SI-313 Series
Digital Signage Player

User's Manual

Version 1.1
(Aug. 2017)

iBASE

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Compliance

CE

In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.

FC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the 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 manufacturer's instructions, may cause harmful interference to radio communications.

UL CCC

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product is compliant with the current RoHS restrictions and prohibits use of the following substances in concentrations exceeding 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

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Important Safety Information

Carefully read the precautions before using the device.

Environmental conditions:

- Lay the device horizontally on a stable and solid surface in case the device may fall, causing serious damage.
- Leave plenty of space around the device and do not block the openings for ventilation. NEVER DROP OR INSERT ANY OBJECTS OF ANY KIND INTO THE VENTIILATION OPENINGS.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the device for ventilation. NEVER INSERT OBJECTS OF ANY KIND INTO THE VENTILATIN OPENINGS.
- Use this product in environments with ambient temperatures between 0˚C and 45˚C.
- DO NOT LEAVE THIS DEVICE IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY IS BELOW -20° C OR ABOVE 80° C. This could damage the device. The device must be used in a controlled environment.

Care for your IBASE products:

- Before cleaning the device, turn it off and unplug all cables such as power in case a small amount of electrical current may still flow.
- Use neutral cleaning agents or diluted alcohol to clean the device chassis with a cloth. Then wipe the chassis with a dry cloth.
- Vacuum the dust with a computer vacuum cleaner to prevent the air vent or slots from being clogged.

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on your device.
- Do not place heavy objects on the top of the device.
- Operate this device from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your distributor or local power company.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure that the total ampere rating of the product plugged into the extension cord does not exceed its limits.

Avoid Disassembly

You are not suggested to disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

Danger of explosion if internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

* PRODUCTS, HOWEVER, THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.

   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)

3. If repair service is required, you can download the RMA form at http://www.ibase.com.tw/english/Supports/RMAService/. Fill out the form and contact your distributor or sales representative.

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Optional Accessories
- Overview
- Dimensions

1.1 Introduction

SI-313, a product code of IBASE digital signage player series, is a mid-range system with iSmart and capable of auto-scheduling for general applications. It is designed with the feature of segregated flow ventilation. The device is powered by the AMD 3rd Gen. Embedded R-Series SOC APU, and outputs through HDMI 4K ultra high definition video playback at 60 Hz. The device is able to be operated at the ambient operating temperature ranging from 0 ~ 45 °C, and even lower from -20 ~ 80 °C for storage.

Phot of SI-313

1.2 Features

- iSMART- for auto-scheduler and power resume
- 3nd Generation AMD Embedded R-series APU (Codenamed: Merlin Falcon), up to 35W for SI-313 & up to 15W for SI-313-N series
- Next-gen AMD Radeon™ HD GPU integrated
- Supports AMD Eyefinity video wall display configuration setting
- 3x HDMI 2.0 with independent audio output support in Hardware EDID emulation function
- 2x DDR4 2133 SO-DIMM, dual-channel, Max. 32GB
- 1x M.2 B key(3042) for storage, Wi-Fi, Bluetooth, 4G options
- 1x Mini PCI-E (Full-size) for Wi-Fi, Bluetooth, 4G, or TV tuner options
- Segregated flow ventilation design for SI-313 series & Fanless design for SI-313-N series

1.3 Packing List

Your product package should include the items listed below. If any of the items below is missing, contact the distributor or the dealer from whom you purchased the product.

- SI-313 Series Digital Signage Player (with Rack Mount Kit) x 1
- Power Adapter x 1
- Power Cord x 1
- HDMI Cable Holder x 1
- Screws for HDMI Cable Holder x 2
- Screws for Rack Mount Kit x 4
- Disk (including drivers and this user manual) x 1

1.4 Optional Accessories

IBASE provide optional accessories as follows. Please contact us or your dealer if you need any.

- WiFi Cable Kit

1.5 Specifications

Product	SI-313	SI-313-N
System		
Mainboard	MBD313	
Operating System	Windows 10 (64-bit) / 10 IoT Enterprise (64-bit) Windows 8.1+ (64-bit) Windows 7 (32-bit / 64-bit) Windows Embedded Standard 8 (32-bit / 64-bit) Windows Embedded Standard 7 (32-bit / 64-bit) Linux Open Source (64-bit)	
CPU	AMD 3rd Gen. Embedded R-Series SoC APU (FP4 BGA) CPU Clock (Max/Base): 3.4 GHz / 2.1 GHz	
TDP	Max. 35W	Max. 15W
Chipset	AMD integrated SoC	
Cache	Up to 4 MB	
Memory	2 x DDR4 SO-DIMM 4GB 2133 MHz, dual channel, expandable up to 32GB	
Graphics	Next-gen. AMD Radeon™ HD GPU integrated	
Super I/O	Fintek F81846AD	
Storage	• 1 x NGFF M.2 (3042) B key • 1 x NGFF M.2 (2280) M key	
Power Requirement	12V DC-in	
Power Supply	150W power adapter	84W power adapter
Wireless	WiFi module 802.11 a/b/g/n (Optional)	
Watchdog	Watchdog Timer 256 segments, 0, 1, 2…255 sec/min	
iSmart	V3.2	
System Fan	1 x CPU fan	
Chassis	Aluminum and SGCC, black & white	
Mounting	Standard system bracket Slim design with wall mount holes	
Dimensions (W x H x D)	215.6 x 33 x 150 mm (8.49” x 1.3” x 5.9”)	
Net Weight	1.55 kg (3.42 lb)	1.5 kg (3.31 lb)
Certificate	CE, FCC Class B, UL, CCC	

Product	SI-313	SI-313-N
I/O Ports		
HDMI	**3 x HDMI 2.0**, choose either way: • Use 2 ports for 4K (3840 x 2160) display at 60 Hz (via HDMI 2.0) (If 3 displays are connected, the resolutions will be 4K, 4K, 1080p per the sequence of connection.) • Use 3 port for 4K (3840 x 2160) display at 30 Hz (via HDMI1.4)	
LAN	1 x GbE RJ45 LAN port	
Serial	• 1 x RJ45 for COM1 RS-232 port • 1 x on-board pin-header for COM2 RS-232 port	
USB	• 2 x USB 3.0 • 2 x USB 2.0	
Audio Jack	• 1 x Line-Out • 1 x Microphone Input	
Power Jack	1 x DC-in power jack	
Expansion	• 1 x M.2 (3042) B Key with PCIe (x2) for storage / WiFi / BT / 4G LTE options • 1 x M.2 (2280) M Key with SATA • 1 x Mini-PCIe (x1) for WiFi / BT / TV tuner / 4G LTE options • 1 x SIM card slot	
Environment		
Temperature	• **Operating:** 0 ~ 45 °C (32 ~ 113 °F) • **Storage:** --20 ~ 80 °C (-4 ~ 176 °F)	
Relative Humidity	10 ~ 90% (non-condensing)	
Vibration Protection	M.2: Operating, random vibration 5 grms (5~500Hz)	

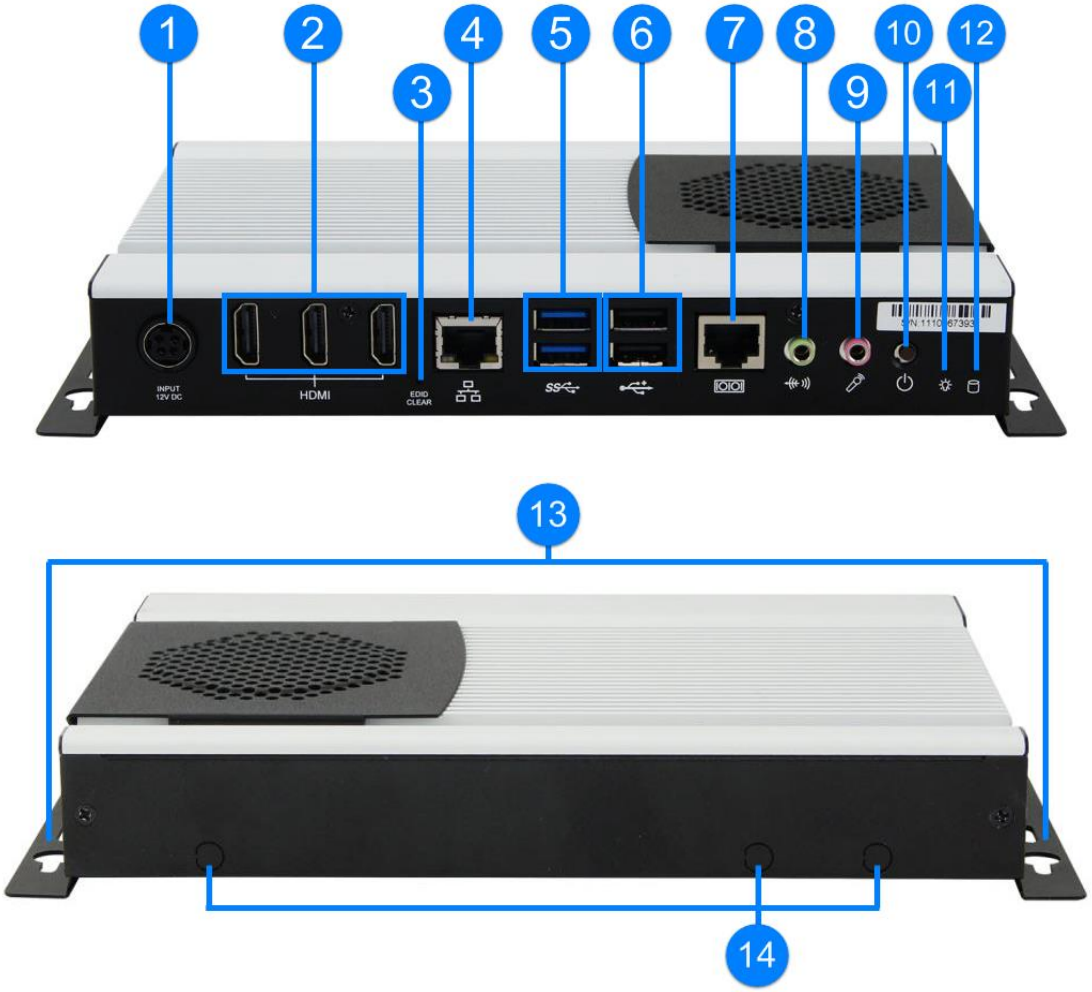
All specifications are subject to change without prior notice.

1.6 Overview – SI-313

Top View

Oblique View

I/O View



No.	Name	No.	Name
1	DC Power Input	8	Audio Line-Out
2	HDMI 2.0 Port	9	Microphone Input
3	EDID Clearance Button*	10	Power Button
4	LAN Port	11	LED Indicator for Power
5	USB 3.0	12	LED Indicator for HDD
6	USB 2.0	13	Mounting Kit
7	COM Port	14	Antenna Hole

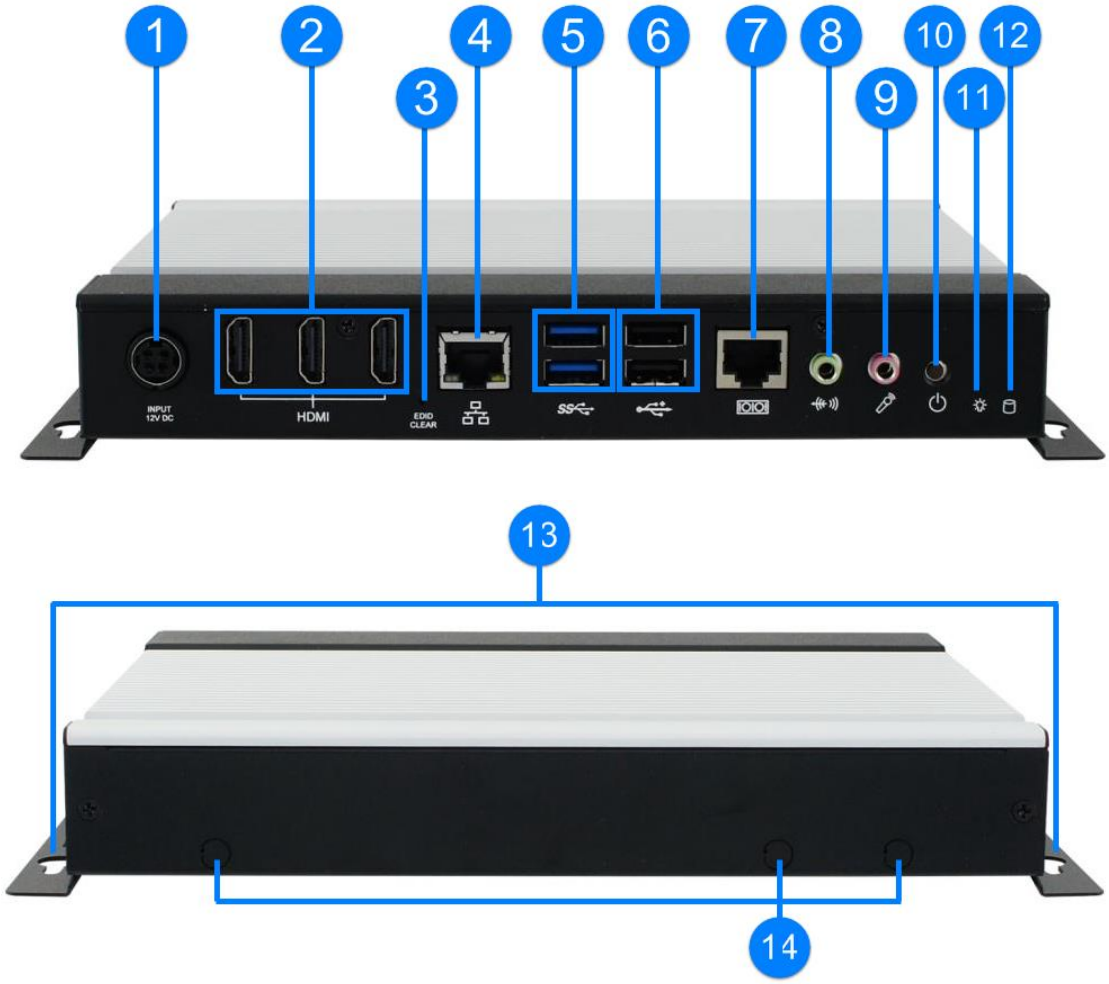
* Be sure to press the EDID Clearance Button shortly so as to clear the EDID register if any connected display/monitor is unable to be recognized, or when the image displayed cannot not be resampled to fit the screen.

