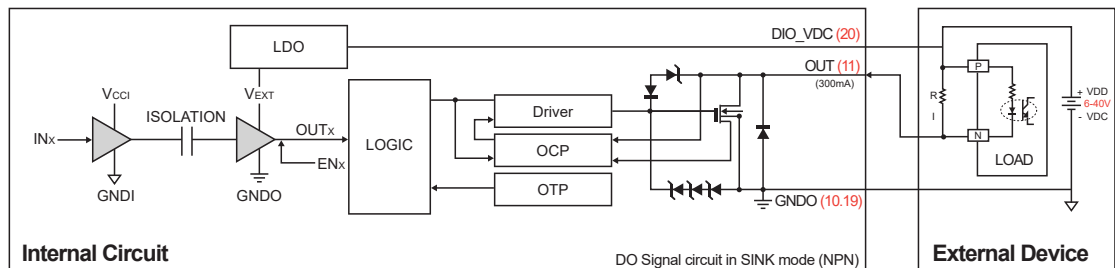


Source Mode  
(PNP)

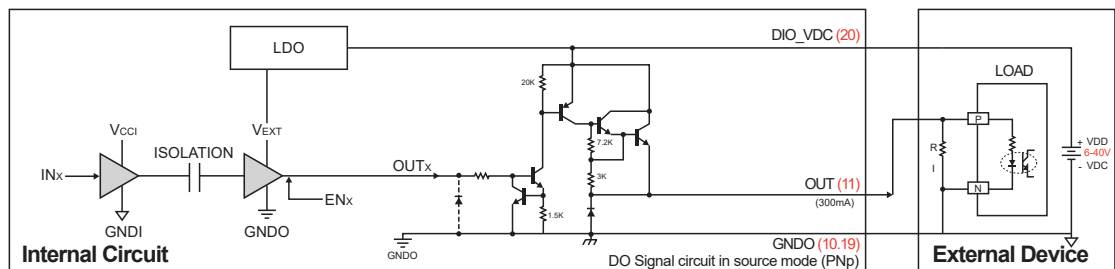


DO reference circuit :

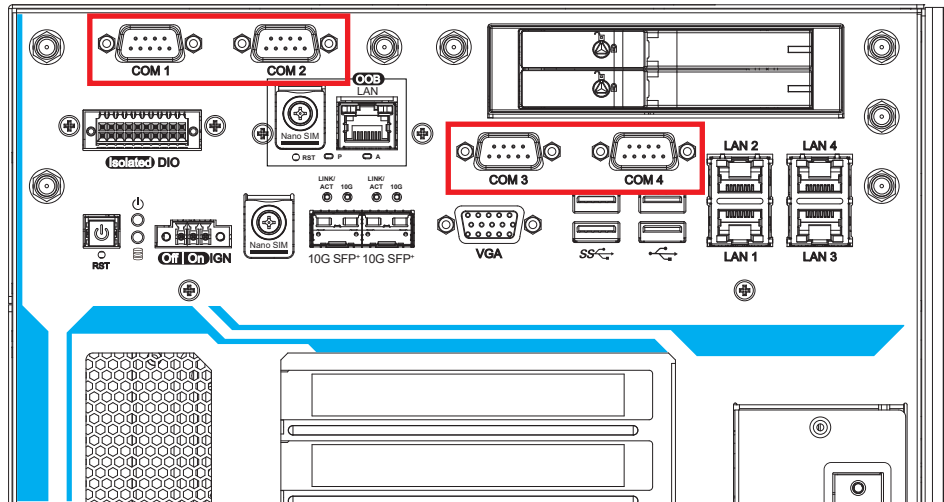
Sink Mode (NPN, Default)



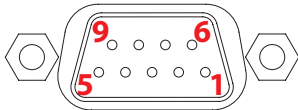
Source (PNP)



## 2.2.14 Serial Port COM



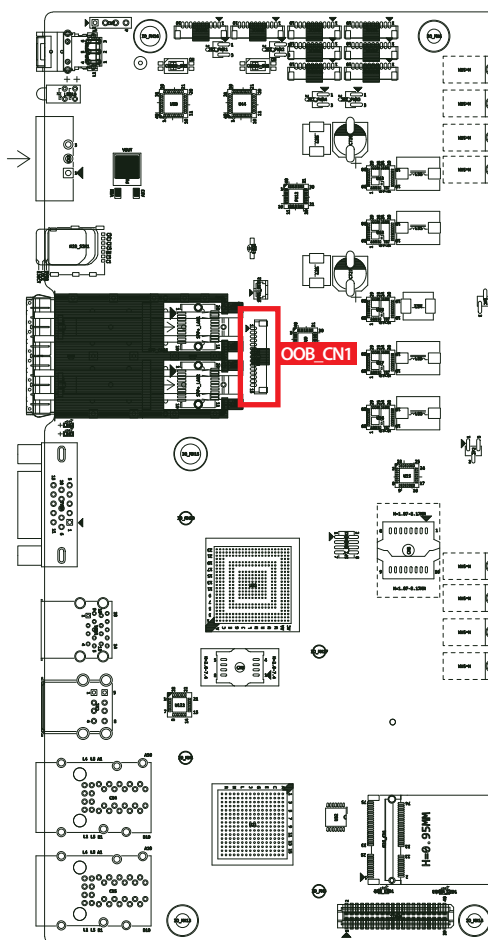
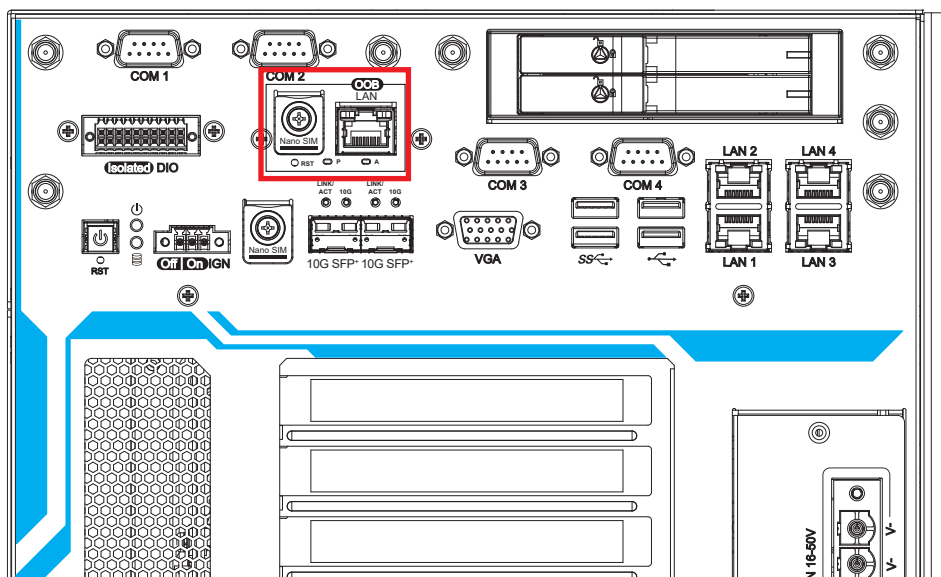
Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

|  | BIOS Setting   | Function                               |
|-------------------------------------------------------------------------------------|----------------|----------------------------------------|
|                                                                                     | COM 1          | RS-232                                 |
|                                                                                     | COM 2          | RS-422 (5-wire)                        |
|                                                                                     | COM 3<br>COM 4 | RS-485<br>RS-485 w/z auto-flow control |

The pin assignments are listed in the table as follows :

| Serial Port  | Pin No. | RS-232 | RS-422 (5-wire) | RS-485 (3-wire) |
|--------------|---------|--------|-----------------|-----------------|
| 1, 2<br>3, 4 | 1       | DCD    | TXD-            | DATA-           |
|              | 2       | RXD    | TXD+            | DATA+           |
|              | 3       | TXD    | RXD+            | -----           |
|              | 4       | DTR    | RXD-            | -----           |
|              | 5       | GND    | GND             | GND             |
|              | 6       | DSR    | -----           | -----           |
|              | 7       | RTS    | -----           | -----           |
|              | 8       | CTS    | -----           | -----           |
|              | 9       | RI     | -----           | -----           |

## 2.2.15 OOB Connector : Remote control ON/OFF/Reset.



| Location | Pin No. | Definition  |
|----------|---------|-------------|
| OOB_CN1  | 1       | 5V          |
|          | 2       | 5V          |
|          | 3       | GND         |
|          | 4       | NC          |
|          | 5       | NC          |
|          | 6       | GND         |
|          | 7       | UART_RX     |
|          | 8       | UART_TX     |
|          | 9       | GND         |
|          | 10      | NC          |
|          | 11      | NC          |
|          | 12      | GND         |
|          | 13      | PSW_NU      |
|          | 14      | OOB_RSTBTN# |
|          | 15      | HDD_LED_N   |

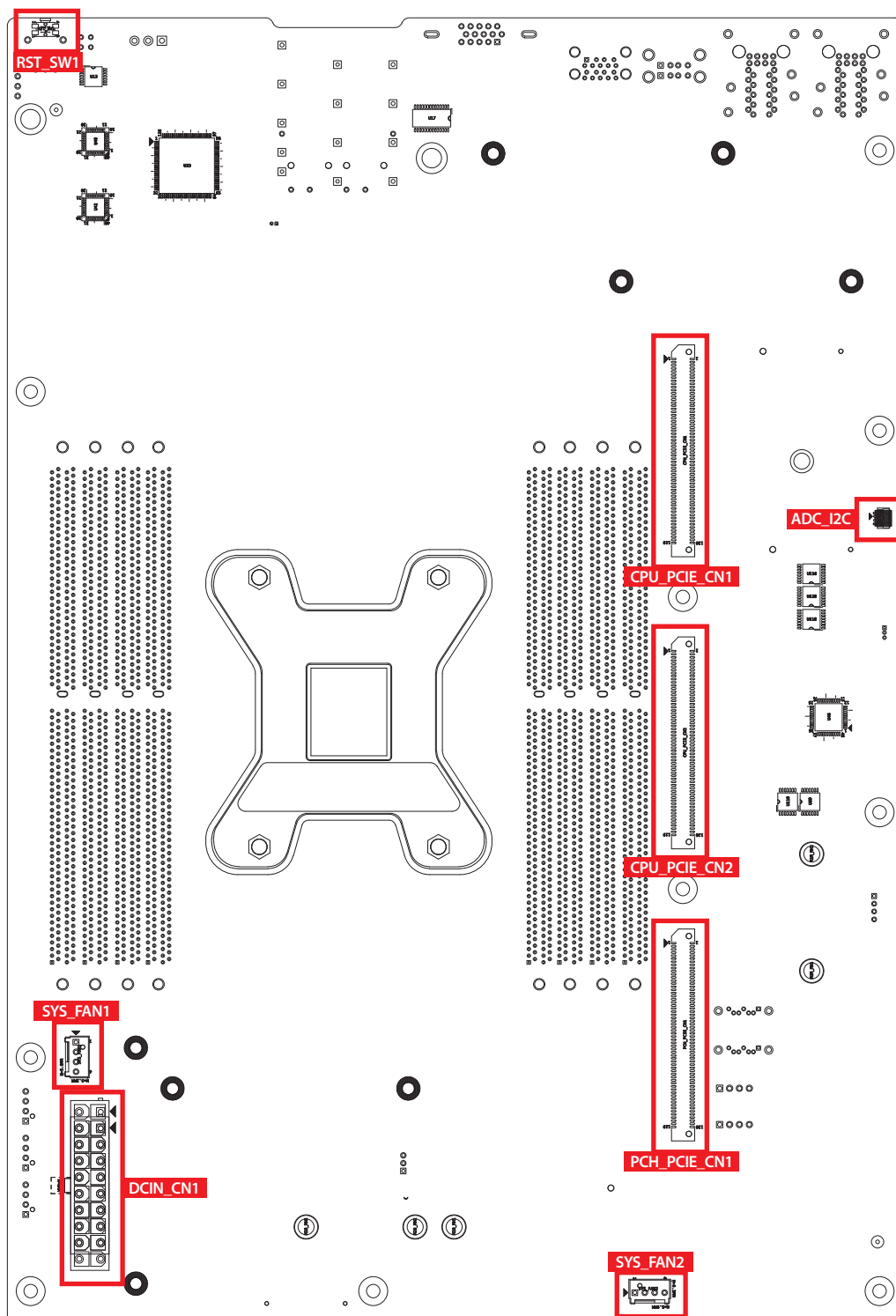
The LED indicator can instantly judge the power status(P) of OOB Enabler and the connection status(A) of OOB Enabler and Allxon Portal.

If both LEDs are on, it means OOB Enabler is running and the connection to Allxon Cloud is stable. The OOB network port is used for OOB out-of-band control.

The SIM card holder is used for OOB 4G network cards. This function is optional. For detailed instructions, please refer to the OOB chapter.

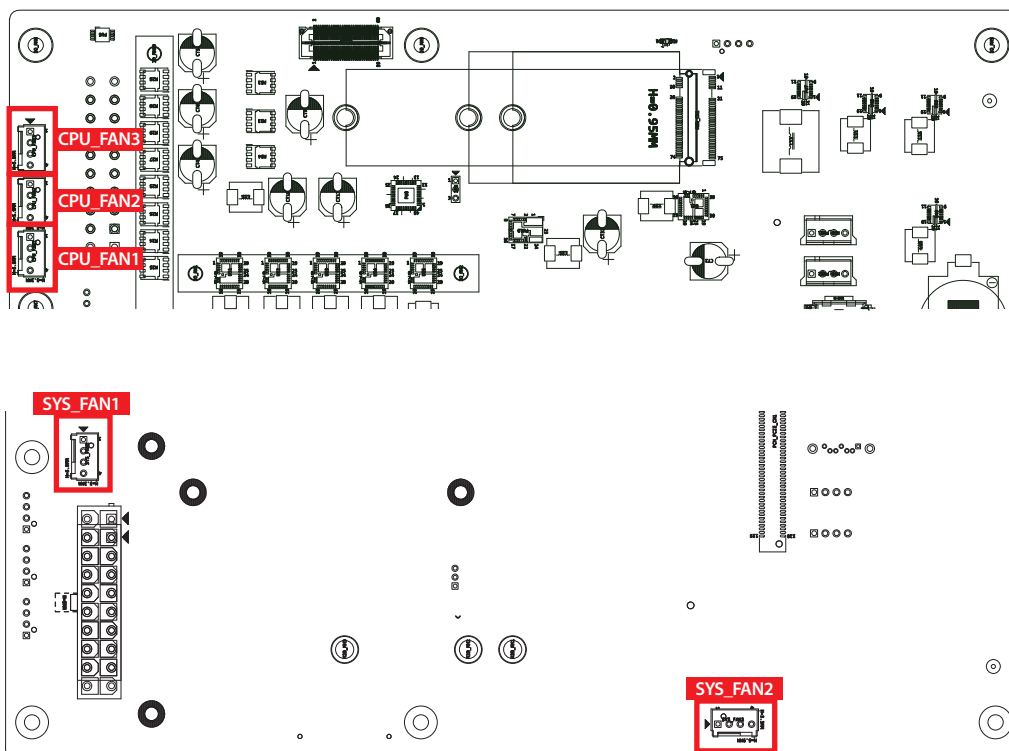


### 2.3.2 Bottom View of ICS-1000 Main Board With Connector Location

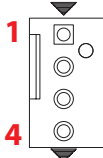




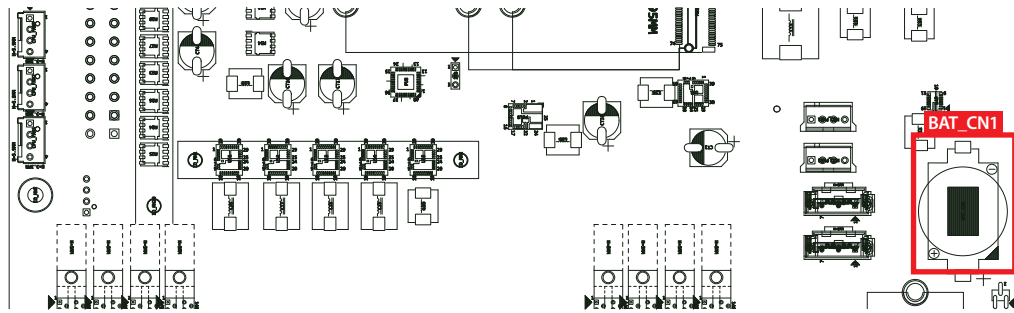
### 2.3.3 CPU\_FAN1, CPU\_FAN2, CPU\_FAN3, SYS\_FAN1, SYS\_FAN2



The fan power connector is for additional thermal requirements. The pin assignments of CPU\_FAN1 , CPU\_FAN2, CPU\_FAN3 , SYS\_FAN1 , SYS\_FAN2 are listed in the following table:

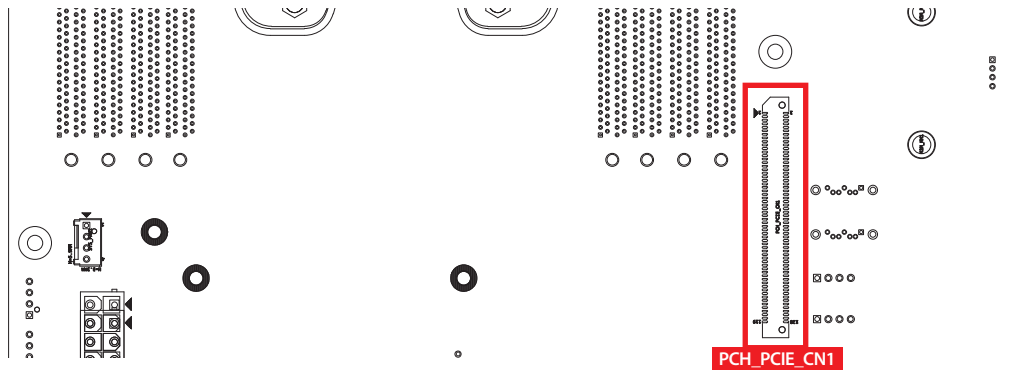
|  | CPU_FAN1,CPU_FAN2, SYS_FAN2 |                  | CPU_FAN3, SYS_FAN1 |                 |
|-------------------------------------------------------------------------------------|-----------------------------|------------------|--------------------|-----------------|
|                                                                                     | Pin No.                     | Description      | Pin No.            | Description     |
|                                                                                     | 1                           | GND              | 1                  | GND             |
|                                                                                     | 2                           | +12V (up to 2A)  | 2                  | +12V (up to 2A) |
|                                                                                     | 3                           | Fan speed sensor | 3                  | NC              |
|                                                                                     | 4                           | Fan PWM          | 4                  | Fan PWM         |

### 2.3.4 BAT\_CN1 : Battery



The ICS-1000's real-time clock is powered by a lithium battery. It is equipped with Panasonic CR2032 220mAh lithium battery. It is recommended that you do not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

### 2.3.5 PCH\_PCIE\_CN1 : Board to Board Conn. (PCH)

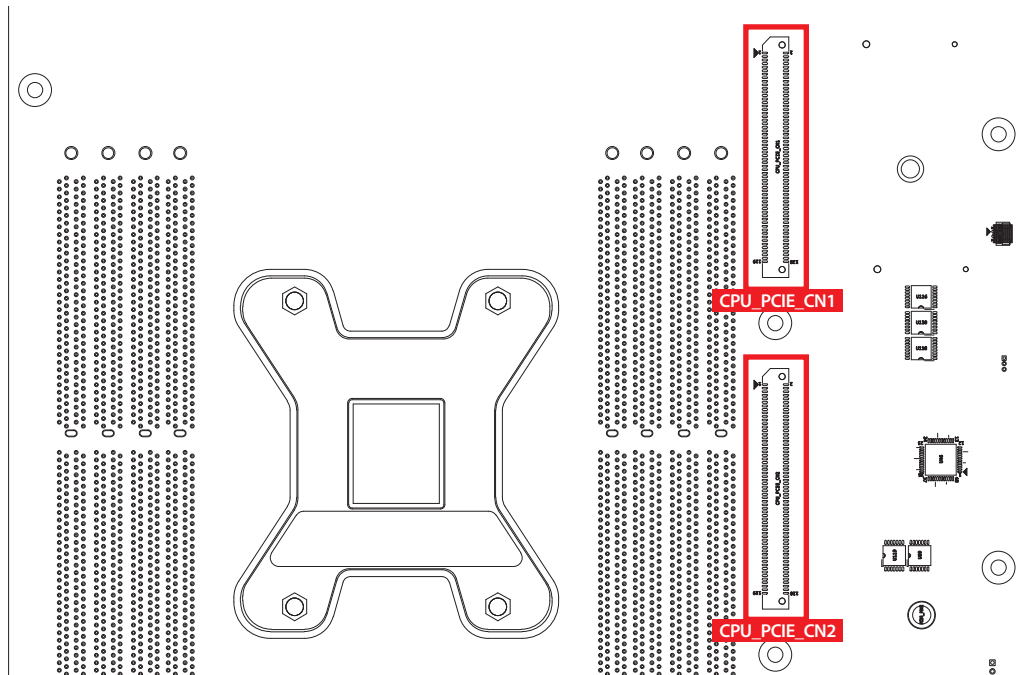


The pin assignments of PCH\_PCIE\_CN1 are listed in the following table :

| Pin No. | Function          | Pin No. | Function                 |
|---------|-------------------|---------|--------------------------|
| 1       | +P3V3             | 2       | PEG_SLIMSAS_SLOT_RST#3   |
| 3       | +P3V3             | 4       | GND                      |
| 5       | +P3V3             | 6       | SMB_SLIMSAS_11_SDA       |
| 7       | +P3V3             | 8       | SMB_SLIMSAS_11_SCL       |
| 9       | +P3V3             | 10      | +P3V3                    |
| 11      | +P3V3             | 12      | +P3V3                    |
| 13      | +P3V3             | 14      | GND                      |
| 15      | +P3V3             | 16      | PCIE_WAKE_N              |
| 17      | +P3V3             | 18      | PEG_SLIMSAS_SLOT_RST#4   |
| 19      | GND               | 20      | PEG_SLIMSAS_SLOT_RST#1   |
| 21      | NC                | 22      | PEG_SLIMSAS_SLOT_RST#2   |
| 23      | GND               | 24      | PCIe_SLIMSAS_SLOT_RST#0  |
| 25      | FM_SLPS3_N        | 26      | GND                      |
| 27      | GND               | 28      | SMB_X2_STBY_SLOT6_SDA    |
| 29      | +P12V_PG          | 30      | SMB_X2_STBY_SLOT6_SCL    |
| 31      | GND               | 32      | GND                      |
| 33      | CLK100M_SLOTX8_DN | 34      | SMB_X8_SLIMSAS_SLOT5_SDA |
| 35      | CLK100M_SLOTX8_DP | 36      | SMB_X8_SLIMSAS_SLOT5_SCL |
| 37      | GND               | 38      | GND                      |
| 39      | PE_PCH_X8_TN0     | 40      | PE_PCH_X8_RN0            |

| Pin No. | Function          | Pin No. | Function      |
|---------|-------------------|---------|---------------|
| 41      | PE_PCH_X8_TP0     | 42      | PE_PCH_X8_RP0 |
| 43      | GND               | 44      | GND           |
| 45      | PE_PCH_X8_TN1     | 46      | PE_PCH_X8_RN1 |
| 47      | PE_PCH_X8_TP1     | 48      | PE_PCH_X8_RP1 |
| 49      | GND               | 50      | GND           |
| 51      | PE_PCH_X8_TN2     | 52      | PE_PCH_X8_RN2 |
| 53      | PE_PCH_X8_TP2     | 54      | PE_PCH_X8_RP2 |
| 55      | GND               | 56      | GND           |
| 57      | PE_PCH_X8_TN3     | 58      | PE_PCH_X8_RN3 |
| 59      | PE_PCH_X8_TP3     | 60      | PE_PCH_X8_RP3 |
| 61      | GND               | 62      | GND           |
| 63      | PE_PCH_X8_TN4     | 64      | PE_PCH_X8_RN4 |
| 65      | PE_PCH_X8_TP4     | 66      | PE_PCH_X8_RP4 |
| 67      | GND               | 68      | GND           |
| 69      | PE_PCH_X8_TN5     | 70      | PE_PCH_X8_RN5 |
| 71      | PE_PCH_X8_TP5     | 72      | PE_PCH_X8_RP5 |
| 73      | GND               | 74      | GND           |
| 75      | PE_PCH_X8_TN6     | 76      | PE_PCH_X8_RN6 |
| 77      | PE_PCH_X8_TP6     | 78      | PE_PCH_X8_RP6 |
| 79      | GND               | 80      | GND           |
| 81      | PE_PCH_X8_TN7     | 82      | PE_PCH_X8_RN7 |
| 83      | PE_PCH_X8_TP7     | 84      | PE_PCH_X8_RP7 |
| 85      | GND               | 86      | GND           |
| 87      | CLK100M_SLOTX2_DN | 88      | PE_PCH_X2_RN8 |
| 89      | CLK100M_SLOTX2_DP | 90      | PE_PCH_X2_RP8 |
| 91      | GND               | 92      | GND           |
| 93      | PE_PCH_X2_TN8     | 94      | PE_PCH_X2_RN9 |
| 95      | PE_PCH_X2_TP8     | 96      | PE_PCH_X2_RP9 |
| 97      | GND               | 98      | GND           |
| 99      | PE_PCH_X2_TN9     | 100     | +P3V3_DAUL    |
| 101     | PE_PCH_X2_TP9     | 102     | +P3V3_DAUL    |
| 103     | GND               | 104     | +P3V3_DAUL    |
| 105     | +P12V             | 106     | +P3V3_DAUL    |
| 107     | +P12V             | 108     | +P3V3         |
| 109     | +P12V             | 110     | +P3V3         |
| 111     | +P12V             | 112     | +P3V3         |
| 113     | +P12V             | 114     | +P3V3         |
| 115     | +P12V             | 116     | +P3V3         |
| 117     | +P12V             | 118     | +P3V3         |
| 119     | +P12V             | 120     | +P3V3         |

