

ECS-9000 USER

Intel® Xeon®/Core™ i7/i5/i3 Fanless Embedded System
Workstation-grade, Rugged, -40°C to 75°C Extended Temperature

Manual

Record of Revision

| Version | Date | Page | Description | Remark |
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| 1.4 | 11/16/2018 | All | Remove M2DOM | |
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Order Information

| Part Number | Description |
|---------------|---|
| ECS-9000-9R | ECS-9000, 9 GigE LAN with 4 PoE ⁺ , 2 Front-access SSD Tray, 6 USB 3.0, 4 COM, 3 SIM, Isolated DIO |
| ECS-9000-9GD | ECS-9000, 9 GigE LAN with 4 PoE ⁺ , 6 USB 3.0, 4 COM, 3 SIM, 16 Isolated DIO |
| ECS-9000-PoER | ECS-9000, 6 GigE LAN with 4 PoE ⁺ , 2 Front-access SSD Tray, 6 USB 3.0, 4 COM, 3 SIM, Isolated DIO |
| ECS-9000-PoE | ECS-9000, 6 GigE LAN with 4 PoE ⁺ , 6 USB 3.0, 4 COM, 3 SIM, Isolated DIO |
| ECS-9000-6FR | ECS-9000, 6 GigE LAN with 2 SFP, 2 Front-access SSD Tray, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |
| ECS-9000-6F | ECS-9000, 6 GigE LAN with 2 SFP, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |
| ECS-9000-4R | ECS-9000, 4 GigE LAN, 2 Front-access SSD Tray, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |
| ECS-9000-4G | ECS-9000, 4 GigE LAN, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |
| ECS-9000-2R | ECS-9000, 2 GigE LAN, 2 Front-access SSD Tray, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |
| ECS-9000-2G | ECS-9000, 2 GigE LAN, 6 USB 3.0, 4 COM, 3 SIM, 16 GPIO |

Order Accessories

| Part Number | Description |
|-------------|---|
| E3-1275 v6 | 7th Gen Intel® Xeon® E3-1275 v6 Processor (8M Cache, up to 4.20GHz, 80W) |
| E3-1275 v5 | 6th Gen Intel® Xeon® E3-1275 v5 Processor (8M Cache, up to 4.00GHz, 80W) |
| E3-1225 v5 | 6th Gen Intel® Xeon® E3-1225 v5 Processor (6M Cache, up to 3.70GHz, 80W) |
| E3-1268L v5 | 6th Gen Intel® Xeon® E3-1268L v5 Processor (8M Cache, up to 3.40GHz, 35W) |
| i7-7700 | 7th Gen Intel® Core™ i7-7700 Processor (8M Cache, up to 4.20GHz, 65W) |
| i7-7700T | 7th Gen Intel® Core™ i7-7700T Processor (8M Cache, up to 3.80GHz, 35W) |
| i7-6700 | 6th Gen Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00GHz) |

| Part Number | Description |
|------------------|--|
| i7-6700TE | 6th Gen Intel® Core™ i7-6700TE Processor (8M Cache, up to 3.40GHz) |
| i5-7500 | 7th Gen Intel® Core™ i5-7500 Processor (6M Cache, up to 3.80GHz, 65W) |
| i5-7500T | 7th Gen Intel® Core™ i5-7500T Processor (6M Cache, up to 3.30GHz, 35W) |
| i5-6500 | 6th Gen Intel® Core™ i5-6500 Processor (6M Cache, up to 3.60GHz) |
| i5-6500TE | 6th Gen Intel® Core™ i5-6500TE Processor (6M Cache, up to 3.30GHz) |
| i3-7101E | 7th Gen Intel® Core™ i3-7101E Processor (3M Cache, up to 3.90GHz, 65W) |
| i3-7101TE | 7th Gen Intel® Core™ i3-7101TE Processor (3M Cache, up to 3.40GHz, 35W) |
| i3-6100 | 6th Gen Intel® Core™ i3-6100 Processor (3M Cache, 3.70GHz) |
| i3-6100TE | 6th Gen Intel® Core™ i3-6100TE Processor (4M Cache, 2.70GHz) |
| DDR4 32G | Certified DDR4 32GB 2666MHz RAM |
| DDR4 16G | Certified DDR4 16GB 2400/2133 MHz RAM |
| DDR4 8G | Certified DDR4 8GB 2400/2133 MHz RAM |
| DDR4 4G | Certified DDR4 4GB 2400/2133 MHz RAM |
| PWA-280W-WT | 280W, 24V, 85V AC to 264V AC Power Adapter with 3-pin Terminal Block (7.62mm pitch), Wide Temperature -30°C to +70°C |
| PWA-180W | 180W, 24V, 90V AC to 132V AC/ 180V AC to 264V AC Power Adapter with 3-pin Terminal Block, 0°C to +40°C |
| PWA-160W-WT | 160W, 24V, 85V AC to 264V AC Power Adapter with 3-pin Terminal Block (7.62mm pitch), Wide Temperature -30°C to +70°C |
| PWA-120W | 120W, 24V, 90V AC to 264V AC Power Adapter |
| VESA Mount | VESA Mounting Kit |
| Rack Mount | 2U Rackmount Kit |
| 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 |
| 4G Module | Mini PCIe 4G/GPS Module with Antenna |
| WiFi & Bluetooth | WiFi & Bluetooth Module with Antenna |

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1

GENERAL INTRODUCTION

1.1 Overview

Vecow ECS-9000 Series is an all-in-one integrated Fanless Embedded Workstation System. LGA1151 Socket supports Quad Core 6th Generation Intel® Xeon®/Core™ i7/i5/i3 processor (Kaby Lake/Skylake) running with workstation-grade Intel® C236 chipset, dual channel DDR4 2400MHz up to 64GB ECC memory, advanced Intel® HD Graphics P630/630/P530/530 supporting DirectX 12, OpenGL 4.4 and OpenCL 2.0 API, onboard DVI-I, DVI-D and DisplayPort display interface for Ultra HD 4K resolution, ECS-9000 offers new generation CPU performance, power efficiency, and graphics performance; PCIe 3.0 (8GT/s), Multiple SATA III (6Gbps), USB 3.0 (5Gbps), PoE (1Gbps) LAN and multiple wireless connections make seamless high-speed data conveying possible. Vecow ECS-9000 Series Fanless Embedded System delivers outstanding system performance and power productivity for demanding workloads in real-time mission critical embedded computing applications.

All-in-one and cable-less designs, fanless -40°C to 75°C operating temperature, 6 GigE LAN ports with 4 IEEE 802.3at (25.5W/48V) PoE⁺ without additional power connections, 2 Front-access 2.5" SSD/HDD trays, up to 6 SIM card sockets for WiFi/4G/3G/LTE/GPRS/UMTS, 1 Front-access CFast socket, 2 SATA III supports software RAID function, 6 external USB 3.0, 4 COM RS-232/422/485, up to 6 Mini PCIe expansions, 16 Isolated DIO, 6V to 36V wide range power input with 80V surge protection, configurable ignition power control, smart remote management features, remote power switch, EN50155 and EN50121-3-2 compliant, optional supports full function SUMIT A, B expansion for multiple 10G LAN/10G SPF+ Fiber connections, Vecow ECS-9000 Series Fanless Embedded System serves new-generation integration for rugged embedded applications.

With outstanding system performance, leading integrated features, smart manageability, flexible expandability, excellent mobile availability, secure power protection and more rugged reliability, Vecow ECS-9000 Series Fanless Embedded System is your superb solution for Machine Vision, Intelligent Automation, Smart Manufacturing, Embedded Cloud, Intelligent Surveillance, Vehicle Computing, Mobile Robot Control, and any performance-driven real-time Industry 4.0 applications in harsh environments.

1.2 Features

- LGA 1151 Socket supports Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) with Intel® C236 Chipset
- Fanless, -40°C to 75°C Operating Temperature
- 2 DDR4 2400/2133 MHz Memory, up to 64GB
- Up to 9 GigE LAN with 4 IEEE 802.3at PoE⁺, iAMT 11.0 supported (Optional)
- 6 Independent GigE LAN with 2 SFP, iAMT 11.0 supported (Optional)
- DVI-I, DVI-D and DisplayPort display interface, up to 4K display
- 3 Mini PCIe Slot, 4 COM, 6 USB 3.0
- 3 External SIM Card Socket support WiFi/4G/3G/LTE/GPRS/UMTS
- Up to 2 Front-access 2.5" HDD/SSD Tray, 1 Front-access CFast Socket
- Full function SUMIT A, B expansion (Optional)
- 16 Isolated DIO (Optional)
- 6V to 36V DC Power Input with 80V Surge Protection
- Configurable Ignition Power Control

1.3 Product Specification

1.3.1 Specifications of ECS-9000-9R

| System | |
|---------------|--|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none">• DDR4 2400/2133 MHz• Up to 64GB• 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none">• 6 USB 3.0 (External)• 1 USB 3.0 (Internal) |
| Isolated DIO | 16 Isolated DIO (8 DI, 8 DO) |
| LED | Power, HDD, Wireless, PoE |
| SIM Card | 3 SIM Card Socket (External) |

| Expansion | |
|--------------------|---|
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 7 | Intel® 82574L GigE LAN |
| LAN 8 | Intel® 82574L GigE LAN |
| LAN 9 | Intel® 82574L GigE LAN |
| PoE | |
| LAN 3 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 4 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 5 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 6 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |

| Others | |
|-------------------------|---|
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.2 Specifications of ECS-9000-9GD

| System | |
|----------------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| Isolated DIO | 16 Isolated DIO (8 DI, 8 DO) |
| LED | Power, HDD, Wireless, PoE |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal) |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |

| Ethernet | |
|-------------------------|---|
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 3 | Intel® I210 GigE LAN |
| LAN 4 | Intel® I210 GigE LAN |
| LAN 5 | Intel® I210 GigE LAN |
| LAN 6 | Intel® I210 GigE LAN |
| PoE | |
| LAN 3 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 4 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 5 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 6 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |

| Environment | |
|-----------------------|---|
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.3 Specifications of ECS-9000-PoER

| System | |
|---------------|--|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| Isolated DIO | 16 Isolated DIO (8 DI, 8 DO) |
| LED | Power, HDD, Wireless, PoE |
| SIM Card | 3 SIM Card Socket (External) |

| Expansion | |
|--------------------|---|
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| PoE | |
| LAN 3 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 4 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 5 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 6 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |

| Others | |
|-------------------------|---|
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.4 Specifications of ECS-9000-PoE

| System | |
|----------------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| Isolated DIO | 16 Isolated DIO (8 DI, 8 DO) |
| LED | Power, HDD, Wireless, PoE |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal) |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |

| Ethernet | |
|-------------------------|---|
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| PoE | |
| LAN 3 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 4 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 5 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| LAN 6 | GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel® I210 |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.5 Specifications of ECS-9000-6FR

| System | |
|----------------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |

| Storage | |
|-------------------------|---|
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 3 | Intel® I210 GigE LAN |
| LAN 4 | Intel® I210 GigE LAN |
| LAN 5 | Intel® I350 GigE LAN supports SFP+ |
| LAN 6 | Intel® I350 GigE LAN supports SFP+ |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |

| Environment | |
|-----------------------|---|
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.6 Specifications of ECS-9000-6F

| System | |
|---------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |

| Graphics | |
|-------------------------|--|
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal) |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 3 | Intel® I210 GigE LAN |
| LAN 4 | Intel® I210 GigE LAN |
| LAN 5 | Intel® I350 GigE LAN supports SFP+ |
| LAN 6 | Intel® I350 GigE LAN supports SFP+ |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |

| Mechanical | |
|-----------------------|---|
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.7 Specifications of ECS-9000-4R

| System | |
|---------------|--|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |

| I/O Interface | |
|----------------------|---|
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 3 | Intel® I210 GigE LAN |
| LAN 4 | Intel® I210 GigE LAN |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |

| | |
|-------------------------|---|
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.8 Specifications of ECS-9000-4G

| System | |
|----------------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal) |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |

| Ethernet | |
|-------------------------|---|
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| LAN 3 | Intel® I210 GigE LAN |
| LAN 4 | Intel® I210 GigE LAN |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.9 Specifications of ECS-9000-2R

| System | |
|----------------------|---|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |
| Expansion | |
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |

| Storage | |
|-------------------------|---|
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |
| Software Support | |
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |

| Environment | |
|-----------------------|---|
| Operating Temperature | 35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F) 80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°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% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.3.10 Specifications of ECS-9000-2G

| System | |
|---------------|--|
| Processor | Quad Core Intel® Xeon®/Core™ i7/i5/i3 Processor (Kaby Lake-S/Skylake-S) |
| Chipset | Intel® C236 |
| BIOS | AMI |
| SIO | IT8786E |
| Memory | <ul style="list-style-type: none"> • DDR4 2400/2133 MHz • Up to 64GB • 2 260-pin SO-DIMM Socket |
| I/O Interface | |
| Serial | 4 COM RS-232/422/485 w/auto flow control |
| USB | <ul style="list-style-type: none"> • 6 USB 3.0 (External) • 1 USB 3.0 (Internal) |
| GPIO | 16 GPIO |
| LED | Power, HDD, Wireless |
| SIM Card | 3 SIM Card Socket (External) |

| Expansion | |
|--------------------|---|
| Mini PCIe | 3 Mini PCIe Socket : <ul style="list-style-type: none"> • 2 Full-size for PCIe/USB/External SIM Card/mSATA • 1 Half-size for PCIe/USB 3.0/External SIM Card |
| SUMIT A, B | 2 SUMIT Slot (Optional) |
| Graphics | |
| Graphics Processor | Intel® HD Graphics P630/630/P530/530 |
| Interface | <ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1200 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz |
| Storage | |
| SATA | 2 SATA III (6Gbps) |
| mSATA | 2 SATA III (Mini PCIe Type, 6Gbps) |
| SATA DOM | 1 SATA II (3Gbps) |
| Storage Device | <ul style="list-style-type: none"> • 1 CFast Socket, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal) |
| Audio | |
| Audio Codec | Realtek ALC888S-VD, 7.1 Channel HD Audio |
| Audio Interface | 1 Mic-in, 1 Line-out |
| Ethernet | |
| LAN 1 | Intel® I219LM GigE LAN supports iAMT 11.0 |
| LAN 2 | Intel® I210 GigE LAN |
| Power | |
| Input Voltage | 6V to 36V, DC-in |
| Power Interface | <ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • Mini-DIN 4-pin |
| Ignition Control | 16 Mode (Internal) |
| Remote Switch | 3-pin Terminal Block : On, Off, IGN |
| Surge Protection | Up to 80V/1ms Transient Power |
| Others | |
| TPM | Optional Infineon SLB9665 supports TPM 2.0, LPC 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. |

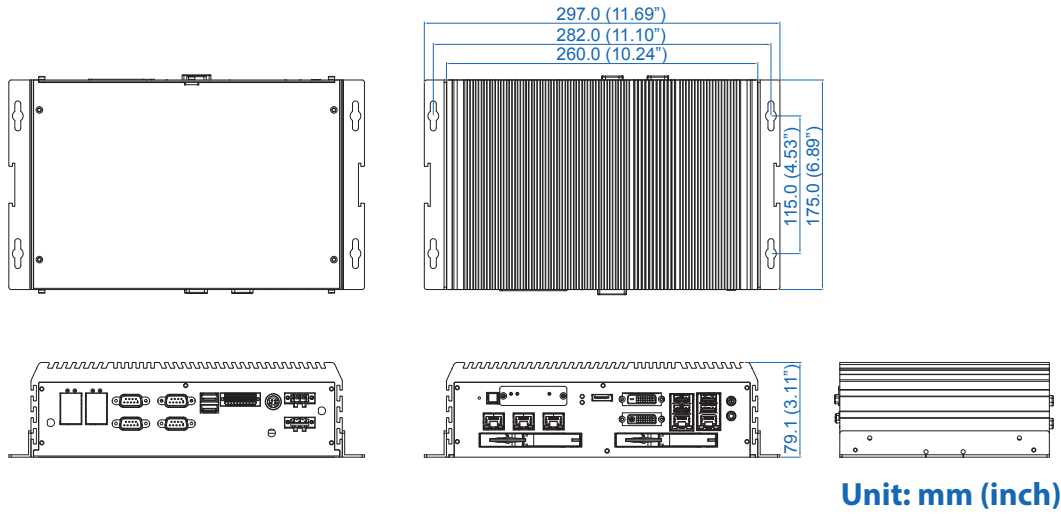
| Software Support | |
|-------------------------|--|
| OS | Windows 10, Windows 8.1, Windows 7, Linux |
| Mechanical | |
| Dimensions (WxDxH) | 260mm x 175mm x 79mm (10.24" x 6.89" x 3.11") |
| Weight | 3.8 kg (8.38 lb) |
| Mounting | <ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional) |
| Environment | |
| Operating Temperature | <p>35W TDP CPU : Core™ i7, i5, i3 : -40°C to 75°C (-40°F to 167°F) Xeon® E3-1268L v5 : -40°C to 70°C (-40°F to 158°F)</p> <p>65W TDP CPU : Core™ i7, i5, i3 : -40°C to 55°C (-40°F to 131°F)</p> <p>80W TDP CPU : Xeon® E3-1275 v6, E3-1275 v5, E3-1225 v5 : -40°C to 45°C (-40°F to 113°F)</p> |
| Storage Temperature | -40°C to 85°C (-40°F to 185°F) |
| Humidity | 5% to 95% Humidity, non-condensing |
| Relative Humidity | 95% at 75°C |
| Shock | <ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms |
| Vibration | <ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis |
| EMC | E13, CE, FCC, EN50155, EN50121-3-2 |

1.4 Supported CPU List

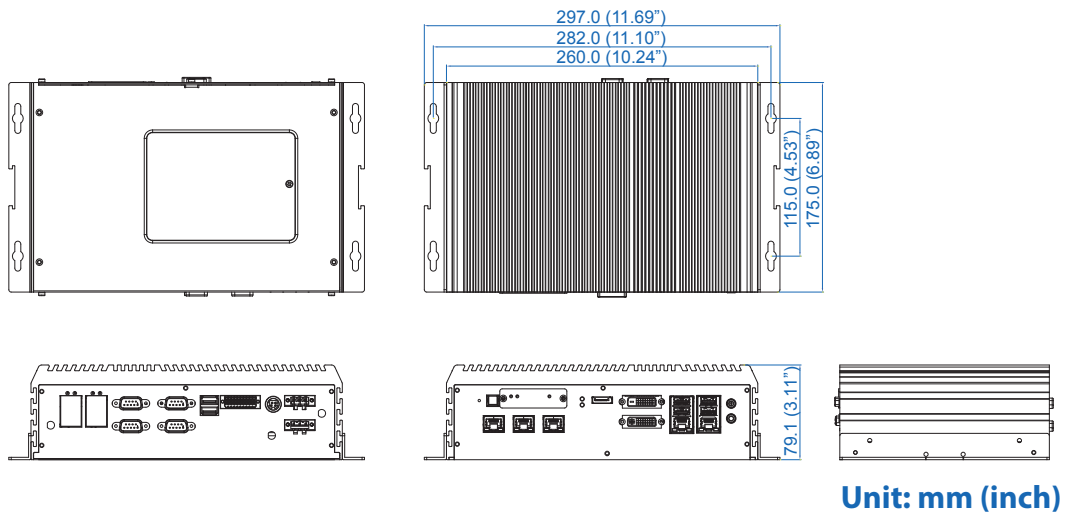
| Processor No. | TDP | Cache | Max. Frequency | Embedded |
|-------------------------|-----|-------|----------------|----------|
| Intel® Xeon® E3-1275 v6 | 80W | 8M | Up to 4.20 GHz | Y |
| Intel® Xeon® E3-1275 v5 | 80W | 8M | Up to 4.00 GHz | Y |
| Intel® Xeon® E3-1225 v5 | 80W | 8M | Up to 3.70 GHz | Y |
| Intel® Xeon® E3-1268 v5 | 35W | 8M | Up to 3.40 GHz | Y |
| Intel® Core™ i7-7700 | 65W | 8M | Up to 4.20 GHz | Y |
| Intel® Core™ i7-7700T | 35W | 8M | Up to 3.80 GHz | Y |
| Intel® Core™ i7-6700 | 65W | 8M | Up to 4.00 GHz | Y |
| Intel® Core™ i7-6700TE | 35W | 8M | Up to 3.40 GHz | Y |
| Intel® Core™ i5-7500 | 65W | 6M | Up to 3.80 GHz | Y |
| Intel® Core™ i5-7500T | 35W | 6M | Up to 3.30 GHz | Y |
| Intel® Core™ i5-6500 | 65W | 6M | Up to 3.60 GHz | Y |
| Intel® Core™ i5-6500TE | 35W | 6M | Up to 3.30 GHz | Y |
| Intel® Core™ i3-7101E | 65W | 3M | Up to 3.90 GHz | Y |
| Intel® Core™ i3-7101TE | 35W | 3M | Up to 3.40 GHz | Y |
| Intel® Core™ i3-6100 | 65W | 4M | Up to 3.70 GHz | Y |
| Intel® Core™ i3-6100TE | 35W | 4M | Up to 2.70 GHz | Y |

1.5 Mechanical Dimension

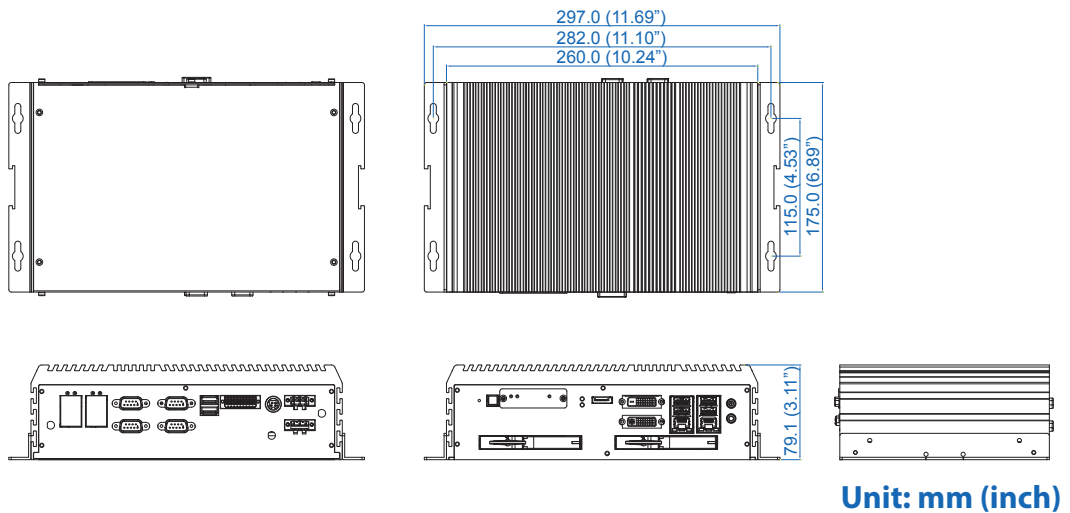
1.5.1 Dimensions of ECS-9000-9R



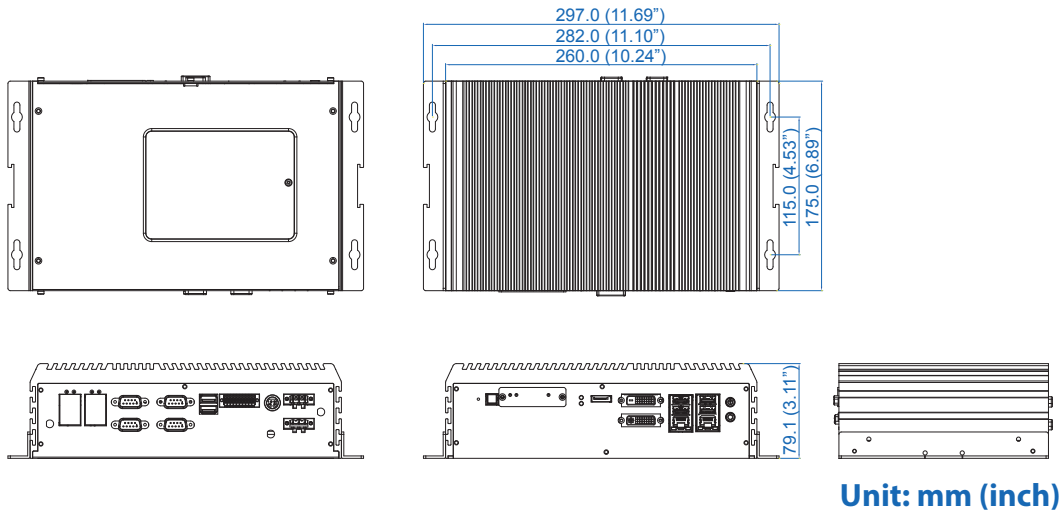
1.5.2 Dimensions of ECS-9000-9GD



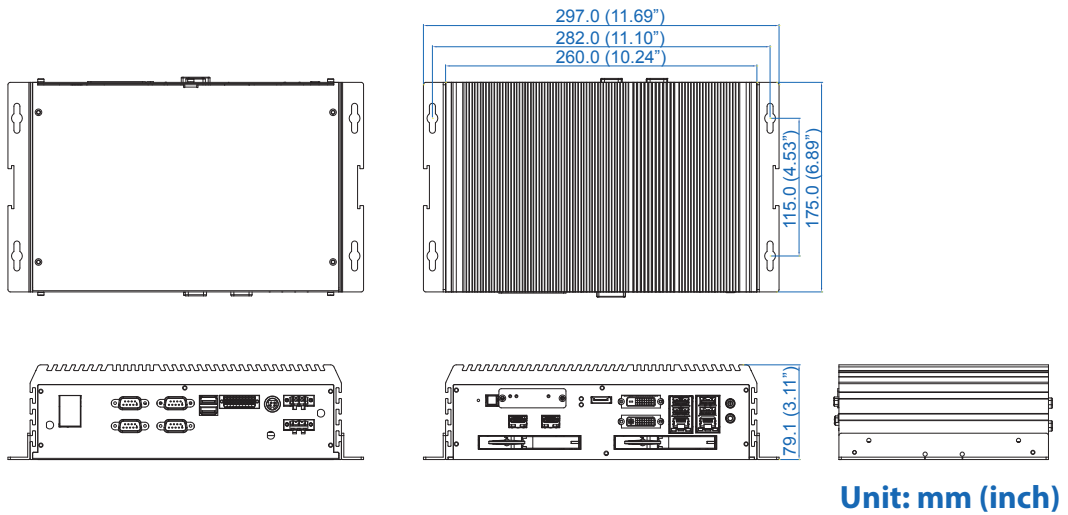
1.5.3 Dimensions of ECS-9000-PoER



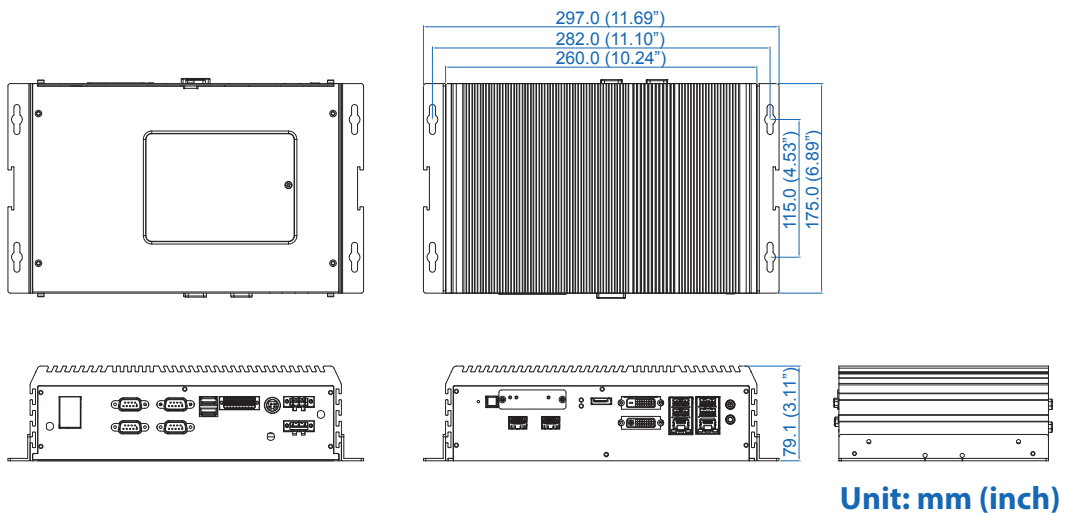
1.5.4 Dimensions of ECS-9000-PoE



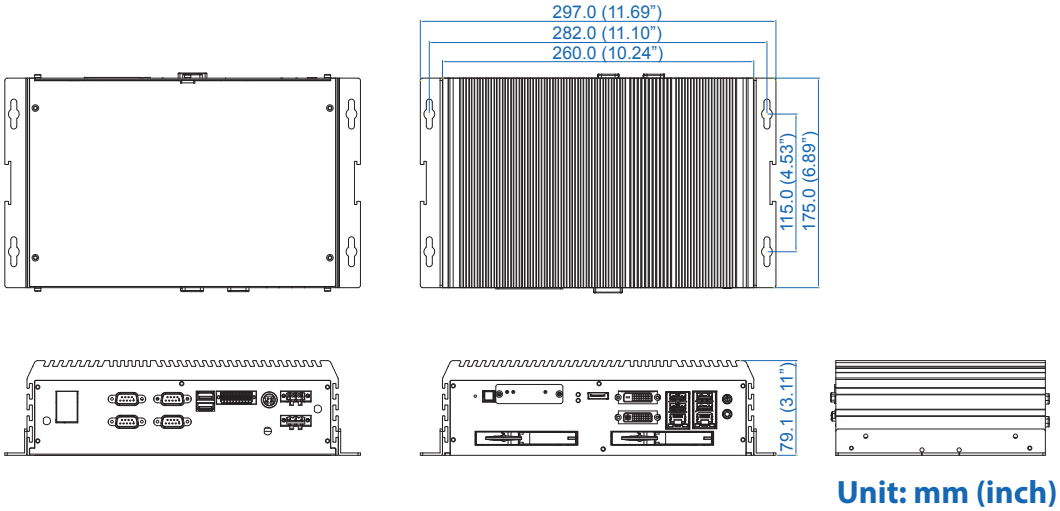
1.5.5 Dimensions of ECS-9000-6FR



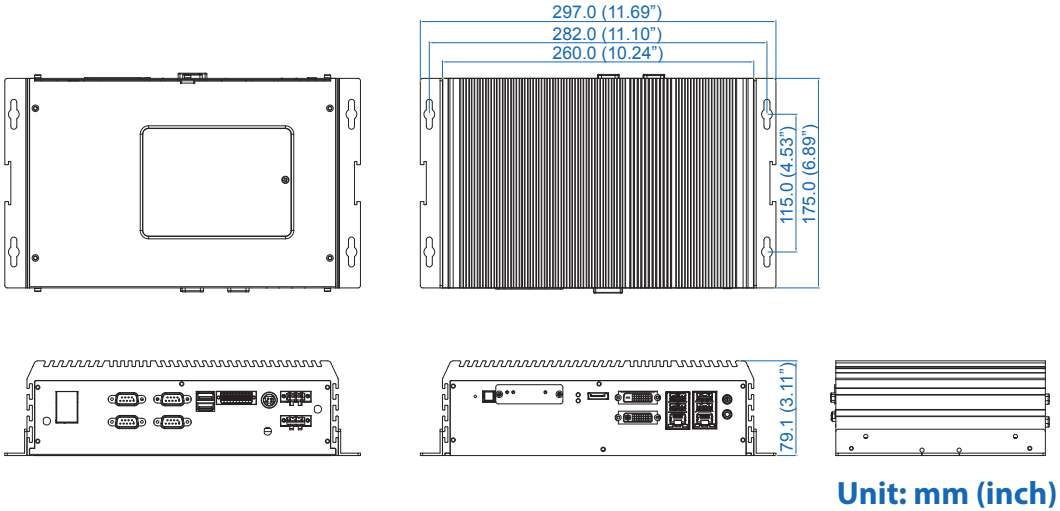
1.5.6 Dimensions of ECS-9000-6F



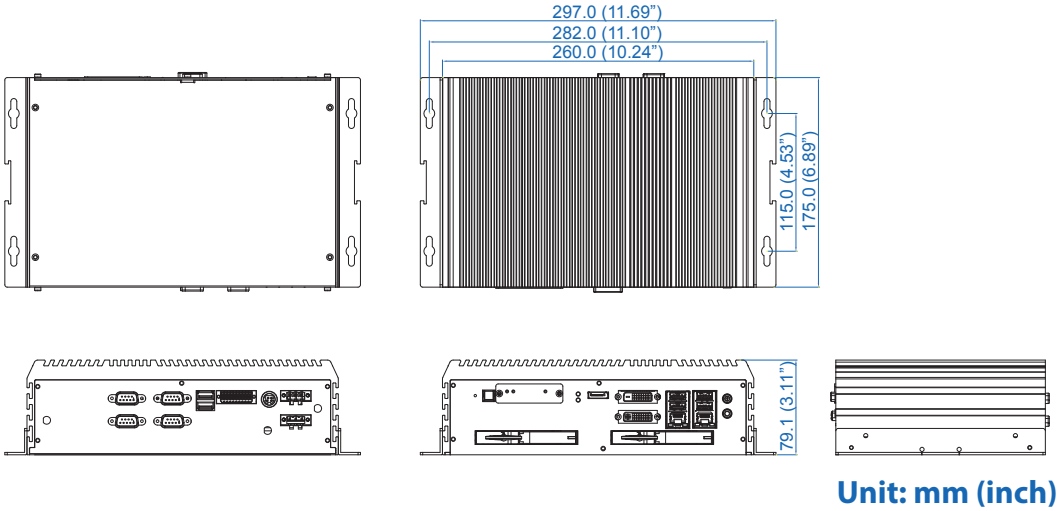
1.5.7 Dimensions of ECS-9000-4R



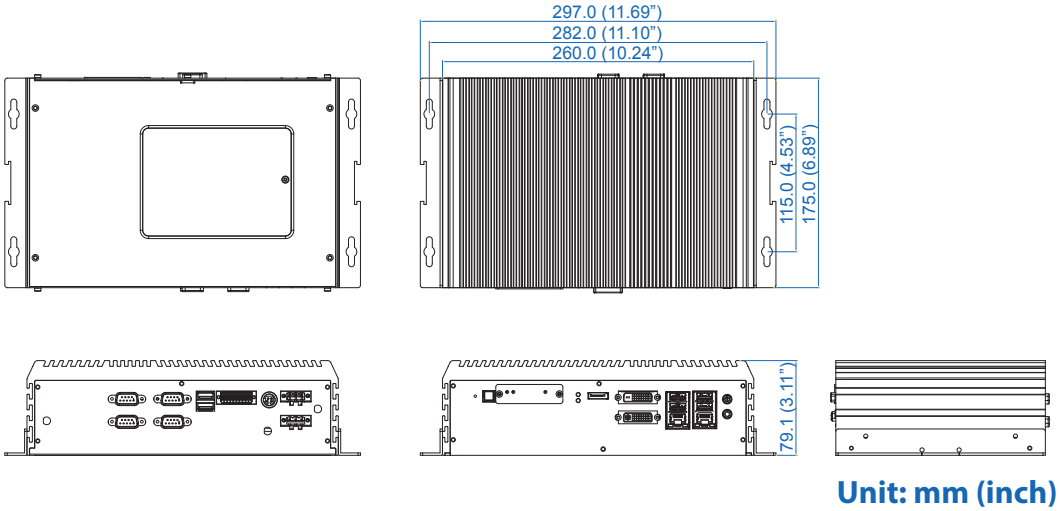
1.5.8 Dimensions of ECS-9000-4G



1.5.9 Dimensions of ECS-9000-2R



1.5.10 Dimensions of ECS-9000-2G



2

GETTING TO KNOW YOUR ECS-9000

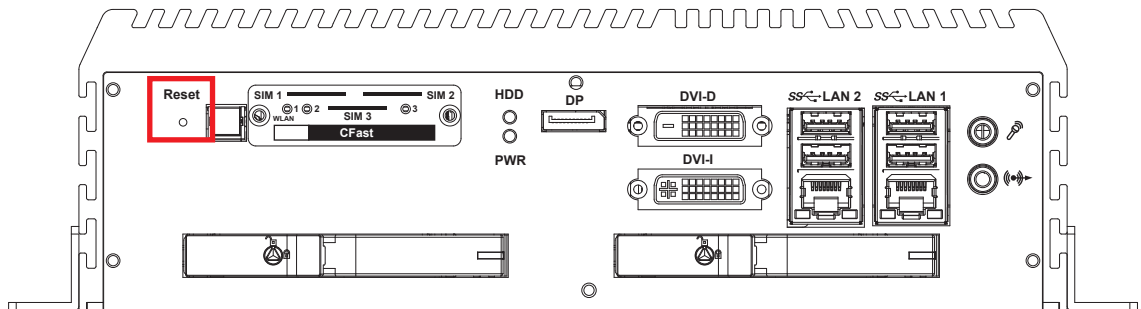
2.1 Packing List

| Item | Description | Qty |
|------|---|---|
| 1 | ECS-9000 Fanless Embedded System (According to the configuration of you order, the ECS-9000 series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.) | 1 |
| 2 | ECS-9000-9GD/PoE/6F/4G/2G accessory box, which contains <ul style="list-style-type: none">● Wall-mounting bracket● KHS#6-32x6 screw for wall-mounting bracket● M2.5x6 screw for Mini PCIe Slot● Din-Rail-PH-Mx16.5-S-Ni● 3-pin pluggable terminal block● 20-pin pluggable terminal block● Foot Pad● SSD/HDD Bracket KH-M3x6L Ni● SATA cable | 2 8 3 4 2 1 4 8 1 |
| 3 | ECS-9000-9R/PoER/6FR/4R/2R accessory box, which contains <ul style="list-style-type: none">● Wall-mounting bracket● KHS#6-32x6 screw for wall-mounting bracket● M2.5x6 screw for Mini PCIe Slot● Din-Rail-PH-M4x16.5-S-Ni● 3-pin pluggable terminal block● 20-pin pluggable terminal block● Foot Pad● SSD/HDD Tray Key | 2 8 3 4 2 1 4 2 |

2.2 Front Panel I/O Functions

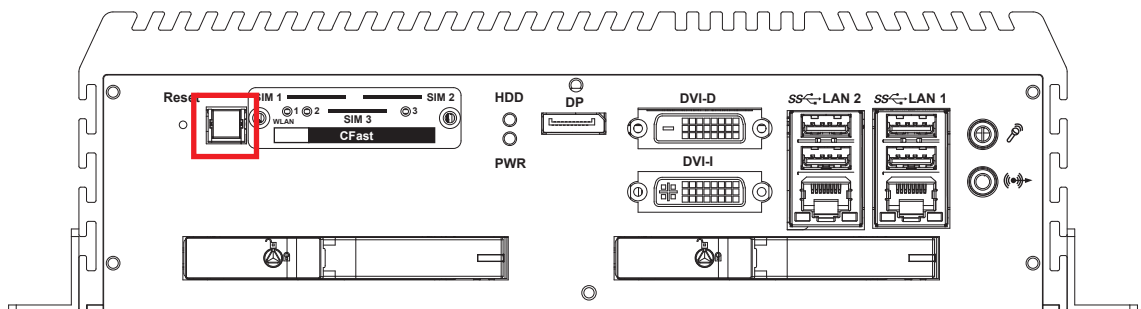
In Vecow ECS-9000 series family, all I/O connectors are located on front panel and rear panel. Most of the general connections to computer device, such as USB, LAN Jack, Display, DVI-D, Display Port and any additional storage, are placed on the front panel.

