Lanner

## Vehicle Computing

Rugged Platforms for Vehicles and Railway Computing

# R3S
# User Manual

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# About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

# Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

**Note or Information**: This mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

**Warning or Important**: This mark indicates that there is a caution or warning and it is something that could damage your property or product.

# Online Resources and Technical Support

To obtain additional documentation resources and software updates for your system, please visit the Lanner Download Center. For certain categories of documents, please register for a Lanner Account at Lanner's official website, in order to access published documents and downloadable resources.

In addition to contacting your distributor or sales representative, you could visit our Lanner Technical Support, to fill in a support ticket to our technical support department.

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# Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Note**

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Important**

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

# Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

# Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

# Lithium Battery Caution

- There is risk of Explosion if Battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Installation only by a skilled person who knows all Installation and Device Specifications which are to be applied.
- Do not carry the handle of power supplies when moving to another place.
- Please conform to your local laws and regulations regarding safe disposal of lithium BATTERY.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

# Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

# Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

# Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

### Mounting Installation Precaution

The following should be put into consideration for rackmount or similar mounting installations:

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

**Installation & Operation :**

- This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
  Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée
- Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
  Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- The machine can only be used in a restricted access location and must be installed by a skilled person.
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.
- This product is intended to be supplied by a Listed Power Adapter or DC power source, rated 12-24Vdc, 17.5-8A minimum, Tma = 70°C, and the altitude of operation = 5000m.

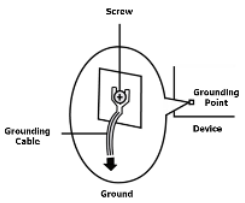
# Electrical Safety Instructions

Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm2 or 10 AWG.

# Consignes de sécurité électrique

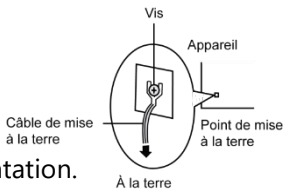
- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

# Grounding Procedure for Power Source




- Loosen the screw of the earthing point.
- Connect the grounding cable to the ground.
- The protection device for the power source must provide 30 A current.
- This protection device must be connected to the power source before power.
- The cable hould 16 AWG

# Procédure de mise à la terre pour source d'alimentation




- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation doit fournir 30 A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation.
- Le câble doit 16 AWG

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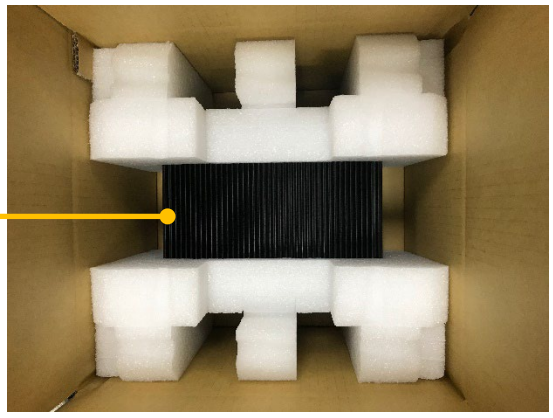
# CHAPTER 1: PRODUCT OVERVIEW

Built for rolling stock setting, the R3S series is certified with EN50155, EN50121-3-2, EN50121-4, EN50125-3 and EN45545 standard as an IP50 rated fan-less rolling stock computer. R3S not only features high-performance Intel Atom x7-E3950 CPU, but also boasts an abundance of I/O and internal expansion capabilities, including 6x M12 X-coded PoE/ PoE+ ports, 1x Removable 2.5" drive bay, 2x COM, dual HDMI, 4x USB 2.0 and 4x DI/DO ports, making it perfect for rolling stock control and monitoring, infotainment, video surveillance, and fleet management.

## Package Content

Your package contains the following items:

- 1x R3S Vehicle and Railway Computer



**Note**: If you should find any components missing or damaged, please contact your dealer immediately for assistance.

## Ordering Information

| SKU No. | Description |
|---|---|
| R3SB | Intel Atom™ x7-E3950 Processor, 6x M12 X-coded IEEE 802.3af PoE port (any 3 ports support IEEE 802.3at PoE+), 2x M.2 3042 B key socket with dual SIM each, +9~50Vdc power input |
| R3SC | Intel Atom™ x7-E3950 Processor ,6x M12 X-coded IEEE 802.3af PoE port (any 3 ports support IEEE 802.3at PoE+) 2x M.2 3042 B key socket with dual SIM each, +43~154Vdc power input |

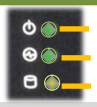
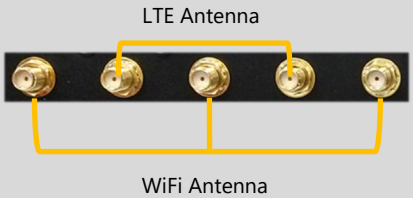
## Optional Accessories

| Model | Description |
|---|---|
| 080W000707000 | Power Cable M12, 5P, 20cm, 180°-180° TIMYN TM-18L-CABLE-5F-20-N |

# System Specifications

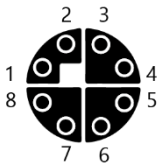
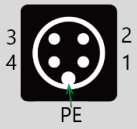
| | | |
|---|---|---|
| **Platform** | CPU | Intel Apollo Lake x7-E3950 1.6G 12W |
| | Frequency | 1.6 GHz |
| | BIOS | AMI SPI Flash BIOS |
| | Chipset | SoC |
| **Fanless** | | Yes |
| **Memory** | Technology | LPDDR4 2133MHz |
| | Max. Capacity | Up to 8GB (Factory default: 8GB pre-populated) |
| | Socket | Memory Down |
| **Ethernet** | Controller | 6x Intel i210IT |
| | Speed | 10/100/1000 Mbps |
| | PoE | IEEE 802.3af/IEEE 802.3at; under maximum 90W power budget |
| | Interface | M12 X-coded |
| **Storage** | Type | 1x Removable 2.5" drive bay (HDD/SSD not included) |
| **I/O** | Display Port | 2x HDMI, 3840x2160 resolution |
| | PoE Port | 6x IEEE 802.3af standard PoE (any 3 ports support IEEE 802.3at PoE+); under maximum 90W power budget |
| | Audio | Mic-in and Line-out with 2-watt by HD Audio |
| | Serial I/O Port | COM1: RS-232/422/485;<br>COM2: RS-232/422/485;<br>COM3: RS-232/CAN (default RS-232 TX/RX only) |
| | GPS | u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band |
| | G-sensor | ADXL 345 |
| | CAN Port | (Optional) 1x CAN Bus J1939 / J1708 |
| | Digital I/O | 12x DI 12V TTL Selectable and 4x DO 12V Level TTL;<br>2x 12V with 1A dry relay |
| | USB Port | 4x USB 2.0 Type A |
| | Antenna | 5x SMA antenna hole (includes GPS+GLONASS x1) |
| **Expansion Interface** | PCIe/USB | 2x M.2 3042 B-Key |
| **Cooling** | Processor | Passive CPU heatsink |
| | System | Fanless design with corrugated aluminum |
| **Power** | Connector | 5-pin M12 K-coded (Ground, DC_IN, Ground, IGN, Chassis Ground) |
| | Input | SKU B: Input Rated: +9~50Vdc<br>SKU C: Input Rated: +43~154Vdc |
| | Output | 12V/1A DC out |
| **Environment** | Operating Temperature | -40~70°C / -40~158°F (85°C for 10 minutes) |
| | Storage Temperature | -40~85°C / -40~185°F |
| | Relative Humidity | 5%~95% @ 40°C / 104°F (Storage Level) |
| **Mechanical** | Dimension (W x H x D) | 272.4 x 114.3 x 228mm (10.72" x 4.5" x 8.97") |
| | Weight | 7 kg |
| | Mounting | Wall mount kit |
| **Driver Support** | Microsoft Windows | Win10 IoT |
| | Linux | Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later |
| **Certification** | EMC | FCC/CE Class A, RoHS |
| | Safety | E-13 include ISO-7637-2 |
| | Certified | IP rated 50, MIL-STD-810G, EN50155, EN50121-3-2, EN50121-4, EN50125-3, EN 45545 |

# Front Panel

| No. | Description | |
|---|---|---|
| F1 | LED Indicator |  System Power<br>System Status<br>HDD Status |
| F2 | USB 2.0 Port | 4x USB 2.0 Type A |
| F3 | Console Port<br> | 1x RS-232 (RJ45 connector)<br>Pin / Signals / Pin / Signals<br>1 / COM_RTS1# / 2 / COM_DTR1#<br>3 / COM_SOUT1 / 4 / GND_COM<br>5 / GND_COM / 6 / COM_SIN1<br>7 / COM_DSR1# / 8 / COM_CTS1# |
| F4 | SIM Card Cover | 4x SIM card slot |
| F5 | Storage Lock | Lock for removable 2.5” storage caddy |
| F6 | Antenna Port |  LTE Antenna<br>WiFi Antenna |
| F7 | Storage Bay | 1x SATA interface storage bay to support removable 2.5” HDD/SSD drive bay |

# Rear Panel

**Grounding Point**:
For safety measures to help prevent people from accidentally coming in contact with electrical hazards.

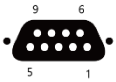
<table>
<tr><th>No.</th><th colspan="2">Description</th></tr>
<tr><td>R1</td><td>PoE Port<br>  <br></td><td>6x M12 X-coded 8-pin PoE/ PoE+ Port<br><table><tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr><tr><td>1</td><td>LANx*_MX0P</td><td>2</td><td>LANx*_MX0N</td></tr><tr><td>3</td><td>LANx*_MX1P</td><td>4</td><td>LANx*_MX1N</td></tr><tr><td>5</td><td>LANx*_MX3P</td><td>6</td><td>LANx*_MX3N</td></tr><tr><td>7</td><td>LANx*_MX2N</td><td>8</td><td>LANx*_MX2P</td></tr></table></td></tr>
<tr><td>R2</td><td>DC Input<br>  <br></td><td>1x M12 K-coded 5-pin for power source,<br>(Ground, DC_IN, Ground, IGN, Chassis Ground)<br>R3SB: Input Rated: 24~36Vdc,<br>R3SC: Input Rated: 72~110Vdc<br><table><tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr><tr><td>1</td><td>GND</td><td>2</td><td>DC-VIN</td></tr><tr><td>3</td><td>MCU_PG</td><td>4</td><td>IGN_IN</td></tr><tr><td>5(PE)</td><td>Chassis_GND</td><td></td><td></td></tr></table></td></tr>
<tr><td>R3</td><td>DC Output<br> <br></td><td>1x M12 A-coded 5-pin for DC 12V power output<br><table><tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr><tr><td>1</td><td>12V_Output</td><td>2</td><td>FORWARD</td></tr><tr><td>3</td><td>SPEED</td><td>4</td><td>12V_GND</td></tr><tr><td>5</td><td>GPS_GND</td><td></td><td></td></tr></table></td></tr>
<tr><td>R4</td><td>HDMI Port</td><td>2x HDMI Connector</td></tr>
<tr><td>R5</td><td>Antenna Port<br>(GPS+GLONASS default)</td><td>1x 3 GNSS (GPS, Galileo, GLONASS, BeiDou) antenna support (G-sensor has no antenna needed)</td></tr>
</table>

**R6** COM Port

2x DB9 Male Connector for RS232/422/485

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1_up | COM2_C_DCD_TN | 2_up | COM2_C_RXD_TP |
| 3_up | COM2_C_TXD_RP | 4_up | COM2_C_DTR_RN |
| 5_up | GND_COM | 6_up | COM2_C_DSR |
| 7_up | COM2_C_RTS | 8_up | COM2_C_CTS |
| 9_up | COM2_C_RI | | |
| 1_down | COM3_C_DCD_TN | 2_down | COM3_C_RXD_TP |
| 3_down | COM3_C_TXD_RP | 4_down | COM3_C_DTR_RN |
| 5_down | GND_COM | 6_down | COM3_C_DSR |
| 7_down | COM3_C_RTS | 8_down | COM3_C_CTS |
| 9_down | COM3_C_RI | | |

**R7** DI/DO Port



12x DI 12V TTL selectable, 4x DO 12V Level TTL,
2x 12V with 1A dry relay

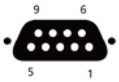
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1_up | DI_1 | 2_up | DI_3 |
| 3_up | DI_5 | 4_up | DI_7 |
| 5_up | DI_9 | 6_up | DI_2 |
| 7_up | DI_4 | 8_up | DI_6 |
| 9_up | DI_8 | | |
| 1_down | DO_0 | 2_down | DO_2 |
| 3_down | DI_COM | 4_down | DI_0 |
| 5_down | DI_10 | 6_down | DO_1 |
| 7_down | DO_3 | 8_down | DGIN_0 |
| 9_down | DI_11 | | |

**R8** Audio Port

1x TSI HD Codec 92HD73C1T5PRGIC1X, supports external Audio I/O for Line-in/Line-out with L/R-channels via 9-pin female connector

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1_down | RELAY1_COMM | 2_down | RELAY2_COMM |
| 3_down | GND_AUD | 4_down | FRONT_OUT_R |
| 5_down | FRONT_OUT_L | 6_down | RELAY1_NOPEN |
| 7_down | RELAY2_NOPEN | 8_down | MIC_IN_R |
| 9_down | MIC_IN_L | | |

**R9** COM/CAN Port

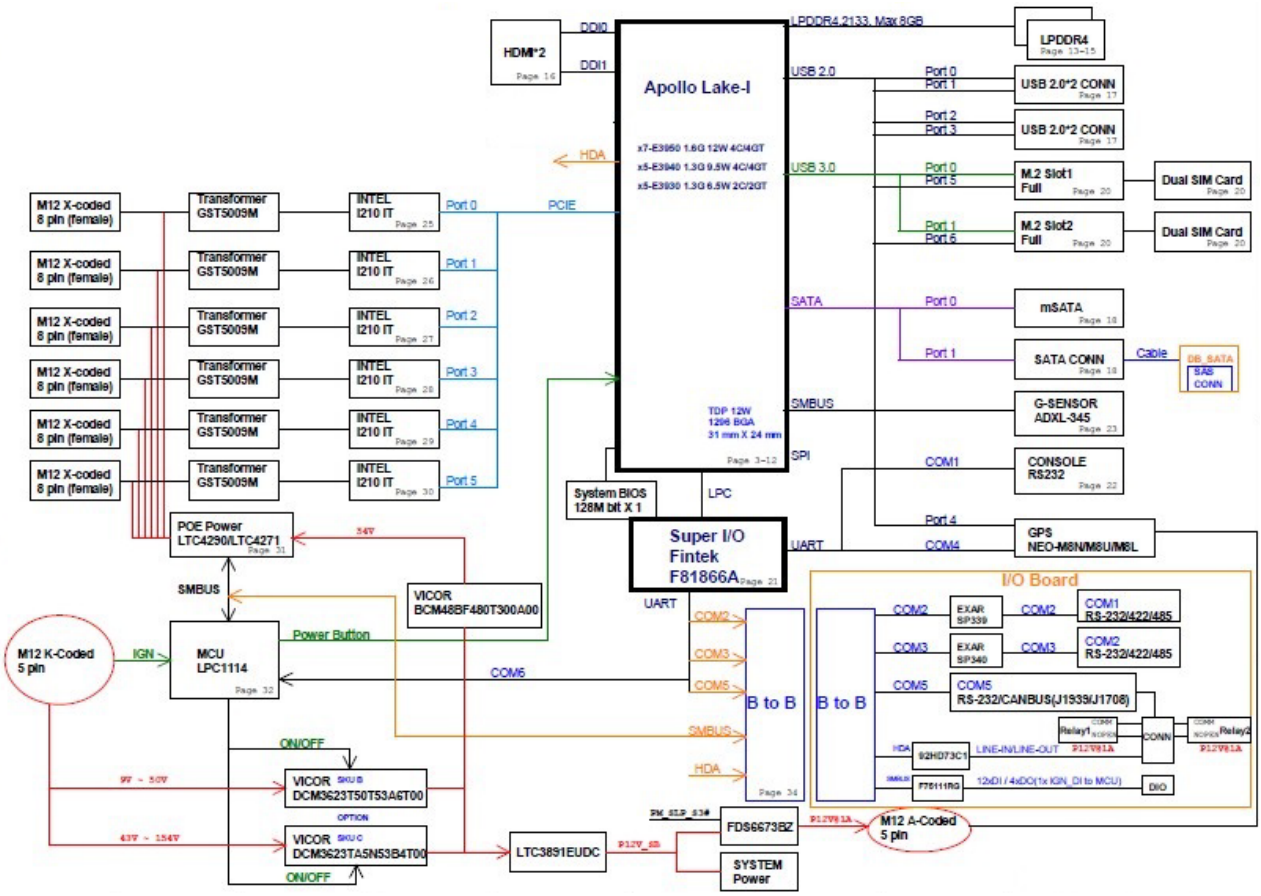


COM/Optional CAN

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1_up | J1850-/J1708-_L | 2_up | GND_C/L |
| 3_up | J1939+/L | 4_up | K_LINE_L |
| 5_up | CAN_L/J1939-_L | 6_up | J1850-/J1708-_L |
| 7_up | J1850+/J1708+_L | 8_up | J1850+/J1708+_L |
| 9_up | POWER (12V or 24V) | | |