### 2.3.6 CPU\_PCIE\_CN1,CPU\_PCIE\_CN2 : Board to Board Conn. (CPU)

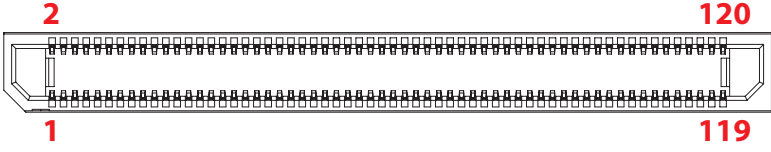


The pin assignments of CPU\_PCIE\_CN1 are listed in the following table :

| Pin No. | Function                     | Pin No. | Function           |
|---------|------------------------------|---------|--------------------|
| 1       | NC                           | 2       | NC                 |
| 3       | SMB_SLIMSAS_8_SDA            | 4       | NC                 |
| 5       | SMB_SLIMSAS_8_SCL            | 6       | NC                 |
| 7       | SMB_SLIMSAS_7_SDA            | 8       | NC                 |
| 9       | SMB_SLIMSAS_7_SCL            | 10      | NC                 |
| 11      | SMB_X8_SLIMSAS_SLOT2_SDA     | 12      | NC                 |
| 13      | SMB_X8_SLIMSAS_SLOT2_SCL     | 14      | NC                 |
| 15      | GND                          | 16      | NC                 |
| 17      | SMB_X16_X8_SLIMSAS_SLOT1_SDA | 18      | GND                |
| 19      | SMB_X16_X8_SLIMSAS_SLOT1_SCL | 20      | CPU_PCIE_CLK_N_OUT |
| 21      | GND                          | 22      | CPU_PCIE_CLK_P_OUT |
| 23      | GND                          | 24      | GND                |
| 25      | PEG0_TXN_15                  | 26      | PCIE0_CRX_N15      |
| 27      | PEG0_TXP_15                  | 28      | PCIE0_CRX_P15      |
| 29      | GND                          | 30      | GND                |
| 31      | PEG0_TXN_14                  | 32      | PCIE0_CRX_N14      |

| Pin No. | Function    | Pin No. | Function      |
|---------|-------------|---------|---------------|
| 33      | PEG0_TXP_14 | 34      | PCIE0_CRX_P14 |
| 35      | GND         | 36      | GND           |
| 37      | PEG0_TXN_13 | 38      | PCIE0_CRX_N13 |
| 39      | PEG0_TXP_13 | 40      | PCIE0_CRX_P13 |
| 41      | GND         | 42      | GND           |
| 43      | PEG0_TXN_12 | 44      | PCIE0_CRX_N12 |
| 45      | PEG0_TXP_12 | 46      | PCIE0_CRX_P12 |
| 47      | GND         | 48      | GND           |
| 49      | PEG0_TXN_11 | 50      | PCIE0_CRX_N11 |
| 51      | PEG0_TXP_11 | 52      | PCIE0_CRX_P11 |
| 53      | GND         | 54      | GND           |
| 55      | PEG0_TXN_10 | 56      | PCIE0_CRX_N10 |
| 57      | PEG0_TXP_10 | 58      | PCIE0_CRX_P10 |
| 59      | GND         | 60      | GND           |
| 61      | PEG0_TXN_9  | 62      | PCIE0_CRX_N9  |
| 63      | PEG0_TXP_9  | 64      | PCIE0_CRX_P9  |
| 65      | GND         | 66      | GND           |
| 67      | PEG0_TXN_8  | 68      | PCIE0_CRX_N8  |
| 69      | PEG0_TXP_8  | 70      | PCIE0_CRX_P8  |
| 71      | GND         | 72      | GND           |
| 73      | PEG0_TXN_7  | 74      | PCIE0_CRX_N7  |
| 75      | PEG0_TXP_7  | 76      | PCIE0_CRX_P7  |
| 77      | GND         | 78      | GND           |
| 79      | PEG0_TXN_6  | 80      | PCIE0_CRX_N6  |
| 81      | PEG0_TXP_6  | 82      | PCIE0_CRX_P6  |
| 83      | GND         | 84      | GND           |
| 85      | PEG0_TXN_5  | 86      | PCIE0_CRX_N5  |
| 87      | PEG0_TXP_5  | 88      | PCIE0_CRX_P5  |
| 89      | GND         | 90      | GND           |
| 91      | PEG0_TXN_4  | 92      | PCIE0_CRX_N4  |
| 93      | PEG0_TXP_4  | 94      | PCIE0_CRX_P4  |
| 95      | GND         | 96      | GND           |
| 97      | PEG0_TXN_3  | 98      | PCIE0_CRX_N3  |
| 99      | PEG0_TXP_3  | 100     | PCIE0_CRX_P3  |
| 101     | GND         | 102     | GND           |
| 103     | PEG0_TXN_2  | 104     | PCIE0_CRX_N2  |
| 105     | PEG0_TXP_2  | 106     | PCIE0_CRX_P2  |
| 107     | GND         | 108     | GND           |
| 109     | PEG0_TXN_1  | 110     | PCIE0_CRX_N1  |
| 111     | PEG0_TXP_1  | 112     | PCIE0_CRX_P1  |
| 113     | GND         | 114     | GND           |
| 115     | PEG0_TXN_0  | 116     | PCIE0_CRX_N0  |
| 117     | PEG0_TXP_0  | 118     | PCIE0_CRX_P0  |
| 119     | GND         | 120     | GND           |

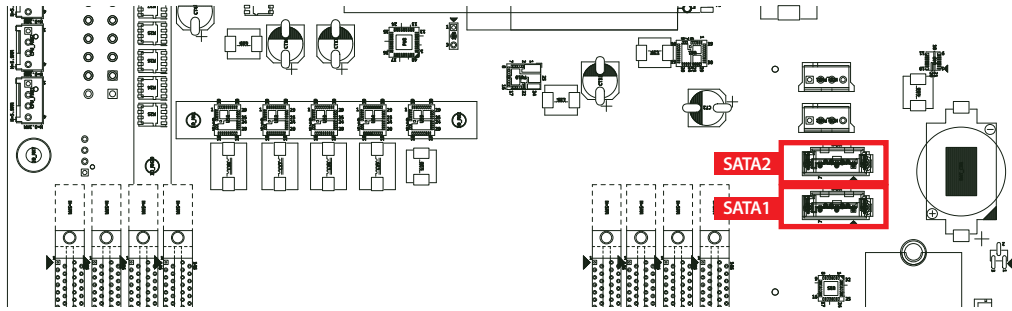
The pin assignments of CPU\_PCIE\_CN2 are listed in the following table :

|  |                              |         |                |
|------------------------------------------------------------------------------------|------------------------------|---------|----------------|
| Pin No.                                                                            | Function                     | Pin No. | Function       |
| 1                                                                                  | NC                           | 2       | NC             |
| 3                                                                                  | SMB_SLIMSAS_10_SDA           | 4       | NC             |
| 5                                                                                  | SMB_SLIMSAS_10_SCL           | 6       | NC             |
| 7                                                                                  | SMB_SLIMSAS_9_SDA            | 8       | NC             |
| 9                                                                                  | SMB_SLIMSAS_9_SCL            | 10      | NC             |
| 11                                                                                 | SMB_X8_SLIMSAS_SLOT4_SDA     | 12      | NC             |
| 13                                                                                 | SMB_X8_SLIMSAS_SLOT4_SCL     | 14      | NC             |
| 15                                                                                 | GND                          | 16      | NC             |
| 17                                                                                 | SMB_X16_X8_SLIMSAS_SLOT3_SDA | 18      | GND            |
| 19                                                                                 | SMB_X16_X8_SLIMSAS_SLOT3_SCL | 20      | CPU_CLK_PCIE_N |
| 21                                                                                 | GND                          | 22      | CPU_CLK_PCIE_P |
| 23                                                                                 | GND                          | 24      | GND            |
| 25                                                                                 | PEG1_TXN_15                  | 26      | PCIE1_CRX_N15  |
| 27                                                                                 | PEG1_TXP_15                  | 28      | PCIE1_CRX_P15  |
| 29                                                                                 | GND                          | 30      | GND            |
| 31                                                                                 | PEG1_TXN_14                  | 32      | PCIE1_CRX_N14  |
| 33                                                                                 | PEG1_TXP_14                  | 34      | PCIE1_CRX_P14  |
| 35                                                                                 | GND                          | 36      | GND            |
| 37                                                                                 | PEG1_TXN_13                  | 38      | PCIE1_CRX_N13  |
| 39                                                                                 | PEG1_TXP_13                  | 40      | PCIE1_CRX_P13  |
| 41                                                                                 | GND                          | 42      | GND            |
| 43                                                                                 | PEG1_TXN_12                  | 44      | PCIE1_CRX_N12  |
| 45                                                                                 | PEG1_TXP_12                  | 46      | PCIE1_CRX_P12  |
| 47                                                                                 | GND                          | 48      | GND            |
| 49                                                                                 | PEG1_TXN_11                  | 50      | PCIE1_CRX_N11  |
| 51                                                                                 | PEG1_TXP_11                  | 52      | PCIE1_CRX_P11  |
| 53                                                                                 | GND                          | 54      | GND            |
| 55                                                                                 | PEG1_TXN_10                  | 56      | PCIE1_CRX_N10  |
| 57                                                                                 | PEG1_TXP_10                  | 58      | PCIE1_CRX_P10  |
| 59                                                                                 | GND                          | 60      | GND            |
| 61                                                                                 | PEG1_TXN_9                   | 62      | PCIE1_CRX_N9   |
| 63                                                                                 | PEG1_TXP_9                   | 64      | PCIE1_CRX_P9   |
| 65                                                                                 | GND                          | 66      | GND            |
| 67                                                                                 | PEG1_TXN_8                   | 68      | PCIE1_CRX_N8   |

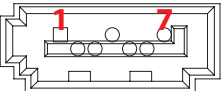
|     |            |     |              |
|-----|------------|-----|--------------|
| 69  | PEG1_TXP_8 | 70  | PCIE1_CRX_P8 |
| 71  | GND        | 72  | GND          |
| 73  | PEG1_TXN_7 | 74  | PCIE1_CRX_N7 |
| 75  | PEG1_TXP_7 | 76  | PCIE1_CRX_P7 |
| 77  | GND        | 78  | GND          |
| 79  | PEG1_TXN_6 | 80  | PCIE1_CRX_N6 |
| 81  | PEG1_TXP_6 | 82  | PCIE1_CRX_P6 |
| 83  | GND        | 84  | GND          |
| 85  | PEG1_TXN_5 | 86  | PCIE1_CRX_N5 |
| 87  | PEG1_TXP_5 | 88  | PCIE1_CRX_P5 |
| 89  | GND        | 90  | GND          |
| 91  | PEG1_TXN_4 | 92  | PCIE1_CRX_N4 |
| 93  | PEG1_TXP_4 | 94  | PCIE1_CRX_P4 |
| 95  | GND        | 96  | GND          |
| 97  | PEG1_TXN_3 | 98  | PCIE1_CRX_N3 |
| 99  | PEG1_TXP_3 | 100 | PCIE1_CRX_P3 |
| 101 | GND        | 102 | GND          |
| 103 | PEG1_TXN_2 | 104 | PCIE1_CRX_N2 |
| 105 | PEG1_TXP_2 | 106 | PCIE1_CRX_P2 |
| 107 | GND        | 108 | GND          |
| 109 | PEG1_TXN_1 | 110 | PCIE1_CRX_N1 |
| 111 | PEG1_TXP_1 | 112 | PCIE1_CRX_P1 |
| 113 | GND        | 114 | GND          |
| 115 | PEG1_TXN_0 | 116 | PCIE1_CRX_N0 |
| 117 | PEG1_TXP_0 | 118 | PCIE1_CRX_P0 |
| 119 | GND        | 120 | GND          |



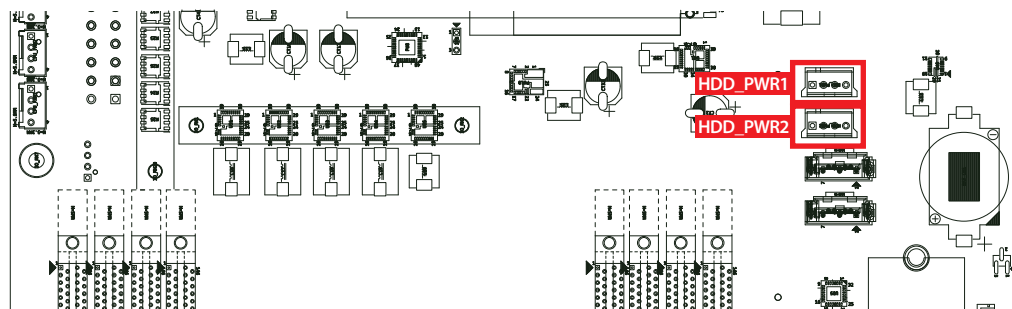
### 2.3.7 SATA1, SATA2 : SATA III Connector



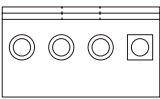
There are two onboard high performance Serial ATA III's (SATA III) on ICS-1000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1, SATA2 are listed in the following table:

|  | Pin No. | Definition | Pin No. | Definition |
|-----------------------------------------------------------------------------------|---------|------------|---------|------------|
|                                                                                   | 1       | GND        | 2       | TXP        |
|                                                                                   | 3       | TXN        | 4       | GND        |
|                                                                                   | 5       | RXN        | 6       | RXP        |
|                                                                                   | 7       | GND        |         |            |

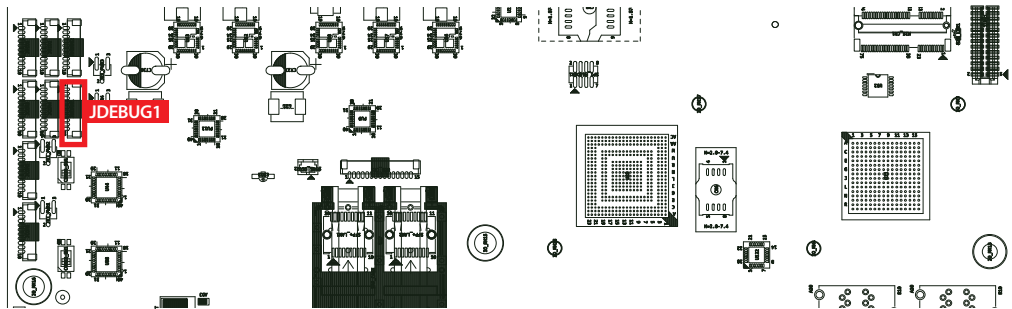
### 2.3.8 HDD\_PWR1, HDD\_PWR2 : SATA Power Connector

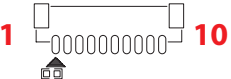


The ICS-1000 is also equipped with two SATA power connectors. It supports 5V (Up to 3A) and 12V (Up to 3A) currents to the hard drive or SSD. The pin assignments of HDD\_PWR1 , HDD\_PWR2 are listed in the following table:

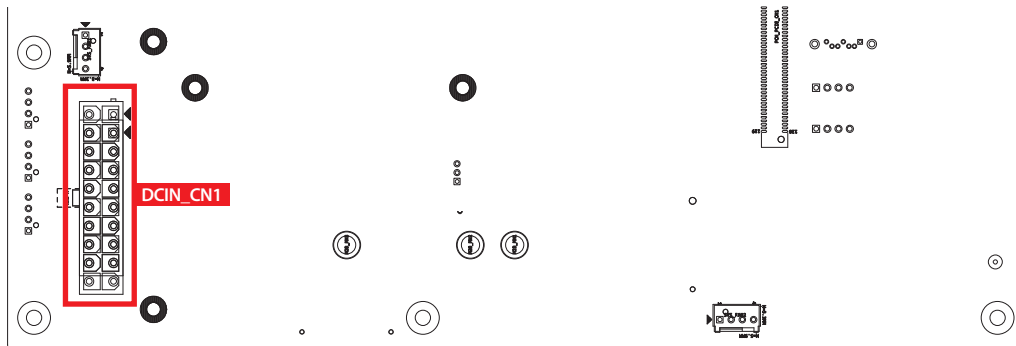
|  | Pin No. | Definition | Pin No. | Definition |
|-------------------------------------------------------------------------------------|---------|------------|---------|------------|
|                                                                                     | 1       | +12V       | 2       | GND        |
|                                                                                     | 3       | GND        | 4       | +5V        |

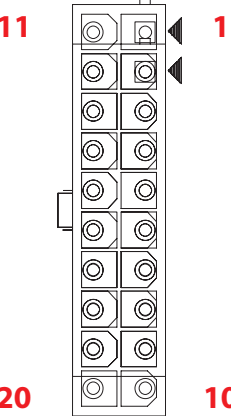
### 2.3.9 JDEBUG1 : ESPI Port 80 Debug Port



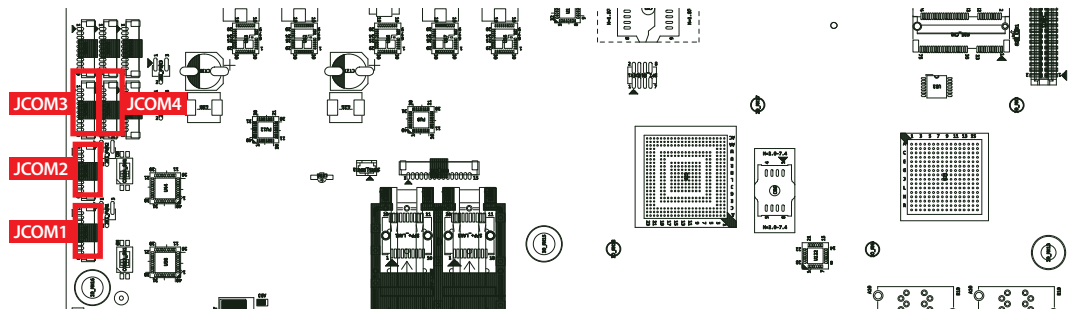
|  | Pin No. | Definition        | Pin No. | Definition       |
|-----------------------------------------------------------------------------------|---------|-------------------|---------|------------------|
|                                                                                   | 1       | +V3.3S            | 2       | Port 80_ESPI_CS# |
|                                                                                   | 3       | Port 80_ESPI_IO0  | 4       | Port 80_ESPI_IO1 |
|                                                                                   | 5       | Port 80_ESPI_IO2  | 6       | Port 80_ESPI_IO3 |
|                                                                                   | 7       | GND               | 8       | Port 80_ESPI_CLK |
|                                                                                   | 9       | Port 80_ESPI_RST# | 10      | GND              |

### 2.3.10 DCIN\_CN1 : DC input Connector(12V Only)

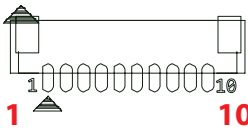


|  | Pin No. | Definition | Pin No. | Definition |
|-------------------------------------------------------------------------------------|---------|------------|---------|------------|
|                                                                                     | 1       | V-         | 11      | V-         |
|                                                                                     | 2       | V-         | 12      | V-         |
|                                                                                     | 3       | V-         | 13      | V-         |
|                                                                                     | 4       | V-         | 14      | V-         |
|                                                                                     | 5       | V-         | 15      | V-         |
|                                                                                     | 6       | V+         | 16      | V+         |
|                                                                                     | 7       | V+         | 17      | V+         |
|                                                                                     | 8       | V+         | 18      | V+         |
|                                                                                     | 9       | V+         | 19      | V+         |
|                                                                                     | 10      | V+         | 20      | V+         |

### 2.3.11 JCOM1, JCOM2, JCOM3, JCOM4 : Serial Ports



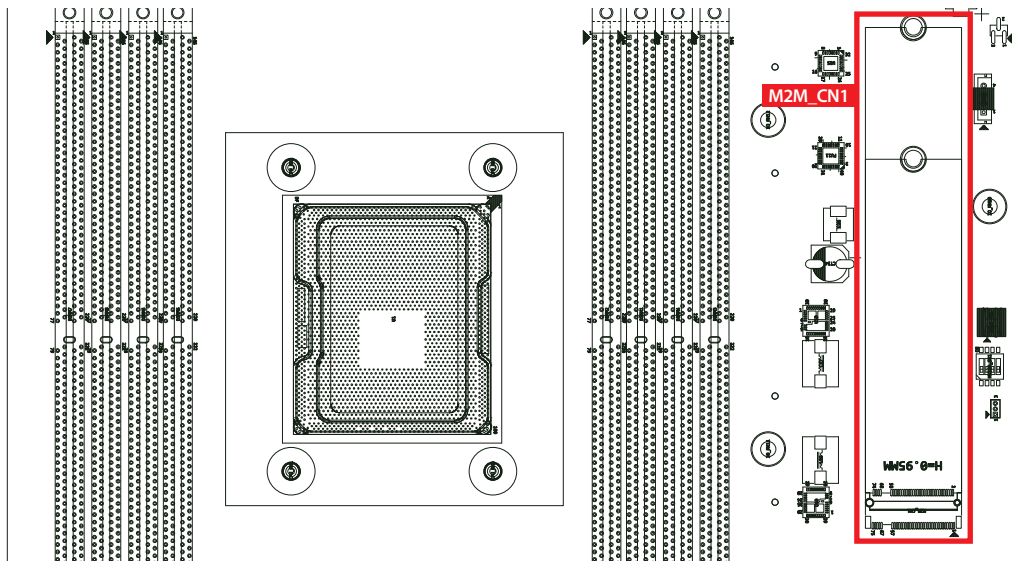
Serial port 1 to 4 (JCOM 1 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 to 4 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS

|  | BIOS Setting                                                     | Function                     |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------|
|                                                                                   | COM 1 (JCOM1)<br>COM 2 (JCOM2)<br>COM 3 (JCOM3)<br>COM 4 (JCOM4) | RS-202                       |
|                                                                                   |                                                                  | RS-422 (5-wire)              |
|                                                                                   |                                                                  | RS-485                       |
|                                                                                   |                                                                  | RS-485 w/z auto-flow control |

The pin assignments are listed in the following table:

|  | Pin No. | Definition | Pin No. | Definition           |
|-------------------------------------------------------------------------------------|---------|------------|---------|----------------------|
|                                                                                     | 1       | NC         | 6       | TXD                  |
|                                                                                     | 2       | GND        | 7       | RTS                  |
|                                                                                     | 3       | RI         | 8       | RXD                  |
|                                                                                     | 4       | DTR        | 9       | DSR 80_ESPI_<br>RST# |
|                                                                                     | 5       | CTS        | 10      | DCD                  |

### 2.3.12 M.2 KEY M: Support PCIE/SATA (BIOS SKU)



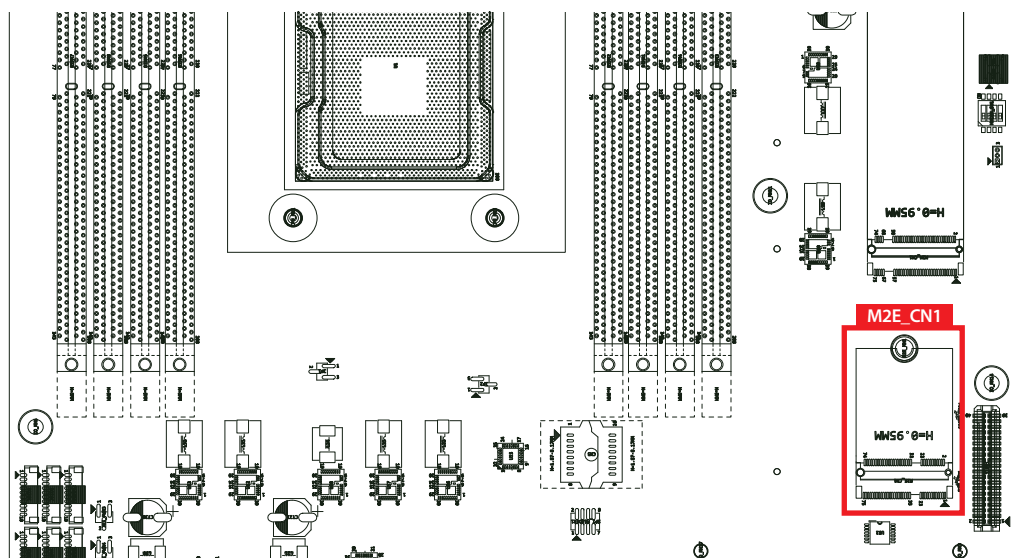
M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe Module card types include 2280,22110 (Support PCIE/SATA (BIOS SKU))

The pin assignments of M.2 Key M are listed in the following table:

| Pin No. | Signal Name | Pin No. | Signal Name   |
|---------|-------------|---------|---------------|
| 1       | GND         | 2       | +P3V3         |
| 3       | GND         | 4       | +P3V3         |
| 5       | NC          | 6       | NC            |
| 7       | NC          | 8       | NC            |
| 9       | GND         | 10      | M2M_SATA_LED# |
| 11      | NC          | 12      | +P3V3         |
| 13      | NC          | 14      | +P3V3         |
| 15      | GND         | 16      | +P3V3         |
| 17      | NC          | 18      | +P3V3         |
| 19      | NC          | 20      | NC            |
| 21      | GND         | 22      | NC            |
| 23      | NC          | 24      | NC            |
| 25      | NC          | 26      | NC            |
| 27      | GND         | 28      | NC            |
| 29      | M2M_17_RXN  | 30      | NC            |
| 31      | M2M_17_RXP  | 32      | NC            |

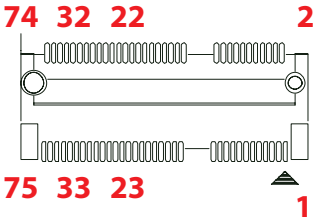
|                |                        |    |             |
|----------------|------------------------|----|-------------|
| 33             | GND                    | 34 | NC          |
| 35             | M2M_17_TXN             | 36 | NC          |
| 37             | M2M_17_TXP             | 38 | DEVS LP     |
| 39             | GND                    | 40 | NC          |
| 41             | M2M_16_RXP/SATA_16_RXP | 42 | NC          |
| 43             | M2M_16_RXN/SATA_16_RXN | 44 | NC          |
| 45             | GND                    | 46 | NC          |
| 47             | M2M_16_TXN/SATA_16_TXN | 48 | NC          |
| 49             | M2M_16_TXP/SATA_16_TXP | 50 | M2M_RST#    |
| 51             | GND                    | 52 | NC          |
| 53             | M2M_CLKN               | 54 | PCIE_WAKE_N |
| 55             | M2M_CLKP               | 56 | NC          |
| 57             | GND                    | 58 | NC          |
| Mechanical Key |                        |    |             |
| 67             | NC                     | 68 | Reserved    |
| 69             | NC                     | 70 | +P3V3       |
| 71             | GND                    | 72 | +P3V3       |
| 73             | GND                    | 74 | +P3V3       |
| 75             | GND                    |    |             |

### 2.3.13 M2E\_CN1 : M.2 KEY E USB2, PCIe1 support



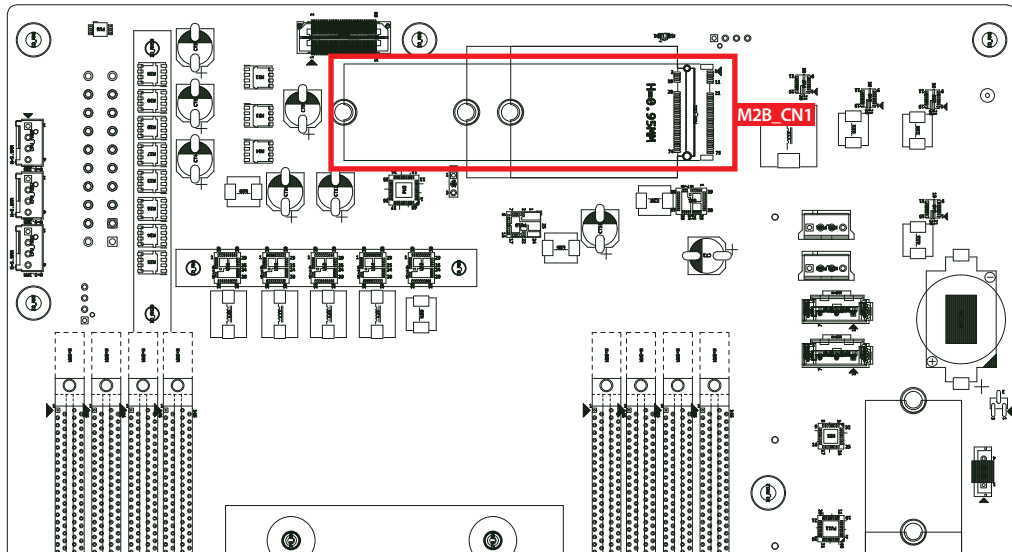
M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi, Bluetooth, NFC or GNSS. Module card types include 2230

The pin assignments of M.2 Key E are listed in the following table:

|  |                   |         |             |
|------------------------------------------------------------------------------------|-------------------|---------|-------------|
| Pin No.                                                                            | Signal Name       | Pin No. | Signal Name |
| 75                                                                                 | GND               | 74      | +V3.3A      |
| 73                                                                                 | NC                | 72      | +V3.3A      |
| 71                                                                                 | NC                | 70      | NC          |
| 69                                                                                 | GND               | 68      | NC          |
| 67                                                                                 | NC                | 66      | NC          |
| 65                                                                                 | NC                | 64      | NC          |
| 63                                                                                 | GND               | 62      | SMB_ALERT#  |
| 61                                                                                 | NC                | 60      | SMB_CLK     |
| 59                                                                                 | NC                | 58      | SMB_DATA    |
| 57                                                                                 | GND               | 56      | NC          |
| 55                                                                                 | PCIE_WAKE#        | 54      | NC          |
| 53                                                                                 | PCIE_CLK_REQ0#    | 52      | PLTRST#     |
| 51                                                                                 | GND               | 50      | NC          |
| 49                                                                                 | PCIE_100M_CLK__N0 | 48      | NC          |
| 47                                                                                 | PCIE_100M_CLK__P0 | 46      | NC          |
| 45                                                                                 | GND               | 44      | NC          |
| 43                                                                                 | PCIE_RX_N0        | 42      | NC          |
| 41                                                                                 | PCIE_RX_P0        | 40      | NC          |
| 39                                                                                 | GND               | 38      | NC          |
| 37                                                                                 | PCIE_TX_N0        | 36      | NC          |
| 35                                                                                 | PCIE_TX_P0        | 34      | NC          |
| 33                                                                                 | GND               | 32      | NC          |

| Mechanical Key |      |    |        |
|----------------|------|----|--------|
| 23             | NC   |    |        |
| 21             | NC   | 22 | NC     |
| 19             | NC   | 20 | NC     |
| 17             | NC   | 18 | GND    |
| 15             | NC   | 16 | NC     |
| 13             | NC   | 14 | NC     |
| 11             | NC   | 12 | NC     |
| 9              | NC   | 10 | NC     |
| 7              | GND  | 8  | NC     |
| 5              | USB- | 6  | LED1#  |
| 3              | USB+ | 4  | +V3.3A |
| 1              | GND  | 2  | +V3.3A |

### 2.3.14 M2B\_CN1 : M.2 KEY B USB3,USB2,PCIe Support



USB3.0/USB2.0 Support(Default) , PCIe2(BIOS control)  
Module card types include 3042,3052,2280.