2.2.1 Reset Tact Switch



It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.2 Power Button



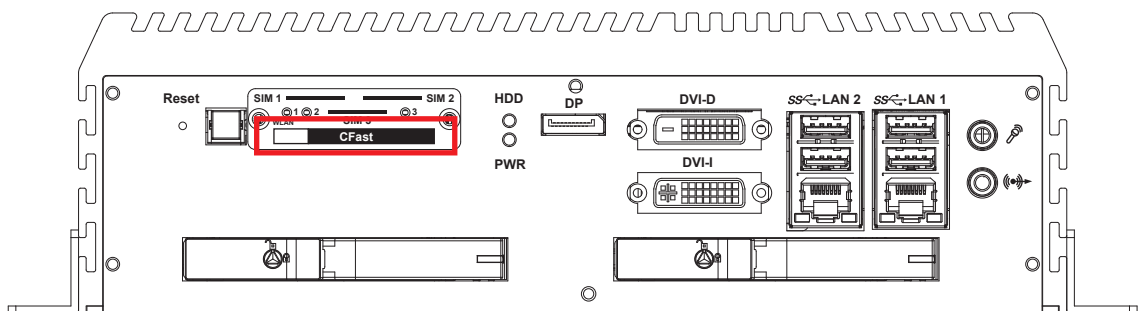
The Power Button is a non-latched switch with dual color LED indication. It indicates power status: S0, S3 and S5. More detail LED indications are listed as follows:

| 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 the system, press the power button and then the blue LED is lightened. To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

If system error, you can just press the power button for 4 seconds to shut down the machine directly. Please do note that a 4-second interval between each 2 power-on/ power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for 4 seconds to initiate another power-on operation).

2.2.3 CFast Card

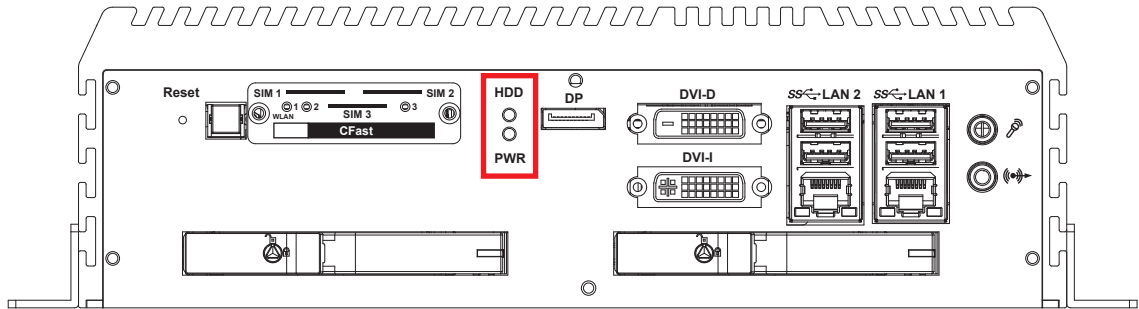


There is a CFast socket on the front panel supporting Type-I/II Compact Flash card. It is implemented by a SATA III Port from CM236 PCH. Be sure to disconnect the power source and unscrew the CFast socket cover before installing a CFast card. The ECS-9000 does not support the CFast hot swap and PnP (Plug and Play) functions. It is necessary to remove power source first before inserting or removing the CFast card.

The pinouts of CFast port are listed as follows:

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| S1 | GND | PC6 | NC |
| S2 | SATA_TXP5 | PC7 | GND |
| S3 | SATA_TXN5 | PC8 | CFAST_LED |
| S4 | GND | PC9 | NC |
| S5 | SATA_RXN5 | PC10 | NC |
| S6 | SATA_RXP5 | PC11 | NC |
| S7 | GND | PC12 | NC |
| PC1 | GND | PC13 | +3.3V |
| PC2 | GND | PC14 | +3.3V |
| PC3 | NC | PC15 | GND |
| PC4 | NC | PC16 | GND |
| PC5 | NC | PC17 | NC |

2.2.4 PWR and HDD LED Indicator

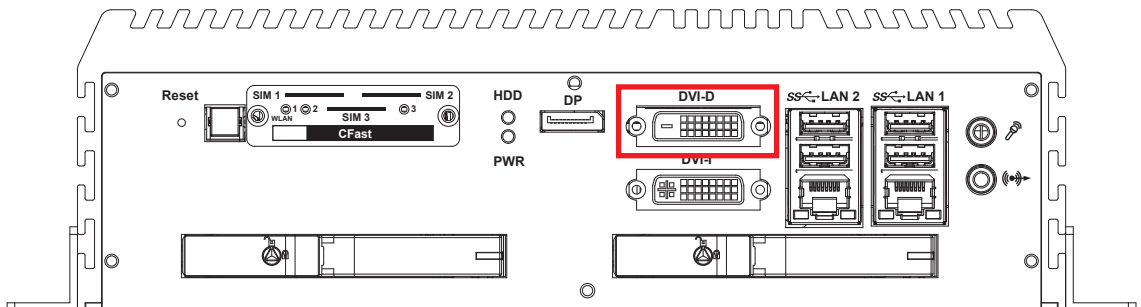


HDD LED/Yellow: A Hard Disk/CFast LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

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

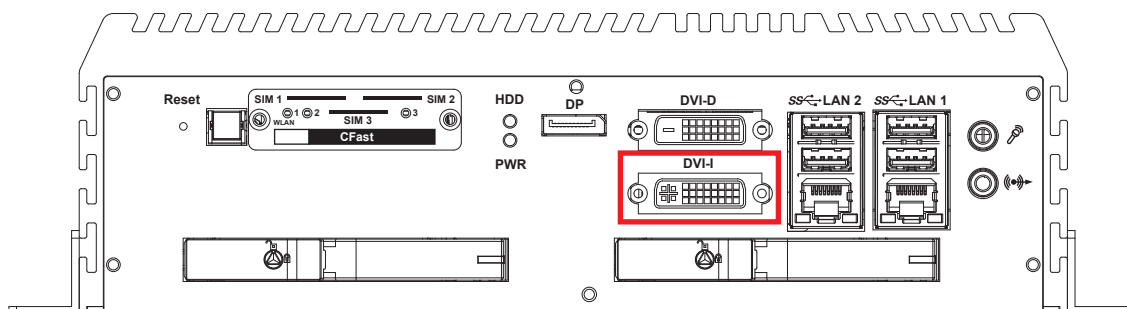
| LED Color | Power Status | System Status |
|-----------|--------------|---|
| Yellow | HDD/CFast | <ul style="list-style-type: none"> • On/Off : Storage status, function or not. • Twinkling : Data transferring. |
| Green | Power | System power status (On/Off) |

2.2.5 DVI-D Connector

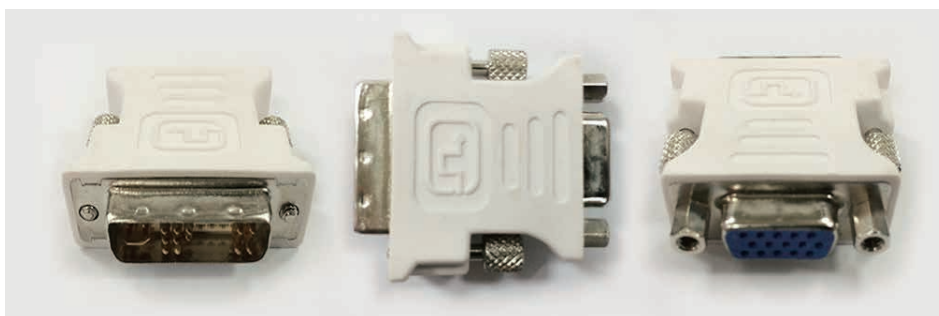


The DVI-D connector on the front panel supports DVI display. This connector can either output DVI signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

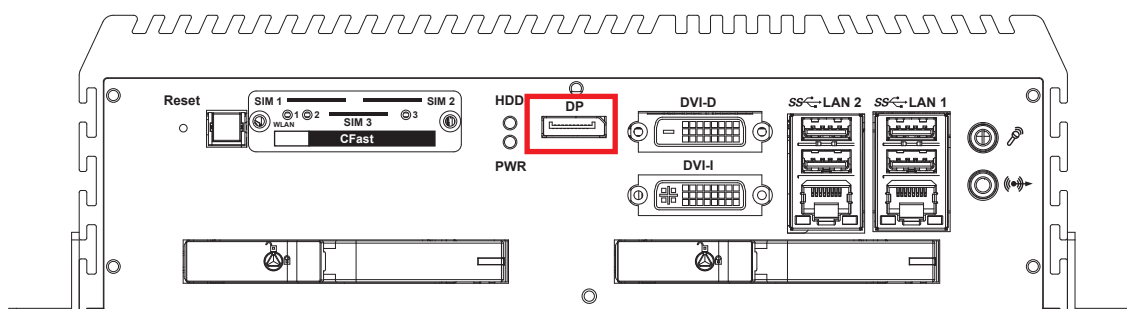
2.2.6 DVI-I Connector



The DVI-I connector on the front panel supports both DVI and VGA display modes. This connector can output DVI signals. The DVI output mode supports up to 1920 x 1200 resolution. The DVI mode is automatically selected according to the display device connected. You will need a DVI-I cable when connecting to a display device. The VGA output mode supports up to 1920 x 1200 resolution. If use VGA function will need a DVI-I to VGA module connecting to DVI-I device. Below is the DVI-I to VGA module picture:

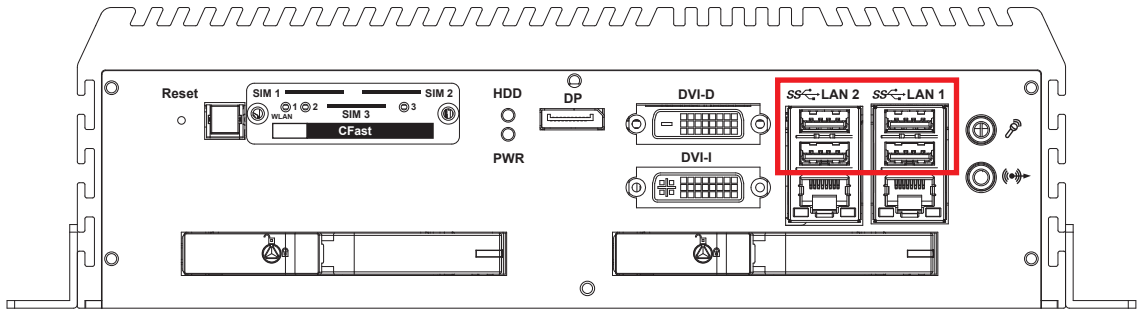


2.2.7 DisplayPort



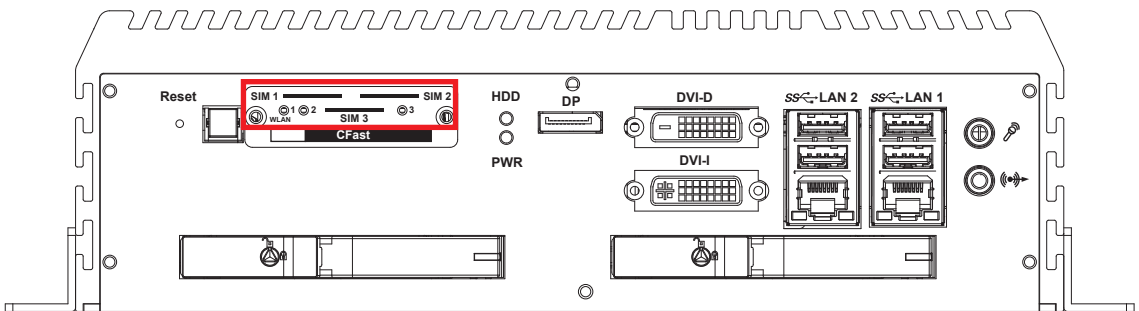
Onboard Display Port support auxiliary channel dual mode, connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.8 USB 3.0



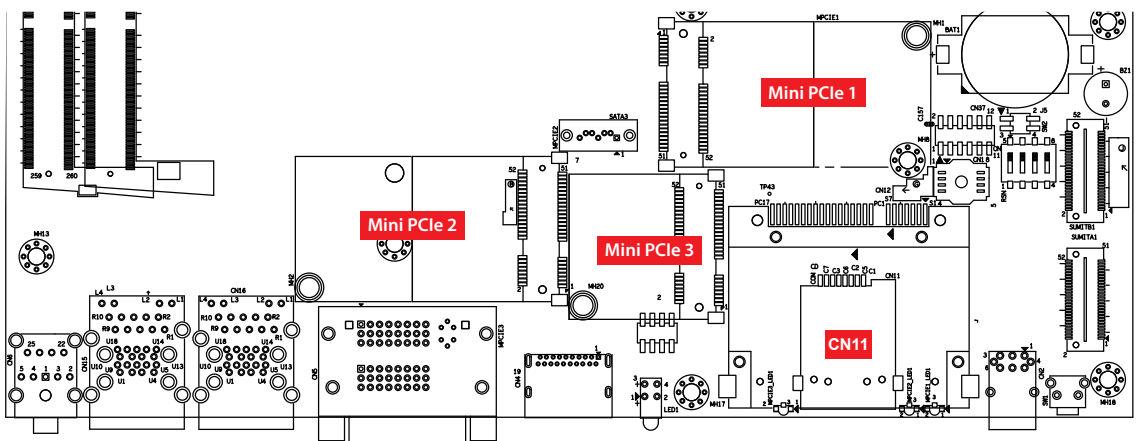
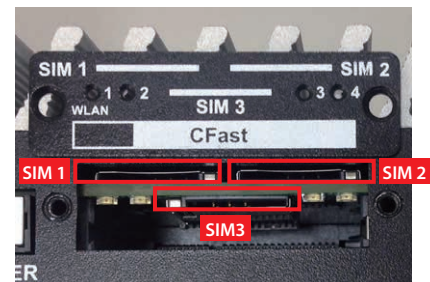
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of ECS-9000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

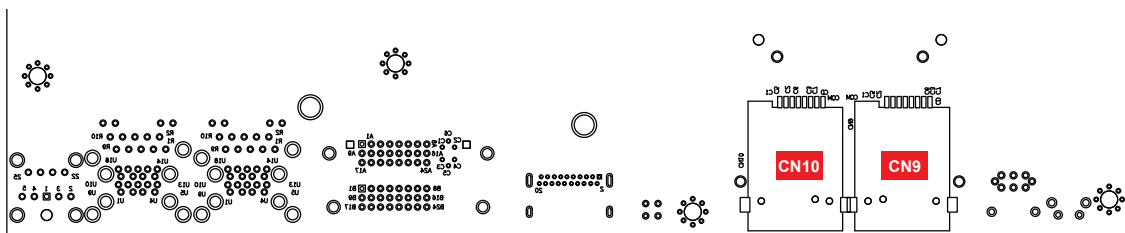
2.2.9 WLAN LED, Mini PCIe, SIM Card Comparison



Mini PCIe Slot/SIM Slot/WLAN LED Mapping Table :

| Mini PCIe | SIM | LED |
|-------------|--------------|-----|
| Mini PCIe 1 | SIM 1 (CN9) | 1 |
| Mini PCIe 2 | SIM 2 (CN10) | 2 |
| Mini PCIe 3 | SIM 3 (CN11) | 3 |

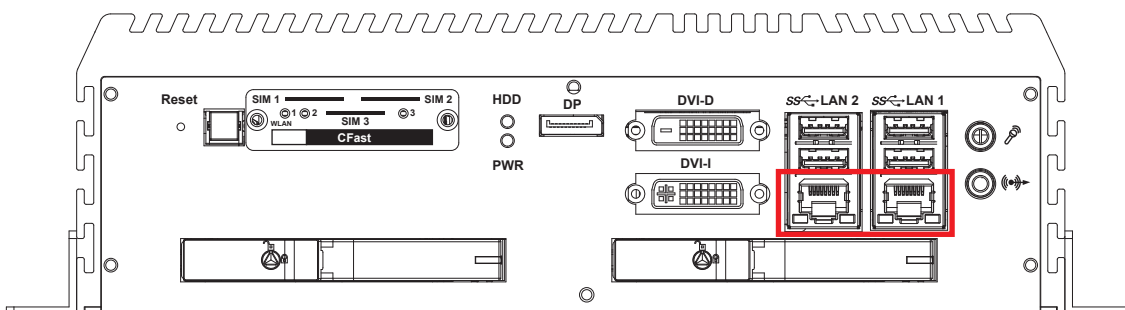




Note:

The SIM card sockets do not support hot-plug. Please make sure to unplug the system power before inserting the SIM card(s).

2.2.9 Ethernet Port



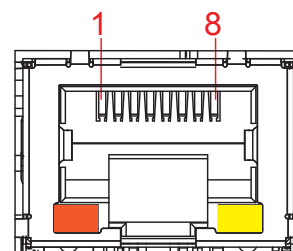
There are 2 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 is powered by Intel I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, iAMT 11.0 function is enabled.

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 LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

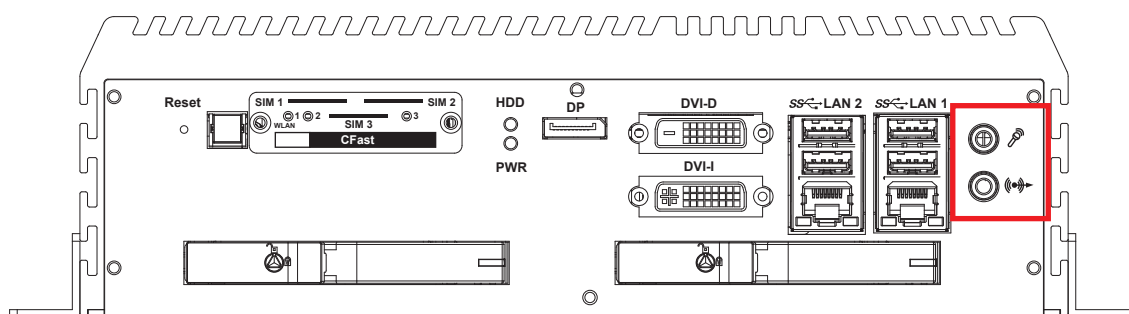
| Pin No. | 10/100 Mbps | 1000Mbps |
|---------|-------------|----------|
| 1 | E_TX+ | MDI0_P |
| 2 | E_TX- | MDI0_N |
| 3 | E_RX+ | MDI1_P |
| 4 | ---- | MDI2_P |
| 5 | ---- | MDI2_N |
| 6 | E_RX- | MDI1_N |
| 7 | ---- | MDI3_P |
| 8 | ----- | MDI3_N |

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.

| | 10Mbps | 100Mbps | 1000Mbps |
|------------------|--------------|--------------|--------------|
| Right Bottom Led | Off | Solid Green | Solid Orange |
| Left Bottom Led | Flash Yellow | Flash Yellow | Flash Yellow |

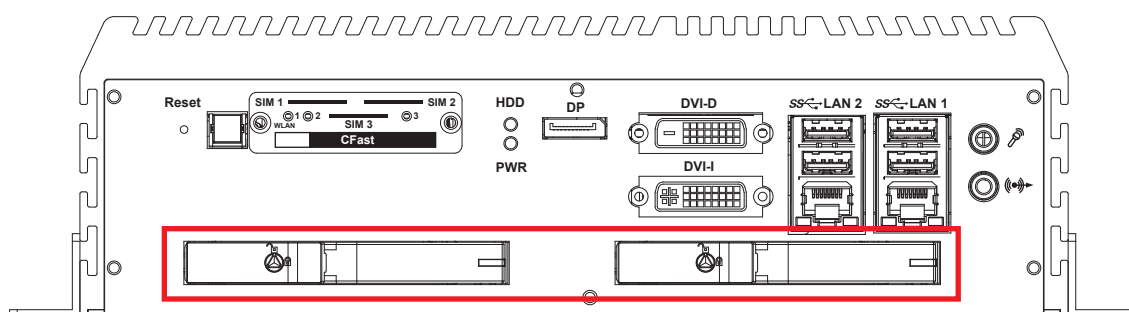


2.2.11 Audio Connector



There are 2 audio connectors, Mic-in and Line-out, in the front side of ECS-9000. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for both Intel CM236 chipset and Realtek ALC888S-VD codec.

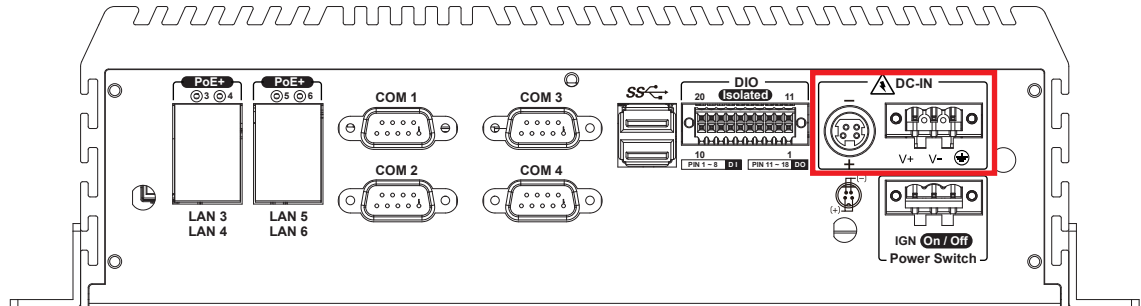
2.2.12 SSD/HDD Tray



There are 2 front-access 2.5" SSD/HDD trays in the front side of ECS-9000. Just trigger to open the SSD/HDD tray, up to 4TB is available.

2.3 Rear Panel I/O and Functions

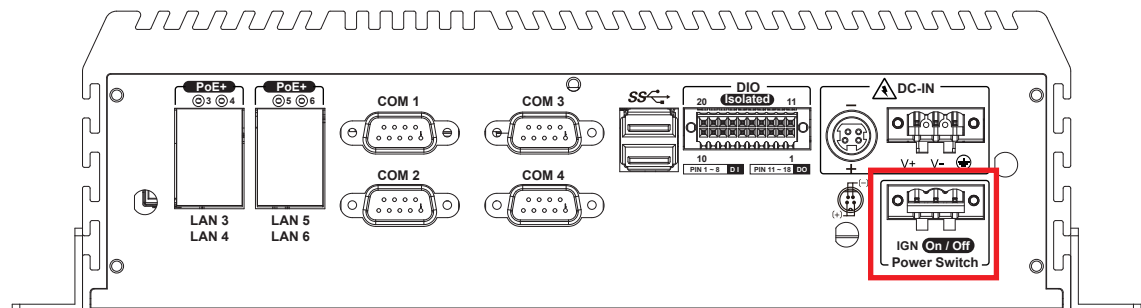
2.3.1 Power Terminal Block



This system supports 6V to 36V DC power input by terminal block in the rear side. In normal power operation, power LED lightens in solid green. Supports up to 80V surge protection.

| Pin No. | Definition | Pin No. | Definition |
|---------|----------------|---------|------------|
| 1 | V+ | 2 | V- |
| 3 | Chassis Ground | | |

2.3.2 Remote Power On/Off Switch & Ignition

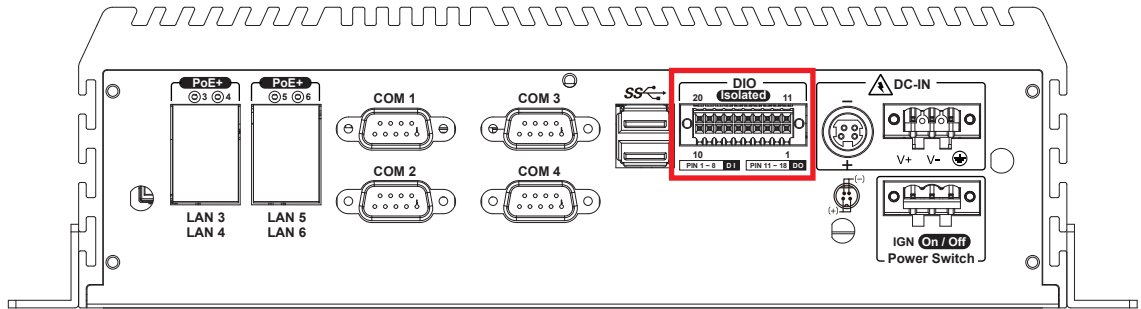


It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/ power-off (instant off or delay 4 second), and suspend mode.

| Pin No. | Definition | Pin No. | Definition |
|---------|--------------------------|---------|--------------------------|
| 1 | Ignition | 2 | External Power Button V+ |
| 3 | External Power Button V- | | |

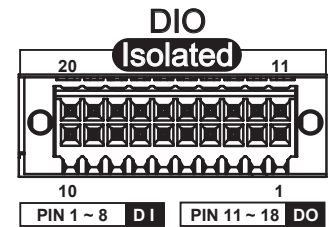
2.3.3 Isolated DIO/GPIO

2.3.3.1 Isolated DIO



There is a 16-bit (8-bit DI, 8-bit DO) connectors in the rear side. DI/DIO supports 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:

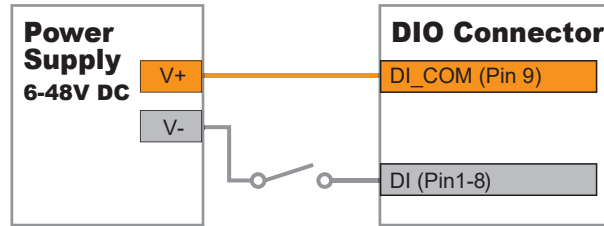
- 4242-VPK Basic Isolation per DIN V VDE V 0884-10 and DIN EN 61010-1
- 3-KVRMS Isolation for 1 minute per UL 1577
- CSA Component Acceptance Notice 5A, IEC 60950-1 and IEC 61010-1 End Equipment Standards
- GB4943.1-2011 CQC Certified



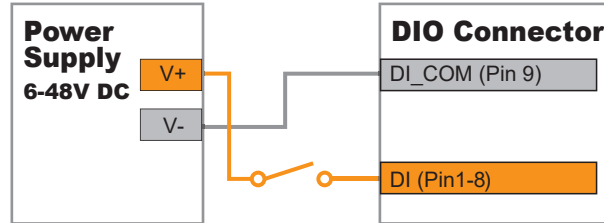
DIO connectors pin out:

| DIO | Pin No. | Definition | Function |
|-----|---------|------------------------|-----------|
| DIO | 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 | DI1_COM | - |
| | 10 | DIO1_GND | - |
| | 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 | DIO1_GND | - |
| | 20 | DIO1_VDC (6~48V Input) | - |

Sink Mode (NPN)

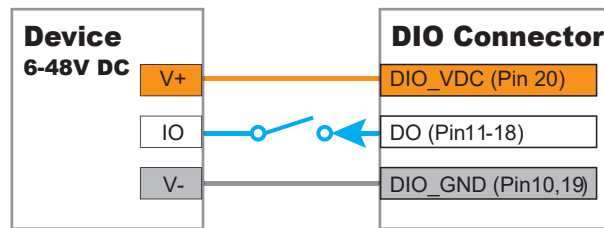


Source Mode (PNP)

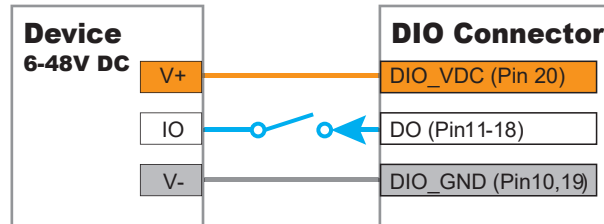


DO Reference Circuit:

Sink Mode
(NPN, Default)



Source Mode (PNP)



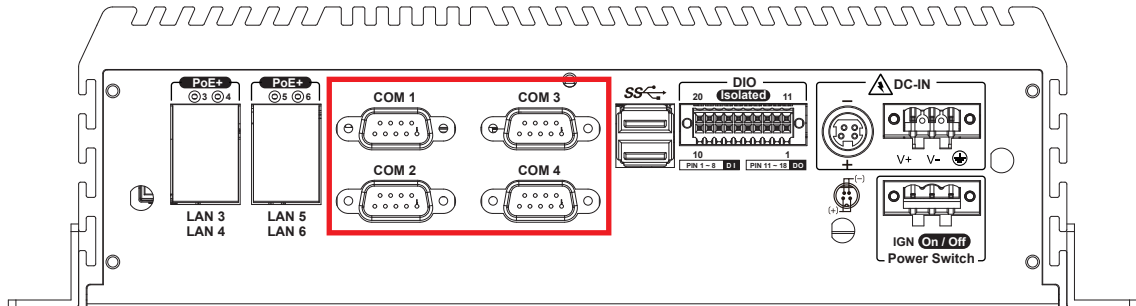
2.3.3.2 GPIO

The system offers sixteen programmable I/O .