1.7 Overview – SI-313-N

Top View

Oblique View

I/O View



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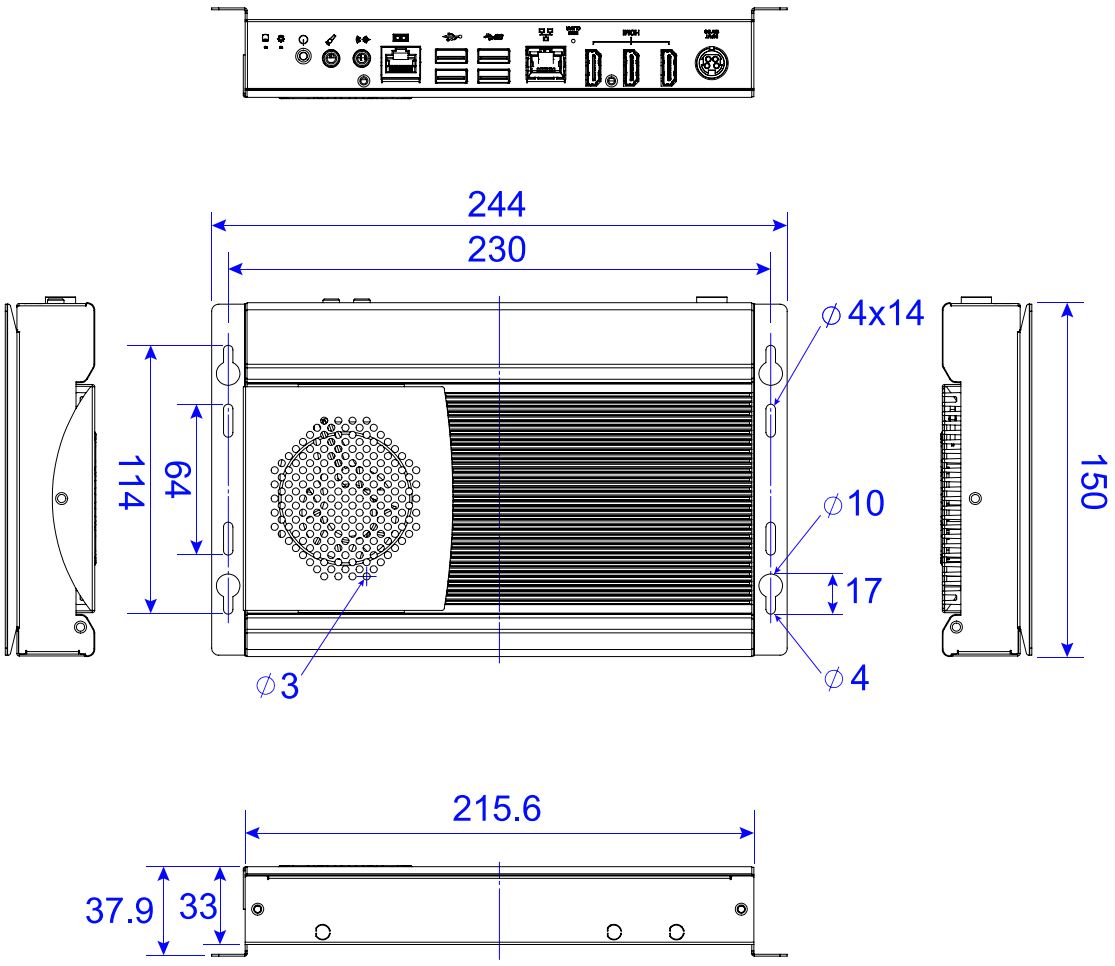
* Be sure to press the EDID Clearance Button shortly so as to clear the EDID register if any connected display/monitor is unable to be recognized, or when the image displayed cannot not be resampled to fit the screen.

1.8 Dimensions

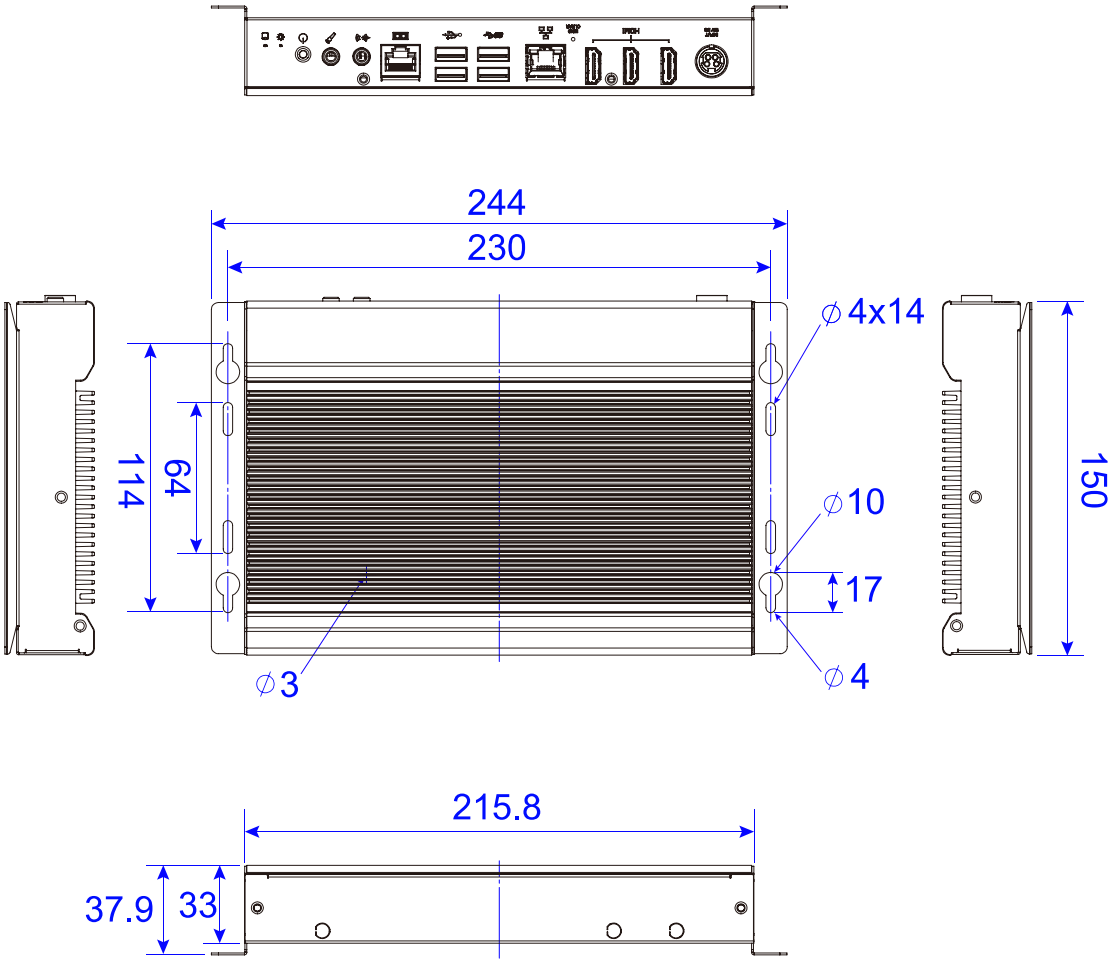
Unit: mm

SI-313:



Unit: mm

SI-313-N:



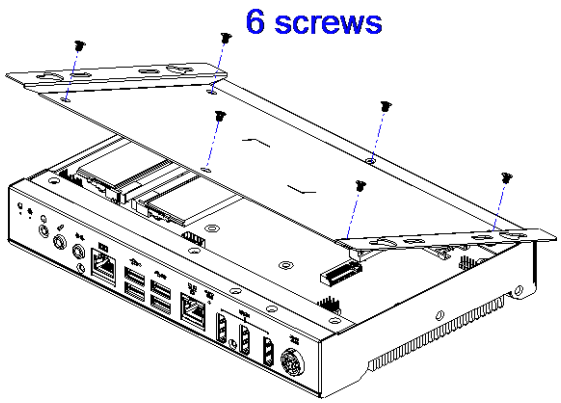
Chapter 2
Hardware Installation & Motherboard Information

The information provided in this chapter includes:

- Essential installations before you begin
- Information and locations of connectors

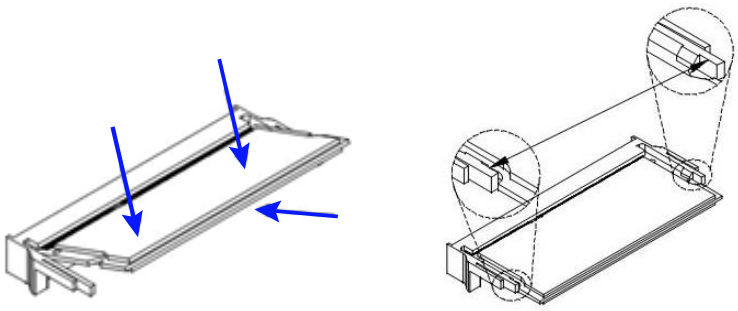
2.1 Essential Installations Before You Begin

Before you perform installations, release the following 6 screws, lift and pull out the bottom cover first.



2.1.1 Memory Installation

To install the modules, locate the memory slot on the board and perform the following steps:



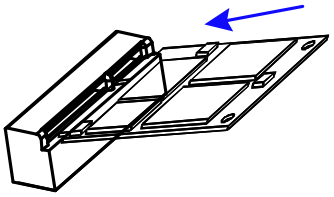
1. Align the key of the memory module with that on the memory slot and insert the module slantwise.
2. Gently push the module in an upright position until the clips of the slot close to hold the module in place when the module touches the bottom of the slot.

To remove the module, press the clips outwards with both hands.

2.1.2 Mini PCIe & M.2 Network Cards Installation

1. Align the key of the mini PCIe card to the Mini PCIe interface, and insert the card slantwise.

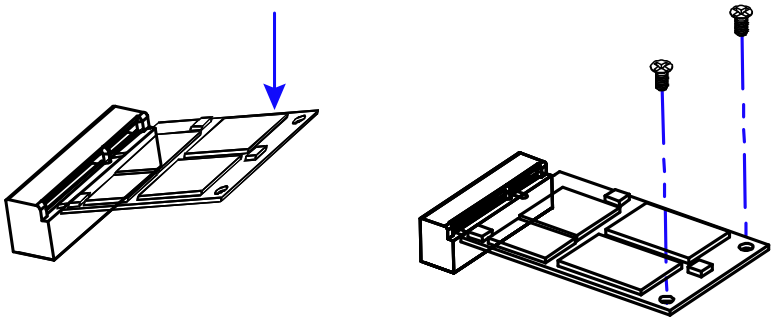
   (Insert the M.2 network card in the same way.)



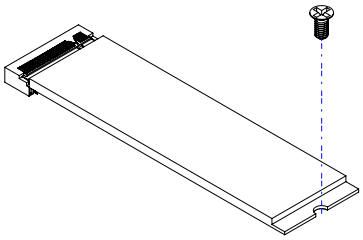
2. Push the mini PCIe card down, fix it with 2 screws.

   (Fix the M.2 network card with a screw.)

   Mini PCIe:



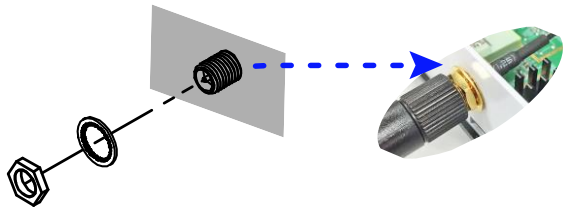
   M.2:



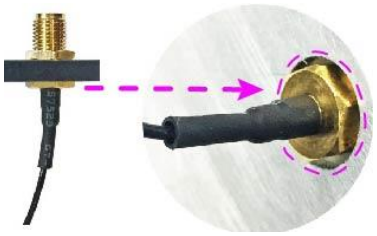
2.1.3 WiFi / 3G / 4G Antenna Installation

Thread the WiFi / 3G / 4G antenna extension cable through an antenna hole of the front I/O cover and fasten the antenna as shown below. Then apply adhesive to the edge of the hex nut behind the front I/O cover to prevent the extension cable from falling if the cable becomes loose.

1. Thread and fasten the hex nut and the washer. Then install the antenna.



2. Apply adhesive around here.



Info: The diameter of the nut is around 6.35 mm (0.25”-36UNC).

2.1.4 Wall Mount Installation

Note: Before mounting the system on wall, ensure that you are following all applicable building and electric codes.

Requirements

When mounting, ensure that you have enough room for power and signal cable routing, and have good ventilation for power adapter. The method of mounting must be able to support weight of the SI-313 plus the suspension weight of all the cables to be attached to the system. Use the following methods for mounting your system:

Selecting the Location

Plan the mounting location thoroughly. Locations such as walkway areas, hallways, and crowded areas are not recommended. Mount the product to a flat, sturdy, structurally sound column or wall surface.

The best mounting surface is a standard countertop, cabinet, table, or other structure that is minimally the width and length of the product. This will reduce the risk that someone may accidentally walk into and damage the product. Local laws governing the safety of individuals might require this type of consideration.

Selecting the type of wall construction

1. Mounting on a hollow wall

   - **Wood surface**
     Use construction-grade wood and the recommended minimum thickness is 38 x 25.4 mm (1.5” x 10”).

     Note: This method provides the most reliable attachment for the product with little risk that the product may come loose or require ongoing maintenance.

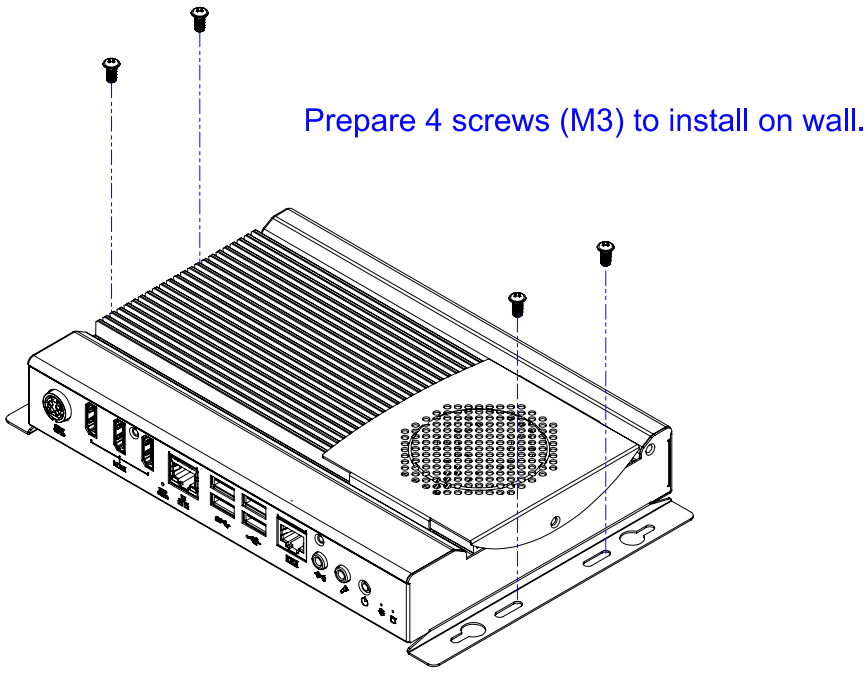
   - **Drywall**
     Drywall over wood studs is acceptable.

2. Mounting on a solid concrete or brick wall with flat and smooth surface

Wall mount installation instructions:

(This is illustrated by the example of SI-313.)

Prepare at least 4 screws (M3) to install the device on wall as below.



You can install your SI-313 on plastic (LCD monitor), wood, drywall surface over studs, or a solid concrete or metal plane directly. The types of fasteners required are dependent on the type of wall construction.