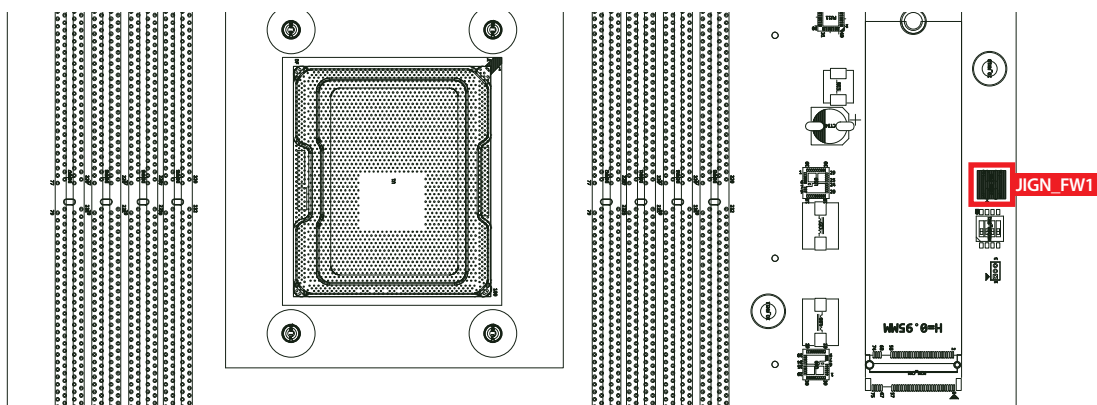
Pin Out :

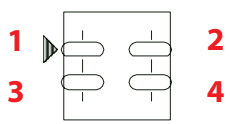
| Pin No. | Signal Name                       | Pin No. | Signal Name  |
|---------|-----------------------------------|---------|--------------|
| 75      | NC                                | 74      | +V3.3A       |
| 73      | GND                               | 72      | +V3.3A       |
| 71      | GND                               | 70      | +V3.3A       |
| 69      | NC                                | 68      | NC           |
| 67      | NC                                | 66      | SIM_DETECT   |
| 65      | NC                                | 64      | NC           |
| 63      | NC                                | 62      | NC           |
| 61      | NC                                | 60      | NC           |
| 59      | NC                                | 58      | NC           |
| 57      | GND                               | 56      | NC           |
| 55      | PCIE_100M_CLK_P                   | 54      | PCIE_WAKE#   |
| 53      | PCIE_100M_CLK_N                   | 52      | PCIE_CLK_REQ |
| 51      | GND                               | 50      | PLTRST#      |
| 49      | (default)USB_TX_1P,<br>PCIe_TX_1P | 48      | NC           |
| 47      | (default)USB_TX_1N,<br>PCIe_TX_1N | 46      | NC           |
| 45      | GND                               | 44      | NC           |



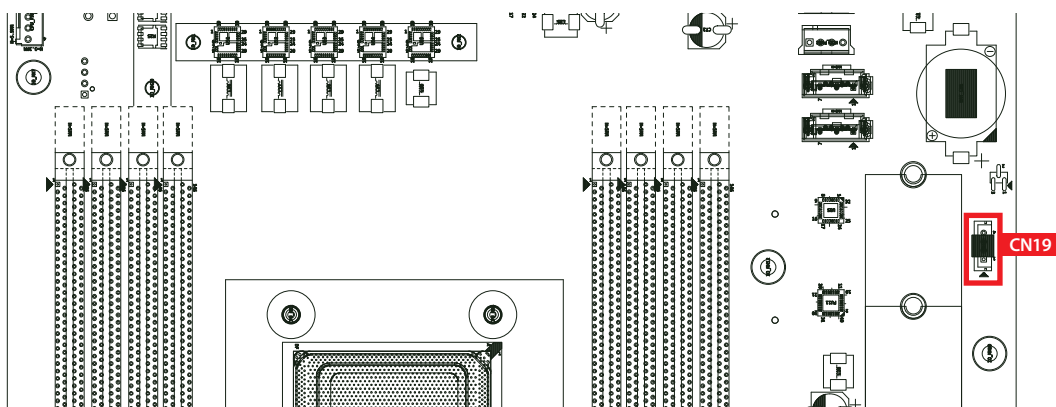
|                |                                   |    |                   |
|----------------|-----------------------------------|----|-------------------|
| 43             | (default)USB_RX_1P,<br>PCle_RX_1P | 42 | NC                |
| 41             | (default)USB_RX_1N,<br>PCle_RX_1N | 40 | NC                |
| 39             | GND                               | 38 | DEVSLP            |
| 37             | (default)USB_TX_2P,<br>PCle_TX_2P | 36 | UIM_PWR           |
| 35             | (default)USB_TX_2N,<br>PCle_TX_2N | 34 | UIM_DATA          |
| 33             | GND                               | 32 | UIM_CLK           |
| 31             | (default)USB_RX_2P,<br>PCle_RX_2P | 30 | UIM_RESET         |
| 29             | (default)USB_RX_2N,<br>PCle_RX_2N | 28 | NC                |
| 27             | GND                               | 26 | NC                |
| 25             | NC                                | 24 | NC                |
| 23             | NC                                | 22 | NC                |
| 21             | NC                                | 20 | NC                |
| Mechanical Key |                                   |    |                   |
| 11             | GND                               |    |                   |
| 9              | USB-                              | 10 | LED1#             |
| 7              | USB+                              | 8  | NC                |
| 5              | GND                               | 6  | FULL_CARD_PWR_OFF |
| 3              | GND                               | 4  | +V3.3A            |
| 1              | NC                                | 2  | +V3.3A            |

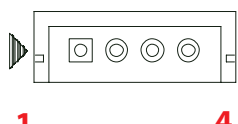
### 2.3.15 JIGN\_FW1 : IGNITION FW Programming Header



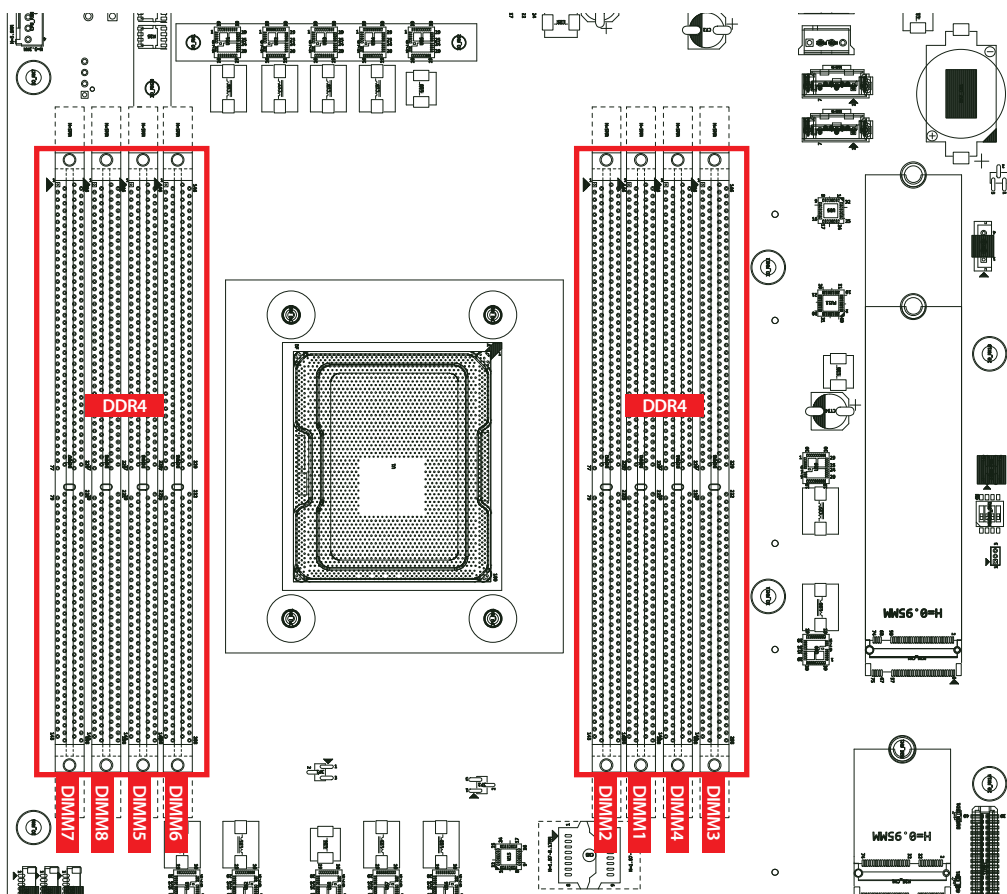
|  | Pin No. | Description |
|-----------------------------------------------------------------------------------|---------|-------------|
|                                                                                   | 1       | GND         |
|                                                                                   | 2       | MCU_RST#    |
|                                                                                   | 3       | +V3.3_MCU   |
|                                                                                   | 4       | MCU_PRG     |

### 2.3.16 CN19 : SATA RAID KEY



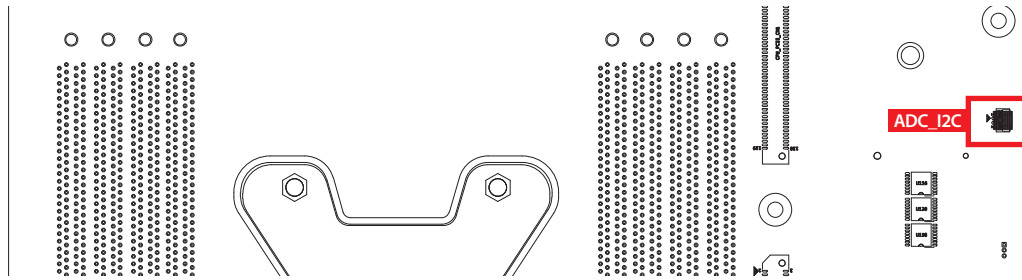
|  | Pin No. | Definition         |
|-------------------------------------------------------------------------------------|---------|--------------------|
|                                                                                     | 1       | GND                |
|                                                                                     | 2       | PU_P3V3            |
|                                                                                     | 3       | GND                |
|                                                                                     | 4       | FM_SATA_RAID_R_KEY |

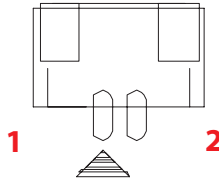
### 2.3.17 DIMM1\_CHA0, DIMM2\_CHA1, DIMM3\_CHB0, DIMM4\_CHB1, DIMM5\_CHG0, DIMM6\_CHG1, DIMM7\_CHH0, DIMM8\_CHH1 : DDR4 U-DIMM slot



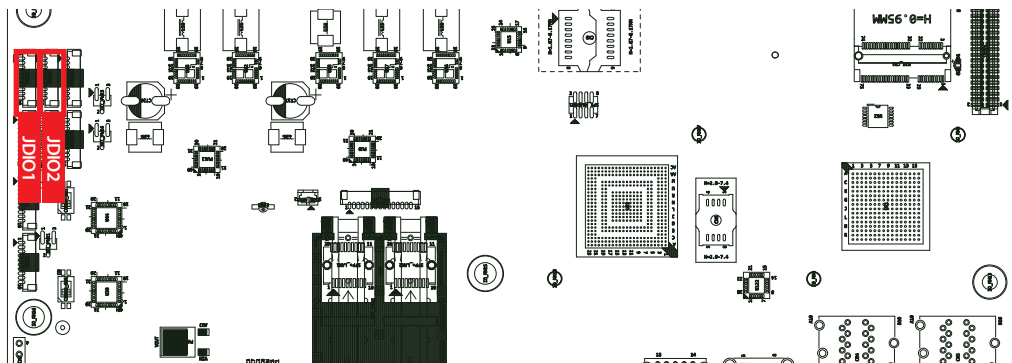
| U-DIMM Quantity | Location                                               |
|-----------------|--------------------------------------------------------|
| 1               | DIMM1                                                  |
| 1               | DIMM7                                                  |
| 2               | DIMM1, DIMM5                                           |
| 4               | DIMM1, DIMM2, DIMM5, DIMM6                             |
| 4               | DIMM1, DIMM2, DIMM7, DIMM8                             |
| 4               | DIMM3, DIMM4, DIMM7, DIMM8                             |
| 8               | DIMM1, DIMM2, DIMM3, DIMM4, DIMM5, DIMM6, DIMM7, DIMM8 |

### 2.3.18 ADC\_I2C : MCU I2C



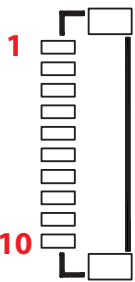
|  | Pin No. | Definition   |
|-----------------------------------------------------------------------------------|---------|--------------|
|                                                                                   | 1       | I2C0_SDA_MCU |
|                                                                                   | 2       | I2C0_SCL_MCU |

### 2.3.19 JDIO1, JDIO2 : GPIO from Super I/O



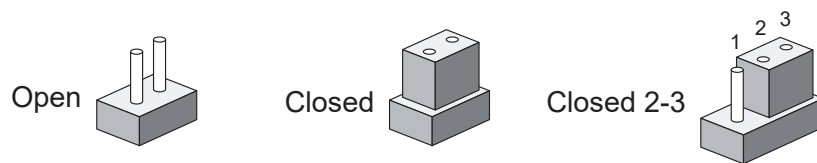
There is a 16-bit GPIO connector in the Top side. Each GPIO channel can be configuration GPI or GPO. JSEL\_DIO header is for SYNC/SOURCE mode selection on ISO\_DIO board (DMX-100-E).

JDIO1 and JDIO2 pins are defined in the following table:

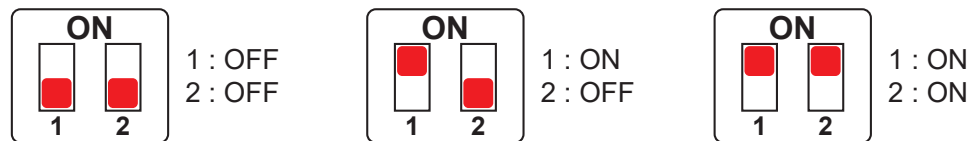
|  | Pin No. | JDIO1 Definition | JDIO2 Definition |
|-------------------------------------------------------------------------------------|---------|------------------|------------------|
|                                                                                     | 1       | SIO_GPI80        | SIO_GPO70        |
|                                                                                     | 2       | SIO_GPI81        | SIO_GPO71        |
|                                                                                     | 3       | SIO_GPI82        | SIO_GPO72        |
|                                                                                     | 4       | SIO_GPI83        | SIO_GPO73        |
|                                                                                     | 5       | SIO_GPI84        | SIO_GPO74        |
|                                                                                     | 6       | SIO_GPI85        | SIO_GPO75        |
|                                                                                     | 7       | SIO_GPI86        | SIO_GPO76        |
|                                                                                     | 8       | SIO_GPI87        | SIO_GPO77        |
|                                                                                     | 9       | +3.3V            | +3.3V            |
|                                                                                     | 10      | GND              | GND              |

## 2.4 Main Board Jumper Settings

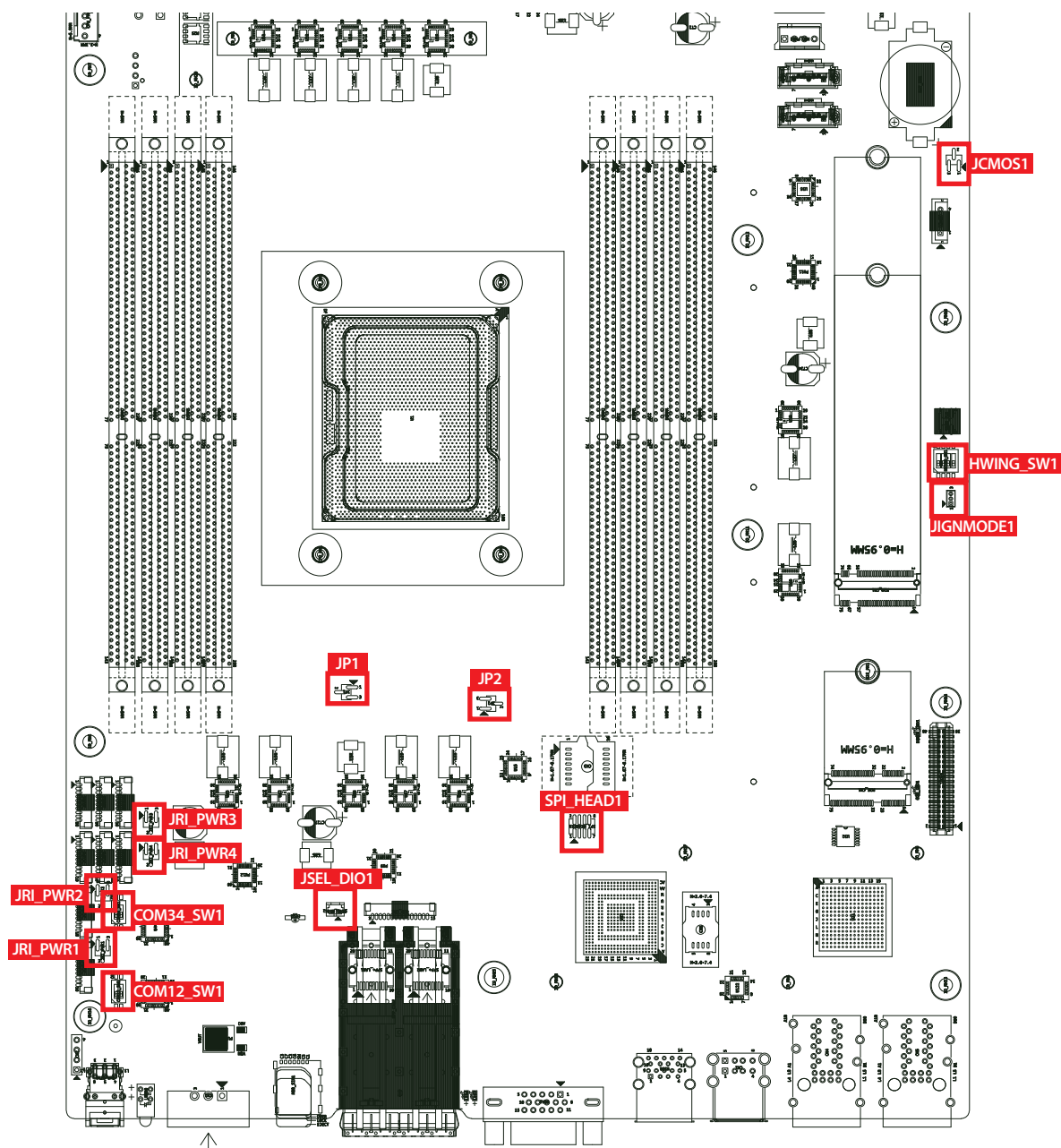
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins to the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



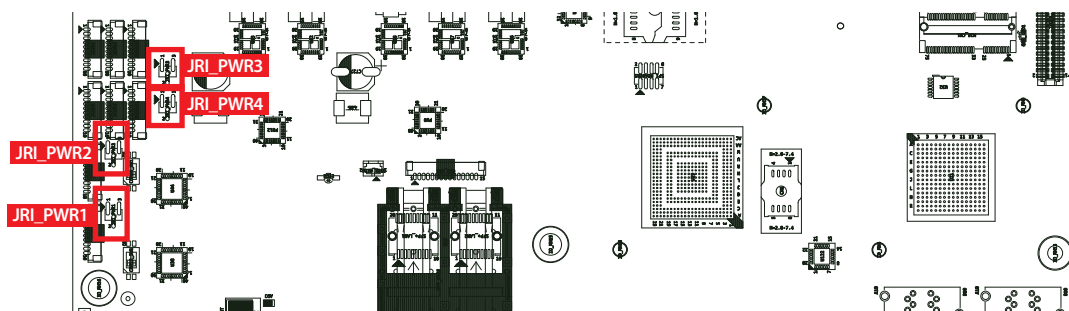
You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.

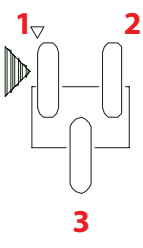


## 2.4.1 Front View of ICS-1000 Main Board With Jumper Location

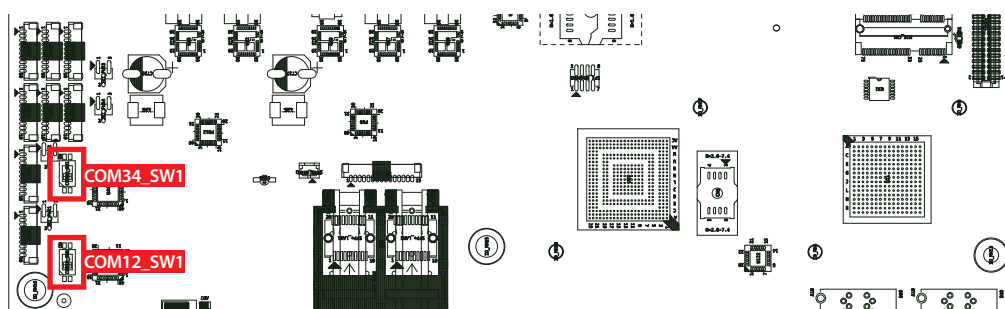


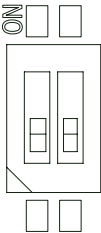
## 2.4.2 JRI\_PWR1-4 : COM1-4 RI Pin Function



|  | Port | Setting | Description      |
|------------------------------------------------------------------------------------|------|---------|------------------|
|                                                                                    | COM1 | 1 - 2   | +12V (0.5A max.) |
|                                                                                    |      | 2 - 3   | RI(Default)      |
|                                                                                    | COM2 | 1 - 2   | +12V (0.5A max.) |
|                                                                                    |      | 2 - 3   | RI(Default)      |
|                                                                                    | COM3 | 1 - 2   | +12V (0.5A max.) |
|                                                                                    |      | 2 - 3   | RI(Default)      |
|                                                                                    | COM4 | 1 - 2   | +12V (0.5A max.) |
|                                                                                    |      | 2 - 3   | RI(Default)      |

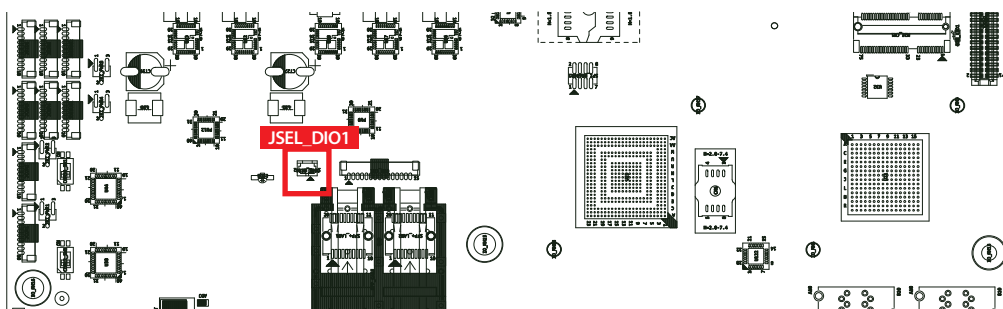
## 2.4.3 COM12\_SW1,COM34\_SW1 : RS-485/422 RECEIVER TERMINATION RESISTANCE

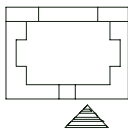


|  | Port      | Setting | Description                                 | Port |
|-------------------------------------------------------------------------------------|-----------|---------|---------------------------------------------|------|
|                                                                                     | COM12_SW1 | 1(ON)   | DCD / RXD Termination 120R enable           | COM1 |
|                                                                                     |           | 1(OFF)  | DCD / RXD Termination 120R Disable(default) |      |
|                                                                                     |           | 2(ON)   | DCD / RXD Termination 120R enable           | COM2 |
|                                                                                     |           | 2(OFF)  | DCD / RXD Termination 120R Disable(default) |      |
|                                                                                     | COM34_SW1 | 3(ON)   | DCD / RXD Termination 120R enable           | COM3 |
|                                                                                     |           | 3(OFF)  | DCD / RXD Termination 120R Disable(default) |      |
|                                                                                     |           | 4(ON)   | DCD / RXD Termination 120R enable           | COM4 |
|                                                                                     |           | 4(OFF)  | DCD / RXD Termination 120R Disable(default) |      |

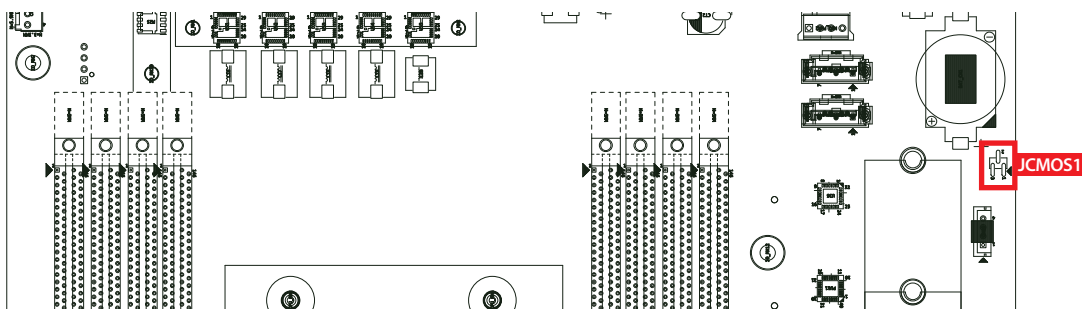


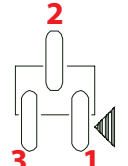
## 2.4.4 JSEL\_DIO1 : Reserved for SINK/SOURCE Mode selection on ISO\_DIO Board(DMX-100-E)



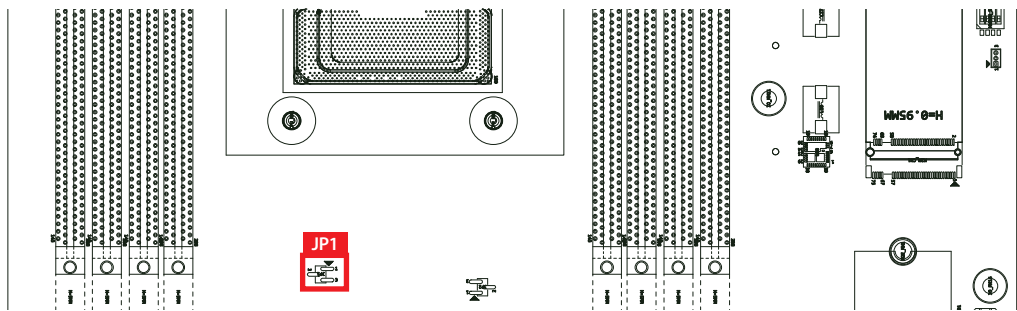
|  | Pin No. | Description    |
|-----------------------------------------------------------------------------------|---------|----------------|
|                                                                                   | 1       | ISO_DIO_SINK   |
|                                                                                   | 2       | ISO_DIO_SOURCE |

