# SI-60E

# User Manual

| Revision | Release Date |
|---|---|
| V1.0 | 2015/06/23 |

# Table of Contents

# Safety Information

Your SI-60E is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

## Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- 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 system for ventilation. ***Never insert objects of any kind into the ventilation openings***.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between -40˚C and 75˚C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -50° C (-58° F) OR ABOVE 85° C (185° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

## Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not function properly even if you follow the operating instructions.
  - The system was dropped or the cabinet is damaged.

## Lithium-Ion Battery Warning

**CAUTION**: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

## NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users

## WARNING
## HAZARDOUS MOVING PARTS
## KEEP FINGERS AND OTHER BODY PARTS AWAY

## Acknowledgments


- AMI is a registered trademark of AMI Software International, Inc.
- AMD and ATI are registered trademarks of AMD Corporation.
- Intel, Pentium, and Intel Core are registered trademarks or trademarks of Intel Corporation.
- Microsoft Windows is a registered trademark of Microsoft Corporation.
- FINTEK is a registered trademark of FINTEK Electronics Corporation.
- REALTEK is a registered trademark of REALTEK Electronics Corporation.
- All other product names or trademarks are properties of their respective owners.

# CHAPTER 1 INTRODUCTION

## 1.1 General Description

The “Signature Book™” SI-60E is a professional digital signage system powered by 4th Gen. Intel® Core™ I Desktop Processors with AMD Radeon™ E8860 graphics. The SI-60E integrates 12 HDMI ports with EDID emulation function and one DVI-I for console. Additionally, SI-60E has two quad-channel DDR3L-1600 sockets to provide up to 32GB of memory. It also has dual Gigabit Ethernet, dual extended SSD drive, Intel AMT for remote control and IBASE’s iSMART green technology for power on/off scheduling and power resume functions. The ruggedized design player’s chassis that provides passive cooling for better system reliability and quiet operation.