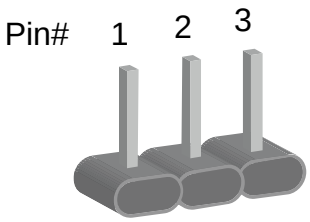
Fasteners are not supplied in the product package. You will need to prepare the fasteners. Choose fasteners that are rated either **Medium Duty** or **Heavy Duty**. To assure proper fastener selection and installation, follow the fastener manufacturer's recommendations.

2.2 Setting the Jumpers

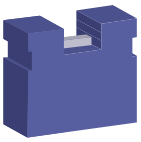
Set up and configure your SI-313 by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

2.2.1 How to Set Jumpers

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

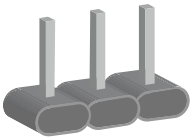
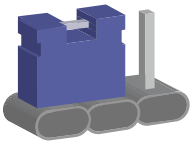
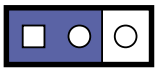
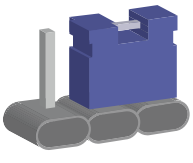
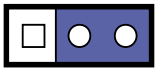


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

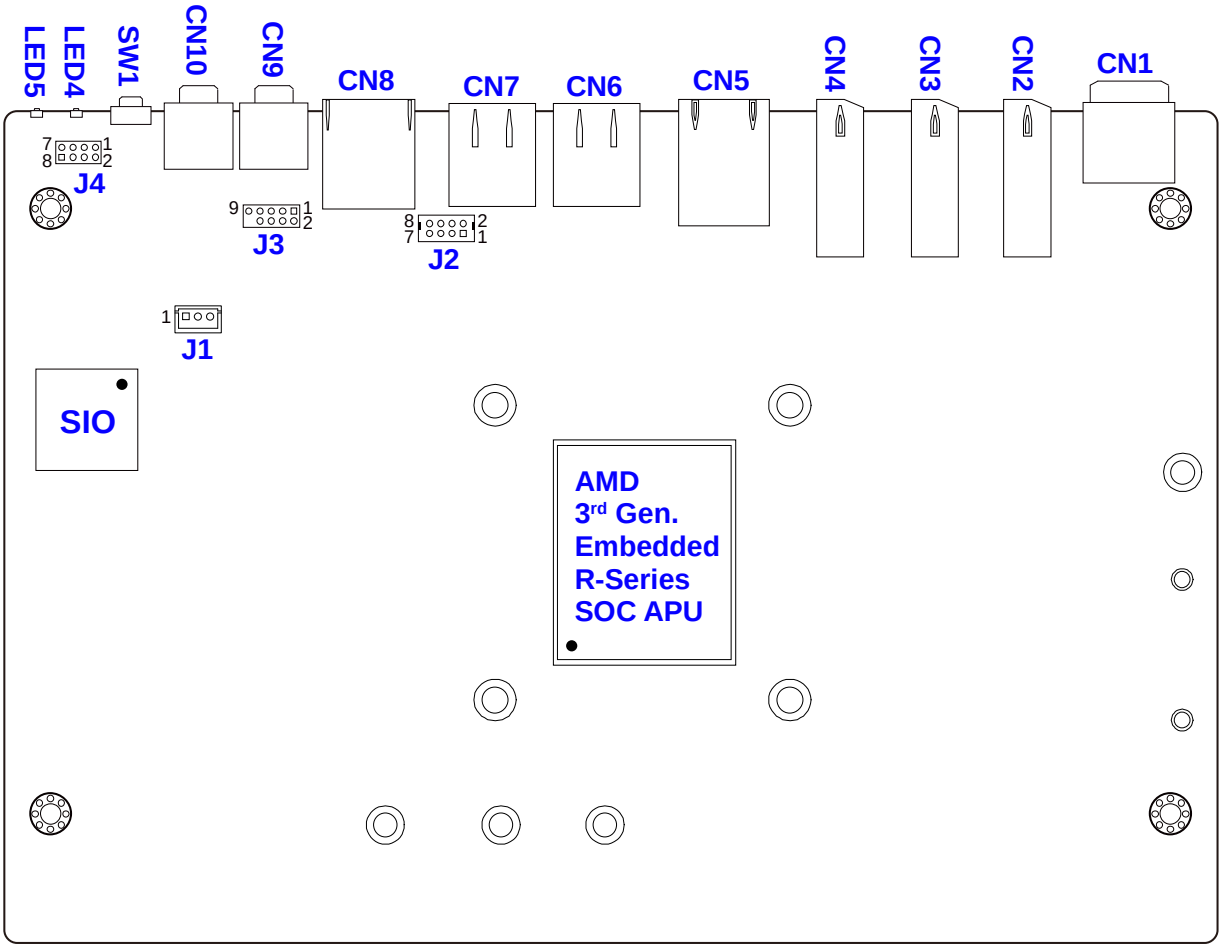
Pin closed	Oblique view	Schematic illustration in the manual
Open		
1-2		
2-3		

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

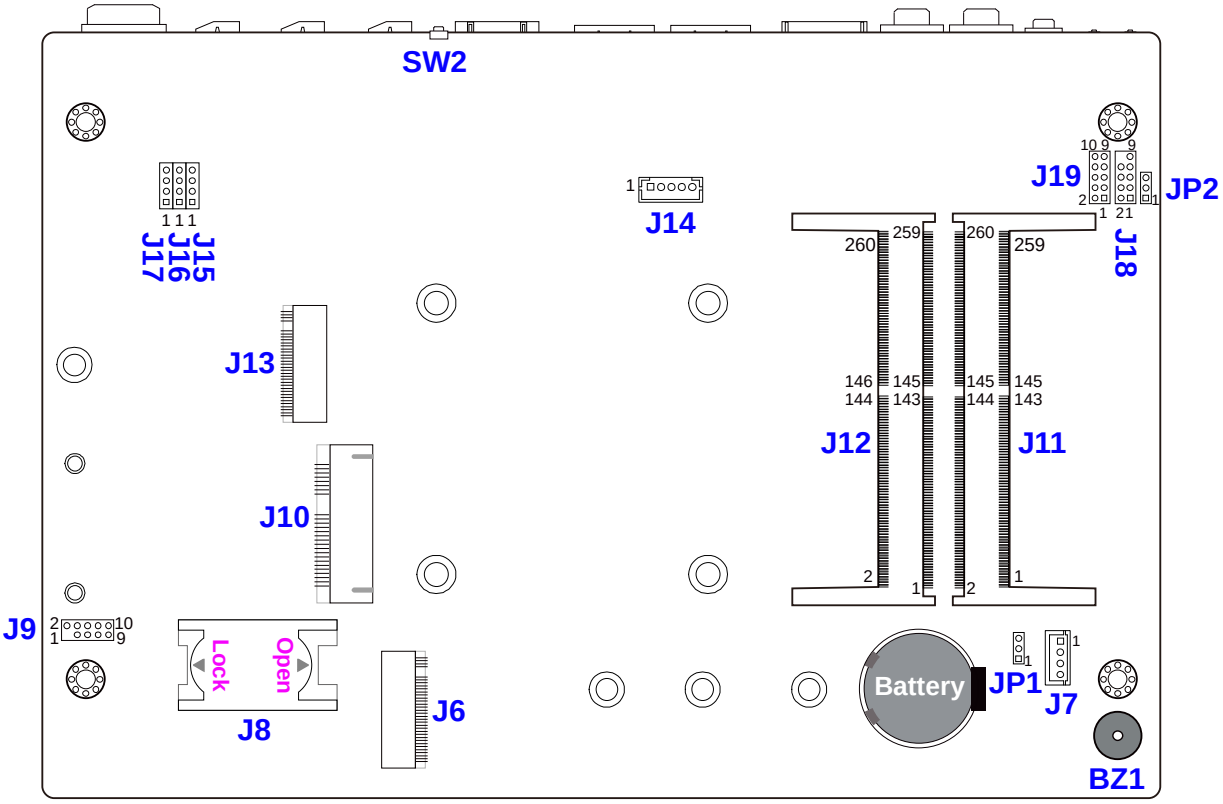
When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations on Motherboard

Motherboard: MBD313



MBD313 - top

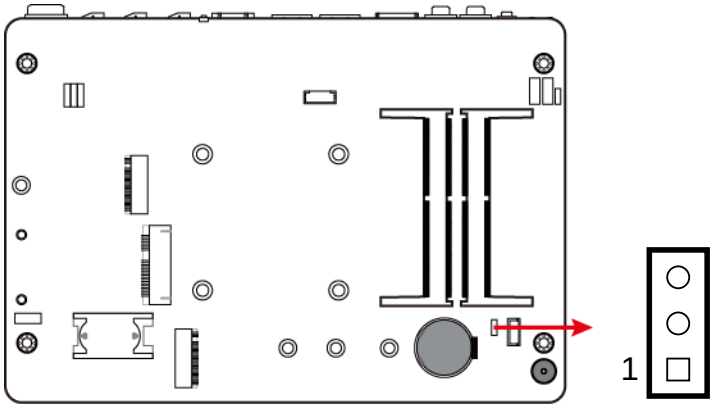


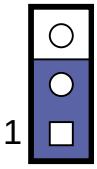
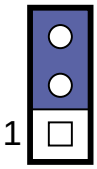
MBD313 - bottom

2.4 Jumpers Quick Reference

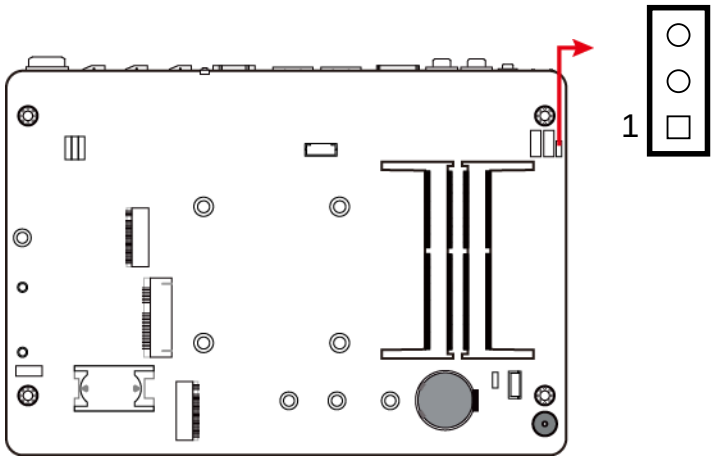
Function	Connector Name	Page
CMOS Data Clearance	JP1	21
ATX / AT Power Mode Selection	JP2	22

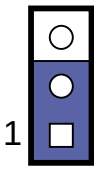
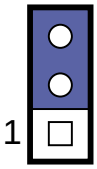
2.4.1 CMOS Data Clearance (JP1)



Function	Pin closed	Illustration
Normal (default)	1-2	
Clear CMOS	2-3	

2.4.2 ATX / AT Power Mode Connector (JP2)



Function	Pin closed	Illustration
ATX (default)	1-2	
AT	2-3	

2.5 Connectors Quick Reference

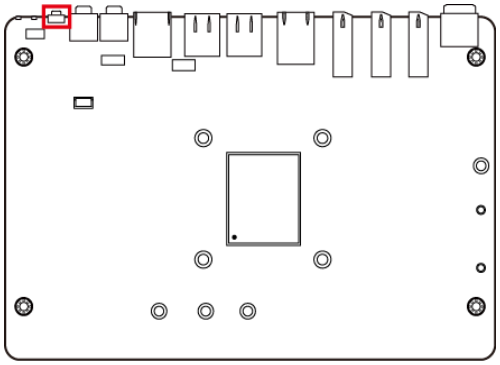
I/O coastline connectors:

Function	Connector Name	Page
Power Button	SW1	24
EDID Clearance Button	SW2	24
LED Indicator	LED4 (Red, for Power) LED5 (Green, for HDD)	25
DC Power Input	CN1	25
HDMI 2.0 Port	CN2,CN3,CN4	26
LAN Port (GbE)	CN5	26
Dual USB 3.0 Ports	CN6	26
Dual USB 2.0 Ports	CN7	27
COM1 RS-232 Port	CN8	27
Audio Jack	CN9 (Line-out) CN10 (Microphone Input)	28

On-board connectors:

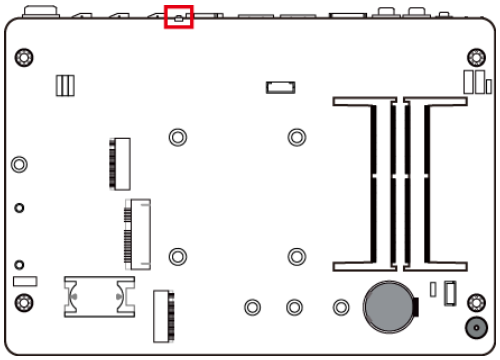
Function	Connector Name	Page
CPU Fan Power Connector	J1	28
USB 2.0 Ports Header	J2	29
COM2 RS232 Port	J3:	29
System Function Connector	J4	30
NGFF M.2 Connector	J6 (M-KEY 2280) J13 (B-KEY 3042)	30
SIM Card Socket	J8	31
Mini PCIE Connectors	J10	31
DDR4 SO-DIMM	J11, J12	31
Digital I/O Header	J19	32
Factory Use Only	J7, J9, J14, J15, J16, J17, J18	--

2.5.1 Power Button (SW1)

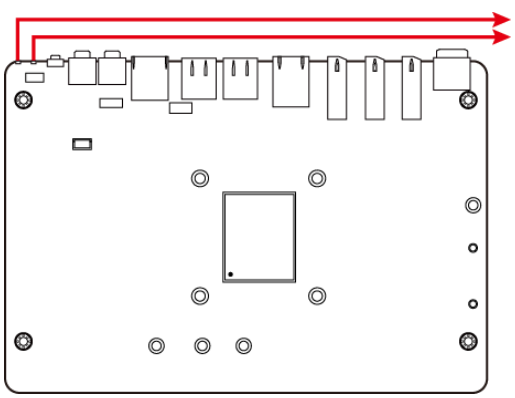


2.5.2 EDID Clearance Button (SW2)

Note: Be sure to press this button shortly so as to clear the EDID register if any connected display/monitor is unable to be recognized, or when the image displayed cannot not be resampled to fit the screen.



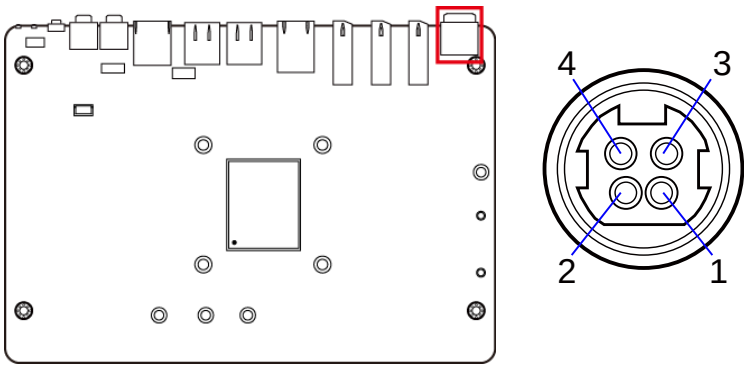
2.5.3 LED Indicators for Power & HDD (LED4, LED5)



LED4 is the red LED indicator for power status. It stays on (not blinks) as the device is on.