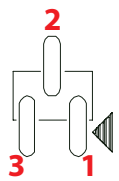
## 2.4.5 JCMOS1 : Clear CMOS



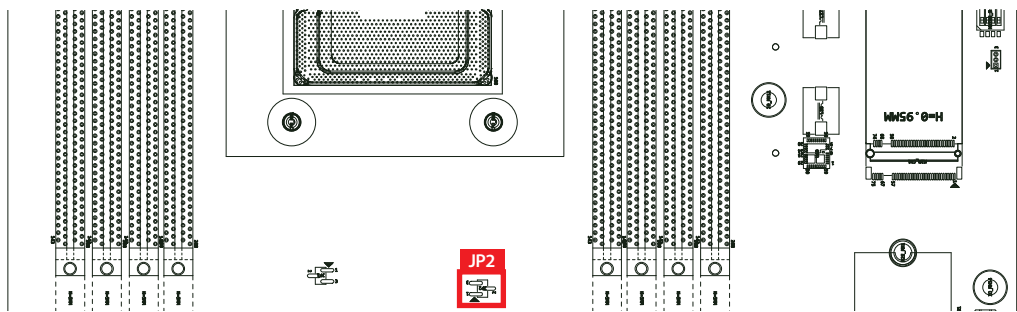
|  | Setting | Description      |
|-------------------------------------------------------------------------------------|---------|------------------|
|                                                                                     | 1-2     | Normal (Default) |
|                                                                                     | 2-3     | Clear CMOS       |

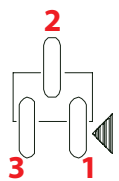
2.4.6 JP1 : SMB\_PECI\_ALRT\_N



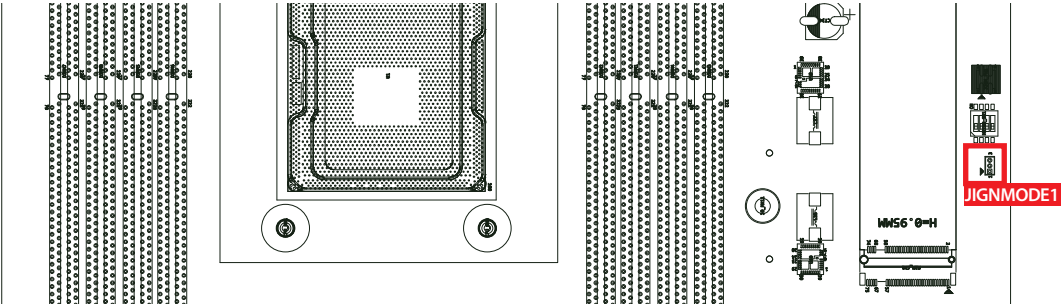
|  | Pin No. | Description     |
|-----------------------------------------------------------------------------------|---------|-----------------|
|                                                                                   | 1       | SMB_PECI_ALRT_N |
|                                                                                   | 2       | GND             |
|                                                                                   | 3       | NC              |

2.4.7 JP2 : CLK\_48M\_FLEX\_BMC



|  | Pin No. | Description               |
|-------------------------------------------------------------------------------------|---------|---------------------------|
|                                                                                     | 1 - 2   | FLA SECURITY OVERRIDE     |
|                                                                                     | 2 - 3   | NORMAL OPERATION(Default) |
|                                                                                     |         |                           |

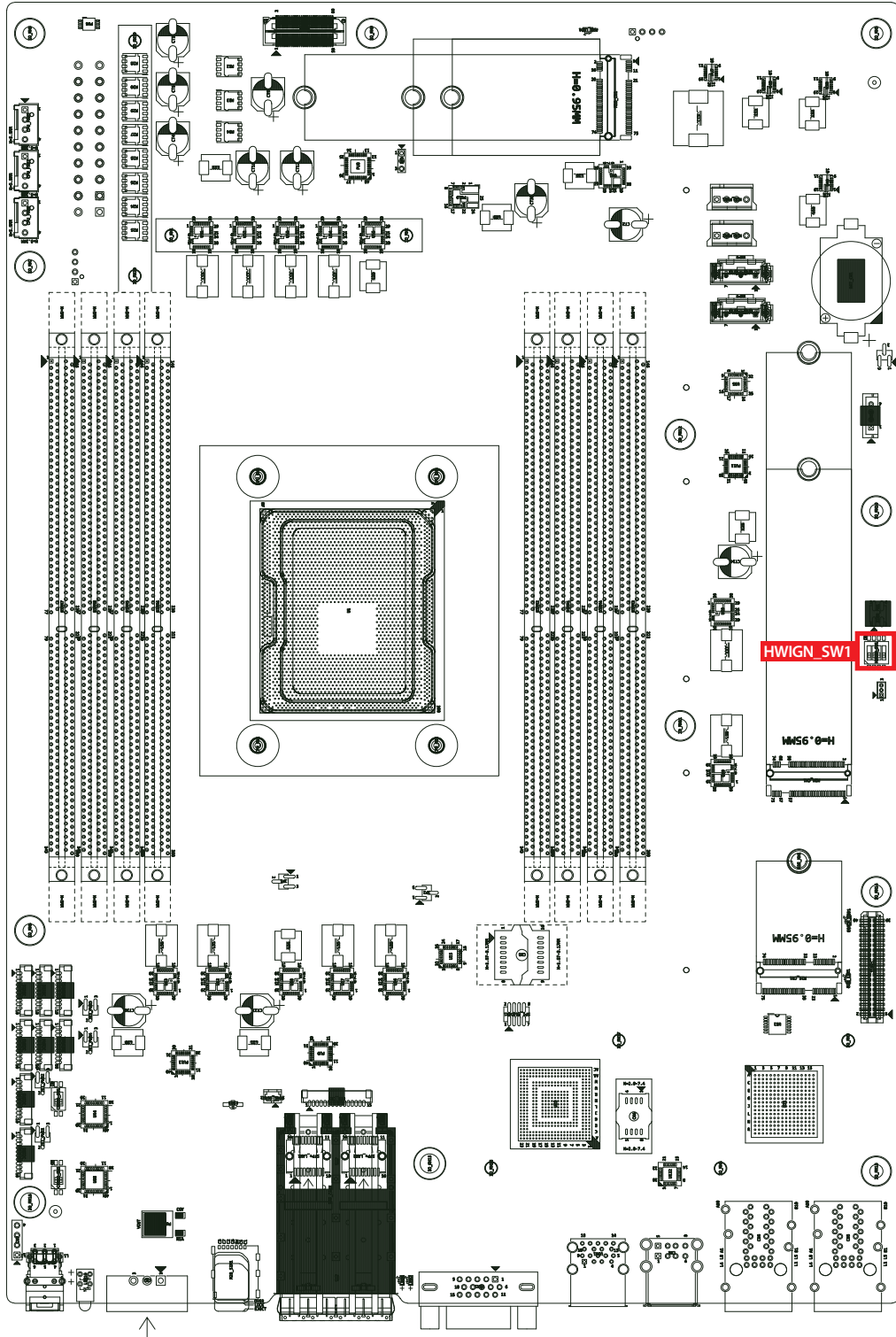
2.4.8 JIGNMODE1 : IGN Mode



|  | Pin No. | Description       |
|--|---------|-------------------|
|  | 1 - 2   | HW Mode           |
|  | 2 - 3   | SW Mode (Default) |

## 2.5 Ignition Control

### 2.5.1 HWIGN\_SW1 : Ignition Control (HW)

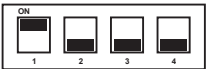
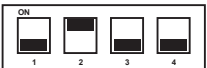
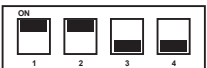


The ICS-1000 provide ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

## 2.5.2 Adjust Ignition Control Modes

The ICS-1000 provide sixteen modes of different power on/off delay periods adjustable via rotary switch. The default rotary switch is set to 0 in ATX/ AT power mode.

The modes are listed in the following table:

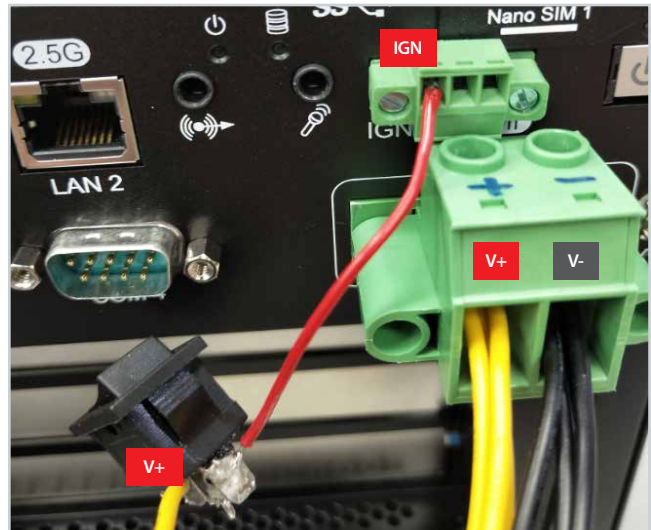
| DIP Switch Position | Power On delay        | Power Off Delay | Switch Position                                                                       |
|---------------------|-----------------------|-----------------|---------------------------------------------------------------------------------------|
| 0                   | ATX/AT mode (Default) |                 |    |
| 1                   | No delay              | No delay        |    |
| 2                   | No delay              | 5 seconds       |    |
| 3                   | No delay              | 10 seconds      |    |
| 4                   | No delay              | 30 seconds      |   |
| 5                   | No delay              | 60 seconds      |  |
| 6                   | 5 seconds             | 10 seconds      |  |
| 7                   | 5 seconds             | 30 seconds      |  |
| 8                   | 5 seconds             | 60 seconds      |  |
| 9                   | 5 seconds             | 90 seconds      |  |
| A                   | 5 seconds             | 120 seconds     |  |
| B                   | 10 seconds            | 10 seconds      |  |
| C                   | 10 seconds            | 30 seconds      |  |
| D                   | 10 seconds            | 60 seconds      |  |
| E                   | 10 seconds            | 90 seconds      |  |
| F                   | 10 seconds            | 120 seconds     |  |

### 2.5.3 Ignition Control Wiring

To activate ignition control, you need to provide IGN signal via the 3-pin plugable terminal block located on the front panel. Please use the following pictures to find the general wiring configuration.



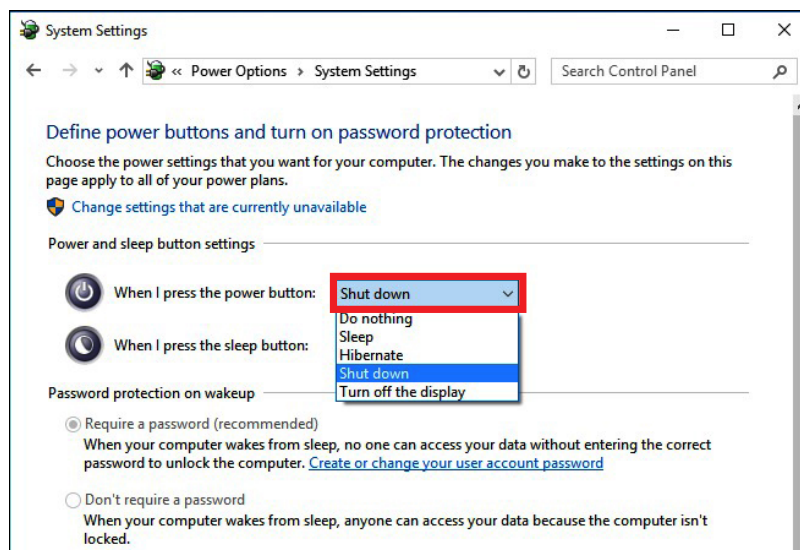
| Pin No. | Definition |
|---------|------------|
| 1       | Ignition   |
| 2       | SW+        |
| 3       | SW-        |



For testing purpose, you can refer to the picture blow to simulate ignition signal input controlled by a latching switch.

Note :

1. DC power source and IGN share the same ground.
2. ICS-1000 supports 16V to 50V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage is fixed to 12V/24V for car battery scenario.
3. For proper ignition control, the power button setting should be "Power Down" mode.



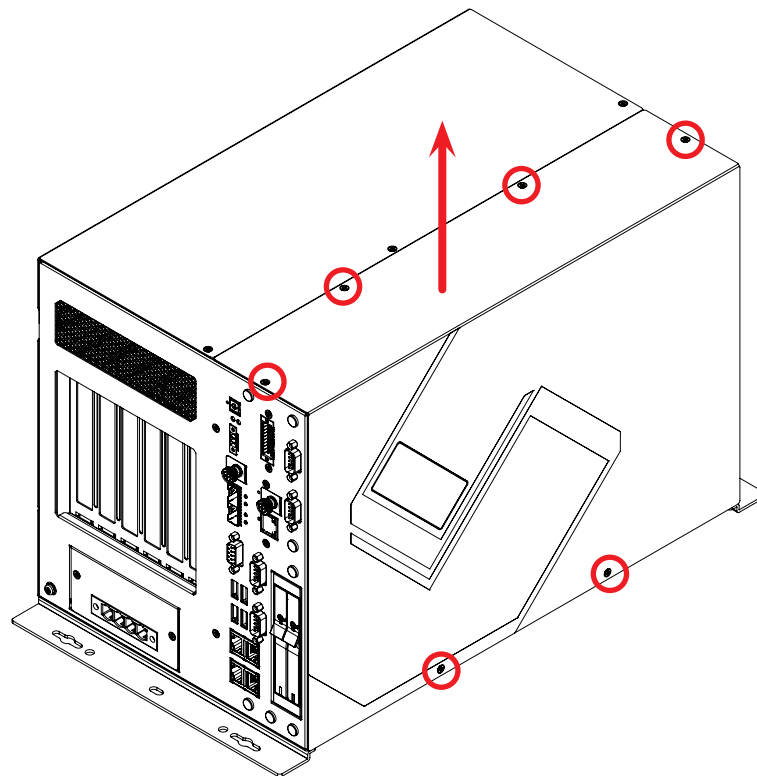
In Windows for example, you need to set "When I press the power button" to Shut down.

# 3

## SYSTEM SETUP

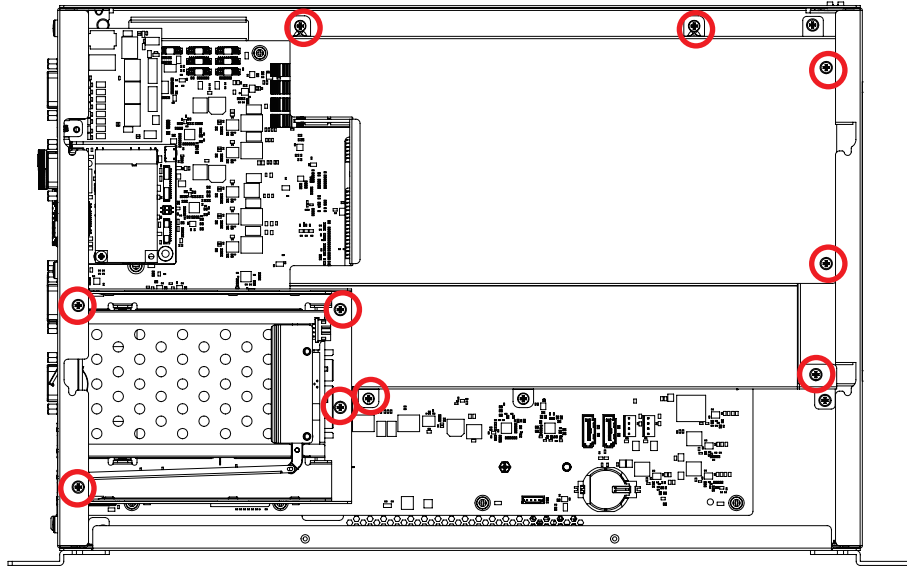
### 3.1 How to open your ICS-1000

Remove the screws indicated and separate the Cover from the enclosure.

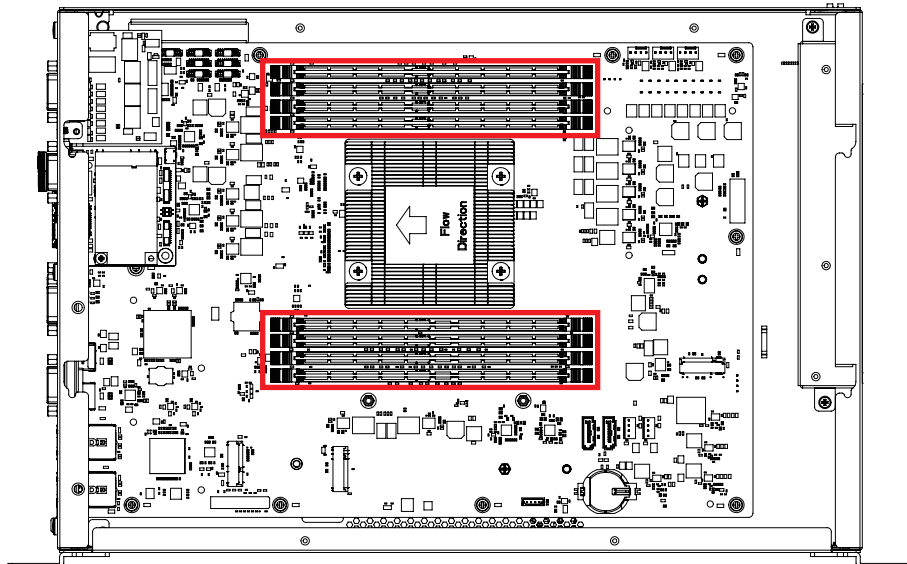


## 3.2 Installing DDR4 UDIMM

**Step 1** Remove ten F-M3x5L screws and pick up HDD bracket and fan duct.



**Step 2** Install UDIMM.

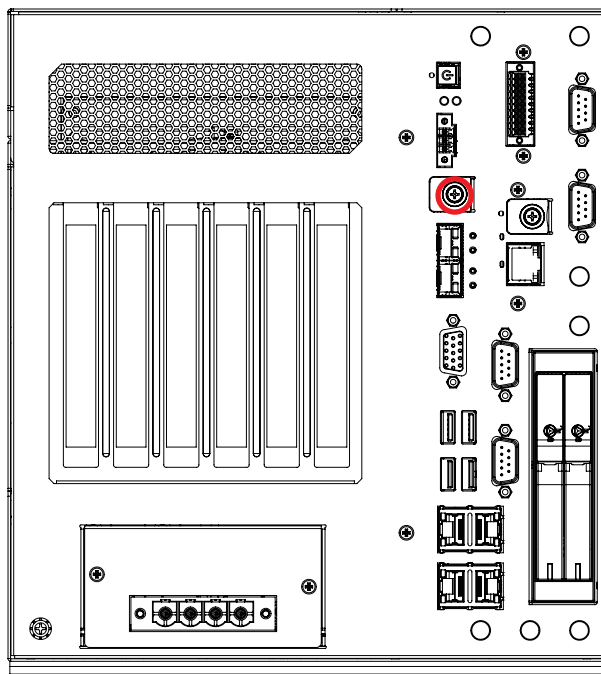




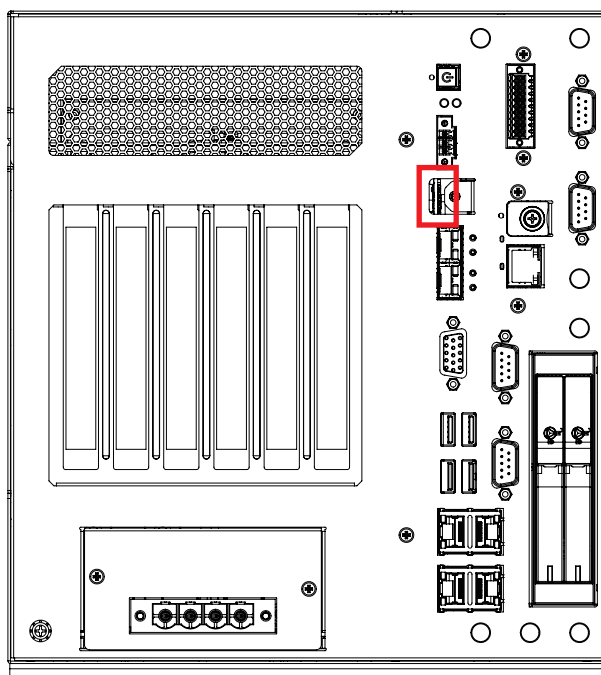
## 3.3 Installing SIM Card

### 3.3.1 SIM Card

**Step 1** Remove the SIM card cover.

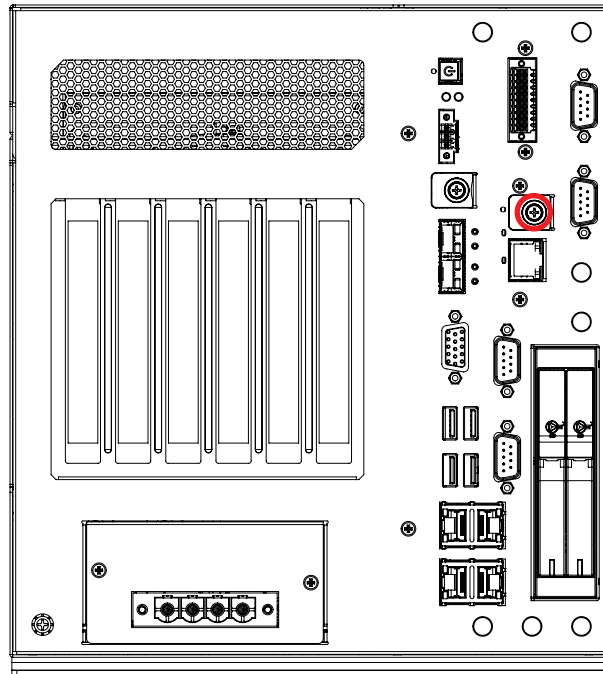


**Step 2** Install SIM card in the marked red area.

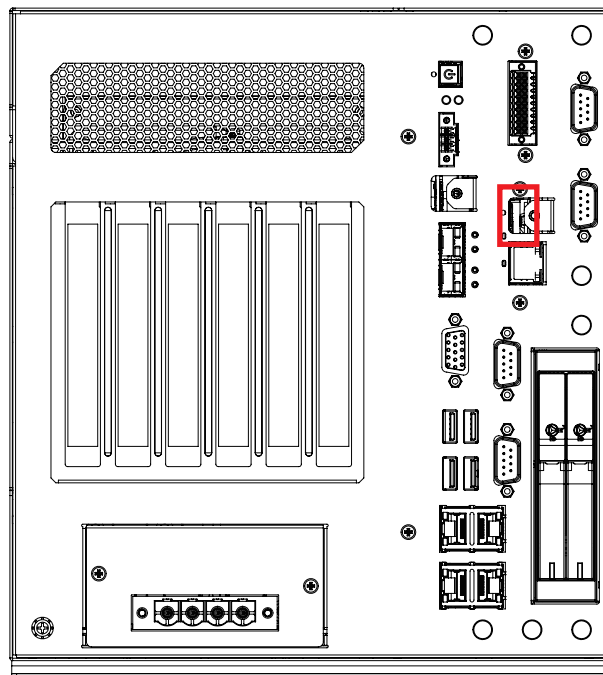


### 3.3.2 OOB SIM Card

**Step 1** Remove the OOB SIM card cover.



**Step 2** Install SIM card.

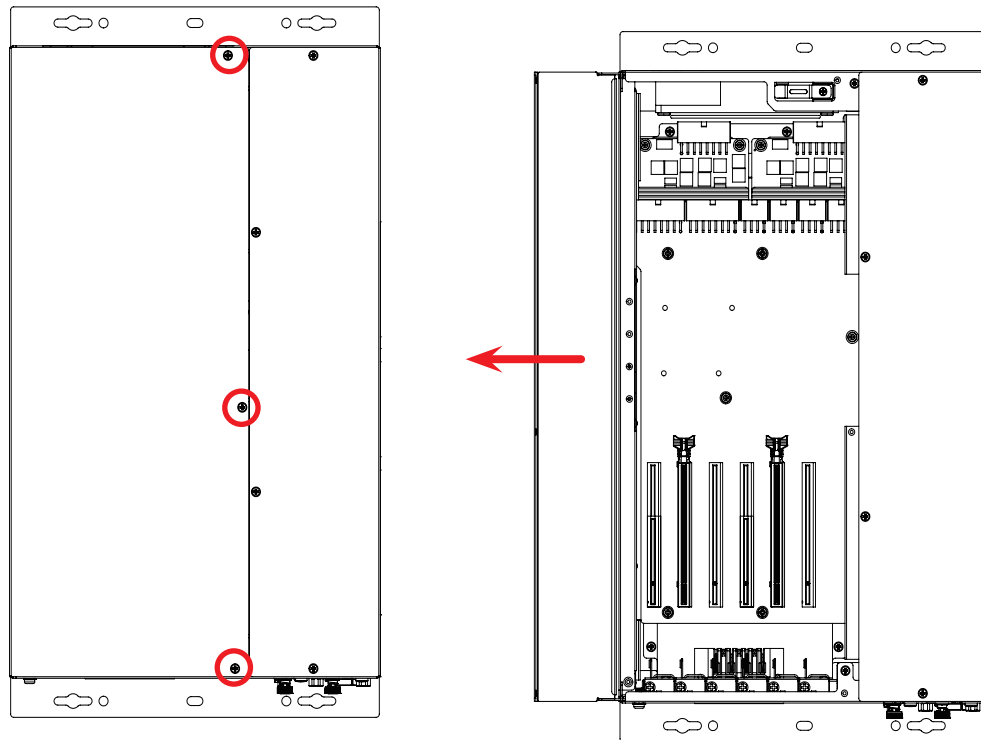


### 3.4 Installing PCIe Card

System designs will support 111.15 mm standard height, 312 mm maximum length (without the I/O bracket & power cable) expansion cards.

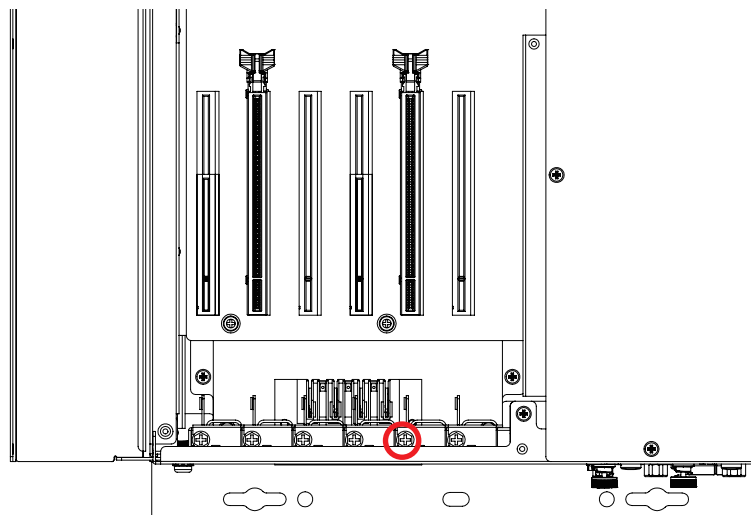
(\*Based on the position of power connectors and the card sink/case design, not all expansion card within the maximum dimension can fit in to the system. Please consult the Vecow support team for confirmation.)

**Step 1** Remove 3 M3 flat head screws and open the top cover.

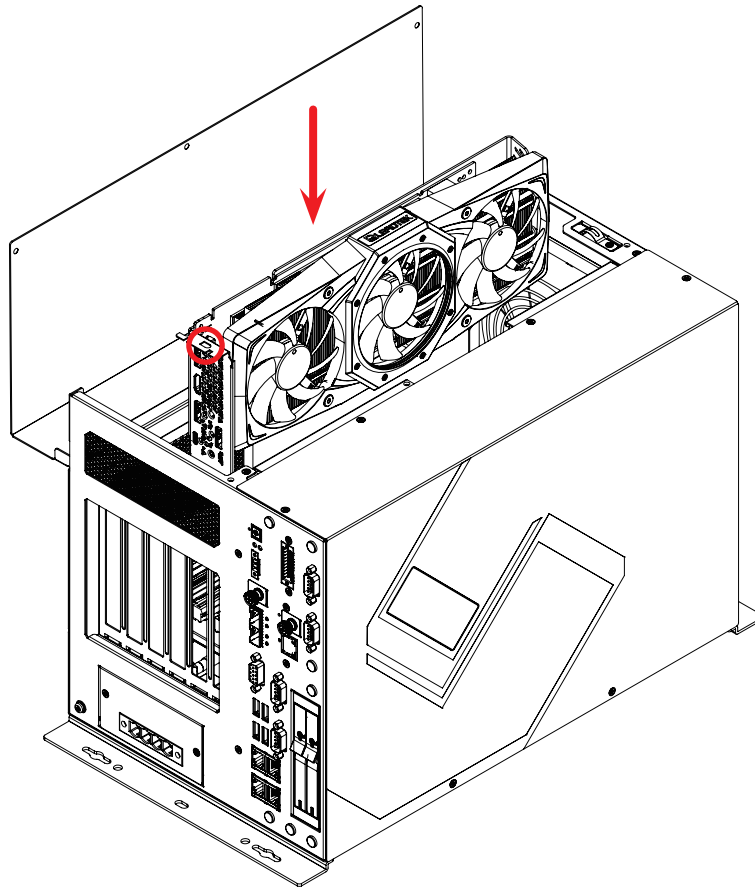


**Step 2** Install PCIe card in the marked red area.

(Notice: For ICS-1000 Series, please press the clip before removing the card.)



