# MTC-4021 USER Manual

21.5" Fanless Multi-Touch Computer, 6 GbE LAN with 4 PoE+, 2 SIM, 4 USB, Intel® Core™ i7/i5/i3 Processor (Broadwell-U)

Vecow

1.1.0 Edition 20161201

# Record of Revision

| Version | Date | Page | Description | Remark |
|---|---|---|---|---|
| 0.1 | 12/18/2015 | All | Preliminary Release | |
| 1.0 | 03/23/2016 | All | Official Release | |
| 1.1 | 12/01/2016 | 45-46 | Update | |

# Declaimer

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# Declaration of Conformity

**FCC**

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

**CE**

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

# Copyright and Trademarks

# Order Information

| Part Number | Description |
|---|---|
| MTC-4021-PoE650U | 21.5" Fanless Multi-Touch Computer, 6 GbE LAN with 4 PoE+, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i7-5650U |
| MTC-4021-PoE350U | 21.5" Fanless Multi-Touch Computer, 6 GbE LAN with 4 PoE+, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i5-5350U |
| MTC-4021-PoE010U | 21.5" Fanless Multi-Touch Computer, 6 GbE LAN with 4 PoE+, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i3-5010U |
| MTC-4021-2G650U | 21.5" Fanless Multi-Touch Computer, 2 GbE LAN, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i7-5650U |
| MTC-4021-2G350U | 21.5" Fanless Multi-Touch Computer, 2 GbE LAN, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i5-5350U |
| MTC-4021-2G010U | 21.5" Fanless Multi-Touch Computer, 2 GbE LAN, 2 SIM, 4 COM, 4 USB, Onboard Intel® Core™ i3-5010U |
| MTC-4021P | 21.5" Fanless Multi-Touch Computer with 5th Gen Intel® Core™ i7/ i5/ i3 Processor (Broadwell-U), built with IP65 Front Bezel |

# Optional Accessories

| Part Number | Description |
|---|---|
| DDR3L8G | Certified DDR3L-1600 8G RAM |
| DDR3L4G | Certified DDR3L-1600 4G RAM |
| PWA-120W | 120W, 24V, 90VAC to 264VAC Power Adapter with 3-pin Terminal Block |
| PWA-160W-WT | 160W, 24V, 85VAC to 264VAC Power Adapter with 3-pin Terminal Block, Wide Temperature -30°C to +70°C |
| Panel-Mount | Panel Mount Kit |
| VESA Stand | VESA Table Stand |
| 3G Module | Mini PCIe 3G/GPS Module with Antenna |
| 4G Module | Mini PCIe 4G/GPS Module with Antenna |
| WiFi Module | Mini PCIe WiFi Module with Antenna |
| WiFi & Bluetooth Module | Mini PCIe WiFi & Bluetooth Module with Antenna |

# Table of Contents

# 1

# GENERAL INTRODUCTION

## 1.1 Overview

MTC-4021 Series Fanless Multi-Touch Computer is a 21.5 inch all-in-one fanless Multi-Touch Computer for Internet of Thing (IoT) and/ or Industry 4.0 applications with excellent performance and trusted reliability. Powered by 5th generation Intel® Core™ i7/ i5/ i3 U-Series SoC (Broadwell-U) engine, dual DDR3L 1333/ 1600 MHz SO-DIMMs, up to 16GB memory. Advanced Intel® HD Graphics 6000 supports 1080p Full HD displays, onboard DVI-D and DisplayPort display interface delivers up to 20% enhanced graphics performance than former generation.

Full HD LCD panel with LED backlight, Projected Capacitive 10-point Multi-Touch Screen with 7H Anti-Scratch Surface, Touchscreen works with gloves, internal 2.5" SSD/ HDD bracket, 6 Gigabit LAN ports with 4 IEEE 802.3at PoE+ ports, 2 Mini PCIe sockets for PCIe/ USB/ External SIM Card/ mSATA, 2 External SIM Card sockets support 3G/ 4G/ LTE/ WiFi/ GPRS/ UMTS, 1 External CFast socket, 2 USB 3.0, 2 USB 2.0, 4 COM RS-232/ 422/ 485, 6V to 36V wide range power input with up to 80V smart surge protection, all-in-one fanless design, 0°C to 50°C operating temperature, optional supports sunlight readable features and IP65 front panel protection, MTC-4021 is ready to customize for your requirements.

Vecow MTC-4021 Series Fanless Multi-Touch Computer integrates outstanding system performance, considerate user experience, smart protection functions and trusted reliability for Smart Manufacturing, Medical, Industrial Automation, Infotainment, Self-service, Smart Transportation and any IoT/ Industry 4.0 applications.

## 1.2 Features

- 21.5" 16 : 9 Full HD (1920 x 1080) LCD Panel with LED Backlight
- Projected Capacitive 10-point Multi-Touch Screen with 7H Anti-Scratch Surface
- Fanless, 5th generation Intel® Core™ i7/ i5/ i3 U-Series Processor (Broadwell-U)
- 6V to 36V DC-in, 80V Surge Protection
- 6 Gigabit LAN with 4 IEEE 802.3at PoE+
- 2 External SIM Socket support 3G/ 4G/ LTE/ WiFi/ GPRS/ UMTS
- External CFast, 4 COM RS-232/ 422/ 485, 2 USB 3.0, 2 USB 2.0
- Touchscreen works with gloves
- Sunlight Readable (Optional)
- IP65 Front Panel Protection (Optional)

## 1.3 Product Specification

### 1.3.1 Specifications of MTC-4021-PoE

| | |
|---|---|
| **Panel** | |
| Panel Type | TFT LCD |
| Active Area | 21.5” (16 : 9) |
| Max Resolution | 1920 x 1080 (Full HD) |
| Display Color | 16.7M (RGB 8-bit) |
| Backlight | LED Backlight |
| Brightness (cd/m2) | 250 (Optional, up to 1200) |
| Viewing Angle | 178°/178° (H/V) |
| Contrast Ratio | 3000 : 1 |
| **Touch Screen** | |
| Touch Screen Type | 10-point Projected Capacitive |
| Transparency | ≧85% |
| Surface Hardness | 7H Surface Hardness |
| Control Interface | USB Interface |
| **System** | |
| Processor | Intel® Core™ i7-5650U/ i5-5350U/ i3-5010U Processor (Broadwell-U) |
| Chipset | Intel® SoC |
| Memory | 2 DDR3L 1333/ 1600 MHz SO-DIMM, up to 16GB |
| Graphics | Intel® HD Graphics 6000 |
| Audio | Realtek ALC892, 5.1 Channel HD Audio |
| OS Support | Windows 8, Windows 7, Linux |
| **I/O Interface** | |
| Serial | 4 COM RS-232/ 422/ 485 |
| USB | • 2 External USB 3.0<br>• 2 External USB 2.0 |
| LAN | • LAN 1 : Intel® I218 Gigabit LAN supports iAMT<br>• LAN 2 : Intel® I210 Gigabit LAN<br>• LAN 3 : Intel® I210 Gigabit LAN supports IEEE 802.3at PoE+<br>• LAN 4 : Intel® I210 Gigabit LAN supports IEEE 802.3at PoE+<br>• LAN 5 : Intel® I210 Gigabit LAN supports IEEE 802.3at PoE+<br>• LAN 6 : Intel® I210 Gigabit LAN supports IEEE 802.3at PoE+ |

| | |
|---|---|
| Audio | 1 Mic-in, 1 Line-out |
| Display | • DVI-D : Up to 1920 x 1080 @ 60Hz<br>• DisplayPort : Up to 3840 x 2160 @ 60Hz |
| LED | Power, HDD |
| CFast | 1 External CFast Socket, Push-in/ Push-out Ejector |
| SIM Card | 2 External SIM Card Socket |
| **Expansion** | |
| Mini PCIe | 2 Mini PCIe Socket :<br>• 1 Mini PCIe for PCIe/ USB/ External SIM Card<br>• 1 Mini PCIe for PCIe/ USB/ External SIM Card/ mSATA |
| **Storage** | |
| SATA | 1 SATA III (6Gbps) |
| mSATA | 1 SATA III (Mini PCIe Type, 6Gbps) |
| Storage Device | • 1 CFast Socket, Push-in/ Push-out Ejector<br>• 1 Internal SSD/ HDD Bracket |
| **Power** | |
| Power Input | 6V to 36V, DC-in |
| Power Interface | 3-pin Terminal Block : V+, V-, Frame Ground |
| Power Adapter | AC to DC 120W Power Adapter (Optional) |
| 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. |
| **Mechanical** | |
| Dimension (W x L x H) | 537.6mm x 329.06mm x 53.1mm (21.2” x 13” x 2.1”) |
| Weight | 5.8 kg (12.8 lb) |
| Front Panel Protection | IP65 Compliant (Optional) |
| Mounting | • VESA Mount (75 x 75mm, 100 x 100mm)<br>• Panel Mount |
| **Environment** | |
| Operating Temperature | 0°C to 50°C (32°F to 122°F) |
| Storage Temperature | -20°C to 60°C (-4°F to 140°F) |
| Humidity | 10% to 90% Humidity, non-condensing |

| | |
|---|---|
| Shock | • IEC 60068-2-27<br>• 20G, Half-sine, 11ms |
| Vibration | • IEC 60068-2-64<br>• Non-operation : 10Hz to 200Hz, 1.5Grms, X, Y, Z, 30 mins each Axis |
| EMC | CE, FCC |

### 1.3.2 Specifications of MTC-4021-2G

| **Panel** | |
|---|---|
| Panel Type | TFT LCD |
| Active Area | 21.5” (16 : 9) |
| Max Resolution | 1920 x 1080 (Full HD) |
| Display Color | 16.7M (RGB 8-bit) |
| Backlight | LED Backlight |
| Brightness (cd/m2) | 250 (Optional, up to 1200) |
| Viewing Angle | 178°/178° (H/V) |
| Contrast Ratio | 3000 : 1 |
| **Touch Screen** | |
| Touch Screen Type | 10-point Projected Capacitive |
| Transparency | ≧ 85% |
| Surface Hardness | 7H Surface Hardness |
| Control Interface | USB Interface |
| **System** | |
| Processor | Intel® Core™ i7-5650U/ i5-5350U/ i3-5010U Processor (Broadwell-U) |
| Chipset | Intel® SoC |
| Memory | 2 DDR3L 1333/ 1600 MHz SO-DIMM, up to 16GB |
| Graphics | Intel® HD Graphics 6000 |
| Audio | Realtek ALC892, 5.1 Channel HD Audio |
| OS Support | Windows 8, Windows 7, Linux |
| **I/O Interface** | |
| Serial | 4 COM RS-232/ 422/ 485 |
| USB | • 2 External USB 3.0<br>• 2 External USB 2.0 |
| LAN | • LAN 1 : Intel® I218 Gigabit LAN supports iAMT<br>• LAN 2 : Intel® I210 Gigabit LAN |

| | |
|---|---|
| Audio | 1 Mic-in, 1 Line-out |
| Display | • DVI-D : Up to 1920 x 1080 @ 60Hz<br>• DisplayPort : Up to 3840 x 2160 @ 60Hz |
| LED | Power, HDD |
| CFast | 1 External CFast Socket, Push-in/ Push-out Ejector |
| SIM Card | 2 External SIM Card Socket |
| **Expansion** | |
| Mini PCIe | 2 Mini PCIe Socket :<br>• 1 Mini PCIe for PCIe/ USB/ External SIM Card<br>• 1 Mini PCIe for PCIe/ USB/ External SIM Card/ mSATA |
| **Storage** | |
| SATA | 1 SATA III (6Gbps) |
| mSATA | 1 SATA III (Mini PCIe Type, 6Gbps) |
| Storage Device | • 1 CFast Socket, Push-in/ Push-out Ejector<br>• 1 Internal SSD/ HDD Bracket |
| **Power** | |
| Power Input | 6V to 36V, DC-in |
| Power Interface | 3-pin Terminal Block : V+, V-, Frame Ground |
| Power Adapter | AC to DC 120W Power Adapter (Optional) |
| 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. |
| **Mechanical** | |
| Dimension (W x L x H) | 537.6mm x 329.06mm x 53.1mm (21.2” x 13” x 2.1”) |
| Weight | 5.8 kg (12.8 lb) |
| Front Panel Protection | IP65 Compliant (Optional) |
| Mounting | • VESA Mount (75 x 75mm, 100 x 100mm)<br>• Panel Mount |
| **Environment** | |
| Operating Temperature | 0°C to 50°C (32°F to 122°F) |
| Storage Temperature | -20°C to 60°C (-4°F to 140°F) |
| Humidity | 10% to 90% Humidity, non-condensing |

| | |
|---|---|
| Shock | • IEC 60068-2-27<br>• 20G, Half-sine, 11ms |
| Vibration | • IEC 60068-2-64<br>• Non-operation : 10Hz to 200Hz, 1.5Grms, X, Y, Z, 30 mins each Axis |
| EMC | CE, FCC |

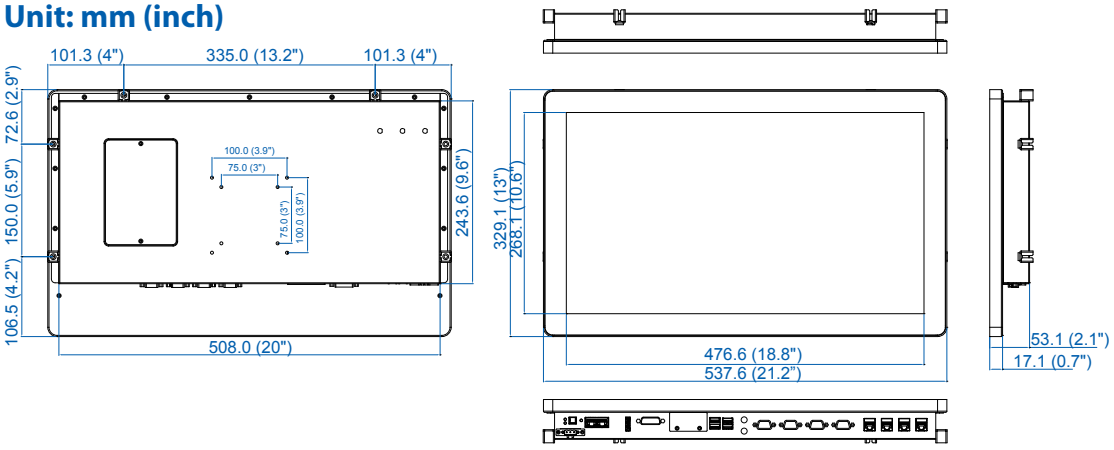
## 1.4 Supported CPU List

| CPU Name | TDP | Cache | Max. Frequency | Embedded |
|---|---|---|---|---|
| i7-5557U | 28W | 4M | Up to 3.40 GHz | |
| i7-5650U | 15W | 4M | Up to 3.20 GHz | Yes |
| i7-5600U | 15W | 4M | Up to 3.20 GHz | |
| i7-5550U | 15W | 4M | Up to 3.00 GHz | |
| i7-5500U | 15W | 4M | Up to 3.00 GHz | |
| i5-5287U | 28W | 3M | Up to 3.30 GHz | |
| i5-5257U | 28W | 3M | Up to 3.10 GHz | |
| i5-5350U | 15W | 3M | Up to 2.90 GHz | Yes |
| i5-5300U | 15W | 3M | Up to 2.90 GHz | |
| i5-5250U | 15W | 3M | Up to 2.70 GHz | |
| i5-5200U | 15W | 3M | Up to 2.70 GHz | |
| i3-5157U | 28W | 3M | Up to 2.5 0 GHz | |
| i3-5020U | 15W | 3M | Up to 2.20 GHz | |
| i3-5015U | 15W | 3M | Up to 2.10 GHz | Yes |
| i3-5010U | 15W | 3M | Up to 2.10 GHz | |
| i3-5005U | 15W | 3M | Up to 2.00 GHz | |
| Pentium 3805U | 15W | 2M | Up to 1.90 GHz | |
| Pentium 3825U | 15W | 2M | Up to 1.90 GHz | |
| Celeron 3765U | 15W | 2M | Up to 1.90 GHz | |
| Celeron 3755U | 15W | 2M | Up to 1.70 GHz | Yes |
| Celeron 3215U | 15W | 2M | Up to 1.70 GHz | |
| Celeron 3205U | 15W | 2M | Up to 1.50 GHz | |

# 1.5 Mechanical Dimensions

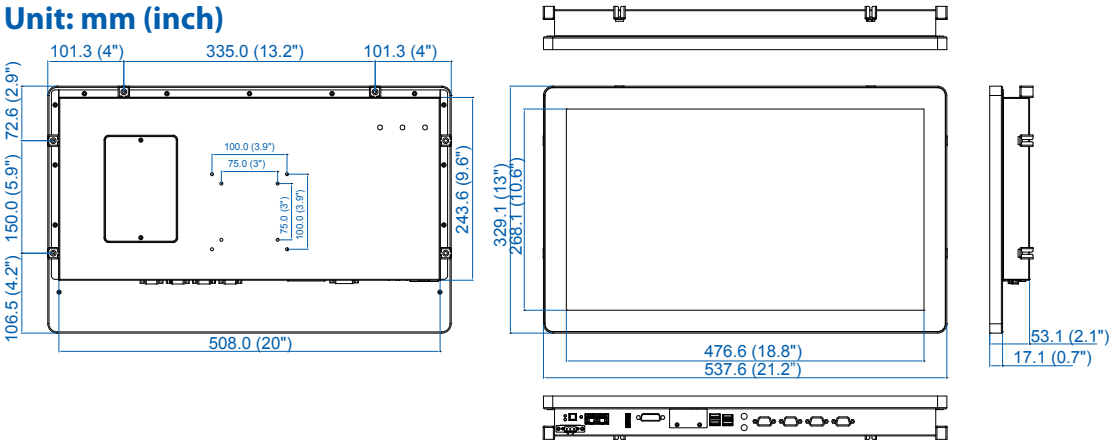
## 1.5.1 Dimensions of MTC-4021-PoE

**Unit: mm (inch)**




## 1.5.2 Dimensions of MTC-4021-2G

**Unit: mm (inch)**



# 2

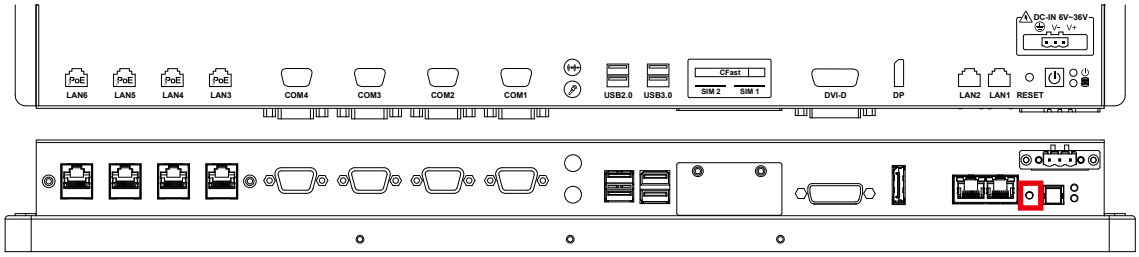
# GETTING TO KNOW YOUR MTC-4021

## 2.1 Packing List

| Item | Description | Qty |
|---|---|---|
| 1 | MTC-4021, 21.5” Fanless Multi-Touch Computer<br>(According to the configuration you order, the MTC-4021 series may contain SSD/HDD and DDR3L SO-DIMM. Please do verify these items if possible.) | 1 |
| 2 | Accessory box, which contains<br>● Vecow Drivers & Utilities DVD<br>● M2.5x6 screw for Mini PCIe Socket<br>● 3-pin pluggable terminal block<br>● M3x6 screw for HDD | <br>1<br>4<br>1<br>4 |

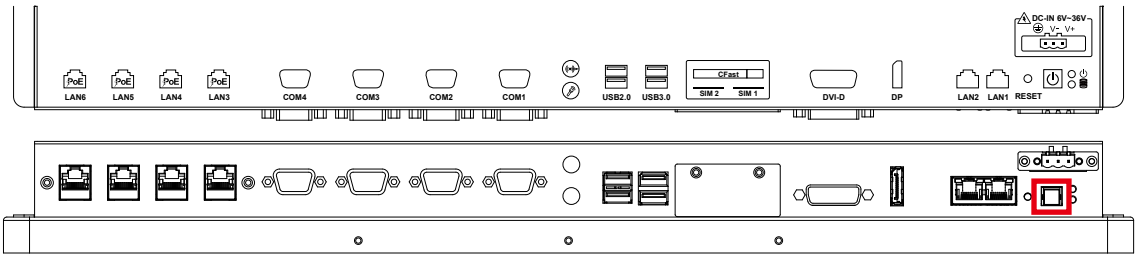
## 2.2 I/O Functions

### 2.2.1 Reset Tact Switch




It is a hardware reset switch to reset the system without power off MTC-4021. Just press the Reset Switch for a few seconds, then you will enable reset function.