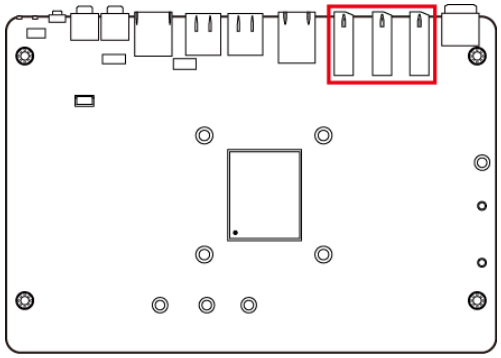
LED5 is the green LED indicator for HDD. When HDD is being read, it blinks.

2.5.4 DC Power Input (CN1)

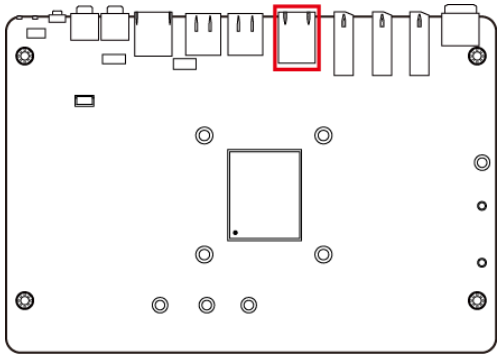


Pin	Assigment	Pin	Assigment
1	Ground	3	+12V
2	Ground	4	+12V

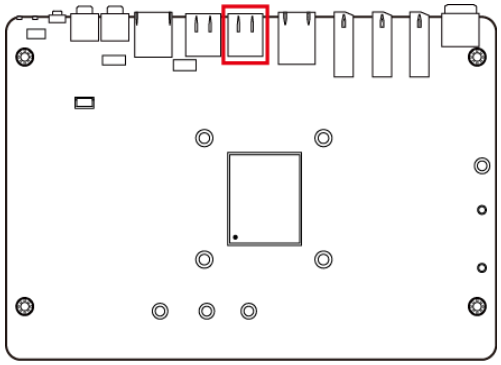
2.5.5 HDMI 2.0 Port (CN2, CN3, CN4)



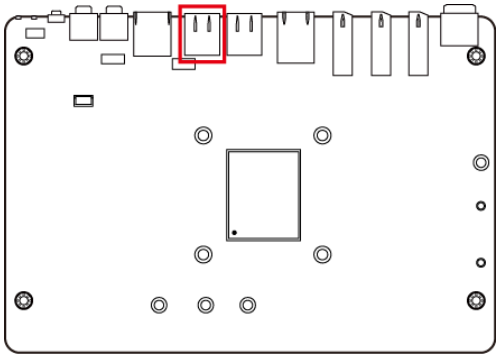
2.5.6 LAN Port (CN5)



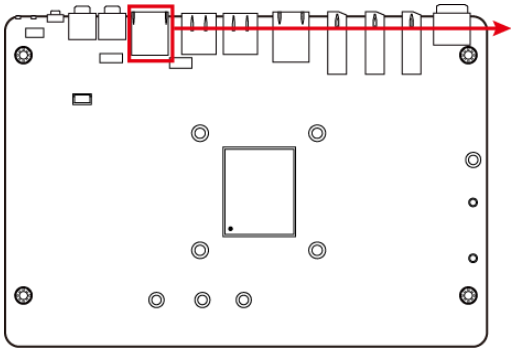
2.5.7 Dual USB 3.0 Ports (CN6)

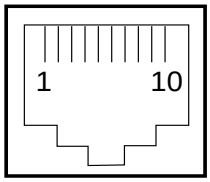


2.5.8 Dual USB 2.0 Ports (CN7)



2.5.9 COM1 RS-232 Port (CN8)

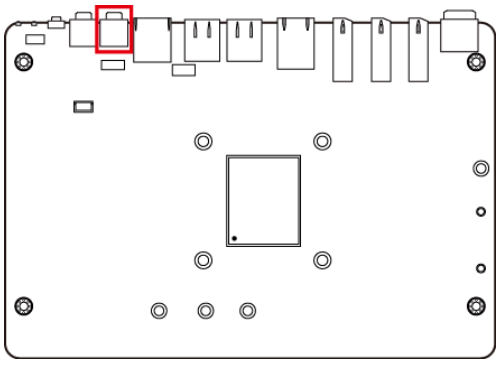




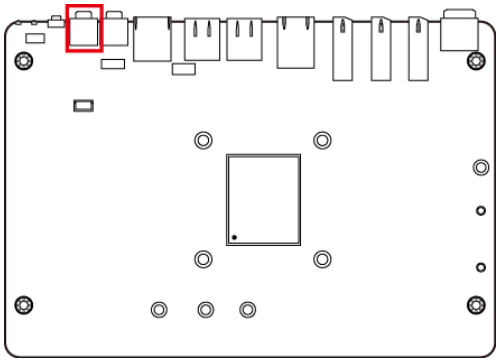
Pin	Assigment	Pin	Assigment
1	DSR (Data set ready)	6	DCD (Data carrier detect)
2	Ground	7	DTR (Data terminal ready)
3	Ground	8	CTS (Clear to send)
4	TX (Transmit)	9	RTS (Request to send)
5	RX (Receive)	10	RI (Ring indicator)

2.5.10 Audio Jack (CN9, CN10)

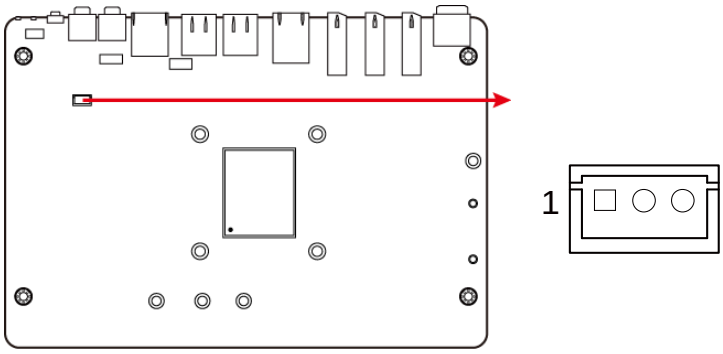
CN9: Line-out



CN10: Microphone Input

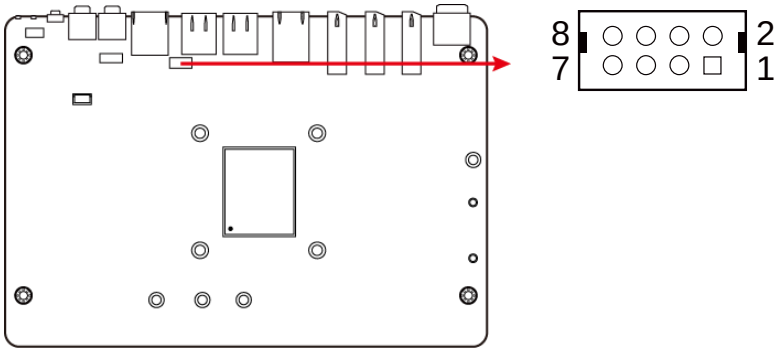


2.5.11 CPU Fan Power Connector (J1)



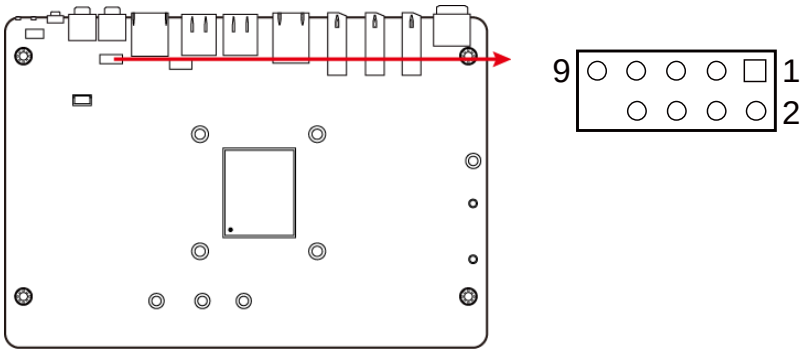
Pin	Assigment
1	Ground
2	+12V
3	Rotation detection

2.5.12 USB 2.0 Ports Header (J2)



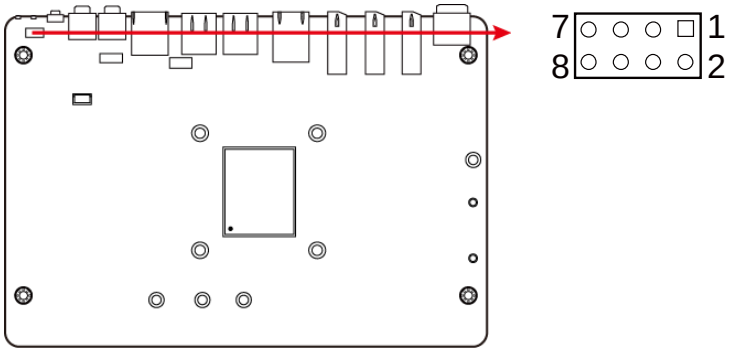
Pin	Assigment	Pin	Assigment
1	+5V	2	+5V
3	Data-	4	Data-
5	Data+	6	Data+
7	Ground	8	Ground

2.5.13 COM2 RS-232 Port (J3)



Pin	Assigment	Pin	Assigment
1	DCD (Data carrier detect)	2	DSR (Data set ready)
3	RXD (Receive data)	4	RTS (Request to send)
5	TXD (Transmit data)	6	CTS (Clear to send)
7	DTR (Data terminal ready)	8	RI (Ring indicator)
9	Ground		

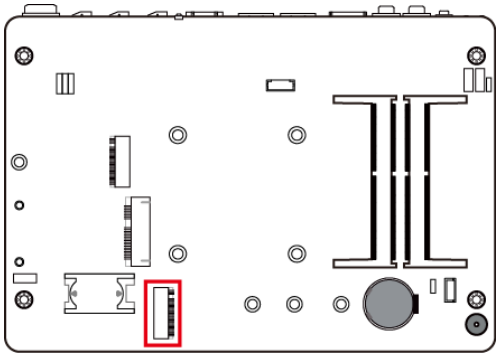
2.5.14 System Function Connector (J4)



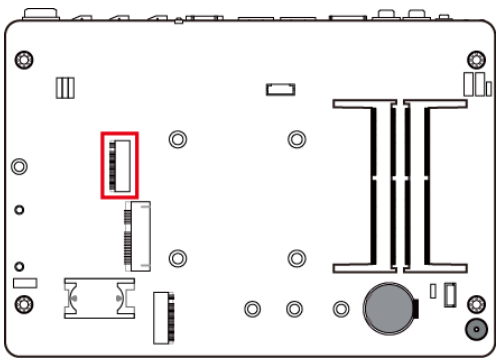
Pin	Assigment	Pin	Assigment
1	Power BTN	2	Power BTN
3	HDD LED+	4	HDD LED-
5	Reset BTN	6	Reset BTN
7	+5V	8	+5VSB

2.5.15 NGFF M.2 Connector (J6, J13)

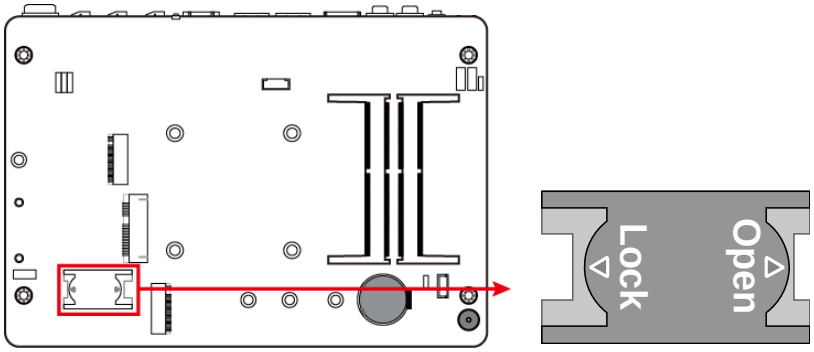
J6 is a M.2 M-Key (2280) connector with SATA.



J13 is a M.2 B-Key (3042) connector with PCIe (x2) , USB 2.0, USB 3.0, and SATA.

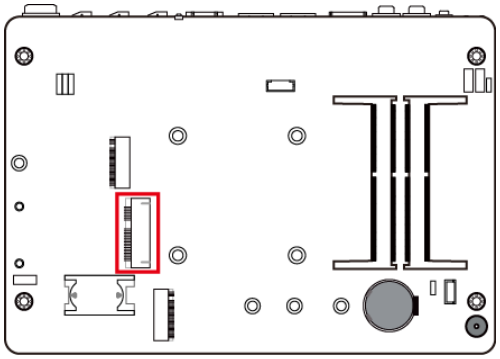


2.5.16 SIM Card Socket (J8)

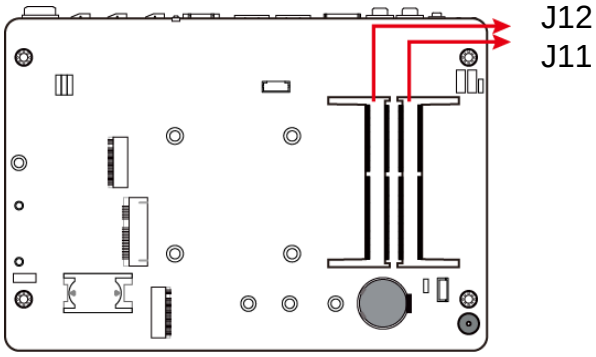


2.5.17 Mini PCIe Connector (J10)

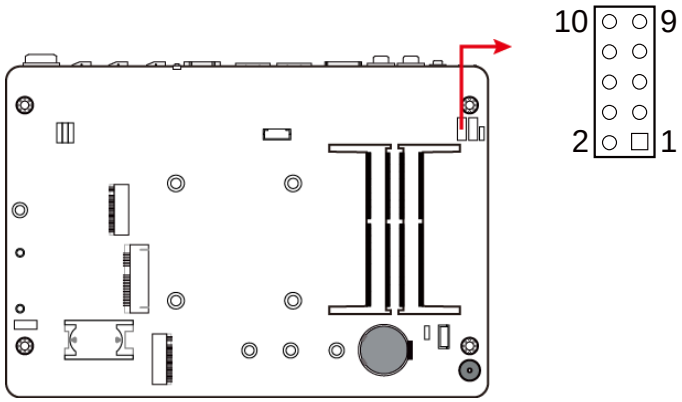
J10 is a Mini PCIe connector with PCI-e, USB and SIM.