# Motherboard Information

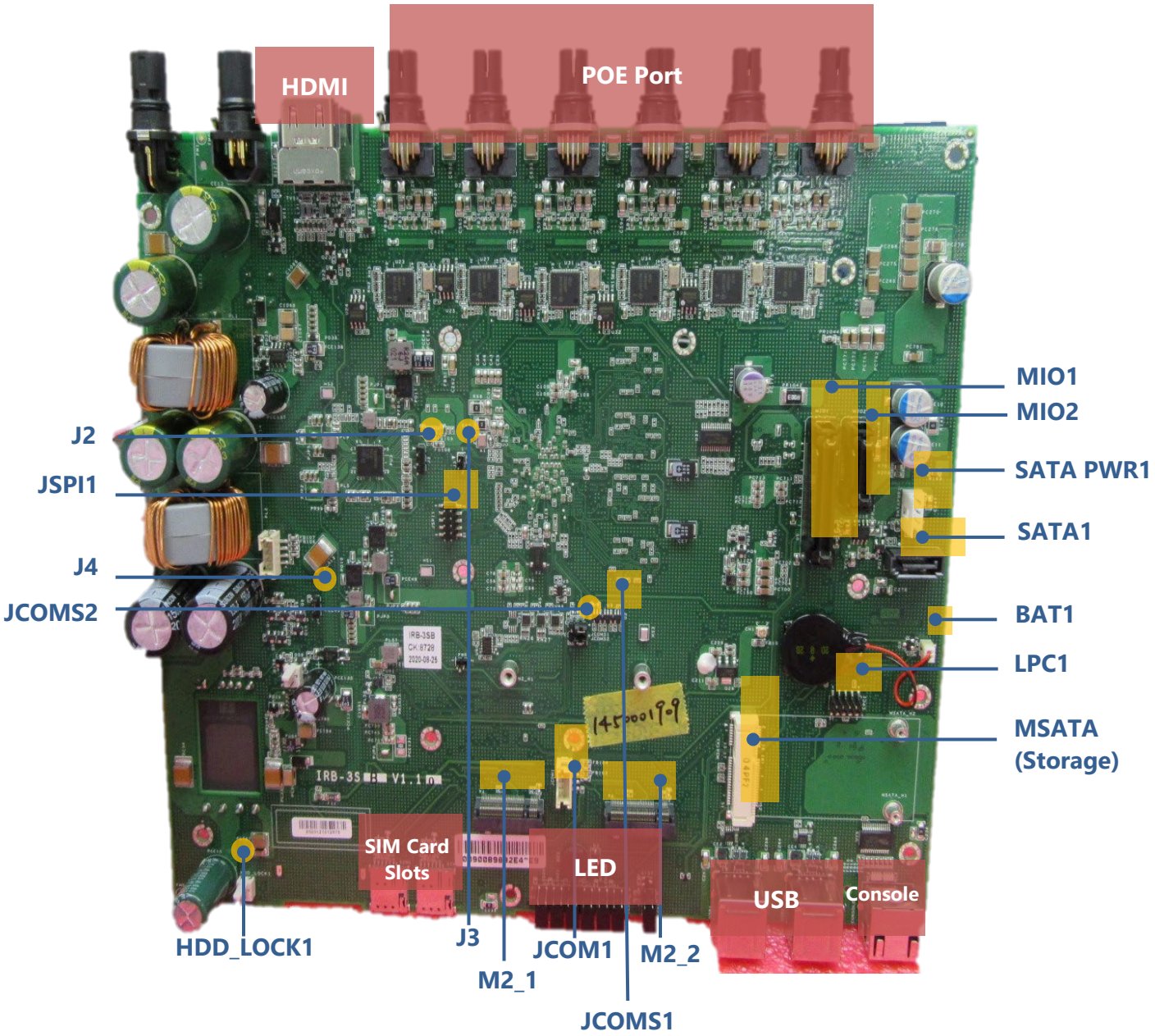
## Block Diagram



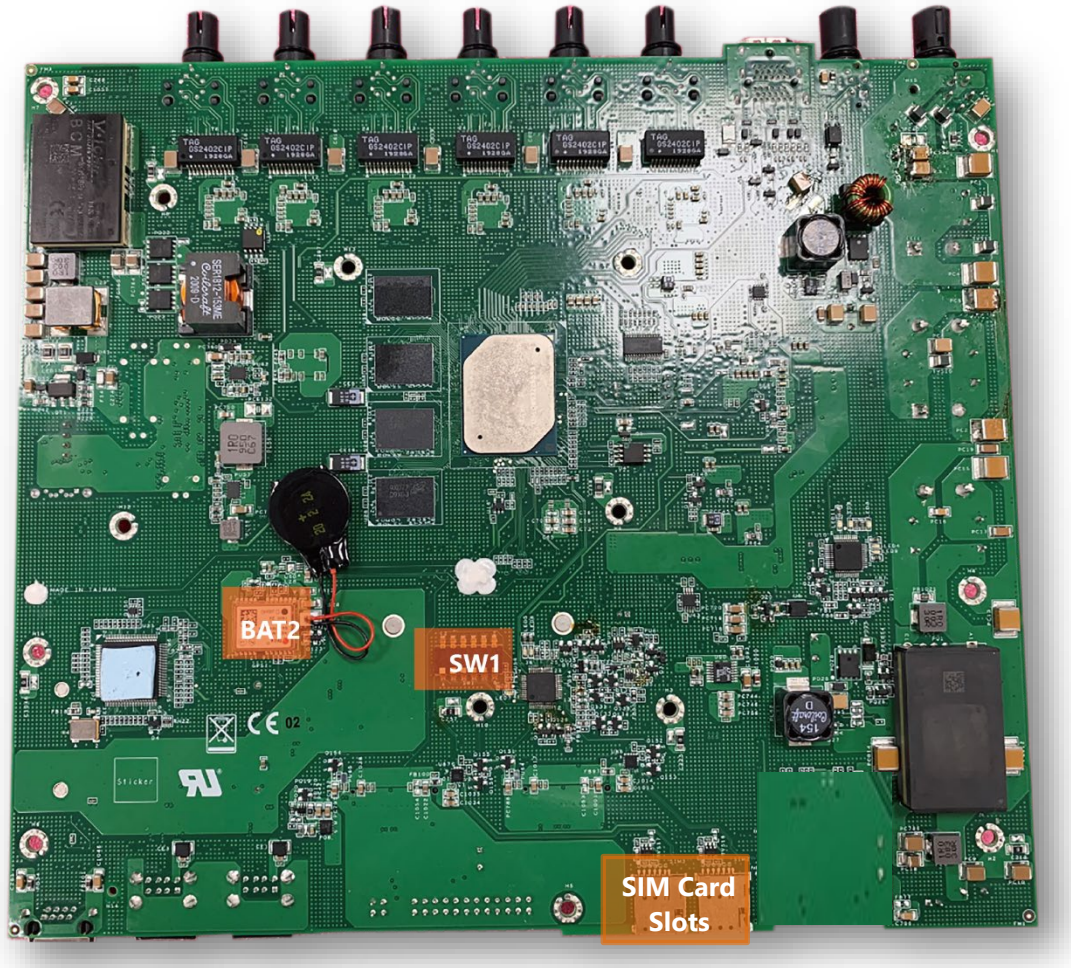
## Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference for the pin assignments and the internal connectors.

### Front



## Rear



# Jumper Setting and Internal Connector

### BAT1

| Pin | Signals |
|---|---|
| 1 | VBAT |
| 2 | GND |

### JCOM1(for MCU)

| Pin | Signals |
|---|---|
| 1 | P3V3 |
| 2 | SYS_RXD |
| 3 | SYS_TXD |
| 4 | GND |

### BAT2

| Pin | Signals |
|---|---|
| 1 | VBAT |
| 2 | GND |

### JCOM2(for power MCU)

| Pin | Signals |
|---|---|
| 1 | IGN3V3 SB |
| 2 | MCU_RXD |
| 3 | MCU_TXD |
| 4 | GND |

### LPC1

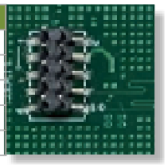
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | L_CLKOUT1 | 6 | P3V3 |
| 2 | LPC_AD1 | 7 | LPC_AD3 |
| 3 | PLTRST_BUF2 | 8 | NC |
| 4 | LPC_ADD | 9 | LPC_AD2 |
| 5 | L_FRAME_N | 10 | GND |

### J4(for power MCU)

| Pin | Signals |
|---|---|
| 1 | IGN3V3_SB |
| 2 | P _PID0_1 |
| 3 | GND_PRI |

### JSPI1

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | SPI0_HOLD_N | 2 | NC |
| 3 | SPI0_CS_N | 4 | V1P8_A_SPI |
| 5 | SPIO_MISO | 6 | NC |
| 7 | NC | 8 | SPIO_CLK |
| 9 | GND | 10 | SPIO_MOSI |

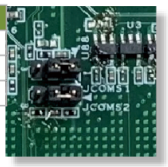


### HDD_LOCK1

| Pin | Signals |
|---|---|
| 1 | HDD LOCK# |
| 2 | GND |

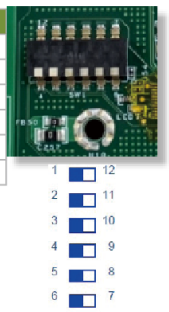
### JCOMS1

| Pin | Signals |
|---|---|
| 1 | NC |
| 2 | VCCRTC_3P3 |
| 3 | GND |



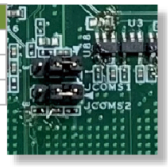
### SW1(for MCU)

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | PIO1_6_RXD | 12 | SOUT6 |
| 2 | PIO1_7_TXD | 11 | SIN6 |
| 3 | PIO1_6_RXD | 10 | SYS_RXD |
| 4 | PIO1_7_TXD | 9 | SYS_TXD |
| 5 | NC | 8 | NC |
| 6 | PIO0_1 | 7 | GND |




### JCOMS2

| Pin | Signals |
|---|---|
| 1 | NC |
| 2 | RTEST_N |
| 3 | GND |

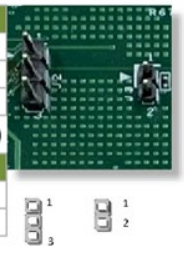


### J2(for PMIC debug)

| Pin | Signals |
|---|---|
| 1 | PMIC_SDA |
| 2 | PMIC_SCL |
| 3 | GND |

### J3(for straps option)

| Pin | Signals |
|---|---|
| 1 | SOC_COM2_TXD |
| 2 | V1P8_A |

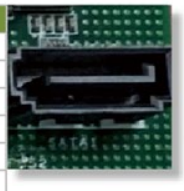


### SATAPWR1

| Pin | Signals |
|---|---|
| 1 | 12V |
| 2 | GND |
| 3 | GND |
| 4 | 5V |

### SATA1

| Pin | Signals |
|---|---|
| 1 | GMD |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |
| 7 | GND |

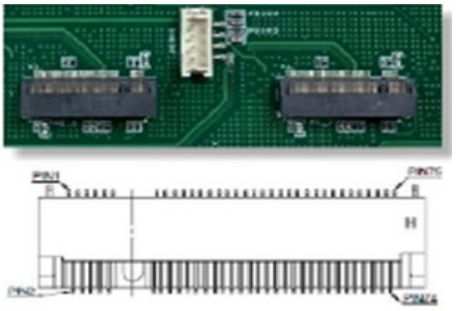


**MSATA1**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | N.C | 2 | +3.3V |
| 3 | N.C | 4 | GND |
| 5 | N.C | 6 | N.C |
| 7 | N.C | 8 | N.C |
| 9 | GND | 10 | N.C |
| 11 | N.C | 12 | N.C |
| 13 | N.C | 14 | N.C |
| 15 | GND | 16 | N.C |
| KEY | | | |
| 17 | N.C | 18 | GND |
| 19 | N.C | 20 | N.C |
| 21 | GND | 22 | N.C |
| 23 | SATA_RXp | 24 | +3.3V |
| 25 | SATA_RXn | 26 | GND |
| 27 | GND | 28 | N.C |
| 29 | GND | 30 | N.C |
| 31 | SATA_TXn | 32 | N.C |
| 33 | SATA_TXp | 34 | GND |
| 35 | GND | 36 | N.C |
| 37 | GND | 38 | N.C |
| 39 | +3.3V | 40 | GND |
| 41 | +3.3V | 42 | N.C |
| 43 | N.C | 44 | N.C |
| 45 | N.C | 46 | N.C |
| 47 | N.C | 48 | N.C |
| 49 | N.C | 50 | GND |
| 51 | N.C | 51 | +3.3V |

**M2_1 & M2_2 (B KEY)**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | GND | 2 | 3V3 AUX |
| 3 | GND | 4 | 3V3 AUX |
| 5 | GND | 6 | F CARD PWROFF# |
| 7 | USB2_D- | 8 | W_DIS# |
| 9 | USB2_D+ | 10 | LED#/1DAS/DSS# |
| 11 | GND | 12 | NOTCH5 |
| 13 | NOTCH1 | 14 | NOTCH6 |
| 15 | NOTCH2 | 16 | NOTCH7 |
| 17 | NOTCH3 | 18 | NOTCH8 |
| 19 | NOTCH4 | 20 | AUDIO 0 |
| 21 | GND_WWAN/OC-SSD | 22 | AUDIO 1 |
| 23 | NC | 24 | AUDIO 2 |
| 25 | NC | 26 | AUDIO 3 |
| 27 | GND | 28 | UIM RFU |
| 29 | PERn1/USB3TX- | 30 | UIM_RESET |
| 31 | PERp1/USB3TX+ | 32 | UIM_CLK |
| 33 | GND | 34 | UIM_DATA |
| 35 | PETn1/USB3TX- | 36 | UIM_PWR |
| 37 | PETp1/USB3TX+ | 38 | DEVSLP |
| 39 | GND | 40 | GNSS0 |
| 41 | NC | 42 | GNSS1 |
| 43 | NC | 44 | GNSS2 |
| 45 | GND | 46 | GNSS3 |
| 47 | NC | 48 | GNSS4 |
| 49 | NC | 50 | PERST# |
| 51 | GND | 52 | CLKREO# |
| 53 | REFCLKN | 54 | WAKE# |
| 55 | REFCLKP | 56 | NC |
| 57 | GND | 58 | NC |
| 59 | ANTCTL0 | 60 | COEX3 |
| 61 | ANTCTL1 | 62 | COEX2 |
| 63 | ANTCTL2 | 64 | COEX1 |
| 65 | ANTCTL3 | 66 | SIM_DET |
| 67 | RESET# | 68 | SUSCLK |
| 69 | PEDET | 70 | 3V3_AUX |
| 71 | GND | 72 | 3V3_AUX |
| 73 | GND | 74 | 3V3_AUX |
| 75 | OC-USB3/GND-OTHER | | |