If the GPIO is logic high, it indicates that the mapping SIO GPIO pin is logic high level. If the GPIO is logic low, it indicates that the mapping SIO GPIO pin is logic low level. GPIO Connectors pin assignments :

| Pin No. | Definition | Pin No. | Definition |
|---------|------------|---------|------------|
| 1 | SIO_GPI70 | 11 | SIO_GPO80 |
| 2 | SIO_GPI71 | 12 | SIO_GPO81 |
| 3 | SIO_GPI72 | 13 | SIO_GPO82 |
| 4 | SIO_GPI73 | 14 | SIO_GPO83 |
| 5 | SIO_GPI74 | 15 | SIO_GPO84 |
| 6 | SIO_GPI75 | 16 | SIO_GPO85 |
| 7 | SIO_GPI76 | 17 | SIO_GPO86 |
| 8 | SIO_GPI77 | 18 | SIO_GPO87 |
| 9 | ----- | 19 | ----- |
| 10 | ----- | 20 | ----- |

2.3.4 Serial Port



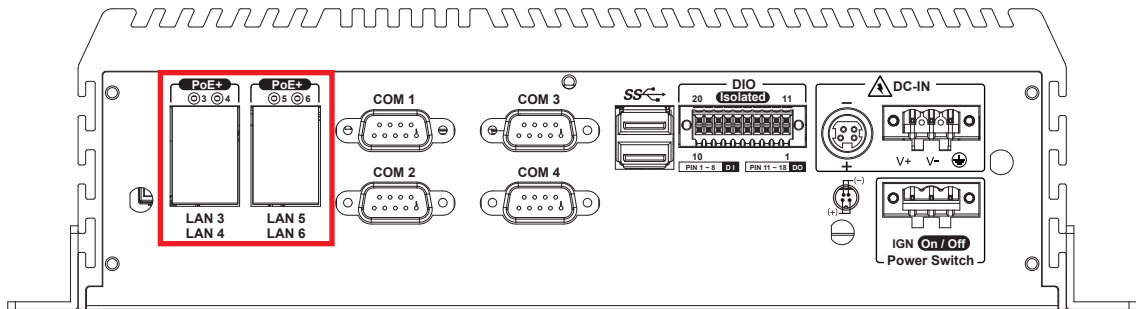
Serial port 1 to 4 (COM 1 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

| BIOS Setting | Function |
|--------------|------------------------------|
| COM 1 | RS-232 |
| | RS-422 (5-wire) |
| COM 2 | RS-422 (9-wire) |
| COM 3 | RS-485 |
| COM 4 | RS-485 w/z auto-flow control |

The pin assignments are listed in the table as follow :

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

2.3.5 PoE (Power over Ethernet) Ports



There are 4 RJ45 connectors in the rear side of ECS-9000. It supports IEEE 802.3at (PoE⁺) Power over Ethernet (PoE) connection delivering up to 37W/54V per port and 1000BASE-T GigE data signals over standard Ethernet Cat 5/Cat 6 cable. Each PoE connection is powered by Intel[®] I210 GigE Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be lightened.

PS. Suggest to use PoE function when power input is over 12V.

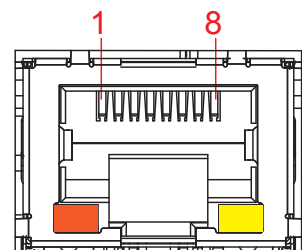
The pin-outs of LAN 1 and LAN 2 are listed as follows:

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

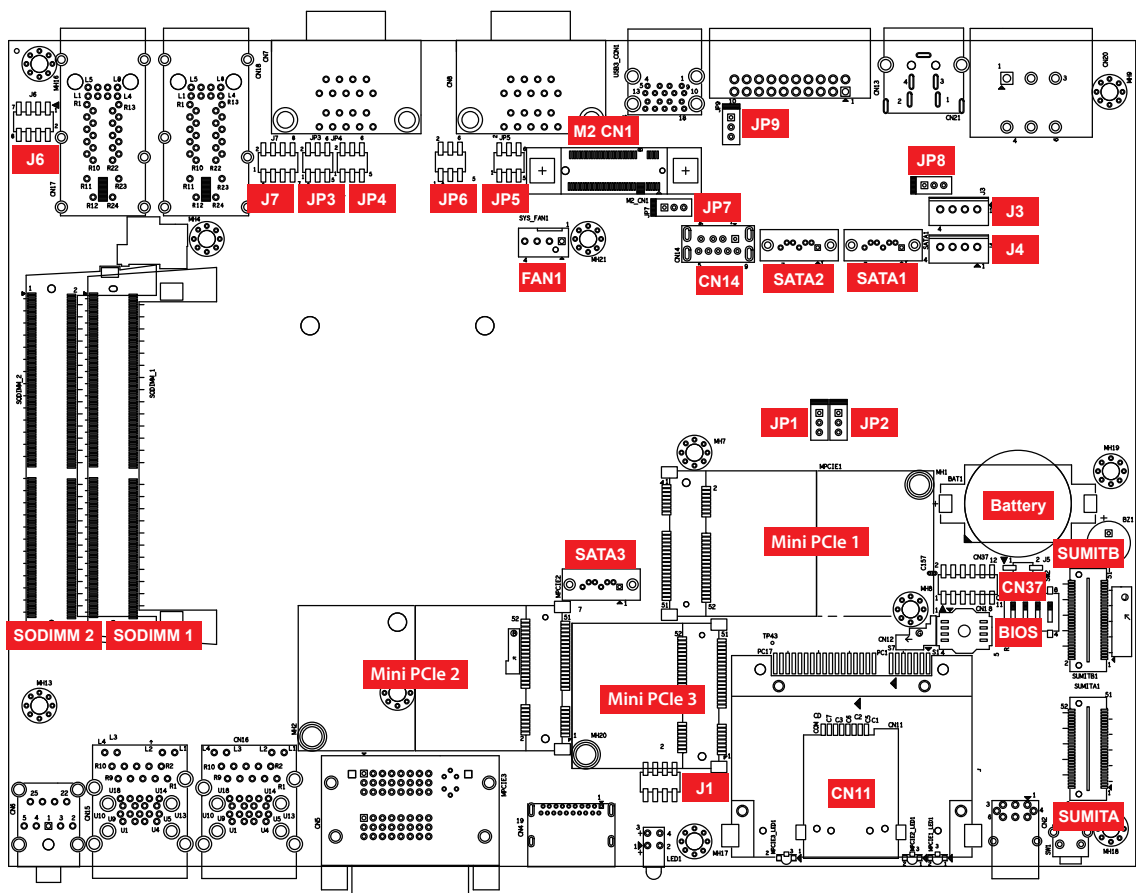
| LED Status | 10Mbps | 100Mbps | 1000Mbps |
|------------------|--------------|--------------|--------------|
| Right Bottom Led | Off | Solid Green | Solid Orange |
| Left Bottom Led | Flash Yellow | Flash Yellow | Flash Yellow |



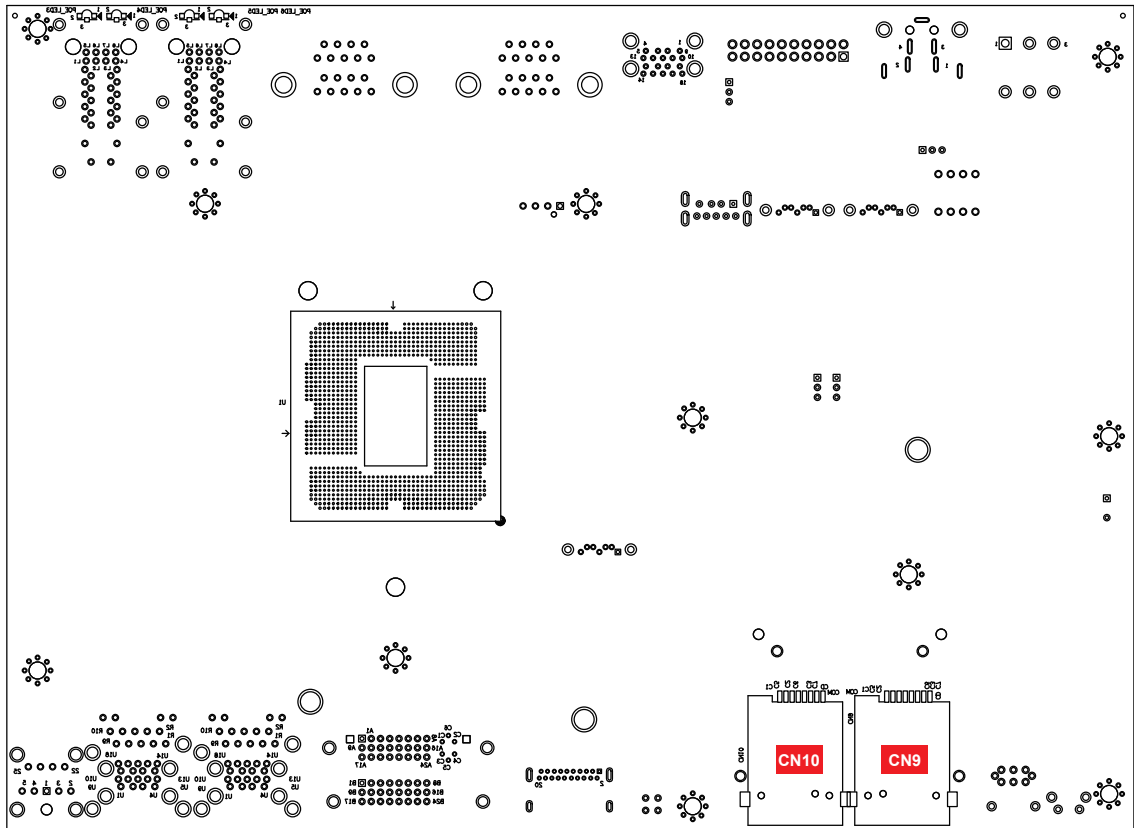
| PoE LED | LED Color | PoE Status |
|-----------|-------------|------------|
| LED 3 - 6 | Solid Green | PoE On |

2.4 Main Board Expansion Connectors

2.4.1 Top View of ECS-9000 Main Board With Connector Location



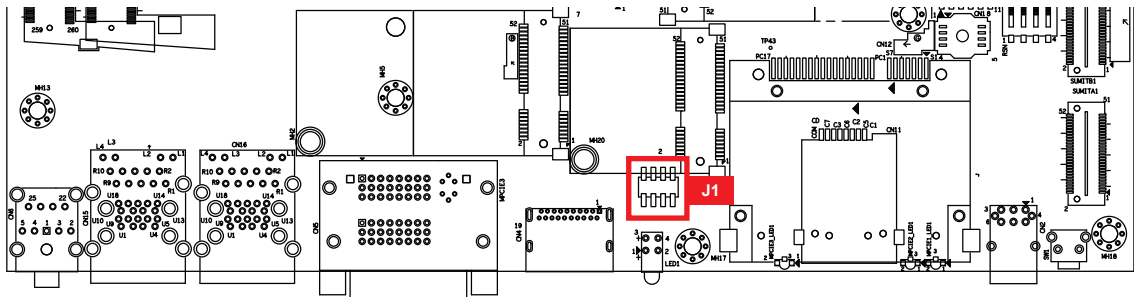
2.4.2 Bottom View of ECS-9000 Main Board With Connector Location



2.4.3 Miscellaneous Pin Header

2.0mm 2x4p header

This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table:

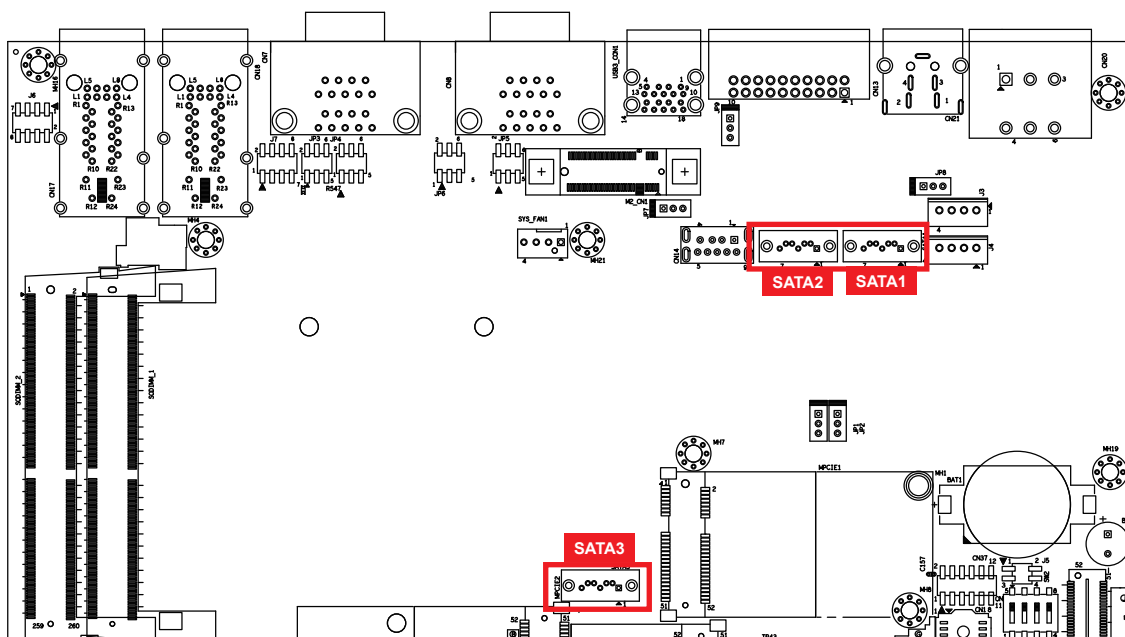


| Group | Pin No. | Description |
|---------|---------|-------------|
| HDD LED | 1 | HDD_LED_P |
| | 3 | HDD_LED_N |

| | | |
|--------------|---|---------------|
| RESET BUTTON | 5 | FP_RST_BTN_N |
| | 7 | Ground |
| POWER LED | 2 | PWR_LED_P |
| | 4 | PWR_LED_N |
| POWER BUTTON | 6 | FP_PWR_BTN_IN |
| | 8 | Ground |

2.4.4 SATA III Connector

There are 3 onboard high performance Serial ATA III (SATA III) on ECS-9000. It supports higher storage capacity with less cabling effort and smaller required space.

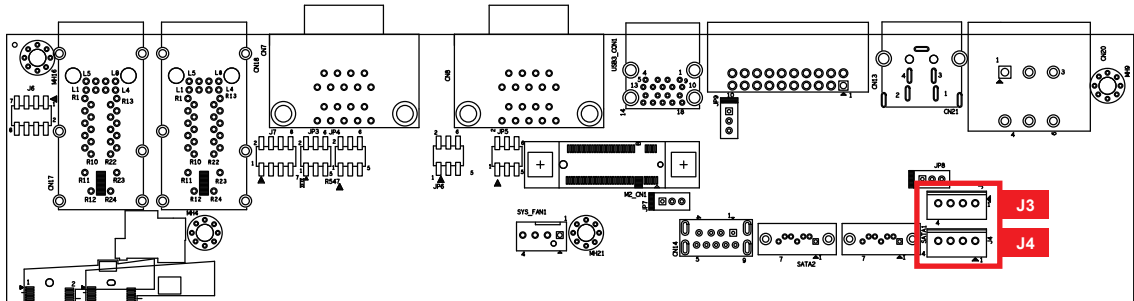


The pin assignments of SATA1 and SATA2 , SATA3 are listed in the following table:

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

2.4.5 SATA Power Connector

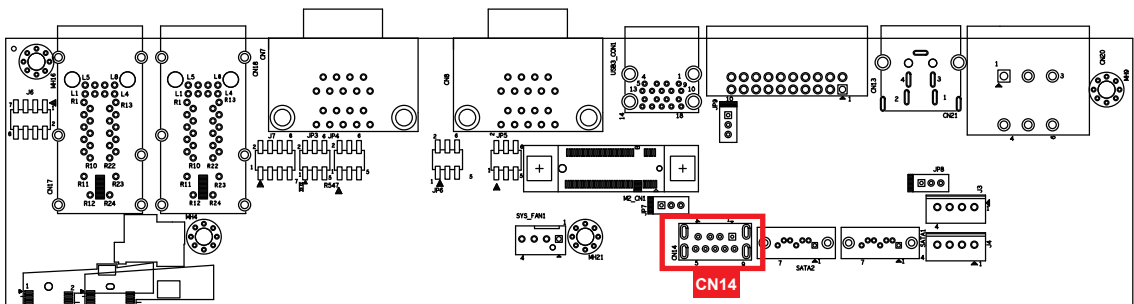
The ECS-9000 also equip with a SATA power connector. The one port supports 5V (up to 2A) and 12V (up to 2A) current to the hard drive or SSD.



The pin assignments of J3, J4 are listed in the following table:

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

2.4.6 Internal USB

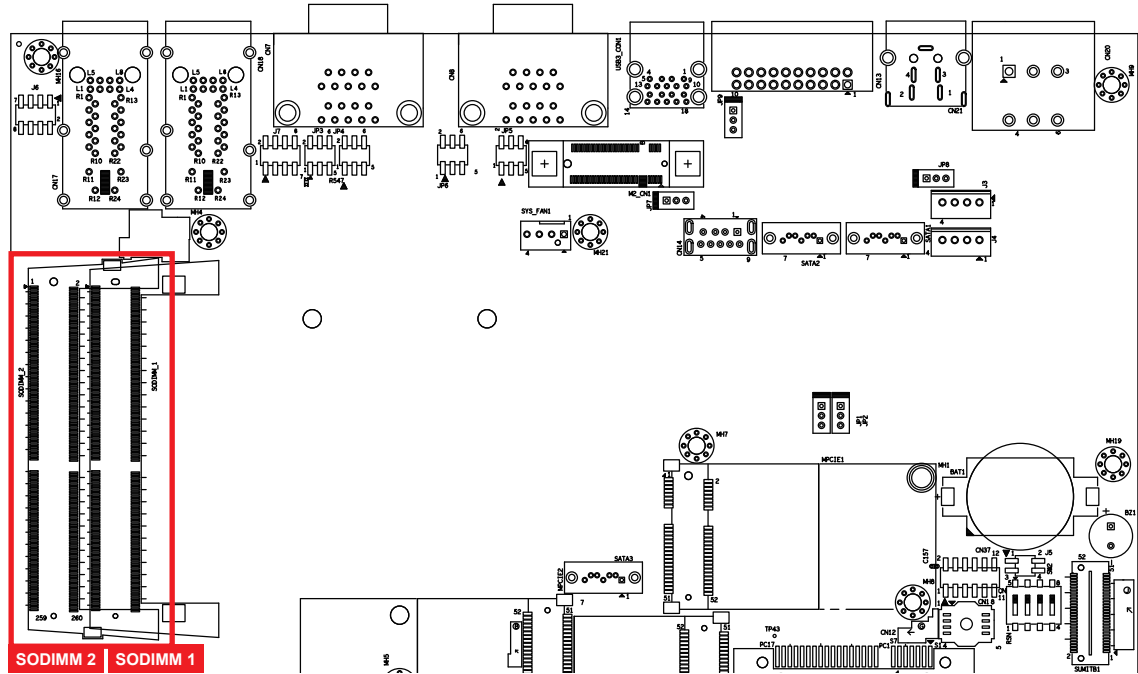


The USB 3.0 connections available supporting up to 5GB per second data rate. It also compliant with the requirements of SuperSpeed (SS), High Speed (HS), Full Speed (FS) and Low Speed (LS). The pin assignments of CN14 are listed in the following table:

| Connector | Pin No. | Description | Pin No. | Description |
|-----------|---------|-------------|---------|-------------|
| CN12 | 1 | USB_VCC | 6 | StdA_SSRX+ |
| | 2 | USBD- | 7 | GND_DRAIN |
| | 3 | USBD+ | 8 | StdA_SSTX- |
| | 4 | GND | 9 | StdA_SSTX+ |
| | 5 | StdA_SSRX- | | |

2.4.7 DDR4 Slot

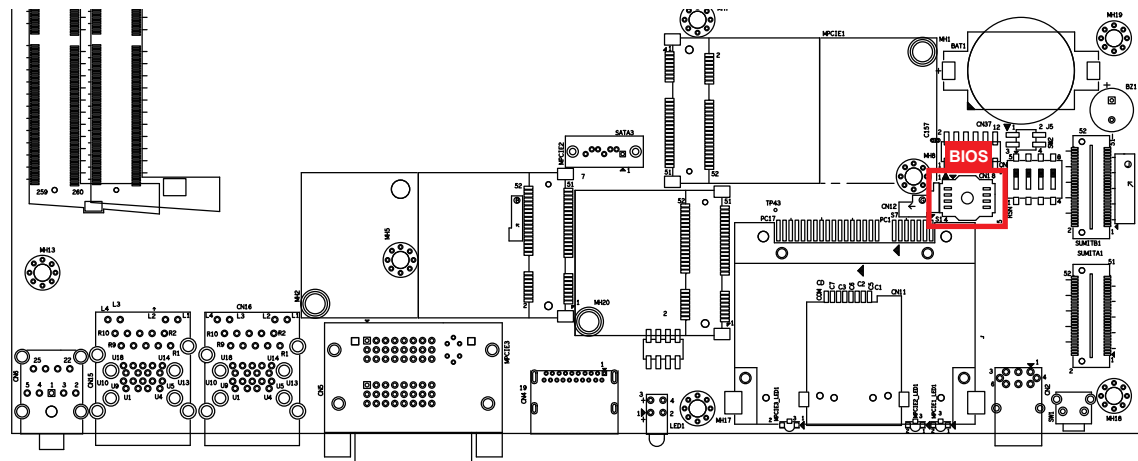
There are 2 DDR4 channel onboard, support DDR4 2400/2133, max 64GB, each channel 32GB



| Slot | Description | Slot | Description |
|----------|----------------|----------|----------------|
| SODIMM_1 | DDR4 Channel A | SODIMM_2 | DDR4 Channel B |

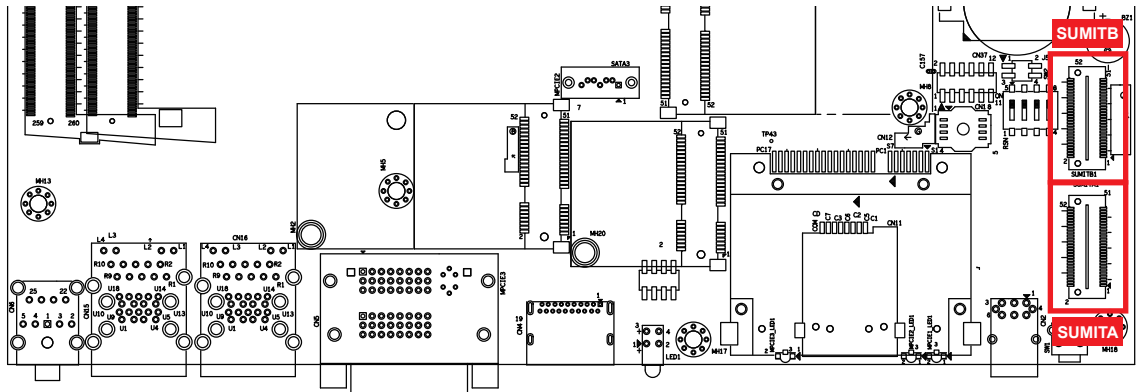
2.4.8 BIOS Socket

If the BIOS needs to be changed, please contact the Vecow RMA service team.



2.4.9 SUMIT A, SUMIT B

This system have standard SUMIT A and SUMIT B for SUMIT type add on cards.



SUMIT A Pin Out:

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|------------|
| 1 | +5V_AUX | 2 | +12V |
| 3 | +3.3V | 4 | SMB_DATA |
| 5 | +3.3V | 6 | XMB_CLK |
| 7 | Reserved | 8 | Reserved |
| 9 | Reserved | 10 | SPI_MISO |
| 11 | USB_OC# | 12 | SPI_MOSI |
| 13 | Reserved | 14 | SPI_CLK |
| 15 | +5V | 16 | SPI_CS10 |
| 17 | USB_3+ | 18 | SPI_CS1# |
| 19 | USB_3- | 20 | Reserved |
| 21 | +5V | 22 | LPC_DRQ1# |
| 23 | USB_2+ | 24 | LPC_AD0 |
| 25 | USB_2- | 26 | LPC_AD1 |
| 27 | +5V | 28 | LPC_AD2 |
| 29 | USB_1+ | 30 | LPC_AD3 |
| 31 | USB_1- | 32 | LPC_FRAME# |
| 33 | +5V | 34 | SERIRQ# |
| 35 | USB_0+ | 36 | Reserved |
| 37 | USB_0- | 38 | CLK_33MHz |
| 39 | GND | 40 | GND |

| | | | |
|----|----------|----|----------------------|
| 41 | A_PET_P0 | 42 | A_PER_P0 |
| 43 | A_PET_N0 | 44 | A_PER_N0 |
| 45 | GND | 46 | APRSNT#/A_PE_CLKREQ# |
| 47 | PERST# | 48 | A_CLKP |
| 49 | WAKE# | 50 | A_CLKN |
| 51 | +5V | 52 | GND |

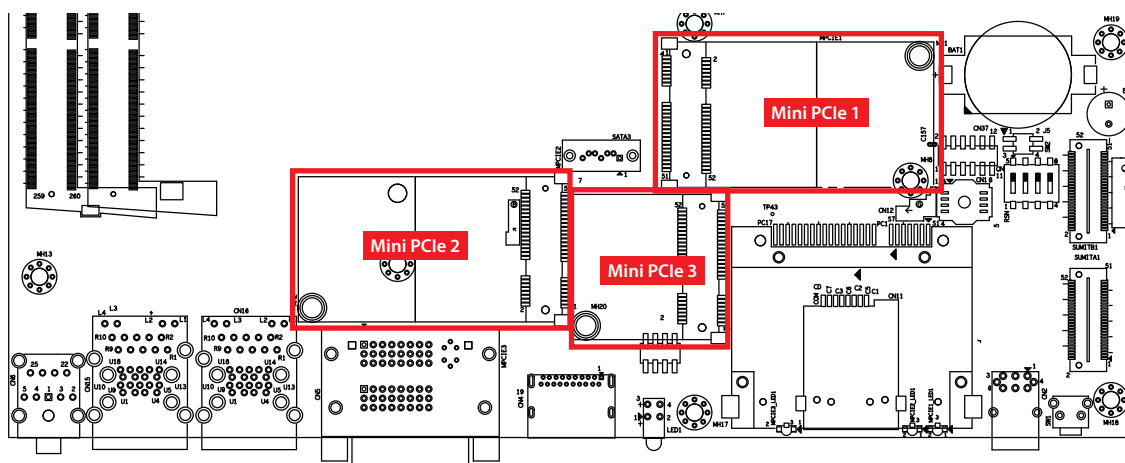
SUMIT B Pin Out:

| Pin No. | Function | Pin No. | Function |
|---------|----------------------|---------|----------|
| 1 | GND | 2 | GND |
| 3 | B_PET_P0 | 4 | B_PER_P0 |
| 5 | B_PET_N0 | 6 | B_PER_N0 |
| 7 | GND | 8 | GND |
| 9 | C_CLKP | 10 | B_CLKP |
| 11 | C_CLKN | 12 | B_CLKN |
| 13 | CPRSNT#/C_PE_CLKREQ# | 14 | GND |
| 15 | C_PET_P0 | 16 | C_PER_P0 |
| 17 | C_PET_N0 | 18 | C_PER_N0 |
| 19 | GND | 20 | GND |
| 21 | C_PET_P1 | 22 | C_PER_P1 |
| 23 | C_PET_N1 | 24 | C_PER_N1 |
| 25 | GND | 26 | GND |
| 27 | C_PET_P2 | 28 | C_PER_P2 |
| 29 | C_PET_N2 | 30 | C_PER_N2 |
| 31 | GND | 32 | GND |
| 33 | C_PET_P3 | 34 | C_PER_P3 |
| 35 | C_PET_N3 | 36 | C_PER_N3 |
| 37 | GND | 38 | GND |
| 39 | PERST# | 40 | WAKE# |
| 41 | Reserved | 42 | Reserved |
| 43 | +5V | 44 | Reserved |

| | | | |
|----|-----|----|---------|
| 45 | +5V | 46 | +3.3V |
| 47 | +5V | 48 | +3.3V |
| 49 | +5V | 50 | +3.3V |
| 51 | +5V | 52 | +5V_AUX |

2.4.10 Mini PCIe

Standard full length Mini PCIe slot:



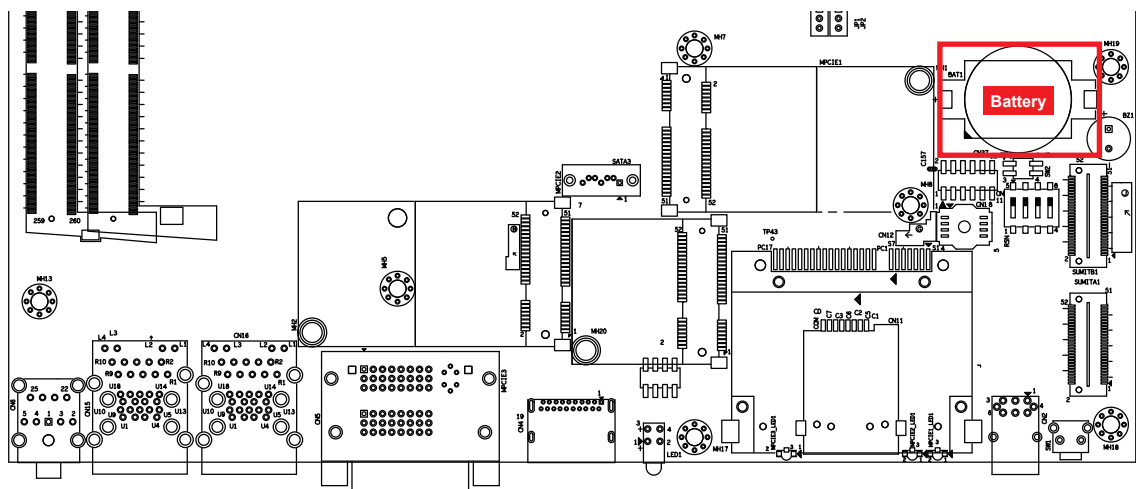
Pin Out:

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 51 | Reserved | 52 | +3.3Vaux |
| 49 | Reserved | 50 | GND |
| 47 | Reserved | 48 | +1.5V |
| 45 | Reserved | 46 | Reserved |
| 43 | GND | 44 | Reserved |
| 41 | +3.3Vaux | 42 | Reserved |
| 39 | +3.3Vaux | 40 | GND |
| 37 | GND | 38 | USB_D+ |
| 35 | GND | 36 | USB_D- |
| 33 | PETp0 | 34 | GND |
| 31 | PETn0 | 32 | SMB_DATA |

| | | | |
|----------------|----------|----|-----------|
| 29 | GND | 30 | SMB_CLK |
| 27 | GND | 28 | +1.5V |
| 25 | PERn0 | 26 | GND |
| 23 | PERp0 | 24 | +3.3Vaux |
| 21 | GND | 22 | PERST# |
| 19 | Reserved | 20 | reserved |
| 17 | Reserved | 18 | GND |
| Mechanical Key | | | |
| 15 | GND | 16 | UIM_VPP |
| 13 | REFCLK+ | 14 | UIM_RESET |
| 11 | REFCLK- | 12 | UIM_CLK |
| 9 | GND | 10 | UIM_DATA |
| 7 | CLKREQ# | 8 | UIM_PWR |
| 5 | Reserved | 6 | 1.5V |
| 3 | Reserved | 4 | GND |
| 1 | WAKE# | 2 | 3.3Vaux |

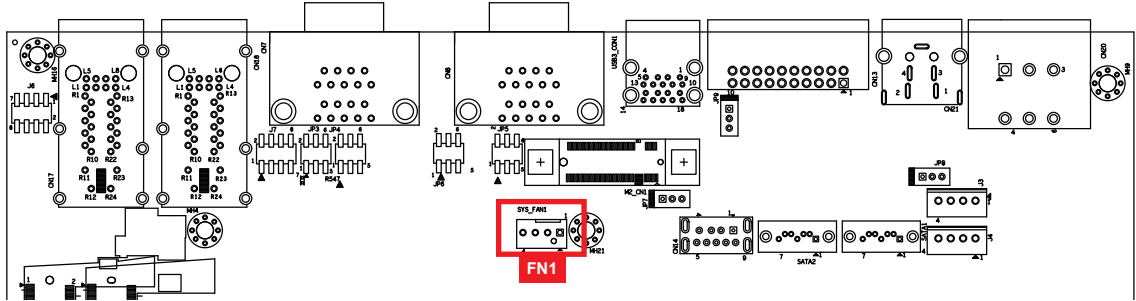
2.4.11 RTC Battery

The system's real-time clock is powered by a lithium battery. It is recommended that you do not the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.



2.4.12 FAN Header

FAN power connector supports for additional thermal requirements. The pin assignments of FAN 1 are shown in the following diagram:

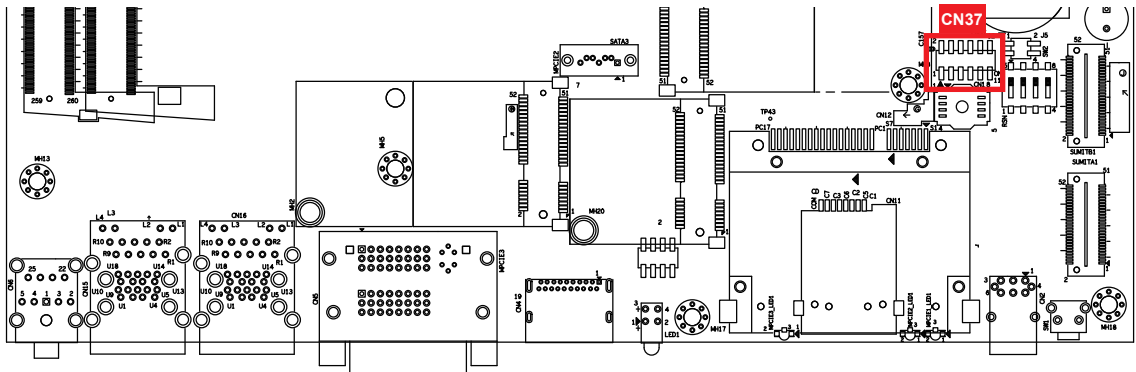


Pin out:

| Pin No. | Function | Pin No. | Function |
|---------|------------------|---------|-----------------|
| 1 | GND | 2 | +12V (1.5A max) |
| 3 | Fan speed sensor | 4 | Fan PWM |

2.4.13 LPC Port 80 Header

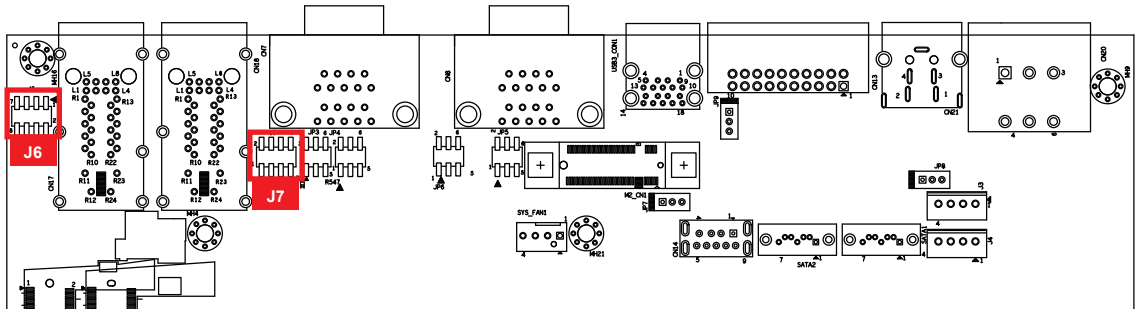
ECS-9000 provides a LPC Port 80 Header for debug card.