SI-60E overview

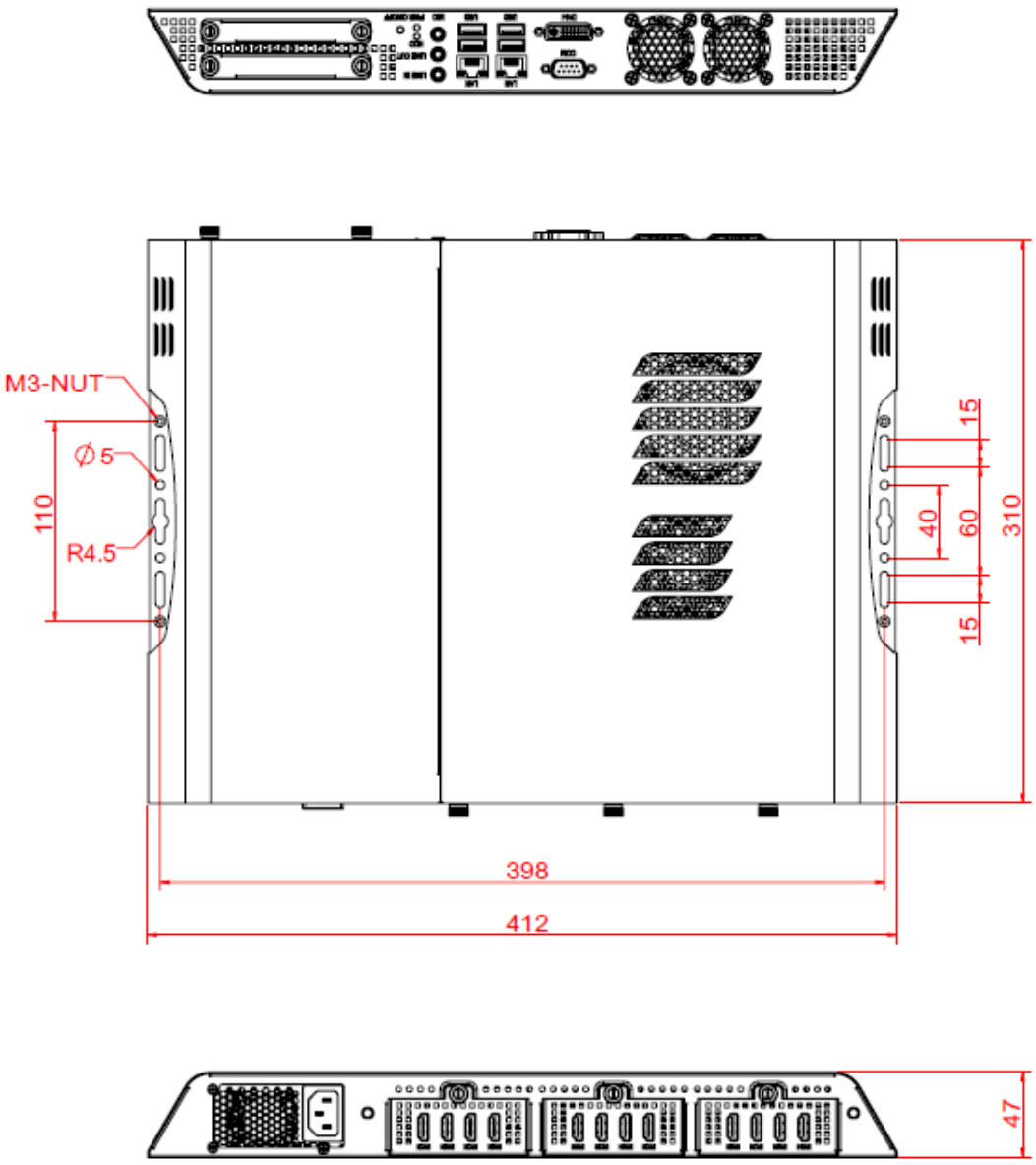
## 1.2 System Specifications

### 1.2.1 Hardware Specifications

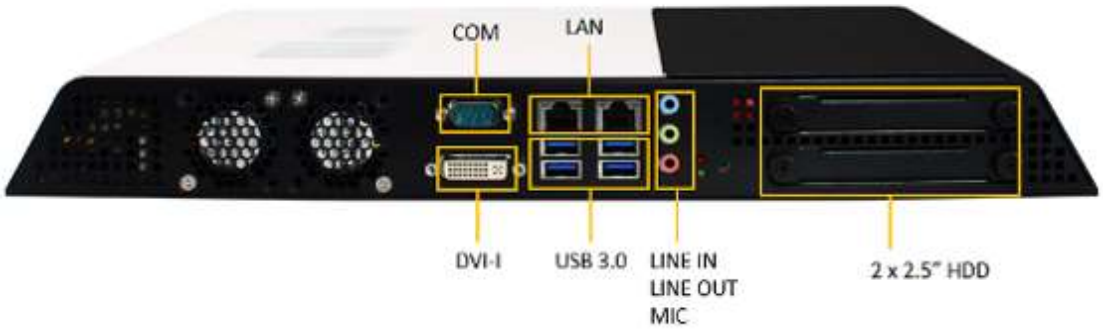
| | |
|---|---|
| Model Name | SI-60E |
| System Mainboard | MBD60E |
| CPU | 4th Generation Intel® Core™ i7/i5/i3 and Pentium® QC/DC processors; Up to 3.5GHz |
| Memory | 4x DDR3 1600 MHz, Max. 32GB |
| I/O Interface | 12x HDMI with EDID emulation function<br>1x DVI-I for console<br>4x USB 3.0 ports<br>2x RJ45 for LAN<br>1x RJ45 for RS232<br>3x Microjack audio connectors for Line-in / Line-out/MIC-in<br>Power LED for power on/off & HDD<br>1x power button<br>1x AC power inlet |
| Storage | 1x mSATA<br>2x SATA 3.0 2.5” HDD Dock (support Raid 1) |
| Expansion Slots | Dual mPCI-E(x1) slots for WiFi, 3G/LTE, capture card and TV tuner options |
| Construction | SGCC |
| Mounting | Standard system bracket |
| Dimensions | 412mm(W) x 310mm(D) x 47mm(H)<br>16.22”(W) x 12.2”(D) x 1.85”(H) |
| Operating Temperature | 0°C~ 45°C (32°F~113°F) |
| Storage Temperature | -20°C ~ 80°C (-4°F~176°F) |
| Relative Humidity | 5~90% @ 45°C, (non-condensing) |
| Vibration | mSATA: 5 grms / 5~500Hz / random operation |
| RoHS | Available |
| Certification | CE, FCC, CCC, UL |