**MIO1**

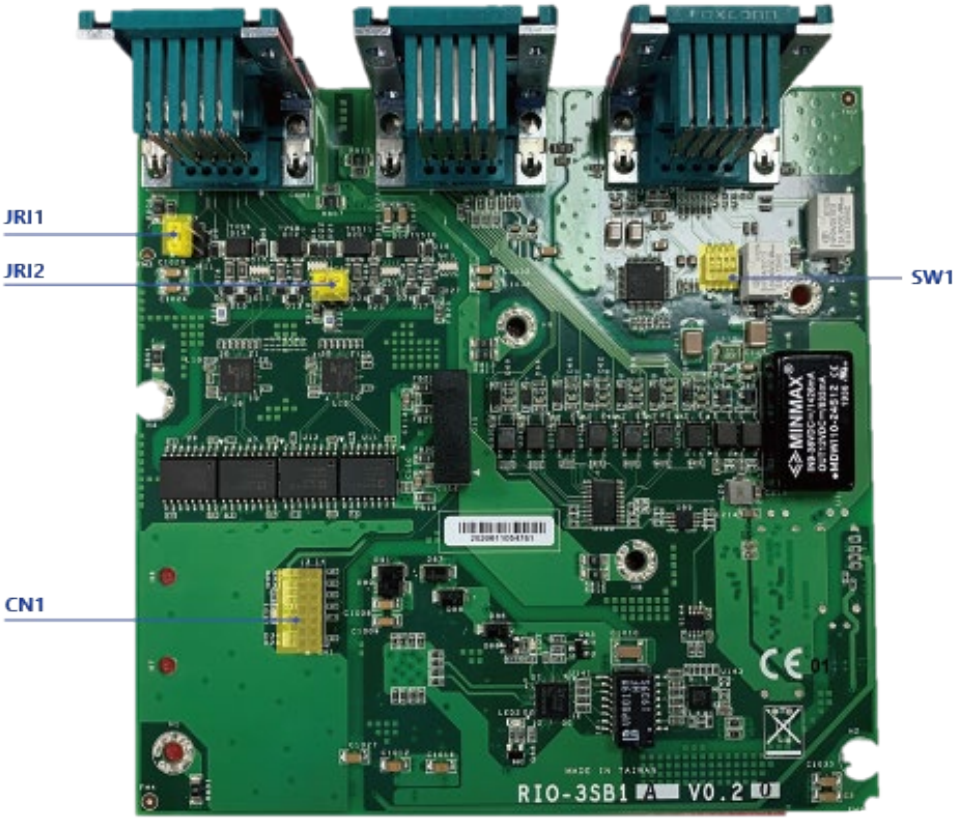
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1~18 | GND | 51~68 | GND |
| 19 | HAD_RST# | 69 | GND |
| 20 | GND | 70 | GND |
| 21 | HAD_BLK | 71 | GND |
| 22 | GND | 72 | GND |
| 23 | HDA_SDO | 73 | PLTRST_BUF2_N |
| 24 | HAD_SYNC | 74 | GND |
| 25 | HAD_SDI0 | 75 | MCU_CLK_R |
| 26 | GND | 76 | MCU_DAT_R |
| 27 | COM2_M0 | 77 | GND |
| 28 | COM2_M1 | 78 | COM3_MO |
| 29 | COM2_TERM | 79 | COM3_M1 |
| 30 | DCD2# | 80 | COM3_TERM |
| 31 | RI2# | 81 | DCD3# |
| 32 | CTS2# | 82 | RI3# |
| 33 | DTR2# | 83 | CTS3# |
| 34 | RTS2# | 84 | DTR3# |
| 35 | DSR#2 | 85 | DSR3# |
| 36 | SOUT2 | 86 | SIN3 |
| 37 | SIN2 | 87 | SOUT3 |
| 38 | GND | 88 | RTS3# |
| 39 | IGN_DI0 | 89 | GND |
| 40 | GND | 90 | SOUT5 |
| 41 | GND | 91 | SIN5 |
| 42 | V3P3_A | 92 | GND |
| 43 | V3P3_A | 93 | RELAY1_EN |
| 44 | V3P3_A | 94 | RELAY2_EN |
| 45 | V3P3_A | 95 | GND |
| 46 | GND | 96 | V3P3_S |
| 47 | V1P8_S | 97 | V3P3_S |
| 48 | V1P8_S | 98 | V3P3 S |
| 49 | V1P8_S | 99 | V3P3_S |
| 50 | V1P8_S | 100 | GND |

**MIO2**

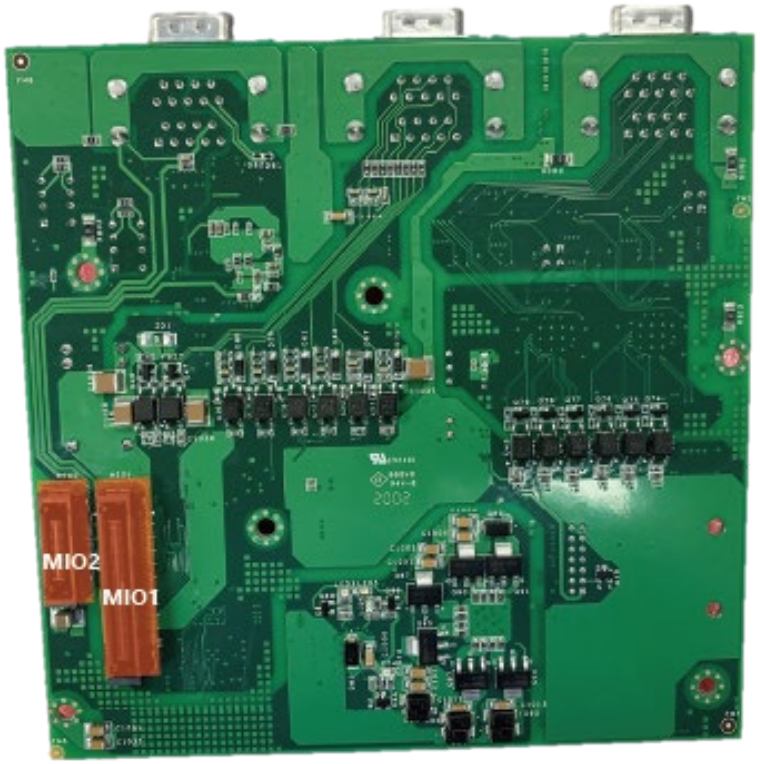
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | NC | 21 | VPORT_OUT6 |
| 2 | NC | 22 | POE_GND |
| 3 | NC | 23 | POE_GND |
| 4 | NC | 24 | VPORT_OUT5 |
| 5 | NC | 25 | POE_GND |
| 6 | NC | 26 | POE_GND |
| 7 | NC | 27 | VPORT_OUT4 |
| 8 | NC | 28 | POE_GND |
| 9 | NC | 29 | POE_GND |
| 10 | NC | 30 | VPORT_OUT3 |
| 11 | NC | 31 | POE_GND |
| 12 | NC | 32 | POE_GND |
| 13 | NC | 33 | VPORT_OUT2 |
| 14 | NC | 34 | POE_GND |
| 15 | NC | 35 | POE_GND |
| 16 | NC | 36 | VPORT_OUT1 |
| 17 | NC | 37 | POE_GND |
| 18 | NC | 38 | V_LED |
| 19 | NC | 39 | POE_GND |
| 20 | NC | 40 | VEE |

## Motherboard Layout (RIO3SB1)

- **Front**



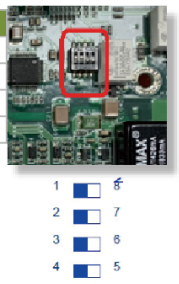

- **Rear**



# Jumper setting and Internal Connector (RIO3SB1)

### SW1

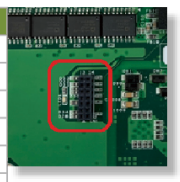
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | SIO_SOUT5 | 8 | J1939+ |
| 2 | SIO_SIN5 | 7 | GND_C |
| 3 | CAN_H/J1939+_L | 6 | J1939+ |
| 4 | GND_CAN | 5 | GND_C |





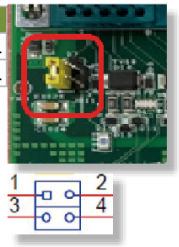

### CN1

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | | 2 | K_LINE |
| 3 | DO | 4 | NC |
| 5 | GND_CANL | 6 | GND_CANL |
| 7 | NC | 8 | J1850+/J1708+ |
| 9 | SIO_SIN5 | 10 | J1850-/J1708- |
| 11 | SIO_SOUT5 | 12 | CAN_H/J1939+_L |
| 13 | P5V | 14 | CAN_L/J1939- |



### JRI1

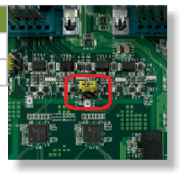
| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | COM1_C_RI | 2 | COM_RI1#SEL |
| 3 | VCC5_ISO1_2 | 4 | COM_RI1#SEL |

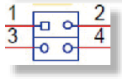





### JRI2

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | COM2_C_RI | 2 | COM_RI2#SEL |
| 3 | VCC5_ISO1_2 | 4 | COM_RI2#SEL |






### MIO1

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1~18 | GND | 51~68 | GND |
| 19 | HAD_RST# | 69 | GND |
| 20 | GND | 70 | GND |
| 21 | HAD_BLK | 71 | GND |
| 22 | GND | 72 | GND |
| 23 | HDA_SDO | 73 | PLTRST_BUF2 N |
| 24 | HAD_SYNC | 74 | GND |
| 25 | HAD_SDI0 | 75 | MCU_CLK_R |
| 26 | GND | 76 | MCU_DAT_R |
| 27 | COM2_M0 | 77 | GND |
| 28 | COM2_M1 | 78 | COM3_M0 |
| 29 | COM2_TERM | 79 | COM3_M1 |
| 30 | DCD2# | 80 | COM3_TERM |
| 31 | RI2# | 81 | DCD3# |
| 32 | CTS2# | 82 | RI3# |
| 33 | DTR2# | 83 | CTS3# |
| 34 | RTS2# | 84 | DTR3# |
| 35 | DSR#2 | 85 | DSR3# |
| 36 | SOUT2 | 86 | SIN3 |
| 37 | SIN2 | 87 | SOUT3 |
| 38 | GND | 88 | RTS3# |
| 39 | IGN_DI0 | 89 | GND |
| 40 | GND | 90 | SOUT5 |
| 41 | GND | 91 | SIN5 |
| 42 | V3P3_A | 92 | GND |
| 43 | V3P3_A | 93 | RELAY1_EN |
| 44 | V3P3_A | 94 | RELAY2_EN |
| 46 | GND | 96 | V3P3_S |
| 47 | VIP8 S | 97 | V3P3_S |
| 48 | VIP8 S | 98 | V3P3_S |
| 49 | V1P8 S | 99 | V3P3_S |
| 50 | V1P& S | 100 | GND |

### MIO2

| Pin | Signals | Pin | Signals |
|---|---|---|---|
| 1 | NC | 21 | VPORT_OUT6 |
| 2 | NC | 22 | POE_GND |
| 3 | NC | 23 | POE_GND |
| 4 | NC | 24 | VPORT_OUT5 |
| 5 | NC | 25 | POE_GND |
| 6 | NC | 26 | POE_GND |
| 7 | NC | 27 | VPORT_OUT4 |
| 8 | NC | 28 | POE_GND |
| 9 | NC | 29 | POE_GND |
| 10 | NC | 30 | VPORT_OUT3 |
| 11 | NC | 31 | POE_GND |
| 12 | NC | 32 | POE_GND |
| 13 | NC | 33 | VPORT_OUT2 |
| 14 | NC | 34 | POE_GND |
| 15 | NC | 35 | POE_GND |
| 16 | NC | 36 | VPORT_OUT1 |
| 17 | NC | 37 | POE_GND |
| 18 | NC | 38 | V_LED |
| 19 | NC | 39 | POE_GND |
| 20 | NC | 40 | VEE |

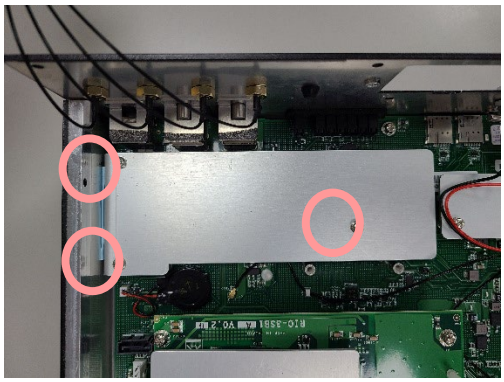
# CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the unit, please remove all power connections to completely shut down the device. Also, please wear ESD protection gloves when conducting the steps in this chapter.

## Open the Chassis

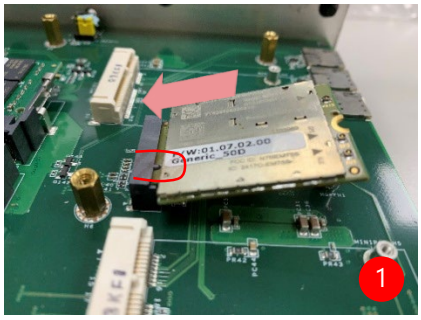
For installation of the M.2 LTE and mSATA storage, please remove the HDD tray and tilt down the device and remove screw on the front/back and two sides as below:

Lift up the chassis and remove the indicated screws that secure the board onto the standoffs

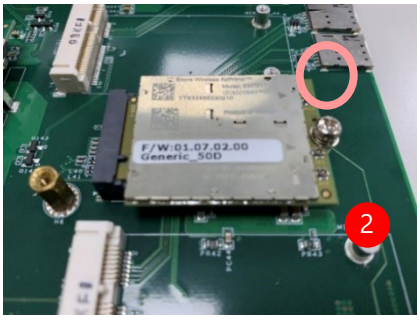


# Installing the M.2 LTE Module

1. Locate **M.2** slot. Align the notch of the module with the socket key in the slot, and insert it at 30 degrees into the socket until it is fully seated in the connector.




2. Push down on the module and secure it with the screw that comes with it.




3. To install the SIM cards, on front panel, loosen the screw that secures the cover onto the system.

4. Push the SIM cards into the socket. Make sure the angled corner of the card is correctly positioned.

5. To remove the card, simply push it to have it bounce out automatically.

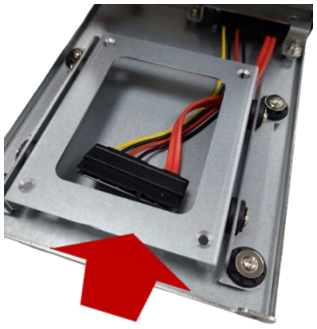
# Hard Disk Installation

To install the hard disk,

1. Loosen the two hand screws that secure the hard disk tray.
2. Pull out the tray as shown in the picture below.

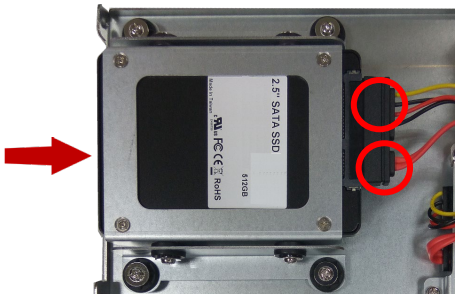
3. Remove the screws shown in the picture.

4. Open the tray and Install the disk onto the tray.



5. Connect the SATA cable and lock the drive in-place with screws.

   Reverse Step 1~ Step 3 to lock the disk tray back into the chassis.



# CHAPTER 3: SOFTWARE SETUP

## BIOS Setup

BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats.

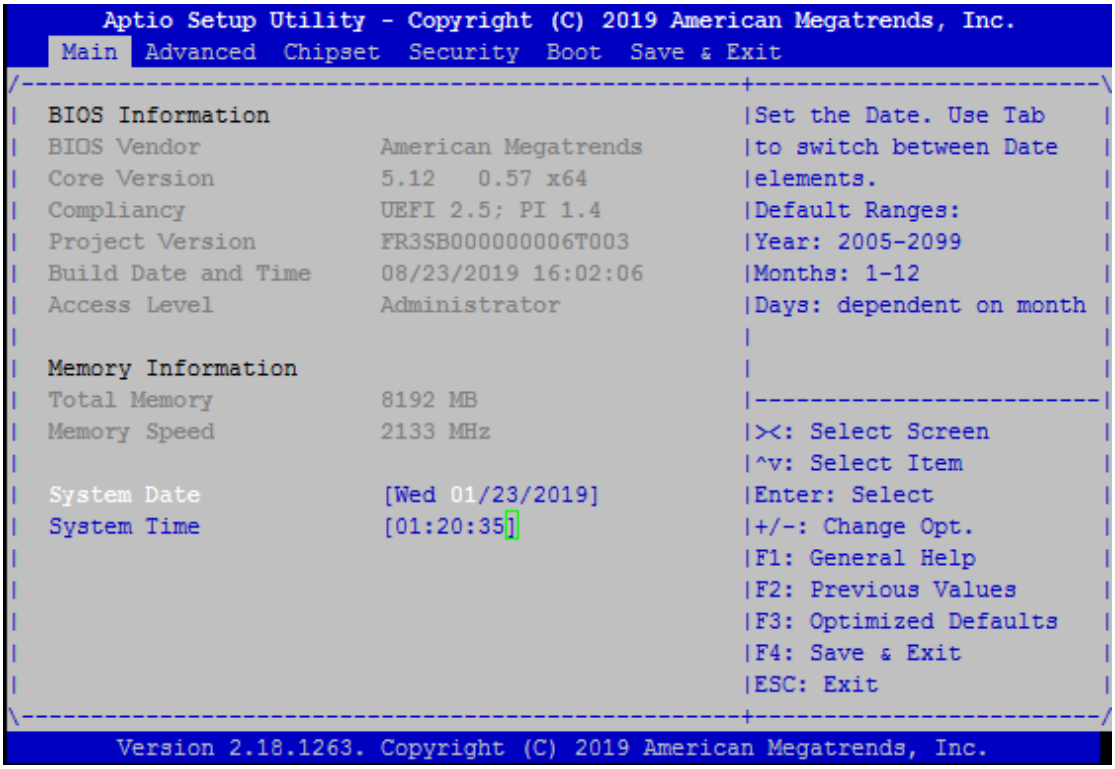
### Main Page Setup

To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Pressing the **<Esc>** or **<Del>** key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

| Control Keys | Description |
|---|---|
| →← | select a setup screen |
| ↑↓ | select an item/option on a setup screen |
| **<Enter>** | select an item/option or enter a sub-menu |
| **+/-** | adjust values for the selected setup item/option |
| **F1** | display General Help screen |
| **F2** | retrieve previous values, such as the last configured parameters during the last time you entered BIOS |
| **F3** | load optimized default values |
| **F4** | save configurations and exit BIOS |
| **<Esc>** | exit the current screen |