2.5.18 DDR4 SO-DIMM (J11, J12)



2.5.19 Digital I/O Connector (J19)



Pin	Assigmentd	Pin	Assigment
1	Ground	2	+5V
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

Chapter 3
Driver Installation

The information provided in this chapter includes:

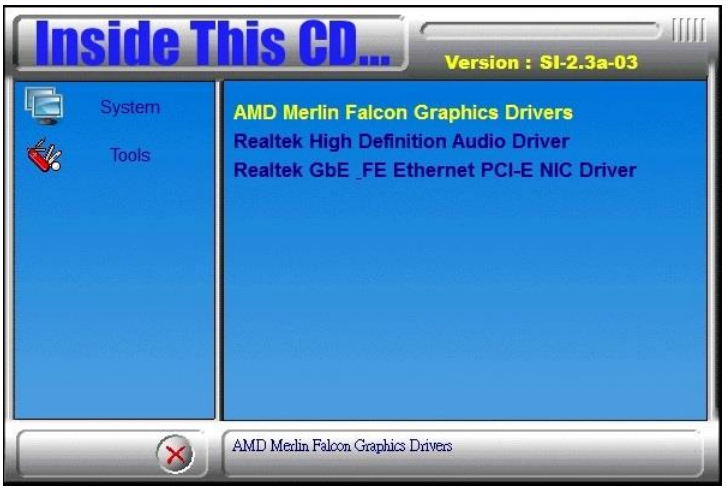
- AMD Merlin Falcon Graphics Drivers Installation
- HD Audio Driver Installation
- LAN Driver Installation

3.1 Introduction

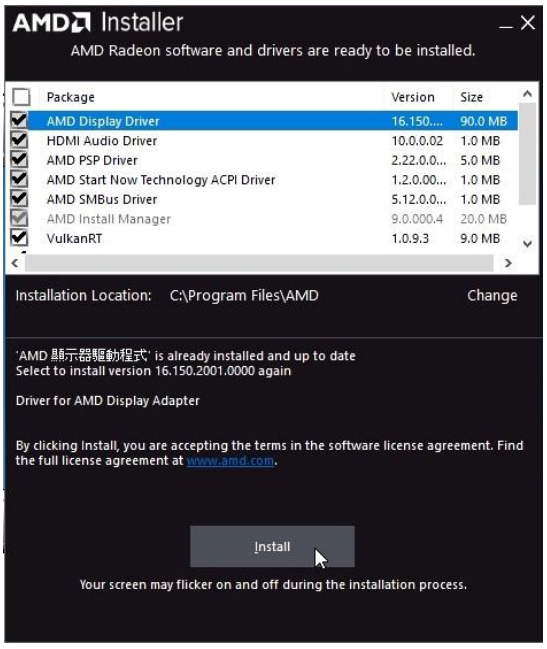
This section describes the installation procedures for software drivers. The software drivers are in a disk enclosed with the product package. If you find anything missing, please contact the distributor where you made the purchase.

3.2 AMD Merlin Falcon Graphics Drivers Installation

1. Insert the disk enclosed in the package. Click **System** and then **AMD Merlin Falcon Graphics Drivers Installation**.



2. Click **Install** to cintinue.
3. Select the desired drivers and click **Install**.

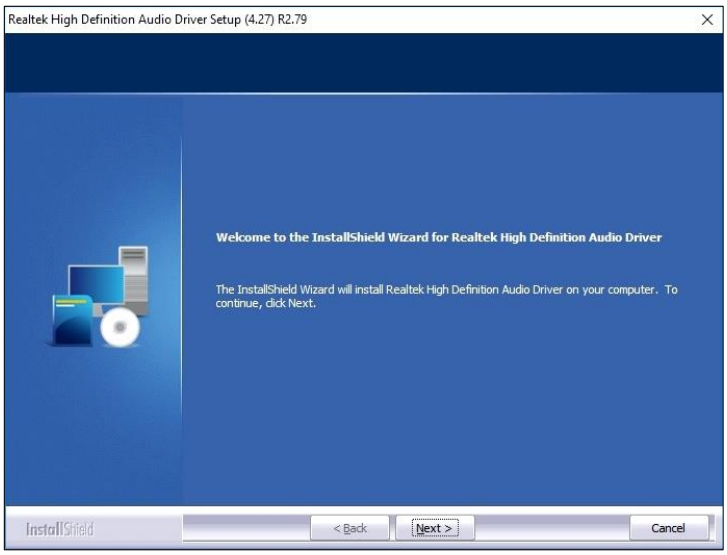


4. The driver has been completely installed. You are suggested to restart the computer for changes to take effect.

3.3 HD Audio Driver Installation

1. Insert the disk enclosed in the package with the board. Click **System** and then **Realtek High Definition Audio Driver**.

2. On the *Welcome* screen of the InstallShield Wizard, click **Next**.



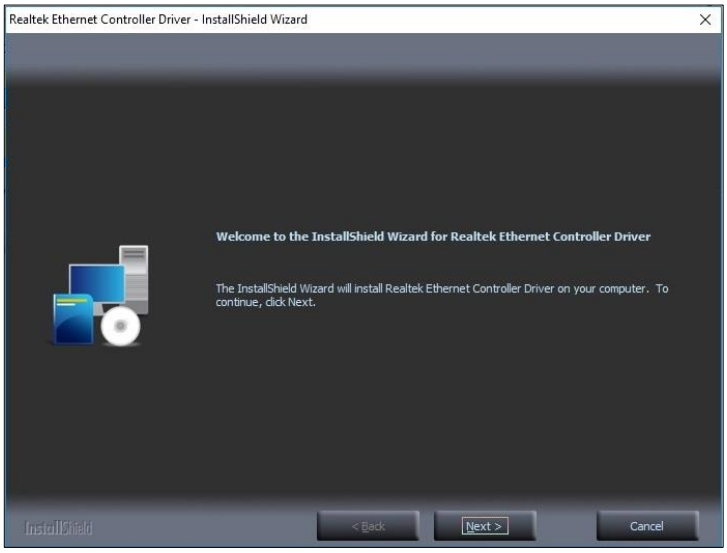
3. After reading the descriptions of the setup options, click **Next** to start installation.

4. The driver has been completely installed. You are suggested to restart the computer and for changes to take effect.

3.4 LAN Driver Installation

1. Insert the disk enclosed in the package with the board. Click **System** and then **Realtek GbE _FE Ethernet PCI-E NIC Driver**.

2. When the *Welcome* screen appears, click **Next** and then **Install** to contiune installation.



3. The driver has been completely installed. You are suggested to restart the computer for changes to take effect.

Chapter 4
BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

- Main Settings
- Advanced Settings
- Chipset Settings
- Security Settingss
- Book Settings
- Save & Exit

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives, serial ports and parallel ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Press the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still need to enter Setup, restart the system by pressing the ”Reset” button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

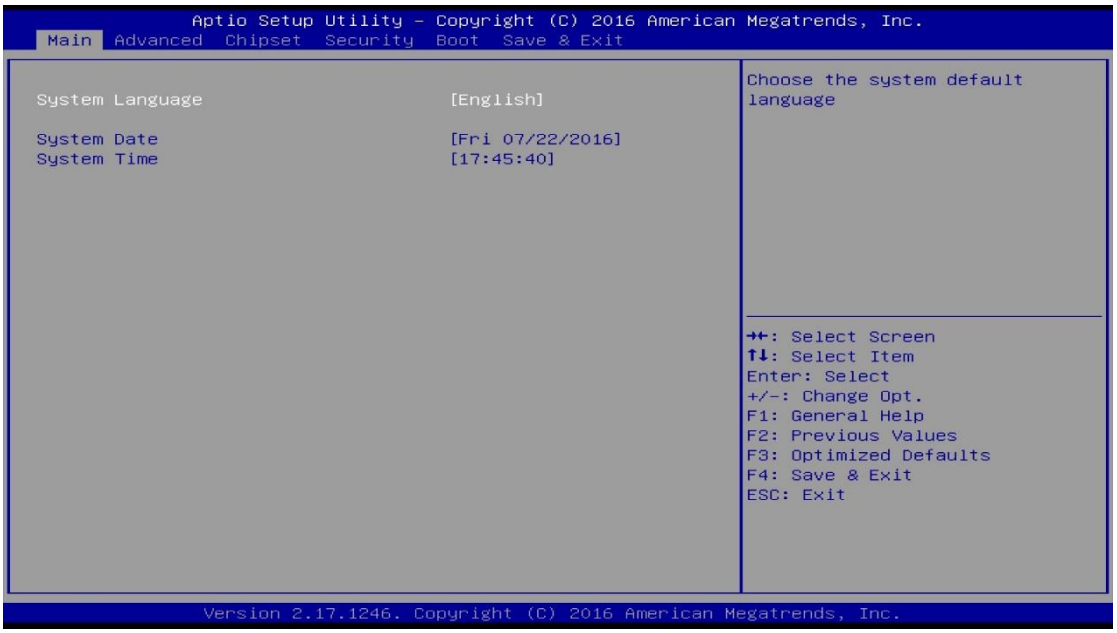
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.

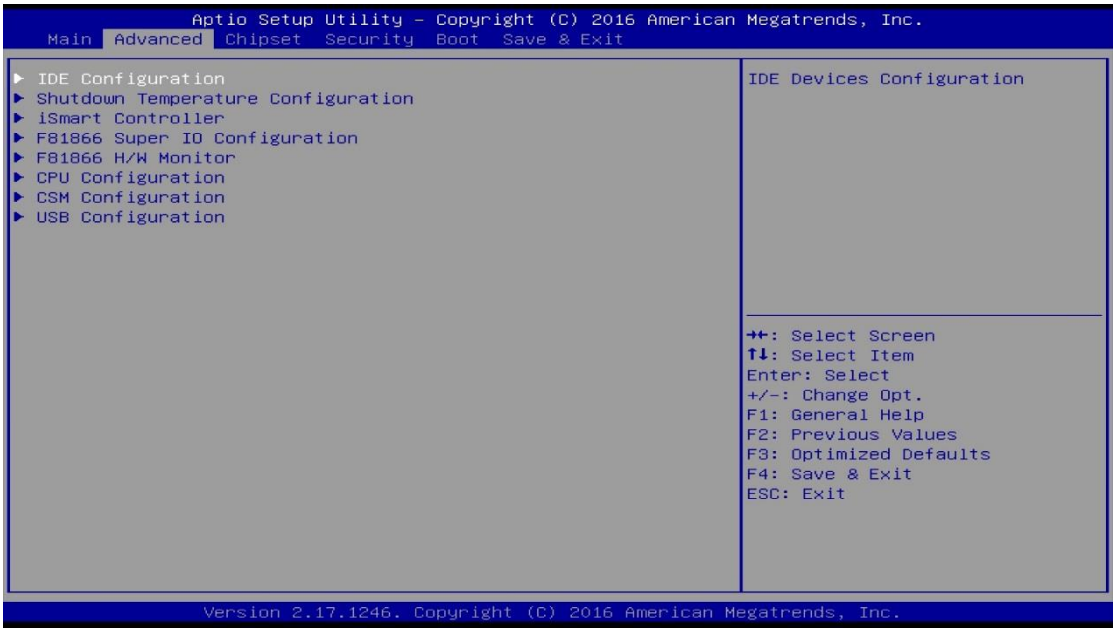
4.3 Main Settings



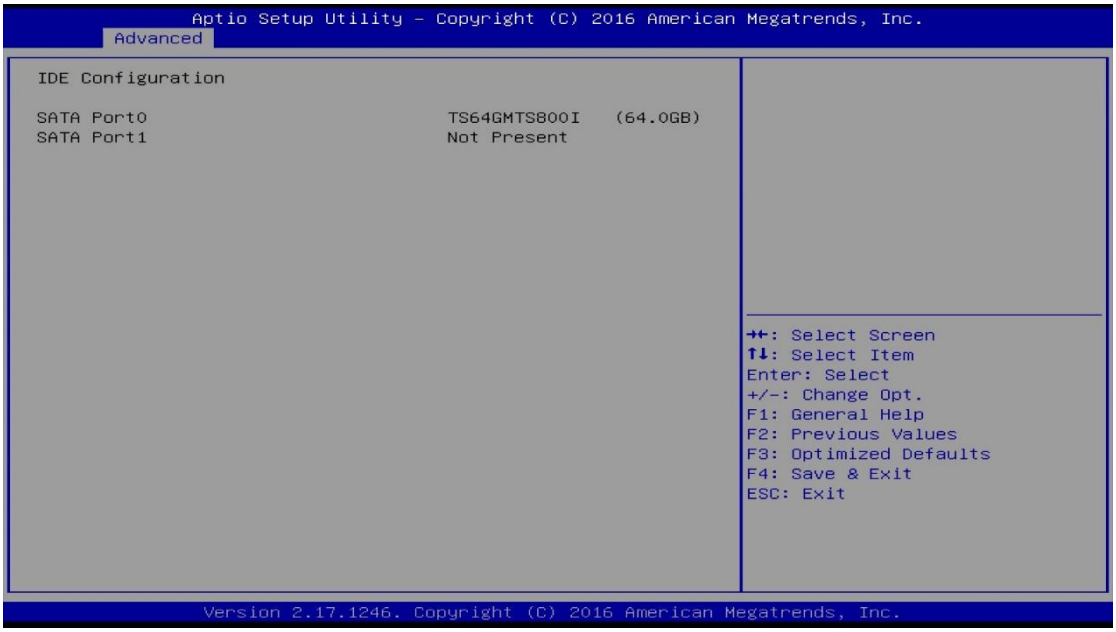
BIOS Setting	Description
System Language	Choose the system default language.
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

4.4 Advanced Settings

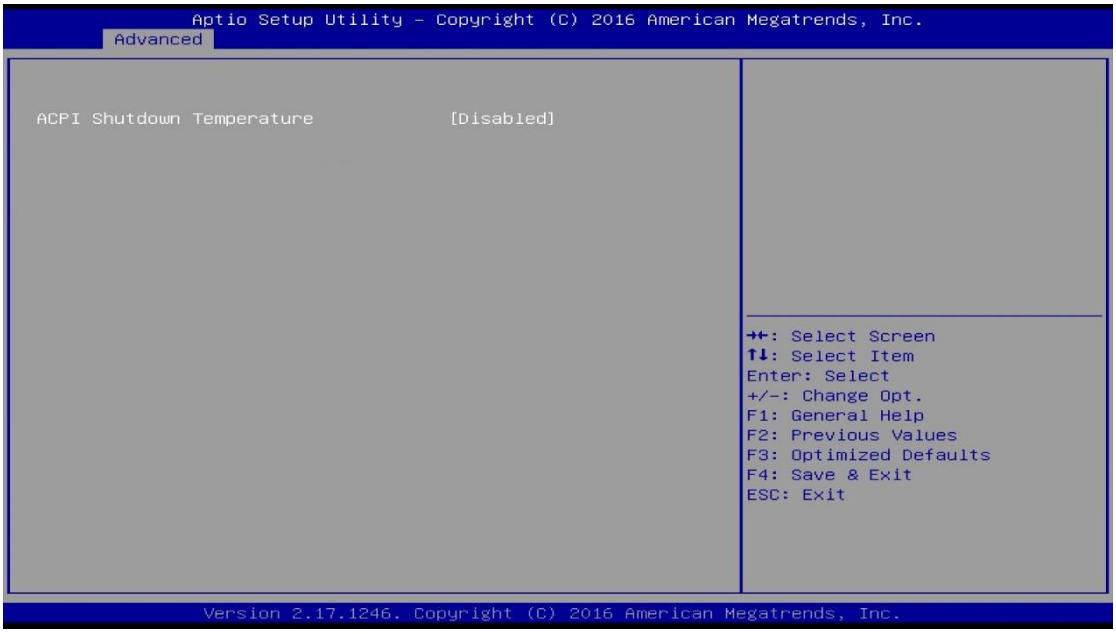
This section allows you to configure, improve your system and allows you to set up some system features according to your preference.