### 2.2.2 Power Button




The Power Button is a non-latched switch with LED indication. It indicates power status: S0, S3 and S5. More details of LED indication 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 |

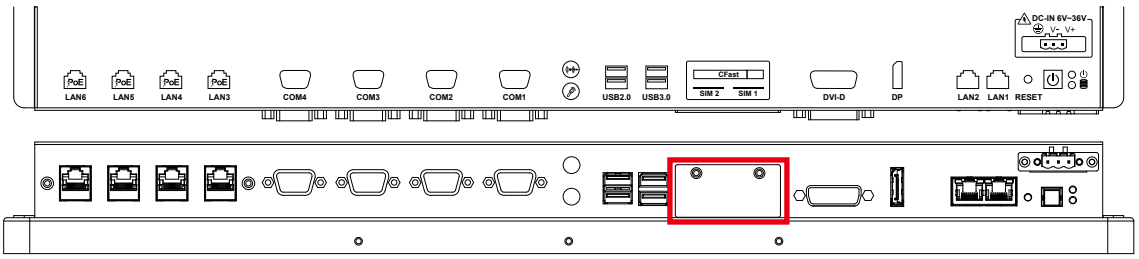
To power on MTC-4021, press the power button and then the blue LED is lightened.

To power off MTC-4021, 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

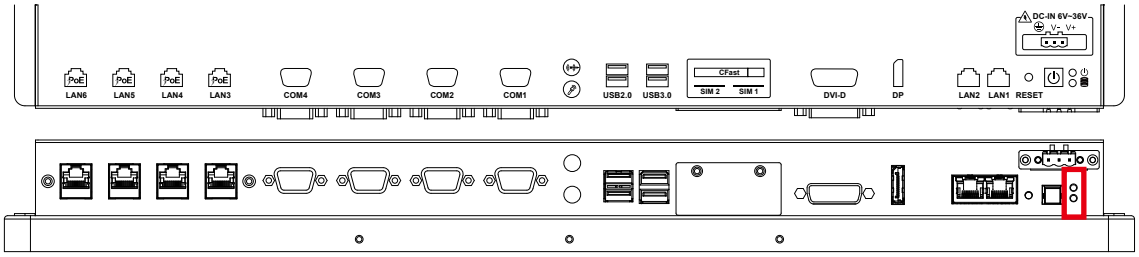



There is a CFast socket supporting Type-I/ Type-II Compact Flash card. It is implemented by a SATA II Port from Broadwell-U PCH. Be sure to disconnect the power source and unscrew the CFast socket cover before installing a CFast card. The MTC-4021 does not support the CFast hot swap and PnP (Plug and 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_TXP | PC7 | GND |
| S3 | SATA_TXN | PC8 | CFAST_LED |
| S4 | GND | PC9 | NC |
| S5 | SATA_RXN | PC10 | NC |
| S6 | SATA_RXP | 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

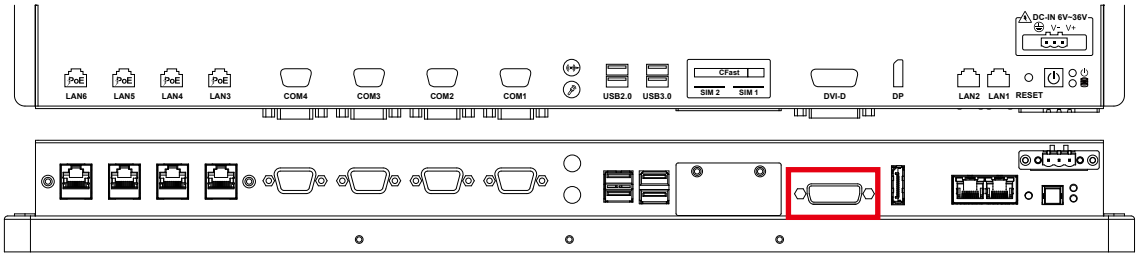



Yellow-HDD LED: A hard disk/ CFast LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

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

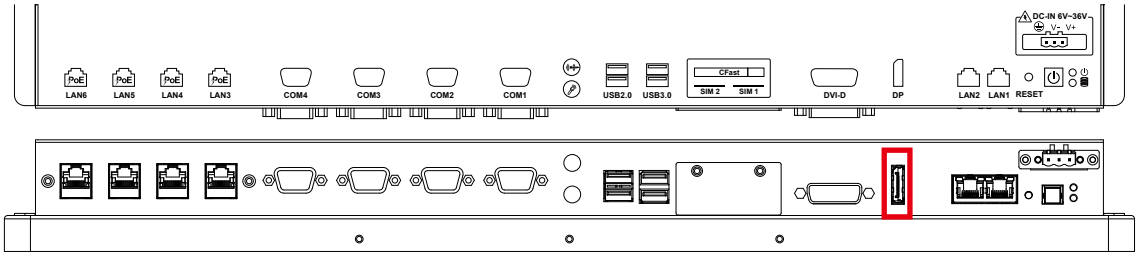
| LED Color | Power Status | System Status |
|---|---|---|
| Yellow | HDD/ CFast | • On/ Off : Storage status, function or not.<br>• Twinkling : Data transferring. |
| Green | Power | System power status (on/ off) |

### 2.2.5 DVI-D Connector



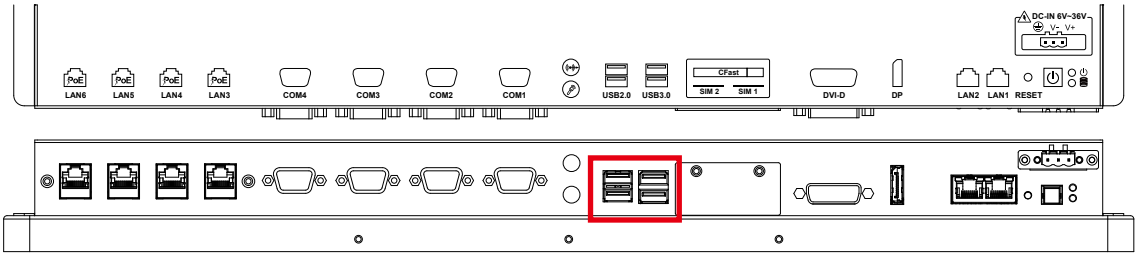

The DVI-D connector supports DVI display modes. The DVI output mode supports up to 1920 x 1080 resolutions.

### 2.2.6 DisplayPort



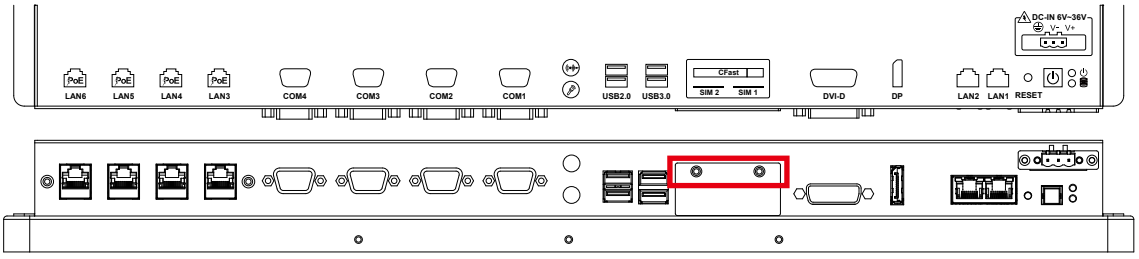

Onboard DisplayPort connection supports up to 3840 x 2160 resolutions at 60 Hz.

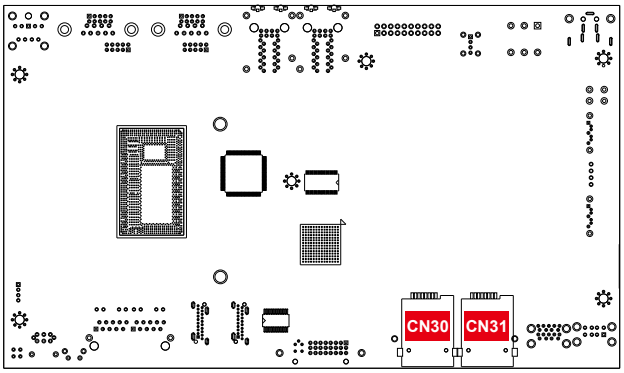
### 2.2.7 External USB




There are 2 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).

### 2.2.8 Mini PCIe & SIM Card Comparison Table

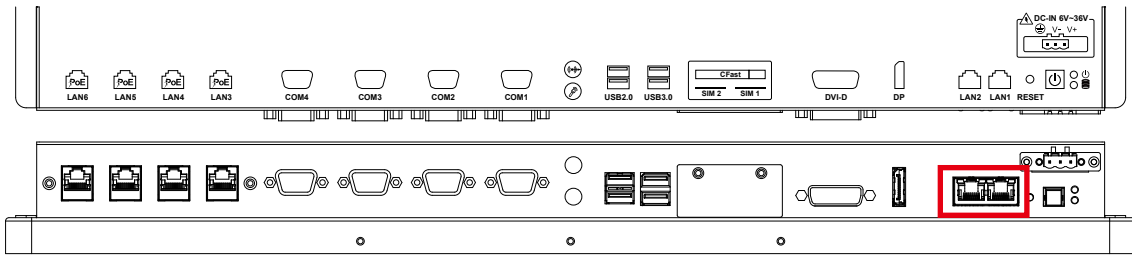



| Mini PCIe | SIM |
|---|---|
| CN18 | CN30 (SIM 1) |
| CN16 | CN31 (SIM 2) |

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 10/ 100/ 1000 Mbps Ethernet Port

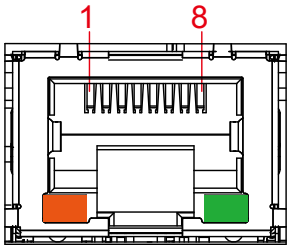



There are 2 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections. LAN 1 is powered by Intel® 218LM Ethernet engine; LAN 2 is powered by Intel I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, basic iAMT function is enabled. Using suitable RJ-45 cable, you can connect MTC-4021 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 pinouts of LAN 1 and LAN 2 are listed as follows:

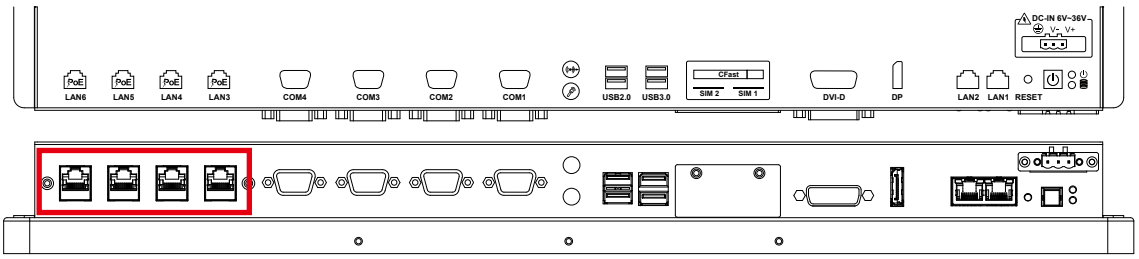
| Pin No. | 10/ 100Mbps | 1000Mbps |
|---|---|---|
| 1 | E_TX+ | MDI0_P |
| 2 | E_TX- | MDI0_N |
| 3 | E_RX+ | MDI1_P |
| 4 | ---- | MDI2_P |
| 5 | ----- | MDI2_N |
| 6 | E_RX- | MDI1_N |
| 7 | ----- | MDI3_P |
| 8 | ------ | MDI3_N |

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



### 2.2.10 PoE (Power over Ethernet) Ports

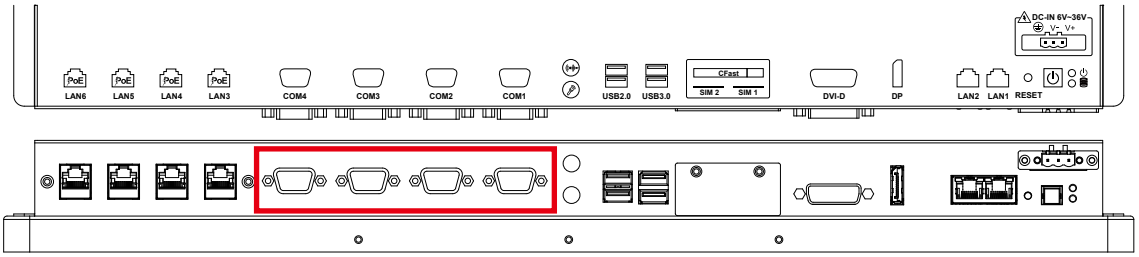



There are 4 RJ45 connectors supporting IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 25.5W/ 48V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/ Cat 6 cable.

Each PoE connection is powered by Intel® I210 Gigabit 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 11V.**

### 2.2.11 Serial Port COM



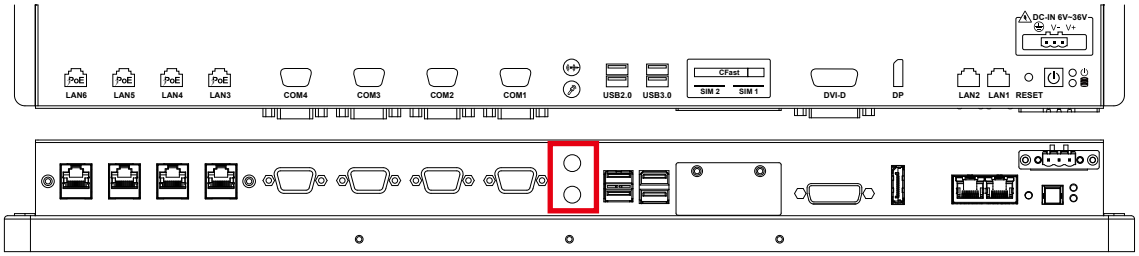

Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

| BIOS Setting | Function |
|---|---|
| COM 1 (CN7) / COM 2 (CN8) / COM 3 (CN11) / COM 4 (CN12) | RS-232 |
| | RS-422 (5-wire) |
| | RS-422 (9-wire) |
| | RS-485 |
| | 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, 2<br>3, 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- | ---------- |

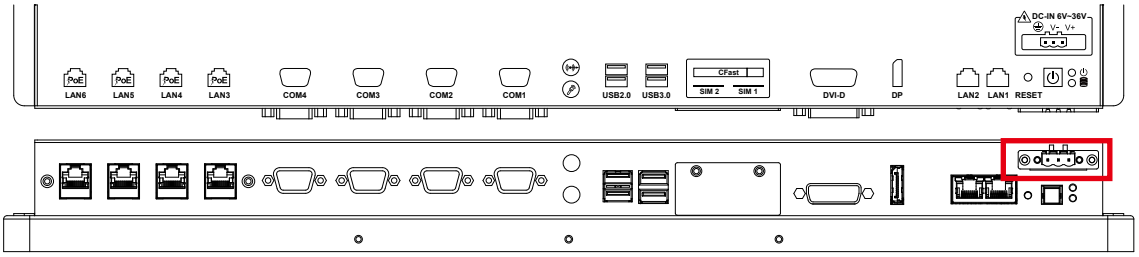
## 2.2.12 Audio Connector




There are 2 audio connectors, Mic-in and Line. Onboard Realtek ALC892 audio codec supports 5.1 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 Broadwell-U chipset and Realtek ALC892 codec.

### 2.2.13 Power Terminal Block

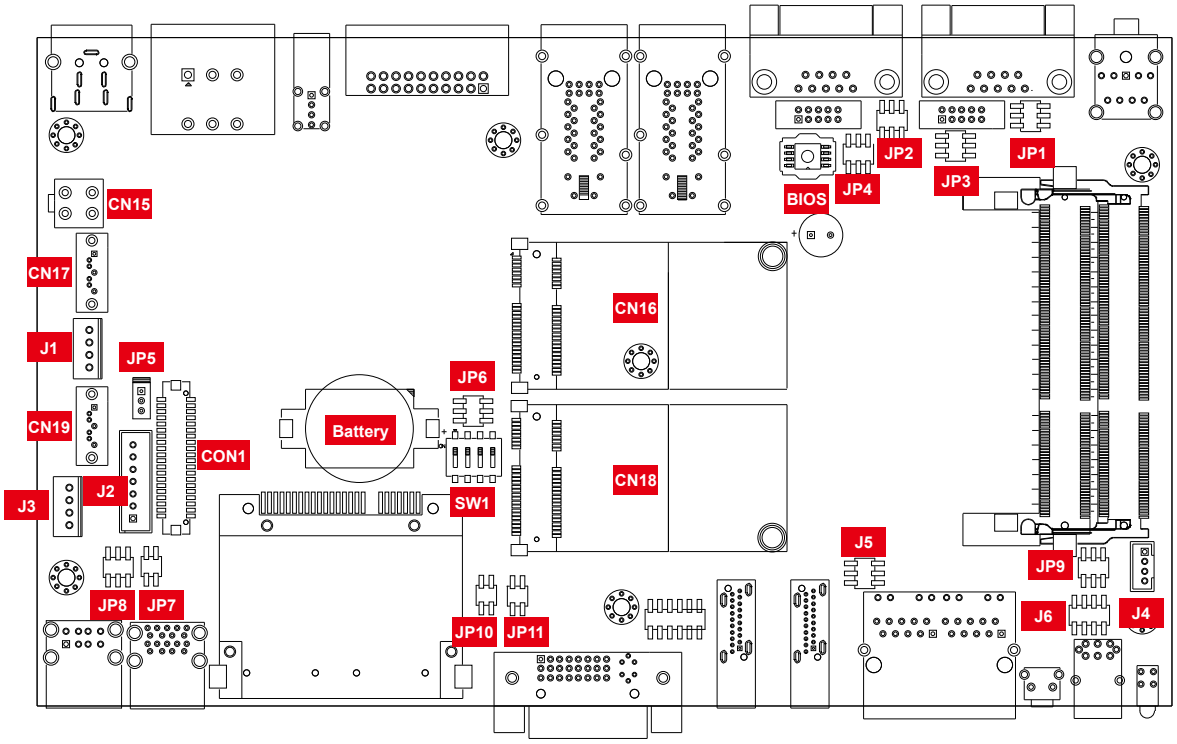



MTC-4021 supports 6V to 36V DC power input by terminal block. In normal power operation, power LED lightens in solid green. MTC-4021 supports up to 80V surge protection.