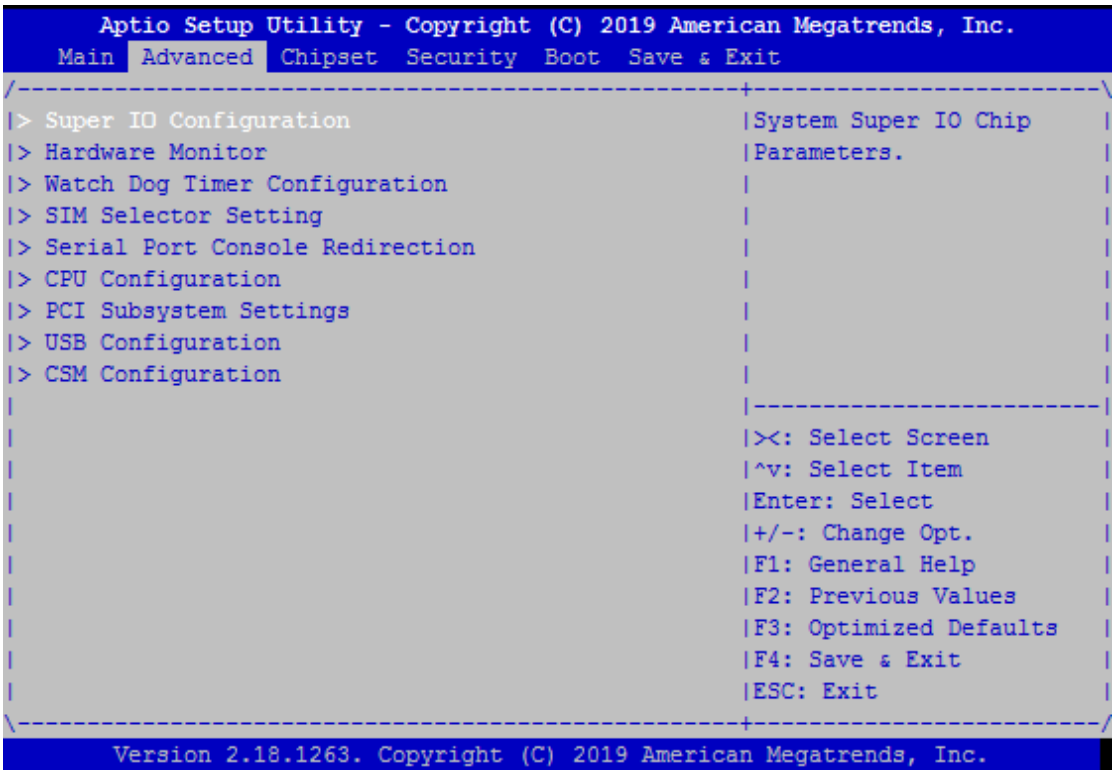
Setup main page contains BIOS information and project version information.



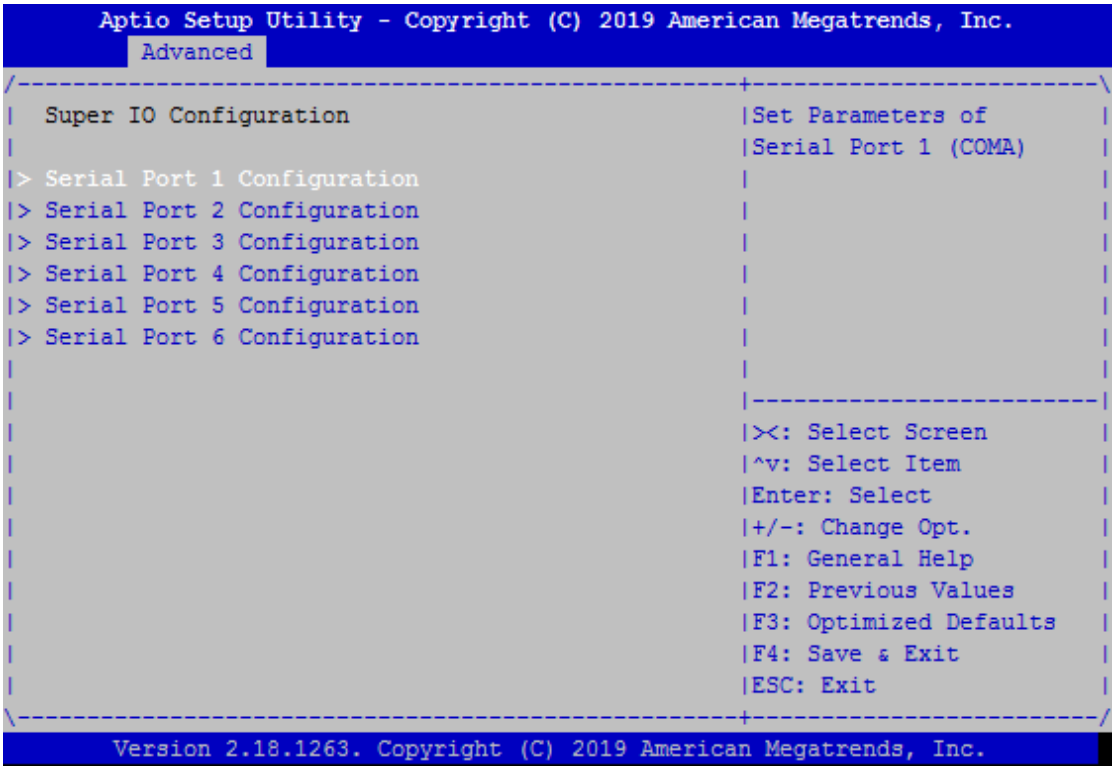

| Feature | Description |
|---|---|
| BIOS Information | BIOS Vendor: American Megatrends<br>Core Version: AMI Kernel version, CRB code base, X64<br>Compliancy: UEFI version, PI version<br>Project Version: BIOS release version<br>Build Date and Time: MM/DD/YYYY<br>Access Level: Administrator / User |
| System Date | To set the Date, use **<Tab>** to switch between Date elements. Default<br>Range of Year: 2005-2099<br>Default Range of Month: 1-12<br>Days: dependent on Month. |
| System Time | To set the Date, use **<Tab>** to switch between Date elements. |

## Advanced Page

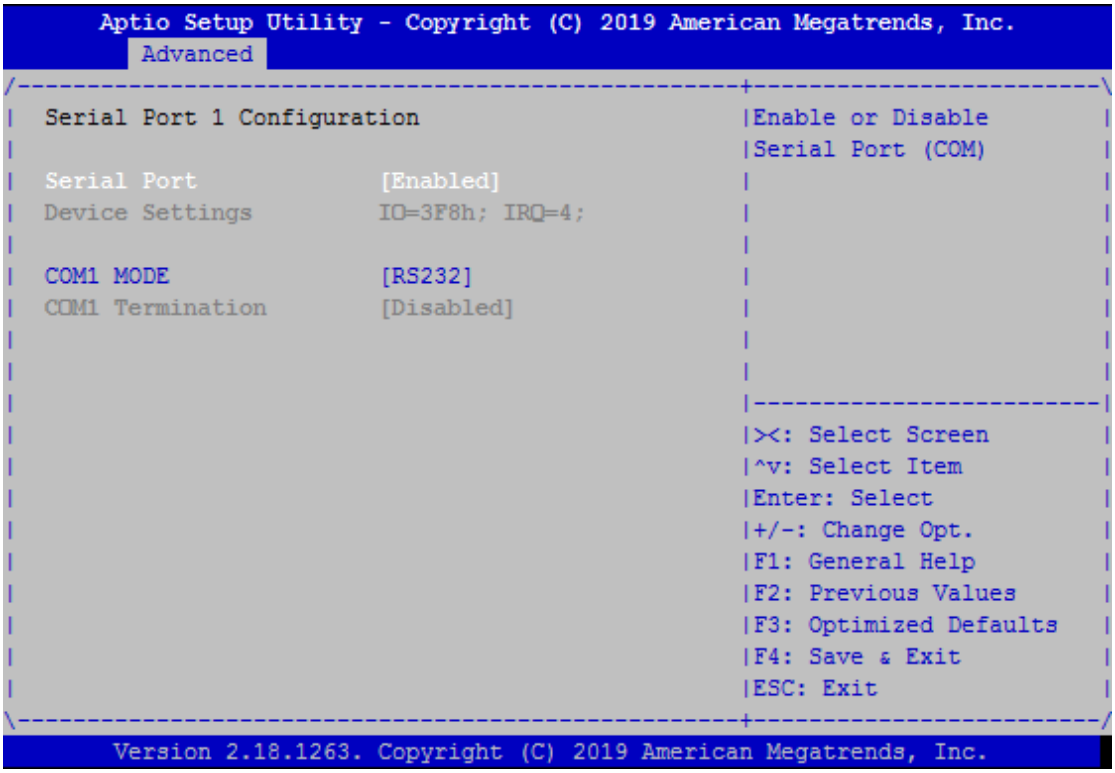
Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



## Super IO Configuration

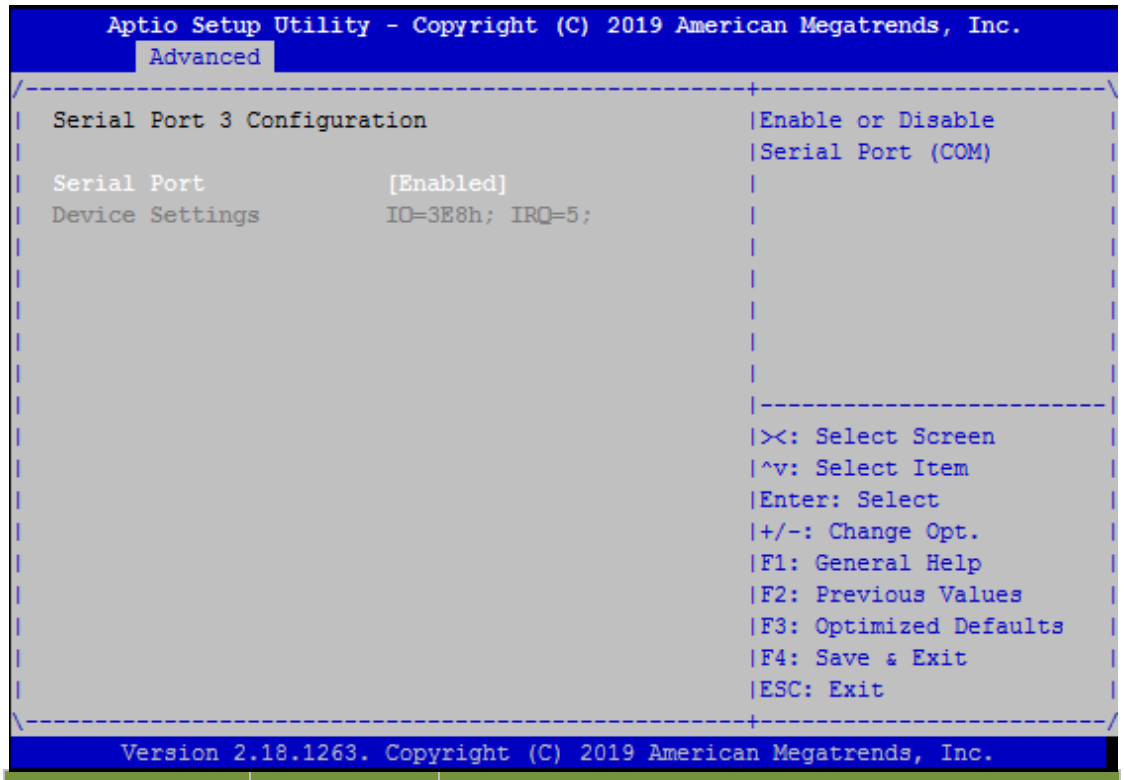


### ■ Serial port 1 ~ 2 Configuration



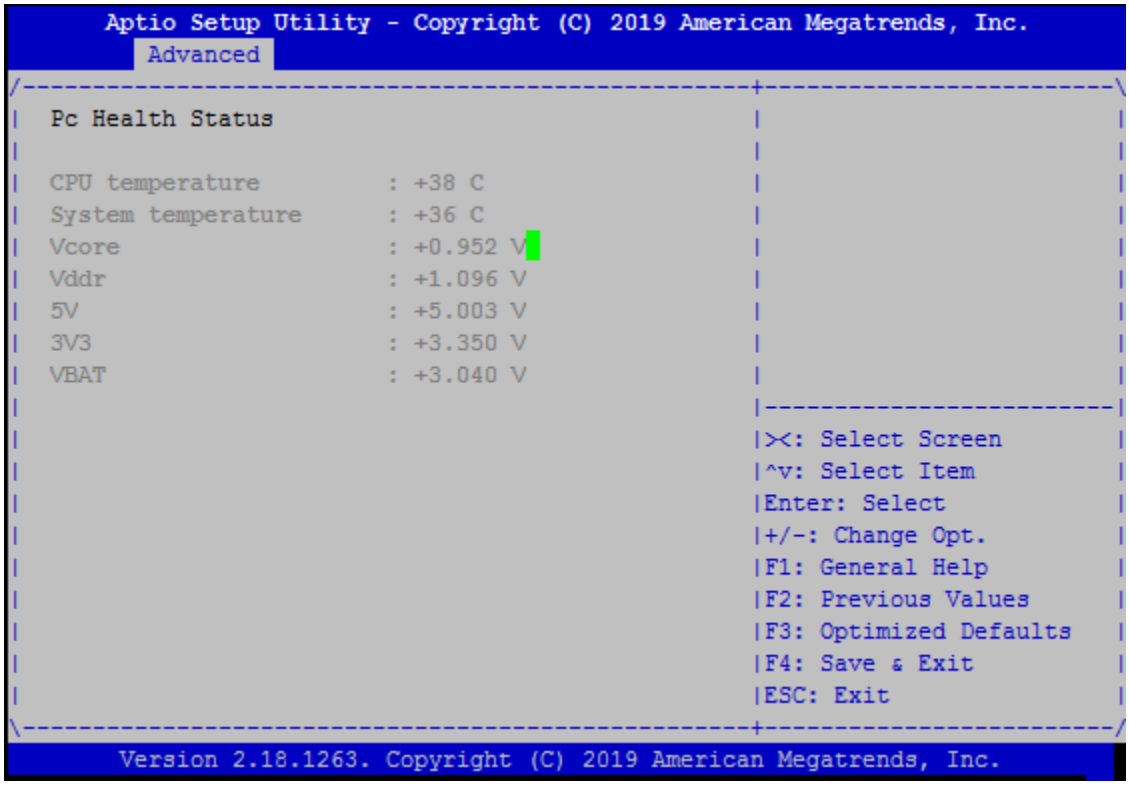

| Feature | Options | Description |
|---|---|---|
| Serial Port | Enabled<br>Disabled | Enables or disables Serial Port 1. |
| Device Settings | NA | IO=3F8h; IRQ = 4 → Serial Port 1<br>IO=2F8h; IRQ = 11 → Serial Port 2 |
| COM mode | RS232<br>RS485<br>RS422 | Configure COM port mode. |