Pin out:

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 1 | SERIRQ | 7 | LFRAME# |
| 2 | +3.3V | 8 | LAD0 |
| 3 | LA3 | 9 | N/C |
| 4 | RESET# | 10 | Ground |
| 5 | LAD1 | 11 | CLOCK |
| 6 | LAD2 | 12 | Ground |

2.4.14 Speed LED Header



Pin out:

J6

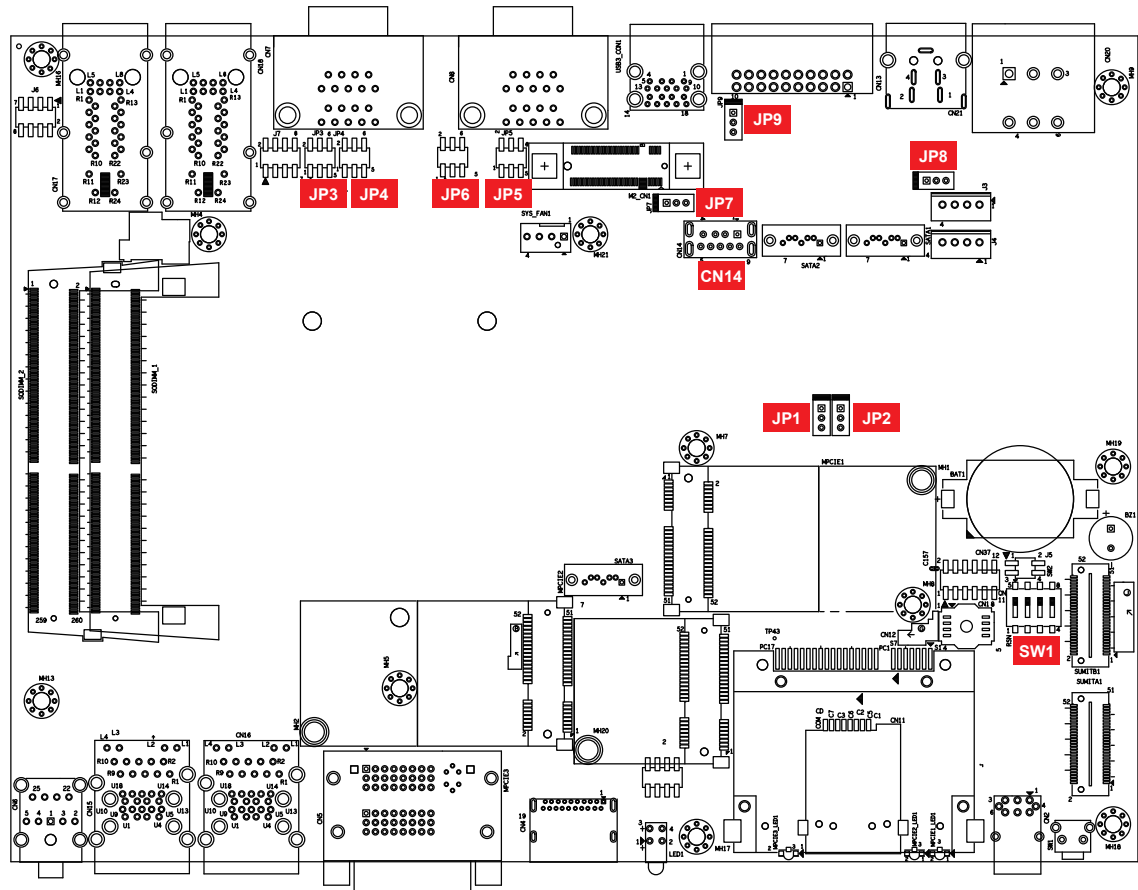
| Pin No. | LAN | Function |
|---------|-------|-----------|
| 1 | LAN 3 | LINK100# |
| 2 | LAN 4 | LINK100# |
| 3 | LAN 3 | LINK1000# |
| 4 | LAN 4 | LINK1000# |
| 5 | LAN 3 | ACT# |
| 6 | LAN 4 | ACT# |
| 7 | LAN 3 | +3V |
| 8 | LAN 4 | +3V |

J7

| Pin No. | LAN | Function |
|---------|-------|-----------|
| 1 | LAN 5 | LINK100# |
| 2 | LAN 6 | LINK100# |
| 3 | LAN 5 | LINK1000# |
| 4 | LAN 6 | LINK1000# |
| 5 | LAN 5 | ACT# |
| 6 | LAN 6 | ACT# |
| 7 | LAN 5 | +3V |
| 8 | LAN 6 | +3V |

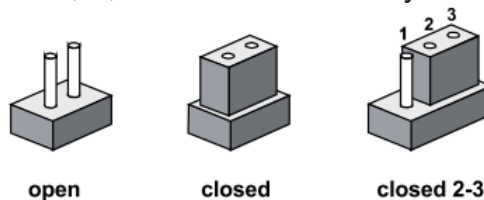
2.5 Main Board Jumper & DIP Switch Settings

2.5.1 Top View of ECS-9000 With Jumper and DIP Switch

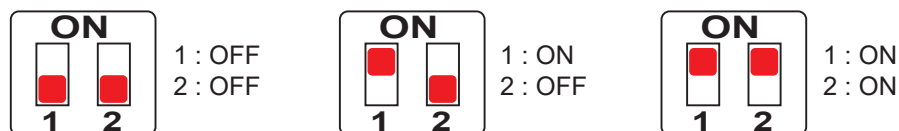


The figure below is the top view of the system board, and it shows the location of the jumpers and the switches.

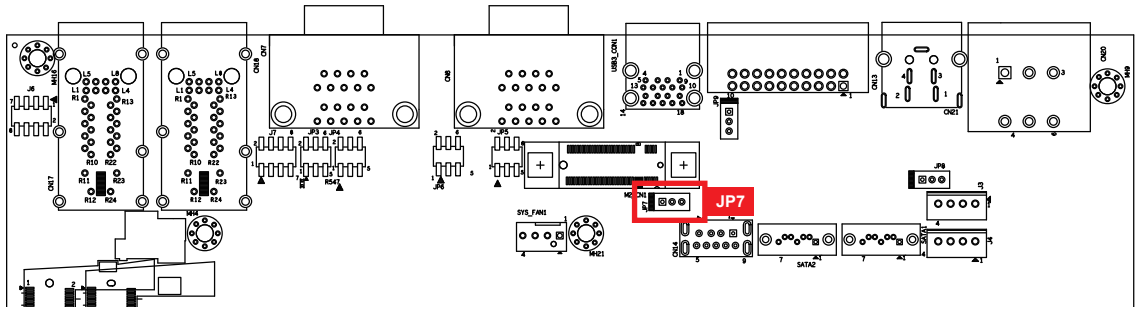
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with 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 shown below (the DIP switch on and off)

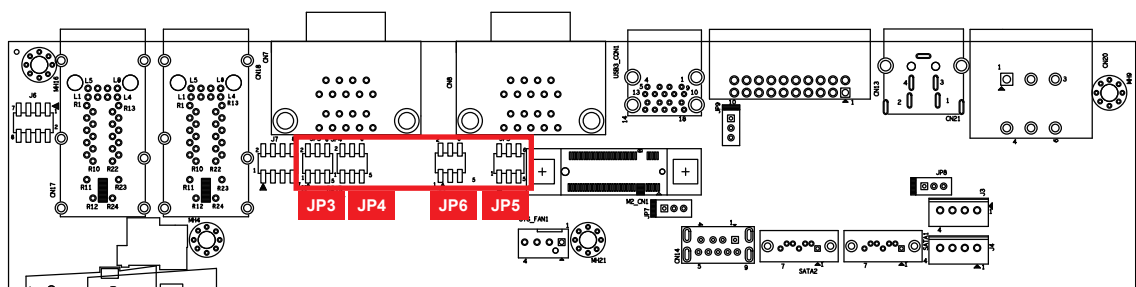


2.5.2 USB Power Jumper



| Jumper | Setting | Function |
|--------|---------|-----------------------------|
| JP7 | 2:3 | Non Wake Up support |
| JP7 | 1:2 | Supported Wake Up (Default) |

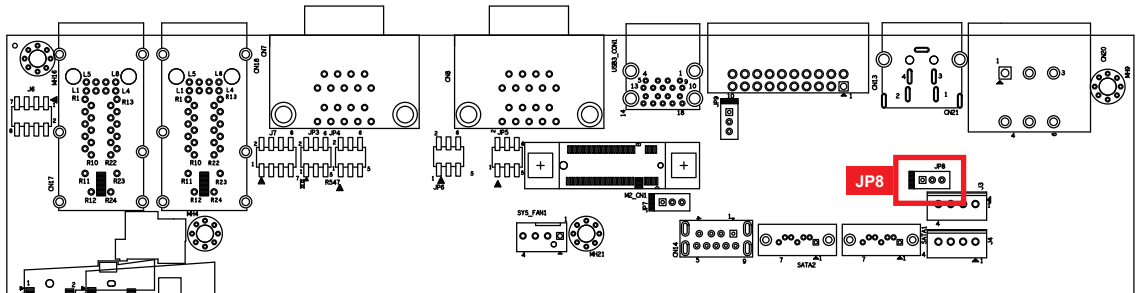
2.5.3 COM Port RI pin Select



| Pin Header | Pin No. | Description |
|--------------|---------|------------------|
| COM 1 JP3 | 1-2 | +5V (1A max.) |
| | 3-4 | +12V (0.5A max.) |
| | 5-6 | RI (Default) |
| Pin Header | Pin No. | Description |
| COM 2 JP4 | 1-2 | +5V (1A max.) |
| | 3-4 | +12V (0.5A max.) |
| | 5-6 | RI (Default) |
| Pin Header | Pin No. | Description |
| COM 3 JP5 | 1-2 | +5V (1A max.) |
| | 3-4 | +12V (0.5A max.) |
| | 5-6 | RI (Default) |

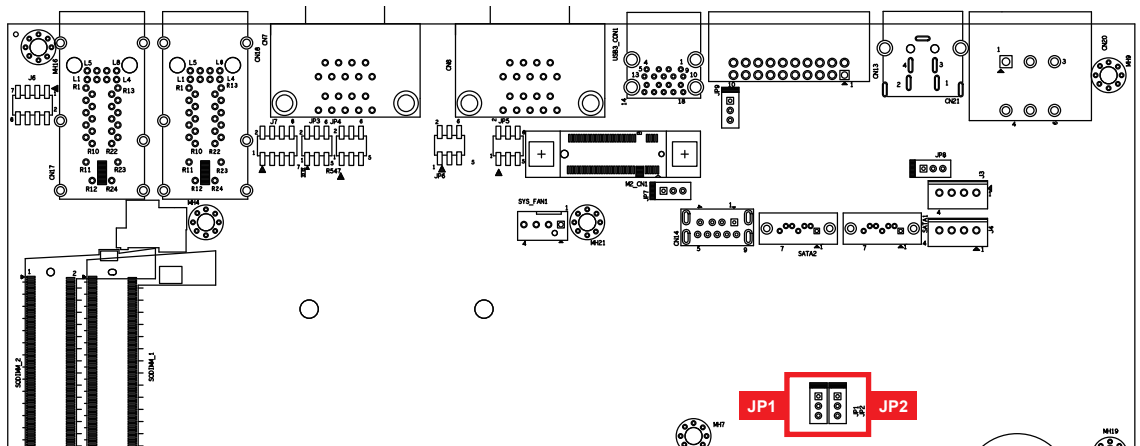
| Pin Header | Pin No. | Description |
|--------------|---------|------------------|
| COM 4 JP6 | 1-2 | +5V (1A max.) |
| | 3-4 | +12V (0.5A max.) |
| | 5-6 | RI (Default) |

2.5.5 PoE Power ON Select



| Jumper | Setting | Function |
|--------|---------|--|
| JP8 | 1:2 | PoE power on at standby power ready |
| JP8 | 2:3 | PoE power on after system power on (Default) |

2.5.6 CMOS & ME Clear



| Jumper | Setting | Function |
|--------|---------|-------------------|
| JP1 | 1:2 | *Normal (Default) |
| JP1 | 2:3 | Clear CMOS |

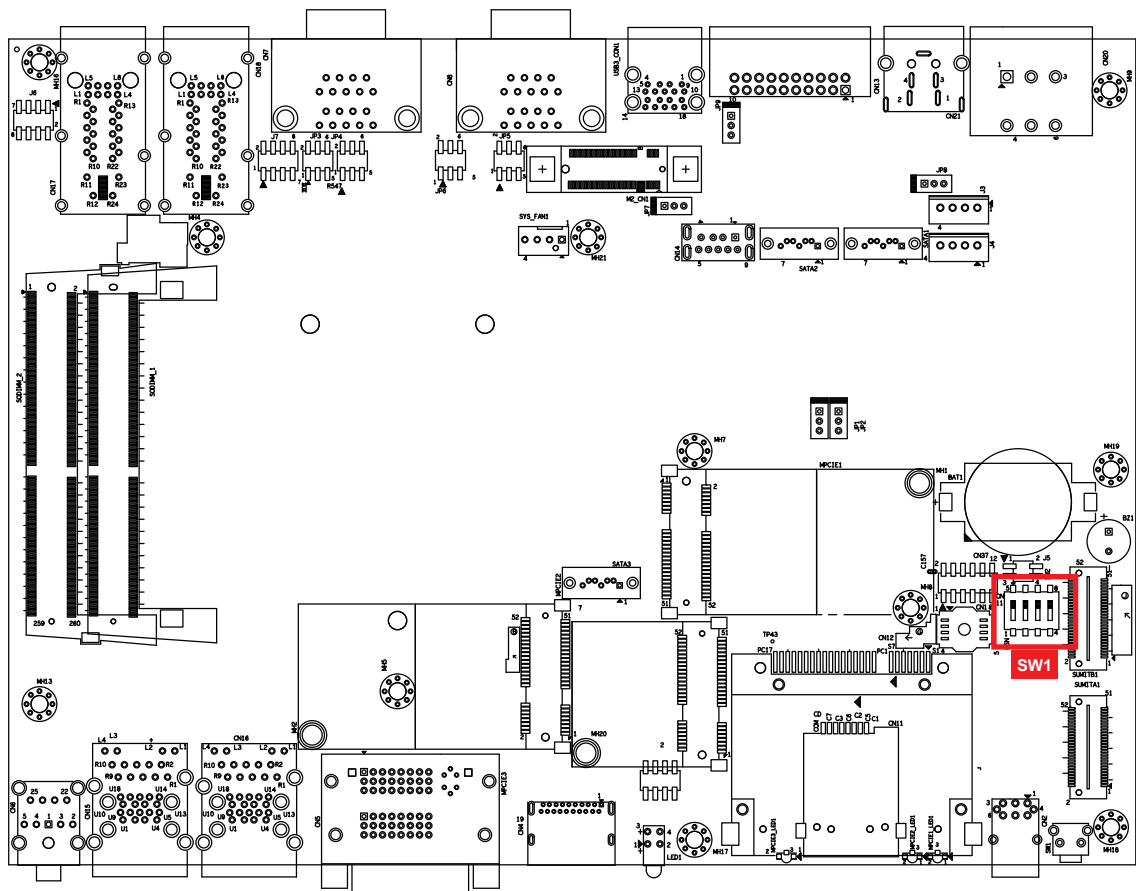
| Jumper | Setting | Function |
|--------|---------|-------------------|
| JP2 | 1:2 | *Normal (Default) |
| JP2 | 2:3 | Clear ME |

2.6 Ignition Control

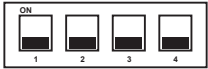
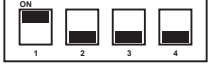
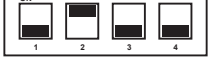

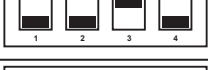









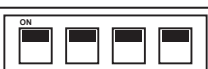

ECS-9000 series provides ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay periods.

2.6.1 Adjust Ignition Control Modes

ECS-9000 series provides 16 modes of different power on/off delay periods adjustable via SW5 switch. The default rotary switch is set to 0 in ATX/AT power mode.



The modes are listed in the following table:

| Item | Power on delay | Power off delay | Switch Position |
|------|----------------|-----------------|---|
| 0 | ATX mode | |  |
| 1 | No delay | No delay |  |
| 2 | No delay | 5 seconds |  |
| 3 | No delay | 10 seconds |  |
| 4 | No delay | 20 seconds |  |
| 5 | 5 seconds | 30 seconds |  |
| 6 | 5 seconds | 60 seconds |  |
| 7 | 5 seconds | 90 seconds |  |
| 8 | 5 seconds | 30 minutes |  |
| 9 | 5 seconds | 1 hour |  |
| A | 10 seconds | 2 hours |  |
| B | 10 seconds | 4 hours |  |
| C | 10 seconds | 6 hours |  |
| D | 10 seconds | 8 hours |  |
| E | 10 seconds | 12 hours |  |
| F | 10 seconds | 24 hours |  |

2.6.2 Ignition Control Wiring

To activate ignition control, you need to provide IGN signal via the 3-pin pluggable terminal block located in the back panel. It is below the general wiring configuration.

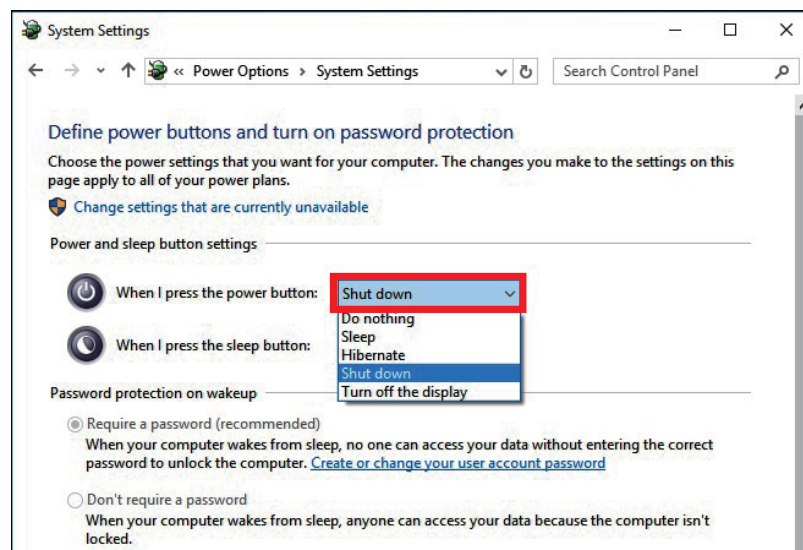
| Pin No. | Definition |
|---------|----------------------|
| 1 | Ignition (IGN) |
| 2 | External Power S/W + |
| 3 | External Power S/W + |



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

Note:

1. DC power source and IGN share the same ground.
2. ECS-9000 supports 6V to 36V 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."

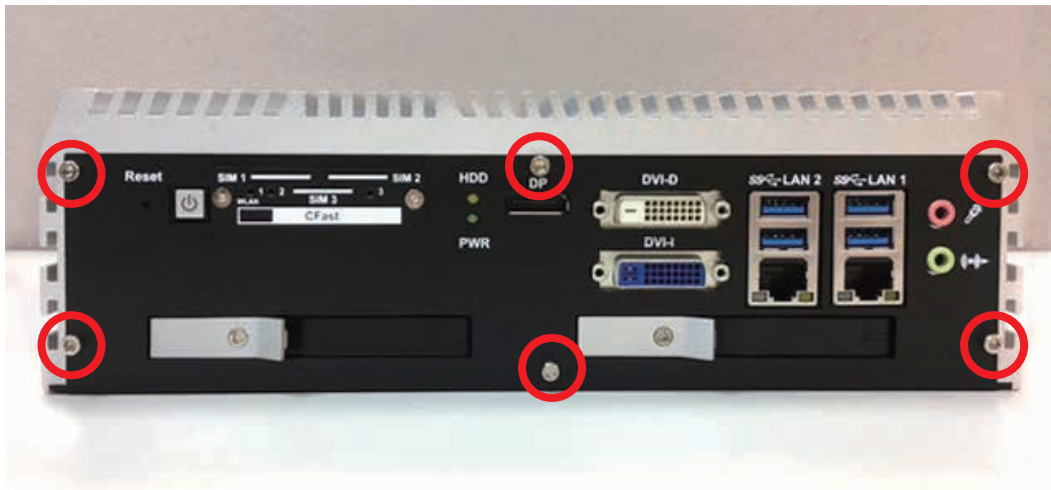
3

SYSTEM SETUP

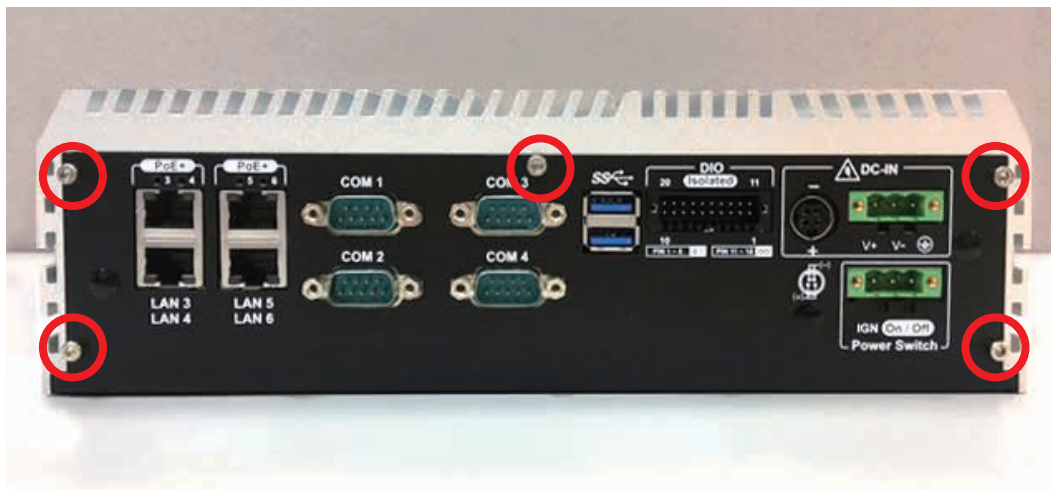
3.1 How to Open Your ECS-9000

3.1.1 ECS-9000-R Series

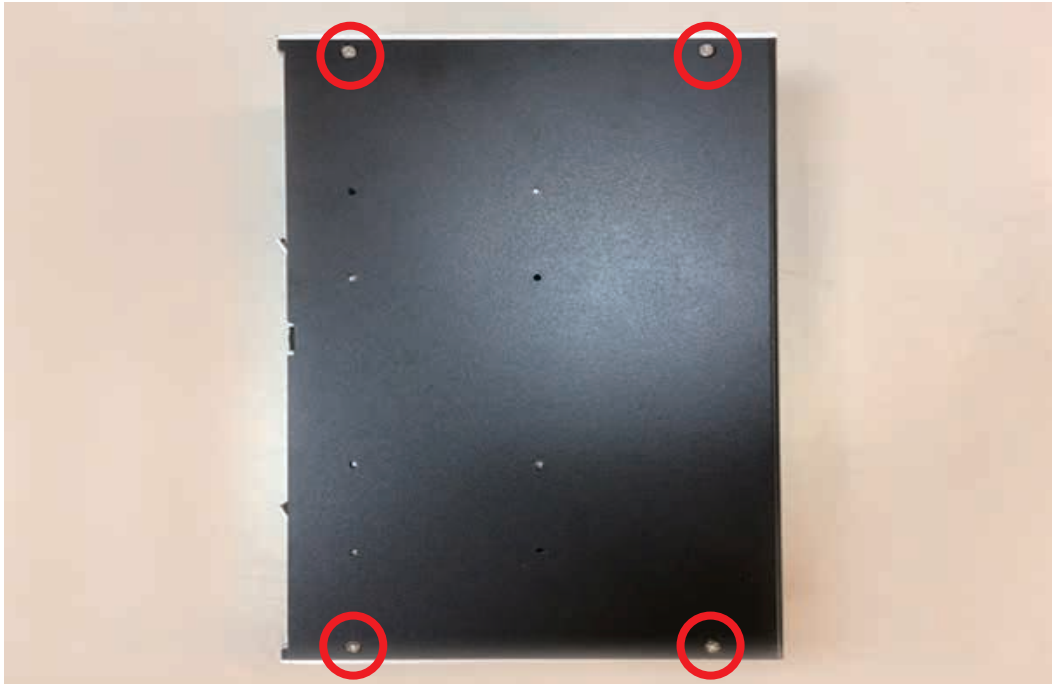
Step 1 Remove front panel six KHS#6-32 screws then pick up front panel.



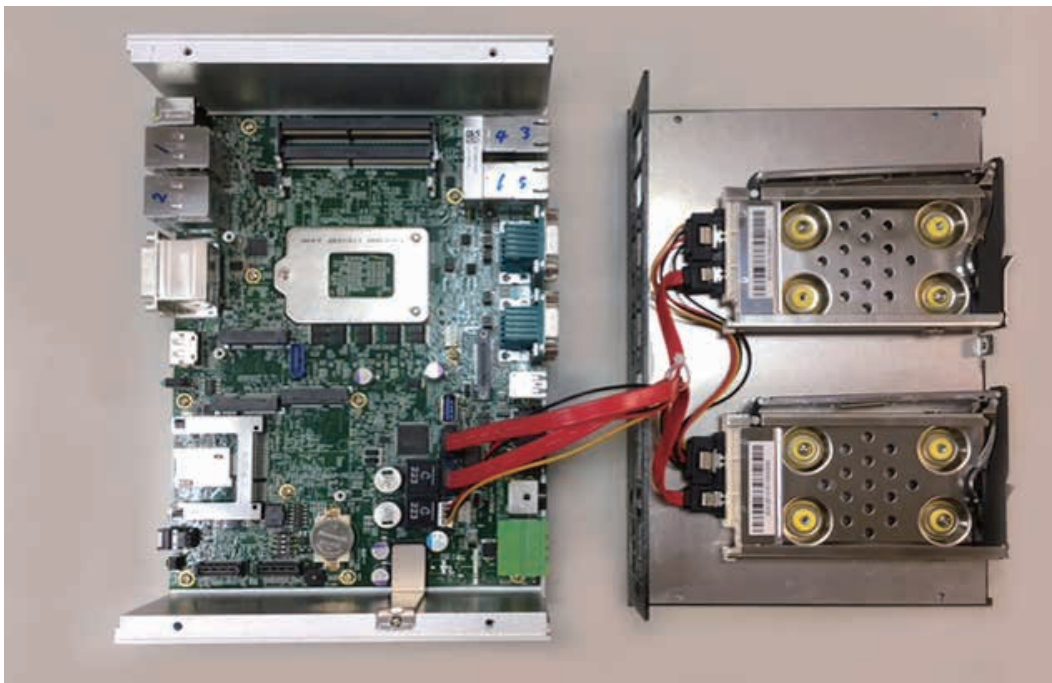
Step 2 Remove rear panel five KHS#6-32 screws.



Step 3 Remove bottom four F#6-32 screws.



Step 4 Finish.

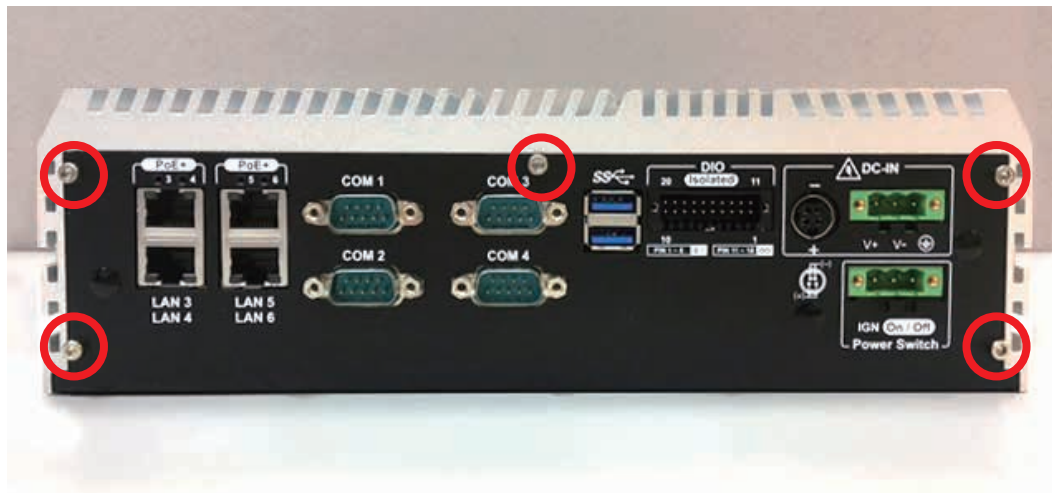


3.1.2 ECS-9000-F/G/PoE Serise

Step 1 Remove front panel six KHS#6-32 screws then pick up front panel.



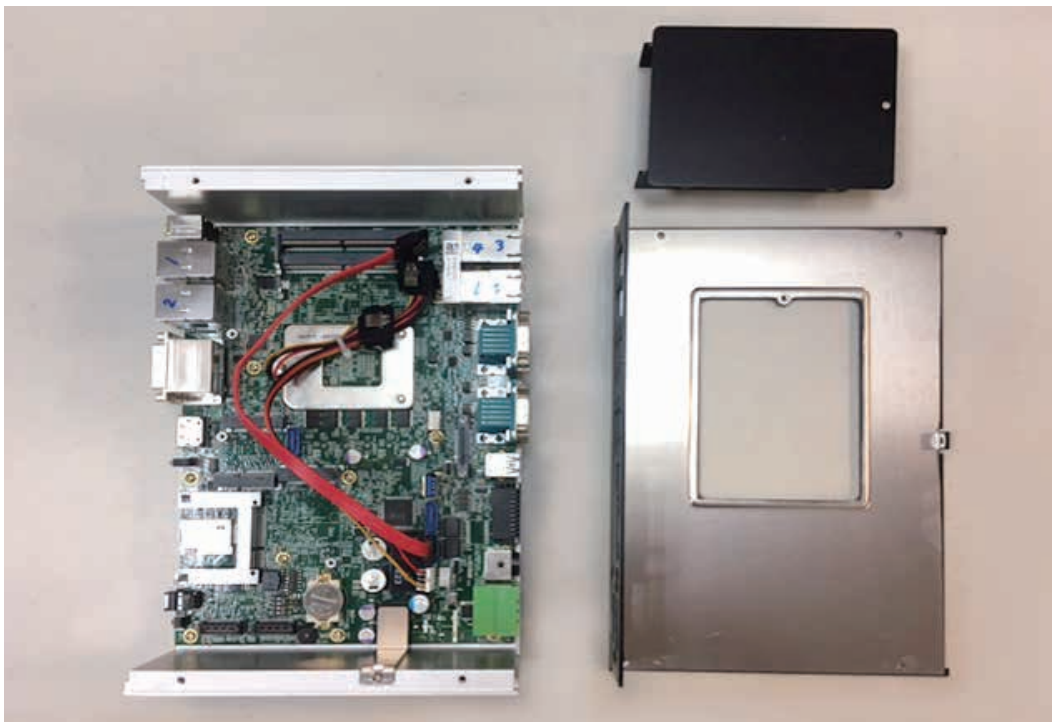
Step 2 Remove rear panel five KHS#6-32 screws.



Step 3 Remove bottom four F#6-32 (circled in red) and one F-M3 (circled in yellow) screws.



Step 4 Finish.

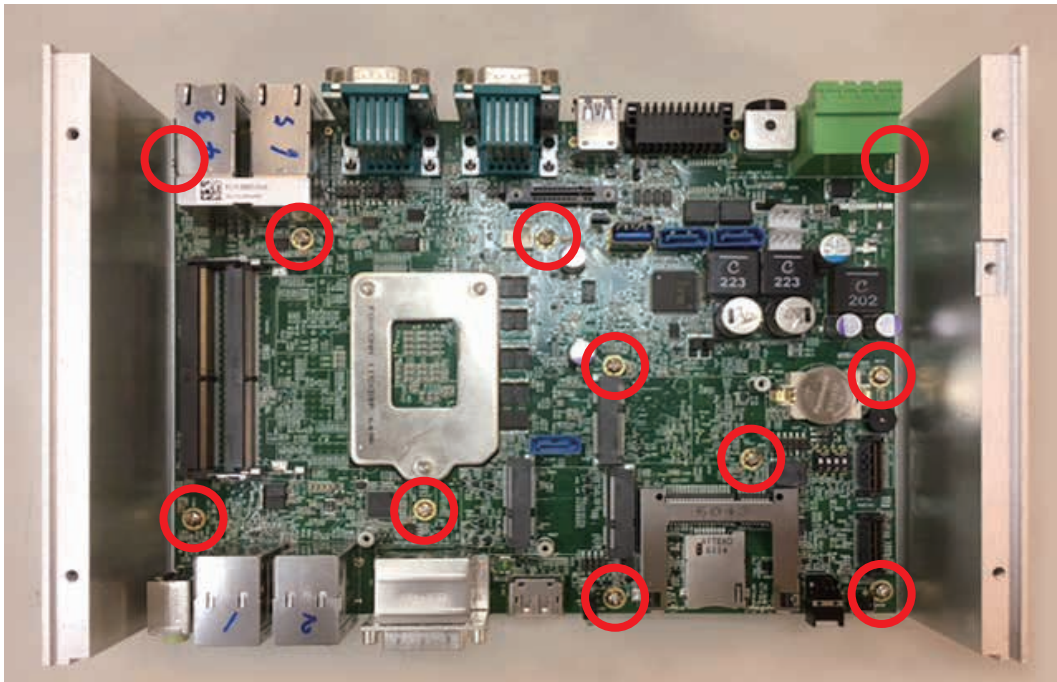


3.2 Installing CPU

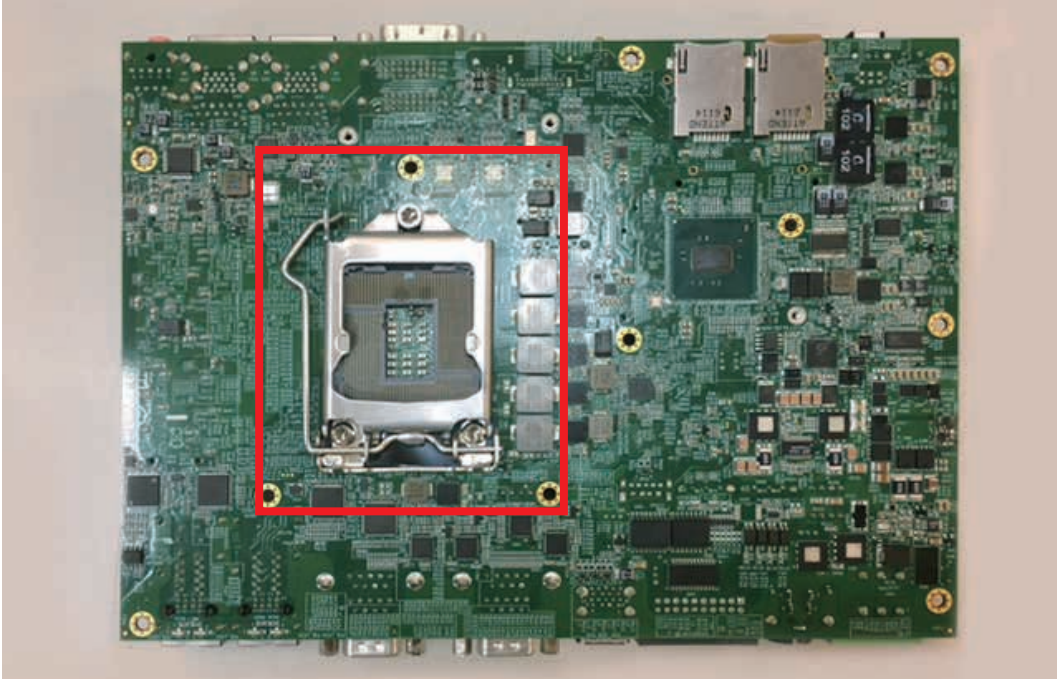
Step 1 Remove one F#6-32 and pick up chock bracket.