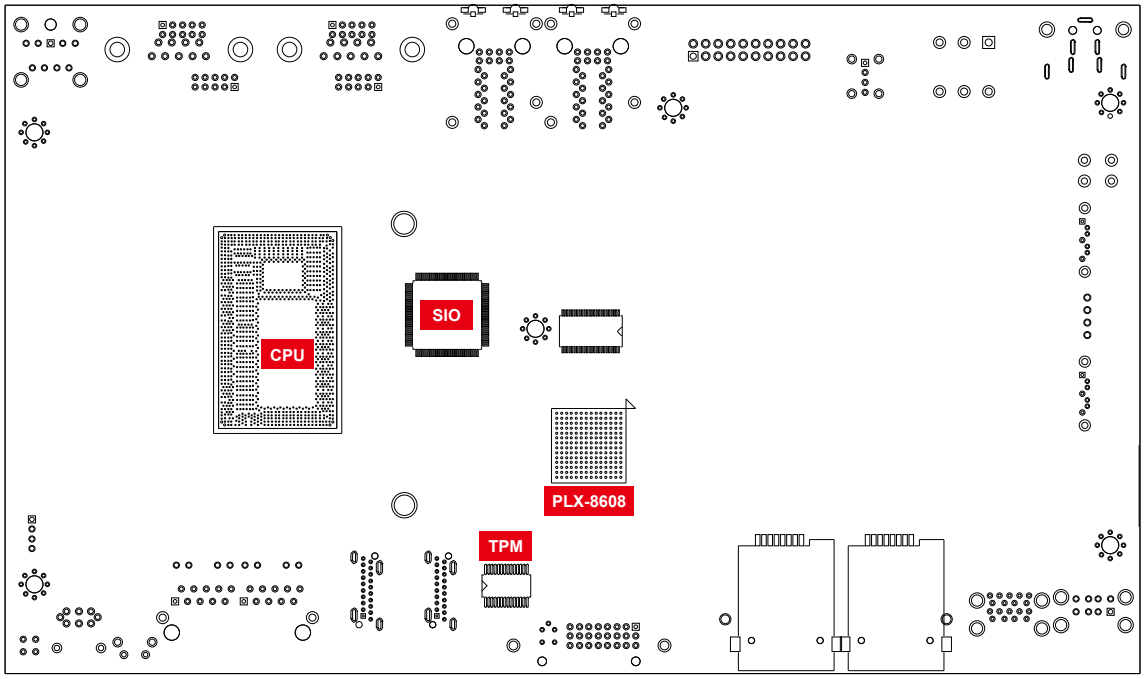
| Pin No. | Definition |
|---|---|
| 1 | V+ |
| 2 | V- |
| 3 | Earth GND |

# 2.3 Main Board Expansion Connectors

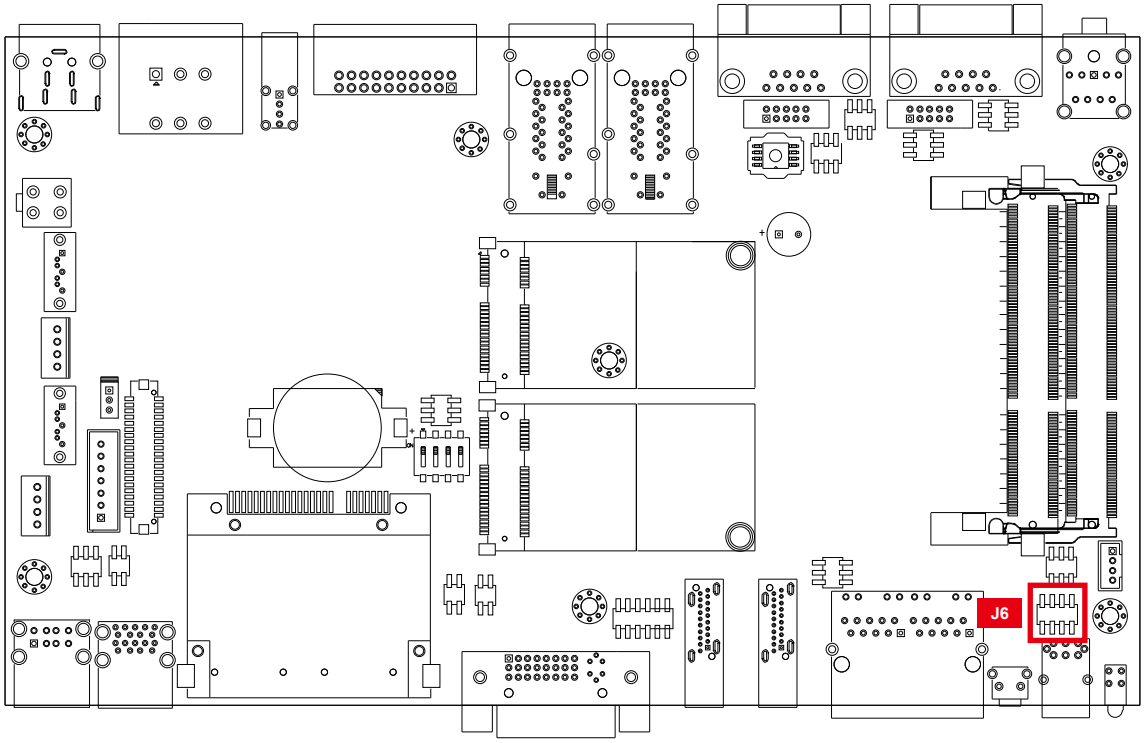
## 2.3.1 Front View of MTC-4021 Main Board With Connector Location




## 2.3.2 Rear View of MTC-4021 Main Board With Connector Location



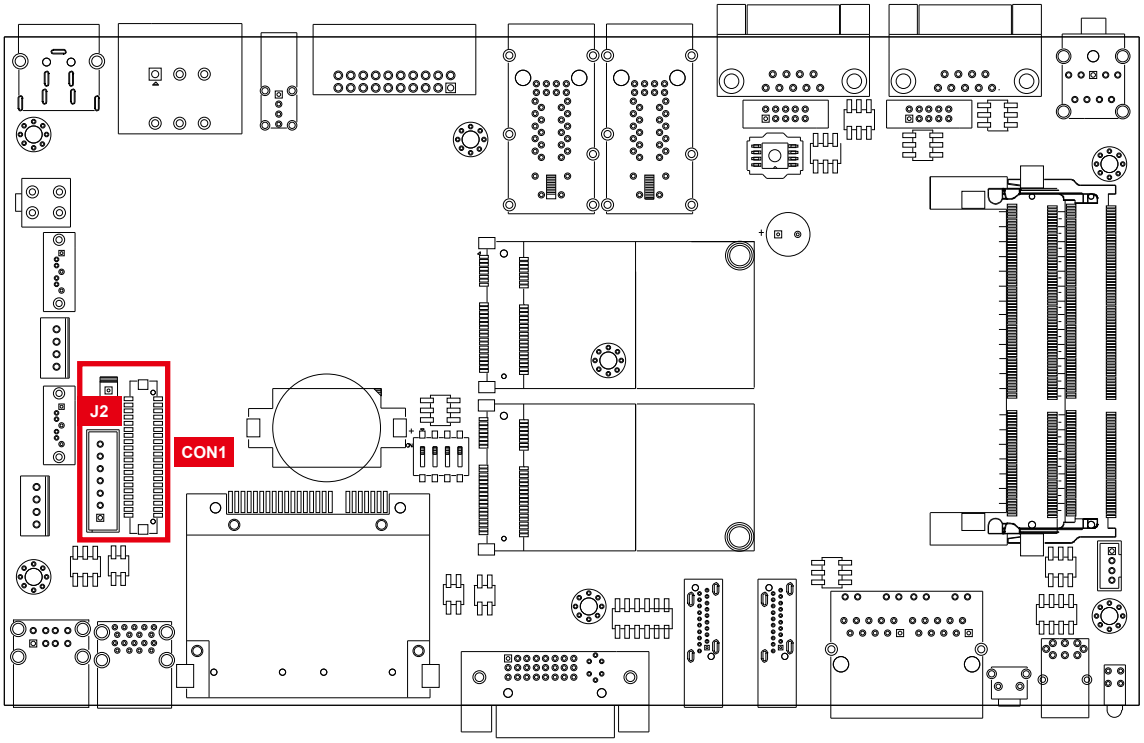
### 2.3.3 J6 Miscellaneous Pin Header




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 pinouts 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 | GND |
| POWER LED | 2 | PWR_LED_P |
| | 4 | PWR_LED_N |
| POWER BUTTON | 6 | FP_PWR_BTN_IN |
| | 8 | GND |

### 2.3.4 CON1 (LVDS), J2



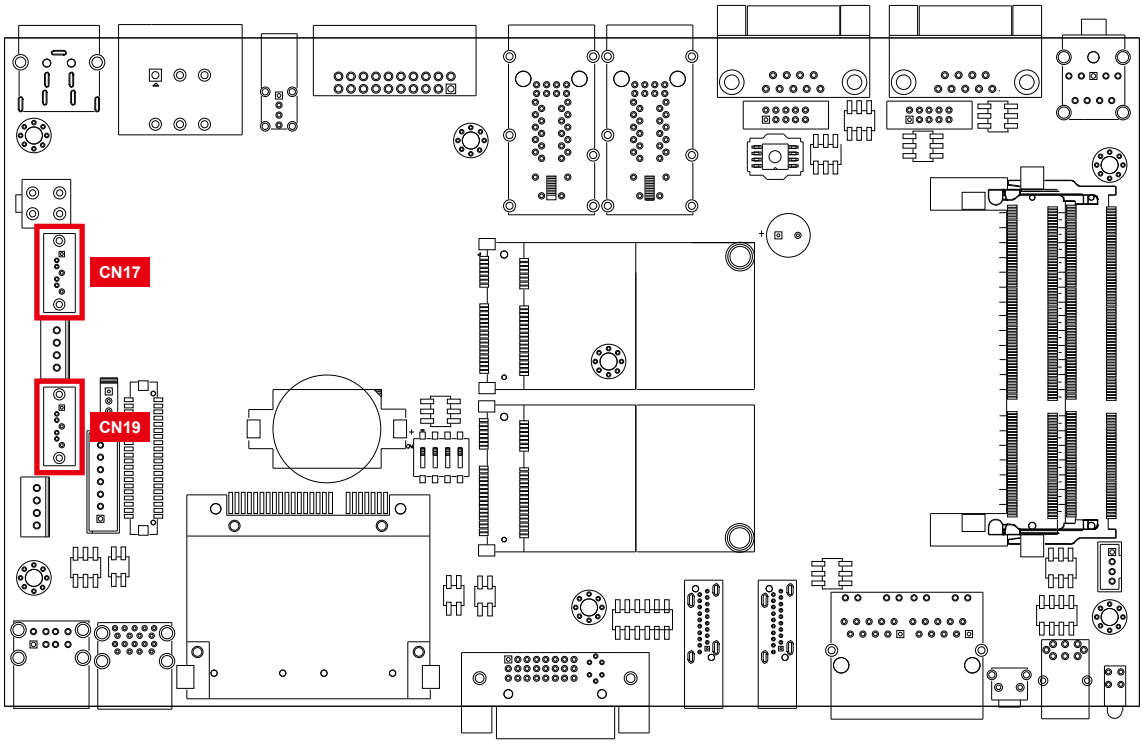

MTC-4021 supports dual-channel 24-bit LVDS display, up to 1920 x 1200 pixels resolution. The pin assignments of CON1 are listed in the following table:

| Pin No. | Definition | Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|---|---|
| 1 | PANEL_VDD | 15 | GND | 29 | GND |
| 2 | TXO0- | 16 | TXOC+ | 30 | TXE2- |
| 3 | PANEL_VDD | 17 | GND | 31 | GND |
| 4 | TXO0+ | 18 | TXO3- | 32 | TXE2+ |
| 5 | PANEL_VDD | 19 | GND | 33 | GND |
| 6 | TXO1- | 20 | TXO3+ | 34 | TXEC- |
| 7 | GND | 21 | GND | 35 | GND |
| 8 | TXO1+ | 22 | TXE0- | 36 | TXEC+ |
| 9 | GND | 23 | GND | 37 | GND |
| 10 | TXO2- | 24 | TXE0+ | 38 | TXE3- |
| 11 | GND | 25 | GND | 39 | LVDS_DET# |
| 12 | TXO2+ | 26 | TXE1- | 40 | TXE3+ |
| 13 | GND | 27 | GND | | |
| 14 | TXOC- | 28 | TXE1+ | | |

The LCD inverter is connected to J2 via a JST 7-pin, 2.5mm connector providing +5V/ +12V power to LCD display. The pin assignments are listed in the following table:

| Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|
| 1 | +5V | 5 | GND |
| 2 | +12V | 6 | GND |
| 3 | +12V | 7 | LBKLT_EN |
| 4 | LBKLT_CTL | | |

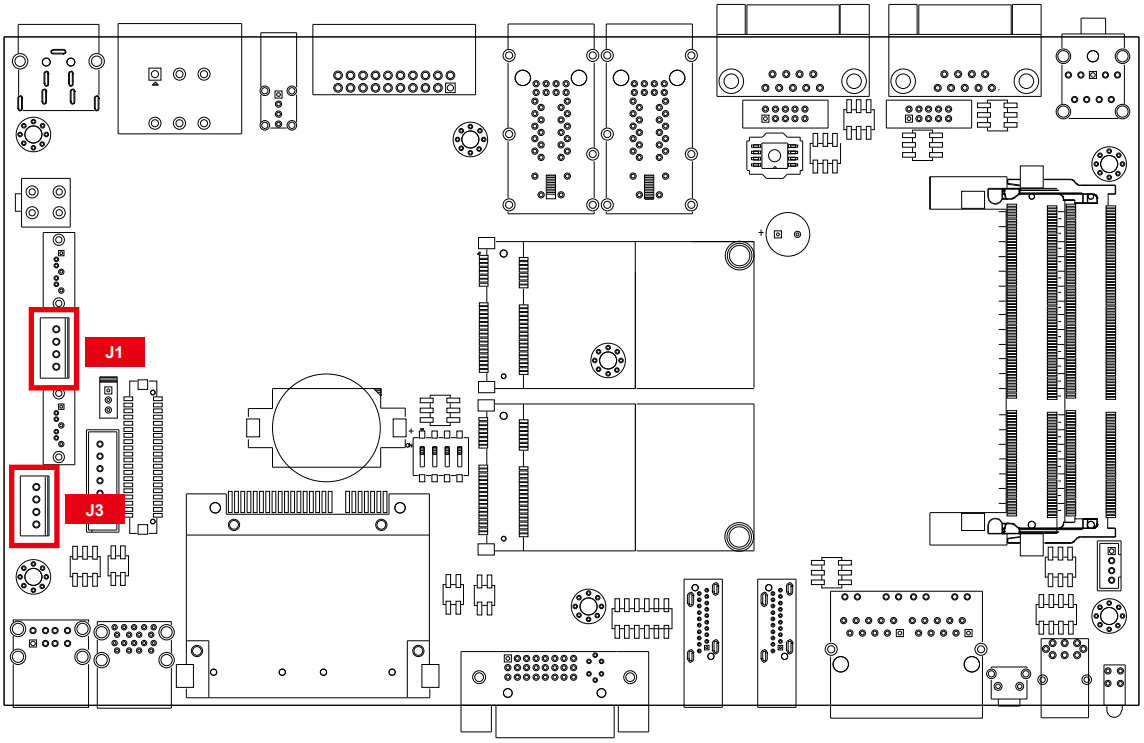
### 2.3.5 CN17, CN19 : SATA III Connector




There are 2 onboard high performance Serial ATA III (SATA III) on MTC-4021. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of CN17 and CN19 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 | | |

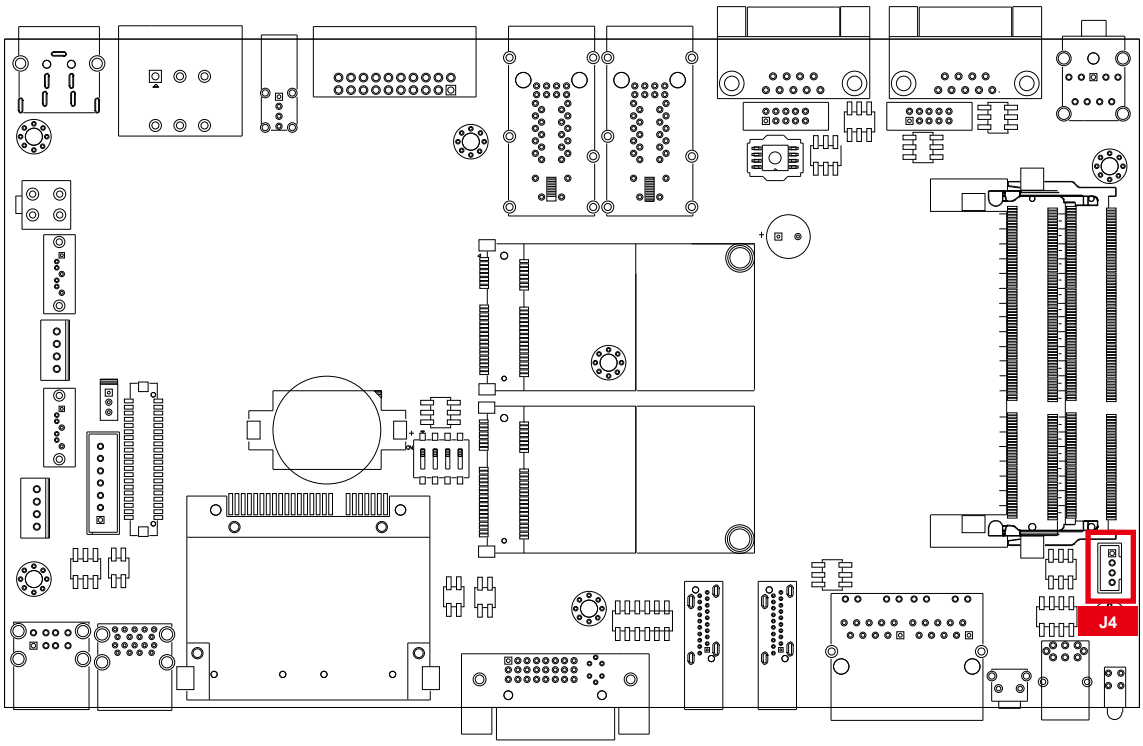
### 2.3.6 J1, J3 : SATA Power Connector




The MTC-4021 also equip with 2 SATA power connector. It supports 5V (Up to 2A) and 12V (Up to 1A) current to the hard drive or SSD. The pin assignments of J1 and J3 are listed in the following table:

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

### 2.3.7 J4 : Internal USB



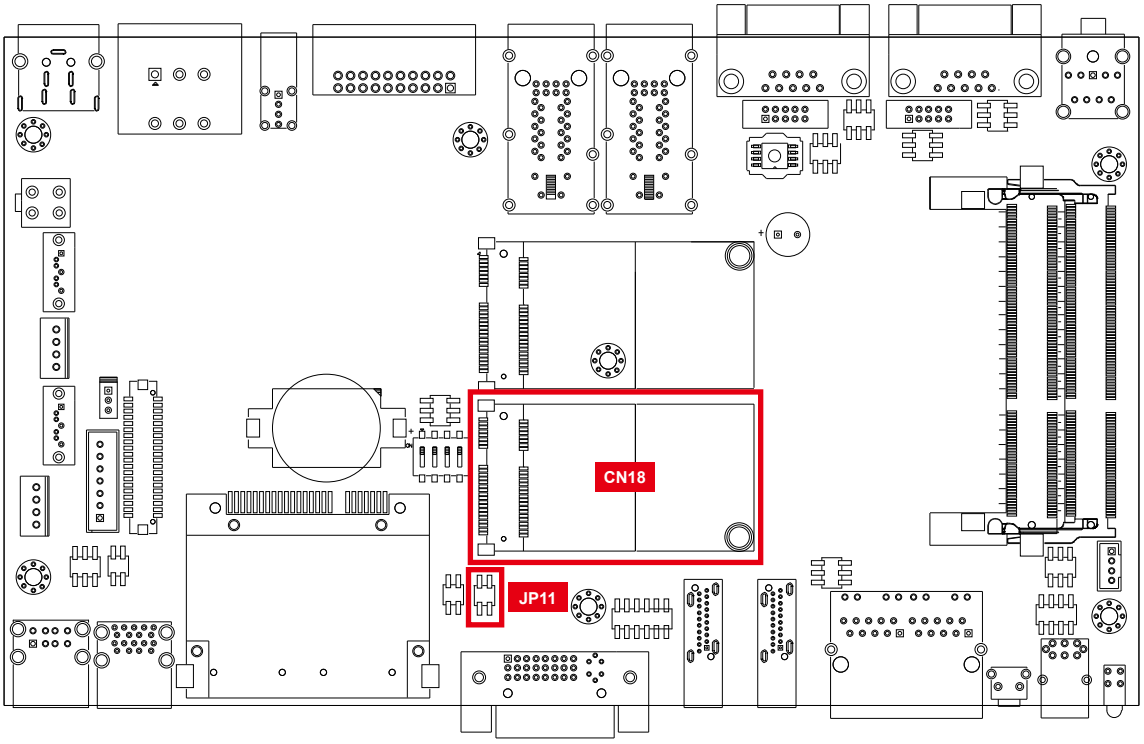

The MTC-4021 main board provide one expansion USB port using plug-and-play for Dongle Key or LCD touch Panel. The USB interface supports 480 Mbps transfer rate which comply with high speed USB specification Rev. 2.0.

The USB interface is accessed through one 4-pin JST 2.0mm connector. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 4-pin connector on one end and a USB connector on the other.

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

| Connector | Pin No. | Description | Pin No. | Description |
|---|---|---|---|---|
| J4 | 1 | USB_VCC | 3 | USBD+ |
| | 2 | USBD- | 4 | GND |

### 2.3.8 CN18 : Mini PCIe, mSATA




Both mSATA and Mini PCIe share the same form factor and similar electrical pinout assignments on their connectors. There was no clear mechanism to distinguish if a mSATA drive or a Mini PCIe device is plugged into the socket until recently that SATA I/O issued an ECN change (ECN #045) to redefine Pin-43 on mSATA connector as “no connect” instead of “return current path” (or GND).

When an mSATA drive is inserted, its Pin-43 is “no connect”, and the respective pin on the socket is being pulled-up to logic 1. When a Mini PCIe device is inserted, its Pin-43 forces the respective pin on the socket to ground, or logic 0.

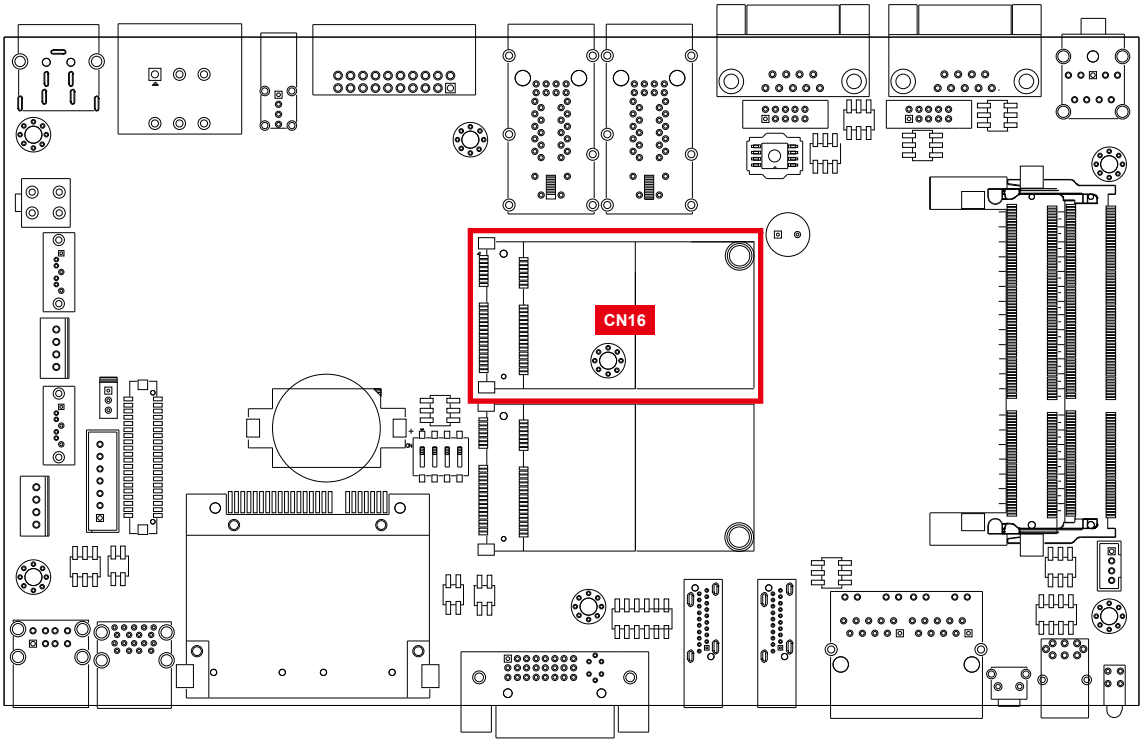
MTC-4021 using JP11 Pin-43 status designed for switching between mSATA drive and Mini PCIe device.

| Header | Interface |
|---|---|
| 1-2 | Auto Detection |
| 2-4 | Mini PCIe |
| 1-3 | mSATA |

The pin assignments of CN18 are listed in the following table:

| Pin No. | Signal Name | Pin No. | Signal Name |
|---|---|---|---|
| 1 | WAKE# | 2 | +3.3Vaux |
| 3 | Reserved | 4 | GND |
| 5 | Reserved | 6 | +1.5V |
| 7 | CLKREQ# | 8 | UIM_PWR |
| 9 | GND | 10 | UIM_DATA |
| 11 | REFCLK- | 12 | UIM_CLK |
| 13 | REFCLK+ | 14 | UIM_RESET |
| 15 | GND | 16 | UIM_VPP |
| Mechanical Key | | | |
| 17 | Reserved | 18 | GND |
| 19 | Reserved | 20 | reserved |
| 21 | GND | 22 | PERST# |
| 23 | PERn0 | 24 | +3.3Vaux |
| 25 | PERp0 | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMB_CLK |
| 31 | PETn0 | 32 | SMB_DATA |
| 33 | PETp0 | 34 | GND |
| 35 | GND | 36 | USB_D- |
| 37 | GND | 38 | USB_D+ |
| 39 | +3.3Vaux | 40 | GND |
| 41 | +3.3Vaux | 42 | Reserved |
| 43 | GND | 44 | Reserved |
| 45 | Reserved | 46 | Reserved |
| 47 | Reserved | 48 | 1.5V |
| 49 | Reserved | 50 | GND |
| 51 | Reserved | 52 | +3.3Vaux |

### 2.3.9 CN16 : Mini PCIe

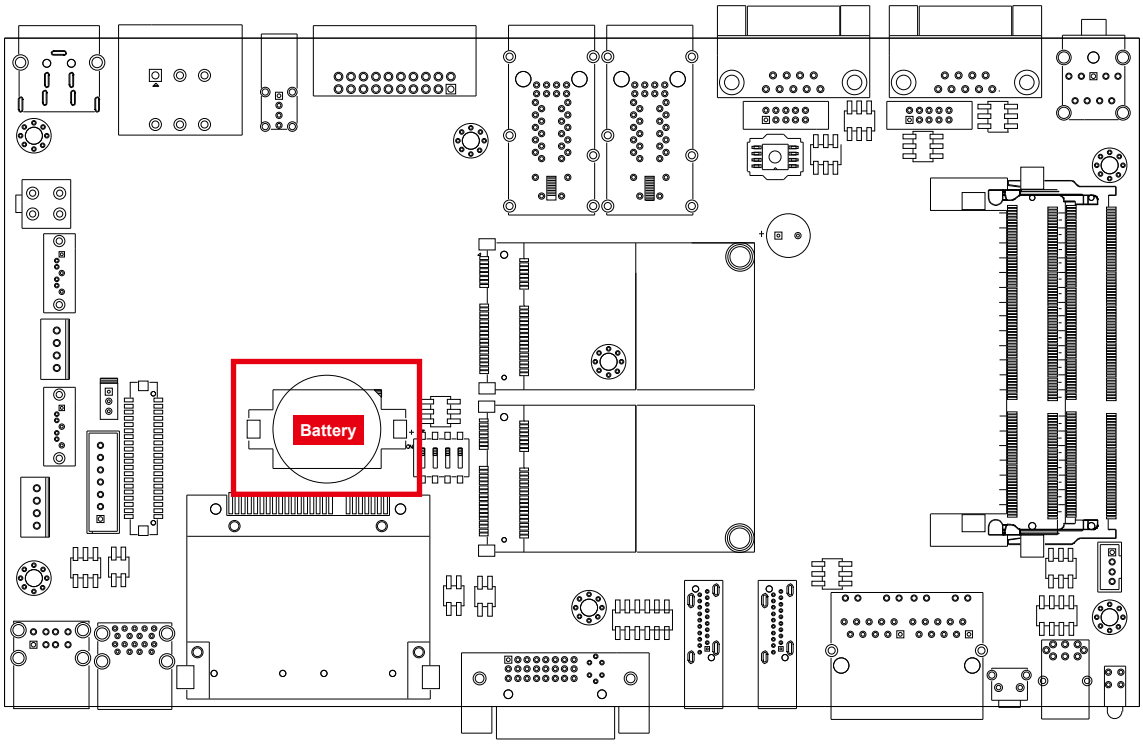



The pin assignments of CN16 are listed in the following table:

| Pin No. | Signal Name | Pin No. | Signal Name |
|---|---|---|---|
| 1 | WAKE# | 2 | +3.3Vaux |
| 3 | Reserved | 4 | GND |
| 5 | Reserved | 6 | +1.5V |
| 7 | CLKREQ# | 8 | UIM_PWR |
| 9 | GND | 10 | UIM_DATA |
| 11 | REFCLK- | 12 | UIM_CLK |
| 13 | REFCLK+ | 14 | UIM_RESET |
| 15 | GND | 16 | UIM_VPP |
| Mechanical Key | | | |
| 17 | Reserved | 18 | GND |
| 19 | Reserved | 20 | reserved |
| 21 | GND | 22 | PERST# |
| 23 | PERn0 | 24 | +3.3Vaux |
| 25 | PERp0 | 26 | GND |
| 27 | GND | 28 | +1.5V |

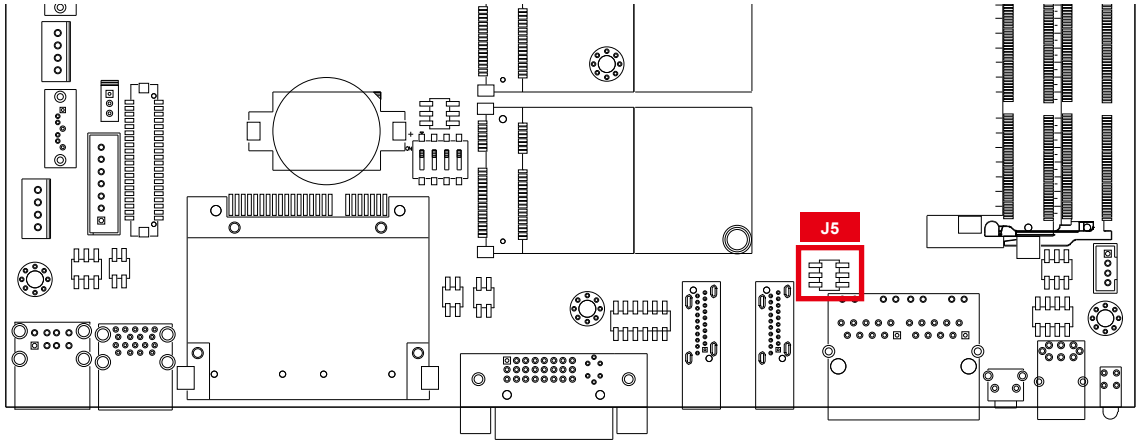
| | | | |
|---|---|---|---|
| 29 | GND | 30 | SMB_CLK |
| 31 | PETn0 | 32 | SMB_DATA |
| 33 | PETp0 | 34 | GND |
| 35 | GND | 36 | USB_D- |
| 37 | GND | 38 | USB_D+ |
| 39 | +3.3Vaux | 40 | GND |
| 41 | +3.3Vaux | 42 | Reserved |
| 43 | GND | 44 | Reserved |
| 45 | Reserved | 46 | Reserved |
| 47 | Reserved | 48 | 1.5V |
| 49 | Reserved | 50 | GND |
| 51 | Reserved | 52 | +3.3Vaux |

### 2.3.10 Battery




The MTC-4021's real-time clock is powered by a lithium battery. It is Equipped with Panasonic BR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

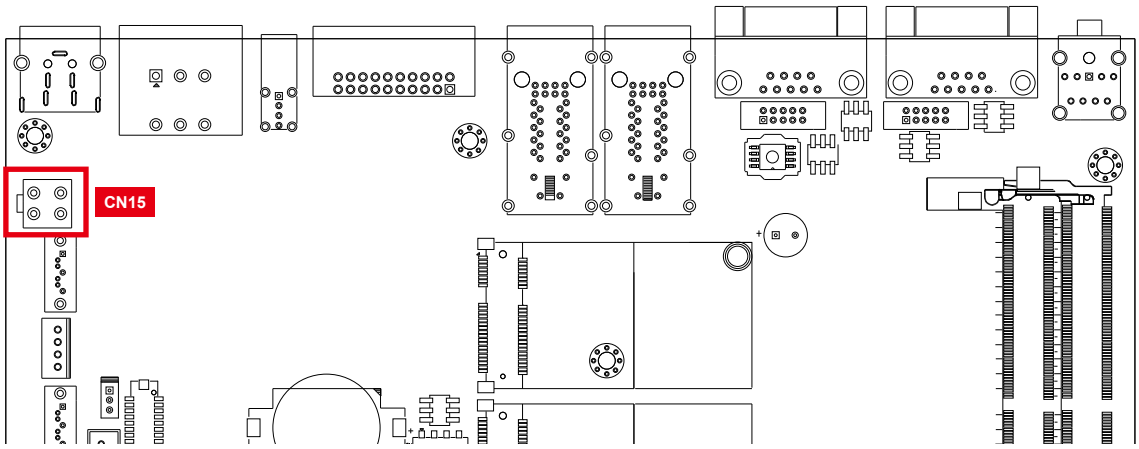
### 2.3.11 J5 : LAN2 I210 SDP




The pin assignments of J5 are listed in the following table:

| Pin No. | Function | Pin No. | Function |
|---|---|---|---|
| 1 | LAN2_SDP0 | 4 | LAN2_SDP3 |
| 2 | LAN2_SDP1 | 5 | GND |
| 3 | LAN2_SDP2 | 6 | GND |

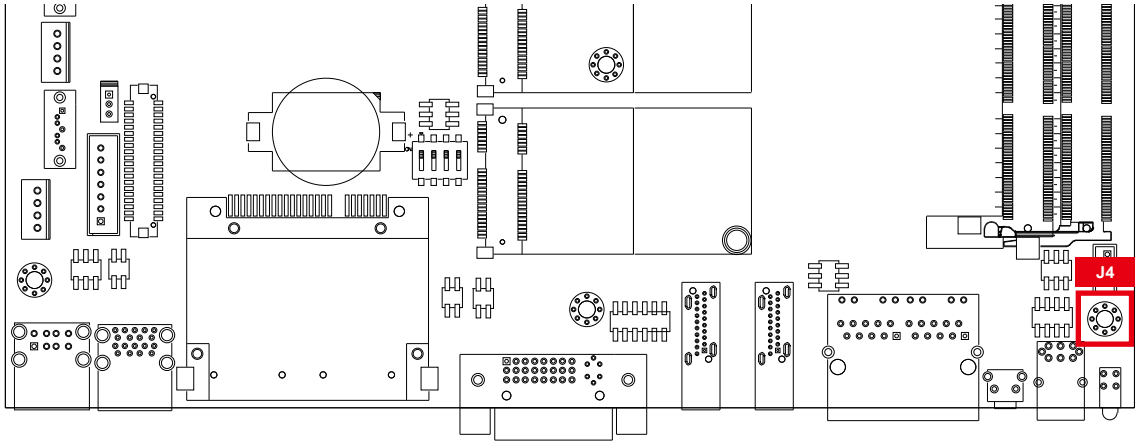
### 2.3.12 CN15 : +12V_SB Output




The pin assignments of CN15 are listed in the following table:

| Pin No. | Function | Pin No. | Function |
|---|---|---|---|
| 1 | GND | 3 | +12V_SB |
| 2 | GND | 4 | +12V_SB |