**Step 3** Install the PCIe card and secure it by tightening the M3 x 5L screws.

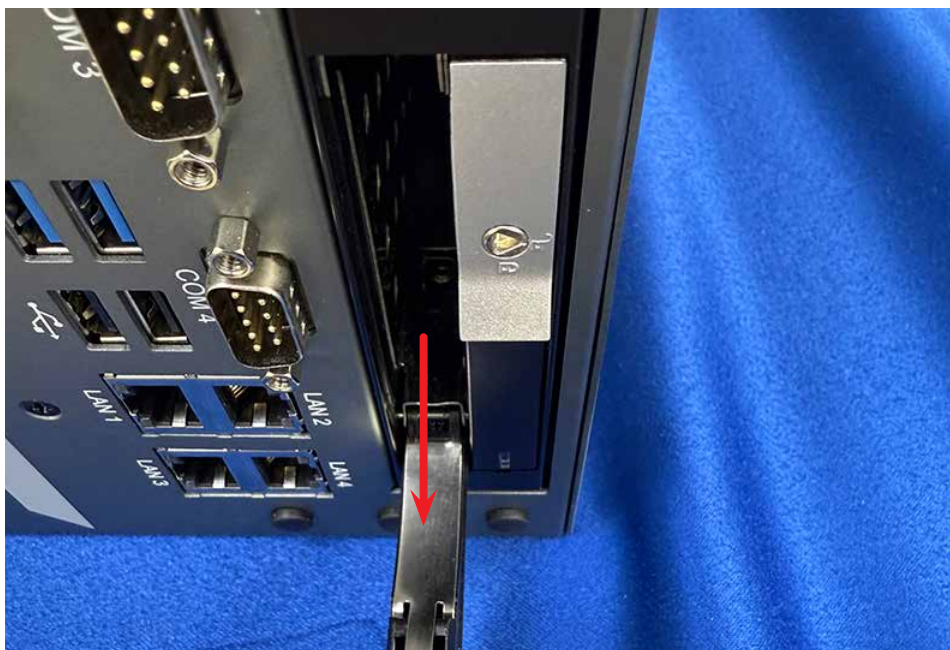


### 3.5 Installing HDD/SSD

**Step 1** Use the trigger and open SSD/HDD tray.



**Step 2** Open front door of SSD/HDD tray.



**Step 3** Install 2.5" SSD/HDD into the tray and close.

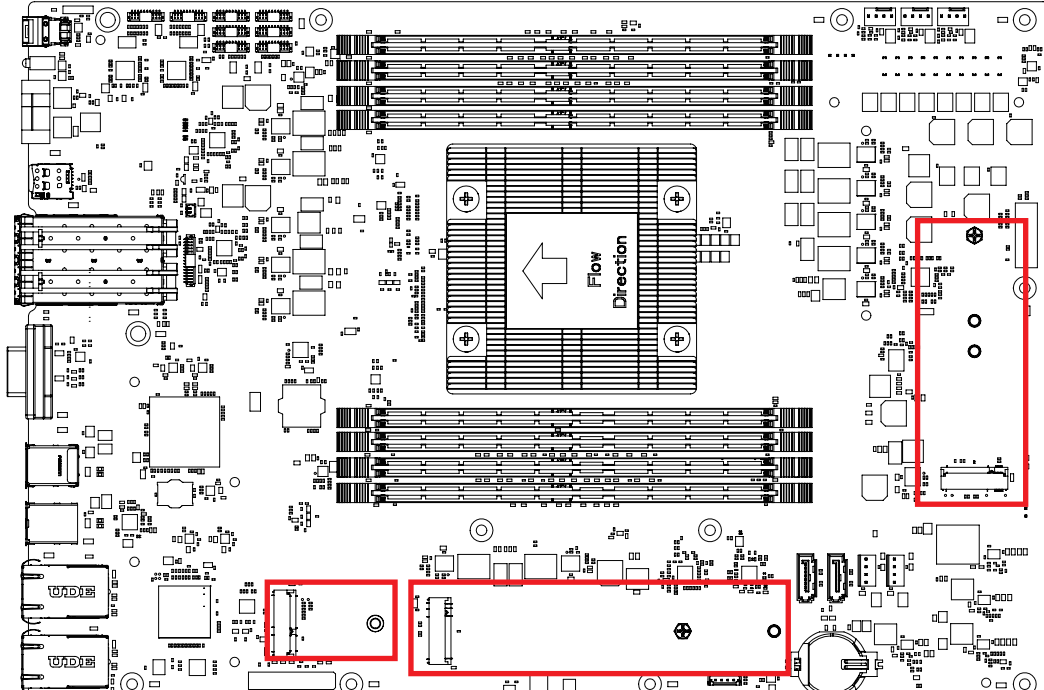


**Step 4** Lock the SSD/HDD tray with key.

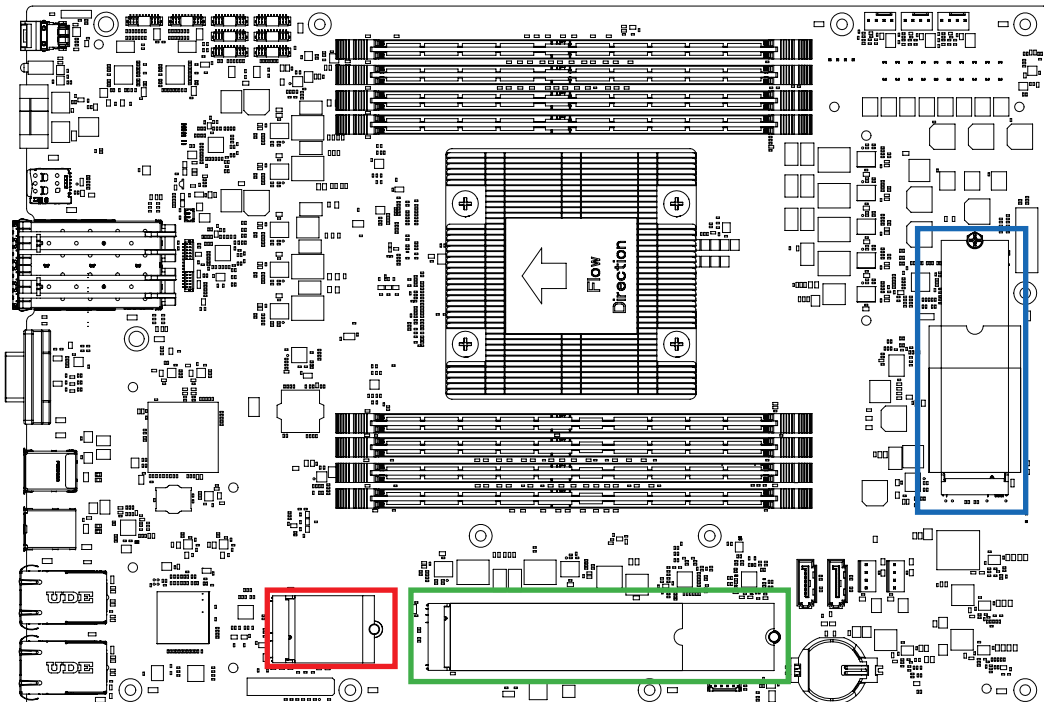


## 3.6 Installing M.2

**Step 1** The red box indicates the location of the M.2.



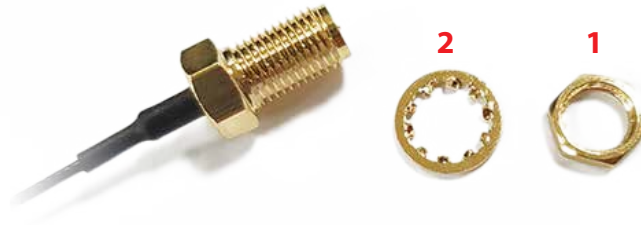
**Step 2** Install M.2 (Key E 2230/Key M 2280-22110/Key B 2280-3042-3052) into slot and fasten one pan head M3x4L screw



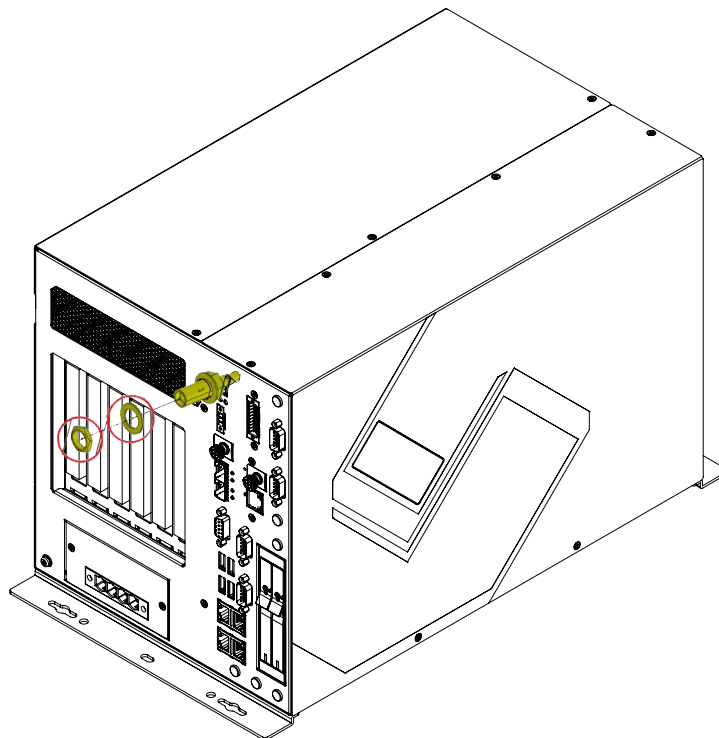


### 3.7 Installing Antenna Cable

**Step 1** Check antenna parts (cable and washers).



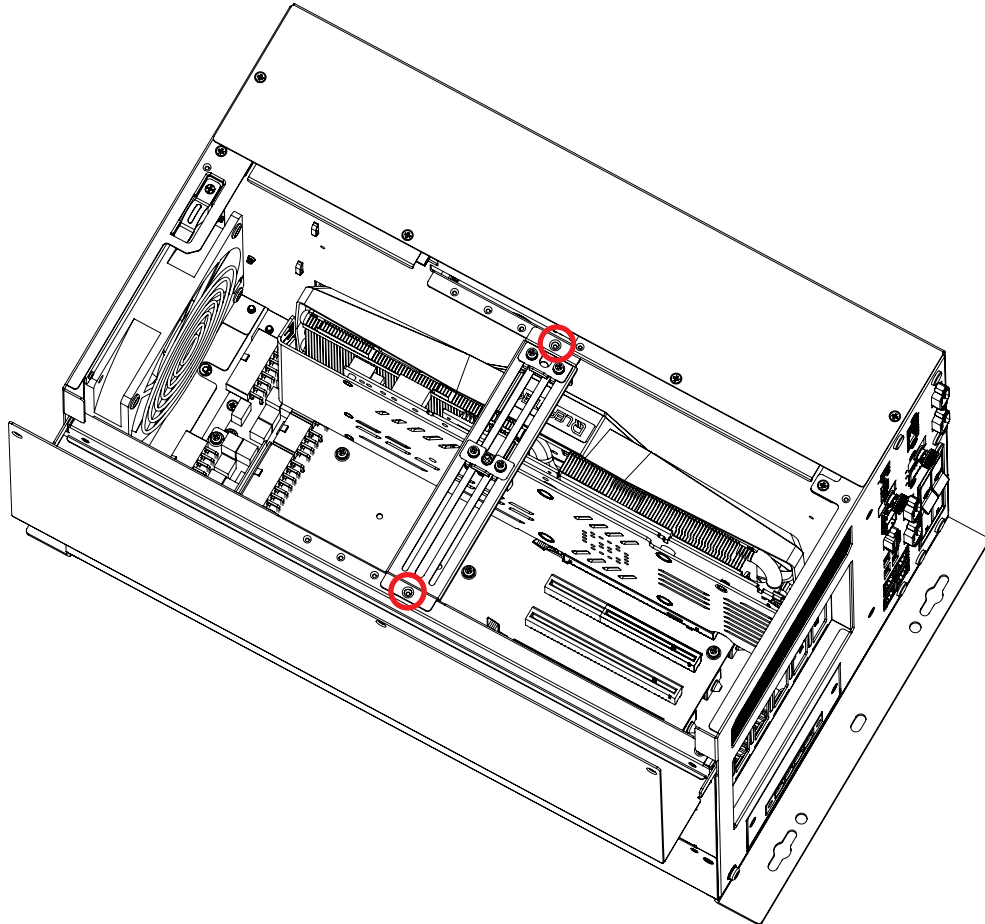
**Step 2** Install the antenna.



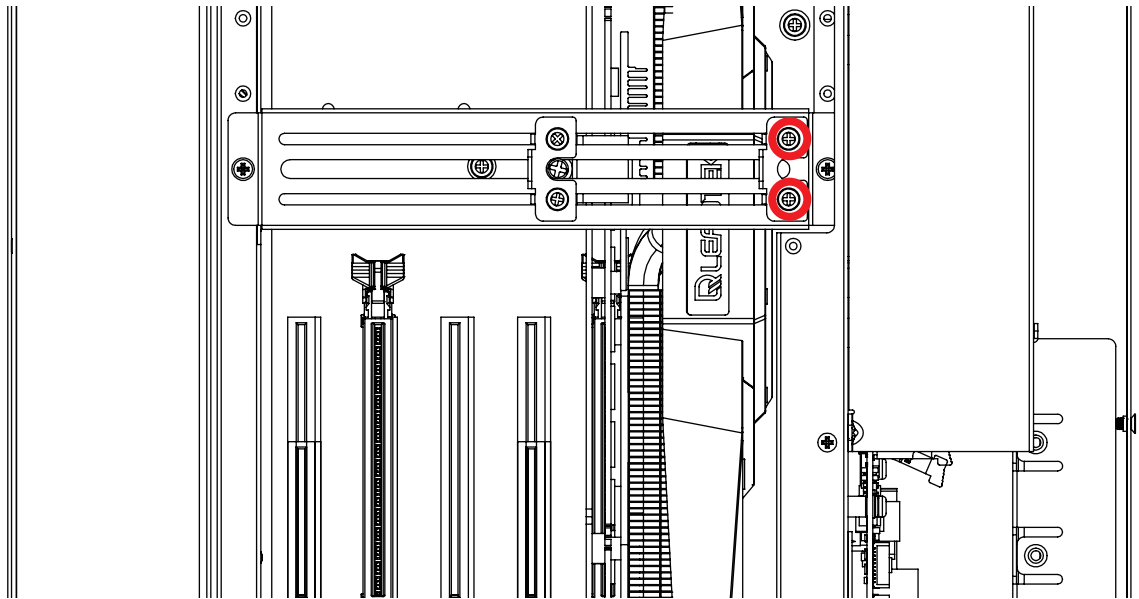


### 3.8 Installing Hold-down Kit

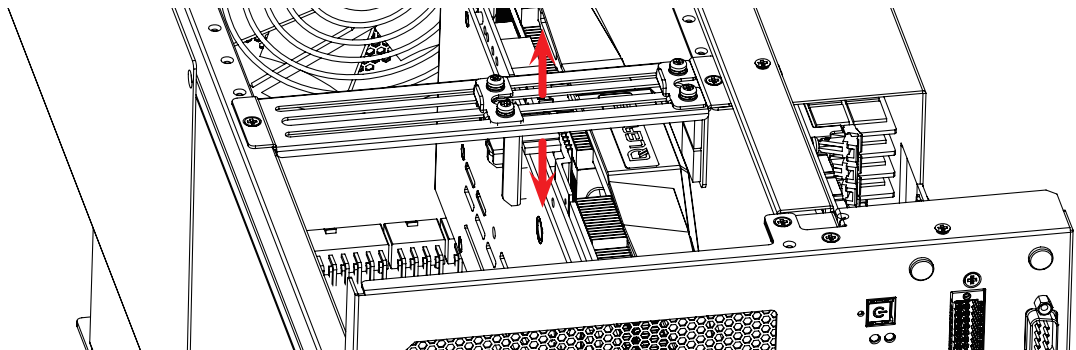
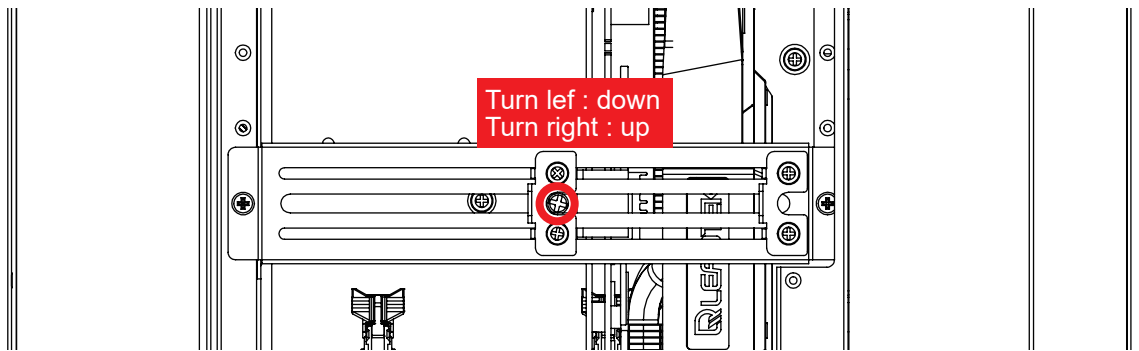
**Step 1** Fasten two pcs F-M3x5L screw.



**Step 2** Fasten two screws on the hold on the bar (marked in yellow) after fitting the card by adjusting the pad left and right.

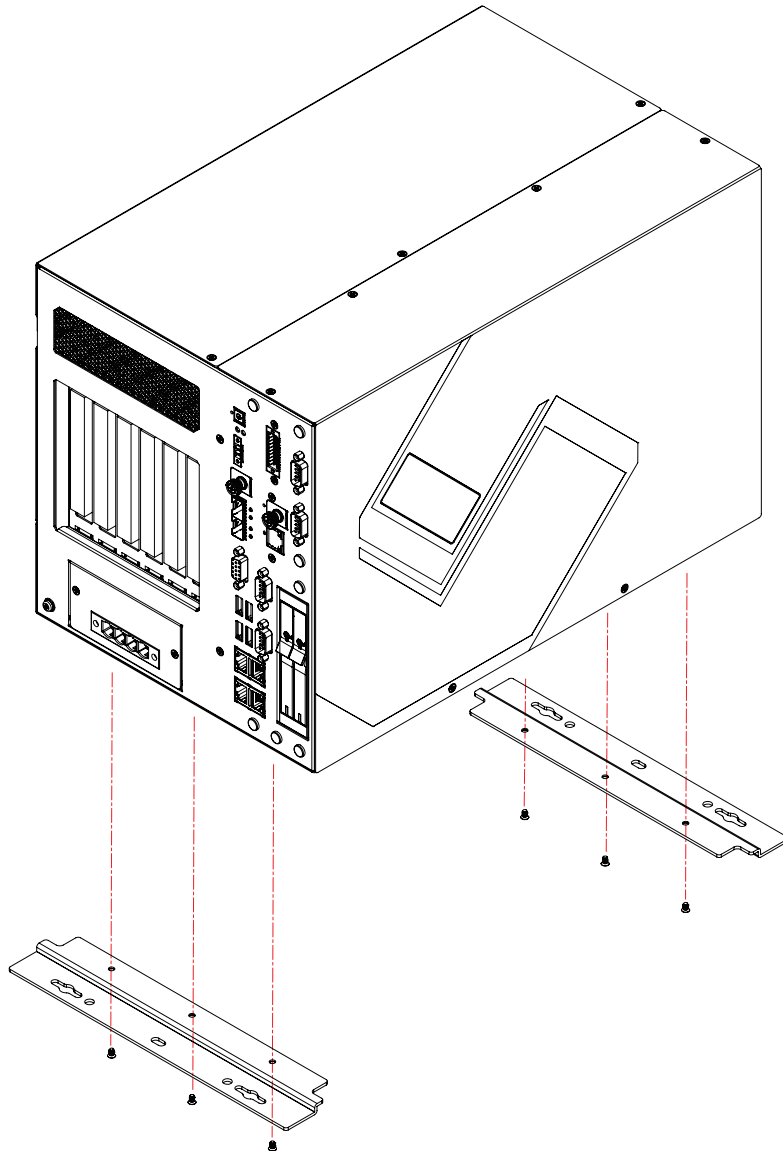


**Step 3** Turn the screw (circle in red) left or right with Phillips screwdriver to adjust the pad up and down.



### 3.9 Mounting Your ICS-1000

Install wall mount bracket then fasten six pcs F-M3x5L screw.



# 4

## BIOS SETUP

### 4.1 BIOS Setup

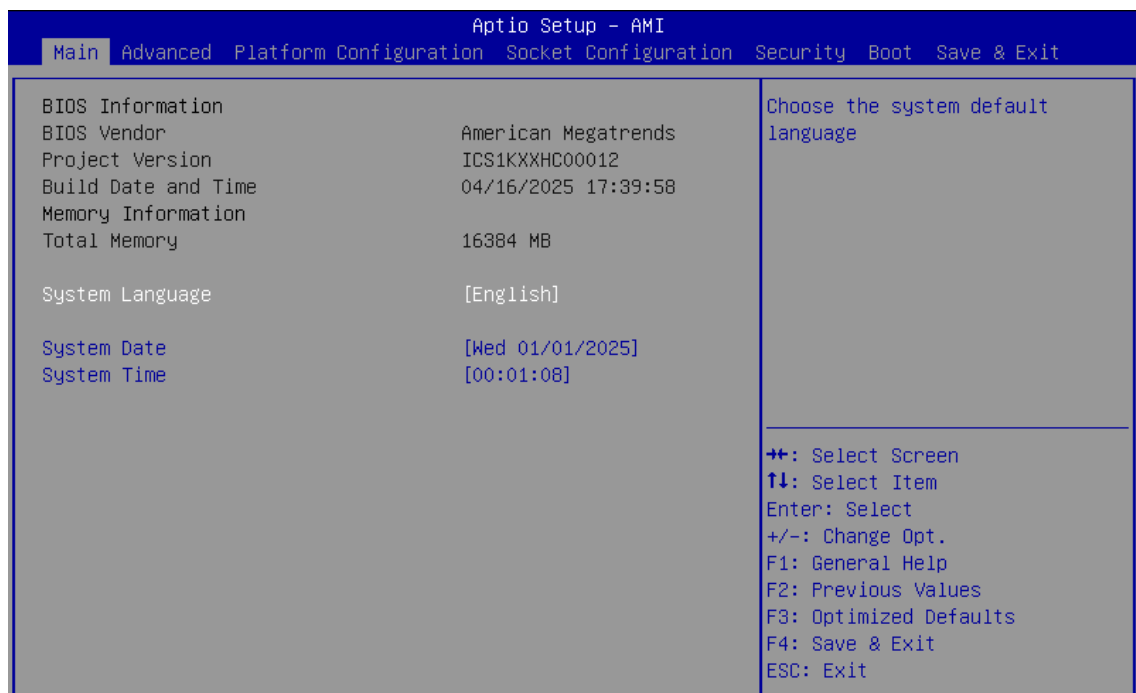


Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the <Del> key when POST display output is shown.

## 4.2 Main Menu

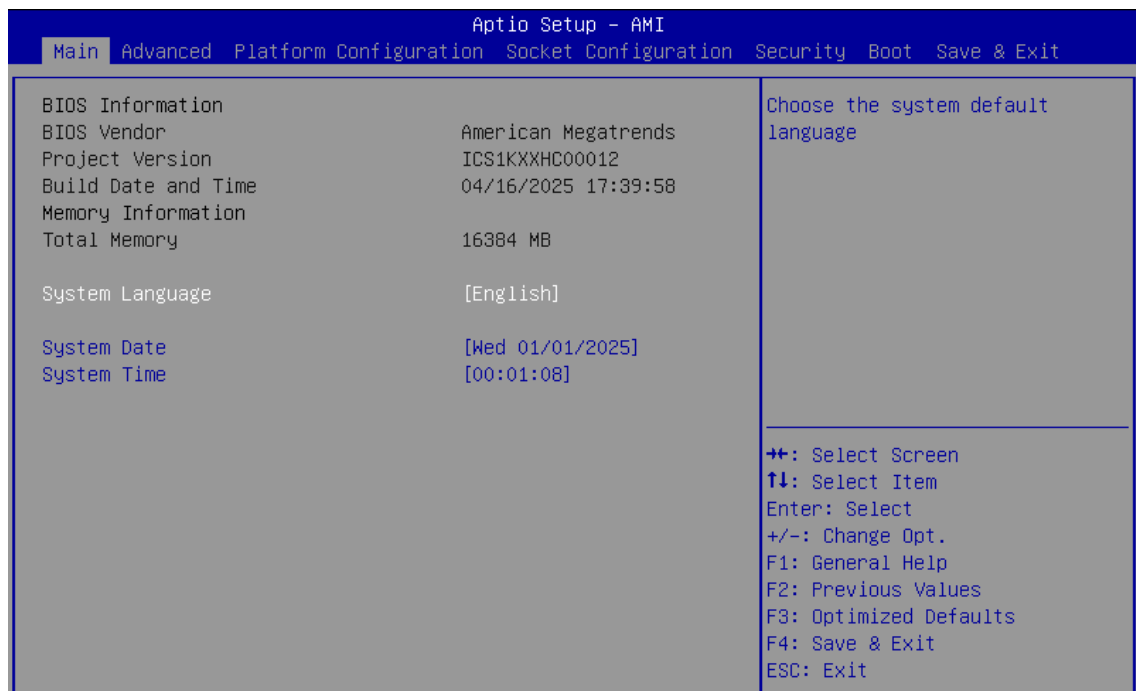


Figure 4-2 : BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on Main menu.

### System Date

Set the Date. Use <Tab> to switch between Date elements.

Default Ranges:

Year: 1998-9999

Months: 1-12

Days: Dependent on month

Range of Years may vary.

### System Time

Set the Time. Use <Tab> to switch between Time elements.

## 4.3 Advanced Menu



Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as SW Ignition ,Trusted Computing, and Super IO configuration.

### 4.3.1 SW Ignition Configuration

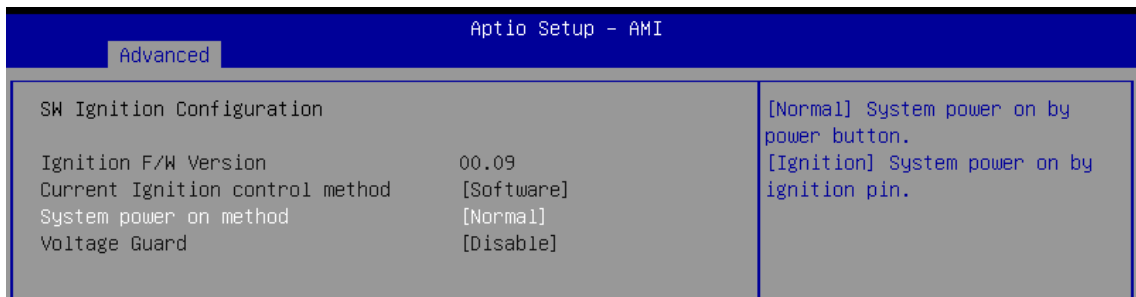


Figure 4-3-1 : SW Ignition Configuration

#### System power on method

[Normal] System power on by power button.