Step 2 Remove eleven PH-M3 screws and pick up mother board.



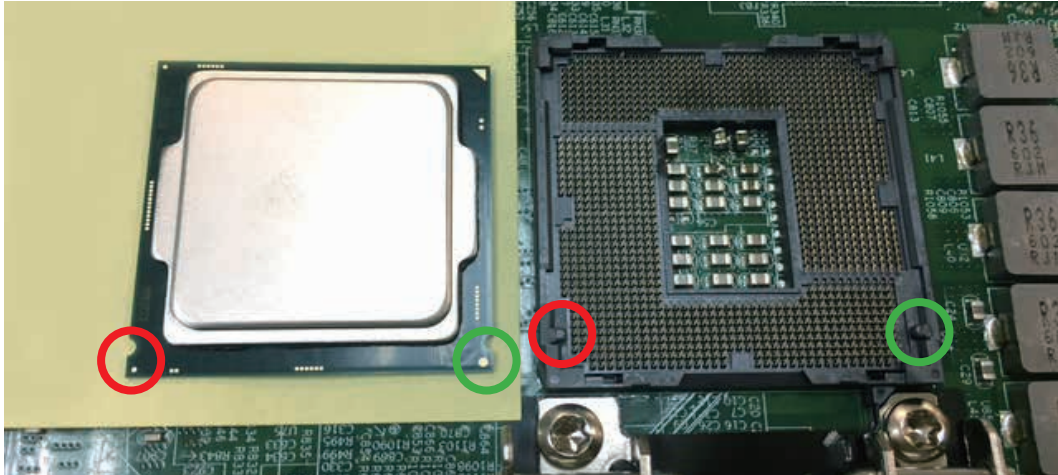
Step 3 CPU Socket.



Step 4 Open the cover of CPU Socket. (Be careful CPU pin)



Step 5 Match CPU with the CPU socket.



Step 6 Installing CPU on the socket.



Step 7 Close and lock the cover of CPU socket.

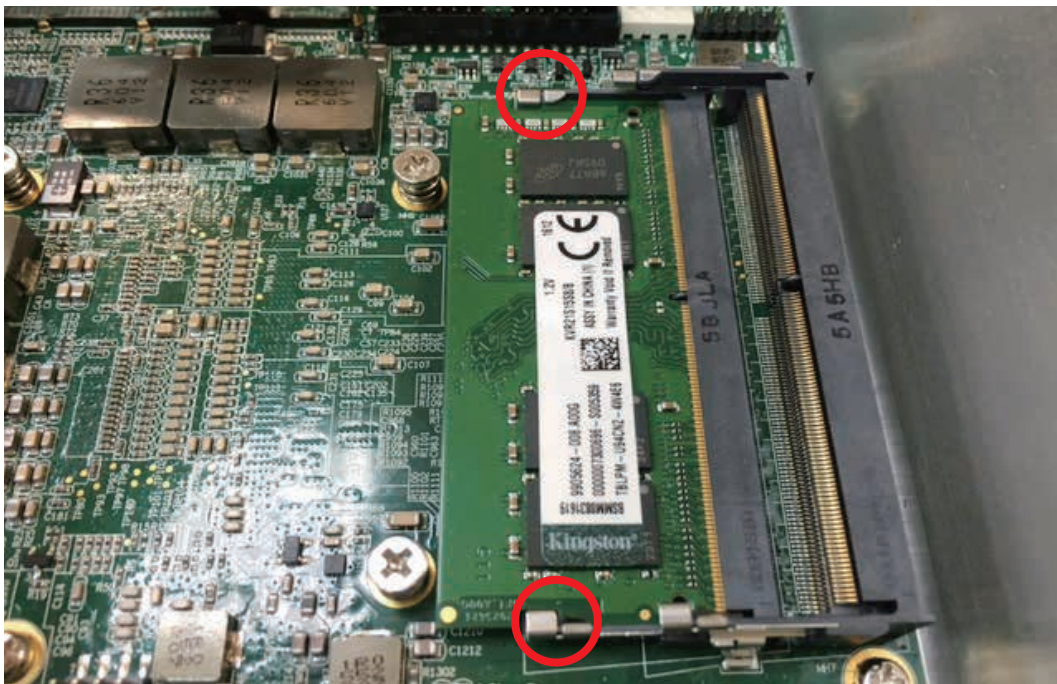


3.3 Installing DDR4 SO-DIMM Modules

Step 1 Install DDR4 RAM module into SO-DIMM slot.



Step 2 Make sure the RAM module is locked by the memory slot.



3.4 Installing Mini PCIe Card

Step 1 Install Mini PCIe card into the Mini PCIe socket.



Step 2 Fasten one M2.5 screw.



3.5 Installing Antenna Cable

Step 1 Check antenna cable and washers.

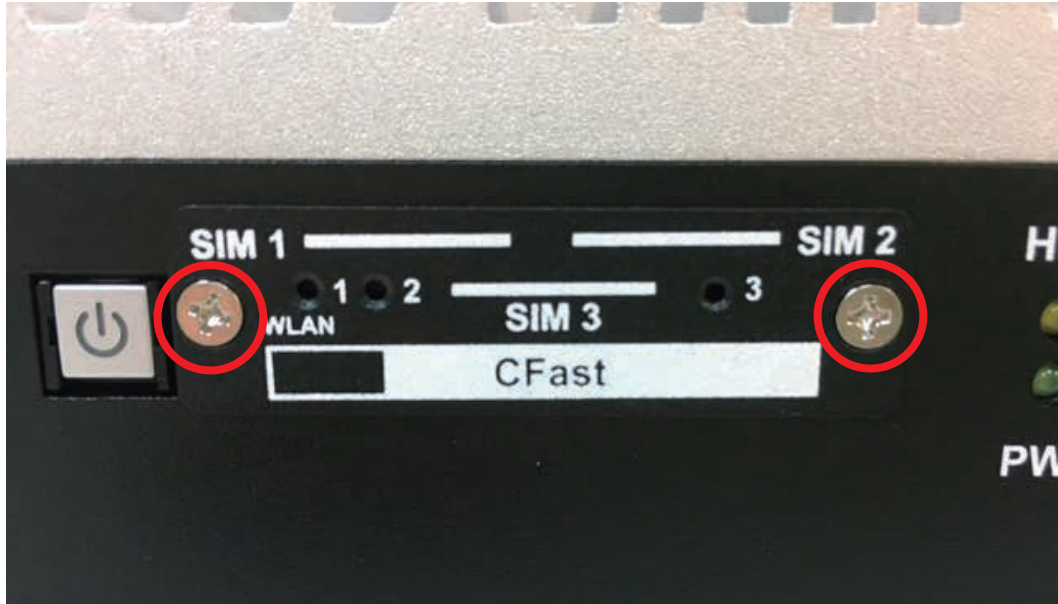


Step 2 Put Antenna cable connector into the hole on rear panel and fasten the washer 1, washer 2 and washer 3 on Antenna cable connector.

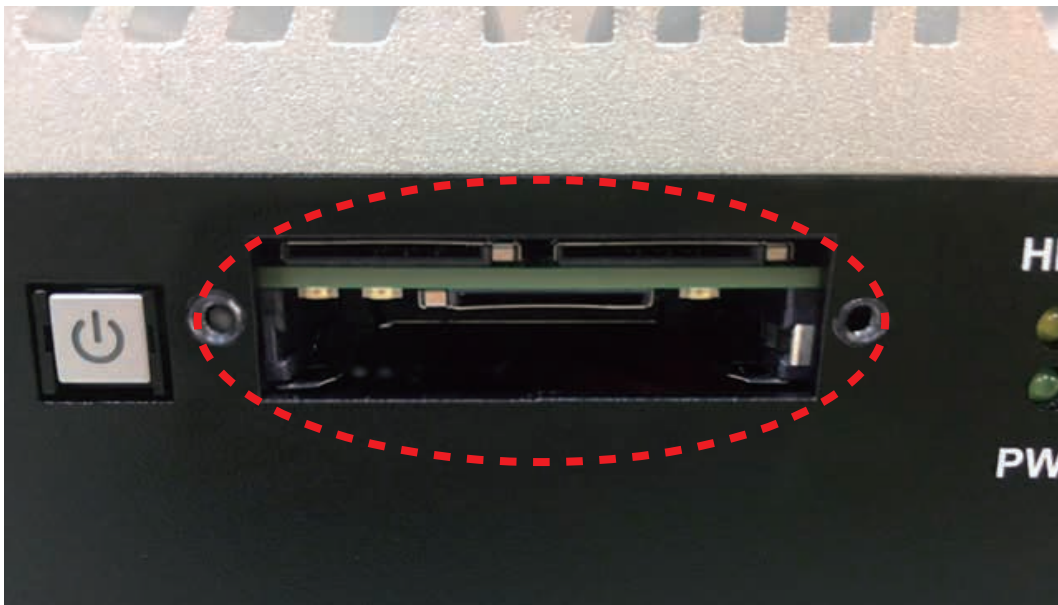


3.6 Installing CFast Card

Step 1 Remove two F-M3x4 screws on CFast Card and SIM Card cover from the front panel.



Step 2 Remove CFast Card and SIM Card cover.



Step 3 Before Inserting CFast & SIM Card, make sure the system power is not plugged.

Step 4 Insert CFast card and push to lock.

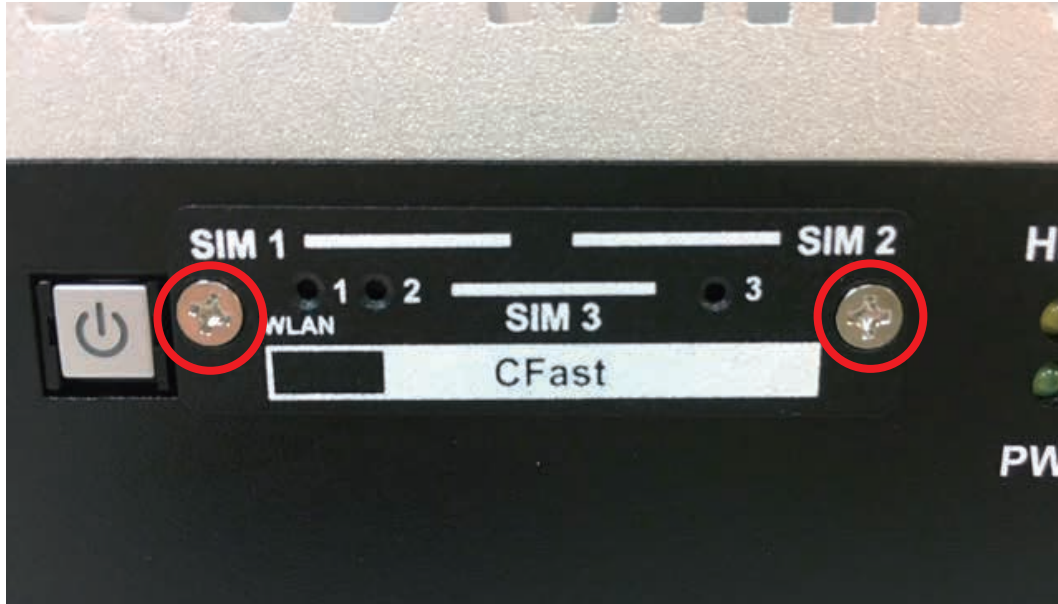


Step 5 Finish.

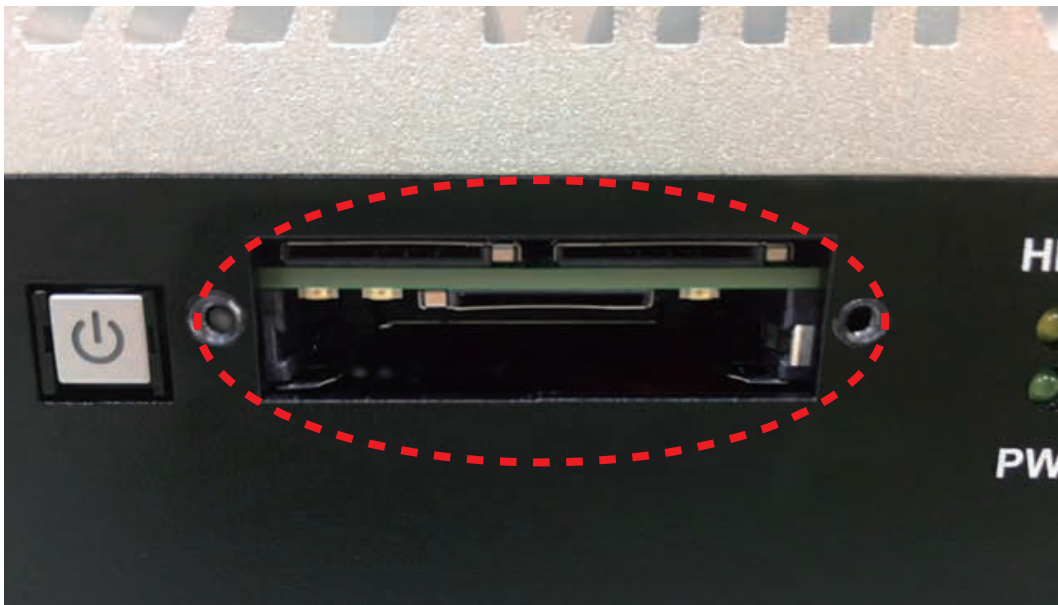


3.7 Installing SIM Card

Step 1 Remove two F-M3x4 screws on CFast Card and SIM Card cover from the front panel.



Step 2 Remove CFast Card and SIM Card cover.

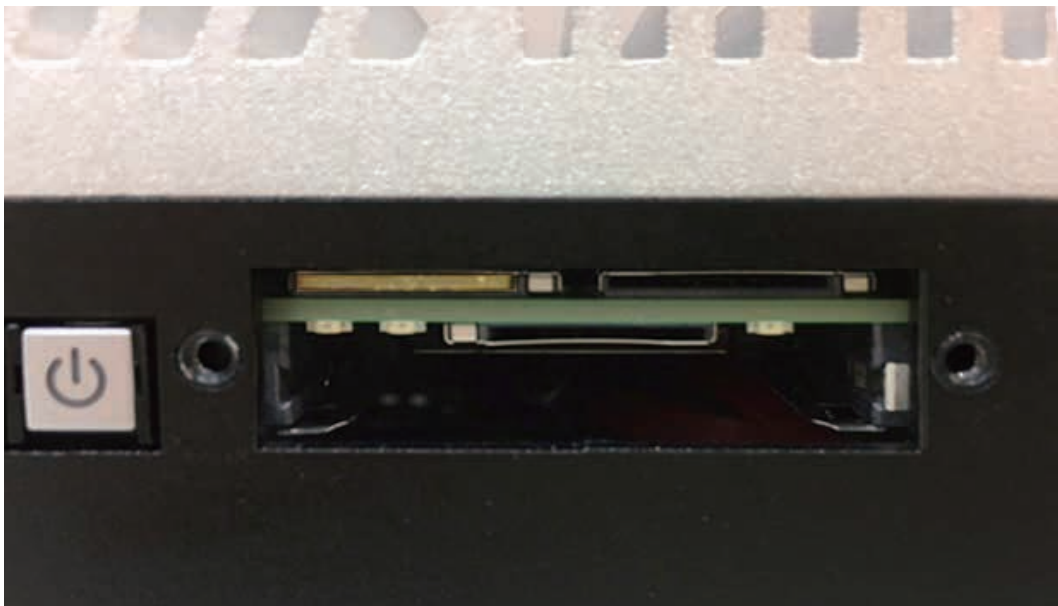


Step 3 Before Inserting CFast & SIM Card, make sure the system power is not plugged.

Step 4 Insert SIM card and push to lock.



Step 5 Finish.



3.8 Installing SSD/HDD

3.8.1 ECS-9000-R Series

Step 1 SSD/HDD tray.



Step 2 Use the trigger and open SSD/HDD tray.



Step 3 Installing 2.5" SSD/HDD into the tray.



Step 4 Lock the SSD/HDD tray with key.



3.8.2 ECS-9000-F/G/PoE Series

Step 1 Remove F-M3 screw.



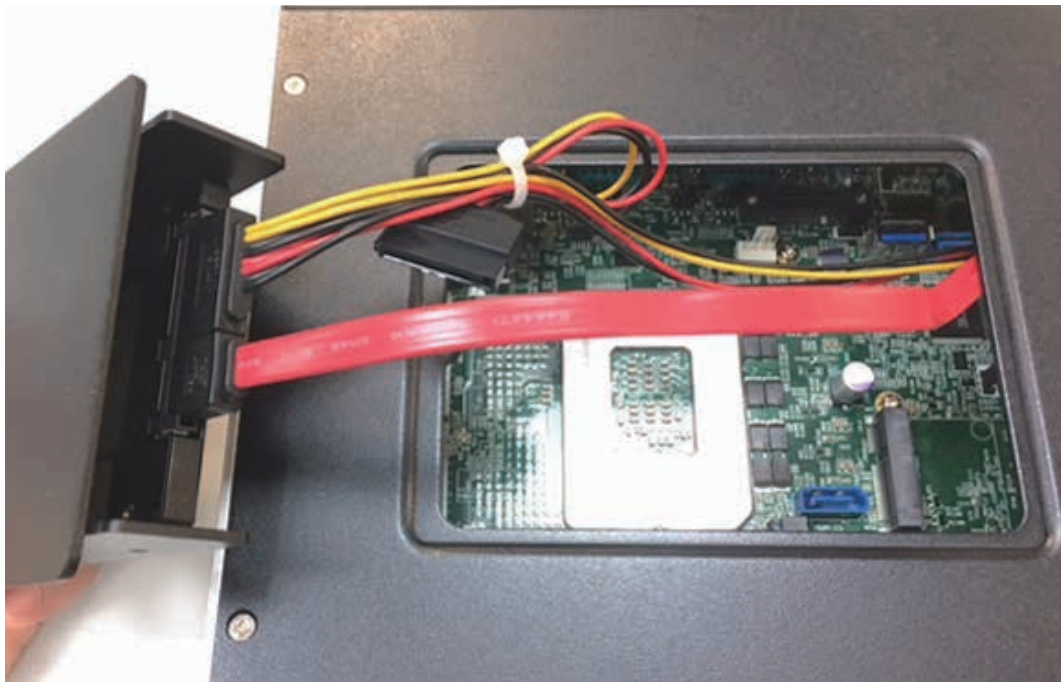
Step 2 Install SSD/HDD with HDD bracket.



Step 3 Lock KH-M3 screw. (One SSD/HDD with four KH-M3 screws)



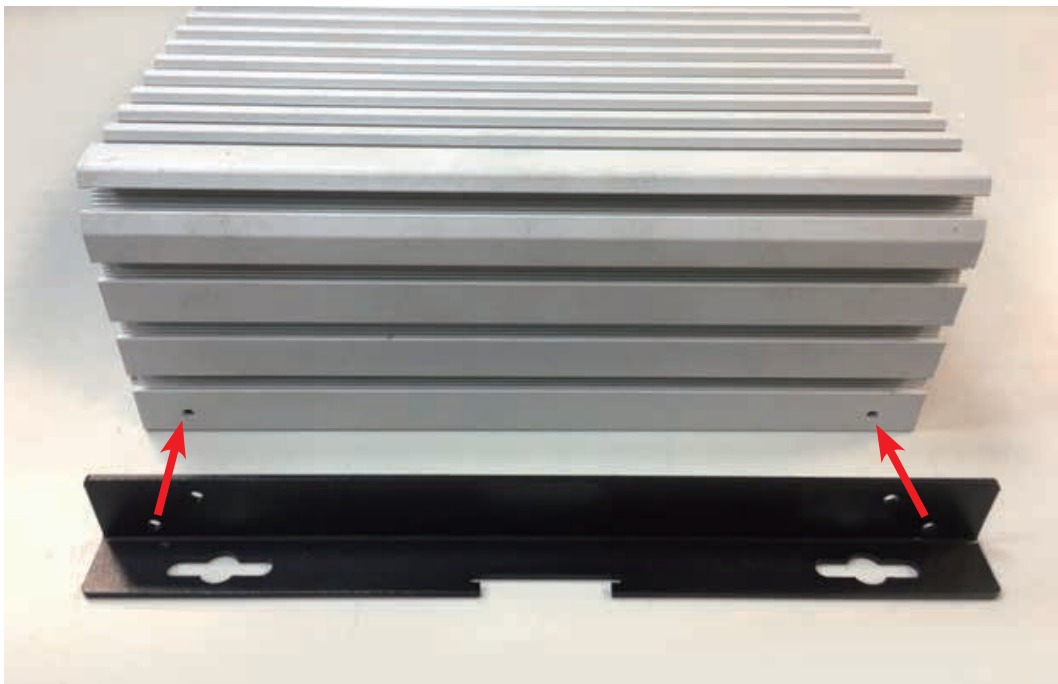
Step 4 Installing power and SATA cable with SSD/HDD.



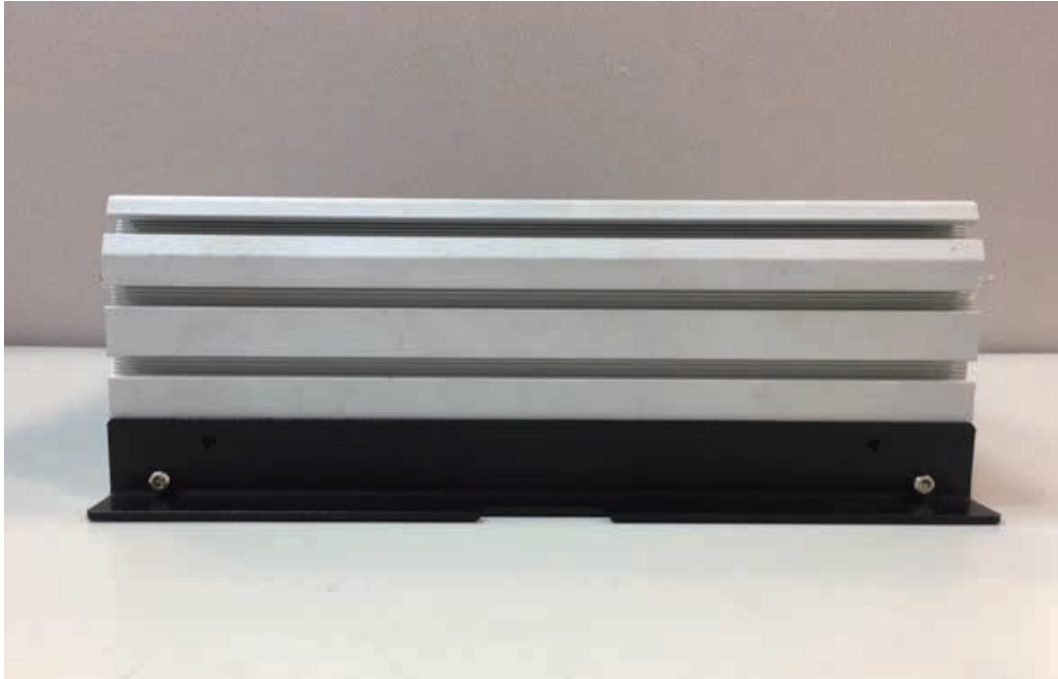
3.9 Mounting Your ECS-9000

3.9.1 Wall Mount Bracket

Step 1 Ensure the screw holes on the right and left side of the upper case match the ones on ECS-9000 wall mount bracket.

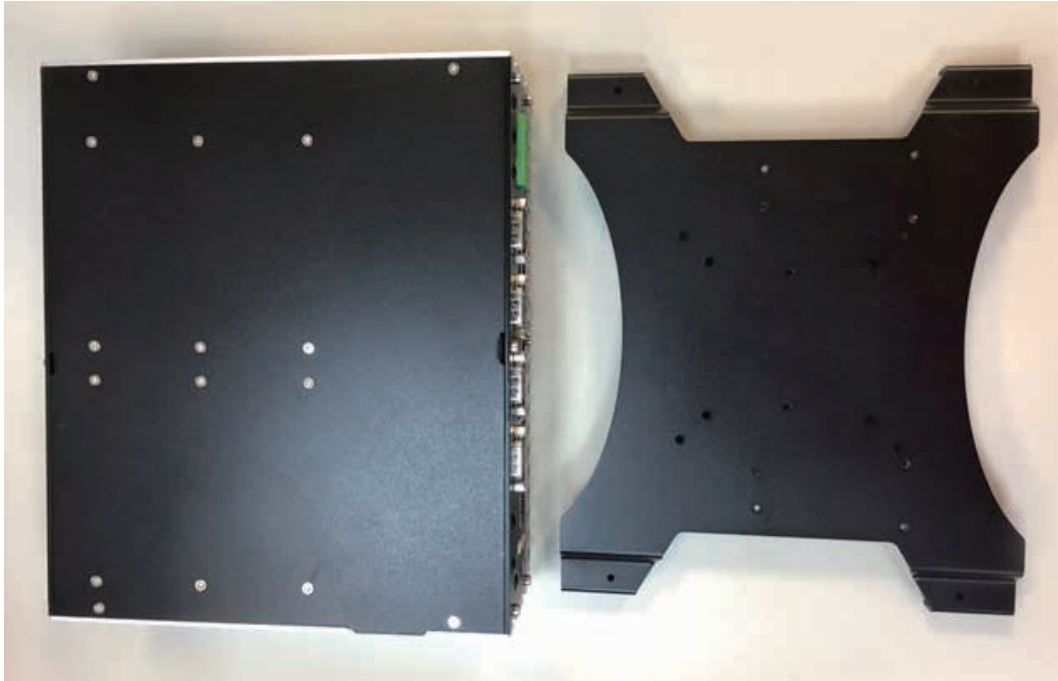


Step 2 Fasten 4pcs KHS#6-32 screws then finish.



3.9.2 VESA Mount

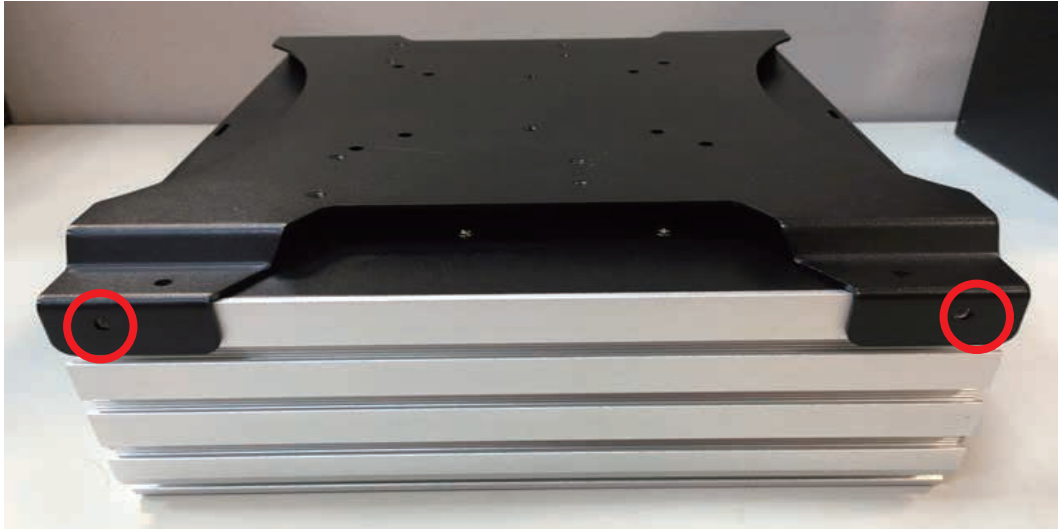
Step 1 ECS-9000 and VESA Mount.



Step 2 Take ECS-9000 and VESA Mount with fasten four KHS#6-32 screws



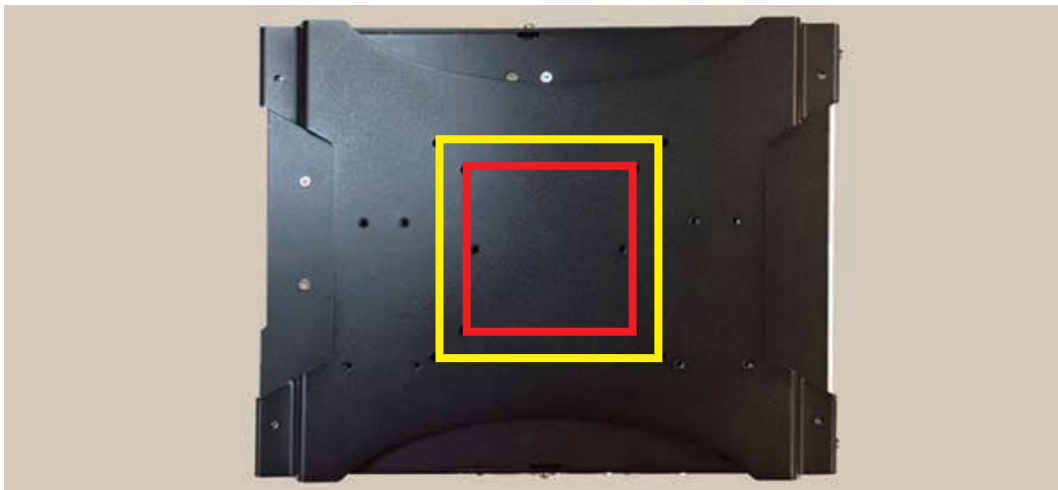
Step 3 Fasten four KHS#6-32 screws and then finish.



Step 4 Finish.



Step 5 ECS-9000 supports 75x75mm (squared in red) and 100x100mm (squared in yellow).



3.9.3 Din Rail Kit

Step 1 ECS-9000 and Din Rail Kit.



Step 2 Take ECS-9000 and VESA Mount with fasten four KHS#6-32 screws



Step 3 Fasten four KHS#6-32 screws and then finish.



Step 4 Finish.



Step 5 ECS-9000 With Din Rail.



4

BIOS SETUP

4.1 BIOS Settings

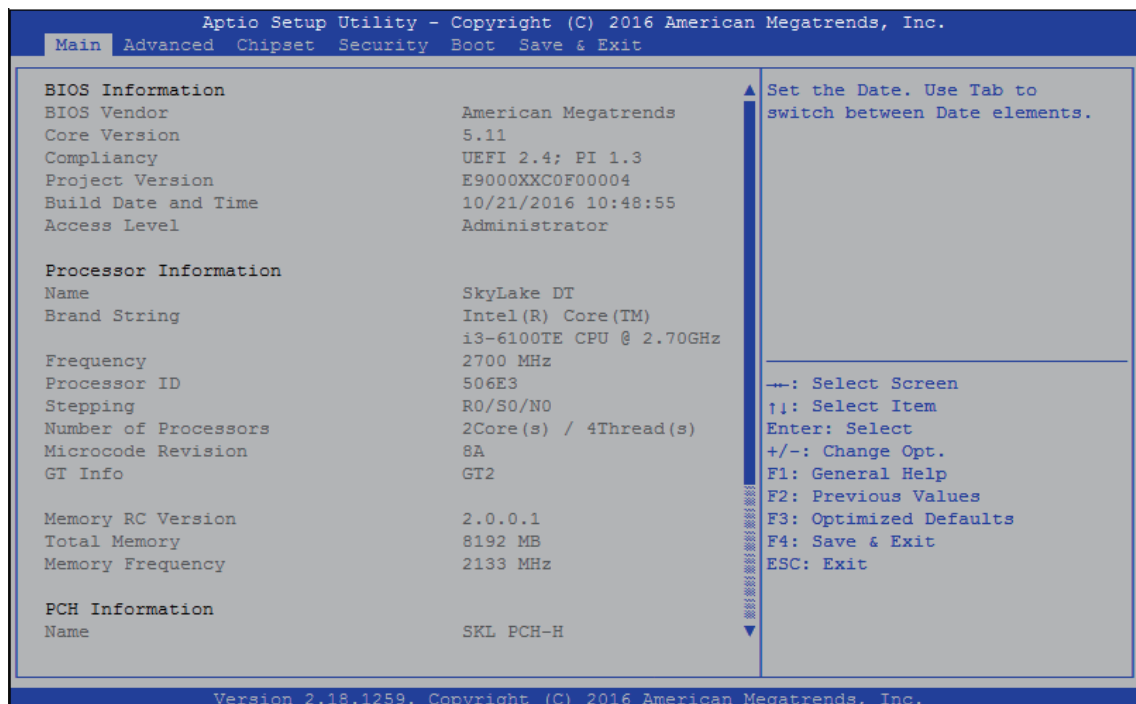


Figure 4-1: Entering Setup Screen

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

4.2 Main

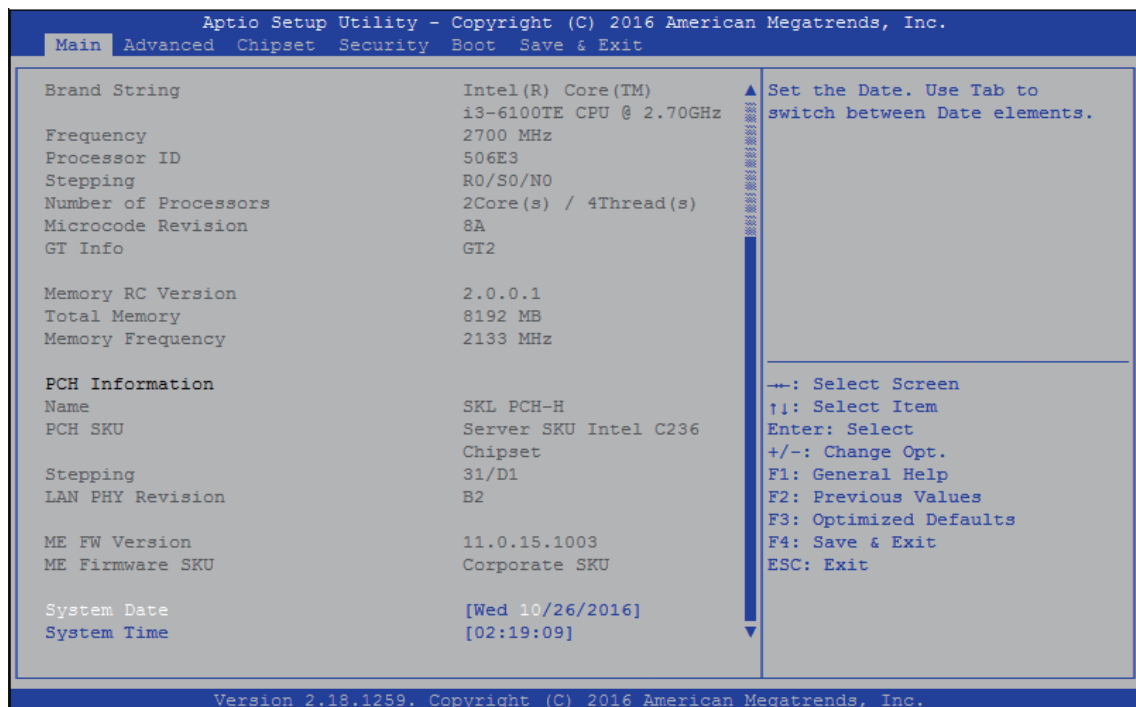


Figure 4-2: BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on the main menu, system date and system time.