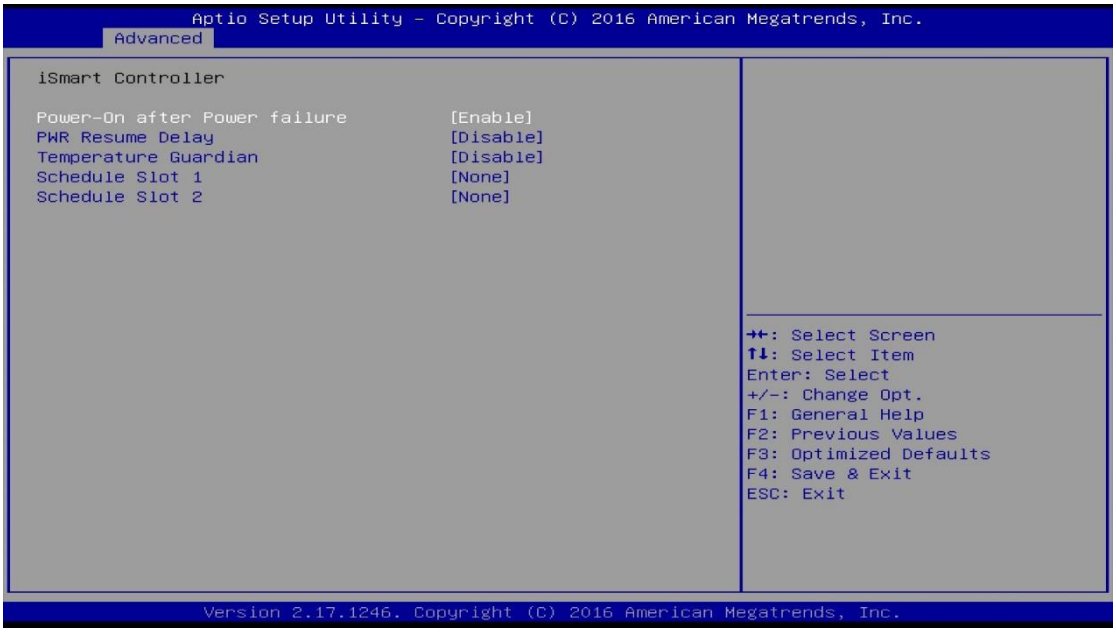
4.4.1 IDE Configuration



4.4.2 ACPI Shutdown Temperature

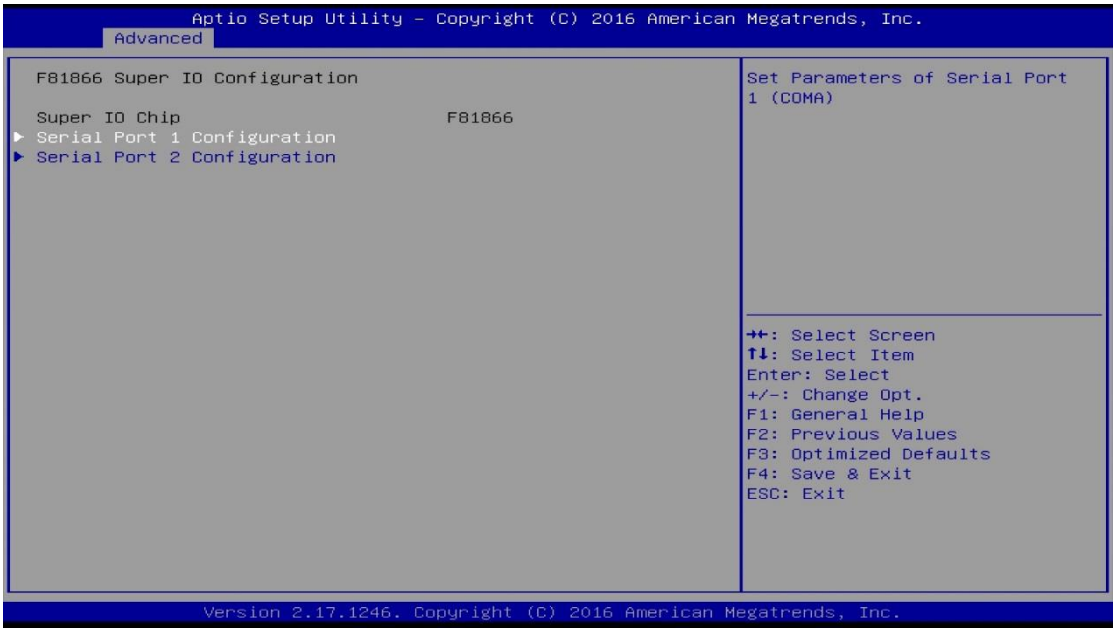


4.4.3 iSMART Controller



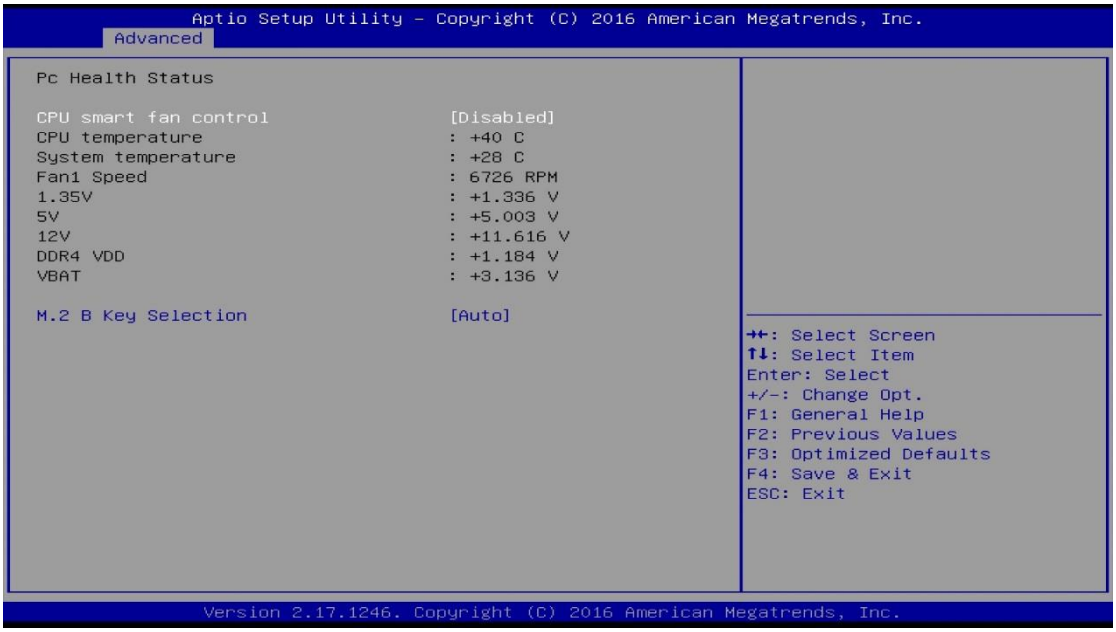
BIOS Setting	Description
Power-On after Power failure	Enables / Disables the system to be turned on automatically after a power failure.
Schedule Slot 1 / 2	Sets up the hour / minute for system powe-on. **Important:** If you would like to set up a schedule between adjacent days, configure two schedule slots. For example, if setting up a schedule from Wednesday 5 p.m. to Thursday 2 a.m., configure two schedule slots. But if setting up a schedule from 3 p.m to 5 p.m. on Wednesday, configure only a schedule slot.

4.4.4 Super IO Configuration



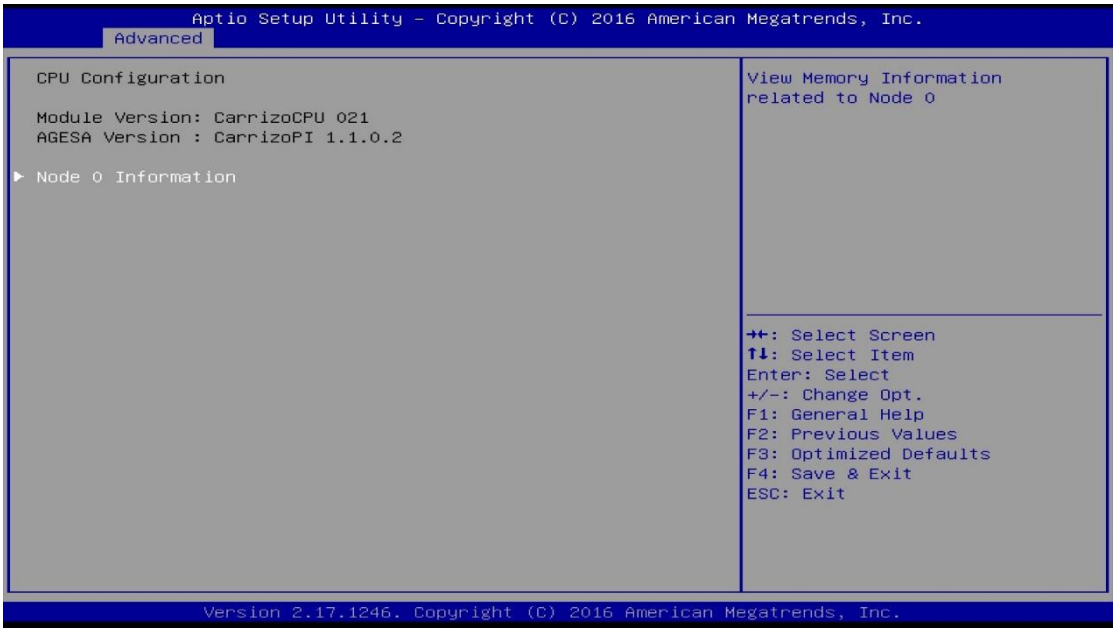
BIOS Setting	Description
Serial Port Configuration	Sets parameters of Serial Ports (COMA). Enables / Disables the serial port and select an optimal setting for the Super IO device.

4.4.5 Hardware Monitor



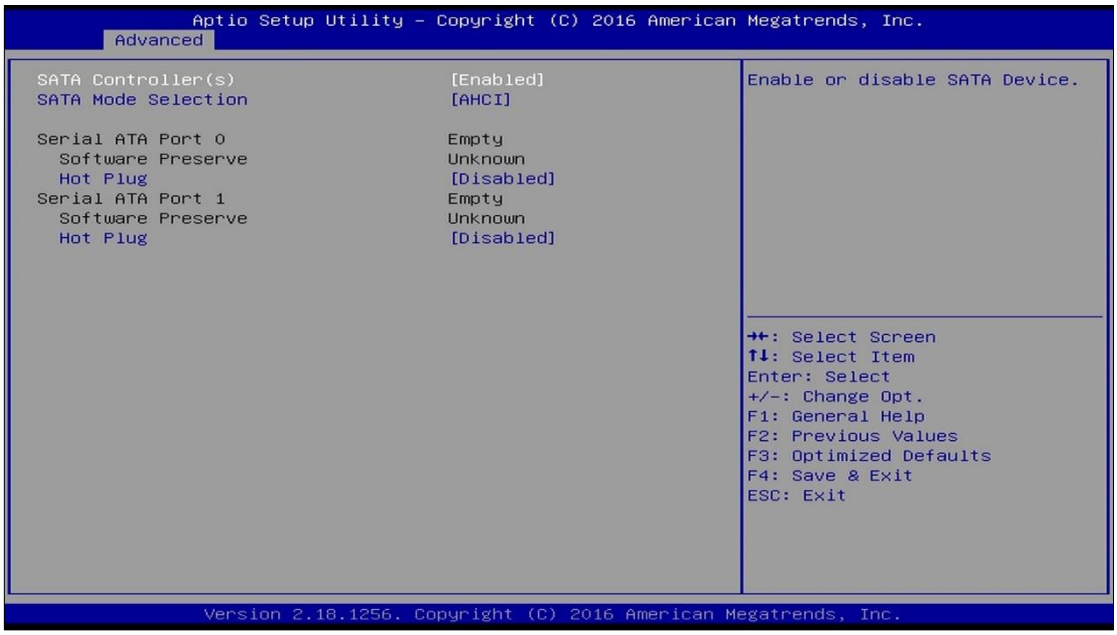
BIOS Setting	Description
CPU smart fan control	Enables / Disables the smart fan feature. Disabled (default) Options: 50 °C / 60 °C / 70 °C / 80 °C / 90 °C
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.
Shutdown Temperature	This field enables or disables the Shutdown Temperature

4.4.6 CPU Configuration



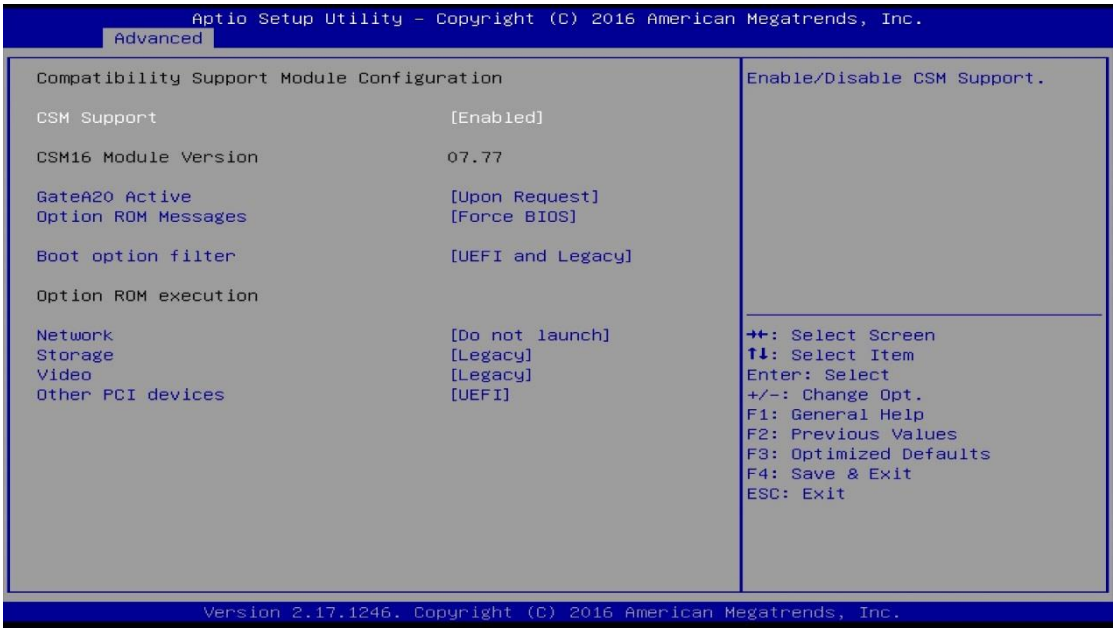
BIOS Setting	Description
Node 0 Information	Shows the memory information related to Node 0.