## ■ Serial port 3 ~ 6 Configuration



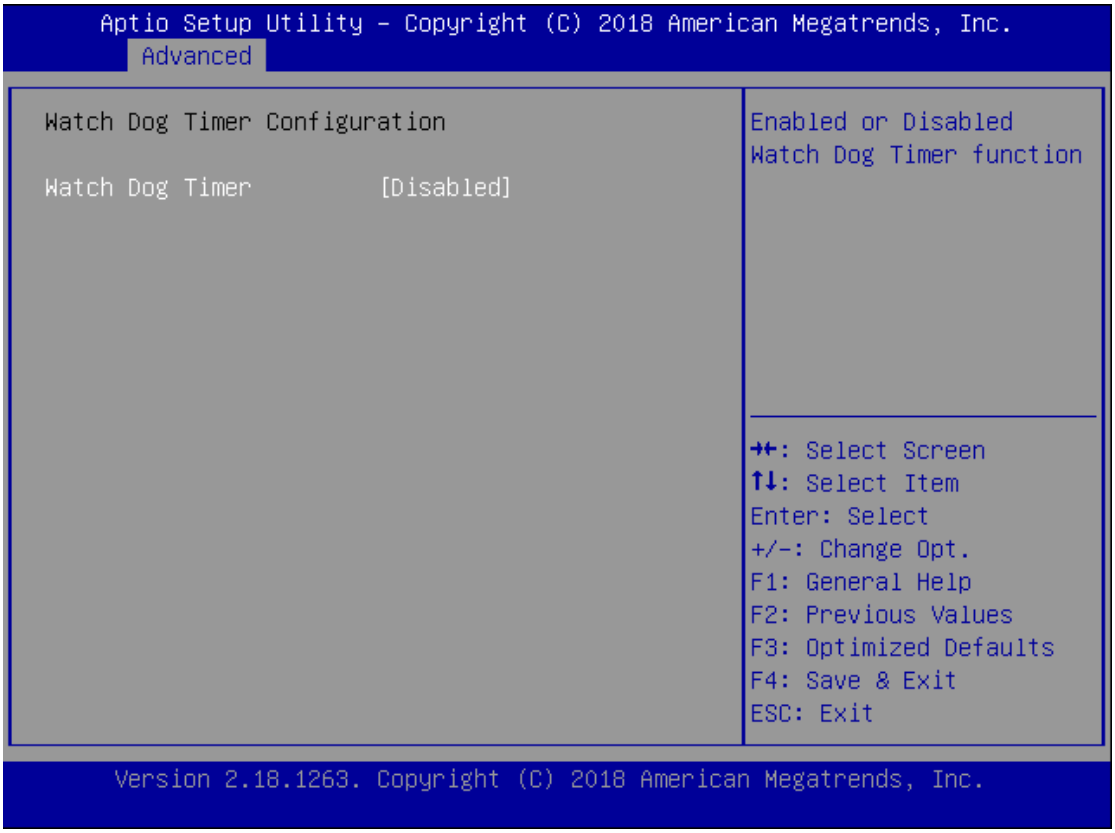

| Feature | Options | Description |
|---|---|---|
| Serial Port | Enabled<br>Disabled | Enables or disables Serial Port 3 ~ 6. |
| Device Settings | NA | Assigned to IO=3E8h; IRQ = 5 |

## ■ Hardware Monitor



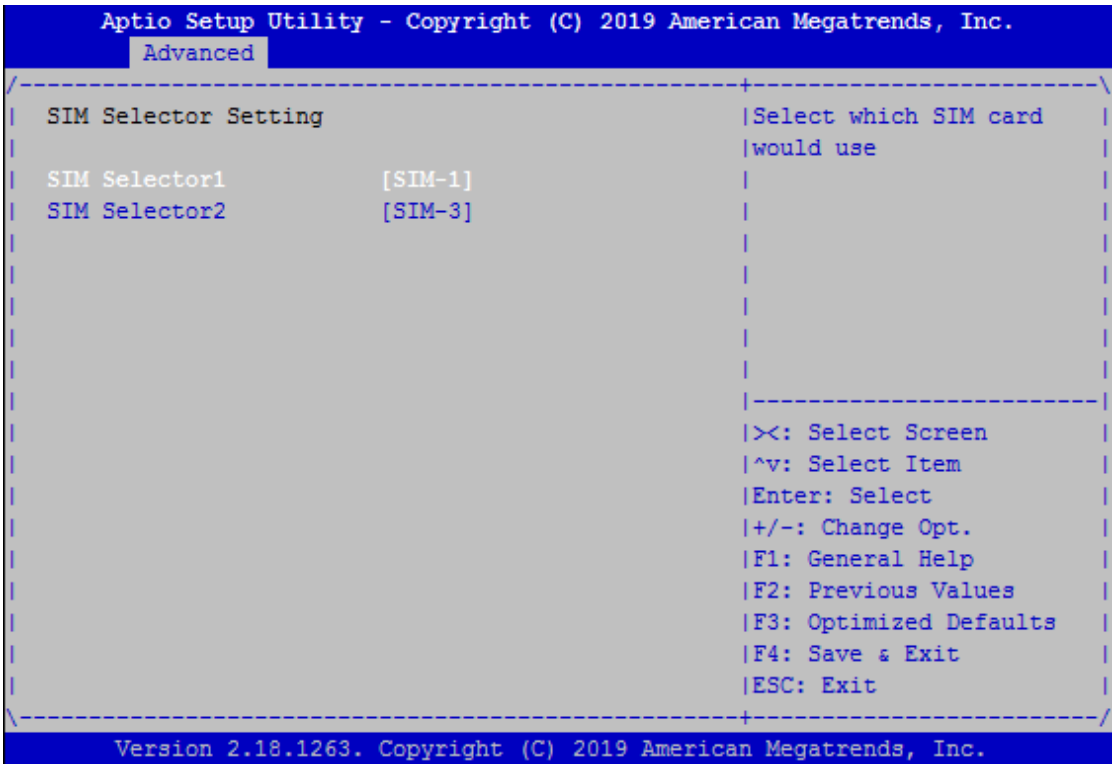

| Feature | Description |
|---|---|
| CPU Temp | This value reports the CPU temperature. |
| SYS Temp | This value reports the System temperature. |
| VCORE | This value reports the CPU VCORE. |
| Vddr | This value reports the Vddr. |
| VBAT | This value reports the VBAT Input voltage. |
| 5V | This value reports the 5V Input voltage. |
| 3V3 | This value reports the 3.3V Input voltage. |

## ■ Watch Dog Timer Configuration



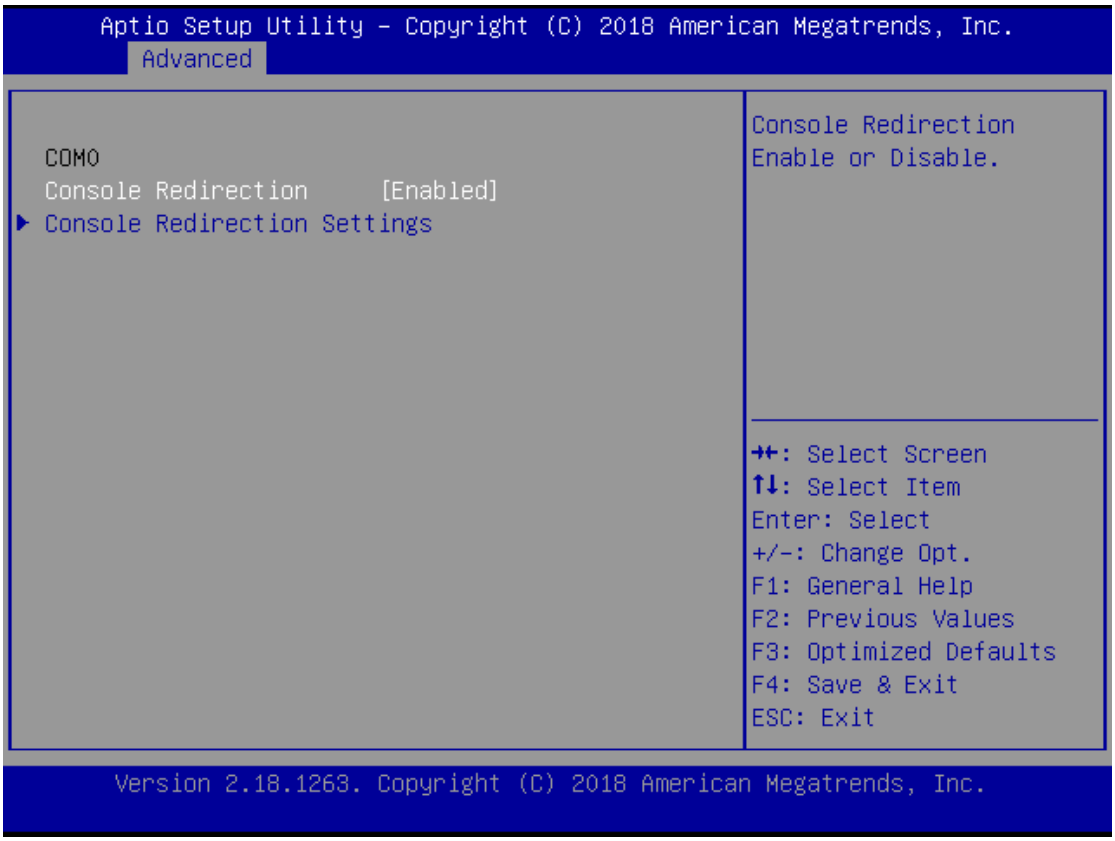

| Feature | Options | Description |
|---|---|---|
| Watch Dog Timer | Enabled<br>Disabled | Enable or Disable Watch Dog function |
| Timer Count Mode | Second Mode<br>Minute Mode | Select Second Mode or Minute Mode |
| Timer out Value | 60 | Watch Dog Timer out Value 0-255 |

## ■ SIM Selector Setting



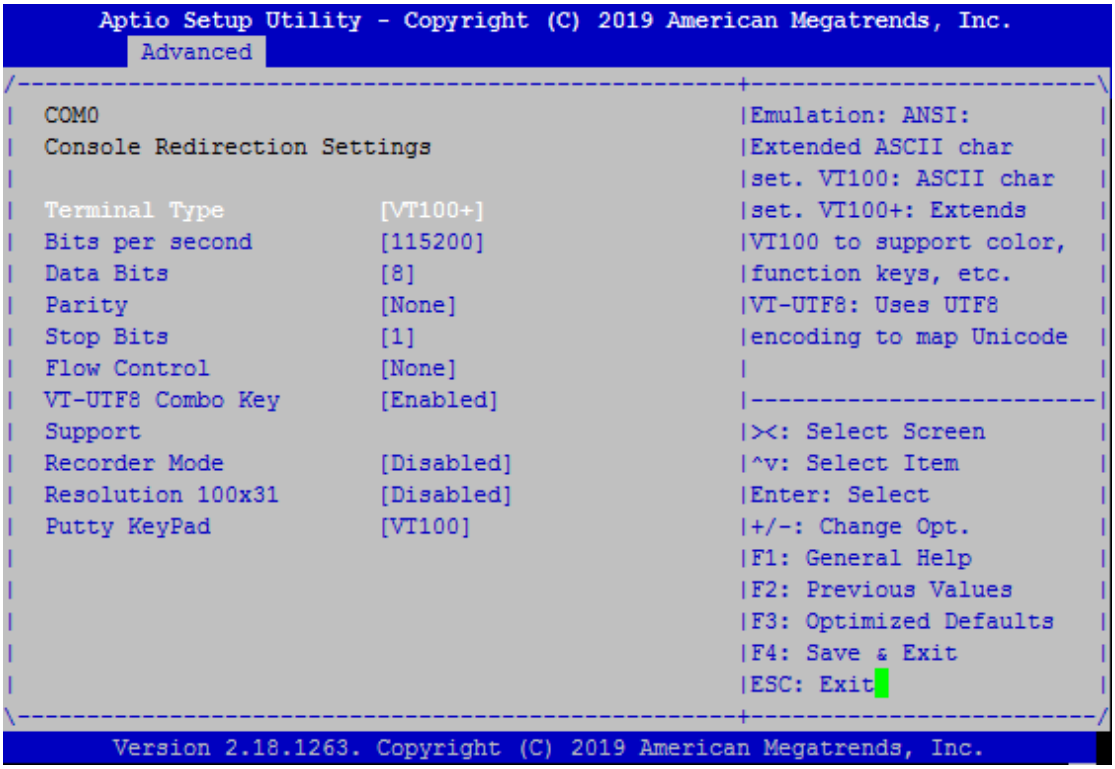

| Feature | Options | Description |
|---|---|---|
| SIM Selector1 | SIM-1<br>SIM-2 | Select which SIM card would use |
| SIM Selector2 | SIM-3<br>SIM-4 | Select which SIM card would use |

## ■ Serial Port Console Redirection




| Feature | Options | Description |
|---|---|---|
| COM0<br>Console Redirection | Enabled<br>Disabled | Console Redirection Enable or Disable. |

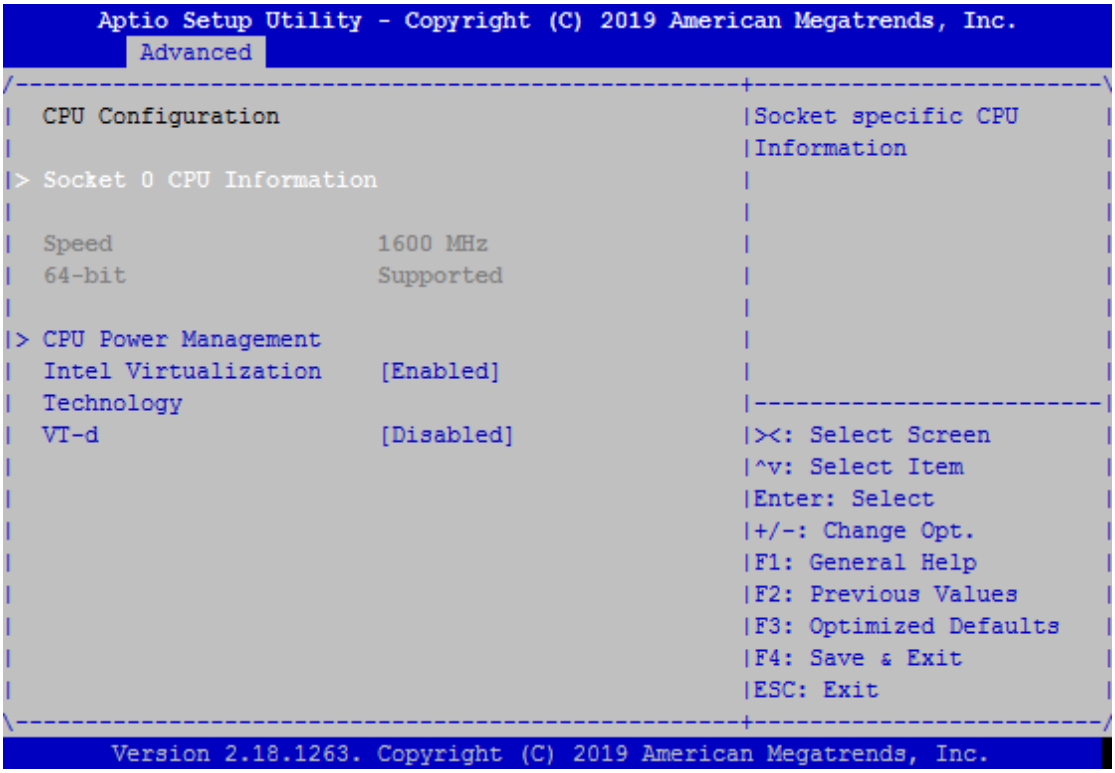
## ■ Console Redirection Setting




| Feature | Options | Description |
|---|---|---|
| Terminal Type | VT100<br>VT100+<br>VT-UTF8<br>ANSI | ANSI: Extended ASCII char set.<br>VT100: ASCII char set.<br>VT100+: Extends VT100 to support color, function keys, etc.<br>VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. |
| Bits per second | 9600<br>19200<br>38400<br>57600<br>115200 | Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. |
| Data Bits | 7<br>8 | Data Bits |
| Parity | None<br>Even<br>Odd<br>Mark<br>Space | A parity bit can be sent with the data bits to detect some transmission errors. |
| Stop Bits | 1 | Stop bits indicate the end of a serial data packet. |