[Ignition] System power on by ignition pin.

#### Delay On Timer (Seconds)

The delay time after user trigger ignition on signal (Seconds).

#### Delay Off Timer (Seconds)

The delay time after user trigger ignition off signal (Seconds).

#### Force Shutdown Timer (Minutes)

Used to force cut off system power when OS unable gracefully shutdown system successfully.

### 4.3.2 Trusted Computing

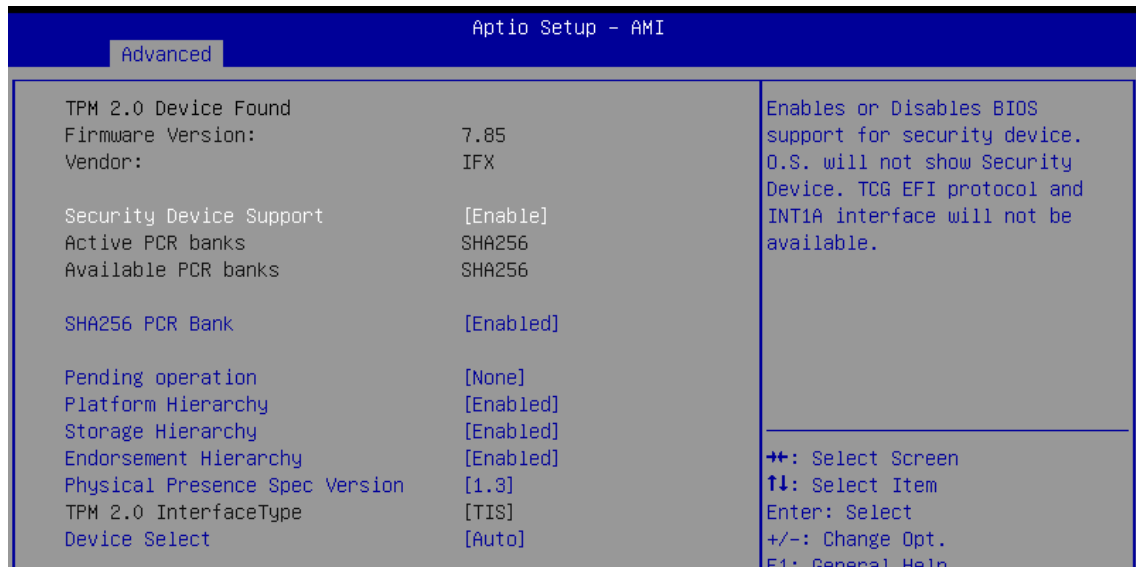


Figure 4-3-2 : Trusted Computing

Control the TPM device status and display related information if TPM chip is present.

### 4.3.3 USB Configuration

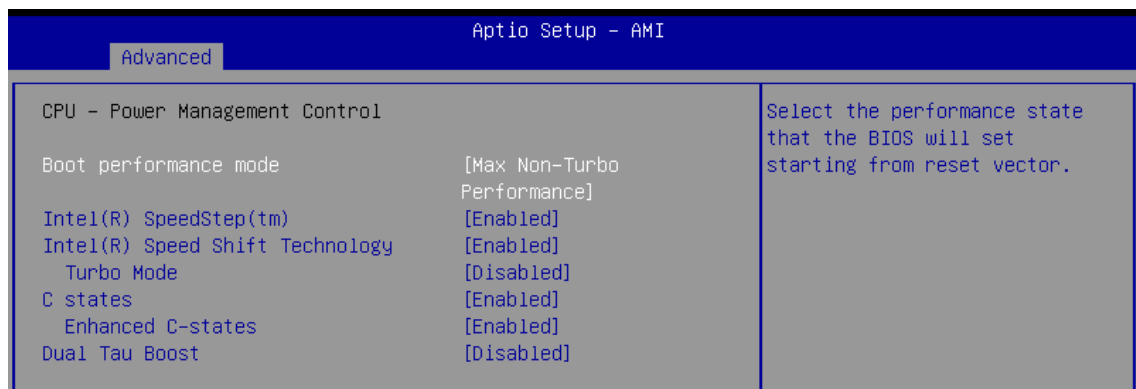


Figure 4-3-3 : USB Configuration

#### Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

#### XHCI Hand-off

This is a workaround for OSES without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

#### USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

### USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

### Device reset time-out

USB mass storage device Start Unit command time-out.

### Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

## 4.3.4 Hardware Monitor

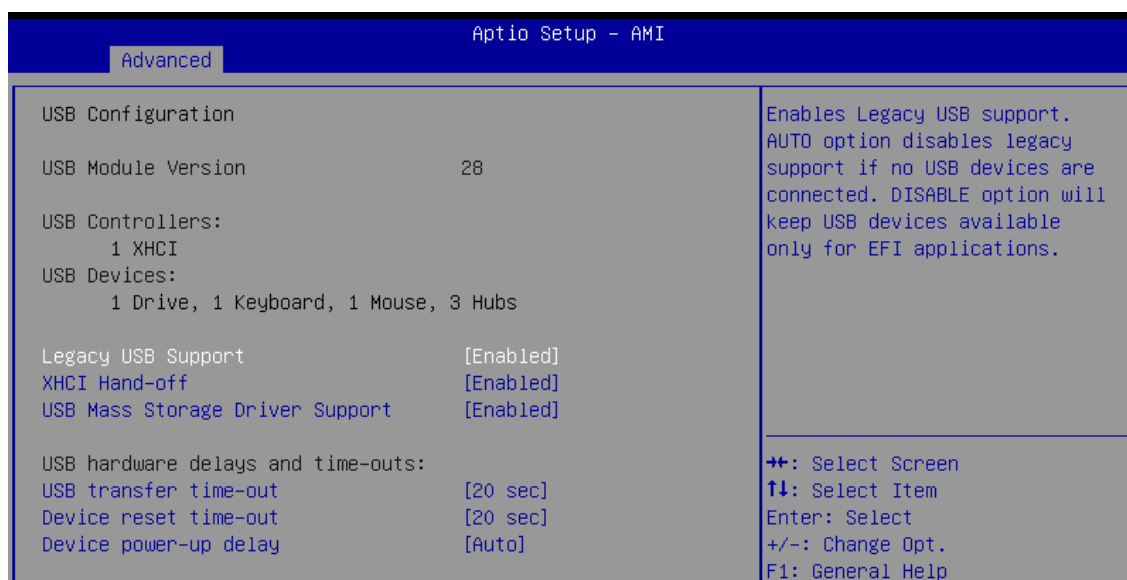


Figure 4-3-4 : Hardware Monitor

The IT8786 SIO features an enhanced hardware monitor providing thermal, fan speed, and system voltage status monitoring.



### 4.3.4.1 Smart Fan Function

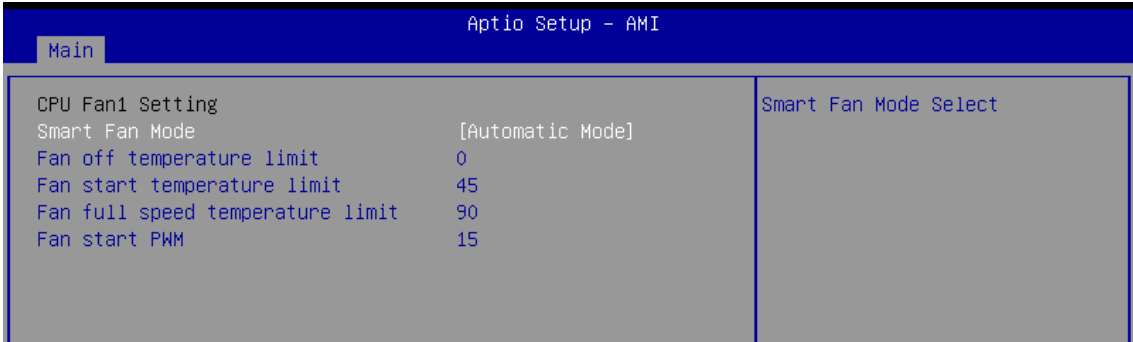


Figure 4-3-4-1 : Smart Fan Function

#### Smart Fan X Mode

Smart Fan Mode Select

#### Fan off temperature limit

Fan will off when temperature lower than this limit

#### Fan start temperature limit

Fan will work when temperature higher than this limit

#### Fan full speed temperature limit

Fan will full speed when temperature higher than this limit

#### Fan start PWM

Fan will start with this PWM value.

### 4.3.5 IT8786 Super IO Configuration

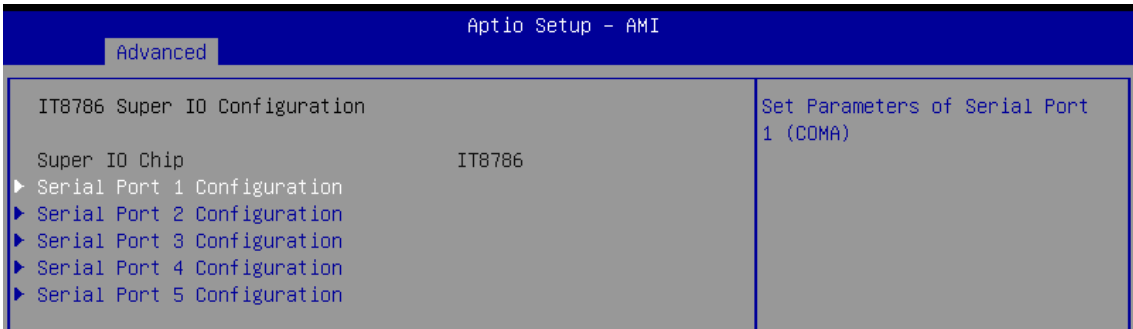


Figure 4-3-5 : IT8786 Super IO Configuration

Control Serial Port 1-5 port Configuration.

### 4.3.5.1 Serial Port X Configuration

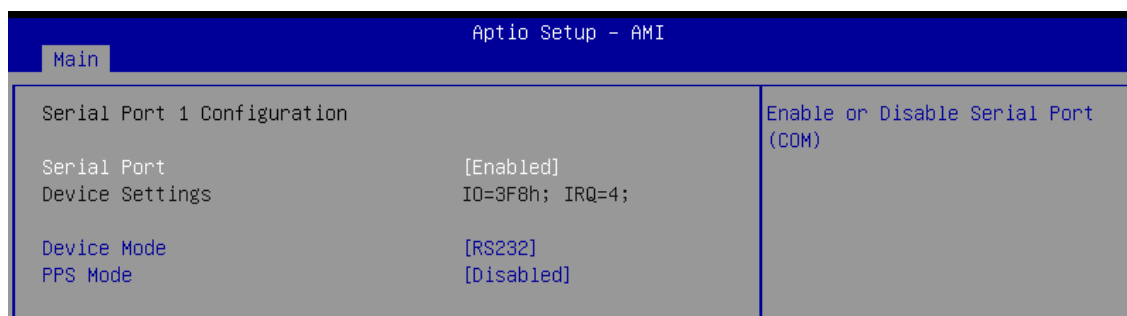


Figure 4-3-5-1 : Serial Port X Configuration

#### Serial Port

Enable or Disable Serial Port (COM)

#### Device Mode

Select Device Mode.

#### PPS Mode

Enable or Disable PPS.

### 4.3.6 Network Stack Configuration

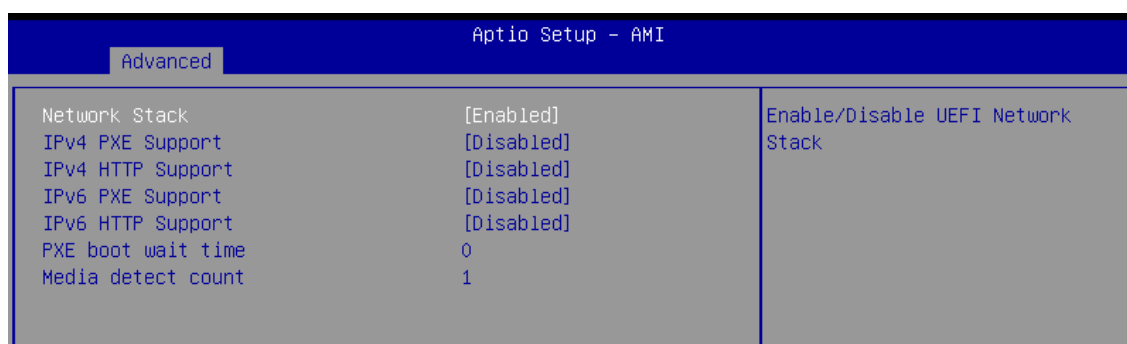


Figure 4-3-6 : Network Stack Configuration

#### Network Stack

Enable/Disable UEFI Network Stack

#### IPv4 PXE Support

Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

#### IPv4 HTTP Support

Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

#### IPv6 PXE Support

Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

#### IPv6 HTTP Support

Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

#### PXE boot wait time

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

#### Media detect count

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

### 4.3.7 NVMe Configuration

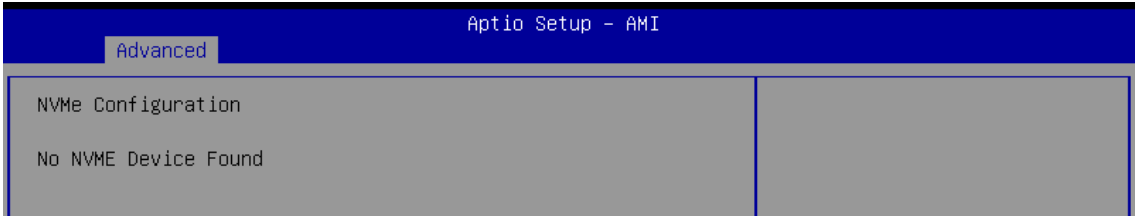


Figure 4-3-7 : NVMe Configuration

Display NVMe controller and Drive information.

## 4.4 Platform Configuration

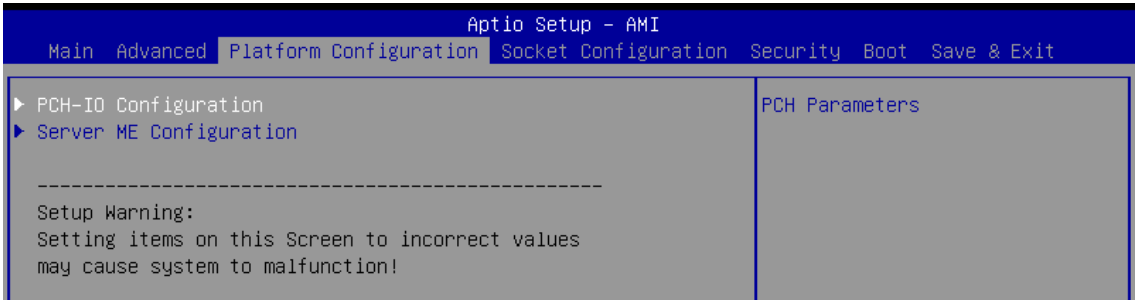


Figure 4-4 : Platform Configuration

Select Platform Configuration tab to enter Platform Configuration BIOS setup options, such as PCH-IO Configuration, and Server ME Configuration.

### 4.4.1 PCH-IO Configuration

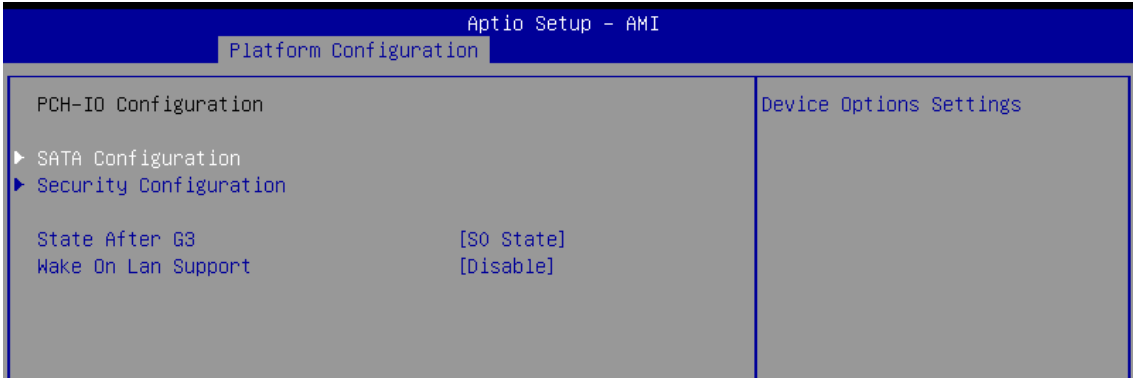


Figure 4-4-1 : PCH-IO Configuration

#### SATA Configuration

Controller SATA Configuration.

#### Security Configuration

Security Configuration settings.

#### State After G3

Specify what state to go to when power is re-applied after a power failure S0 / S5 State.

#### Wake On Lan Support

Enable or Disable Wake On Lan Support.

#### 4.4.1.1 SATA Configuration

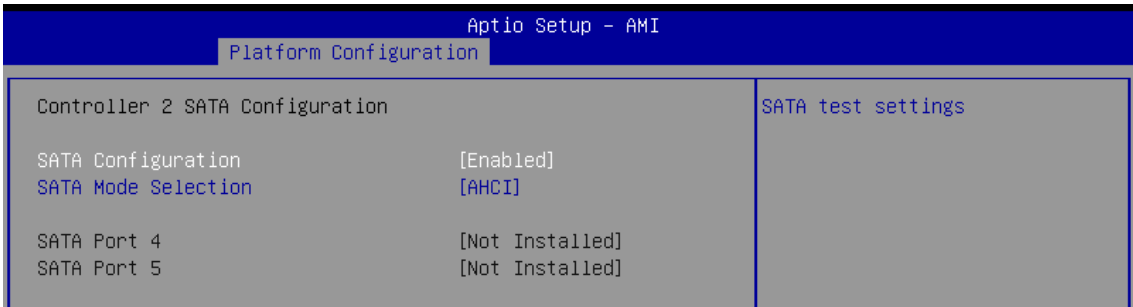


Figure 4-4-1-1 : SATA Configuration

#### SATA Configuration

Enable/Disable SATA Device.

#### SATA Mode Selection

Select SATA controller operate mode AHCI / RAID.

### 4.4.1.2 Security Configuration

| Aptio Setup - AMI      |            |                                                                            |
|------------------------|------------|----------------------------------------------------------------------------|
| Platform Configuration |            |                                                                            |
| Security Configuration |            | Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM |
| RTC Memory Lock        | [Enabled]  |                                                                            |
| BIOS Lock              | [Disabled] |                                                                            |

Figure 4-4-1-2 : Security Configuration

#### RTC Memory Lock

Enable or Disable will lock of RTC RAM.

#### BIOS Lock

Enable/Disable the BIOS Lock Enable feature.

### 4.4.2 Server ME Configuration

| Aptio Setup - AMI         |             |  |
|---------------------------|-------------|--|
| Platform Configuration    |             |  |
| General ME Configuration  |             |  |
| Oper. Firmware Version    | 11:5.0.4.67 |  |
| Backup Firmware Version   | N/A         |  |
| Recovery Firmware Version | 11:5.0.4.67 |  |
| ME Firmware Status #1     | 0x00000245  |  |
| ME Firmware Status #2     | 0x89116026  |  |
| Current State             | Operational |  |
| Error Code                | No Error    |  |
| Recovery Cause            | N/A         |  |

Figure 4-4-2 : Server ME Configuration

Display Server ME Configuration information.

# 4.5 Socket Configuration

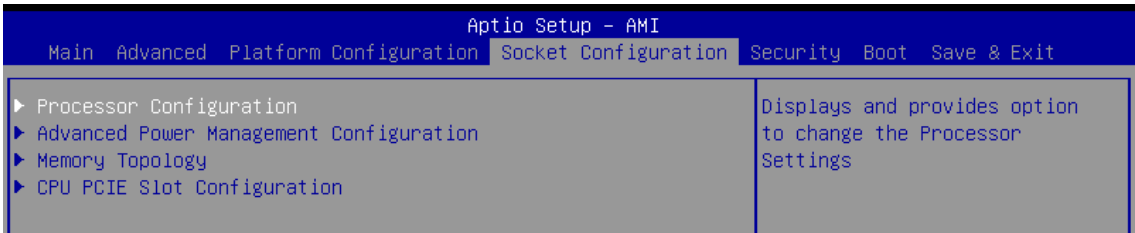


Figure 4-5 : Socket Configuration

Select Socket Configuration tab to enter Socket Configuration BIOS setup options, such as Processor Configuration, Advanced Power Management Configuration, and Memory Topology.

## 4.5.1 Processor Configuration

| Aptio Setup - AMI         |                         |          | Socket Configuration                                                                  |
|---------------------------|-------------------------|----------|---------------------------------------------------------------------------------------|
| Processor Configuration   |                         |          | Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads. |
| -----                     |                         |          |                                                                                       |
| Processor BSP Revision    | 606C1 - ICX-D HCC       |          |                                                                                       |
| Processor Socket          | Socket 0                | Socket 1 |                                                                                       |
| Processor ID              | 000606C1*               |          |                                                                                       |
| Processor Frequency       | 1.800GHz                |          |                                                                                       |
| Processor Max Ratio       | 12H                     |          |                                                                                       |
| Processor Min Ratio       | 08H                     |          |                                                                                       |
| Microcode Revision        | 01000230                |          |                                                                                       |
| L1 Cache RAM(Per Core)    | 80KB                    |          |                                                                                       |
| L2 Cache RAM(Per Core)    | 1280KB                  |          |                                                                                       |
| L3 Cache RAM(Per Package) | 20480KB                 |          |                                                                                       |
| Processor 0 Version       | Intel(R) Xeon(R) D-2752 |          |                                                                                       |
|                           | TER CPU @ 1.80GHz       |          |                                                                                       |
| Hyper-Threading [ALL]     | [Enable]                |          | ++: Select Screen                                                                     |
| Hardware Prefetcher       | [Enable]                |          | ↑↓: Select Item                                                                       |
| Adjacent Cache Prefetch   | [Enable]                |          | Enter: Select                                                                         |
| Extended APIC             | [Disable]               |          | +/-: Change Opt.                                                                      |
| APIC Physical Mode        | [Disable]               |          | F1: General Help                                                                      |
| PECI                      | [Enable]                |          | F2: Previous Values                                                                   |
| Enable Intel(R) TXT       | [Disable]               |          | F3: Optimized Defaults                                                                |
| VMX                       | [Enable]                |          | F4: Save & Exit                                                                       |
| Enable SMX                | [Disable]               |          | ESC: Exit                                                                             |

Figure 4-5-1 : Processor Configuration

### Hyper-Threading [ALL]

Enable or Disable Hyper-Threading Technology.

### Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

### Adjacent Cache Prefetch

To turn on/off the MLC Spatial Prefetcher.

### Extended APIC

Enable/disable extended APIC support.

### APIC Physical Mode

Enable/Disable the APIC physical destination mode.

### PECI

PECI in trust bit Enable/Disable..

### Enable Intel(R) TXT

To enable the Intel TXT option.

### VMX

Enables the Vanderpool Technology, takes effect after reboot.

### Enable SMX

Enables Safer Mode Extensions.

## 4.5.2 Advanced Power Management Configuration

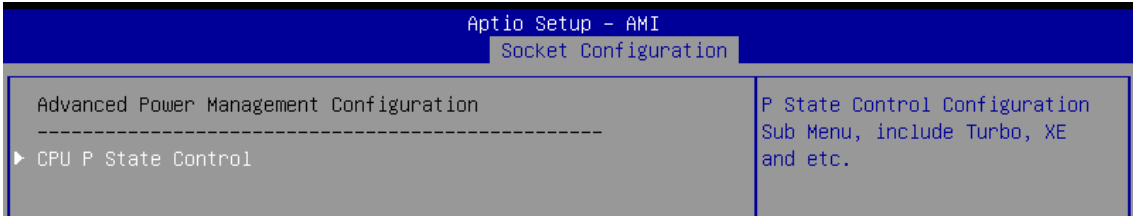


Figure 4-5-2 : Advanced Power Management Configuration

Provides option to change the Power Management Settings.

### 4.5.2.1 CPU P State Control

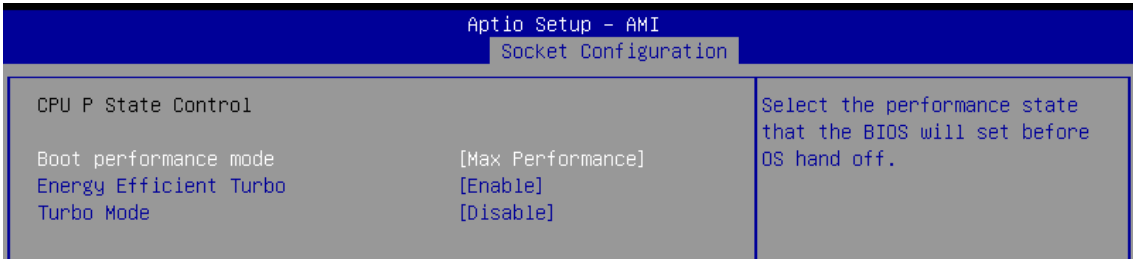


Figure 4-5-2-1 : CPU P State Control

#### Boot performance mode

Select the performance state that the BIOS will set before OS hand off.

#### Energy Efficient Turbo

Energy Efficient Turbo Enable/Disable.

#### Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too).

## 4.5.3 Memory Topologyn

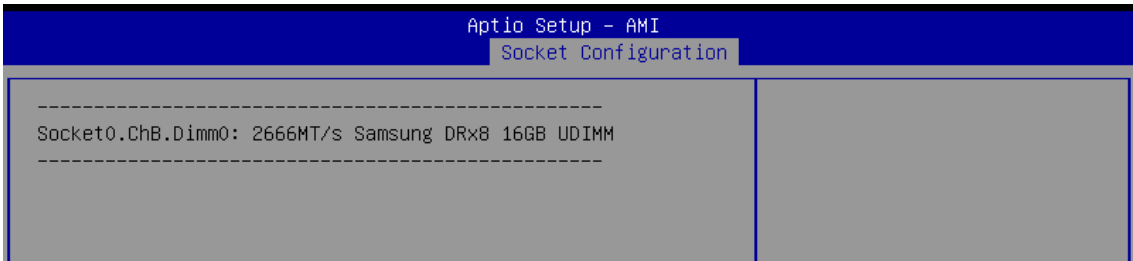


Figure 4-5-3 : Memory Topologyn

Displays memory topology with DIMM population information.



## 4.5.4 CPU PEG Slot X

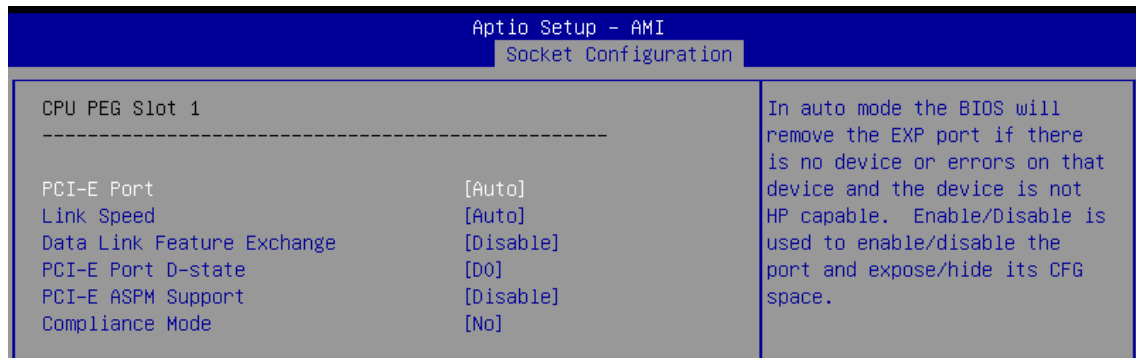


Figure 4-5-4 : CPU PEG Slot X

### PCI-E Port

Enable/Disable the PCI-E port.

Auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable.

### Link Speed

Choose Link Speed for this PCIe port.

### Data Link Feature Exchange

Enable/Disable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register.

### PCI-E Port D-state

Set to D0 for normal operation, D3Hot to be in low-power state.