System Date

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

System Time

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

4.3 Advanced

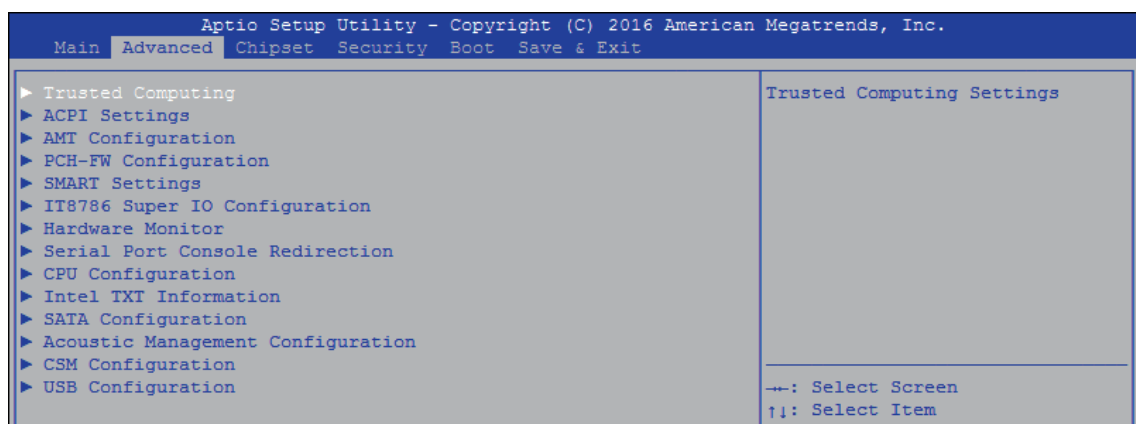


Figure 4 3: BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, SATA configuration, and USB configuration.

4.3.1 ACPI Settings

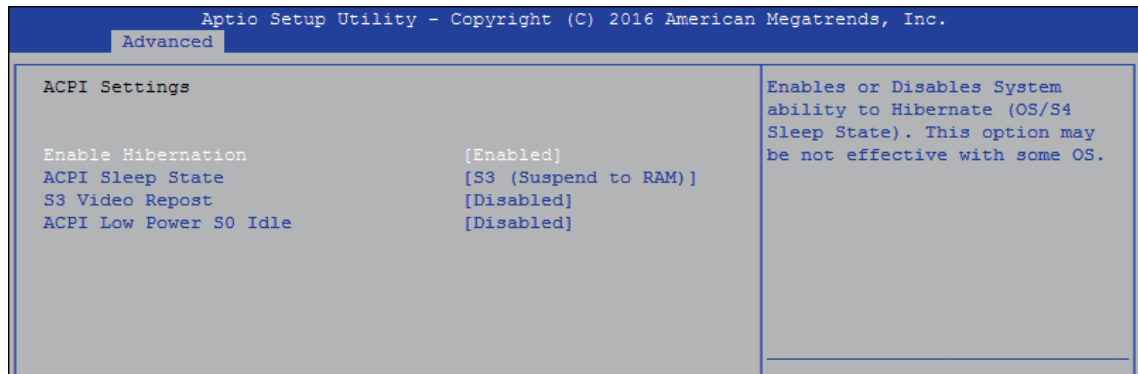


Figure 4 3-1: ACPI Settings

Enable Hibernation

Enables or Disables system's ability to hibernate (OS/S4 sleep state). This option may not be effective with some OS.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3 Video Repost

Enables or Disables S3 video repost.

ACPI Low Power S0 Idle

Enables or Disables ACPI low power S0 idle support.

4.3.2 AMT Configuration

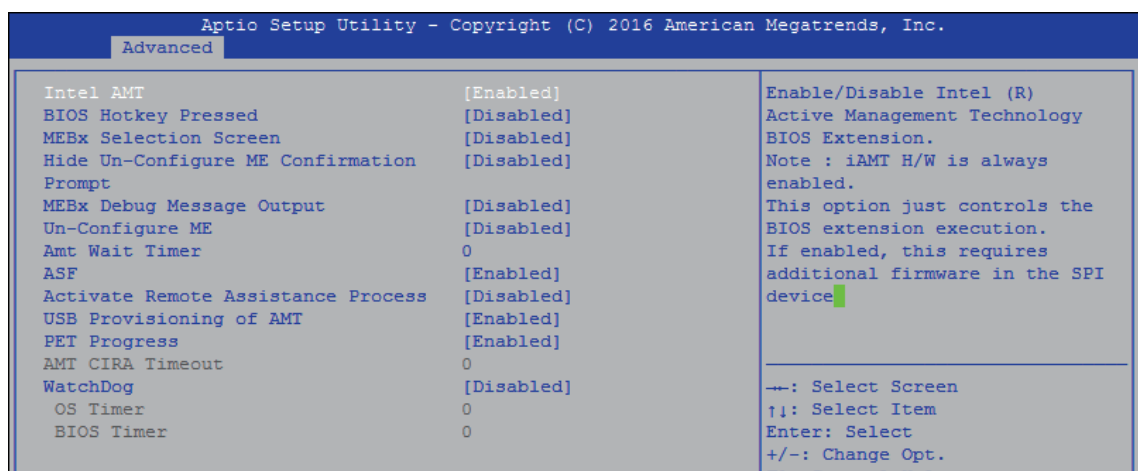


Figure 4 3-2: Intel AMT Settings

Intel AMT

Enables/Disables Intel (R) Active Management Technology BIOS extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

4.3.3 PCH-FW Configuration

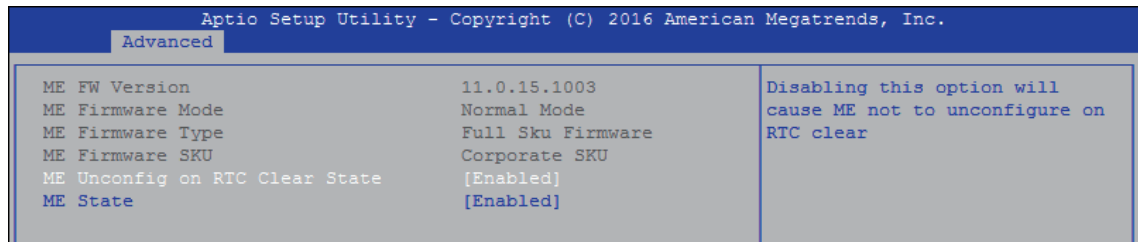


Figure 4 3-3: PCH-FW Settings

ME Unconfig on RTC Clear State

Disabling this option will cause ME not to unconfigure on RTC clear.

ME State

Set ME to Soft temporarily Disabled.

4.3.4 SMART Settings

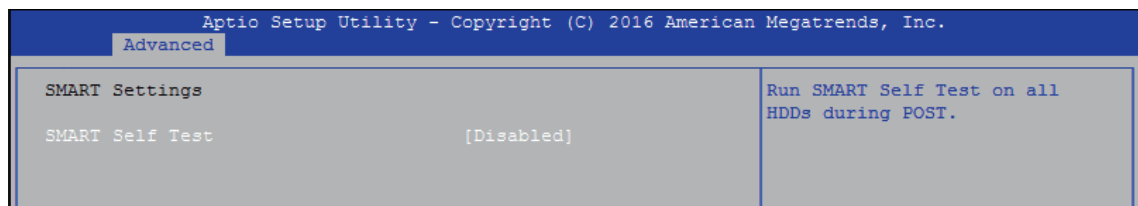


Figure 4 3-4: SMART Settings

SMART Self Test

Run SMART self test on all HDDs during POST.

4.3.5 IT8786 Super IO Configuration

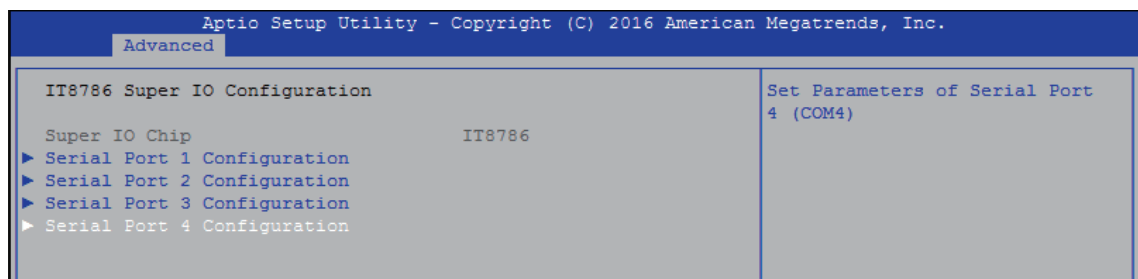


Figure 4-3-5: Super IO Settings

Serial Port 1 Configuration

Set parameters of serial port 1 (COM1).

Serial Port 2 Configuration

Set parameters of serial port 2 (COM2).

Serial Port 3 Configuration

Set parameters of serial port 3 (COM3).

Serial Port 4 Configuration

Set parameters of serial port 4 (COM4).

4.3.6 Hardware Monitor

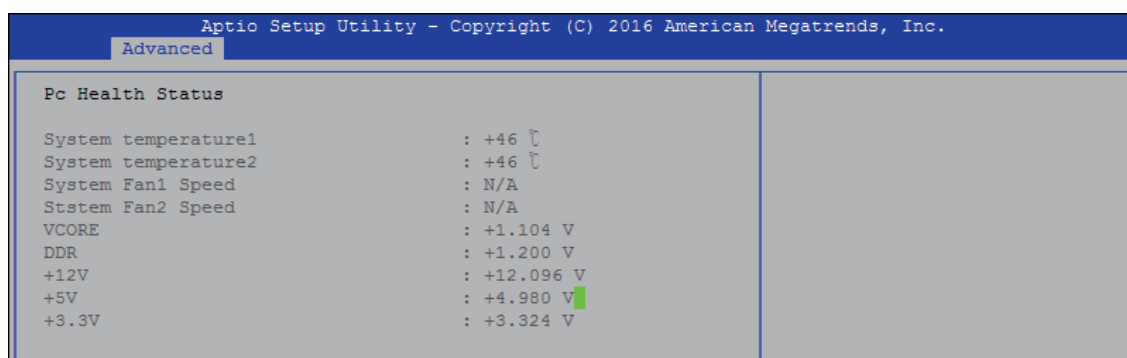


Figure 4 3-6: Hardware Monitor Settings

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

4.3.7 Serial Port Console Redirection

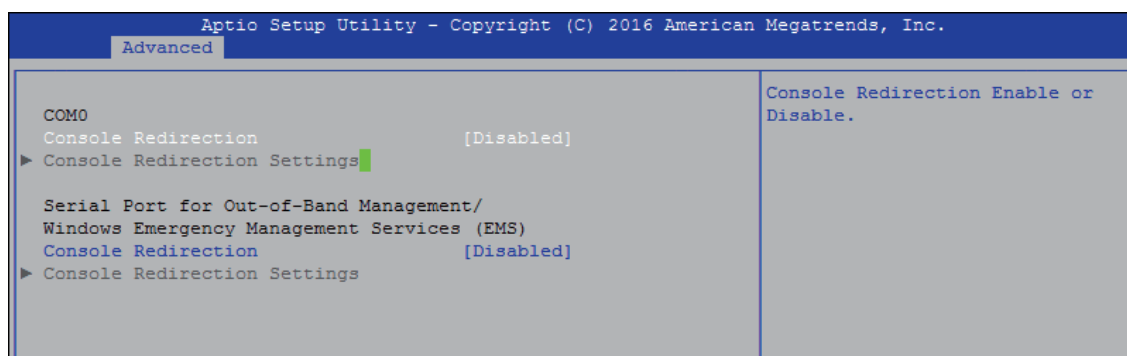


Figure 4 3-7: Serial Port Console Redirection Settings

Console Redirection

Console redirection enable or Disable.

Console Redirection Settings

These settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

4.3.8 CPU Configuration

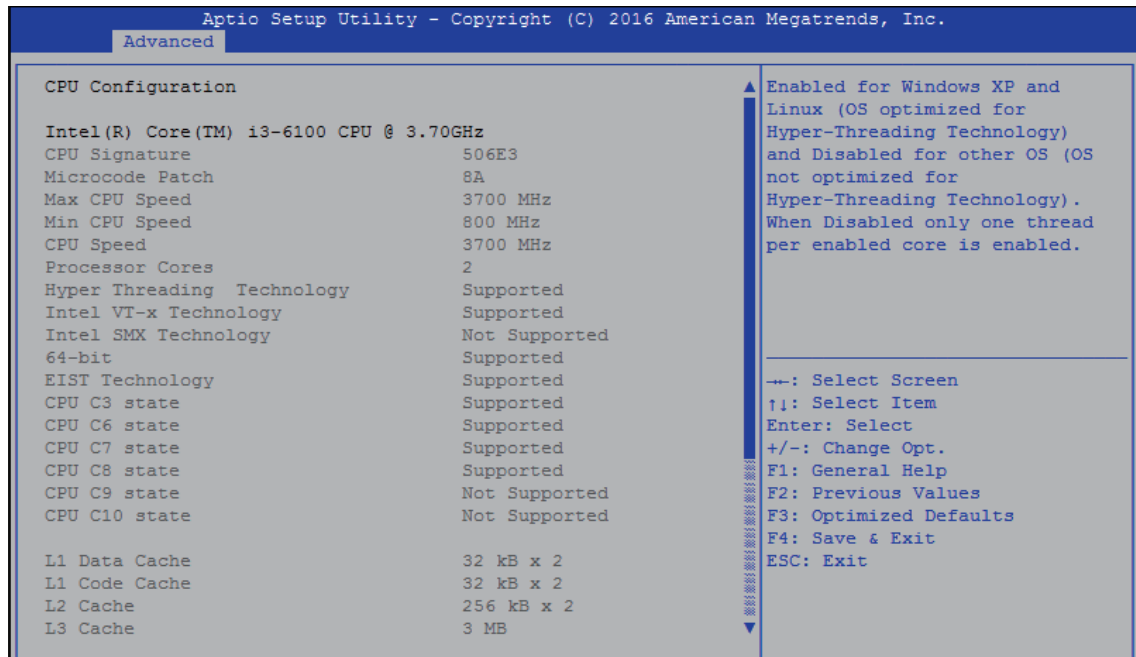


Figure 4 3-8: CPU Function Settings

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

CPU AES

Enable/Disable CPU Advanced Encryption Standard instructions.

Boot performance mode

Select the performance state that the BIOS will set before OS handoff.

Intel(R) SpeedStep(tm)

Allows more than two frequency ranges to be supported.

Turbo Mode

Turbo Mode.

CPU C state

Enable or Disable CPU C states.

Enhanced C-states

Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

Package C State limit

Package C State limit.

Intel TXT(LT) Support

Enables or Disables Intel (R) TXT (LT) support.

4.3.9 Intel TXT Information

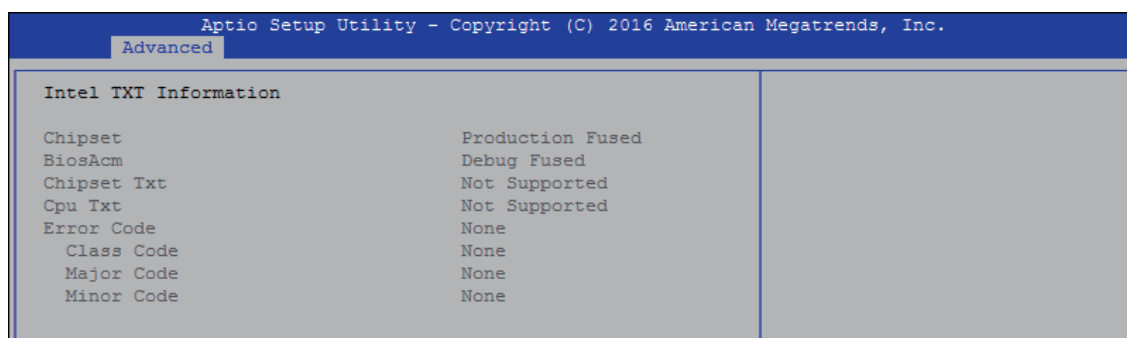


Figure 4 3-9: Intel TXT Information

Display Intel TXT information.

4.3.10 SATA Configuration

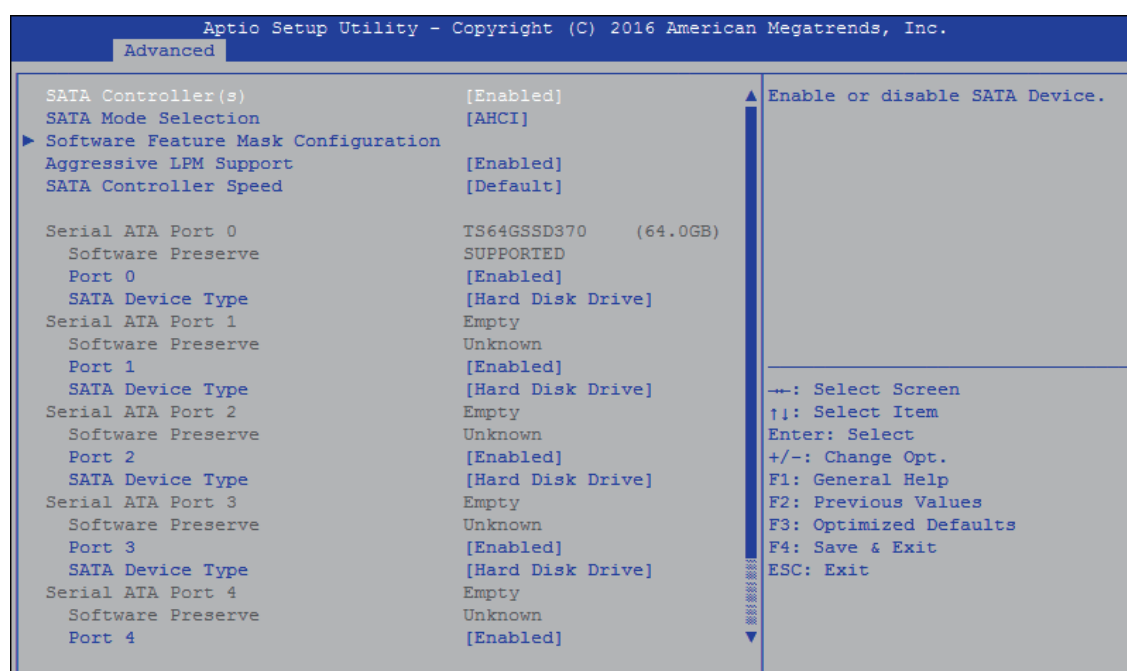


Figure 4 3-10: SATA Devices Settings

SATA Controller(s)

Enable or Disable SATA Device.

SATA Mode Selection

Determines how SATA controller(s) operate.

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or Disable the storage features.

Aggressive LPM Support

Enable PCH to aggressively enter link power state.

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

Options for each SATA port

Port 0

Enable or Disable SATA Port.

SATA Device Type

Identifies that the SATA port is connected to solid state drive or hard disk drive.

4.3.11 Acoustic Management Configuration

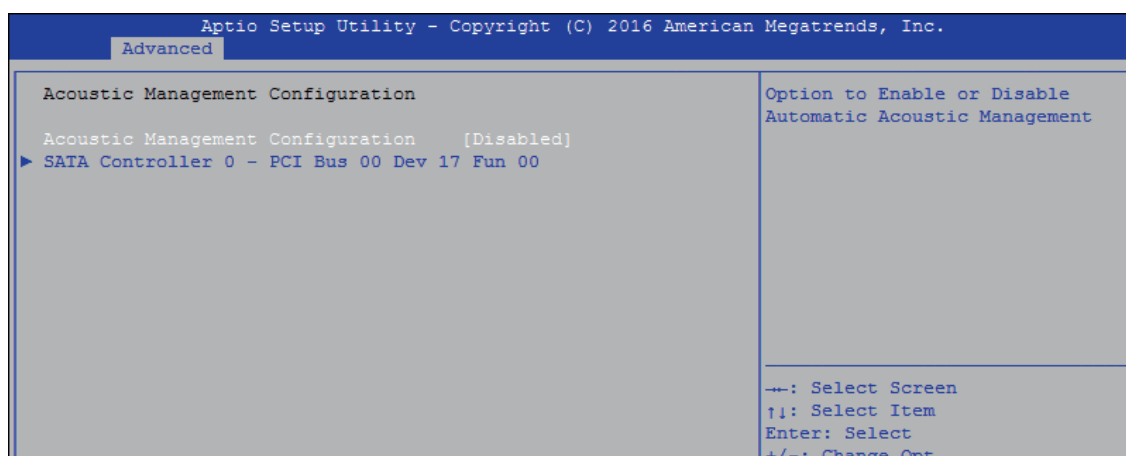


Figure 4 3-11: Acoustic Management Settings

Acoustic Management Configuration

Option to enable or Disable automatic acoustic management.

4.3.12 CSM Configuration

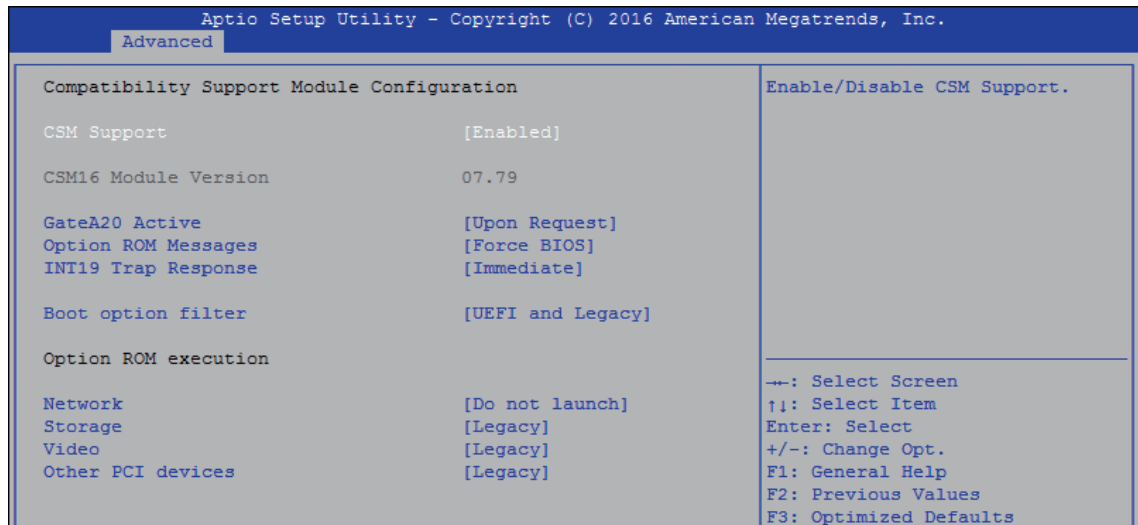


Figure 4 3-12: CSM Settings

CSM Support

Enable/Disable CSM support

GateA20 Active

UPON REQUEST - GA20 can be Disabled using BIOS services.

ALWAYS - do not allow GA20 to be Disabled; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM:

IMMEDIATE - execute the trap right away;

POSTPONED - execute the trap during legacy boot.

Boot option filter

This option controls Legacy/UEFI ROM's priority.

Network

Controls the execution of UEFI and Legacy PXE OpROM.

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Video

Allows more than two frequency ranges to be supported.

Other PCI devices

Determines OpROM execution policy for devices other than network, storage, or video.

4.3.13 USB Configuration

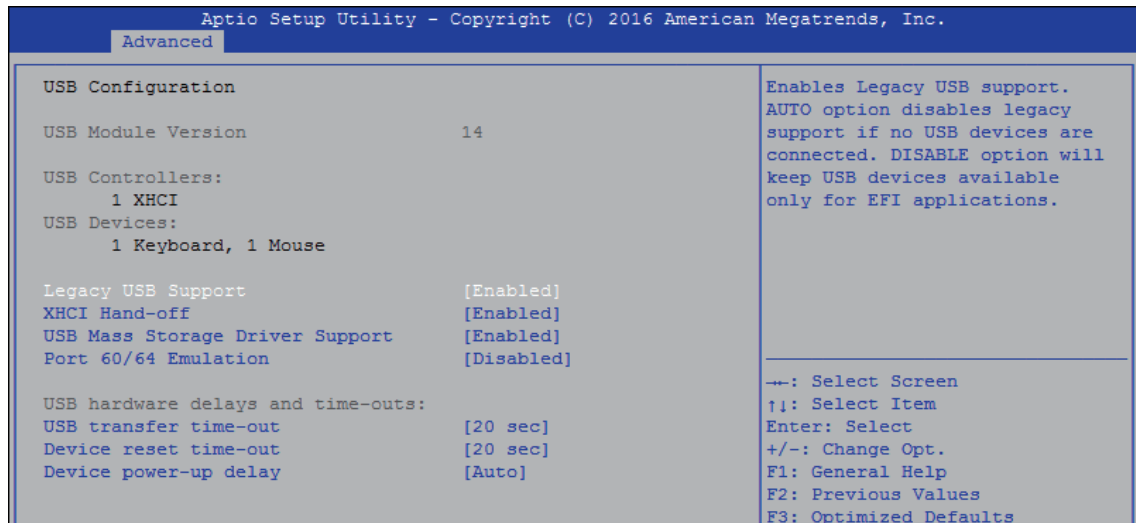


Figure 4 3-13: USB Settings

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 OS-es 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.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OS-es.

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 the hub descriptor.

4.4 Chipset

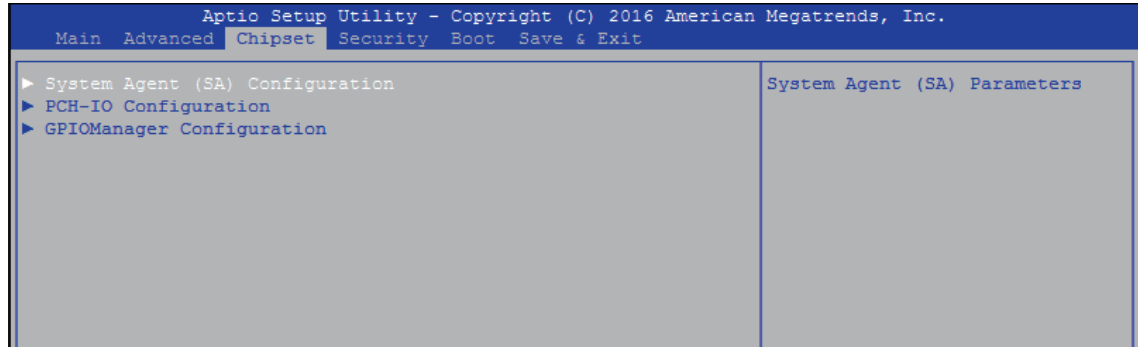


Figure 4-4: BIOS Chipset Menu

System Agent (SA) Configuration

System Agent (SA) parameters.

PCH-IO Configuration

PCH parameters.

GPIOManager Configuration

GPIOManager parameters.

4.4.1 System Agent (SA) Configuration

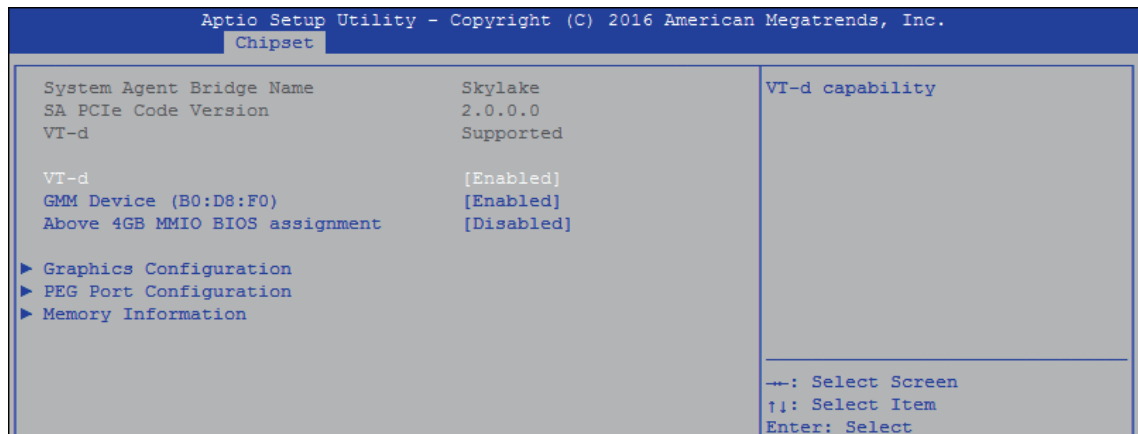


Figure 4-4-1: System Agent Settings

VT-d

VT-d capability.

GMM Device (B0:D8:F0)

Enable/Disable SA GMM device.

Above 4GB MMIO BIOS assignment

Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is Disabled automatically when aperture size is set to 2048MB.

4.4.2 Graphics Configuration

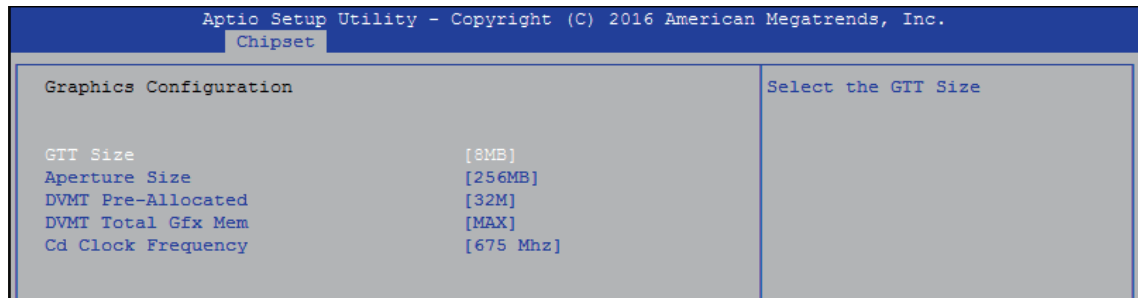


Figure 4-4-2: Graphics Settings

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size.

Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please Disable CSM Support.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.

Cd Clock Frequency

Select the highest Cd Clock frequency supported by the platform.

4.4.3 PEG Port Configuration (SA)

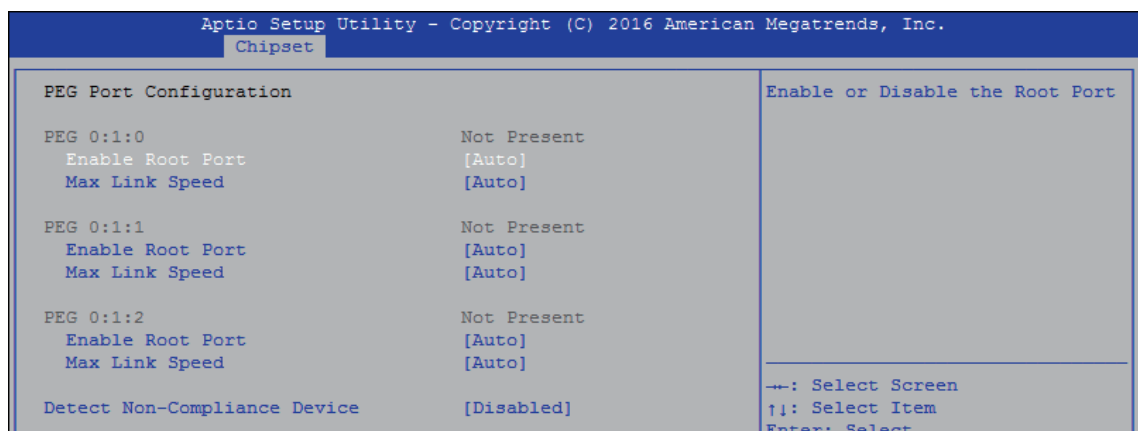


Figure 4-4-3: PEG Port Configuration

PEG port options for PCIe device.

4.4.4 Memory Information

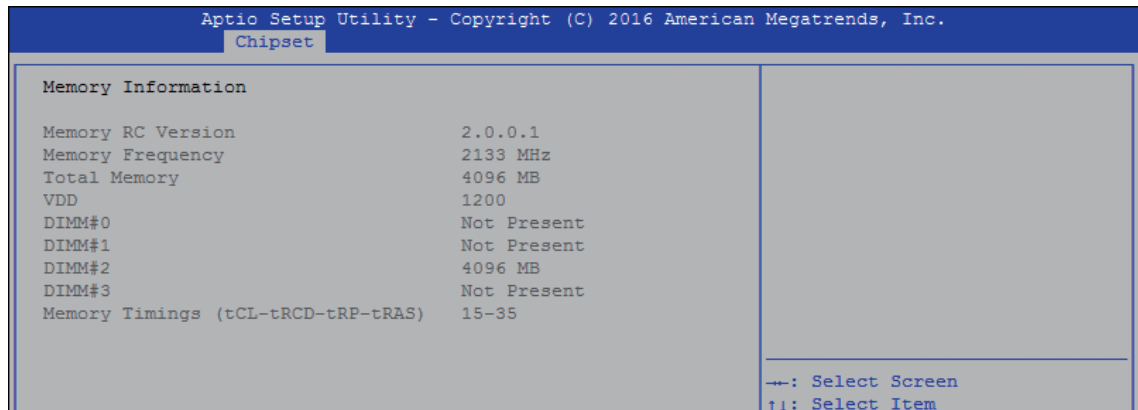


Figure 4-4-4: Memory Information

Displays memory information.