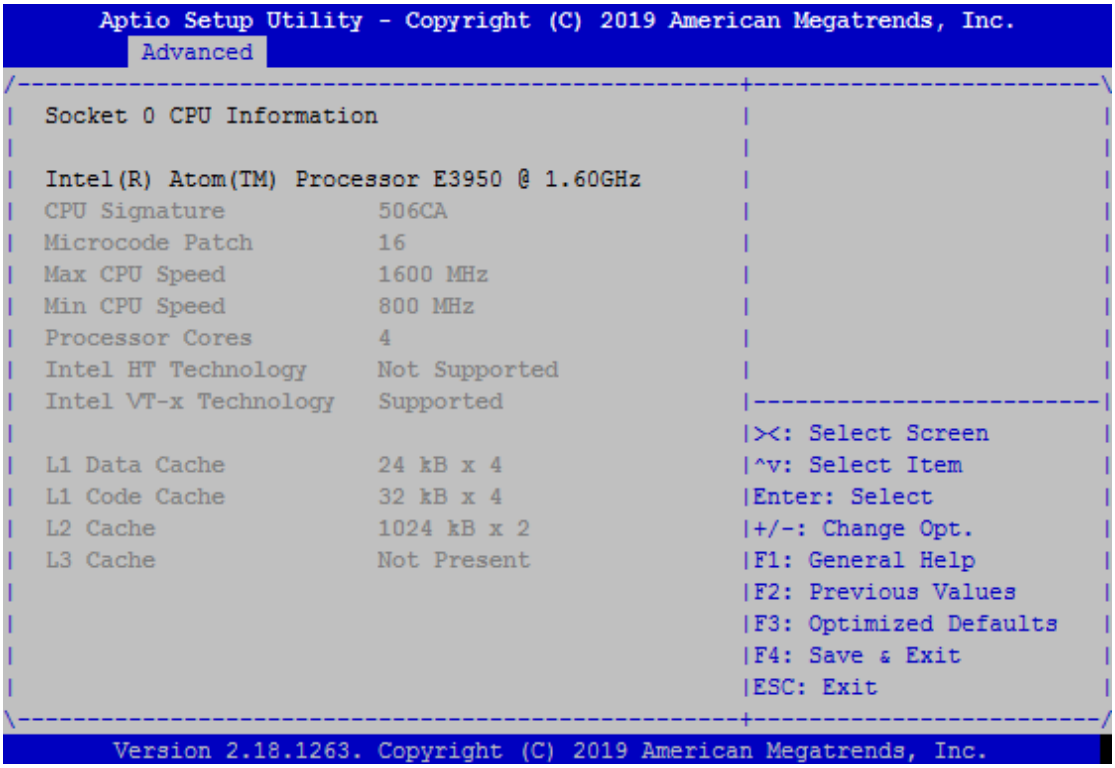
| | | |
|---|---|---|
| | 2 | |
| Flow Control | None<br>Hardware<br>RTS/CTS | Flow control can prevent data loss from buffer overflow. |
| VT-UTF8 Combo Key Support | Disabled<br>Enabled | Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals |
| Recorder Mode | Disabled<br>Enabled | With this mode enabled only text will be sent. This is to capture Terminal data. |
| Resolution 100x31 | Disabled<br>Enabled | Enables or disables extended terminal resolution. |
| Putty KeyPad | VT100<br>LINUX<br>XTERM86<br>SCO<br>ESCN<br>VT400 | Select FunctionKey and KeyPad on Putty. |

## ■ CPU Configuration

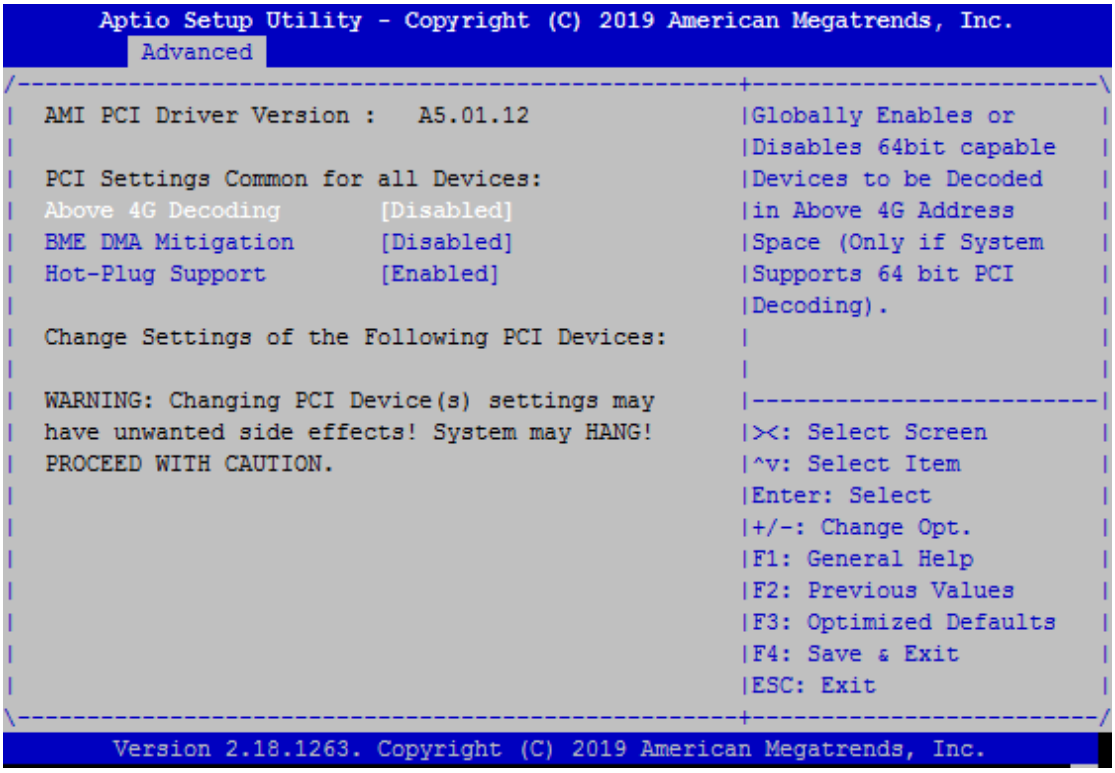



| Feature | Options | Description |
|---|---|---|
| Intel Virtualization Technology | Disabled<br>Enabled | When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology |
| VT-d | Disabled<br>Enabled | Enable/Disable CPU VT-d |

## ■ Socket 0 CPU Information

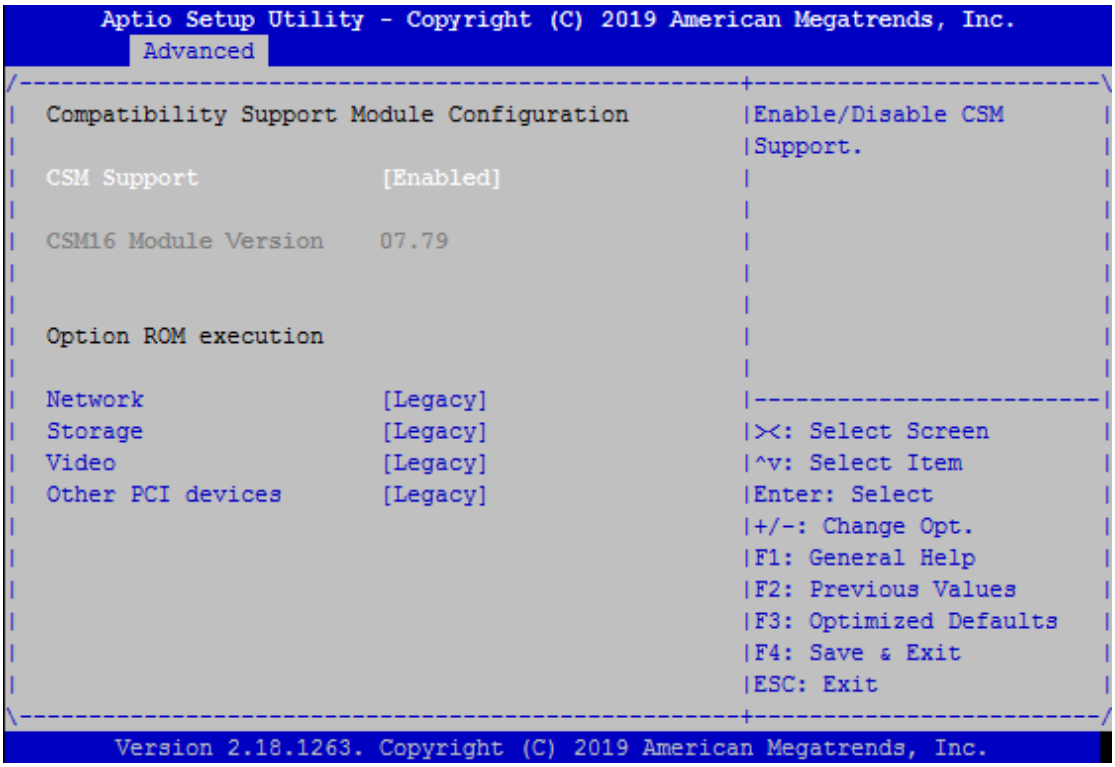


## ■ PCI Subsystem Settings



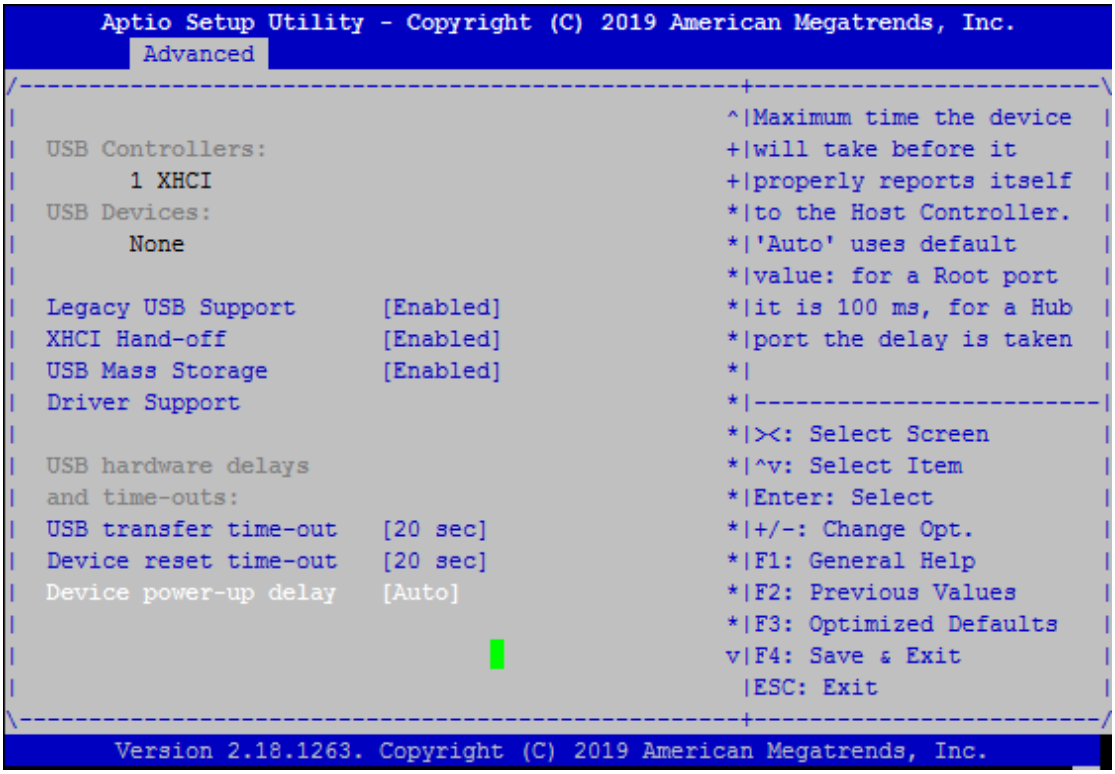

| Feature | Options | Description |
|---|---|---|
| Above 4G Decoding | Disabled<br>Enabled | Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding). |
| BME DMA Mitigation | Disabled<br>Enabled | Re-enable Bus Master Attribute disabled during PCI enumeration for PCI bridge after SMM Lockeed. |
| Hot-Plug Support | Enabled<br>Disabled | Globally Enables or Disables Hot-Plug support for the entire System. If System has Hot-Plug capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug. |

## ■ CSM Configuration




| Feature | Options | Description |
|---|---|---|
| CSM Support | Disabled<br>Enabled | Enables or disables CSM Support |
| Network | Do Not Launch<br>UEFI<br>Legacy | Controls the execution of UEFI and Legacy PXE OpROM |
| Storage | Do Not Launch<br>UEFI<br>Legacy | Controls the execution of UEFI and Legacy Storage OpROM |
| Video | Do Not Launch<br>UEFI<br>Legacy | Controls the execution of UEFI and Legacy Video OpROM |
| Other PCI device | Do Not Launch<br>UEFI<br>Legacy | Determines OpROM execution policy for devices other than Network, Storage, or Video |

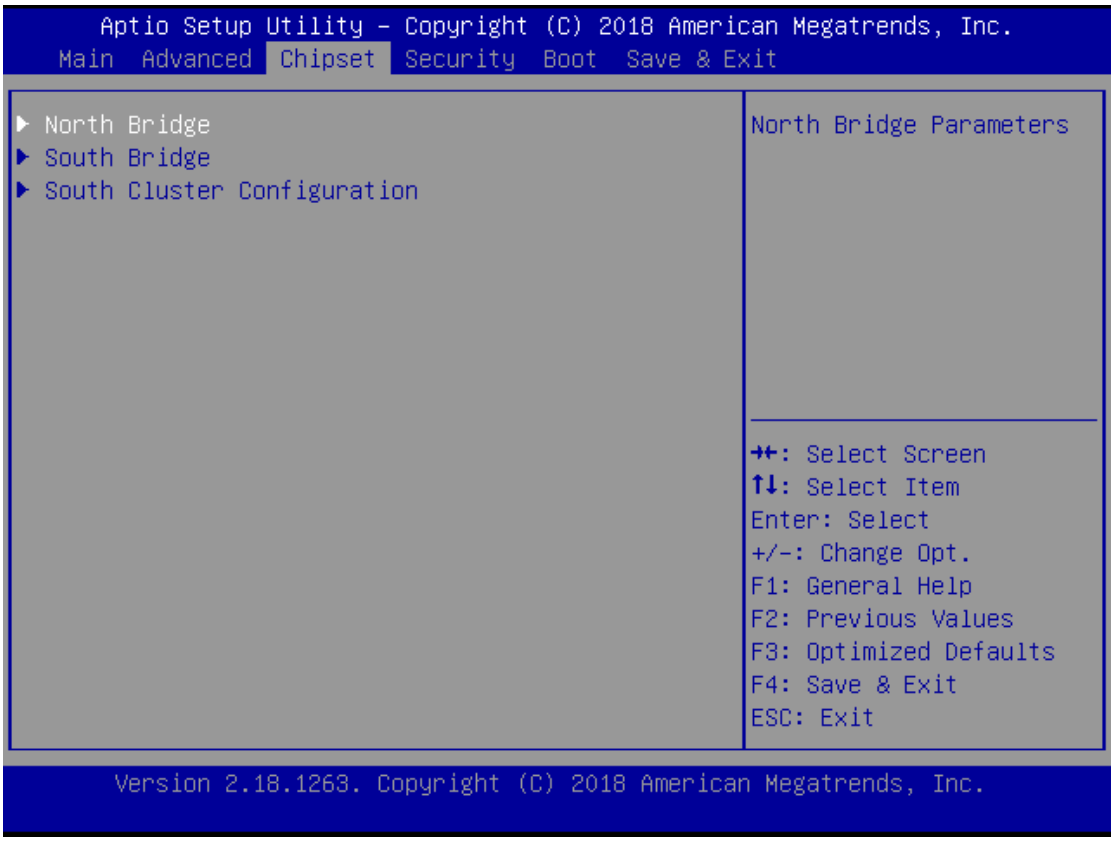
## ■ USB Configuration



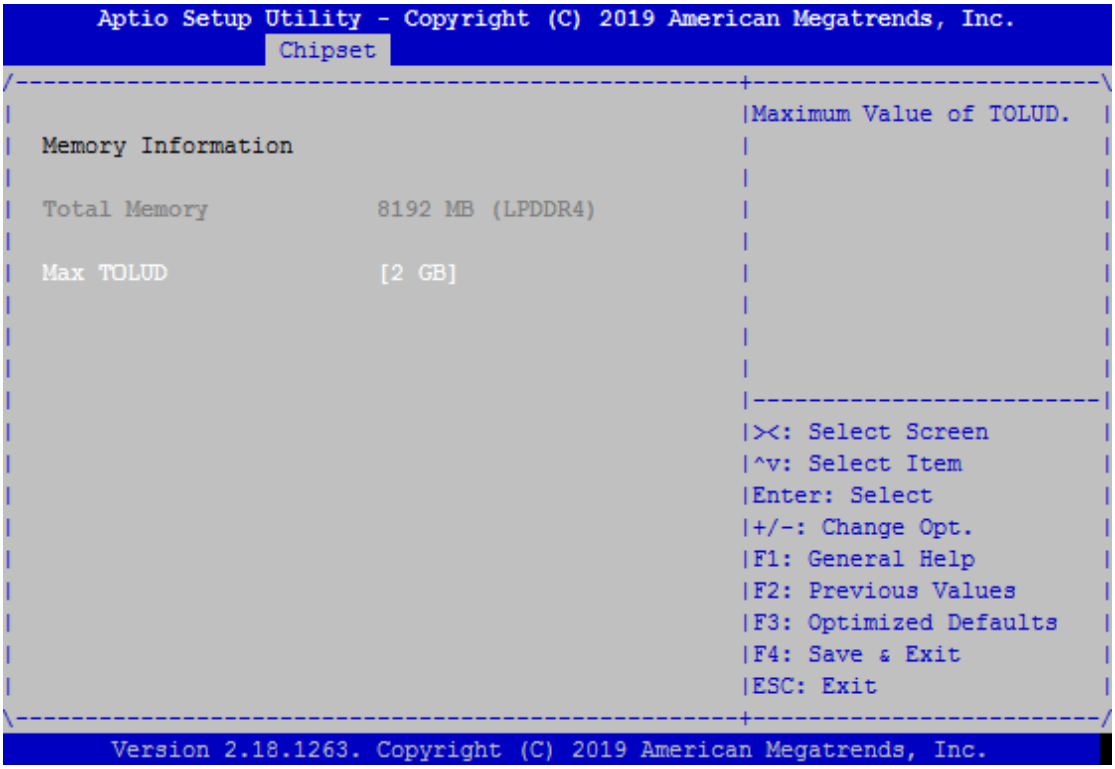

| Feature | Options | Description |
|---|---|---|
| Legacy USB Support | Enabled<br>Disabled<br>Auto | Enables Legacy USB support.<br>**Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications. |
| XHCI Hand-off | Enabled<br>Disabled | This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. |
| USB Mass Storage Driver Support | Enabled<br>Disabled | Enables or disables USB Mass Storage Driver Support. |
| USB transfer time-out | 1 sec / 5 sec<br>10 sec / 20 sec | The time-out value for Control, Bulk, and Interrupt transfers |
| Device reset time-out | 1 sec / 5 sec<br>10 sec / 20 sec | USB mass storage device Start Unit command time-out |
| Device power-up delay | Auto<br>Manual | Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor. |

# IntelRCSetup

Select the IntelRCSetup menu item from the BIOS setup screen to enter the Platform Setup screen. Users can select any of the items in the left frame of the screen.