***·This specification is subject to change without prior notice.***

## 1.2.2 Dimensions



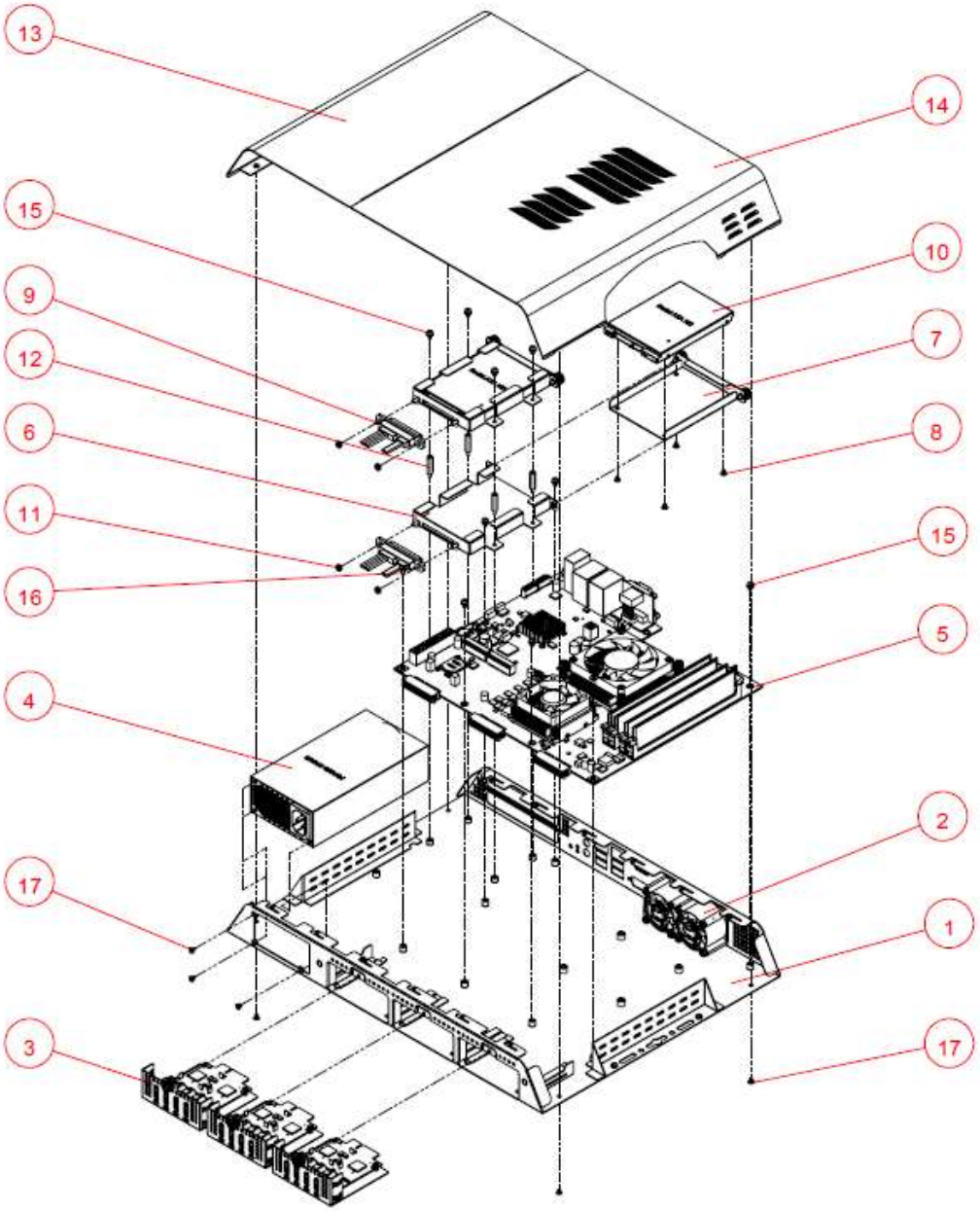
### 1.2.3 I/O View




SI-60E front side


SI-60E rear side

## 1.3 Exploded View of the SI-60E Assembly



### 1.3.1 Parts Description

| Part No. | Description | Part No. | Description |
|---|---|---|---|
| 1 | SI-60E_BASE | 2 | 4028_fan |
| 3 | HDMI Board Module | 4 | Power module |
| 5 | SI-60E Main Board | 6 | SI-60E_HDD-TRAY |
| 7 | SI-60E_HDD-BRK | 8 | Screw F Type M3*0.5 |
| 9 | SATA Cable | 10 | 2.5" SATA HDD |
| 11 | M3 nut | 12 | M3 double screw bolt |
| 13 | SI-60E_top-cover_L | 14 | SI-60E_top-cover_r |
| 15 | Screw PW Type M3*0.5 | 16 | M3 screw |
| 17 | Screw F Type M3*0.5 BK | | |

## 1.4 Packing List

| Item No. | Description | Qty |
|---|---|---|
| 1 | Driver CD | 1 |
| 2 | Power adaptor | 1 |
| 3 | Power cord | 1 |