4.4.5 PCH-IO Configuration

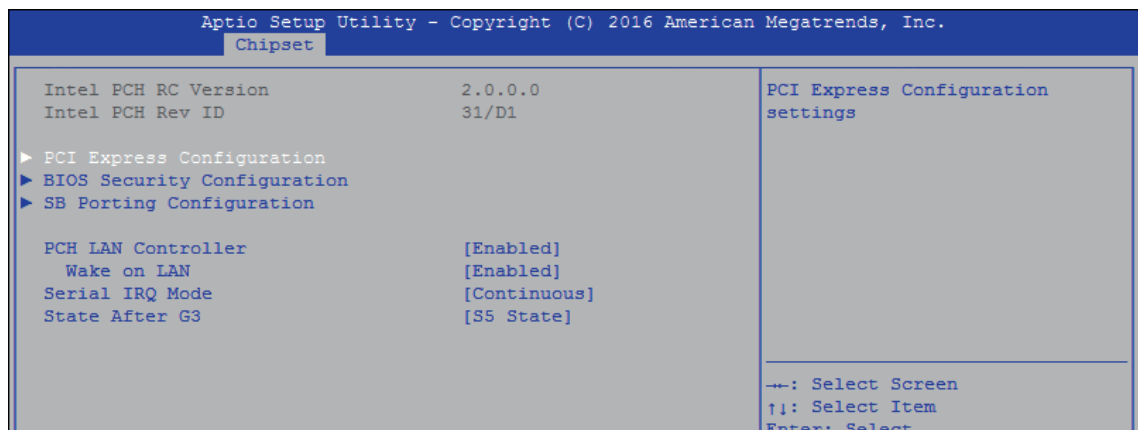


Figure 4-4-5: PCH-IO Settings

PCH LAN Controller

Enable or Disable onboard NIC.

Wake on LAN

Enable or Disable integrated LAN to wake the system. (The Wake on LAN cannot be Disabled if ME is on at Sx state.)

Serial IRQ Mode

Configure serial IRQ mode.

State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state).

S0 State: Always turn-on the system when power source plugged-in.

S5 State: Always turn-off the system when power source plugged-in.

4.4.6 PCI Express Configuration

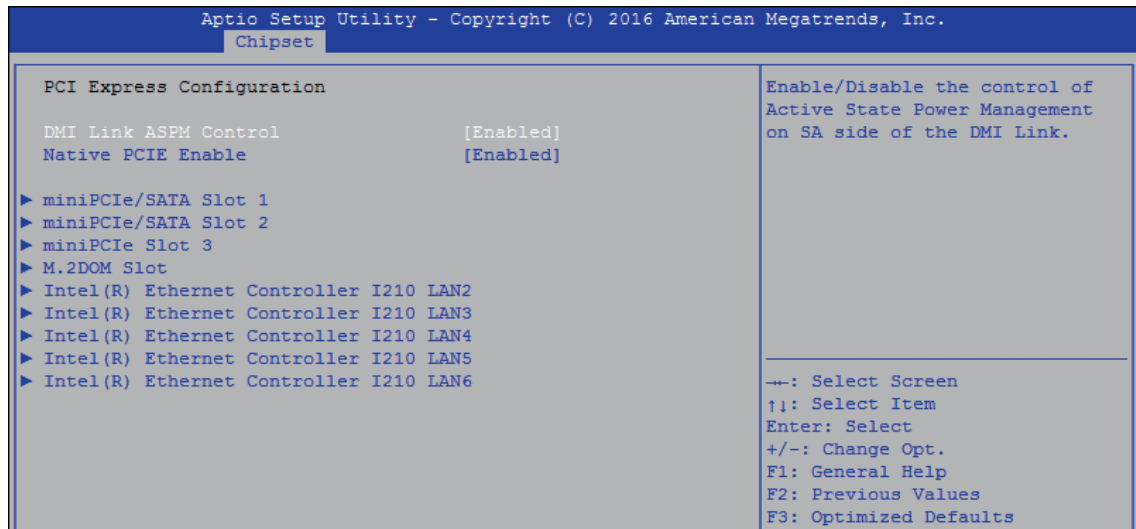


Figure 4-4-6: PCH-IO Settings

DMI Link ASPM Control

Enable/Disable the control of active state power management on SA side of the DMI link.

Native PCIE Enable

PCI Express Native Support Enable/Disable. This feature is available in vista and beyond Windows OS.

4.4.7 BIOS Security Configuration of PCH-IO

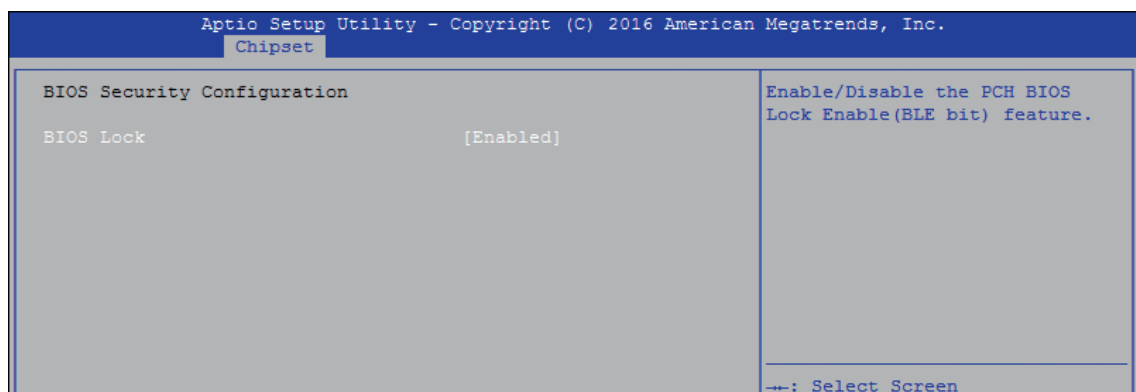


Figure 4-4-7: BIOS Security Settings

BIOS Lock

Enable/Disable the PCH BIOS Lock Enable (BLE bit) feature.

4.4.8 SB Porting Configuration of PCH-IO

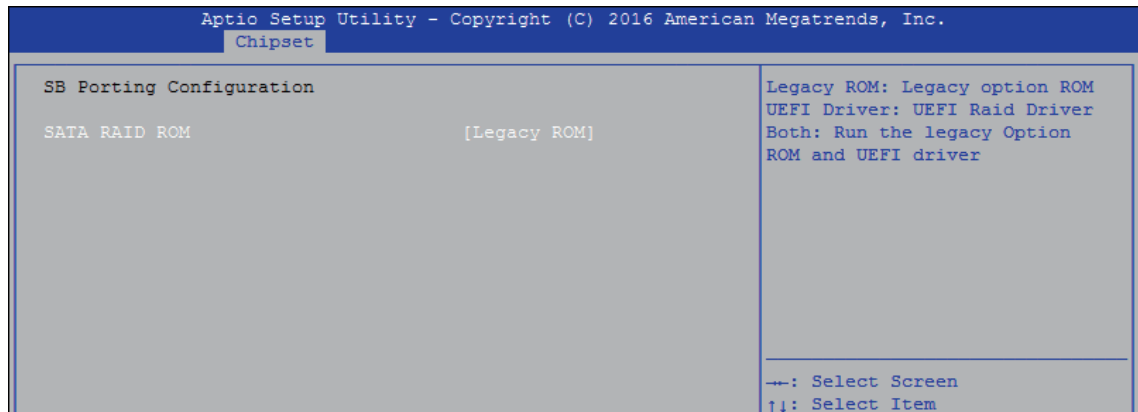


Figure 4-4-8: RAID ROM Settings

SATA RAID ROM

Legacy ROM: Legacy option ROM

UEFI Driver: UEFI Raid Driver

Both: Run the Legacy Option ROM and UEFI driver.

4.4.9 GPIO Manager Configuration

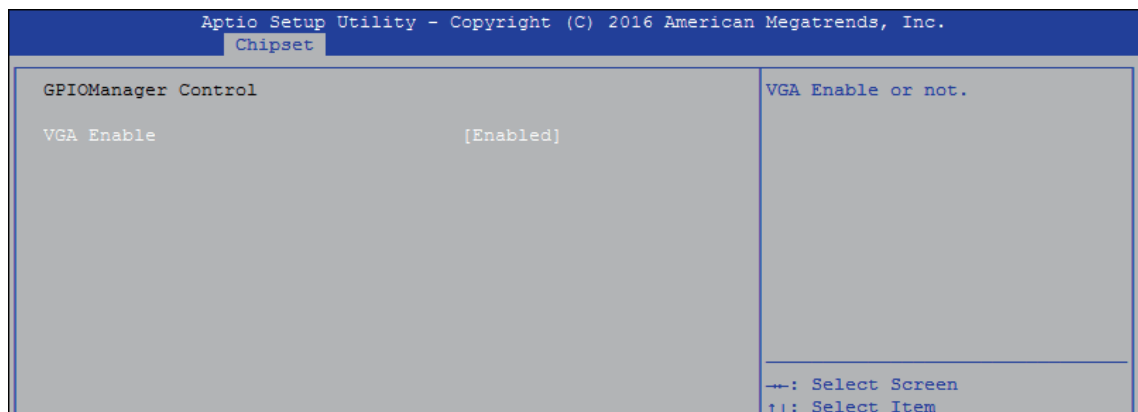


Figure 4-4-9: GPIO Manager Settings

VGA Enable

Enable: VGA display output enabled

Disable: VGA display output Disabled

4.5 Security

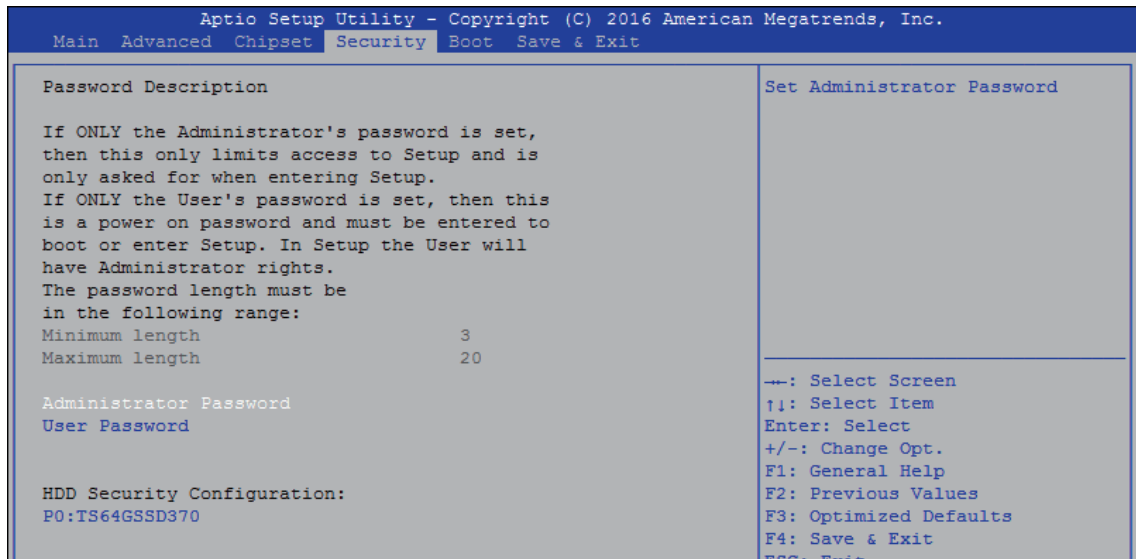


Figure 4-5: BIOS Security Menu

Administrator Password

Set administrator password.

User Password

Set user password.

4.5.1 HDD Security Configuration

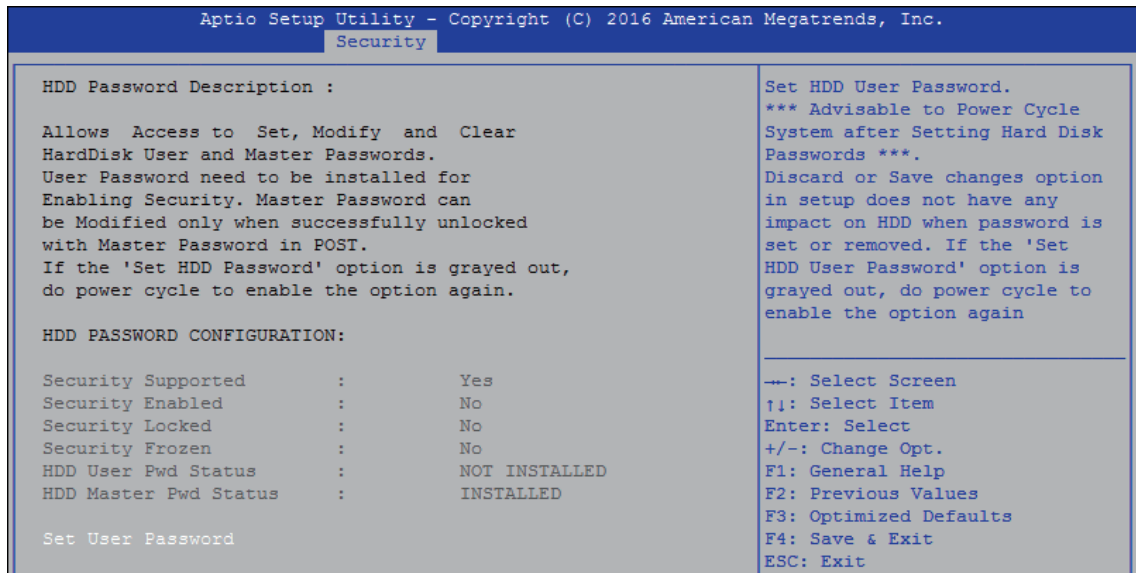


Figure 4-5-1: HDD Security Settings

Set User Password

Set HDD user password.

*** Advisable to power cycle system after setting hard disk passwords ***

Discard or save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is gray, do power cycle to enable the option again.

4.6 Boot

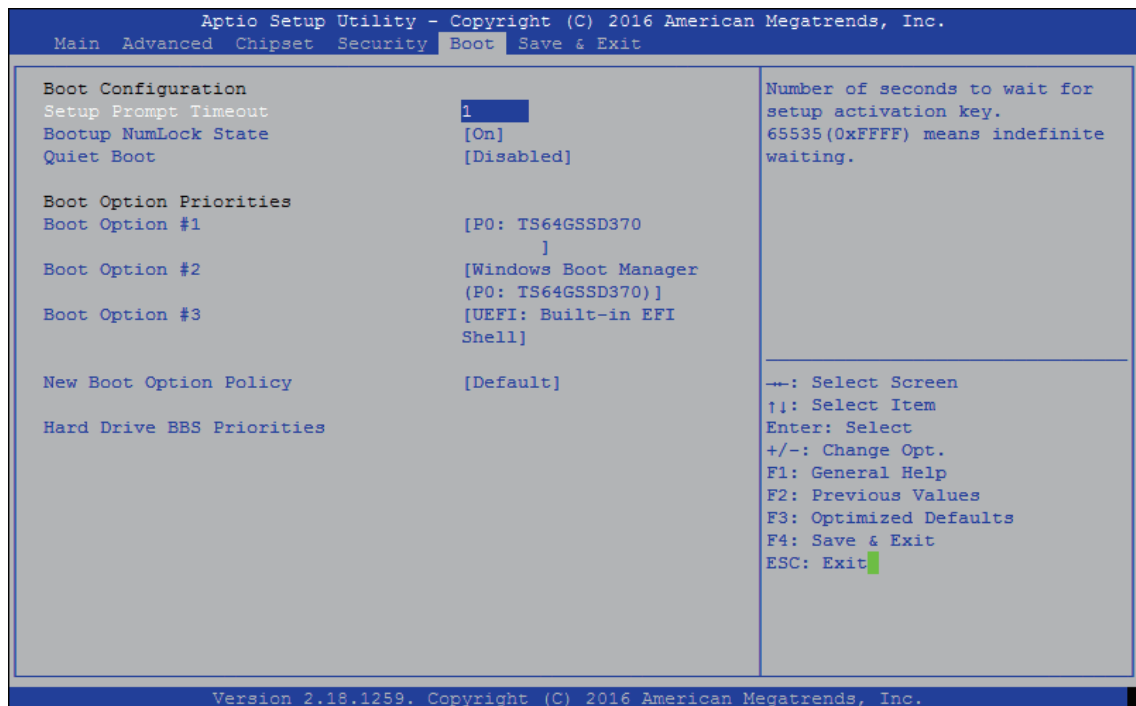


Figure 4-6: BIOS Boot Menu

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 Option #x

Sets the system boot order.

New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

Hard Drive BBS Priorities

Set the order of the Legacy devices in this group.

4.7 Save & Exit

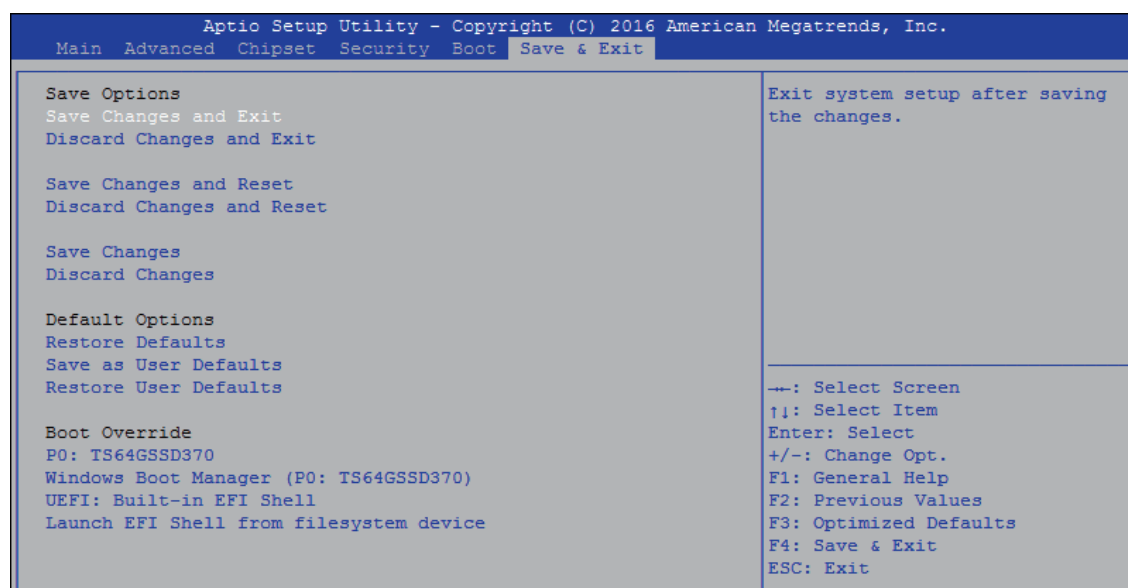


Figure 4-7: Bios Save and Exit Menu

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Default Options:

Restore Defaults

Restore/Load default values for all the setup options.

Save as User Defaults

Save the changes done so far as user defaults.

Restore User Defaults

Restore the user defaults to all the setup options.

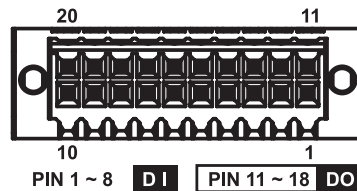
A

APPENDIX A : Isolated DIO Guide

A.1 Function Description

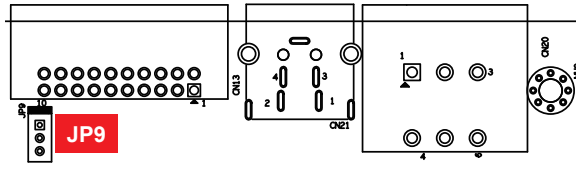
The ECS-9000 offers a 16-bit DIO (Isolated/Non-Isolated) 20-pin terminal block connector, a watchdog timer, and a 4-port PoE.

Isolated DIO pins are fix by Hardware design that cannot change in/out direction in runtime process. DIO definition is shown below:



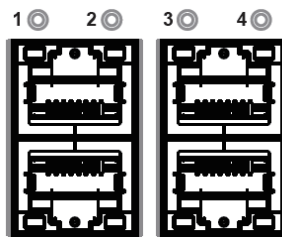
| Pin No. | Isolated DIO Definition | Non Isolated DIO Definition | Pin No. | Isolated DIO Definition | Non Isolated DIO Definition |
|---------|-------------------------|-----------------------------|---------|-------------------------|-----------------------------|
| 1 | DI0 | DIO0 | 11 | DO0 | DIO8 |
| 2 | DI1 | DIO1 | 12 | DO1 | DIO9 |
| 3 | DI2 | DIO2 | 13 | DO2 | DIO10 |
| 4 | DI3 | DIO3 | 14 | DO3 | DIO11 |
| 5 | DI4 | DIO4 | 15 | DO4 | DIO12 |
| 6 | DI5 | DIO5 | 16 | DO5 | DIO13 |
| 7 | DI6 | DIO6 | 17 | DO6 | DIO14 |
| 8 | DI7 | DIO7 | 18 | DO7 | DIO15 |
| 9 | DI COM | NC | 19 | DIO GND | DIO GND |
| 10 | DIO GND | DIO GND | 20 | External VDC | NC |

Isolated DIO jumper setting is shown below:



| DIO | Jumper | Setting | Status |
|------|--------|---------|--------------|
| DIO1 | JP9 | 1-2 | NPN (Sink) |
| | | 2-3 | PNP (Source) |

PoE definition is shown below:



| Port No. | Definition | Port No. | Definition |
|----------|------------|----------|------------|
| 1 | PoE 0 | 3 | PoE 2 |
| 2 | PoE 1 | 4 | PoE 3 |

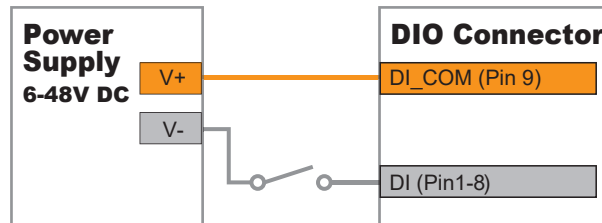
Do NOT use these functions in below:

1. PE-2000: DIO1 (ID = 0), PoE
2. PE-3000: PoE
3. UE-1000: USB (ID = 0)

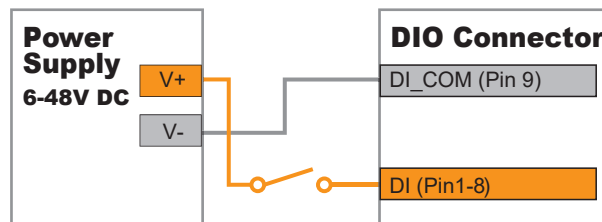
A.2 Isolated DIO Signal Circuit

DI Reference Circuit:

Sink Mode (NPN)

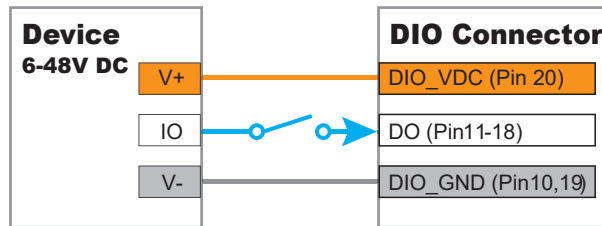


Source Mode (PNP)

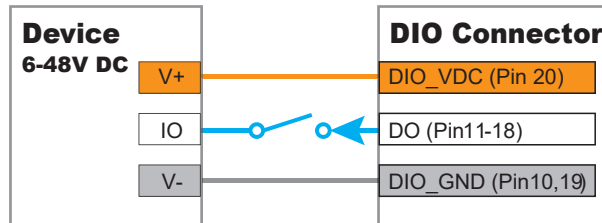


DO Reference Circuit:

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 followed:

Win7_32.bat:

Installation for 32-bit driver

Win7_64.bat:

Windows update package which driver required (need to restart), and Installation for 64-bit driver

Win8_32.bat, Win8_64.bat:

Installation for driver, and guideline to Framework 3.5 distribution for sample

Win10_32.bat, and Win10_64.bat:

Installation for driver, and installation to Framework 3.5 distribution for sample

Uninstall_32.bat, and Uninstall_64.bat:

Uninstallation for driver

Run batch file as Administrator.

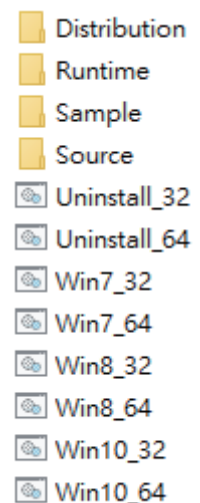
Support Windows 7 above.

Make sure Windows version before installation.

Runtime folder include head file for software developer or System Integration.

Sample folder include sample program, driver library, and API library.

Source folder include sample program source code that compile on Visual Studio 2008.

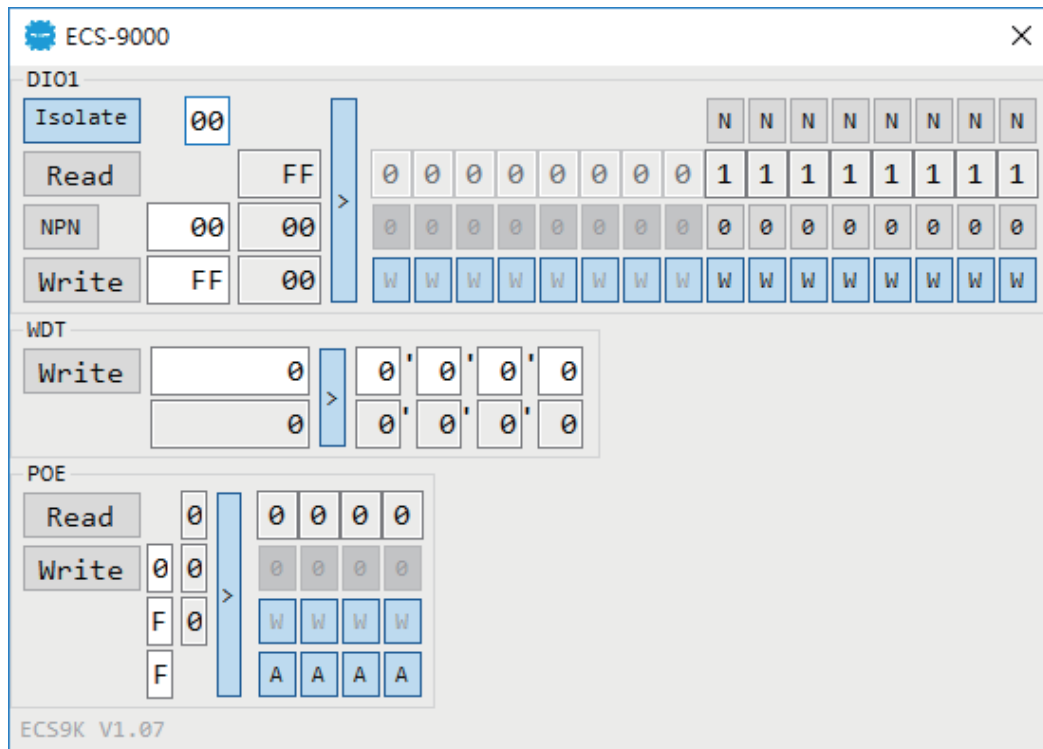


A.4 Sample

Execute DIO demo tool (ECS9K.exe).



Sample ECS9K.exe, as shown below:



DIO1 group:

Isolate check button:

DIO type of DIO configuration, isolated/non-isolated, defined in ECS-9000 series user manual.

Read button:

Set DIO configuration to get DI/DIO input state.

DO type check button:

User setting, DO type of DIO configuration to setup 8 pins - Source/Sink.
Use for Write (DO) button activate.

Write button:

Set DIO configuration to set DO/DIO output state.

DI preference text:

User setting, DI type of DIO configuration by hexadecimal bitmask - Source/Sink.

Use for Read (DI) button activate.

DO/DIO output text:

User setting, DO/DIO output state by hexadecimal bitmask - on/off.
Use for Write button activate.

DO/DIO writable text:

User setting, DO/DIO writable of DIO configuration by hexadecimal
bitmask - yes/no.
Use for Read (DIO)/Write button activate.

DI/DIO input text (read only):

DI/DIO input state by hexadecimal bitmask – on/off.
Use for Read button activate.

DO/DIO text (read only):

DO/DIO output state with input state (DIO) and configuration.
Use for Write button activate.

DO/DIO output text (read only):

DO/DIO output state with configuration.
Use for Write button activate.

DI type pin check button (pin 8 ~ pin 1):

User setting, DI pin type of DIO configuration - Source/Sink.

DI/DIO input pin texts (read only, pin 8 ~ pin 1/pin 18 ~ pin 11, pin 8 ~ pin 1):

DI/DIO input pin state
Use for Read button activate.

DO/DIO output pin check button (pin 18 ~ pin 11/pin 18 ~ pin 11, pin 8 ~ pin 1):

User setting, DO/DIO output pin state
Use for Write button activate.

DO/DIO pin writable check button (pin 18 ~ pin 11/pin 18 ~ pin 11, pin 8 ~ pin 1):

User setting, DO/DIO pin writable of DIO configuration.
Use for Read (DIO)/Write button activate.

WDT group:

Write button:

Set WDT when WDT setup text is valid.

Stop button:

Cancel WDT and counting.
Use after Write button action.

WDT setup text:

User setting, WDT value, unit: second.
Use for Write button activate.

WDT counting text (read only):

WDT counting by program timer after set WDT.
Shown after Write button action.

WDT setup day format texts (user setting):

User setting, WDT value, format: day'hour'minute'second.

WDT counting day format text (read only):

WDT counting, format: day'hour'minute'second.

PoE group:

Read button:

Set PoE configuration to get PoE state.

Write button:

Set PoE configuration to set PoE state.

PoE output text:

User setting, PoE output state by hexadecimal bitmask - on/off.

Use for Write button activate.

PoE writable text:

User setting, PoE writable of PoE configuration by hexadecimal bitmask - yes/no.

Use for Write button activate.

PoE mode text:

User setting, PoE mode of PoE configuration by hexadecimal bitmask - Auto/Manual.

Use for Write button activate.

PoE input text (read only):

PoE input state by hexadecimal bitmask - on/off.

Use for Read button activate.

PoE text (read only):

PoE output state with input state and configuration.

Use for Write button activate.

PoE output text (read only):

PoE output state with configuration.

Use for Write button activate.

PoE input port texts (read only, port 4 ~ port 1):

PoE input port state

Use for Read button activate.

PoE output port check button (port 4 ~ port 1):

User setting, PoE output port state

Use for Write button activate.

PoE port writable check button (port 4 ~ port 1):

User setting, PoE port writable of PoE configuration.

Use for Write button activate.

PoE port mode check button (port 4 ~ port 1):

User setting, PoE port mode of PoE configuration.

Use for Write button activate.

B

APPENDIX B : Software Functions

B.1 Driver API Guide

In Runtime folder, on ECS9K.h:

`_DLL_IMPORT_` definition is used on LoadLibrary API for ECS9K.dll.

`ECS9K_EXPORTS` definition is used on ECS9K.dll building.

Otherwise, that is used to compile with ECS9K.lib.

BOOL Initial(BYTE Isolate_Type, BYTE DIO_NPN)

Initial machine for DIO, watchdog timer, and PoE

Isolate_Type: DIO type

1: Isolated DIO; 0: Non-Isolated DIO

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 initial error (version is too old, or machine not match))

BOOL GetDIO1Config(BYTE *Isolate_Type, BYTE *DI_NPN, WORD *Mask)

Get DIO configuration (by variable)

Isolate_Type: DIO type

1: Isolated DIO; 0: Non-Isolated DIO

DI_NPN ([7:0]): DI type, pin setting by hexadecimal bitmask

1: PNP (Source) mode for European rule;

0: NPN (Sink) mode for Japanese rule

DO_NPN: DO type

1: PNP (Source) mode for European rule;

0: NPN (Sink) mode for Japanese rule

Mask ([15:0]): In / Out, pin setting by hexadecimal bitmask

1: Output; 0: Input

Return:

TRUE (1): Success;

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

BYTE Isolate_Type, BYTE DI_NPN, BYTE DO_NPN, WORD Mask

Set DIO configuration

Isolate_Type: DIO type

1: Isolated DIO; 0: Non-Isolated DIO

DI_NPN ([7:0]): DI type, pin setting by hexadecimal bitmask

1: PNP (Source) mode for European rule;

0: NPN (Sink) mode for Japanese rule

DO_NPN: DO type

1: PNP (Source) mode for European rule;

0: NPN (Sink) mode for Japanese rule

Mask ([15:0]): In / Out, pin setting by hexadecimal bitmask

1: Output; 0: Input

Return:

TRUE (1): Success;

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

BOOL GetDI1(BYTE *DI)

Get isolated DIO input (DI)

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

1: High; 0: Low

Return:

TRUE (1): Success;

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

BOOL GetDO1(BYTE *DO)

Get 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 call by pointer error, or hardware problem)

BOOL SetDO1(BYTE DO)

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)

BOOL GetDIO1(WORD *DI)

Get non-isolated DIO input (DIO input)

DI ([15:0]): Input state, pin setting by hexadecimal bitmask

1: High; 0: Low

Return:

TRUE (1): Success;

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

problem)

BOOL SetDIO1(WORD DO)

Set non-isolated DIO output (DIO output)

DO ([15:0]): output state, pin setting by hexadecimal bitmask

1: High; 0: Low

Return:

TRUE (1): Success;

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

BOOL GetWDT(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 SetWDT(DWORD WDT)

Set watchdog timer setup

WDT: watchdog timer setup

Unit: second. (Range: 1 ~ 65535 sec, 1093 ~ 65535 min

(=65580 ~ 3932100 sec))

Return:

TRUE (1): Success;

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

BOOL CancelWDT()

Cancel watchdog timer

Return:

TRUE (1): Success;

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

BOOL GetPoEConfig(BYTE *Auto, BYTE *Mask)

Get PoE configuration (by variable)

Auto ([3:0]): Auto mode, pin setting by hexadecimal bitmask

1: Auto; 0: Manual

Mask ([3:0]): DC Enable / Disable, pin setting by hexadecimal bitmask

1: Enable; 0: Disable

Return:

TRUE (1): Success;

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

BOOL SetPoEConfig(BYTE Auto, BYTE Mask)

Set PoE configuration

Auto ([3:0]): Auto mode, pin setting by hexadecimal bitmask

1: Auto; 0: Manual

Mask ([3:0]): DC Enable / Disable, pin setting by hexadecimal bitmask

1: Enable; 0: Disable

Return:

TRUE (1): Success;

FALSE (0): Fail (Initial error, or out of range error, or hardware problem)

BOOL GetPoE(BYTE *PoE)

Get PoE input

PoE ([3:0]): PoE state, pin setting by hexadecimal bitmask

1: On; 0: Off

Return:

TRUE (1): Success;

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

BOOL SetPoE(BYTE PoE)

Set PoE output

PoE ([3:0]): PoE state, pin setting by hexadecimal bitmask

1: On; 0: Off

Return:

TRUE (1): Success;

FALSE (0): Fail (Initial error, or out of range error, or hardware problem)

C

APPENDIX C : RAID Functions

C.1 SATA Mode for RAID

Please select SATA device to RAID mode on BIOS menu.
Advanced → SATA Configuration → SATA Mode Selection

| Main | Advanced | Chipset | Boo | Security | Save & Exit | |
|----------------------|----------|---------|-----|----------|-------------|--------------------|
| SATA Controller(s) | | | | | [Enabled] | Item Specific Help |
| SATA Model Selection | | | | | [AHCI] | |

C.2 OS Installation

ECS-9000 is featured with seven SATA, include two internal SATA, two mSATA, 1 SATA DOM, and 1 CFast.