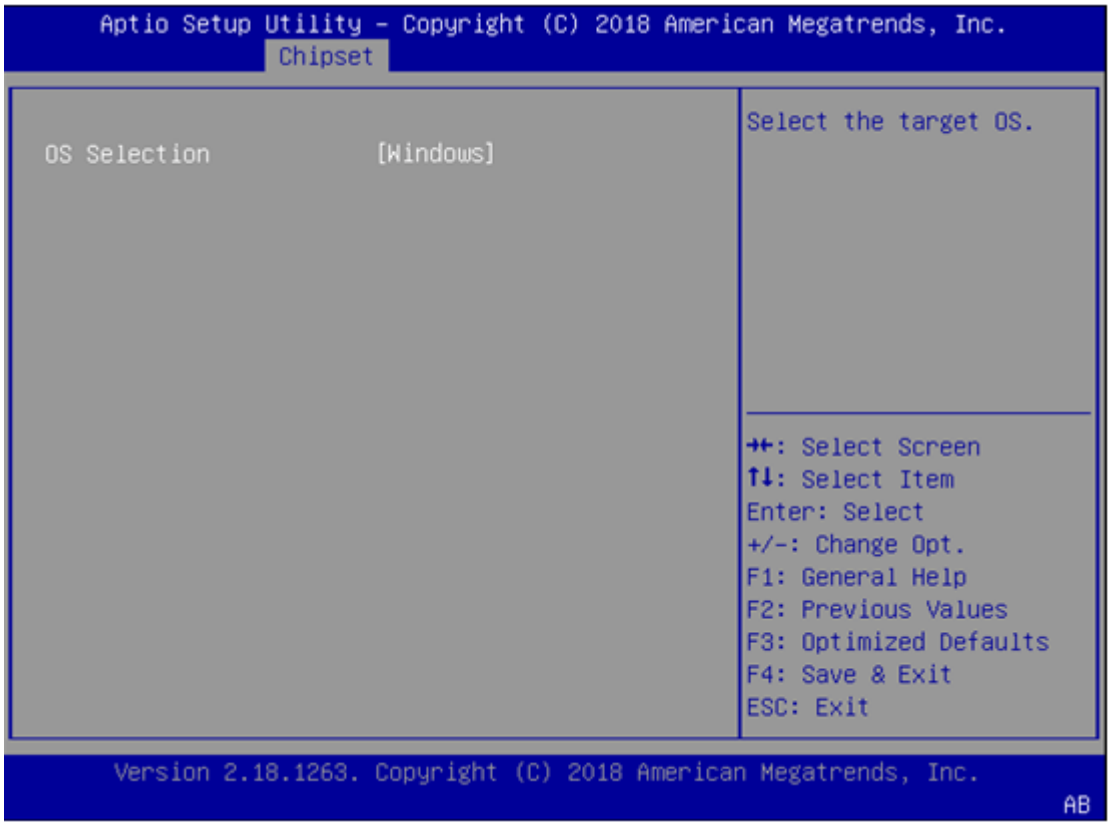
## ■ North Bridge




| Feature | Options | Description |
|---|---|---|
| Max TOLUD | 2 GB<br>2.25 GB<br>2.5 GB<br>2.75 GB<br>3 GB | Maximum Value of TOLUD. |

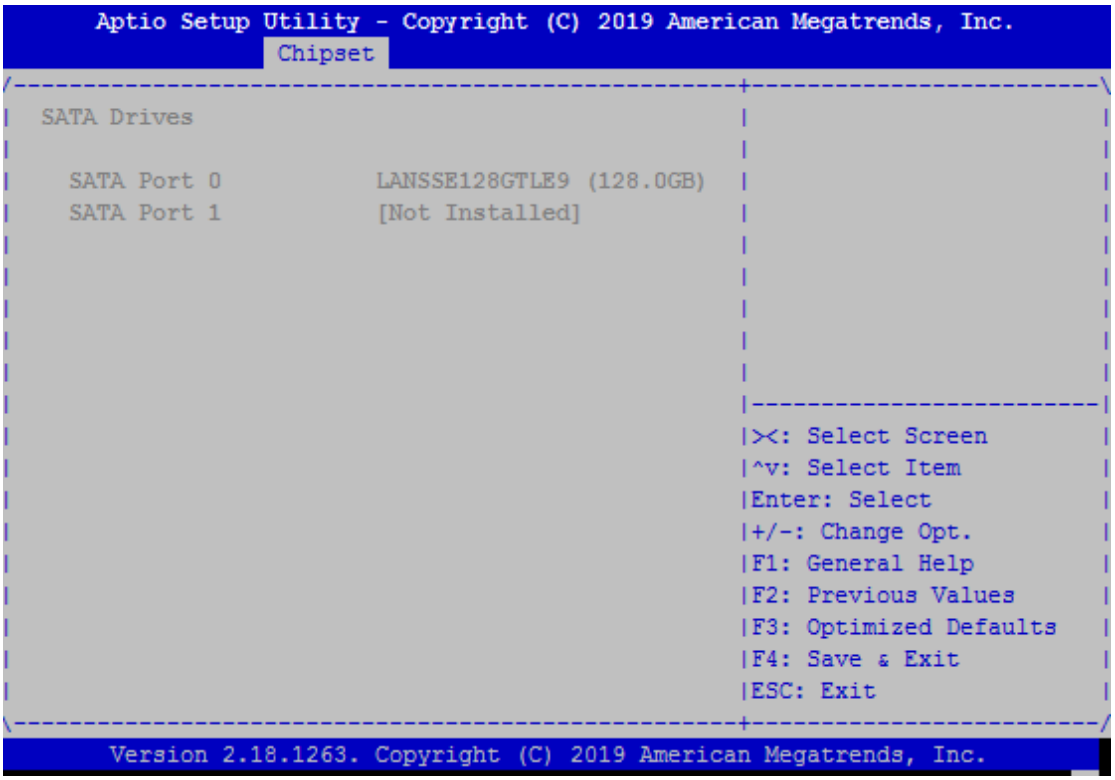
=

## ■ South Bridge



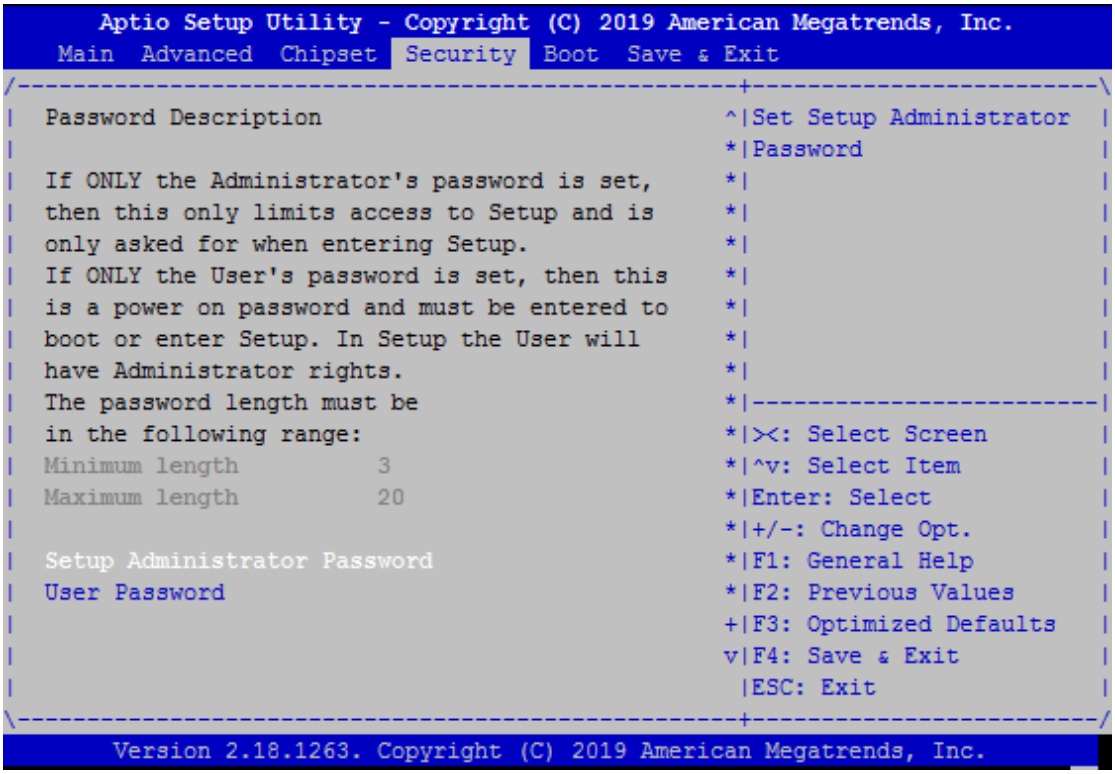

| Feature | Options | Description |
|---|---|---|
| OS Selection | Windows<br>Android<br>Win7<br>Intel Linux | Select the target OS |

## ■ South Cluster Configuration



# Security

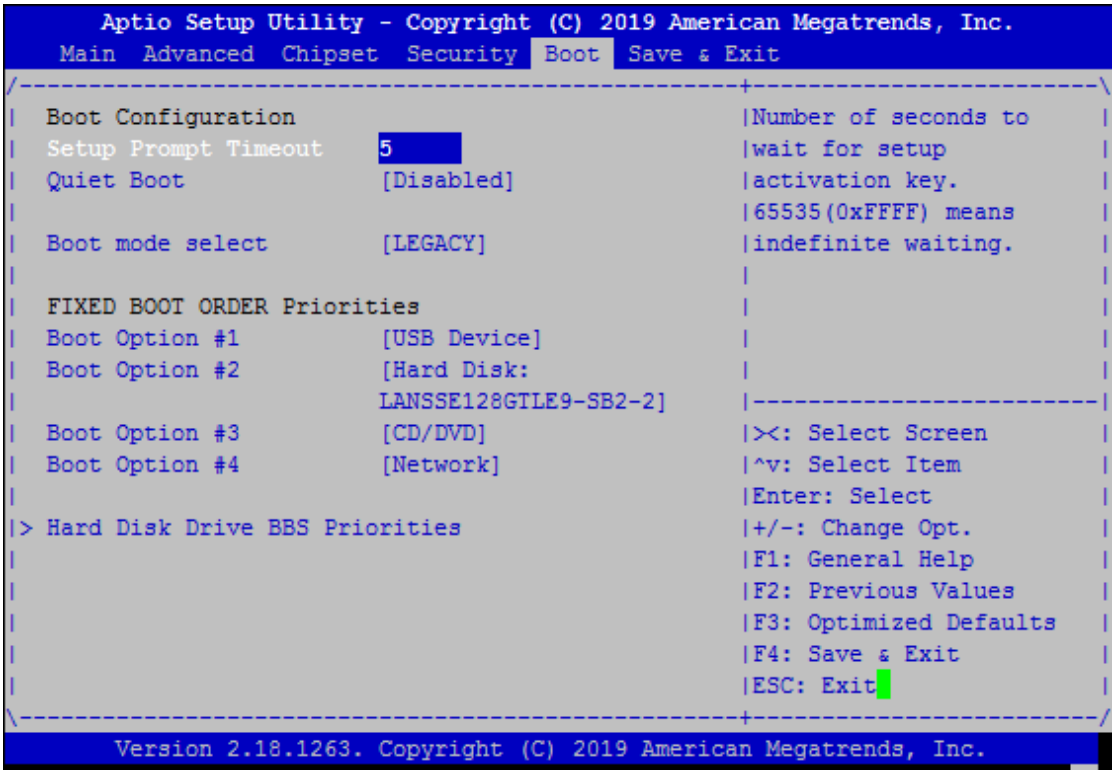
Select the Security menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.




| Feature | Description |
|---|---|
| Administrator Password | If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup. |
| User Password | If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the User will have Administrator rights. |

# Boot Menu

Select the Boot menu item from the BIOS setup screen to enter the Boot Setup screen. Users can select any of the items in the left frame of the screen.

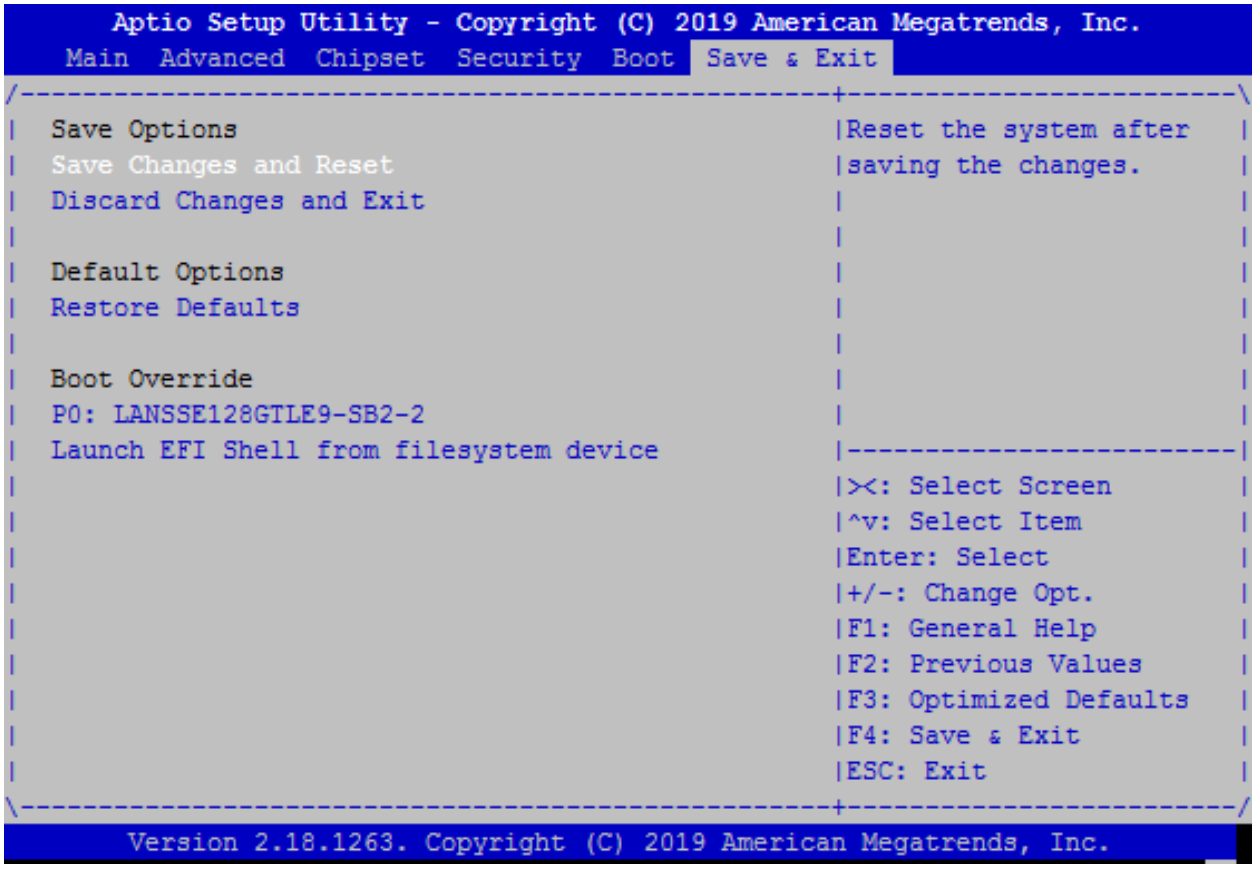



| Feature | Options | Description |
|---|---|---|
| Setup Prompt Timeout | 5 | The number of seconds to wait for setup activation key.<br>65535 means indefinite waiting. |
| Bootup NumLock State | On<br>Off | Select the keyboard NumLock state |
| Quiet Boot | Disabled<br>Enabled | Enables or disables Quiet Boot option. |
| Boot mode select | LEGACY<br>UEFI<br>DUAL | Select boot mode for LEGACY or UEFI. |

- Choose boot priority from boot option group.
- Choose specifies boot device priority sequence from available Group device.