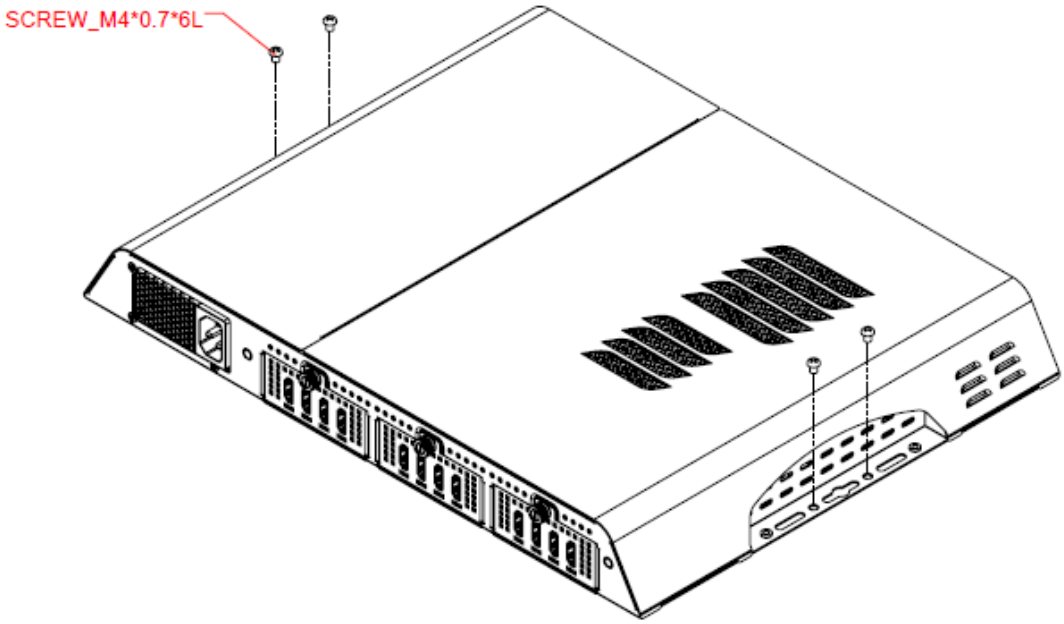
## 1.4.1 Optional Items module

| WiFi Solution | Description | |
|---|---|---|
| WiFi module | Wireless; PCI-E Mini Card 802.11B/G/N [AW-NE238H] (A008WLAWNE238H000P) |  |
| External Antenna 2pcs | WiFi Antenna (A055RFA02C2M20800P) | |
| Internal cable 1pcs | Internal Antenna 300mm [BTC130-1-70B-300] RoHS (A055RFA0000020100P) |  |
| Internal cable 1pcs | Internal Antenna 200mm [BTC130-1-70B-200-1] RoHS (A055RFA0000020000P) | |
| Screw, 2pcs | Screw; A44-N NI 3.4 NYLOK M2*L3.8 P0.4mm [LHS] RoHS (H02203A0442200N00P) | |
| Bracket, -1set | Component BOM; MPCIE-EXT V-B2 Bracket (SC2MPCIEEXT0B2100P) |  |
| **3G Solution** | **Description** | |
| 3G | Wireless; 3.75G UMTS/HSPA [ZU202] RoHS (A008WIRELESS00520P) |  |
| 3G+GPS | Wireless; 3.75G UMTS/HSPA & GPS Module [ZU200] RoHS (A008WIRELESS00510P) | |
| WW-350U | Wireless; 3.75G UMTS/HSPA [NAVISYS WW-350U] RoHS (A008WIRELESS00530P) | |
| Cable | Cable; SMA IPX Cable For 3G 30CM [RF11030A] RoHS (A012INTENAL010000P) | |
| Antenna | 3G [ANT0921Q2P] RoHS (A055ANT0921Q2P000P) | |
| **COM Port Cable** | **Description** | |
| EXT-311 | Cable; EXT-311 2-HD 10C 150CM; DSUB-9F => RJ45-10M RoHS (C501EXT3110A12000P) |  |
| EXT-312 | Cable; EXT-312 2-HD 10C 150CM; DSUB-9M => RJ45-10M RoHS (C501EXT3120A12000P) | |