### 2.3.13 J4 Internal USB2.0



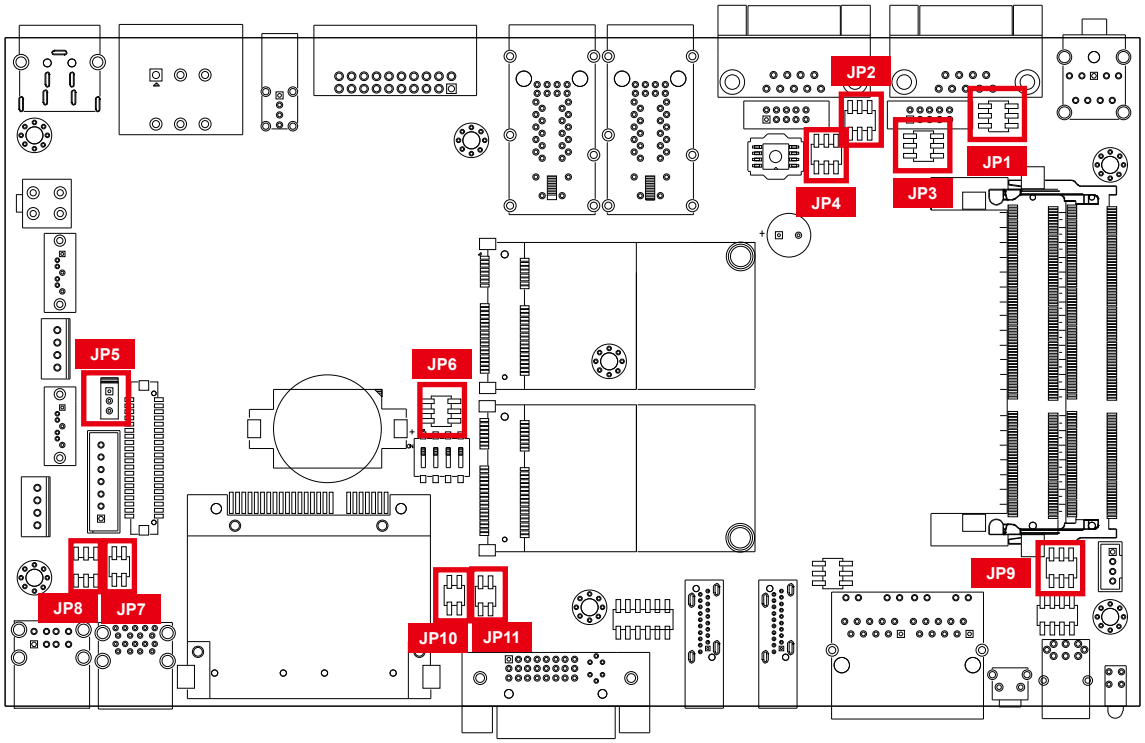

The pin assignments of J4 are listed in the following table:

| Pin No. | Function | Pin No. | Function |
|---|---|---|---|
| 1 | Vcc | 3 | D+ |
| 2 | D- | 4 | GND |

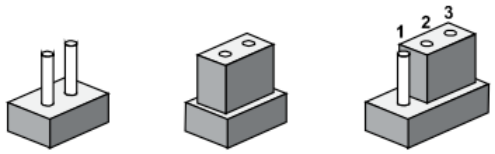
## 2.4 Main Board Jumper Settings

### 2.4.1 Front View of MTC-4021 Main Board with Jumper Location

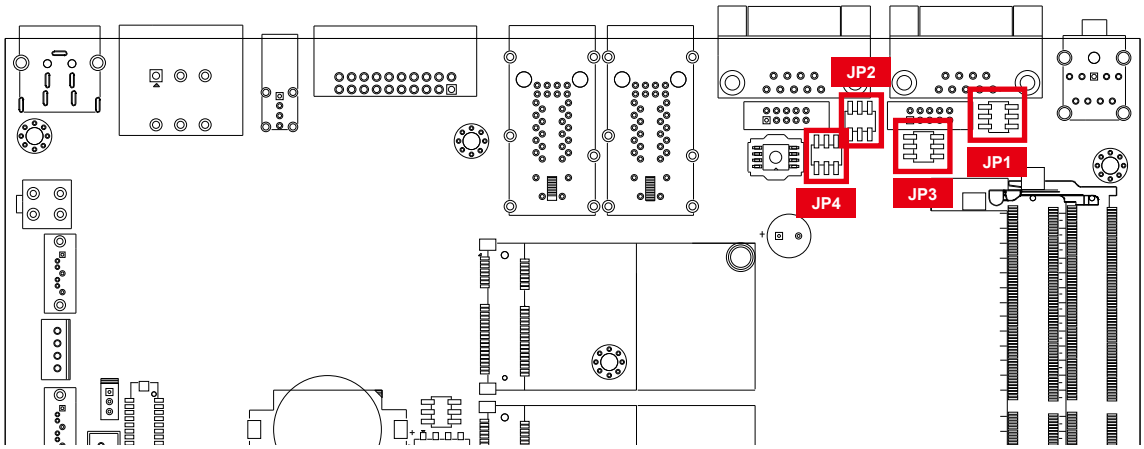
The figure below is the top view of the MTC-4021 main board which is the main board used in the MTC-4021 Series system. It shows the location of the jumpers.




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.



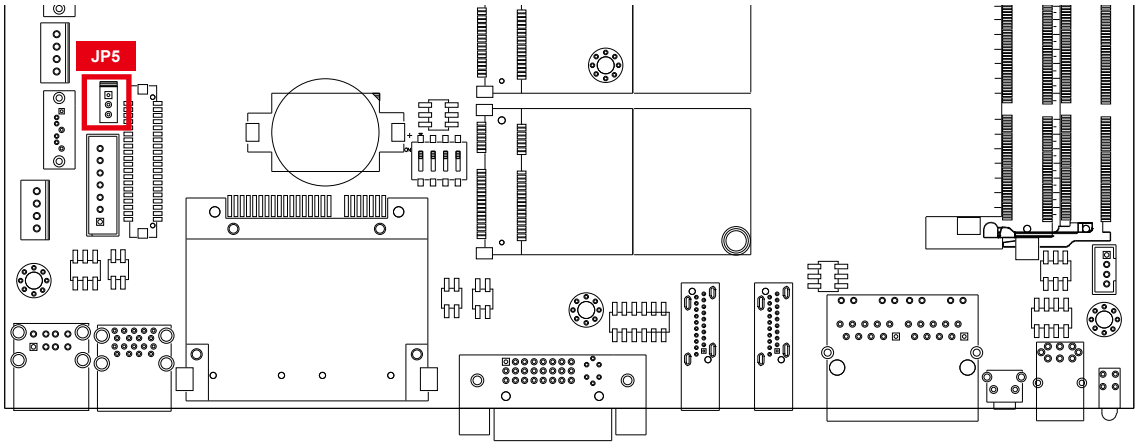
### 2.4.2 JP1, JP2, JP3, JP4




COM 1 to COM 4 Pin 9 Function:

| Pin No. | RI/ +5V/ +12V |
|---|---|
| 1-2 | +12V |
| 3-4 | +5V |
| 5-6 | RI |

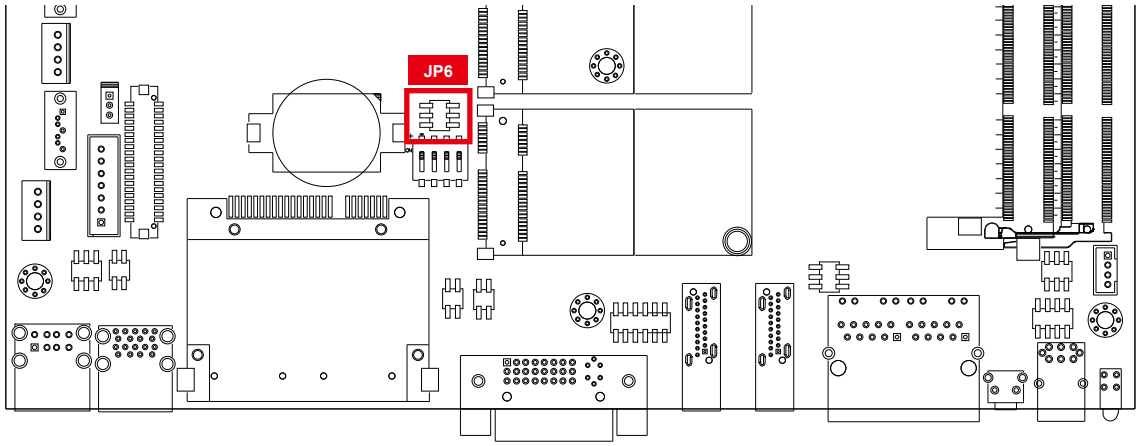
### 2.4.3 JP5 : LVDS Backlight, Power Selection




JP5 provides LVDS voltage selection function, closing Pin 1, 2 is for 3.3V LVDS power input; closing Pin 2, 3 is for 5V LVDS power input.

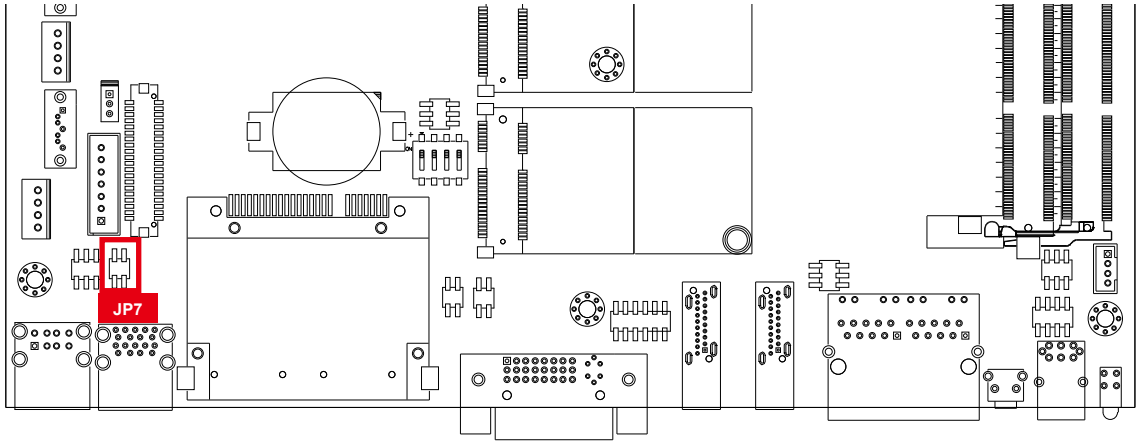
| Pin No. | Function | Pin No. | Function |
|---|---|---|---|
| 1-2 | +3.3V (Default) | 2-3 | +5V |

### 2.4.4 JP6 CMOS/ME



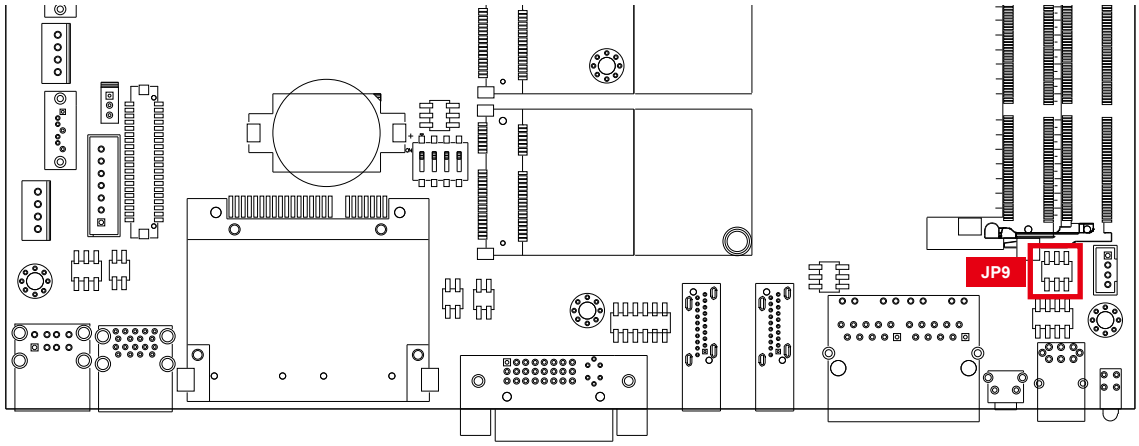

| CMOS | Header | ME | Header |
|---|---|---|---|
| 1-2 | Normal | 2-4 | Normal |
| 2-3 | Clear CMOS | 4-6 | Clear ME |

### 2.4.5 JP7 External USB3.0/2.0 Power Select




| Header | Power | Header | Power |
|---|---|---|---|
| 1-2 | +5V Standby Power | 3-4 | +5V System Power |

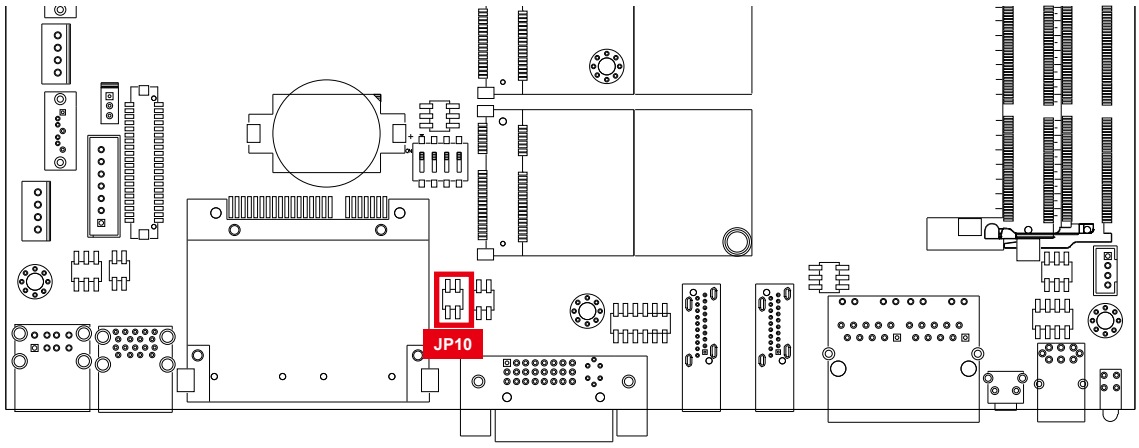
### 2.4.6 JP9 Internal USB Power Select




Internal USB PWR Select:

| JP9 | +V5A/ +V5/ +V3.3 |
|---|---|
| 1-2 | +5V Standby |
| 3-4 | +5V |
| 5-6 | +3.3V |

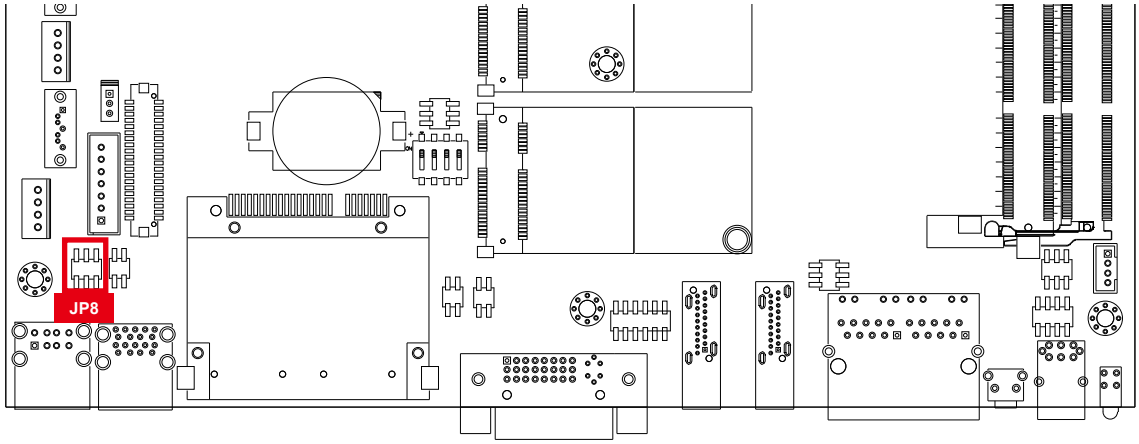
### 2.4.7 JP10 : MCU Spy-bi Wire Interface for Download FW




The pin assignments of JP10 are listed in the following table:

| Pin No. | Function | Pin No. | Function |
|---|---|---|---|
| 1 | GND | 3 | 3.3V_MCU |
| 2 | MCU_RST# | 4 | MCU_PRG |

## 2.4.8 JP8 Backlight Control Level Select




| Dimming | Header |
|---|---|
| 1-3 | 3.3V |
| 3-5 | 5V |

| On/ Off | Header |
|---|---|
| 2-4 | 3.3V |
| 4-6 | 5V |

# 3

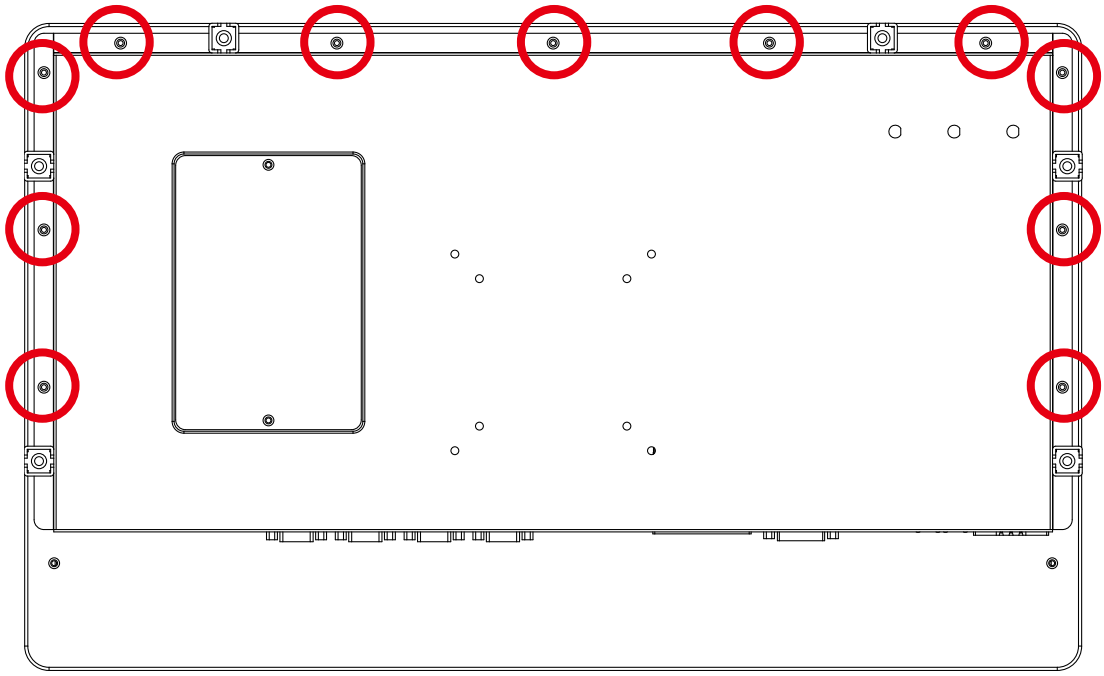
# SYSTEM SETUP

"Please make sure to assemble the system in an anti-static environment."