### PCI-E ASPM Support

This option can disable ASPM support in a PCIe root port.

### Compliance Mode

Enable/Disable Compliance Mode for this PCIe port.

# 4.6 Security Function

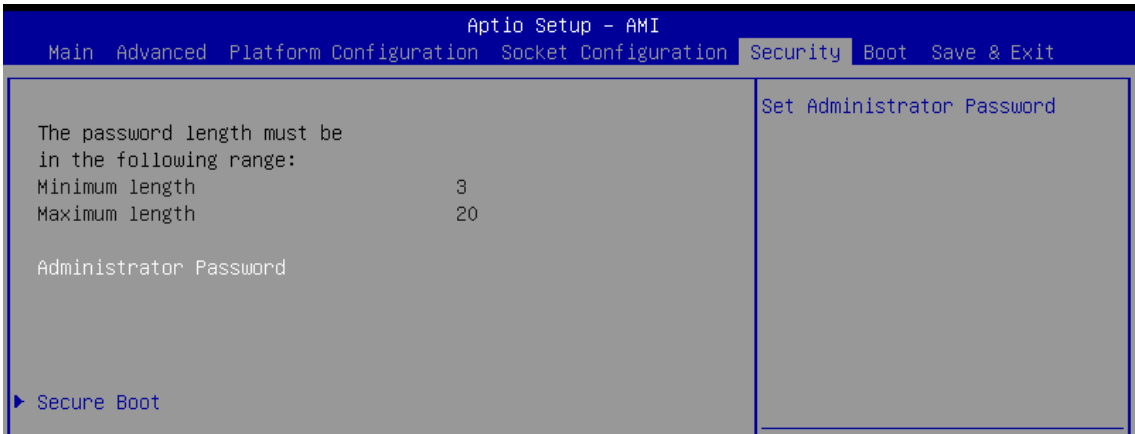


Figure 4-6 : BIOS Security Menu

## Administrator Password

Set administrator password.

### 4.6.1 Security Boot



Figure 4-6-1 : Security Boot

#### Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset

#### Secure Boot Mode

Secure Boot mode options: Standard or Custom.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

#### Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases

#### Reset To Setup Mode

Delete all Secure Boot key databases from NVRAM

#### Key Management

Enables expert users to modify Secure Boot Policy variables without variable authentication

## 4.7 Boot Function

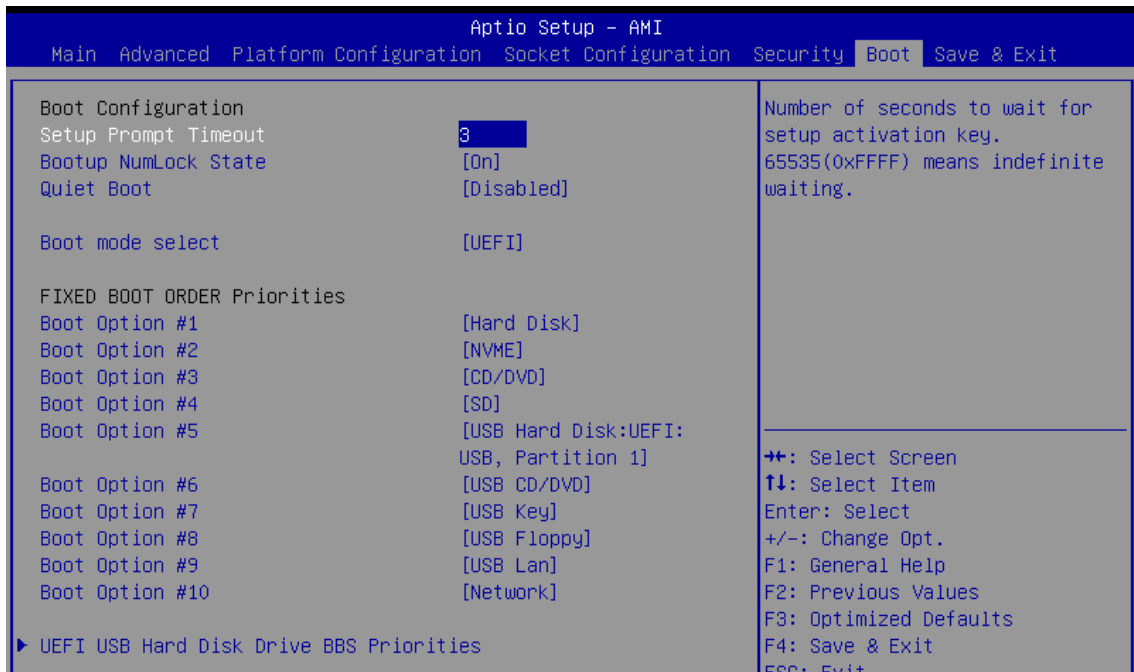


Figure 4-7 : BIOS Boot Menu

### Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

### Bootup NumLock State

Select the keyboard NumLock state.

### Quiet Boot

Enables or disables Quiet Boot option.

### Boot mode select

Select boot mode LEGACY/UEFI.

### Boot Option Priorities

Sets the system boot order.

## 4.8 Save & Exit

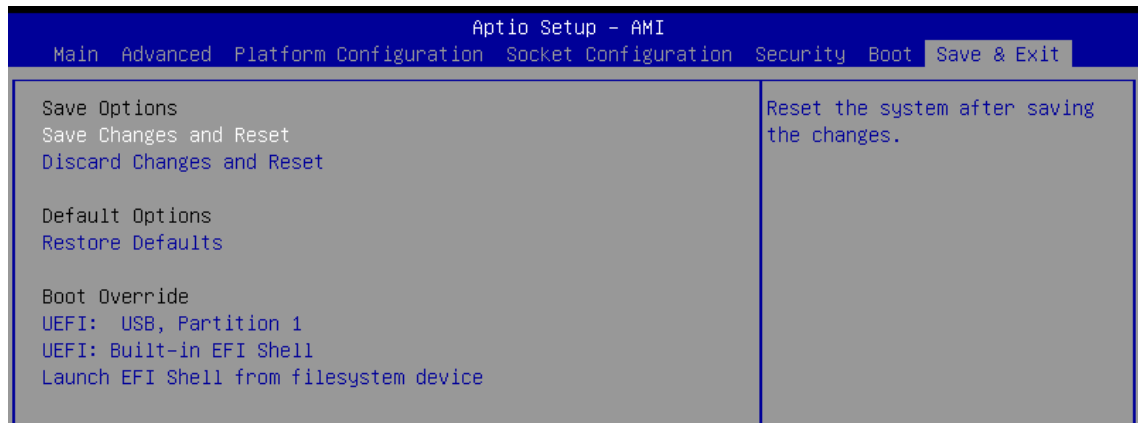


Figure 4-8 : BIOS Save & Exit Menu

### **Save Changes and Reset**

Reset the system after saving the changes.

### **Discard Changes and Reset**

Reset system setup without saving any changes.

### **Restore Defaults**

Restore/Load Default values for all the setup options.

# A

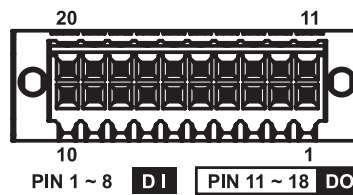
## APPENDIX A : Isolated DIO Guide

### A.1 Function Description

The ICS-1000 offers two 16-bit Isolated DIO 20-pin terminal block connector, a watchdog timer.

Isolated DIO pins are fix by Hardware design that cannot change in/out direction in runtime process.

DIO definition is shown below :

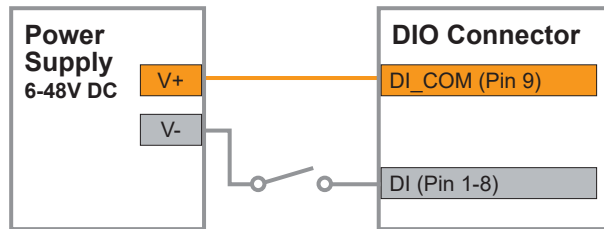


| Pin No. | Isolated DIO | Non-Isolated DIO Definition | Pin No. | Isolated DIO Definition | Non-Isolated DIO Definition |
|---------|--------------|-----------------------------|---------|-------------------------|-----------------------------|
| 1       | DI 0         | DIO 0                       | 11      | DO 0                    | DIO 8                       |
| 2       | DI 1         | DIO 1                       | 12      | DO 1                    | DIO 9                       |
| 3       | DI 2         | DIO 2                       | 13      | DO 2                    | DIO 10                      |
| 4       | DI 3         | DIO 3                       | 14      | DO 3                    | DIO 11                      |
| 5       | DI 4         | DIO 4                       | 15      | DO 4                    | DIO 12                      |
| 6       | DI 5         | DIO 5                       | 16      | DO 5                    | DIO 13                      |
| 7       | DI 6         | DIO 6                       | 17      | DO 6                    | DIO 14                      |
| 8       | DI 7         | DIO 7                       | 18      | DO 7                    | DIO 15                      |
| 9       | DI COM       | NC                          | 19      | DIO_GND                 | DIO_GND                     |
| 10      | DIO_GND      | DIO_GND                     | 20      | External VDC            | NC                          |

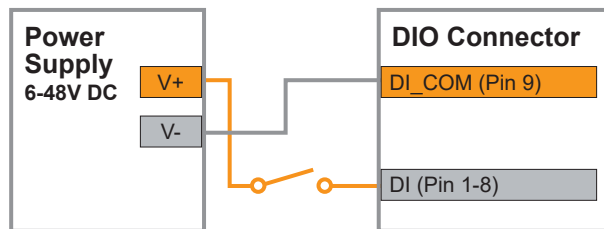
## A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode  
(NPN)

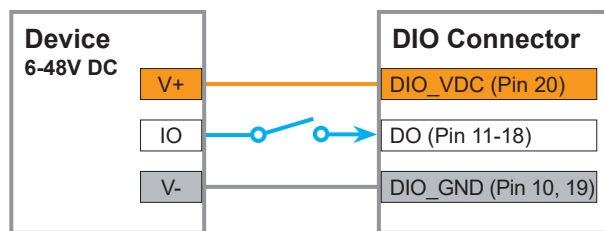


Source Mode  
(PNP)

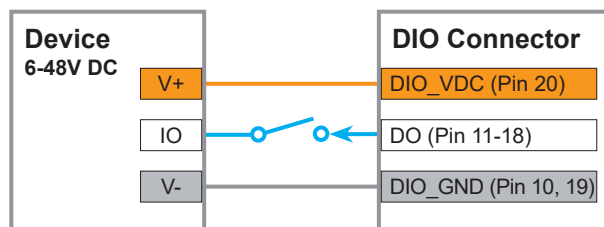


DO reference circuit :

Sink Mode  
(NPN, Default)



Source Mode  
(PNP)



## A.3 Software Package Contain

- Distribution folder include x32 and x64 versions, use batch file for installation.

There are included as fallowed :

Win10\_32.bat, and Win10\_64.bat :

Installation for driver, and

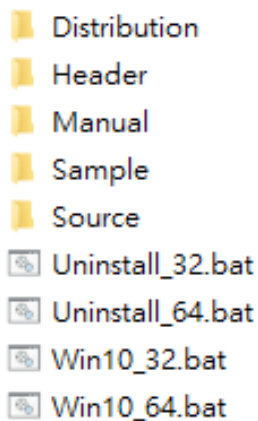
Uninstall\_32.bat, and Uninstall\_64.bat :

Uninstallation for driver

Run batch file as Administrator.

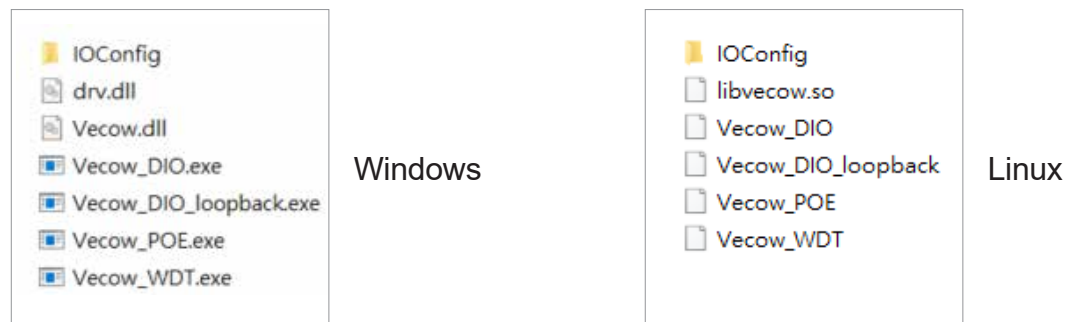
Make sure Windows version before installation.

- Header folder include head file for software developer or System Integration.
- Manual folder include API description.
- Sample folder include sample program, driver library, and API library for Windows/Linux
- Source folder include sample program source code that compile on Visual Studio 2008/Ubuntu18.04.



## A.4 Sample

Execute demo tool.



Sample, as shown below :

```
DIO sample version : v1.0.0609.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Choose IO : (1/2)
```

Vecow\_DIO

```
DIO loopback sample version : v1.0.1509.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

How many IO temp_port : (1/2)
```

Vecow\_DIO\_loopback

```
COMPORT sample version : v1.0.0309.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.48.0701.0000
PCB_ver = B

COMPORT1 mode : RS232
COMPORT2 mode : RS232
COMPORT3 mode : RS232
COMPORT4 mode : RS232
Choose port : (1~4) 1
COMPORT1 mode selection: 0:RS232
                        1:RS422-5W
                        2:RS422-9W
                        3:RS485
                        4:Loopback

Select port mode : 0
Set COMPORT mode success!
```

Vecow\_COMPORT



# B

## APPENDIX B : Software Functions

### B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usable API for Windows/Linux.

#### **BOOL initial\_SIO(BYTE Isolate\_Type, BYTE DIO\_NPN)**

Initial machine for IO and watch dogtimer.

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DIO\_NPN : DI/DO type.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Driver not exists, or version is too old, or machine not match).

#### **BOOL get\_IO1\_configuration(BYTE \*Iso, BYTE \*DI\_mode, BYTE \*DO\_mode, WORD \*Mask)**

#### **BOOL get\_IO2\_configuration(BYTE \*Iso, BYTE \*DI\_mode, BYTE \*DO\_mode, WORD \*Mask)**

Get DIO configuration (by variable)

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI\_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO\_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO(GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem).

**BOOL set\_IO1\_configuration(BYTE Iso, BYTE DI\_mode, BYTE DO\_mode, WORD Mask)**

**BOOL set\_IO2\_configuration(BYTE Iso, BYTE DI\_mode, BYTE DO\_mode, WORD Mask)**

Set DIO configuration.

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI\_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO\_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO(GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL get\_DIO1(BYTE \*DO\_data, BYTE \*DI\_data)**

**BOOL get\_DIO2(BYTE \*DO\_data, BYTE \*DI\_data)**

Get isolated DIO output(DO) and input (DI).

DI ([7:0]) : Input state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL set\_DIO1(BYTE DO\_data)**

**BOOL set\_DIO2(BYTE DO\_data)**

Set isolated DIO output(DO).

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL get\_GPIO1(WORD \*GPIO\_data)**

Get GPIO.

GPIO\_data ([15:0]) : GPIO state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL set\_GPIO1(WORD GPIO\_data)**

Set GPIO.

GPIO\_data ([15:0]) : GPIO state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL get\_WDT(DWORD \*WDT)**

Get watchdog timer setup.

WDT : watchdog timer setup.

Unit : second (Range : 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)).

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem).

**BOOL set\_WDT(DWORD WDT)**

Set watchdog timer setup.

WDT : watchdog timer setup.

Unit : second (Range : 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)).

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or setup 0, or hardware problem).

**BOOL cancel\_WDT()**

Cancel watchdog timer.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

FALSE (0) : Fail (Driver not exists, or version is too old, or out of range error).

**BOOL config\_COMPORT(BYTE \*PORT\_NUM)**

Set COMPORT configuration.

A. PORT\_NUM : Usable COMPORT number.

Range : 1~6.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or setup 0, or hardware problem).

**BOOL set\_COMPORT\_mode(BYTE port, BYTE mode, BYTE term)**

Set COMPORT mode.

B. port : which port set.

Range : 1~6.

C. mode : Usable COMPORT number.

0 : RS232 mode;

1 : RS422-5Wire mode.

2 : RS422-9Wire mode;

4 : RS485 mode.

4 : Loopback mode.

D. term : Termination enable for RS422/RS485 mode.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

**BOOL get\_COMPORT\_mode(BYTE port, BYTE \*mode, BYTE term)**

Get COMPORT mode.

E. port : which port get.

Range : 1~6.

F. mode : Usable COMPORT number.

0 : RS232 mode;

1 : RS422-5Wire mode.

2 : RS422-9Wire mode;

4 : RS485 mode.

4 : Loopback mode.

G. term : Termination enable for RS422/RS485 mode.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).



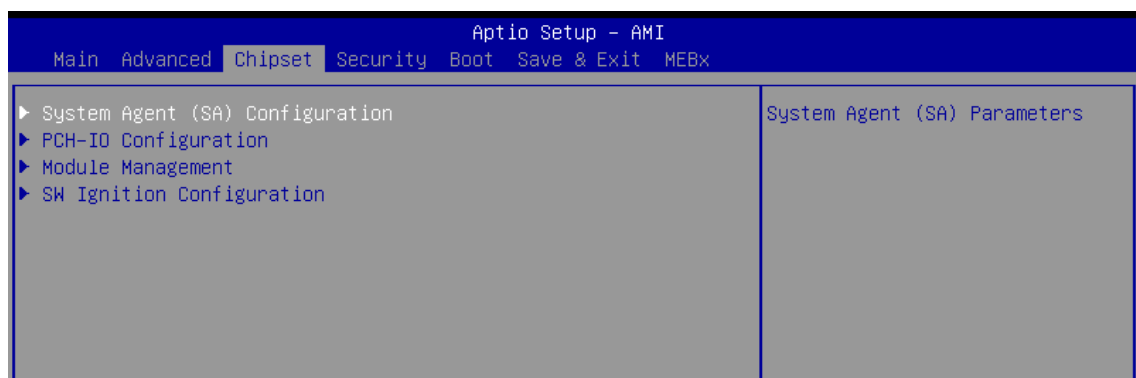
## APPENDIX C : RAID Functions

### C.1.1 VMD Mode for RAID

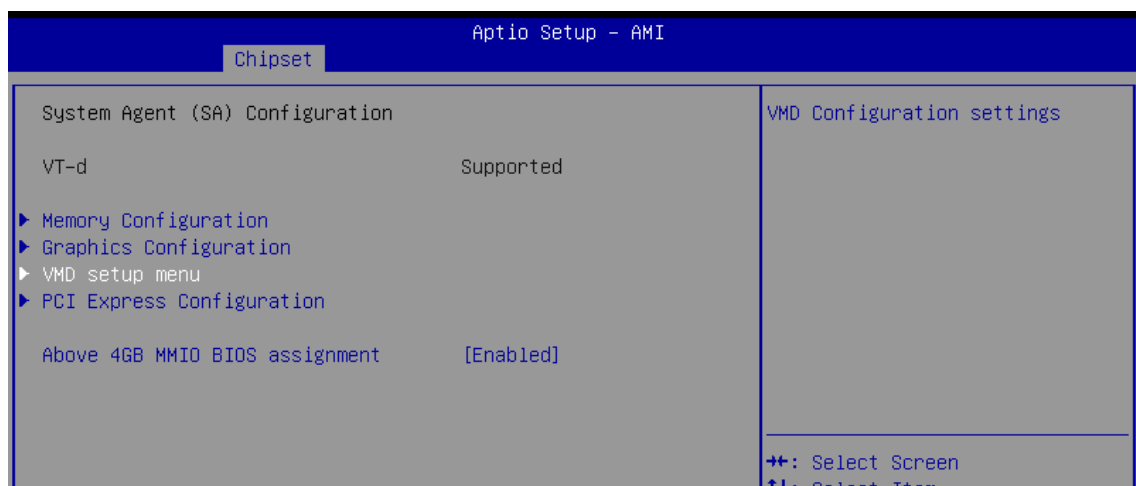
Please set Enable VMD controller as Enabled on BIOS menu.

Chipset → System Agent (SA) Configuration → VMD setup menu → Enable VMD controller → Enabled → Save Changes and Reset.

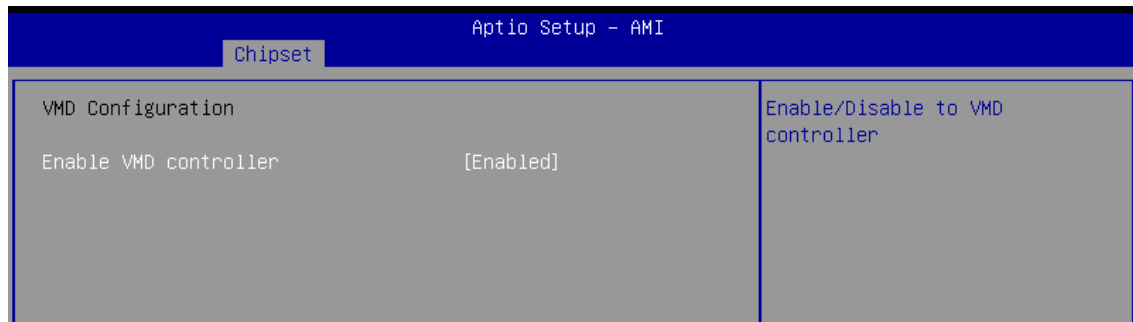
1. Select System Agent (SA) Configuration.



2. Select VMD setup menu.

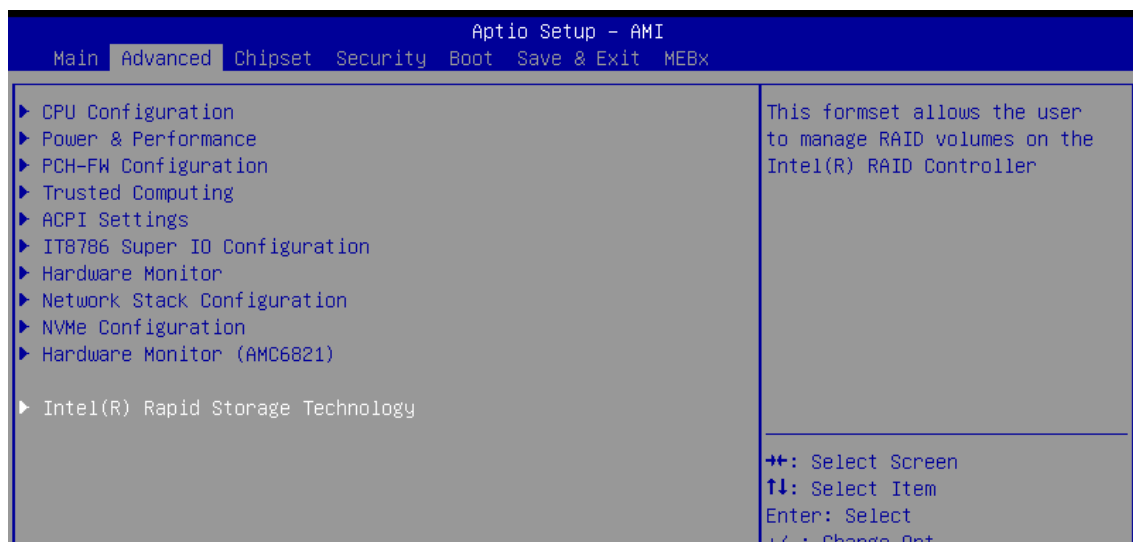


3. Enabled VMD controller. Then Save Changes and Reset.



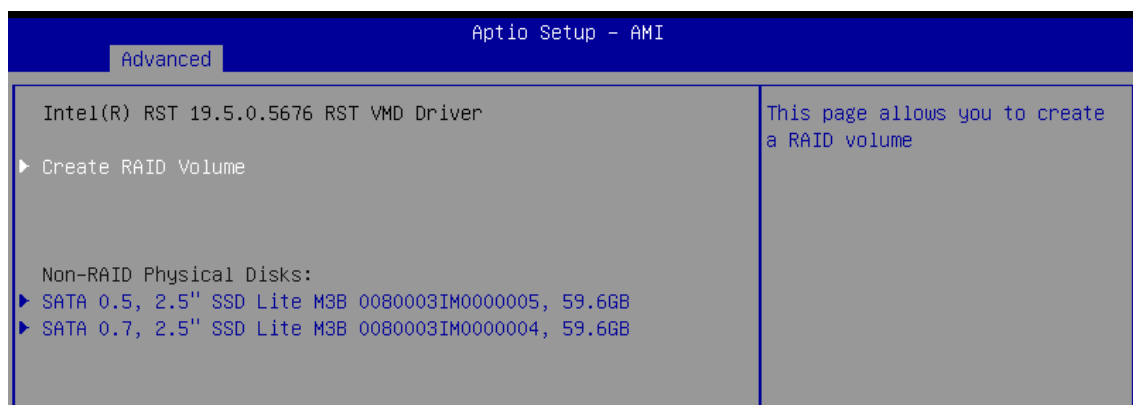
## C.1.2 UEFI Mode for RAID

1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu. Advanced → Intel(R) Rapid Storage Technology

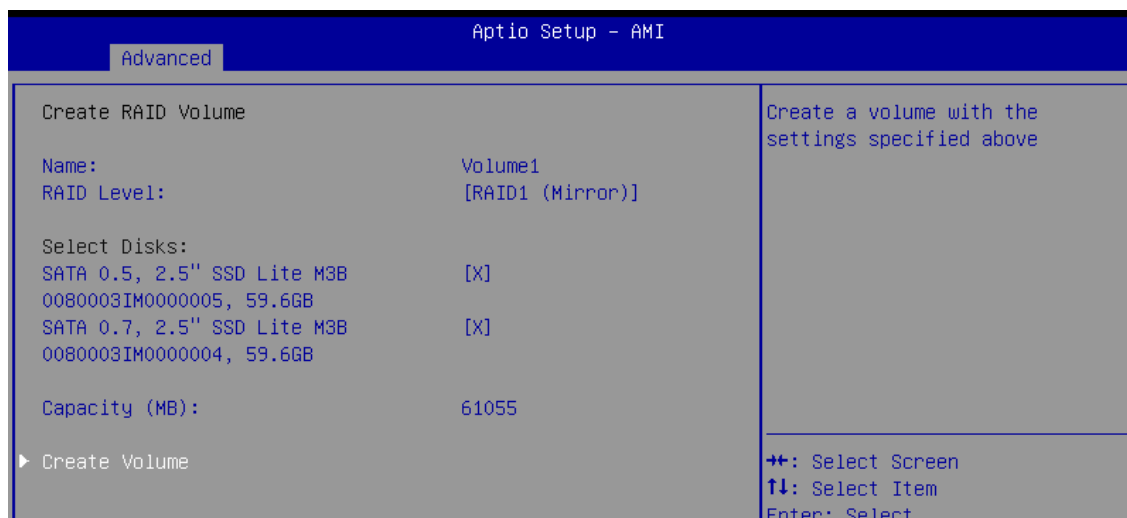


2. Select Create RAID Volume on BIOS menu.

This system is featured 2 M.2 Key M for NVMe SSD, and 4 SATA slots for HDD. Please note. Storage device M.2 and SATA cannot be mixed to create a RAID Volume.