## 1.5 HARDWARE INSTALLATION

### 1.5.1 Mounting Installation

1. Please install SI-60E to the intended location using 4x M4*0.7*6L screws, as shown in the picture.



### 1.5.2 Installing the storage

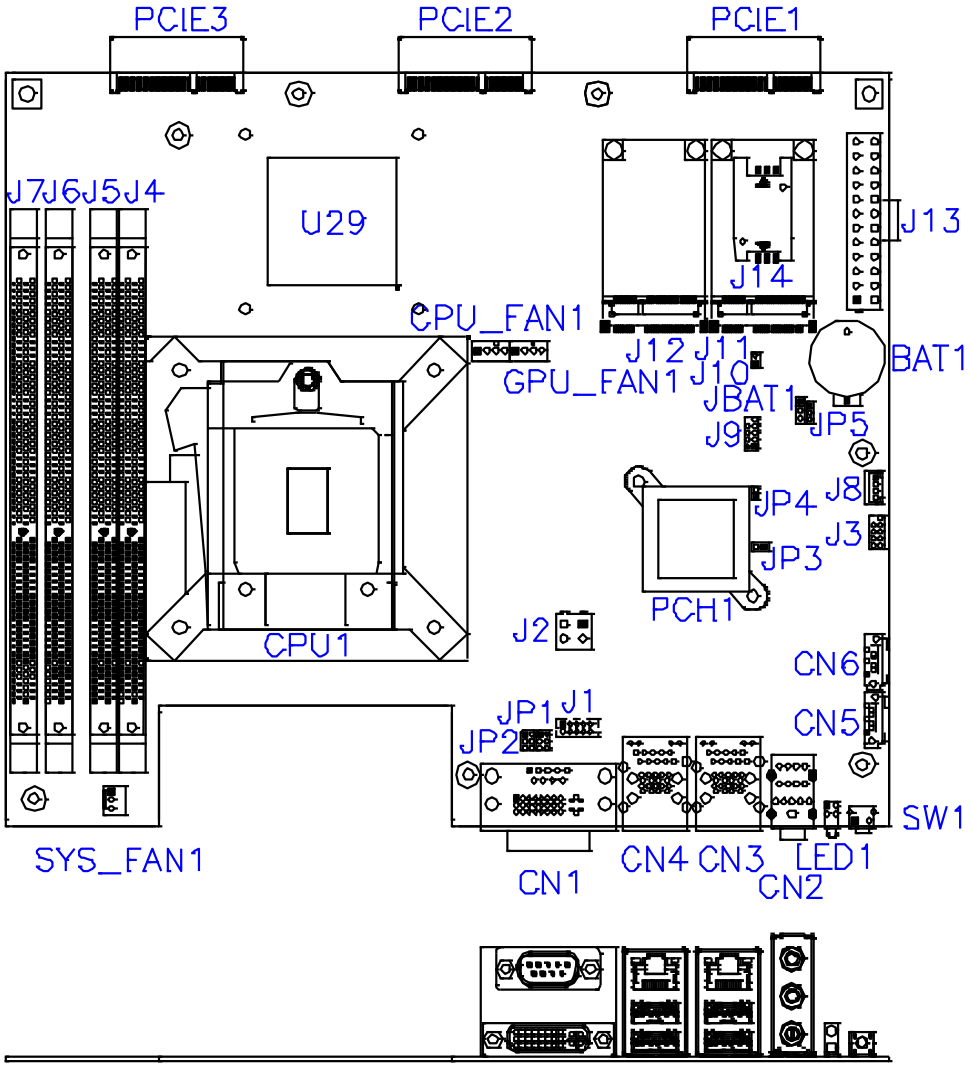
1. Remove the two screws on the HDD cover and draw the HDD out.