## 3.1 How to Open Your MTC-4021

### 3.1.1 MTC-4021

**Step 1** Remove 11pcs FH M3 screws (circled in red) from back cover.

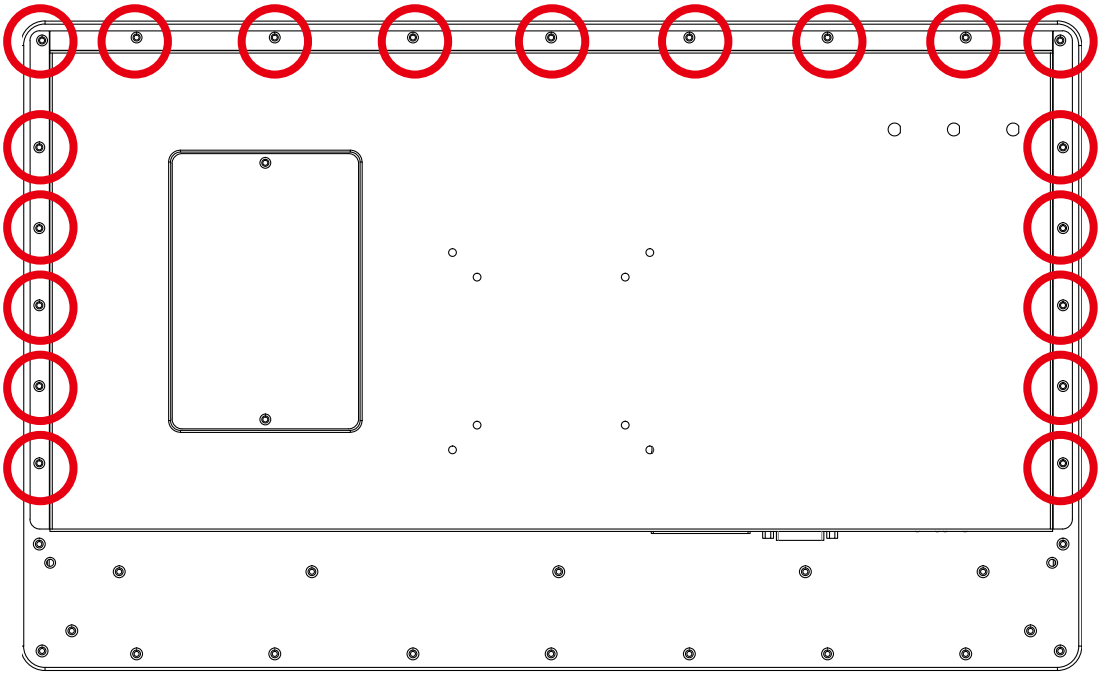



**Step 2** Remove 2pcs #4-40 screws (circled in red) from I/O.

**Step 3** Now you can take off the back cover. Please do remove the back cover carefully.

### 3.1.2 MTC-4021 with IP65

**Step 1** Remove 19pcs FH M3 screws (circled in red) from back cover.

**Step 2** Remove 2pcs #4-40 screws (circled in red) from I/O.

**Step 3** Now you can take off the back cover. Please do remove the back cover carefully.

## 3.2 Installing DDR3L SO-DIMM Modules

**Step 1** Install DDR3L RAM module into SO-DIMM socket.

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

## 3.3 Installing Mini PCIe Cards

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


**Step 2** Fasten 2pcs M2.5 screws.

## 3.4 Installing Antenna Cable

**Step 1** Check Antenna cable and washers..


**Step 2** Remove the rubber cork on back cover.
(Pick up the location you want.)

**Step 3** Put Antenna cable connector into the hole on back cover.

**Step 4** Fasten the washer 1, washer 2 and washer 3 on Antenna cable connector.

## 3.5 Installing CFast Card and SIM Card

**Step 1** Remove 2pcs F-M3x4 screws on CFast & SIM Card cover on back cover.

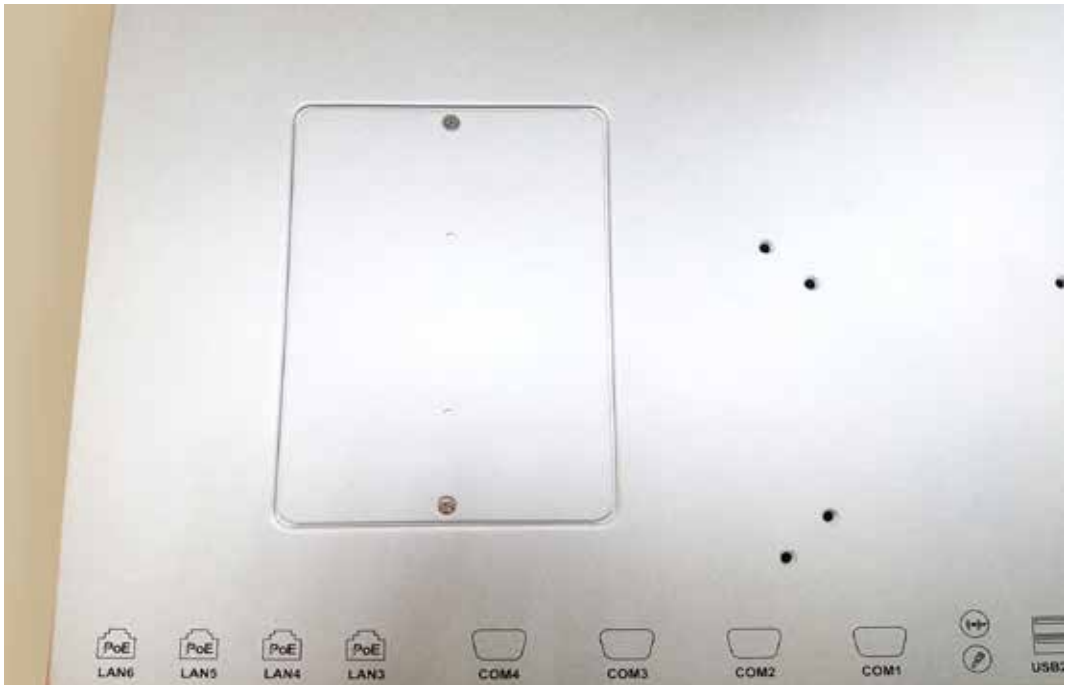
**Step 2** Make sure the system is power-off and unplugged.

**Step 3** Before Inserting SIM card, make sure the system power is not plugged.

**Step 4** Insert CFast card and SIM card and push to lock.

## 3.6 Installing SSD/ HDD

**Step 1** Remove 2pcs M3x4 screws of SSD/ HDD Tray from back cover.



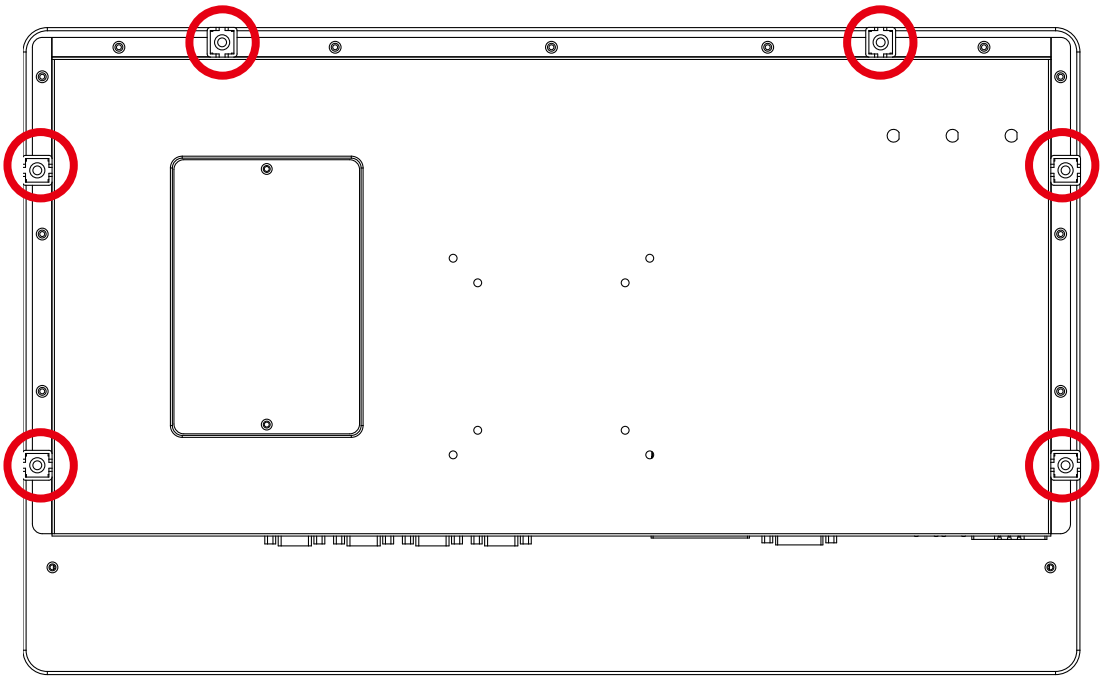

**Step 2** Take SSD/ HDD Tray and face the bracket side up.

**Step 3** Fasten 4pcs M3x6 screws (marked in red) to fix the SSD/ HDD on the tray.


**Step 4** Plug-in SATA cable to SSD/HDD on the tray.

## 3.7 Mounting MTC-4021

Panel mount position



**Step 1** Make sure your M5x20 screws and screw tongues for Panel mount.

**Step 2** Make sure the screw tongues match MTC-4021 back cover.

**Step 3** Fasten the M5x20 screw.

# 4

# BIOS AND DRIVER

## 4.1 BIOS Settings

The board uses UEFI BIOS that is use Serial Peripheral Interface (SPI) Flash. The SPI Flash contains the BIOS Setup program, POST, the PCI auto-configuration utility, LAN, EEPROM information, and Serial port support. The BIOS setup program is accessed by pressing the <Del> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. The menu bar is shown below.


Figure 4 1: BIOS Menu Bar

## 4.2 Main Menu

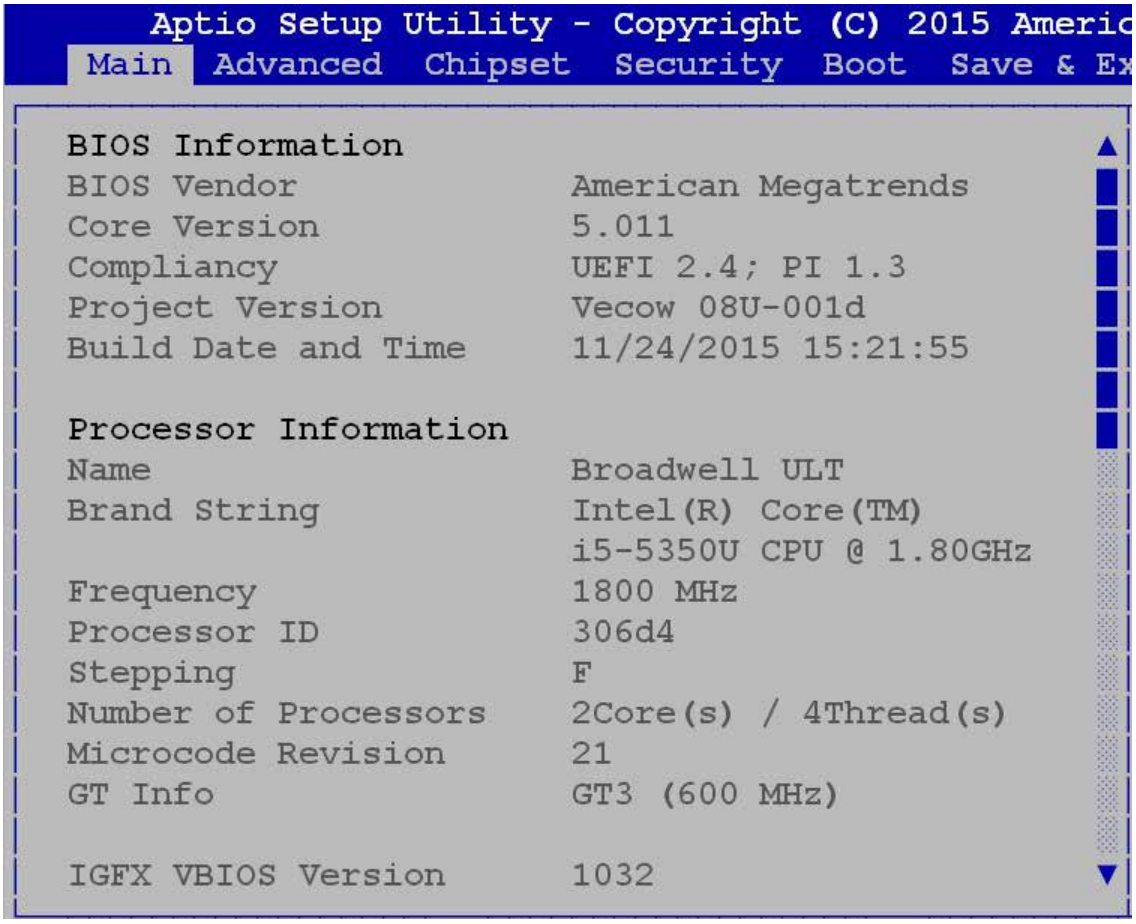



Figure 4 2: BIOS Main screen

In this page, you could make sure you CPU type and DRAM type that you are install into this system.

### 4.2.1 System Time/Date Setting

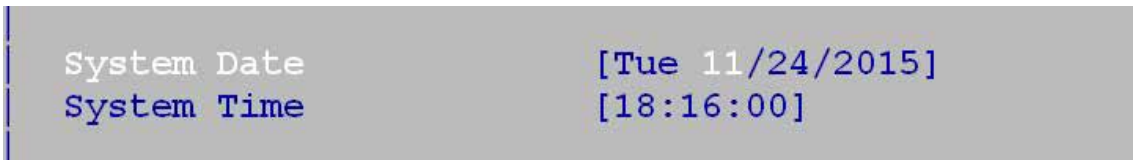



Figure 4 2-1: System Time / Date setting

**System Time/ Date**

Press “TAB” key to switch sub-items of value .Then press “+” key or “-“ key number key for modify value.

## 4.3 Advanced Function

### 4.3.1 ACPI Setting

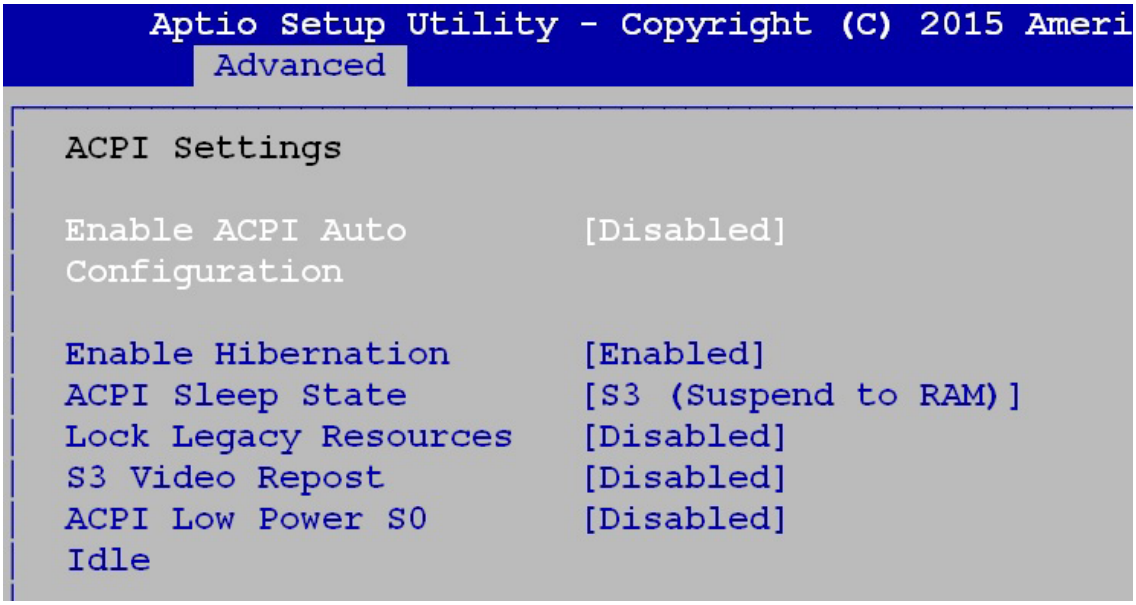



Figure 4 3-1: ACPI Setting setup screen

**Enable ACPI Auto Configuration**
This system support ACPI function as auto process. You should Enable / Disable that depend as your O.S.

**Enable Hibernation**
It is able to use Hibernate function if O.S support. But some O.S maybe not effective with this function.