4.4.7 SATA Configuration



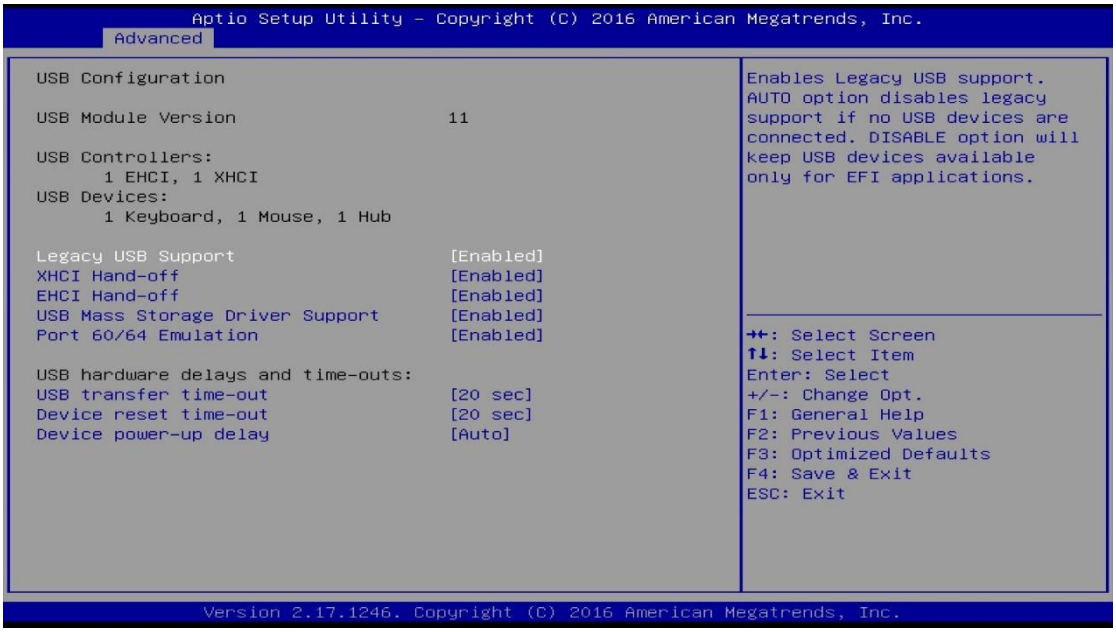
BIOS Setting	Description
SATA Controller(s)	Enables / Disables SATA devices.
SATA Mode Selection	Determines how the SATA controller(s) operate. • AHCI Mode. • RAID Mode.
Serial ATA Ports	Enables / Disables Serial Ports.
Hot Plug	Designates this port as Hot Pluggable.

4.4.8 CSM Configuration



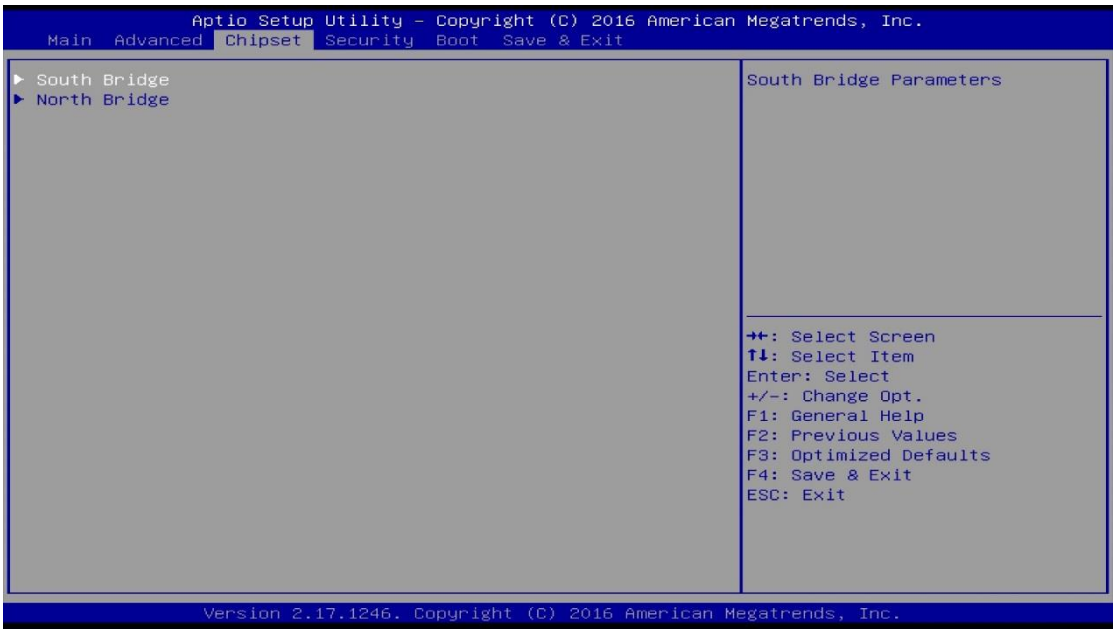
BIOS Setting	Description
CSM Support	Enables or disables CSM support.

4.4.9 USB Configuration



BIOS Setting	Description
Legacy USB SUpport	• **Enable:** Enables Ledacy USB Support. • **Auto:** Disables legacy support if no USB devices are connected. • **Disable:** Keeps USB devices available only for EFI applications.
XHCI / EHCI Hand-off	This is a workaround for OSes without XHCI / EHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
Port 60/64 Emulation	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB Transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	Seconds of delaying execution of start unit command to USB mass storage device.
Device power-up delay	The 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 100ms. But for a Hub port, the delay is taken from Hub descriptor.

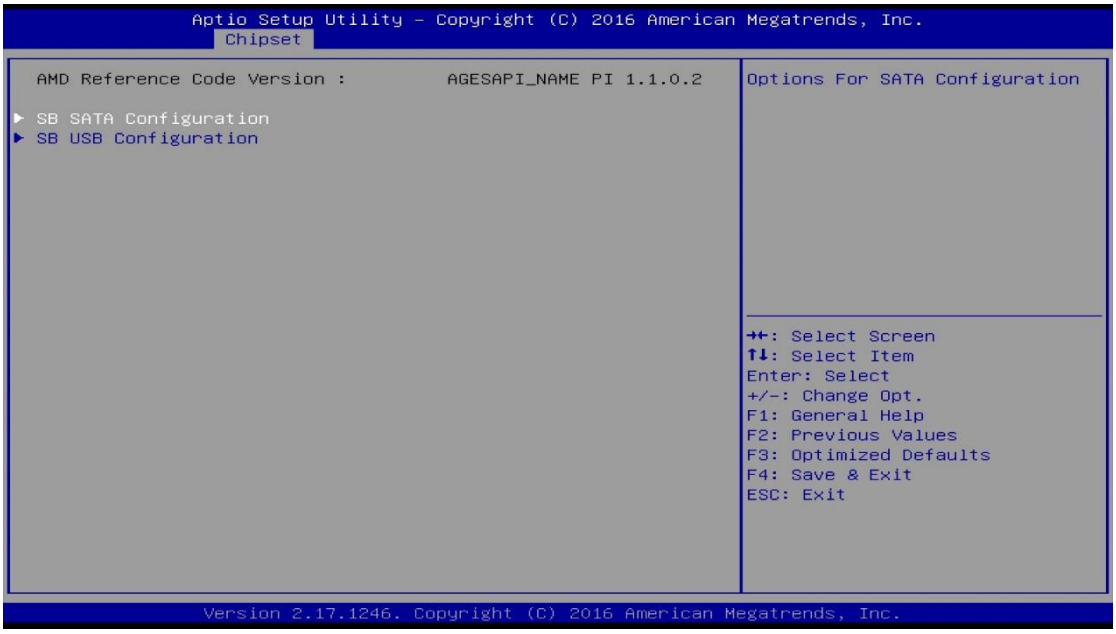
4.5 Chipset Settings

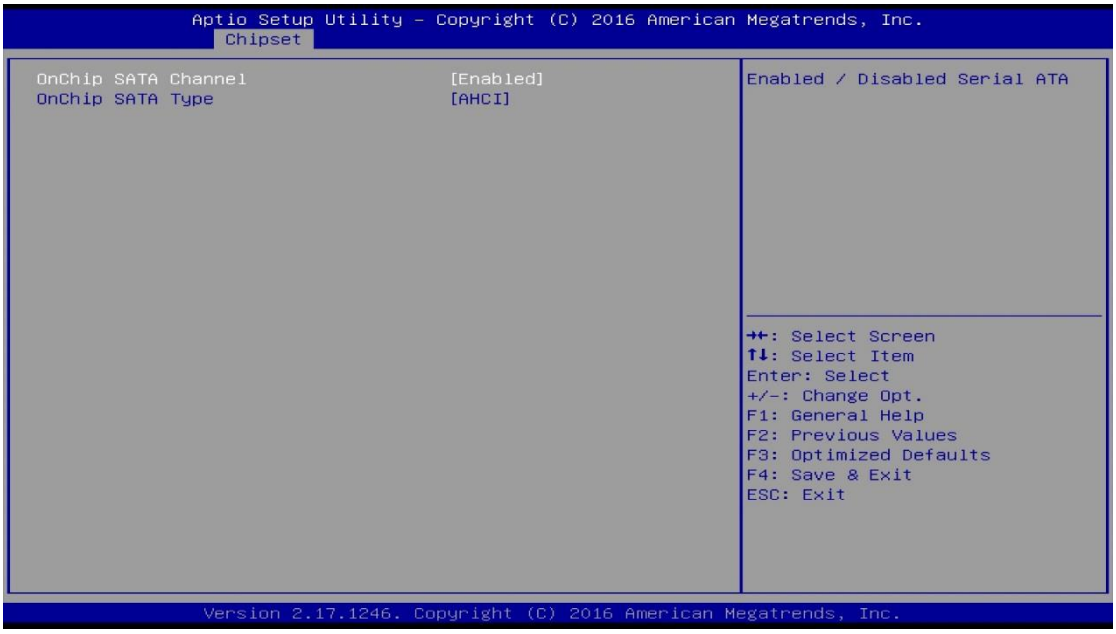


BIOS Setting	Description
Sourth Bridge	South Bridge parameters
North Bridge	North Bridge parameters

4.5.1 South Bridge

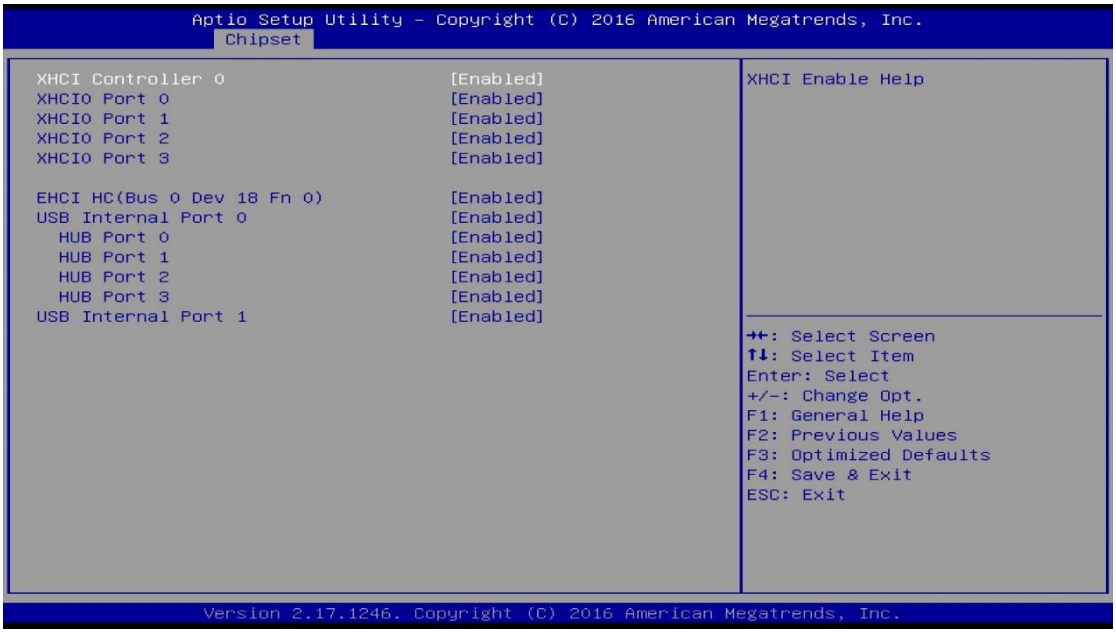
4.5.1.1. SATA Configuration



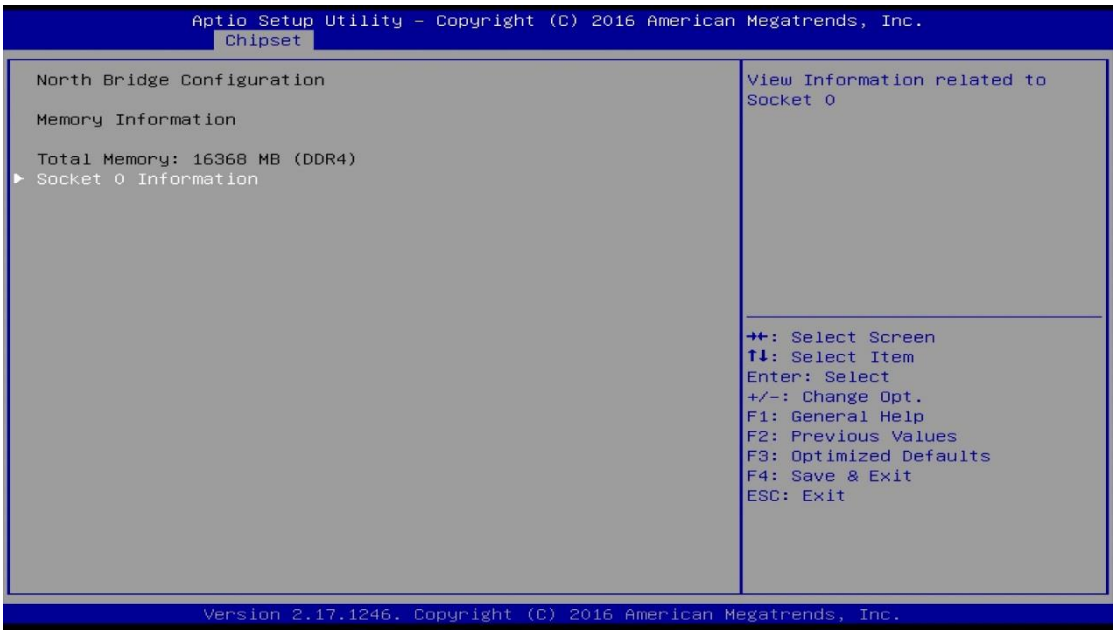


BIOS Setting	Description
SB SATA / USB Configuration	Options for SATA Configuration