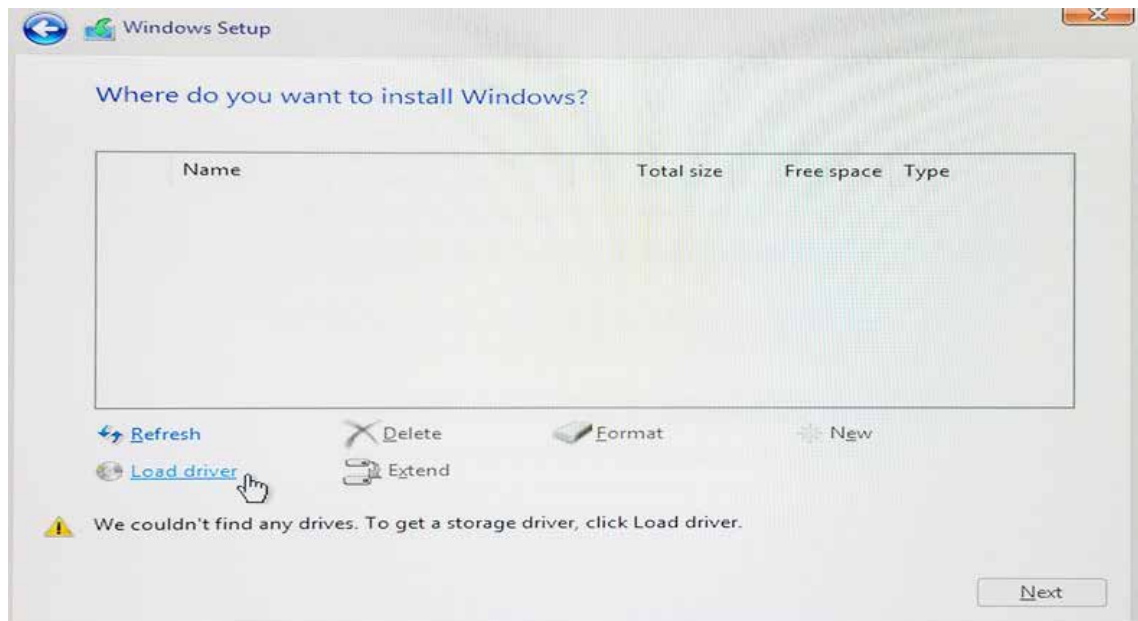
3. Select disks to create RAID Volume, then Save Changes and Reset to install OS.



## C.2 OS Installation

This system is featured 2 M.2 Key M for NVMe SSD, and 4 SATA slots for HDD. We used SATA HDD for Windows 10 OS installation as an example.

Please note. After Enabled VMD controller needs to load the IRST driver first before it can read the hard disk.



You can find the latest information and software directly from Intel's website.

[http://www.intel.com/p/en\\_US/support/highlights/chpsts/imsn](http://www.intel.com/p/en_US/support/highlights/chpsts/imsn)

Download driver "SetupRST.exe" and decompress it.

You can refer to Intel official teaching.

<https://www.intel.com/content/www/us/en/support/articles/000094664/technologies/intel-rapid-storage-technology-intel-rst.html>

Open Windows PowerShell or CMD and navigate to the location of the SetupRST.exe file.

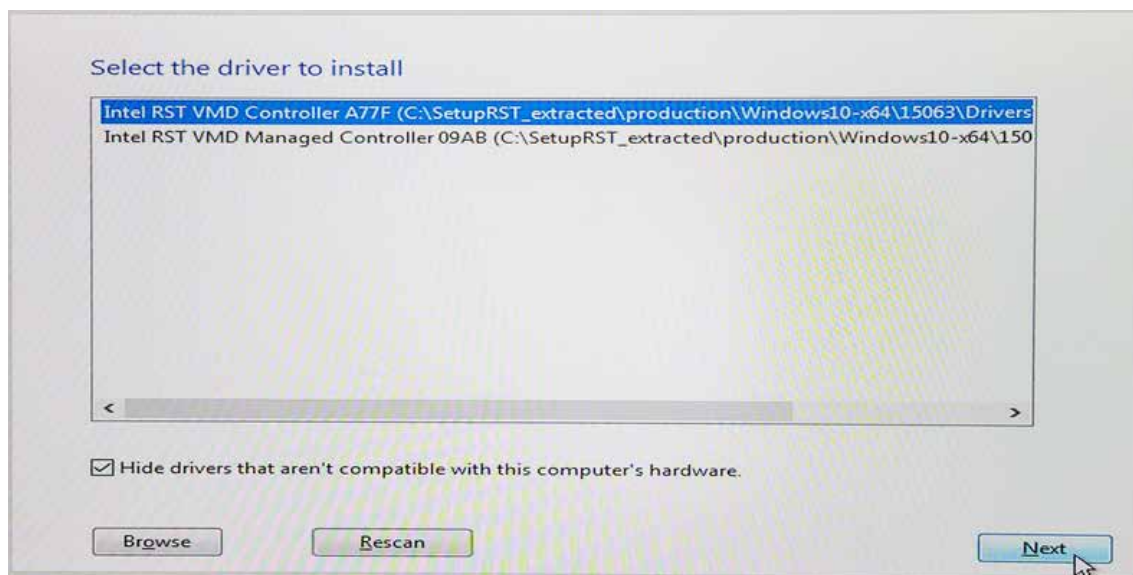
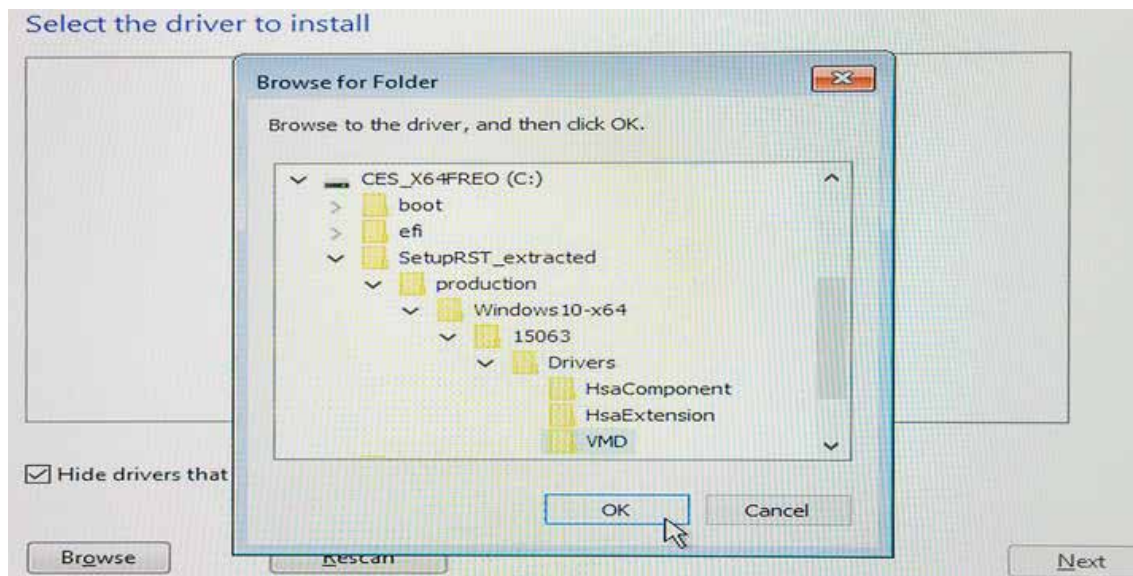
Enter the following command to extract:

**./SetupRST.exe -extractdrivers SetupRST\_extracted.**

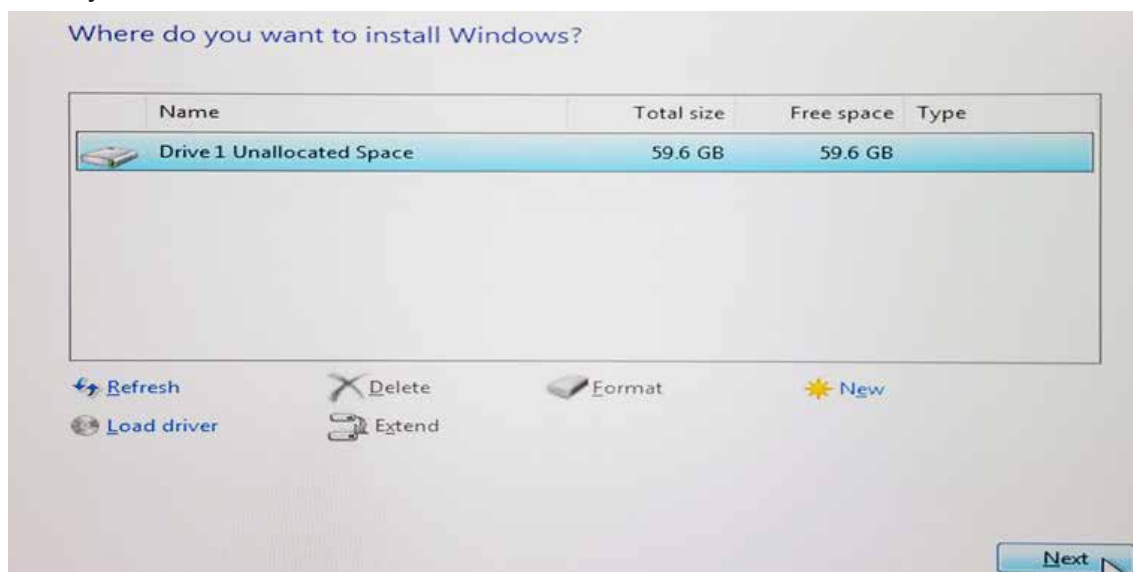
After extraction, a "SetupRST\_extracted " folder will be created, then put the folder on the USB drive used for installing Windows.

Loading driver and install it when installing Windows.





Then you can select the hard drive and install the OS.



## C.3 To Install All Device Drivers of the System

The instructions are as follows:

1. Install Chipset driver
2. Install VGA driver
3. Install ME driver (if available)
4. Install Network driver
5. Install Audio driver

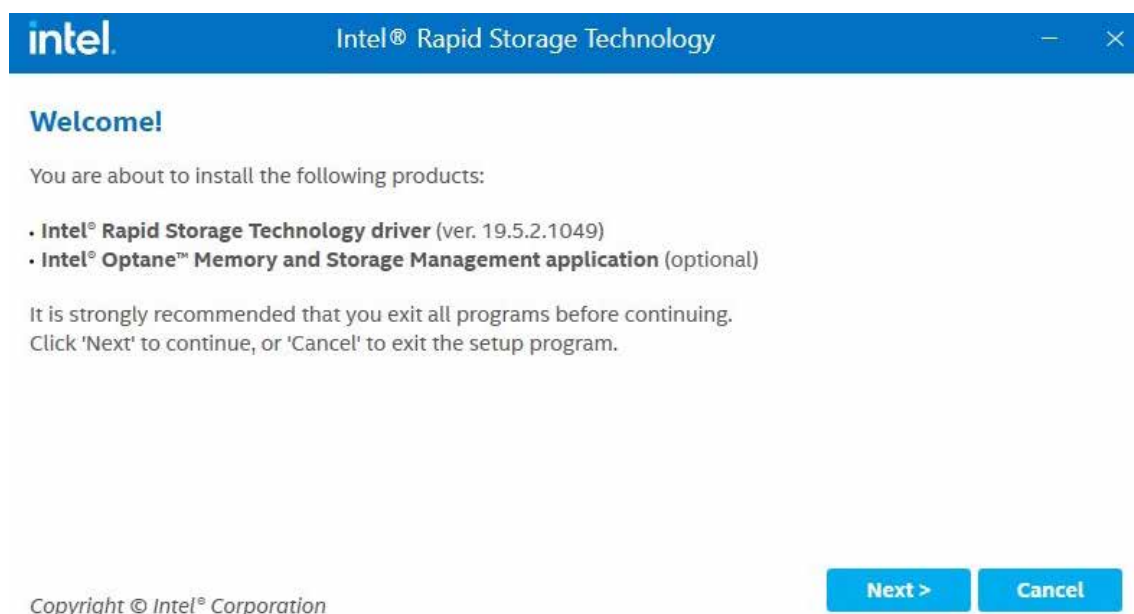
## C.4 To Install “Intel Rapid Storage Technology” driver

You can get the software from driver CD.

Also, you can find the latest information and software directly from Intel’s website.

[http://www.intel.com/p/en\\_US/support/highlights/chpsts/ims](http://www.intel.com/p/en_US/support/highlights/chpsts/ims)

Install "SetupRST.exe"



The RAID environment has been done when you completed the steps above.  
At this point, the basic RAID Volume setup steps have concluded.

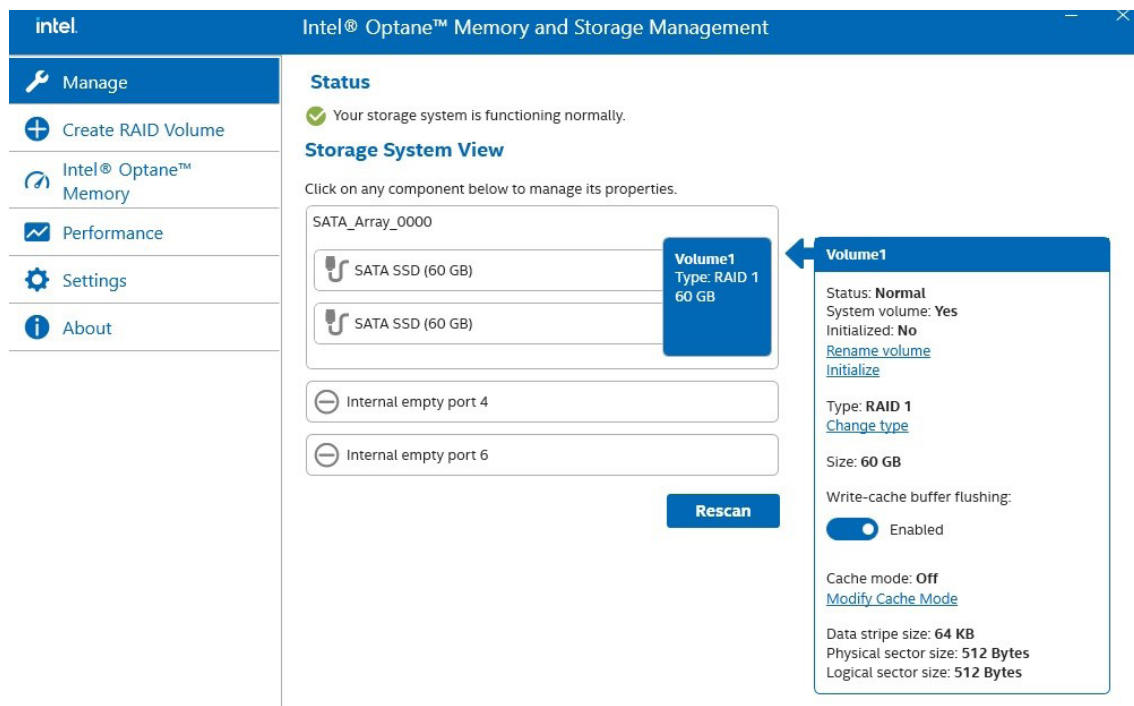
## C.5 Manage RAID Volume on “Intel® Optane™ Memory and Storage Management” Software

You can download "Intel® Optane™ Memory and Storage Management" to manage and create RAID Volumes.

You can find it at Microsoft Store.

<https://apps.microsoft.com/detail/9MZNG5HZWZ1T?activetab=pivot%3Aoverviewtab&hl=en-us&gl=US>

After installation, the created RAID Volume will be displayed here.



## C.6 To Insert SATA HDD for RAID

Please note, you can use additional two SATA ports for SATA HDD, except for mSATA slot. And storage device M.2 and SATA cannot be mixed to create a RAID Volume.

## C.7 To Create RAID Volume on “Intel® Optane™ Memory and Storage Management” Software

You can connect additional SATA devices to build RAID Volumes, and use "Intel® Optane™ Memory and Storage Management" Software for management.

The screenshot shows the 'Intel® Optane™ Memory and Storage Management' application window. On the left is a navigation sidebar with the following items: 'Manage' (with a wrench icon), 'Create RAID Volume' (with a plus icon and highlighted in blue), 'Intel® Optane™ Memory' (with a circular arrow icon), 'Performance' (with a checkmark icon), 'Settings' (with a gear icon), and 'About' (with an information icon). The main content area is titled 'Create RAID Volume' and contains the following fields and options:

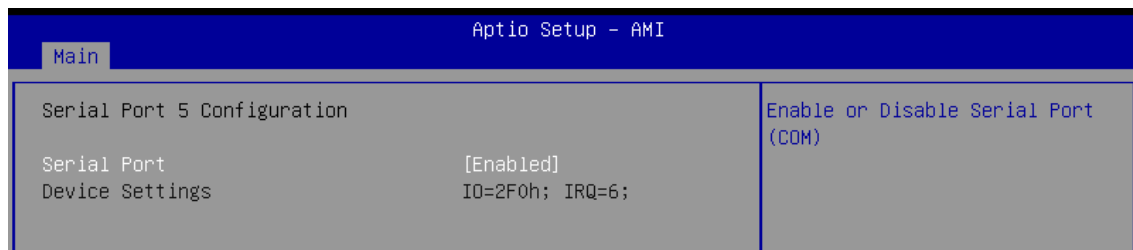
- Name:** A text input field containing 'volume\_0001'.
- Select controller:** Two radio button options: 'PCIe' and 'SATA'.
- Select volume type:** Four radio button options: 'Optimized disk performance (RAID 0)', 'Real-time data protection (RAID 1)', 'Efficient data hosting and protection (RAID 5)', and 'Balanced performance and data protection (RAID 10)'.
- Next:** A grey button located at the bottom right of the main content area.

# D

## APPENDIX D : Setting up Allxon OOB

### 1. BIOS Setting before using Allxon on system

Enable Allxon OOB Remote Management



### 2. Setting up Allxon OOB

This section will guide you step-by-step on how to enable and activate OOB Management Services. If you need to use both services (Allxon INB and OOB features), please follow the steps below.

#### 2.1 Enable Allxon INB & OOB Services

##### 2.1.1 Install Allxon Agent on Device

Users can easily initiate the Allxon Agent installation process from their desktop using selected devices from Allxon's hardware partners.

Refer to the following webpage for detailed instructions:  
[Install Allxon Agent via Command Prompt](#)

##### 2.1.2 Pairing Edge Device to Allxon Portal

- Get Device Pairing Code

Refer to the following webpage for detailed instructions:  
[Get Device Pairing Code](#)

- Get Add Your Device on Allxon Portal

Refer to the following webpage for detailed instructions:

[Add Your Device on Allxon Portal](#)

### **2.1.3 Enable OOB Enabler on Device**

After you have paired and added your device onto Allxon Portal, you will now have the option to also link the OOB Enabler to Allxon Portal.

Refer to the webpage for detailed instructions:

[Enable Out-Of-Band Management on Device](#)

## **2.2 Allxon swiftDR for Power Cycling**

Allxon swiftDR Series is a powerful Out-Of-Band remote device management solution to empower disaster recovery. This section details Allxon swiftDR for Power Cycling on Allxon Portal, to introduce Allxon's power-related OOB features.

Refer to the webpage for detailed instructions:

[Allxon swiftDR for Power Cycling](#)

# **3. Troubleshooting Your OOB Enabler**

## **3.1 Network Connectivity Requirements**

To get the best out of Allxon Services, ensure you are connected to a stable Internet connection. If your organization restricts Internet communications with the network using a firewall or proxy device, refer to the following webpage for detailed Information:

[Allxon Service Port/Protocol and Whitelist Information](#)

# E

## APPENDIX E : Power Consumption

| Testing Board   | ICS-1000                                |
|-----------------|-----------------------------------------|
| RAM             | 64GB * 8                                |
| USB-1           | USB Microsoft Wired Keyboard 600 1576   |
| USB-2           | USB Mouse HP MOFYUO                     |
| SATA 0          | Apacer AS340X 120GB                     |
| Graphics output | VGA                                     |
| Power plan      | Balance(Windows Server 2022 Power plan) |
| Power Source    | Chroma 62006P-100-25                    |
| Test Program    | BurnInTest V10.2 (Build 1011)           |

## E.1 Intel Xeon D-2752TER (20M Cache, up to 2.80 GHz)

Power on and boot to Windows Server 2022 64-bit (without turbo boost technology)

| CPU            | Power Input | Standby Mode |                 | Power on and boot to Windows Server 2022 64bit |                 |                    |                 |
|----------------|-------------|--------------|-----------------|------------------------------------------------|-----------------|--------------------|-----------------|
|                |             |              |                 | idle status CPU usage less 3%                  |                 | Run 100% CPU usage |                 |
|                |             | Max Current  | Max Consumption | Max Current                                    | Max Consumption | Max Current        | Max Consumption |
| Xeon D-2752TER | 16V         | 0.780A       | 12.48W          | 5.533A                                         | 88.53W          | 8.092A             | 129.47W         |
| Xeon D-2752TER | 24V         | 0.562A       | 13.49W          | 3.742A                                         | 89.81W          | 5.563A             | 133.51W         |
| Xeon D-2752TER | 36V         | 0.435A       | 15.66W          | 2.579A                                         | 92.84W          | 3.803A             | 136.91W         |
| Xeon D-2752TER | 50V         | 0.370A       | 18.50W          | 1.911A                                         | 95.55W          | 2.770A             | 138.50W         |



# F

## APPENDIX F : Supported Memory and Storage List

| Testing Board | ICS-1000                   |
|---------------|----------------------------|
| Memory Test   | MemTest86 V11.3 Build 1000 |
| BurnInTest    | V10.2 (Build 1011)         |

### F.1 Tset Item

| Channel     | Memory Test | Bunin | Reboot |
|-------------|-------------|-------|--------|
| DIMM1~DIMM8 | PASS        | PASS  | PASS   |

### F.2 Supported Non-ECC Memory List

| Brand                         | Info              | Test Temp. (Celsius) |
|-------------------------------|-------------------|----------------------|
| InnoDisk 8GB DDR4 3200 U-DIMM | M4U0-8GSX2CEM-H03 | 25°C                 |

### F.3 Supported ECC Memory List

| Brand                             | Info              | Test Temp. (Celsius) |
|-----------------------------------|-------------------|----------------------|
| InnoDisk 8GB DDR4 3200 ECC U-DIMM | M4C0-8GSSMCEM-H03 | 25°C                 |

## F.4 Supported RDIMM ECC Memory List

| Brand                         | Info              | Test Temp.<br>(Celsius) |
|-------------------------------|-------------------|-------------------------|
| InnoDisk 64GB DDR4 3200 RDIMM | M4R0-CGS7GCEM-H03 | 25°C                    |

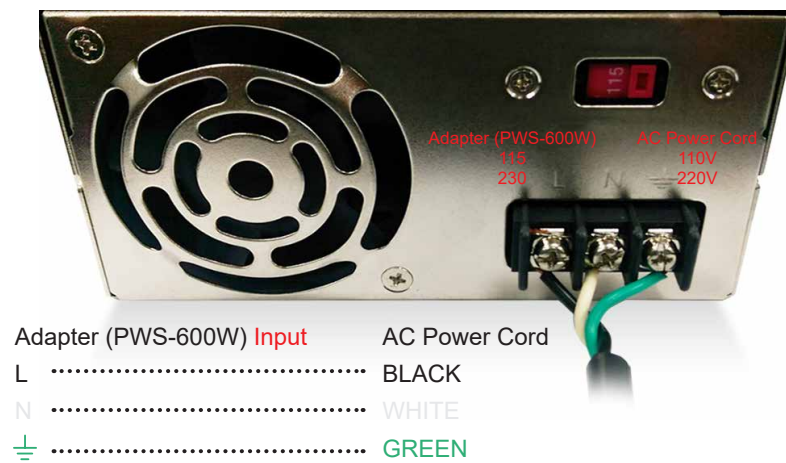
## F.5 Supported Storage Device List

| Type            | Brand     | Model                 | Capacity |
|-----------------|-----------|-----------------------|----------|
| SATA SSD        | Apacer    | AS340X                | 120GB    |
|                 | Innodisk  | DES25-C12DK1KCCQL-H03 | 512GB    |
|                 | Transcend | TS512GSSD460K         | 512GB    |
| M.2 PCIe<br>SSD | Innodisk  | DGM28-C12DP1KCAEF-H03 | 512GB    |
|                 | Transcend | TS512GMTE720T         | 512GB    |

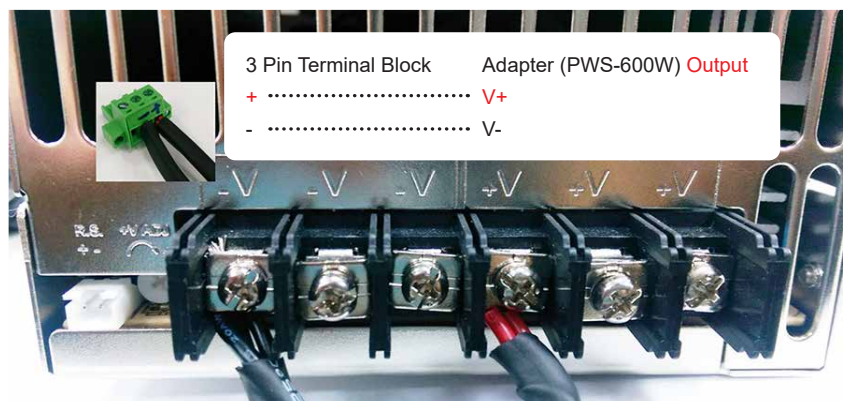


## APPENDIX G : How to Install Power Supply

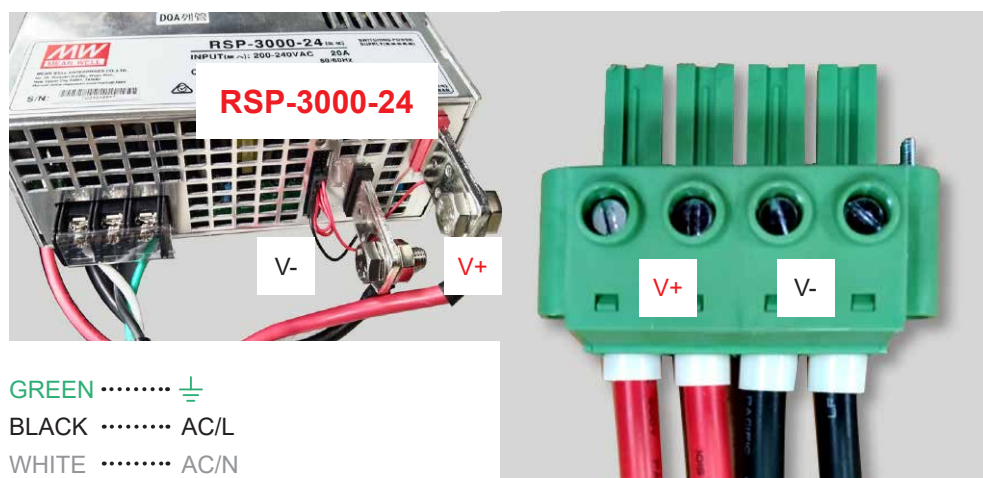
### G.1.1 PWS-600W Adapter AC Cable



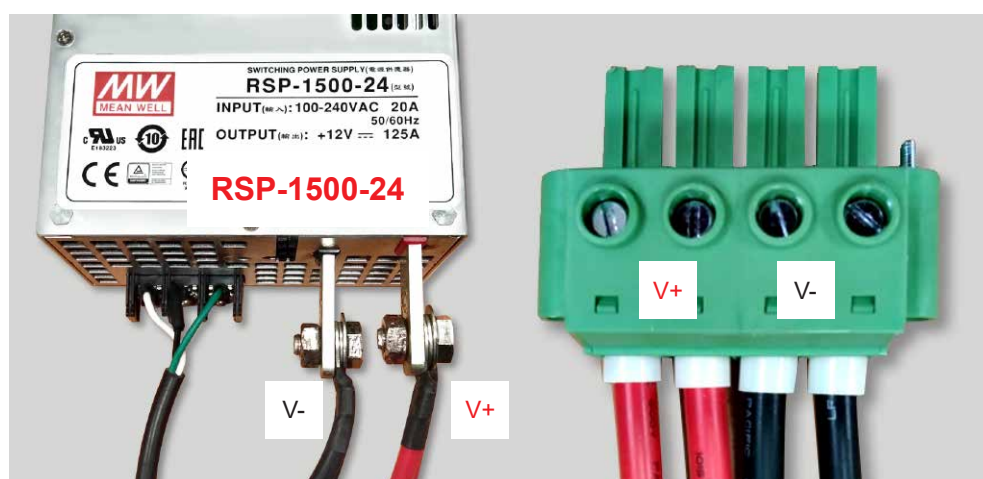
### G.1.2 PWS-600W Adapter DC Cable



## G.2.1 RSP-3000-24 Power Supply



## G.2.2 RSP-1500-24 Power Supply



\*\* If more help is needed, please contact Vecow technical support.



For further support information, please visit [www.vecow.com](http://www.vecow.com)

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