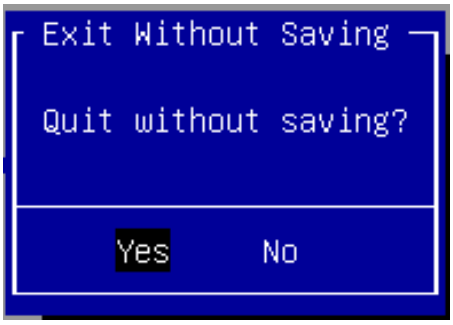
# Save and Exit Menu

Select the Save and Exit menu item from the BIOS setup screen to enter the Save and Exit Setup screen. Users can select any of the items in the left frame of the screen.



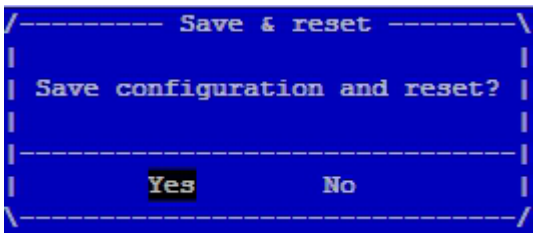

**■ Discard Changes and Exit**

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the "**Discard Changes and Exit**" option is selected. Select "**Yes"** to Discard changes and Exit Setup.



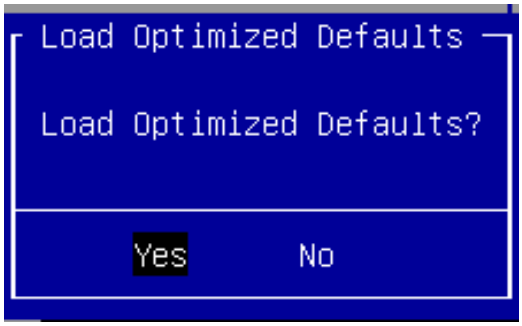
**■ Save Changes and Reset**

When Users have completed the system configuration changes, select this option to save the changes and reset from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the "**Save Changes and Reset**" option is selected. Select "**Yes**" to Save Changes and reset.




**■ Restore Defaults**

Restore default values for all setup options. Select "**Yes"** to load Optimized defaults.




PS: The items under Boot Override were not same with image. It should depend on devices connect on system.

# APPENDIX A: LED INDICATOR EXPLANATIONS

The status explanations of LED indicators on Front Panel are as follows:

- **HDD Activity Status**

| | |
|---|---|
| *Blinking Amber* | *Data access activities* |
| *Off* | *No data access activities* |

- **System Power**

| | |
|---|---|
| *Solid Green* | *The system is powered on* |
| *Off* | *The system is powered off* |

- **LAN LED Status (**LED1~LED6)

| | | |
|---|---|---|
| *Speed* | *Solid Green* | *100M link* |
| | *Solid Amber* | *1G link* |
| | *Off* | *10M/No activities* |

| | | |
|---|---|---|
| *Link/Act* | *Solid Amber* | *link* |
| | *Blinking Amber* | *Active* |
| | *Off* | *No activities* |

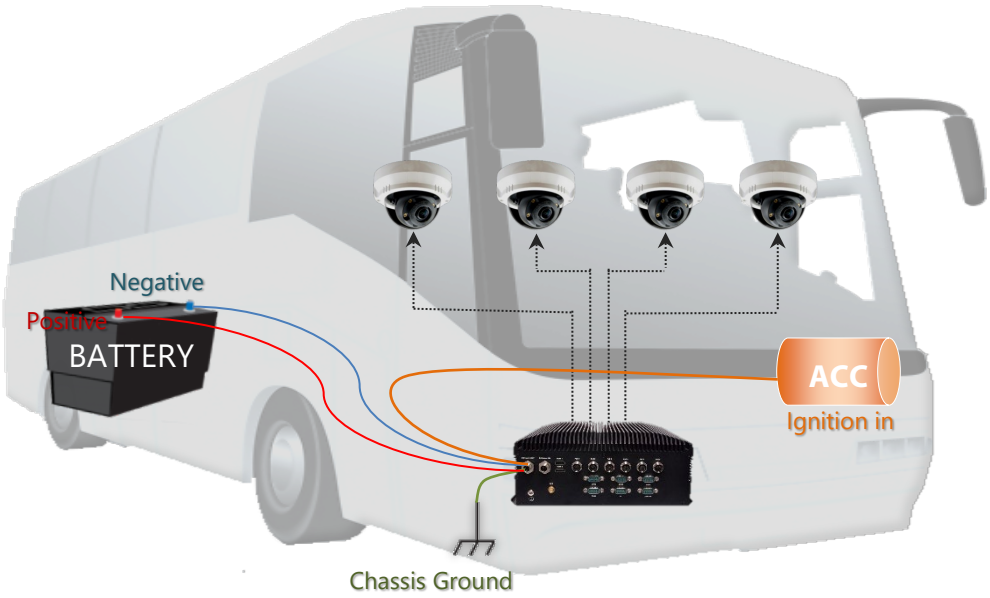
# APPENDIX B: IGINITION CONTROL SETUP

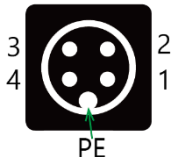
## Connecting the Devices

The system comes with a controller to ensure that the device is well-shielded against premature failure at the boot or shutdown phase. When installing:

1. Make sure both your vehicle and the system are turned off.
2. Follow the wiring definition and illustration below to connect the vehicle battery and ignition (ACC) to the in-vehicle system through the 5-pin M12 male connector marked as “DC Input” on the system, through the right pin contact.

In a typical in-vehicle computing solution, this system usually acts as a PSE (Power Sourcing Equipment) to power up connected PoE devices, for which you should ensure a minimum of 48V DC power supply to the system with the use of a **DC to DC Adapter**.



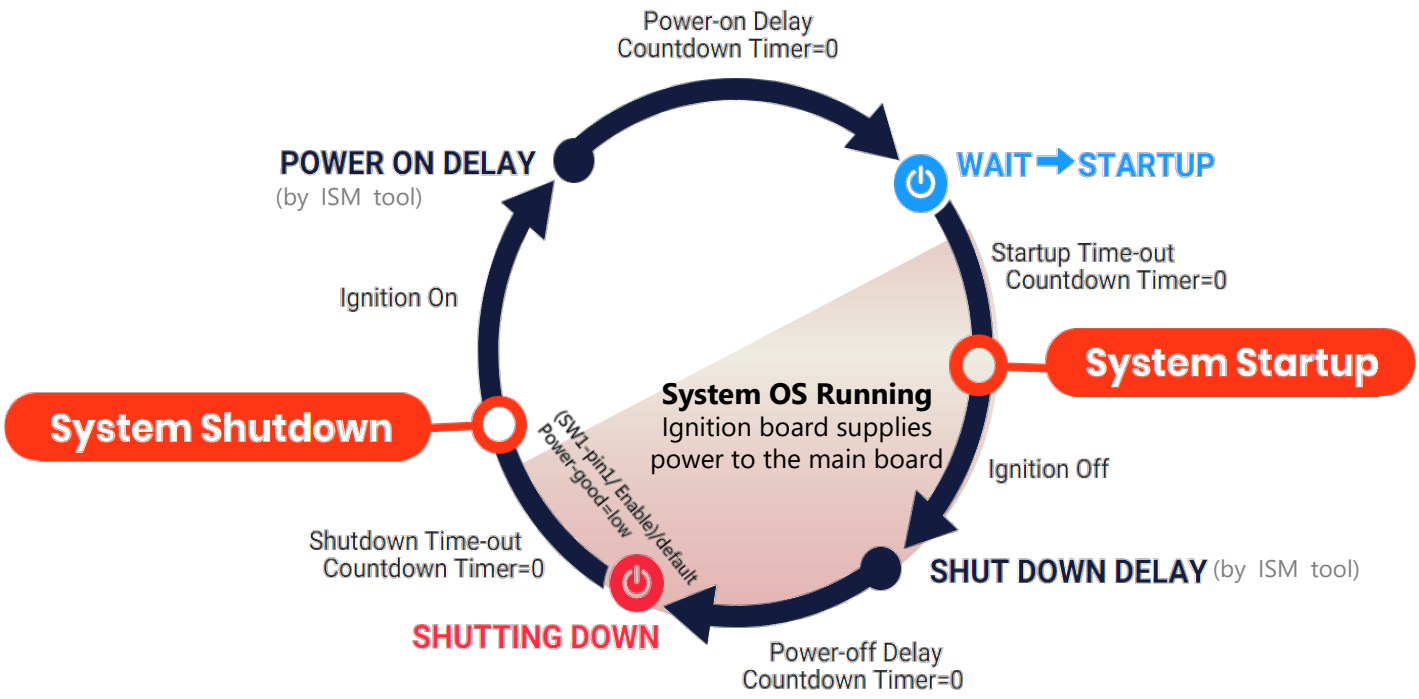




**DC Input**
(System)

| | |
|---|---|
| Pin1 | Ground |
| Pin2 | VCC |
| Pin3 | GND_DCIN |
| Pin4 | Ignition |
| PE | Chassis Ground |

# Power States Cycle Diagram

The diagram below describes the cycle of system's power states controlled by the Ignition System Manager (ISM) when the appropriate timer control parameters are set.




**Note:** When the system's shutdown timer starts counting down 60sec, using ignition or External PWR_BTN to start the system again during shutdown process will not work until the countdown finishes.

# Using the Ignition System Manager (ISM)

Command Format:

1. Host communication interface: COM#6 (RS-232)
2. Support baud rate: 57600/ 8N1
3. Communication protocol: ANSI terminal.

GET VariableName

SET VariableName value

| MCU Command | Wirte/Read (SET/GET) | VariableName | value | |
|---|---|---|---|---|
| Startup Voltage(mV) | SET | STARTUP_VOLTAGE | 0(default) | 0mV |
| | GET | STARTUP_VOLTAGE | | |
| Shutdowm Voltage(mV) | SET | INPUT_VOLTAGE_MIN | 0(default) | 0mV |
| | GET | INPUT_VOLTAGE_MIN | | |
| PowerOn Delay (Sec) | SET | POWERON_DELAY | 4(default) | 4S |
| | GET | POWERON_DELAY | | |
| PowerOff Delay (Sec) | SET | SHUTDOWN_DELAY | 4(default) | 4S |
| | GET | SHUTDOWN_DELAY | | |
| Input Voltage | GET | INPUT_VOLTAGE | | |
| Wakeup DI1 | SET | WAKEUP_ENABLE | 7(default) | 1:DI1<br>2:Reserved<br>4: Reserved |
| Device ID | GET | DEVICE_ID | R3S_N | |
| Firmware Version | GET | VERSION | 0.06B | |
| Digital Out (SIM selection) | SET | DIGITAL_OUT | 0(default) | |
| Digial In | GET | DIGITAL_IN | | |
| Ignition | GET | IGNITION | | |
| Digital POE | SET | DIGITAL_POE | 63(default) | 0~63 |
| | GET | DIGITAL_POE | | |
| Digital DO | SET | DIGITAL_DO | 0(default) | 0~15 |
| Digital DI | GET | DIGITAL_DI | | |
| Relay Switch | SET | RELAY_SWITCH | 0(default) | 0~3 |
| | GET | RELAY_SWITCH | | |
| Save flash | SAVE | | | |

**Example:**

1. The minimun voltage for startup,
Setting : 6V(6000mV)

| Command | Response massage |
|---|---|
| SET STARTUP_VOLTAGE 6000 | OK |
| GET STARTUP_VOLTAGE | STARTUP_VOLTAGE= 6000 |

2.The delay time for POWERON_DELAY state,
Setting : 4 S

| Command | Response massage |
|---|---|
| SET POWERON_DELAY 4 | OK |
| GET POWERON_DELAY | POWERON_DEALY= 4 |

3.Wakeup DI1 Enable,
Setting : DI1 enable (001)

| Command | Response massage |
|---|---|
| SET WAKEUP_ENABLE 1 | OK |
| GET WAKEUP_ENABLE | WAKEUP_ENABLE= 1 |

4.Device ID

| Command | Response massage |
|---|---|
| GET DEVICE_ID | DEVICE_ID= R3S_N |

5.Firmware Version

| Command | Response massage |
|---|---|
| GET VERSION | VERSION= 0.06B |

6.Write/Read Digital_Out state,
Setting : SIM Card Control

| Command | Response massage |
|---|---|
| SET DIGITAL_OUT 3 | OK |
| GET DIGITAL_OUT | DIGITAL_OUT= 3 |

---

bit0 = LTE 1(M.2) - SIM Control
1: SIM #2
0: SIM #1

bit1 = LTE 2(M.2) - SIM Control
1: SIM #1
0: SIM #2

bit2 = LTE 1(M.2) - Power Control
1: Power Off
0: Power On

bit3 = LTE 2(M.2) - Power Control
1: Power Off
0: Power On

7.Read Digial_In state

| Command | Response massage |
|---|---|
| GET DIGITAL_IN | DIGITAL_IN= 3 |

8.Ignition state (only read)

| Command | Response massage |
|---|---|
| GET IGNITION | IGNITION= 0<br>(0: Ignition off / 1: ignition on) |

9.Control the ON/OFF of each POE port

| Command | Response massage |
|---|---|
| SET DIGITAL_POE 1 | OK |
| GET DIGITAL_POE | DIGITAL_POE= 1 |

---

POE1/bit0 = 1
POE2/bit1 = 2
POE3/bit2 = 4
POE4/bit3 = 8
POE5/bit4 = 16
POE6/bit5 = 32

To achieve POE1~6 enable, please entry value setting at 63.

10.Write/Read Digital_DO state,
Setting : DO1、DO2、DO3、DO4

| Command | Response massage |
|---|---|
| SET DIGITAL_DO 3 | OK |
| GET DIGITAL_DO | DIGITAL_DO= 3 |

---

DO1/bit0 = 1
DO2/bit1 = 2
DO3/bit2 = 4
DO4/bit3 = 8

To achieve DO1~4 enable, please entry value setting at 15.

11. Relay Control

| Command | Response massage |
|---|---|
| SET RELAY_SWITCH 1 | OK |
| GET RELAY_SWITCH | RELAY_SWITCH= 1 |

---

bit0 = Relay1 Control
1: Enable
0: Disable

bit1 = Relay2 Control
1: Enable
0: Disable

12.Save setting

| Command | Response massage |
|---|---|
| SAVE | OK Flash Updated |

# APPENDIX C: TERMS AND CONDITIONS

## Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after-service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service, "RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
   - Improper or inadequate maintenance by the customer
   - Unauthorized modification, misuse, or reversed engineering of the product
   - Operation outside of the environmental specifications for the product.

## RMA Service

### Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

**Note**: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

# RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

| **RMA No:** | Reasons to Return: ☐ Repair (Please describe failure details) ☐ Testing Purpose |
|---|---|
| Company: | Contact Person: |
| Phone No. | Purchased Date: |
| Fax No.: | Apply Date: |
| Return Shipping Address: _____ | |
| Shipping by: ◻ Air Freight ◻ Sea ◻ Express:_____ | ◻ Others:_____ |

| Item | GP | Model Name | Serial Number | Configuration |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Item | Problem Code | Failure Status |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

***Problem Code:**

01:D.O.A.
02: Second Time R.M.A.
03: CMOS Data Lost
04: FDC Fail
05: HDC Fail
06: Bad Slot
07: BIOS Problem
08: Keyboard Controller Fail
09: Cache RMA Problem
10: Memory Socket Bad
11: Hang Up Software
12: Appearance Damage
13: SCSI
14: LPT Port
15: PS2
16: LAN
17: COM Port
18: Watchdog Timer
19: DIO
20: Buzzer
21: Shut Down
22: Panel Fail
23: CRT Fail
24: Others (Pls specify)

***Requested by***

_____

**Authorized Signature / Date**

***Confirmed by supplier***

_____

**Authorized Signature / Date**