4.5.1.2. XHCI Controller

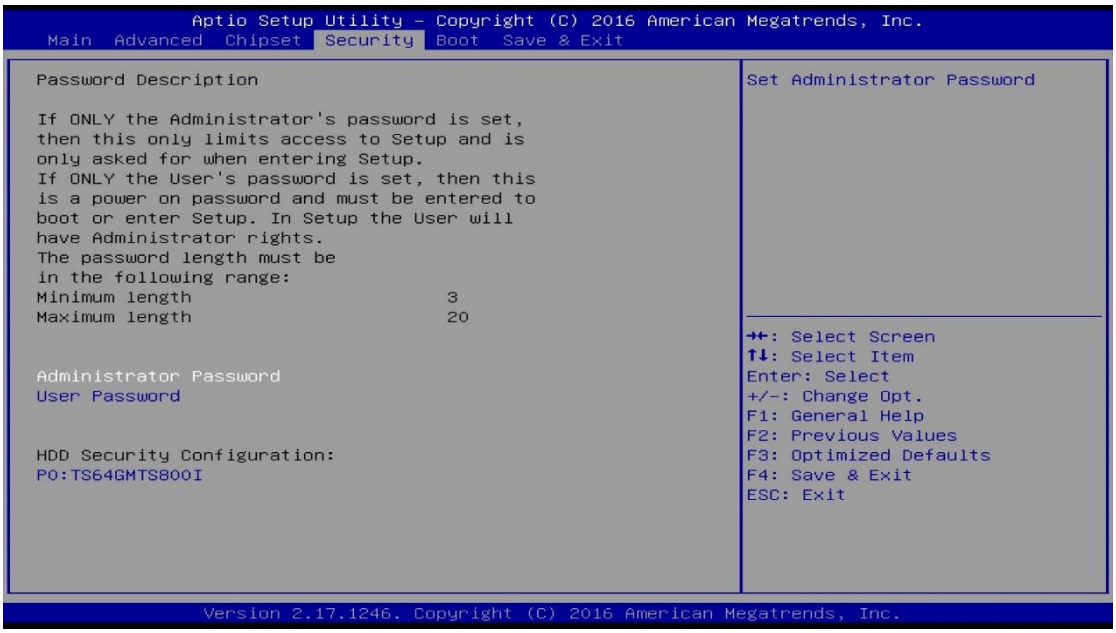


4.5.2 North Bridge



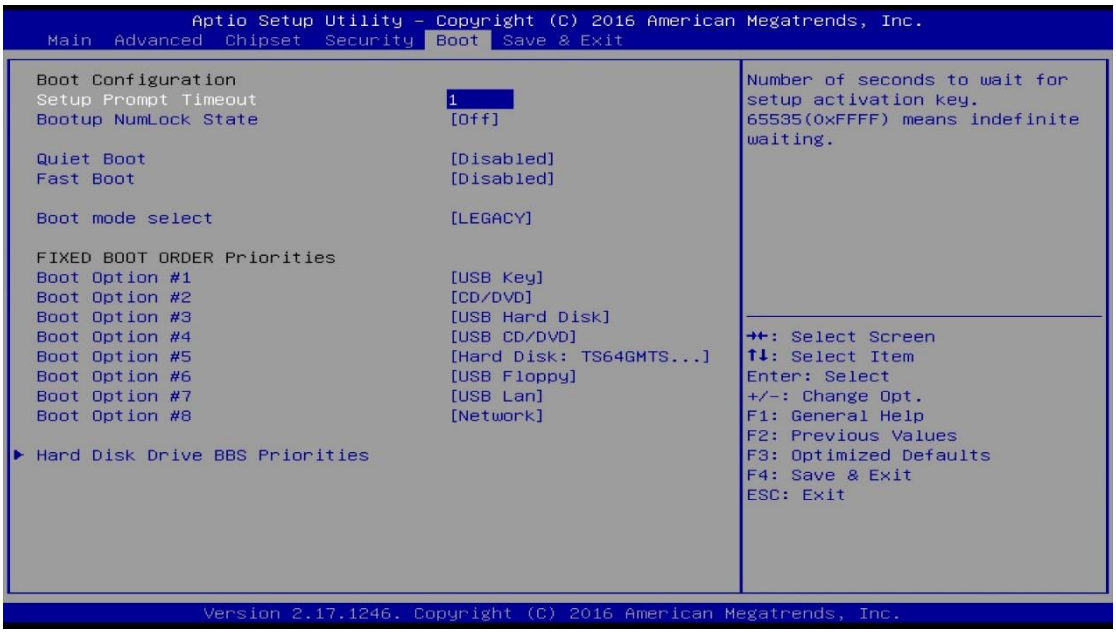
BIOS Setting	Description
Socket 0 Information	Displays the information related to Socket 0..

4.6 Security Settings



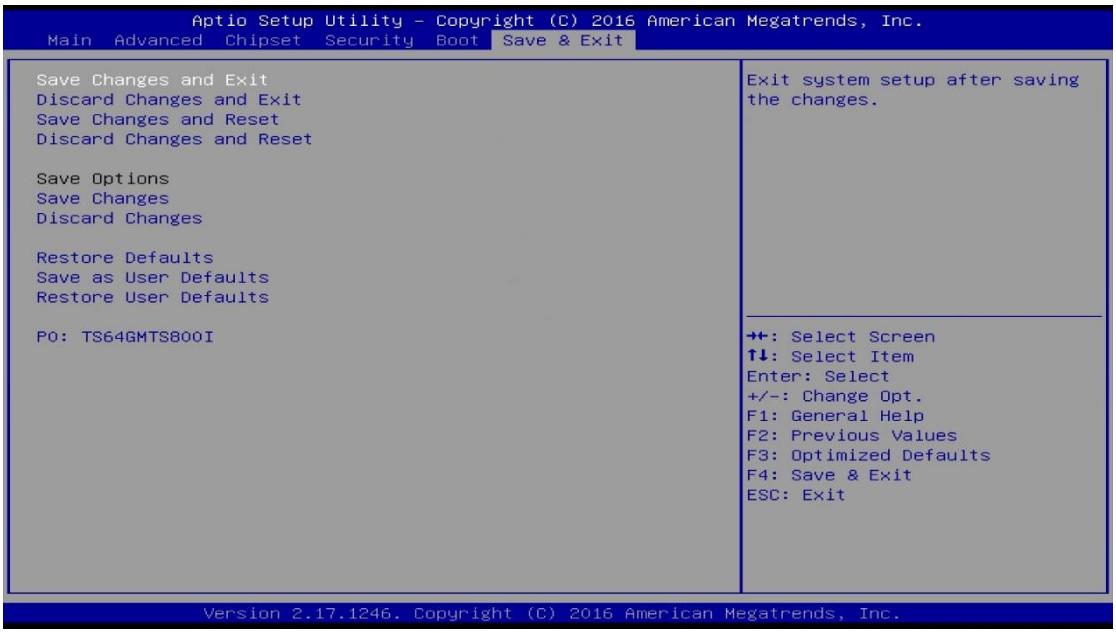
BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.

4.7 Boot Settings



BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Fast Boot	Enables / Disables boot with initialization of a minimal set of devices required to launch the active boot option. There no effect for BBS boot options.
Fixed Boot Order Priorities	Sets the system boot order.
Boot Option Priorities	Sets the system boot order.

4.8 Save & Exit Settings



BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as user defaults.
Restore User Defaults	Restores the user defaults to all the setup options.

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

- I/O Port Address Map
- Interrupt Request Lines (IRQ)
- Digital I/O Sample Code
- Watchdog Timer Configuration

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0x00000A00-0x00000A0F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000000-0x0000000F	Direct memory access controller
0x00000000-0x0000000F	PCI Express Root Complex
0x00000000-0x0000000F	Motherboard resources
0x00000081-0x00000083	Direct memory access controller
0x00000087-0x00000087	Direct memory access controller
0x00000089-0x0000008B	Direct memory access controller
0x0000008F-0x0000008F	Direct memory access controller
0x000000C0-0x000000DF	Direct memory access controller
0x00000070-0x00000071	System CMOS/real time clock
0x0000E000-0x0000E0FF	Realtek PCIe GBE Family Controller
0x0000E000-0x0000E0FF	PCI Express Root Port
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000020-0x00000021	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000003E0-0x00000CF7	PCI Express Root Complex
0x000003B0-0x000003DF	PCI Express Root Complex
0x000003B0-0x000003DF	AMD Radeon R7 Graphics
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000F000-0x0000F0FF	AMD Radeon R7 Graphics
0x000003C0-0x000003DF	AMD Radeon R7 Graphics
0x00000040-0x00000043	System timer
0x0000F140-0x0000F147	Standard SATA AHCI Controller
0x0000F130-0x0000F133	Standard SATA AHCI Controller

Address	Device Description
0x0000F120-0x0000F127	Standard SATA AHCI Controller
0x0000F110-0x0000F113	Standard SATA AHCI Controller
0x0000F100-0x0000F10F	Standard SATA AHCI Controller
0x00000010-0x0000001F	Motherboard resources
0x00000022-0x0000003F	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x0000006F	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x000000A2-0x000000BF	Motherboard resources
0x000000B1-0x000000B1	Motherboard resources
0x000000E0-0x000000EF	Motherboard resources
0x000004D0-0x000004D1	Motherboard resources
0x0000040B-0x0000040B	Motherboard resources
0x000004D6-0x000004D6	Motherboard resources
0x00000C00-0x00000C01	Motherboard resources
0x00000C14-0x00000C14	Motherboard resources
0x00000C50-0x00000C51	Motherboard resources
0x00000C52-0x00000C52	Motherboard resources
0x00000C6C-0x00000C6C	Motherboard resources
0x00000C6F-0x00000C6F	Motherboard resources
0x00000CD0-0x00000CD1	Motherboard resources
0x00000CD2-0x00000CD3	Motherboard resources
0x00000CD4-0x00000CD5	Motherboard resources
0x00000CD6-0x00000CD7	Motherboard resources
0x00000CD8-0x00000CDF	Motherboard resources

Address	Device Description
0x00000800-0x0000089F	Motherboard resources
0x00000B20-0x00000B3F	Motherboard resources
0x00000900-0x0000090F	Motherboard resources
0x00000910-0x0000091F	Motherboard resources
0x0000FE00-0x0000FEFE	Motherboard resources
0x00000061-0x00000061	System speaker

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System timer
IRQ 0	High precision event timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	High precision event timer
IRQ 18	Standard Enhanced PCI to USB Host Controller
IRQ 19	Standard SATA AHCI Controller
IRQ 39	High Definition Audio Controller
IRQ 40	High Definition Audio Controller
IRQ 54 - 204	Microsoft ACPI-Compliant System
IRQ 256 - 511	Microsoft ACPI-Compliant System
IRQ 4294967285	Realtek PCIe GBE Family Controller
IRQ 4294967286	AMD Radeon R7 Graphics
IRQ 4294967287	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967288	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967289	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967290	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967291	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967292	AMD PSP 2.0 Device
IRQ 4294967293	AMD PSP 2.0 Device
IRQ 4294967294	PCI Express Root Port

C. Watchdog Timer Configuration

The Watchdog Timer (WDT) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for the use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven.

Under normal circumstance, you will need to restart the WDT at regular intervals before the timer counts to zero.

Sample Code:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81866.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]); void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
unsigned char bBuf; unsigned char bTime; char **endptr;

char SIO;
printf("Fintek 81866 watch dog program\n"); SIO = Init_F81866();
if (SIO == 0)
{
printf("Can not detect Fintek 81866, program abort.\n"); return(1);
}//if (SIO == 0)

if (argc != 2)
{
printf(" Parameter incorrect!!\n"); return (1);
}

bTime = strtol (argv[1], endptr, 10);
printf("System will reset after %d seconds\n", bTime);

if (bTime)
{       EnableWDT(bTime);    } else
{       DisableWDT();   } return 0;
}
```

```
//-------------------------------------------------------------------------
void EnableWDT(int interval)
{
unsigned char bBuf;

bBuf = Get_F81866_Reg(0x2B);  bBuf &= (~0x20);
Set_F81866_Reg(0x2B, bBuf);   //Enable WDTO

Set_F81866_LD(0x07);      //switch to logic device 7
Set_F81866_Reg(0x30, 0x01);   //enable timer

bBuf = Get_F81866_Reg(0xF5);  bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81866_Reg(0xF5, bBuf);           //count mode is second  Set_F81866_Reg(0xF6,
interval);    //set timer
bBuf = Get_F81866_Reg(0xFA);  bBuf |= 0x01;
Set_F81866_Reg(0xFA, bBuf);   //enable WDTO output

bBuf = Get_F81866_Reg(0xF5);  bBuf |= 0x20;
Set_F81866_Reg(0xF5, bBuf);   //start counting
}
//-------------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;
Set_F81866_LD(0x07);      //switch to logic device 7  bBuf = Get_F81866_Reg(0xFA);
bBuf &= ~0x01;
Set_F81866_Reg(0xFA, bBuf);   //disable WDTO output

bBuf = Get_F81866_Reg(0xF5);  bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81866_Reg(0xF5, bBuf);   //disable WDT
}
//-------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include "F81866.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81866_BASE; void Unlock_F81866 (void); void Lock_F81866 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81866(void)
{
unsigned int result; unsigned char ucDid;

F81866_BASE = 0x4E;
result = F81866_BASE;

ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)      //Fintek 81866
{       goto Init_Finish; }

F81866_BASE = 0x2E;
result = F81866_BASE;

ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)      //Fintek 81866
{       goto Init_Finish; }

F81866_BASE = 0x00;
result = F81866_BASE;

Init_Finish:
return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_UNLOCK); outportb(F81866_INDEX_PORT,
F81866_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81866_LD( unsigned char LD)
{
Unlock_F81866();
outportb(F81866_INDEX_PORT, F81866_REG_LD);
outportb(F81866_DATA_PORT, LD);  Lock_F81866();
```

```
}
//---------------------------------------------------------------------------
void Set_F81866_Reg( unsigned char REG, unsigned char DATA)
{
Unlock_F81866(); outportb(F81866_INDEX_PORT, REG); outportb(F81866_DATA_PORT,
DATA); Lock_F81866();
}
//---------------------------------------------------------------------------
unsigned char Get_F81866_Reg(unsigned char REG)
{
unsigned char Result; Unlock_F81866();
outportb(F81866_INDEX_PORT, REG); Result = inportb(F81866_DATA_PORT);
Lock_F81866();
return Result;
}
//---------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#ifndef       F81866_H
#define        F81866_H     1
//---------------------------------------------------------------------------
#defineF81866_INDEX_PORT   (F81866_BASE)
#defineF81866_DATA_PORT    (F81866_BASE+1)
//---------------------------------------------------------------------------
#defineF81866_REG_LD   0x07
//---------------------------------------------------------------------------
#define F81866_UNLOCK  0x87
#defineF81866_LOCK       0xAA
//---------------------------------------------------------------------------
unsigned int Init_F81866(void);
void Set_F81866_LD( unsigned char);
void Set_F81866_Reg( unsigned char, unsigned char); unsigned char
Get_F81866_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif //      F81866_H
```