### 4.3.2 CPU Configuration

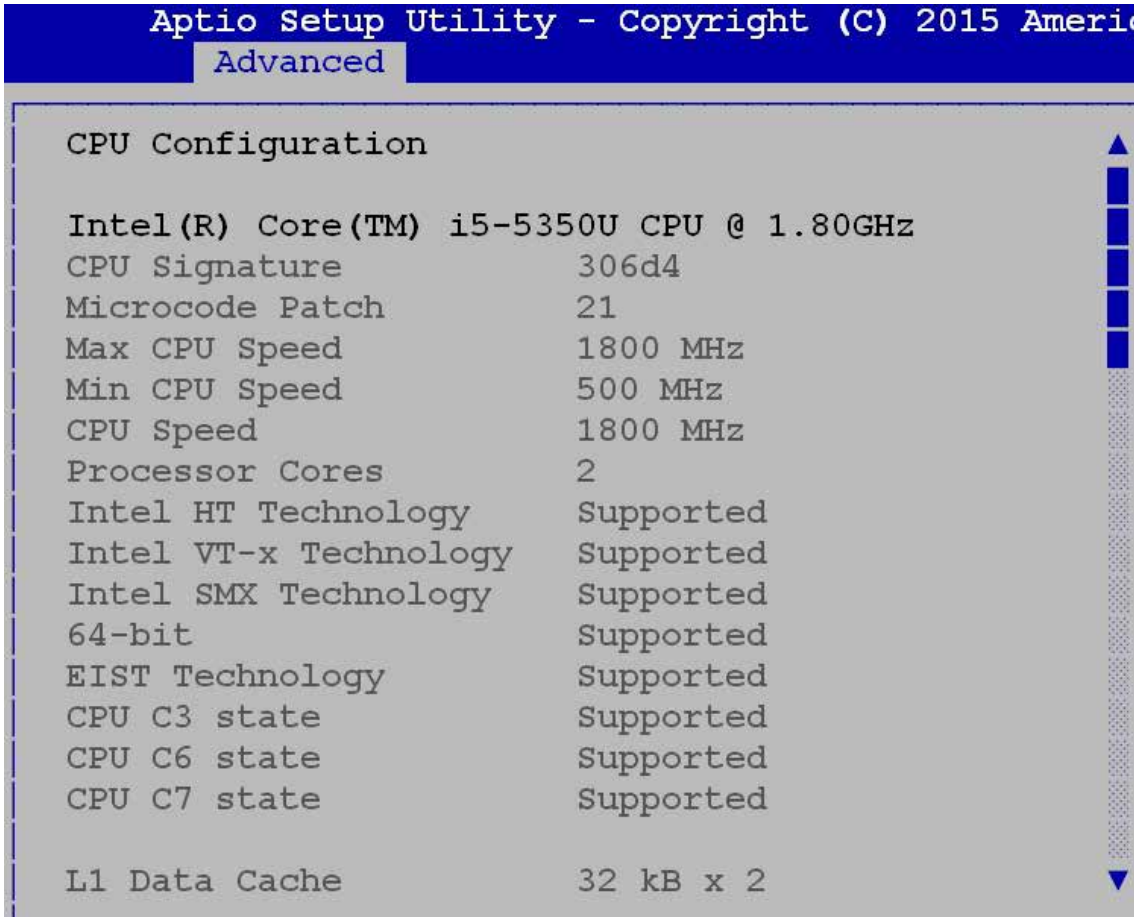



Figure 4-3-2: CPU Configuration setup screen

**Intel Virtualization Technology**

This for Virtualization Application or platform usage, when enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

### 4.3.3 SATA Configuration

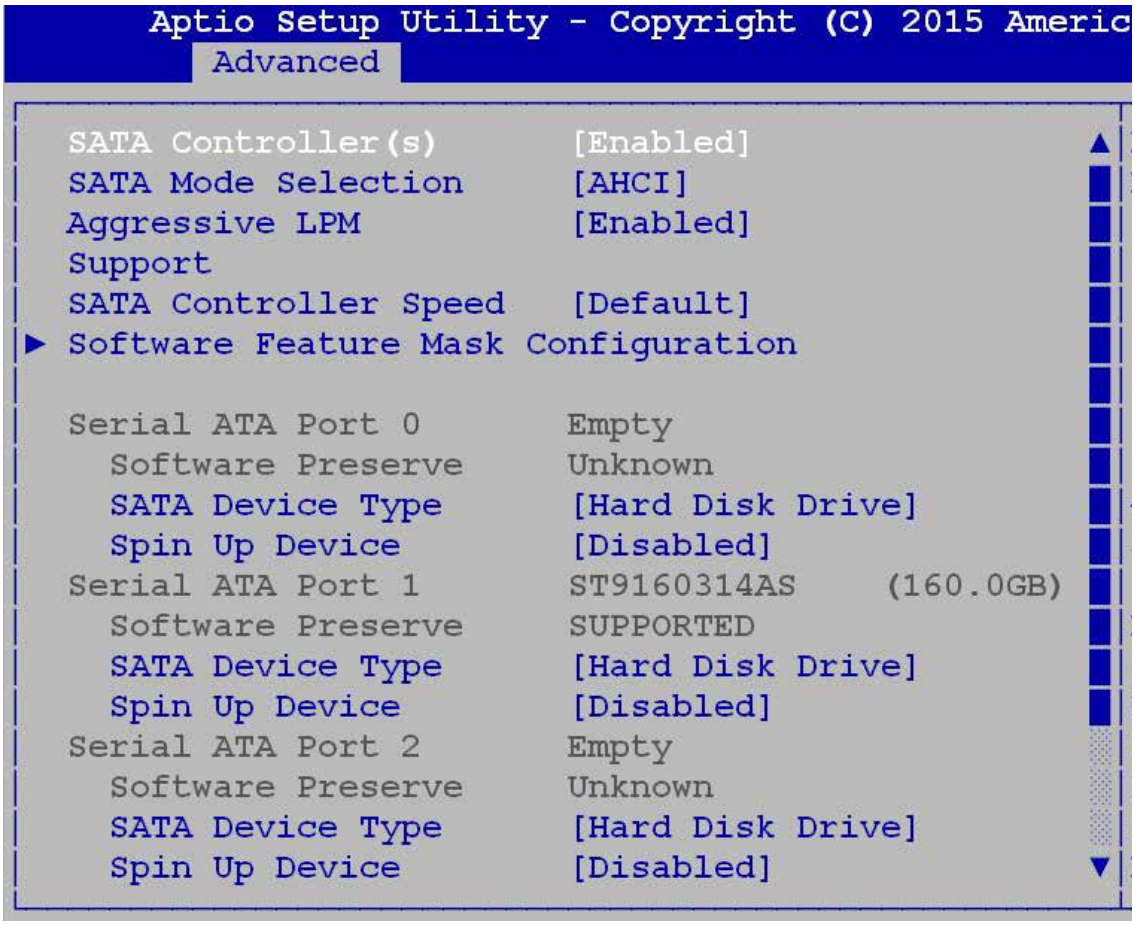



Figure 4-3-3: SATA Configuration setup screen

**SATA Controller(s)**
Enables or Disables integrate SATA controller for Storage device use.

**SATA Mode Selection**
Determines how the SATA transfer mode for operate. Here has two options for choice [AHCI] / [RAID].

**Serial ATA Port 0 to Port 3**
This system offers four SATA port for SATA device connection.

### 4.3.4 AMT Configuration

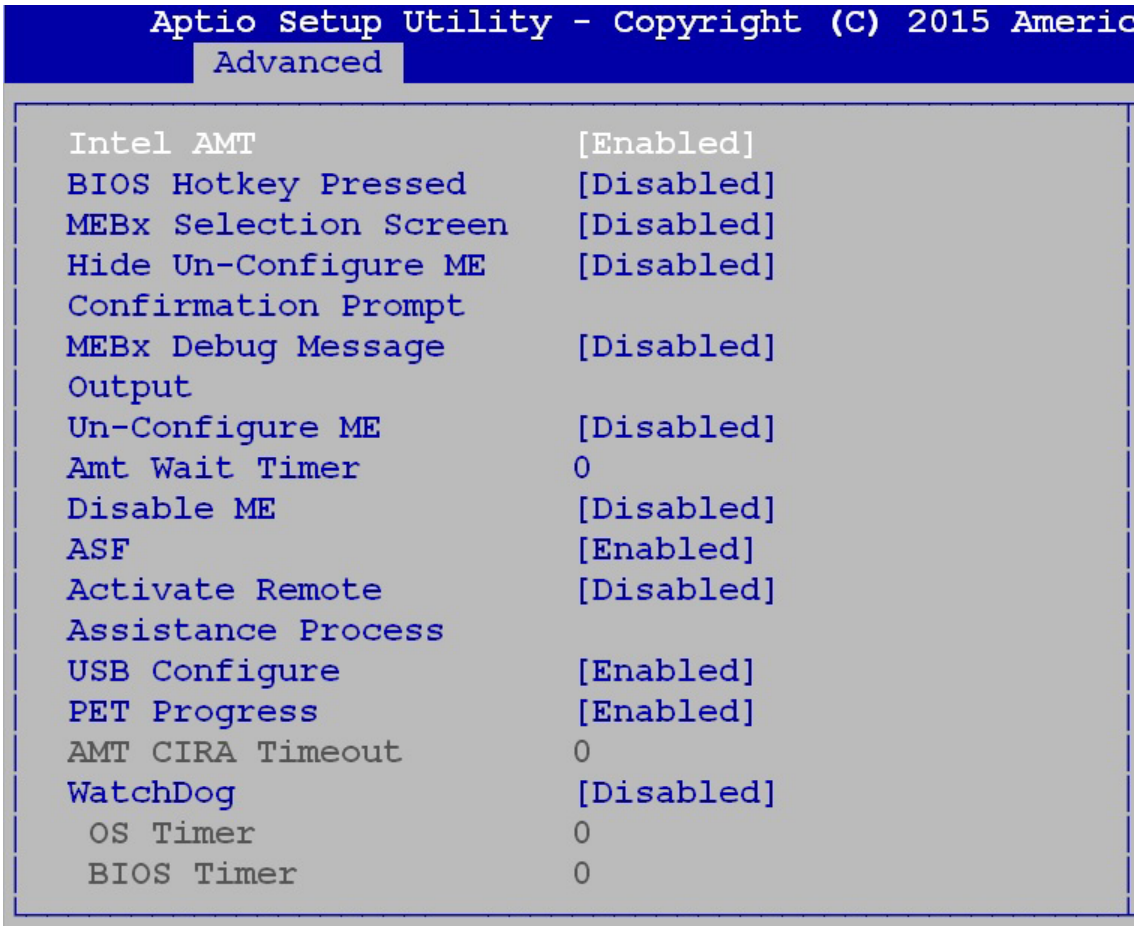



Figure 4-3-4: AMT Setup screen

**Intel AMT**

Enables or Disables Intel(R) Active Management Technology BIOS extension. This option just controls the BIOS extension executes.

### 4.3.5 Serial Port 1 Configuration

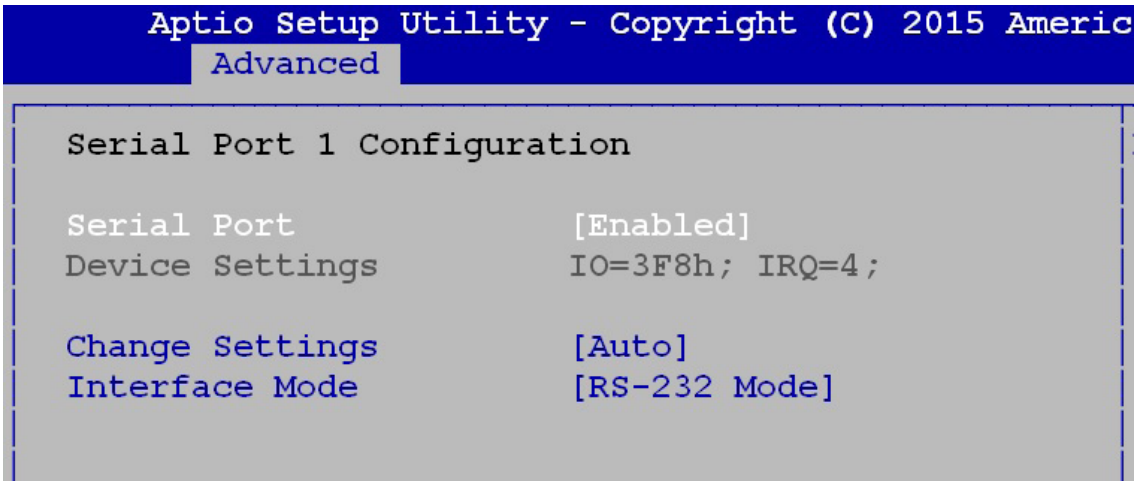



Figure 4-3-5: Serial Port 1 Setup screen

**Serial Port**
Enable or Disable Serial Port.

**Device Setting**
Current IO address and interrupt resource of Serial Port.

**Change Settings**
Select another device setting.
There are 6 options as follow :

- Auto
- IO=3F8h; IRQ=4;
- IO=3F8h; IRQ=3,4,12;
- IO=2F8h; IRQ=3,4,12;
- IO=3E8h; IRQ=3,4,12;
- IO=2E8h; IRQ=3,4,12;

**Interface Mode**
There are 3 options as follow :

- RS-232 Mode
- RS-422 Mode
- RS-485 Mode

### 4.3.6 Serial Port 2 Configuration

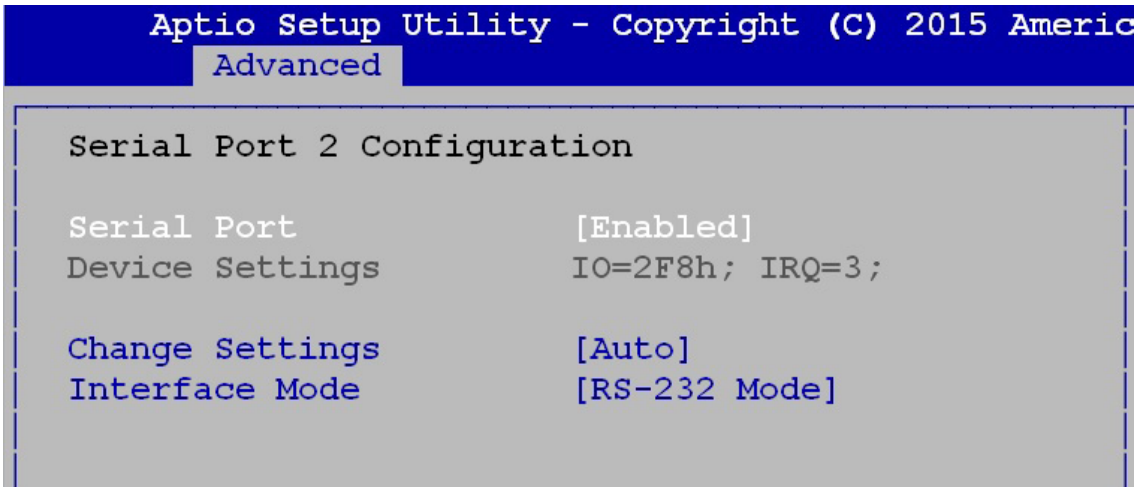



Figure 4-3-6 : Serial Port 2 Setup screen

**Serial Port**
Enable or Disable Serial Port.

**Device Setting**
Current IO addresses and interrupts resource of Serial Port.

**Change Settings**
Select another device setting.
There are 6 options as follow :

- Auto
- IO=2F8h; IRQ=3;
- IO=3F8h; IRQ=3,4,12;
- IO=2F8h; IRQ=3,4,12;
- IO=3E8h; IRQ=3,4,12;
- IO=2E8h; IRQ=3,4,12;

**Interface Mode**
There are 3 options as follow :

- RS-232 Mode
- RS-422 Mode
- RS-485 Mode

### 4.3.7 Serial Port 3 Configuration

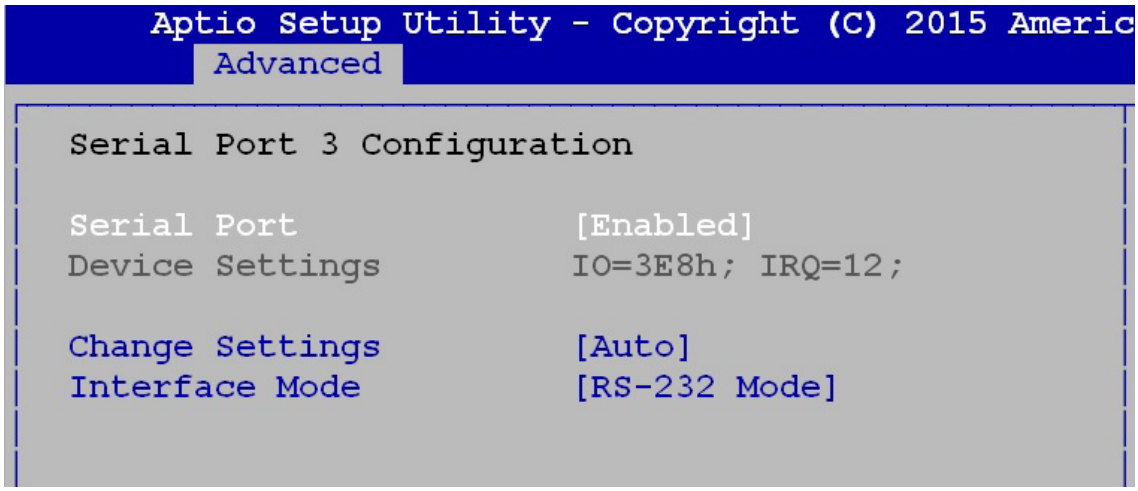



Figure 4-3-7: Serial Port 3 Setup screen

**Serial Port**
Enable or Disable Serial Port.

**Device Setting**
Current IO address and interrupt resource of Serial Port.

**Change Settings**
Select another device setting.
There are 6 options as follow :

- Auto
- IO=3E8h; IRQ=12;
- IO=3E8h; IRQ=3,4,12;
- IO=2E8h; IRQ=3,4,12;
- IO=2F0h; IRQ=3,4,12;
- IO=2E0h; IRQ=3,4,12;

**Interface Mode**
There are 3 options as follow :

- RS-232 Mode
- RS-422 Mode
- RS-485 Mode

### 4.3.8 Serial Port 4 Configuration

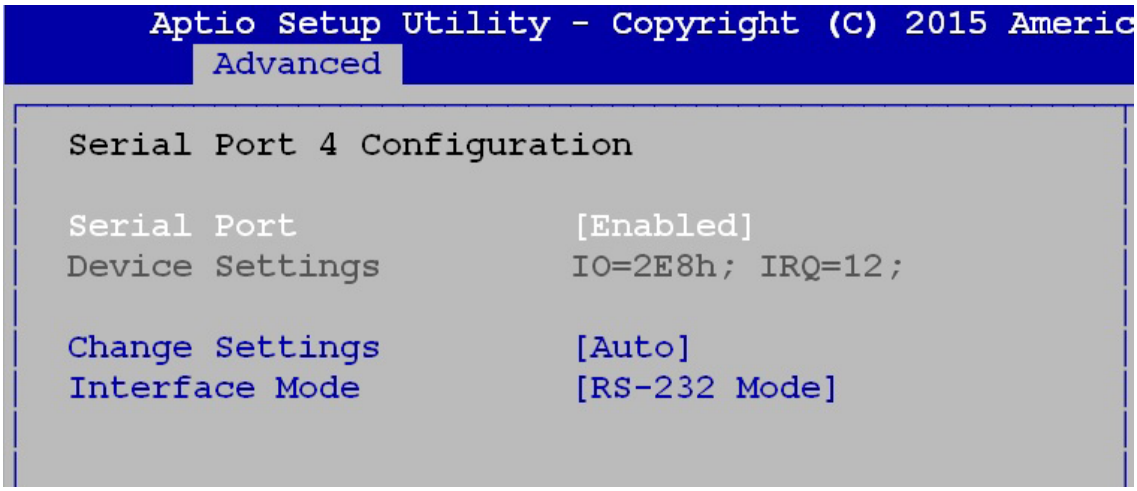



Figure 4-3-8: Serial Port 4 Setup screen

**Serial Port**
Enable or Disable Serial Port.

**Device Setting**
Current IO address and interrupt resource of Serial Port.

**Change Settings**
Select another device setting.
There are 6 options as follow :

- Auto
- IO=2E8h; IRQ=12;
- IO=3E8h; IRQ=3,4,12;
- IO=2E8h; IRQ=3,4,12;
- IO=2F0h; IRQ=3,4,12;
- IO=2E0h; IRQ=3,4,12;