You can select one of SATA ports for OS installation
We used CFast card for Windows 10 OS installation as an example.

C.3 Install All Device Drivers of ECS-9000 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 Install “Intel Rapid Storage Technology” Software

You can get the latest information and the software directly from Intel website.

http://www.intel.com/p/en_US/support/highlights/chpsts/imsm

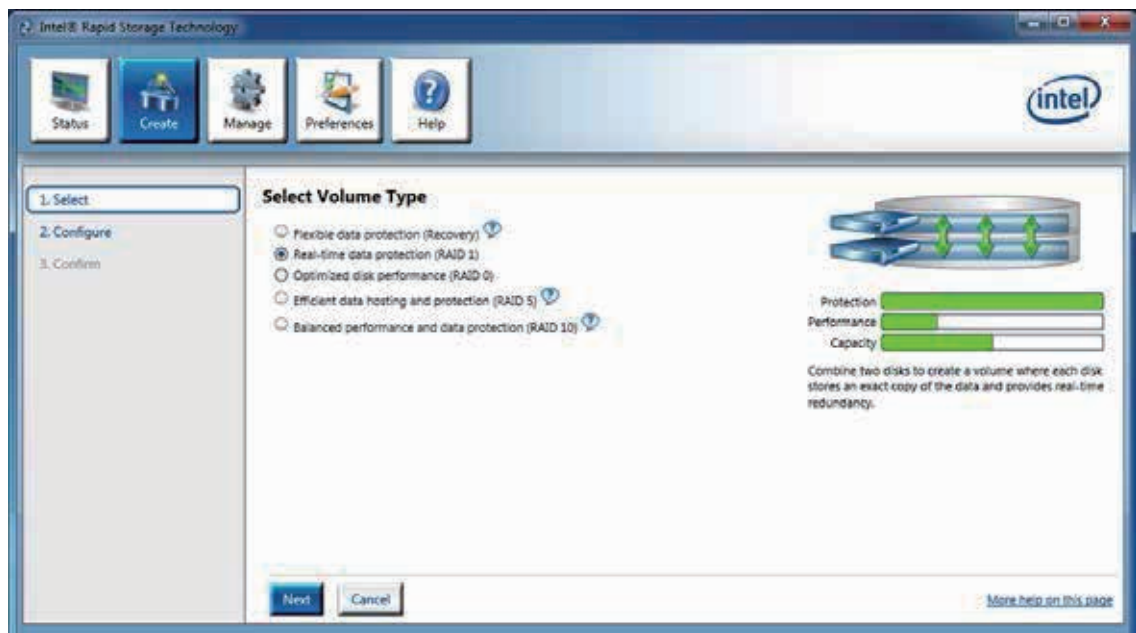
The RAID environment has been done if you completed the steps above.

C.5 Insert SATA HDD for RAID 1

Please notice, you can use seven SATA ports for SATA storage devices.

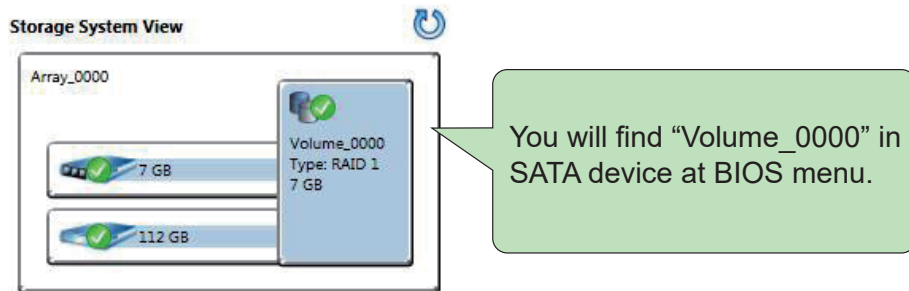
C.6 Create RAID Volume on “Rapid Storage Technology” Software

ECS-9000 is featured with seven SATA storage devices for RAID volume, so there are three options for choose on this page. Let’s take RAID 1 as example, please select “RAID 1”.



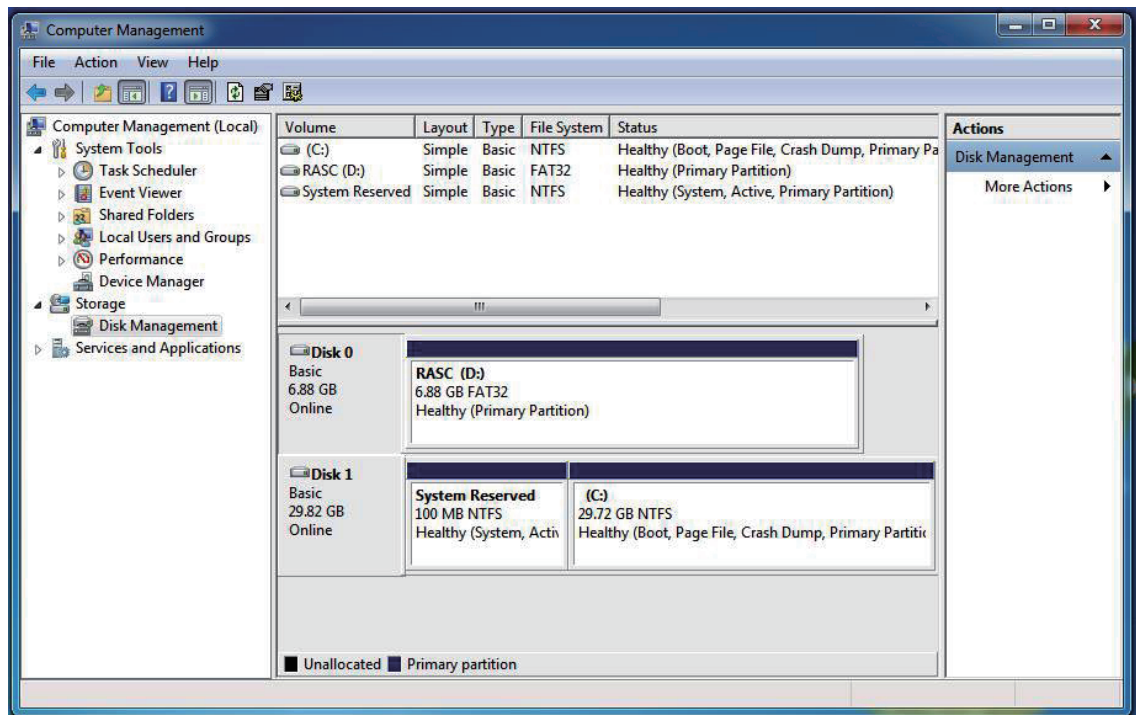
C.7 Disk Management : Partition the Disk

After RAID 1 volume created, you can see the figure of SATA device allocation.



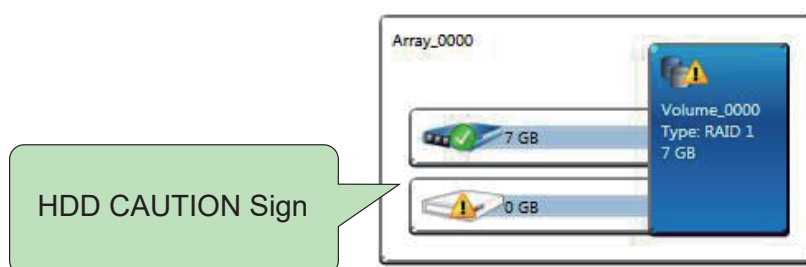
To start Disk Management tool, select "initialize disk."

Then add "Logical Device" for Windows access.

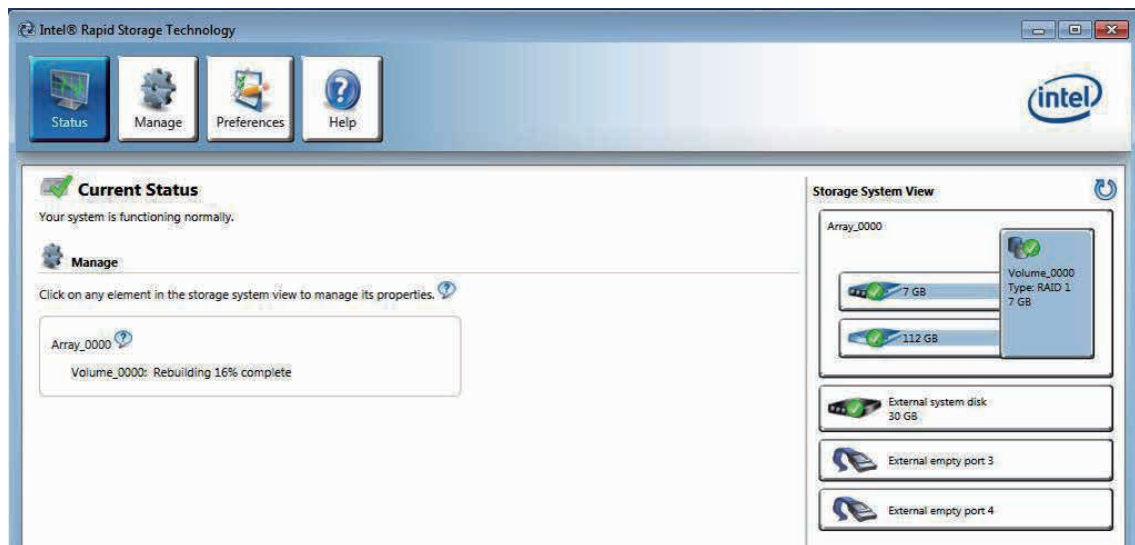


C.8 If One SATA HDD on RAID Volume is Out-of-use

After RAID 1 volume created, you can see the figure of SATA device allocation.



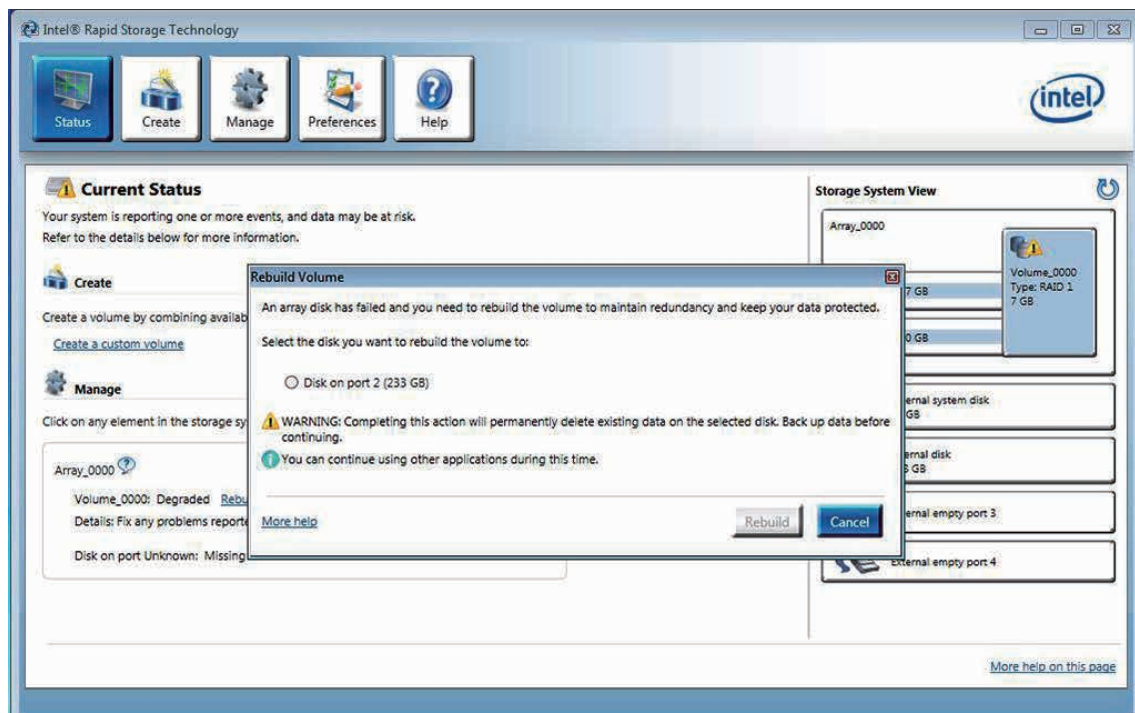
C.9 Recovery and Auto Re-build When Use the **SAME** RAID HDD



C.10 Recovery and Auto Re-build When Use **DIFFERENT** RAID HDD

There is a warning will pop-up to ask you if the disk is not a member of original RAID volume.

If you press “Rebuild”, it will replace the broken SATA HDD to the last one SATA HDD of RAID volume.



D

APPENDIX D : Power Consumption

| Testing Board | ECS-9000 |
|-----------------|------------------------------|
| RAM | 16GB x2 |
| USB-1 | USB Keyboard Logitech K120 |
| USB-2 | USB Mouse Microsoft 1113 |
| USB-3 | USB Flash Transcend 3.0 8GB |
| USB-4 | USB Flash Transcend 3.0 8GB |
| CFAST | Transcend CFX600 |
| SATA 0 | Transcend SSD370 64GB |
| SATA 1 | TOSHIBA SSD 64GB |
| LAN 1 (i219) | 1.0Gbps |
| LAN 2 (i210) | 1.0Gbps |
| Graphics Output | DVI |
| Power Plan | Balance(Windows7 Power plan) |
| Power Source | Chroma 62006P-100-25 |

D.1 Intel® Core™ i7-6700@3.4GHz (8M Cache, 4.0GHz)

Power on and boot to Win7 (64-bit)

| CPU | Power Input | Standby Mode | | Idle Status : CPU usage less 3% | |
|---------------|-------------|--------------|-----------------|------------------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i7-6700 | 06V | 0.984A | 05.90W | 3.166A | 19.00W |
| Core™ i7-6700 | 09V | 0.650A | 05.85W | 2.391A | 21.52W |
| Core™ i7-6700 | 12V | 0.471A | 05.65W | 1.814A | 21.77W |
| Core™ i7-6700 | 24V | 0.370A | 08.88W | 0.945A | 22.68W |
| Core™ i7-6700 | 36V | 0.322A | 11.59W | 0.730A | 26.28W |

| CPU | Power Input | Run 100% CPU usage without 3D | | Run 100% CPU usage with 3D | |
|---------------|-------------|-------------------------------|-----------------|----------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i7-6700 | 06V | 7.911A | 47.47W | 10.899A | 65.39W |
| Core™ i7-6700 | 09V | 5.211A | 46.90W | 7.114A | 64.03W |
| Core™ i7-6700 | 12V | 3.984A | 47.81W | 5.434A | 65.21W |
| Core™ i7-6700 | 24V | 2.044A | 49.06W | 2.788A | 66.91W |
| Core™ i7-6700 | 36V | 1.430A | 51.48W | 1.931A | 69.52W |

D.2 Intel® Core™ i5-6500TE@2.3GHz (6M Cache, 4.0GHz)

Power on and boot to Win7 (64-bit)

| CPU | Power Input | Standby Mode | | Idle Status : CPU usage less 3% | |
|-----------------|-------------|--------------|-----------------|------------------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i5-6500TE | 06V | 1.057A | 06.34W | 3.497A | 20.98W |
| Core™ i5-6500TE | 09V | 0.693A | 06.24W | 2.263A | 20.37W |
| Core™ i5-6500TE | 12V | 0.495A | 05.94W | 1.704A | 20.45W |
| Core™ i5-6500TE | 24V | 0.371A | 08.90W | 0.965A | 23.16W |
| Core™ i5-6500TE | 36V | 0.332A | 11.95W | 0.695A | 25.02W |

| CPU | Power Input | Run 100% CPU usage without 3D | | Run 100% CPU usage with 3D | |
|-----------------|-------------|-------------------------------|-----------------|----------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i5-6500TE | 06V | 5.457A | 32.74W | 7.617A | 45.70W |
| Core™ i5-6500TE | 09V | 3.482A | 31.34W | 4.934A | 44.41W |
| Core™ i5-6500TE | 12V | 2.622A | 31.46W | 3.677A | 44.12W |
| Core™ i5-6500TE | 24V | 1.421A | 34.10W | 1.899A | 45.58W |
| Core™ i5-6500TE | 36V | 1.004A | 36.14W | 1.340A | 48.24W |

D.3 Intel® Core™ i3-6100@3.7GHz (3M Cache, 3.7GHz)

Power on and boot to Win7 (64-bit)

| CPU | Power Input | Standby Mode | | Idle Status : CPU usage less 3% | |
|---------------|-------------|--------------|-----------------|------------------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i3-6100 | 06V | 1.196A | 07.18W | 3.504A | 21.02W |
| Core™ i3-6100 | 09V | 0.773A | 06.96W | 2.313A | 20.81W |
| Core™ i3-6100 | 12V | 0.561A | 06.73W | 1.728A | 20.74W |
| Core™ i3-6100 | 24V | 0.405A | 09.72W | 0.981A | 23.54W |
| Core™ i3-6100 | 36V | 0.347A | 12.49W | 0.745A | 26.82W |

| CPU | Power Input | Run 100% CPU usage without 3D | | Run 100% CPU usage with 3D | |
|---------------|-------------|-------------------------------|-----------------|----------------------------|-----------------|
| | | Max Current | Max Consumption | Max Current | Max Consumption |
| Core™ i3-6100 | 06V | 6.711A | 40.27W | 10.041A | 60.25W |
| Core™ i3-6100 | 09V | 4.405A | 39.65W | 6.617A | 59.55W |
| Core™ i3-6100 | 12V | 3.256A | 39.07W | 4.821A | 57.85W |
| Core™ i3-6100 | 24V | 1.722A | 41.33W | 2.593A | 62.23W |
| Core™ i3-6100 | 36V | 1.253A | 45.11W | 1.802A | 64.87W |

E

APPENDIX E : Supported Memory & Storage List

E.1 Supported Memory List

| | |
|---------------|--------------|
| Testing Board | ECS-9000 |
| Memory Test | Version: 5.1 |
| Burn-in Test | V8.1 |

E.2 Test Item

| Channel | Memory Test | Burn-in | Flash BIOS | Remove Battery |
|---------------|-------------|---------|------------|----------------|
| *2 | PASS | PASS | PASS | PASS |
| *1 (Socket 1) | PASS | PASS | N/A | PASS |
| *1 (Socket 2) | PASS | PASS | N/A | PASS |

E.3 NON-ECC

| Brand | Info | NOTE & S/N | Test Temp. (Celsius) |
|---|-------------------------|-------------------|----------------------|
| Transcend 8GB | 8G 2Rx8 DDR4 2400 SO | TS9CBSESE0000 | 25°C |
| | | C96645-0001 | 25°C |
| | | C96645-0002 | 25°C |
| 4GB Innodisk DDR4 SODIMM | M4S0-4GSSNCRG | M0S11601080040001 | 25°C |
| | | M0S11601080040002 | 25°C |
| 8GB Innodisk DDR4 2133 W/T SODIMM | M4S0-8GSSO5RG | M0S21606010020001 | 25°C |
| | | M0S21606010020002 | 25°C |
| 16GB Innodisk DDR4 2133 W/T SODIMM | M4S0-AGS1O5RG | M0S11608040020001 | 25°C |
| | | M0S11608040020002 | 25°C |
| Kingston 16GB 2Rx8 2Gx64-Bit PC4-2133 | KVR21S15D8/16 | BKMM1641607 | 25°C |
| | | BKMM1661618 | 25°C |

E.4 ECC

| Brand | Info | NOTE & S/N | Test Temp. (Celsius) |
|----------------------------------|-----------------------------|-------------------|----------------------|
| Transcend 16GB ECC Wild Temp. | 16G 2Rx8 DDR4 2133 ECCSO | C94147-0001 | 85°C |
| | | C94147-0002 | 85°C |
| 8GB Innodisk DDR4 2133 ECC | MSD0-8GSSQCRG | M0S11601080090001 | 25°C |
| | | M0S11601080090002 | 25°C |

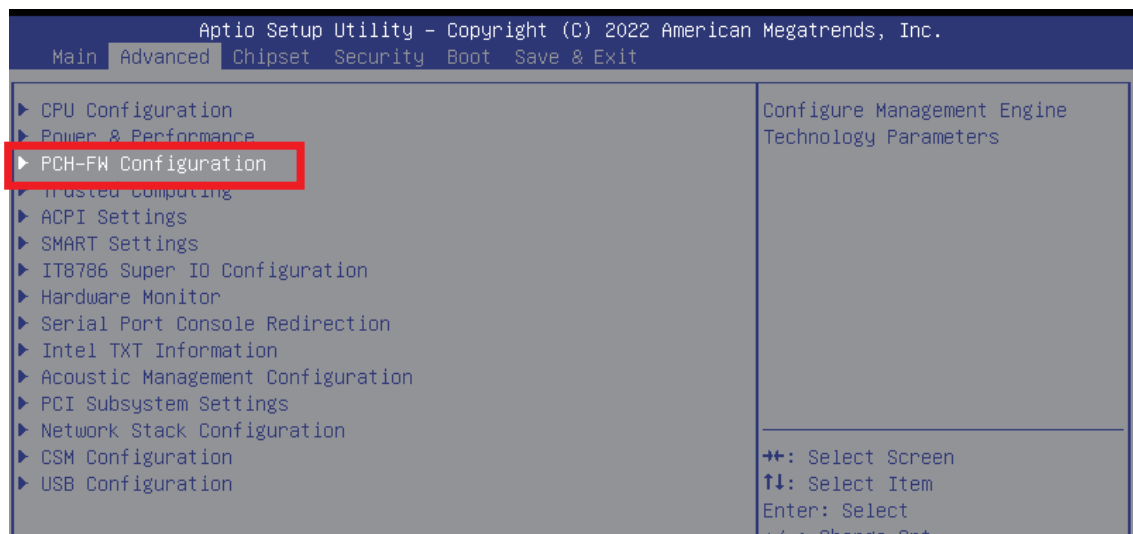
E.5 Supported Storage Device List

| Type | Vendor | Model | Capacity |
|----------|---------------|--------------------------|----------|
| mSATA | Intel | Intel-310 SSDMAEMC080G2 | 80GB |
| | Silicon Power | SP128GMSA301SWO | 128GB |
| SATA SSD | Transcend | SSD370 TS64GSSD370 | 64GB |
| | Innodisk | 3MG2-P DGS25-64GD81BW1QC | 64GB |
| | | 3MR3-P DRS25-64GD70BCAQC | 64GB |
| | MEMXPRO | 3MG2-P DGS25-B56D81BW3QC | 128GB |
| SATA HDD | TOSHIBA | MK5055GSX | 500GB |

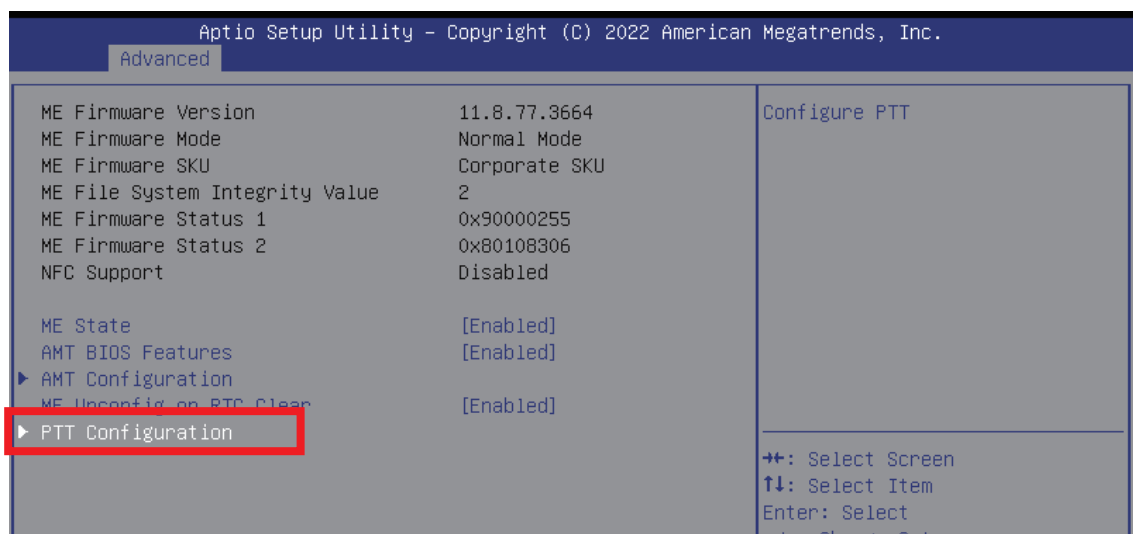
F

APPENDIX F : Install Win11 (BIOS TPM Setting)

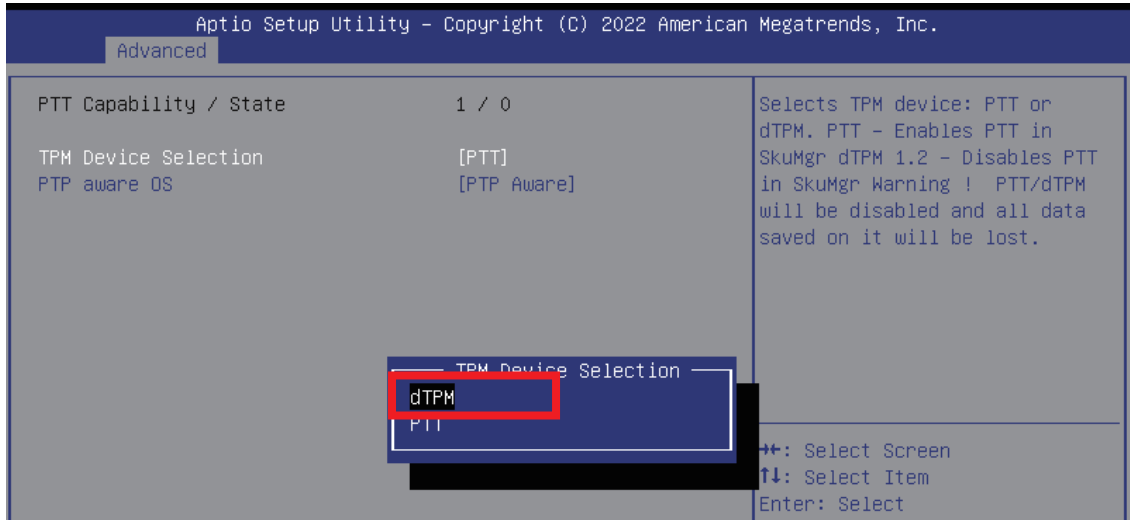
Step 1 Click on “Advanced”, then click on “PCH-FW Configuration”



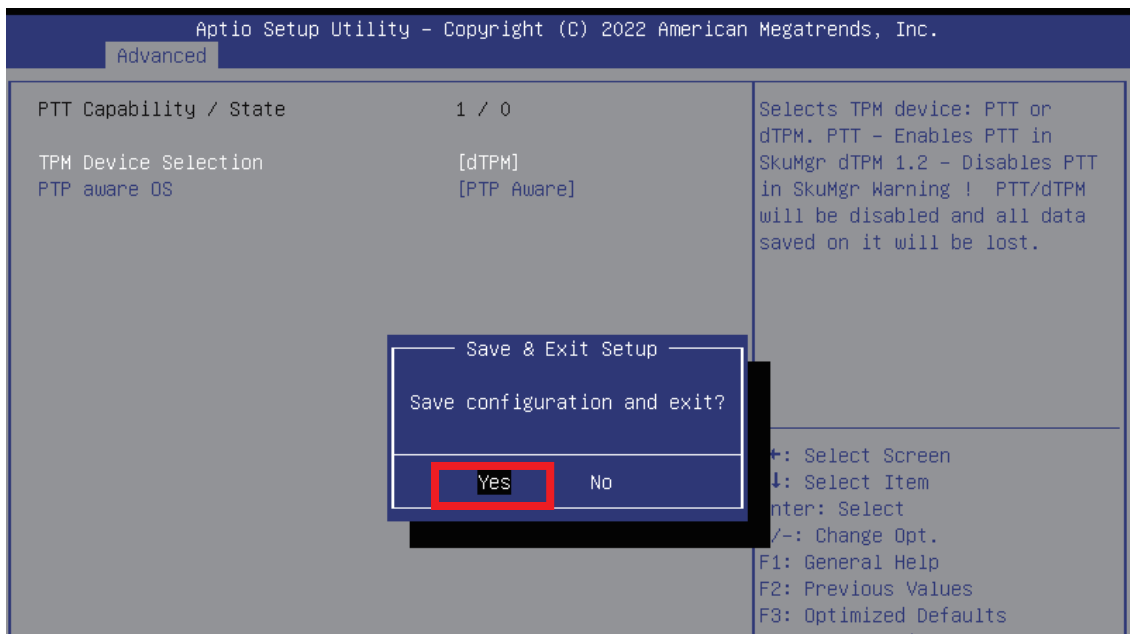
Step 2 Click on “PTT Configuration”



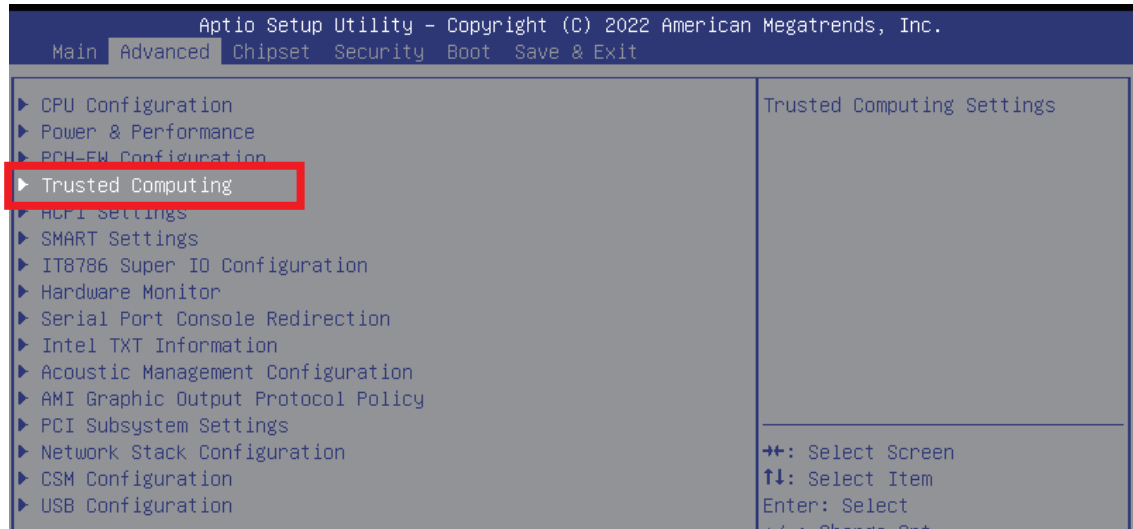
Step 3 Click on “dTPM” (TPM Device Selection)



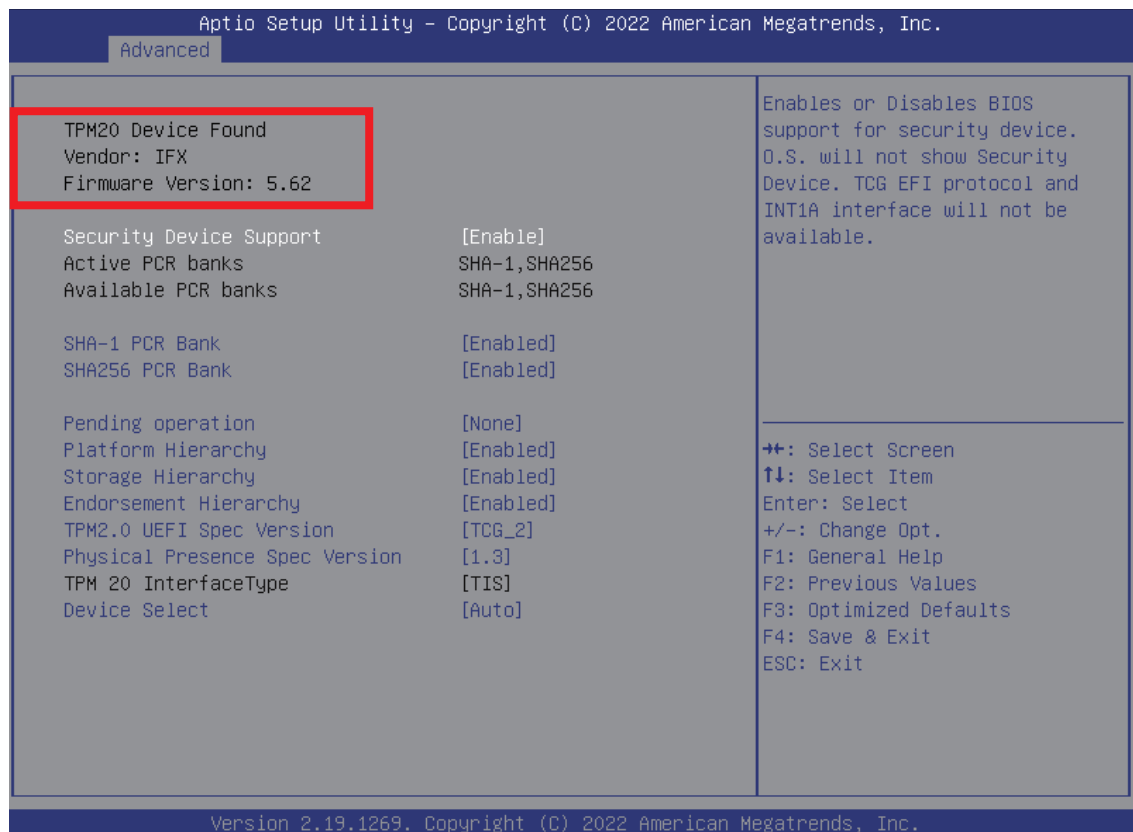
Step 4 Please save the BIOS settings by pressing F4. Please press Enter when the pop-up window which asks “Save configuration and exit?” appears. The computer will then restart.



Step 5 Click on “Trusted Computing”



Step 6 If the window shows “TPM2.0 Device Found Firmware Version:5.62”, then the setting is completed.



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



For further support information, please visit www.vecow.com

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