**Interface Mode**
There are 3 options as follow :

- RS-232 Mode
- RS-422 Mode
- RS-485 Mode

## 4.4 Chipset Function


Figure 4-4: Chipset Function Setup screen

### 4.4.1 WOL Configuration

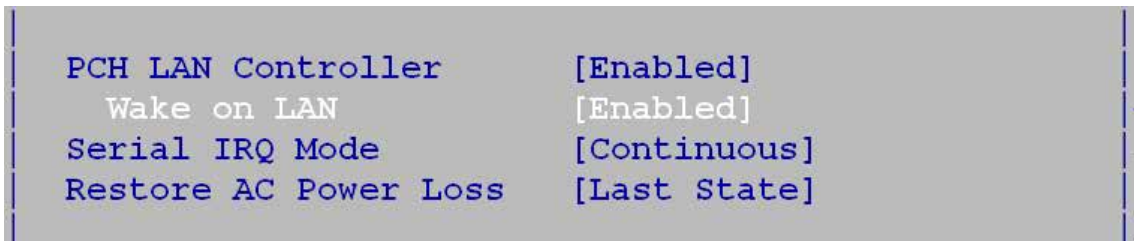



Figure 4-4-1 : Network Setup screen

**PCH LAN Controller**
Enable or Disable on board network device.

**Wake on LAN**
Enable or Disable integrated LAN to wake the system.

## 4.5 Boot Function

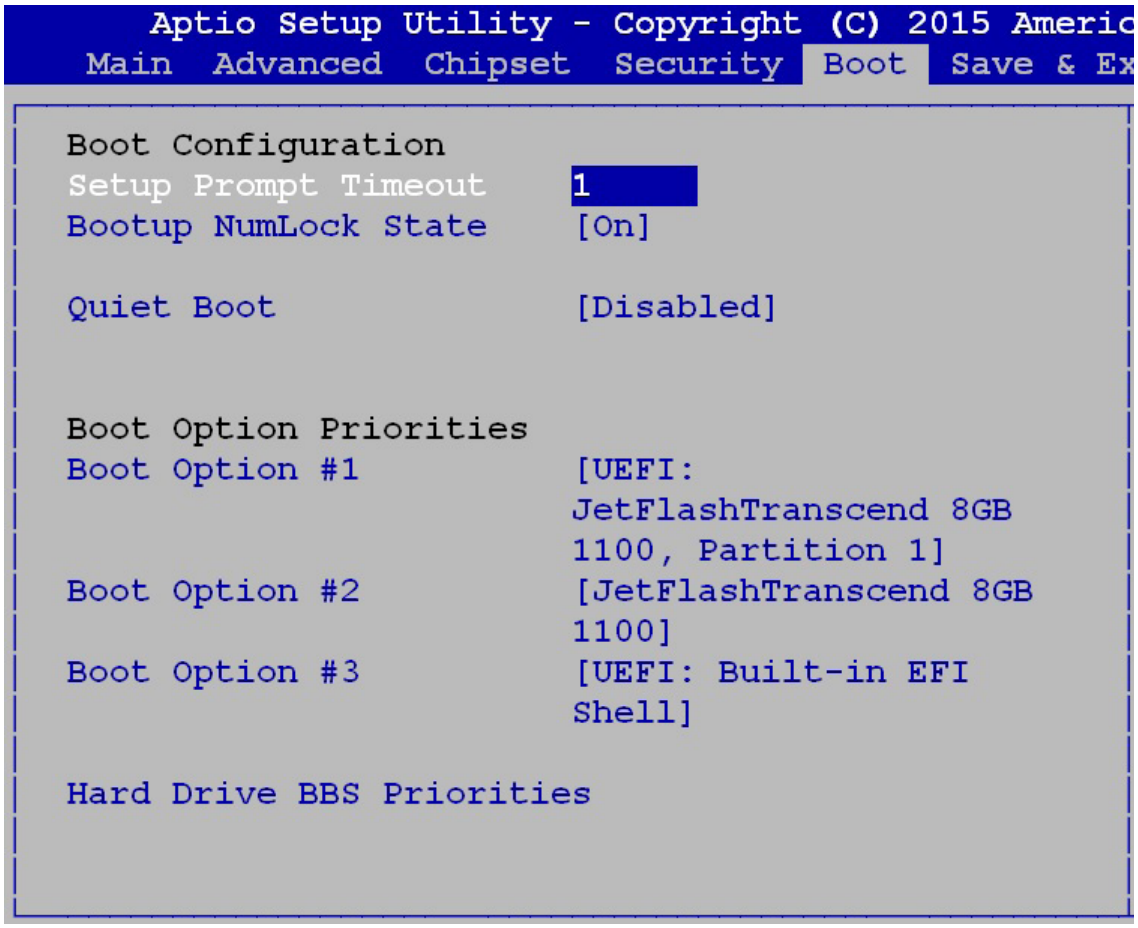



Figure 4-5: Boot function Setup screen

### 4.5.1 Boot Option


Figure 4-5-1 Boot Option Setup screen

**Boot option**

You can select boot device priority in this page.

## 4.6 Save & Exit

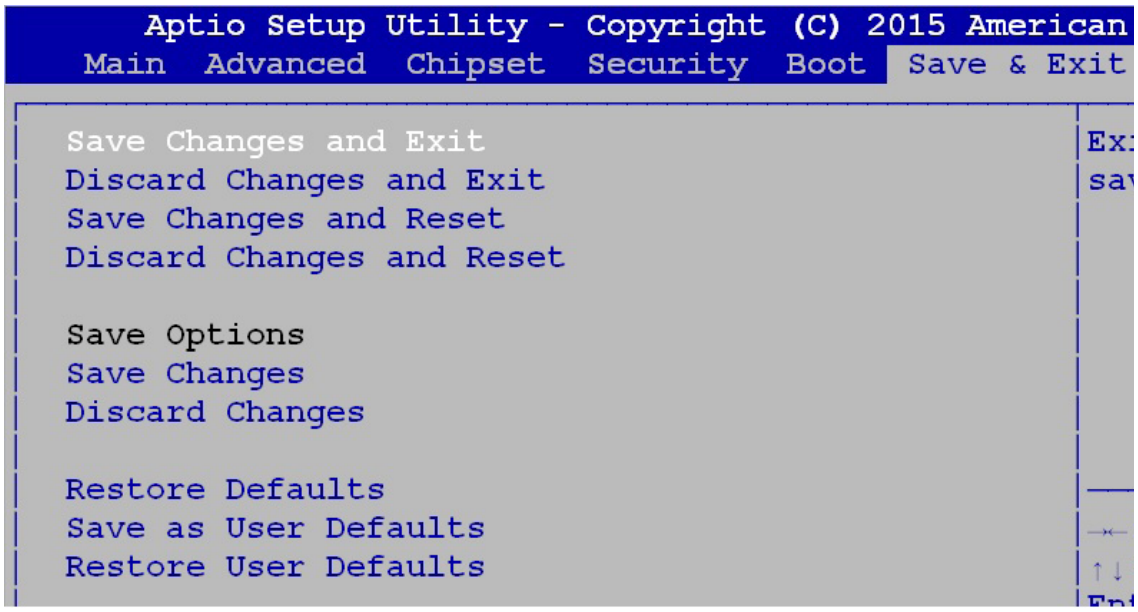



Figure 4-6 Save & Exit Setup screen

### Save Changes and Exit / Save Changes and Reset

Choose this setting to exit the BIOS setup program and save changes to the BIOS NVRAM memory. Make sure you select this in order to keep your changes.

### Discard Changes and Exit / Discard Changes and Reset

Choose this setting to exit the BIOS SETUP program discarding all changes made.

# A

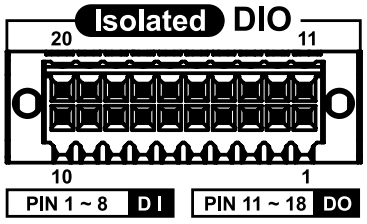
# APPENDIX A : ISOLATED DIO GUIDE

## A.1 I/O Pin Definition

| I/O Pin | Base Adr | Usage |
|---|---|---|
| GPIO 10~17 | 0xA00 | CN16-GPIO |
| GPIO 20~27 | 0xA01 | DIO Output |
| GPIO 30~37 | 0xA02 | ---------- |
| GPIO 40~47 | 0xA03 | ---------- |
| GPIO 50~57 | 0xA04 | DIO Input |
| GPIO 60~67 | 0xA05 | CN16-GPIO |

## A.2 Function Description

The ECS-4000 offers a 16-bit DIO (8-DI/ 8-DO) 20-pin terminal block connector. Each bit of DI and DO equipped with a photo-coupler for isolated protection. All I/O pins are fixed by Hardware design and cannot change in/out direction in runtime process. The definition is listed as follows:

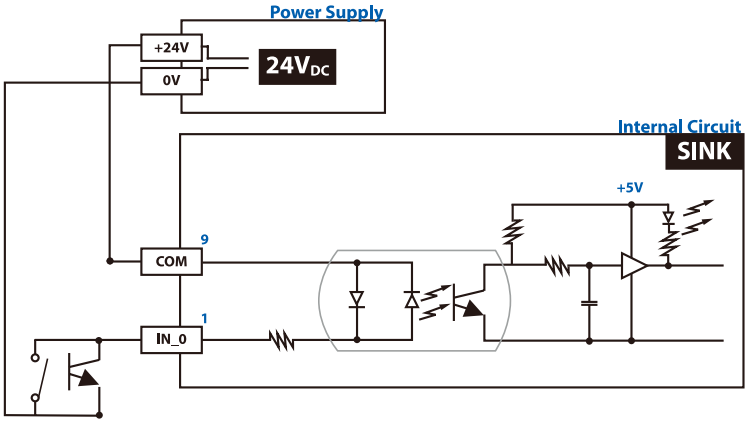



| Pin No. | Definition | Description | Pin No. | Definition | Description |
|---|---|---|---|---|---|
| 1 | EXT_IN0 | GPIO Input 0 | 11 | EXT_OUT0 | GPIO Output 0 |
| 2 | EXT_IN1 | GPIO Input 1 | 12 | EXT_OUT1 | GPIO Output 1 |
| 3 | EXT_IN2 | GPIO Input 2 | 13 | EXT_OUT2 | GPIO Output 2 |
| 4 | EXT_IN3 | GPIO Input 3 | 14 | EXT_OUT3 | GPIO Output 3 |
| 5 | EXT_IN4 | GPIO Input 4 | 15 | EXT_OUT4 | GPIO Output 4 |

| | | | | | |
|---|---|---|---|---|---|
| 6 | EXT_IN5 | GPIO Input 5 | 16 | EXT_OUT5 | GPIO Output 5 |
| 7 | EXT_IN6 | GPIO Input 6 | 17 | EXT_OUT6 | GPIO Output 6 |
| 8 | EXT_IN7 | GPIO Input 7 | 18 | EXT_OUT7 | GPIO Output 7 |
| 9 | DI_COM | GPIO COM | 19 | Reserved | NC |
| 10 | EGND | GPIO GND | 20 | E24V | External 24V DC |

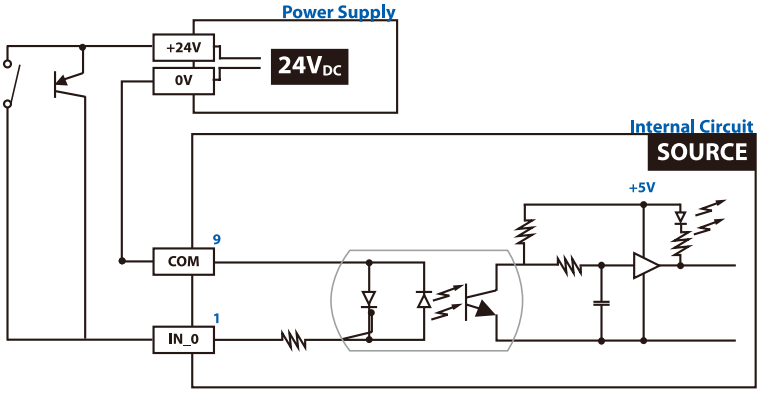
## Signal Circuit of Input NPN

Digital GPIO input signal circuit in SINK mode (NPN) is illustrated as follow.



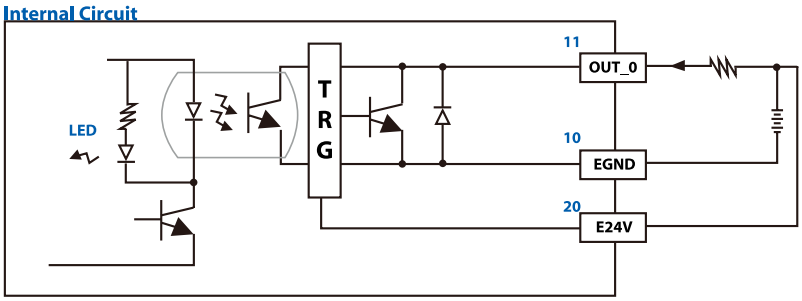

## Signal Circuit of Input PNP

Digital GPIO input signal circuit in SOURCE mode (PNP) is illustrated as follow.




## Signal Circuit of Output NPN

Digital GPIO output signal circuit in SINK mode (NPN) is illustrated as follow.



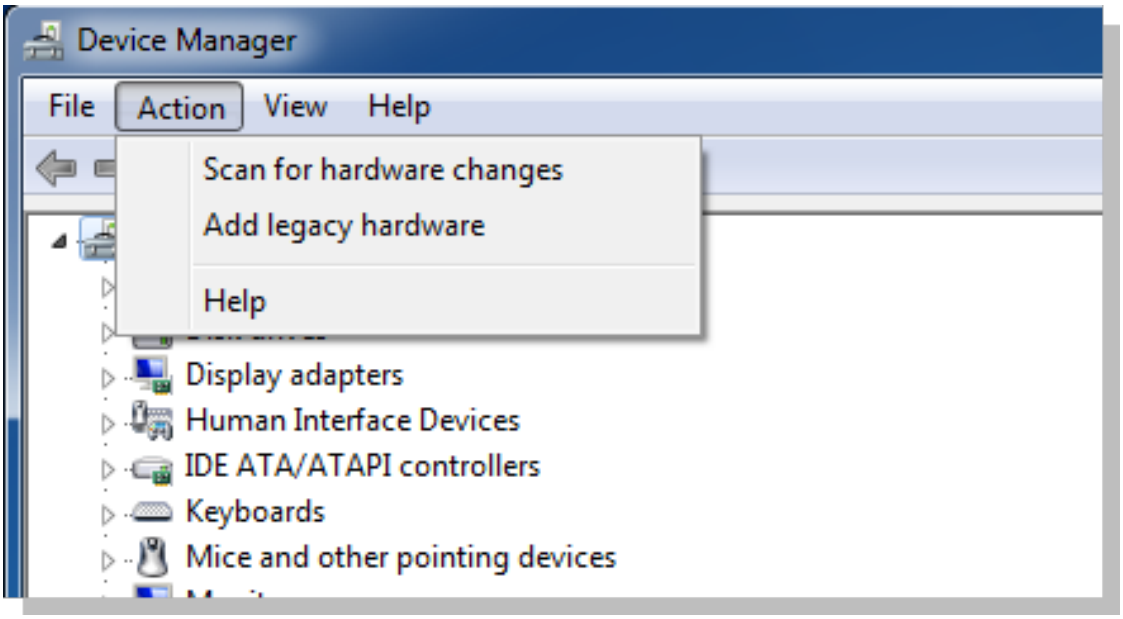
## A.3 Software Package

There are 2 folders inside :
1. Driver Folder
2. DIO Demo Tool Folder

## A.4 Driver Installing

Supports Windows 8.1 and Windows 7. Please do make sure your OS version before installing.

Please select “Add legacy hardware” on device management



# B

# APPENDIX B : GPIO and WDT Functions

## B.1 Function Description

The WDT are using internal Super I/O function. However, you must entry super I/O configuration mode to set it.

Super I/O special address port = 0x2E
Super I/O special data port = 0x2F
GPIO Logical device is 0x07

## B.2 Entry Functions

### 1. Entry MB PnP Mode.

*//write twice 0x87 value.*
outportb(Super I/O special address port, 0x87);
outportb(Super I/O special address port, 0x01);
outportb(Super I/O special address port, 0x55);
outportb(Super I/O special address port, 0x55);

### 2. Located on Logical Device 7(LOGIC_DEVICE_WDT)

*//write 0x07 on Reg [0x07] , this setup must follow Step A. that can be workable.*
outportb(Super I/O special address port, 0x07);
outportb(Super I/O special data port, 0x07);

### 3. Config the WDT Register

outb(WDT_Config,SPECIAL_ADDRESS_PORT);
outb(WDT_As_Second|WDT_Pin_PWRGD,SPECIAL_DATA_PORT);

### 4. Start WDT TimeOut Value

Here have 2 Byte for WDT timing count, MSB and LSB should be write the value separate.

| | |
|---|---|
| ***WDT_TimeOut_MSB,SPECIAL*** | ***WDT_TimeOut_LSB,SPECIAL*** |

outb(WDT_TimeOut_LSB,SPECIAL_ADDRESS_PORT);
outb(WDT_TimeOutValue,SPECIAL_DATA_PORT);

# APPENDIX C : Power Consumption

### ECS-4000 Power Consumption Testing :

| ECS-4000 | | | |
|---|---|---|---|
| Storage-CFast | N/A | Aux card 1 | N/A |
| Storage-SATA 0 | Transcend SSD370 SATA SSD 64GB | Aux card 2 | N/A |
| Storage-SATA 1 | N/A | Power Source | Chroma 62006P-100-25 |

### Power Source :

| CPU | RAM | Input Power | Standby Mode | |
|---|---|---|---|---|
| | | | Max Current | Max Consumption |
| i7-5650U | 4GB X 2 | 06V | 0.330A | 01.98W |
| i7-5650U | 4GB X 2 | 09V | 0.227A | 02.04W |
| i7-5650U | 4GB X 2 | 12V | 0.190A | 02.28W |
| i7-5650U | 4GB X 2 | 24V | 0.215A | 05.16W |
| i7-5650U | 4GB X 2 | 28V | 0.192A | 05.38W |
| i7-5650U | 4GB X 2 | 36V | 0.137A | 04.93W |

| CPU | Power-on and boot to Win7 64-bit | | | |
|---|---|---|---|---|
| | Idle Status : CPU usage less 3% | | Run 100% CPU usage | |
| | Max Current | Max Consumption | Max Current | Max Consumption |
| i7-5650U | 2.200A | 13.20W | 3.600A | 21.60W |
| i7-5650U | 1.430A | 12.87W | 2.250A | 20.25W |
| i7-5650U | 1.070A | 12.84W | 1.610A | 19.32W |
| i7-5650U | 0.610A | 14.64W | 0.900A | 21.60W |
| i7-5650U | 0.530A | 14.84W | 0.760A | 21.28W |
| i7-5650U | 0.430A | 15.48W | 0.610A | 21.96W |

Vecow

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