2. Install the HDD/SSD to the HDD bracket with 4 screws.

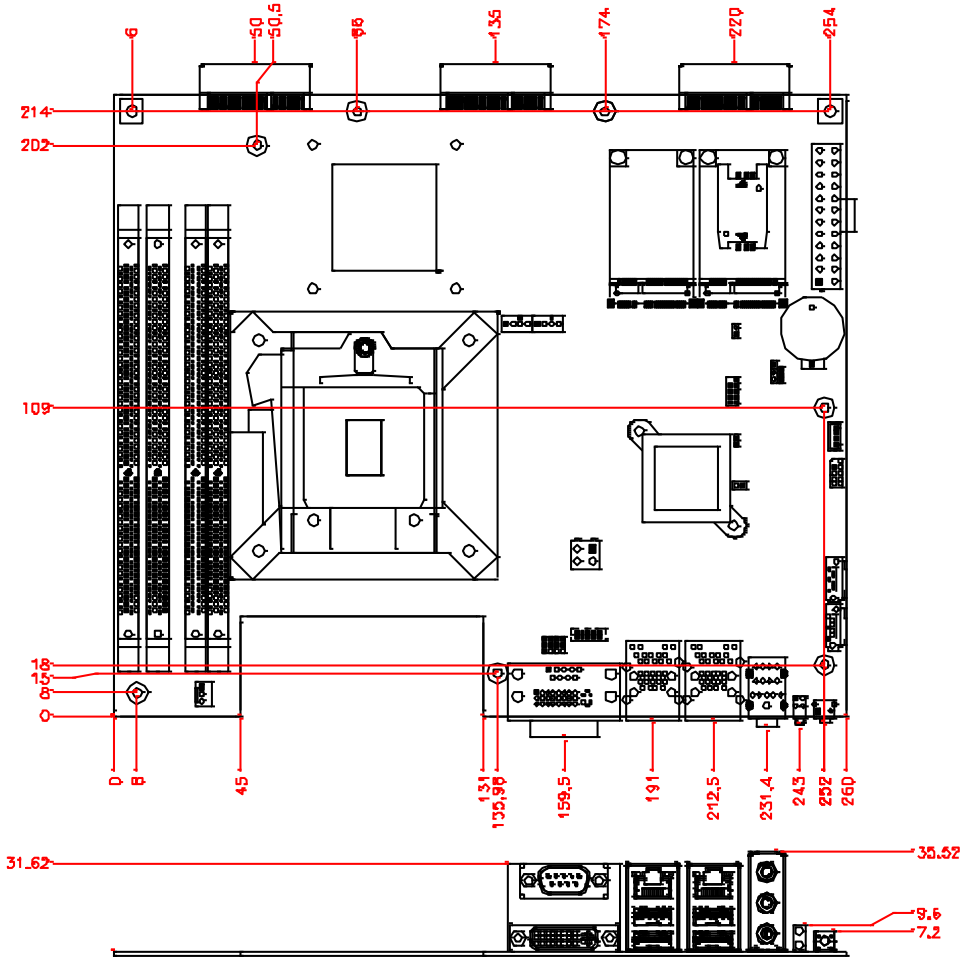
# CHAPTER 2 MOTHERBOARD INTRODUCTION

## 2.1 Introduction

### MBD60E Jumpers and Connectors



## IMBD60E Board Dimensions



## 2.2 Installations

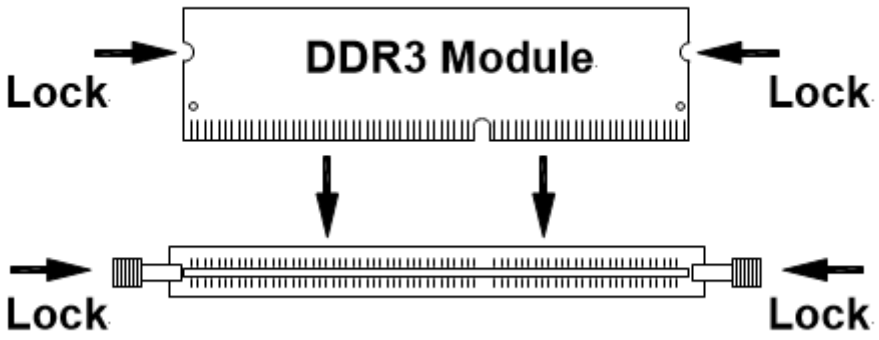
### 2.2.1 Installing the Memory

The MBD60E board supports four DDR3 memory modules for a maximum total of 32GB in DDR3 SODIMM memory type.

**Installing and Removing Memory Modules**

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

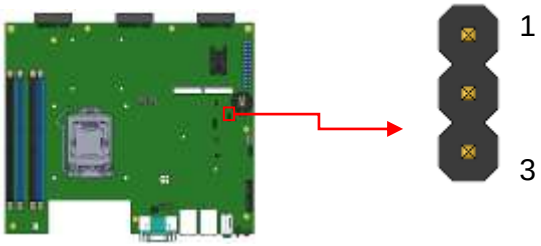
1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.



## 2.3 Setting the Jumpers

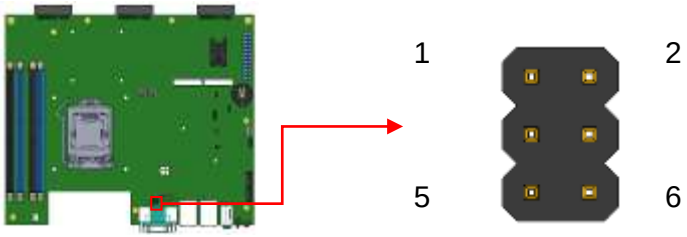
Jumpers are used on MBD60E to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the jumpers and connectors on MBD60E and their respective functions.

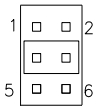
**JBAT1: Clear CMOS Contents**



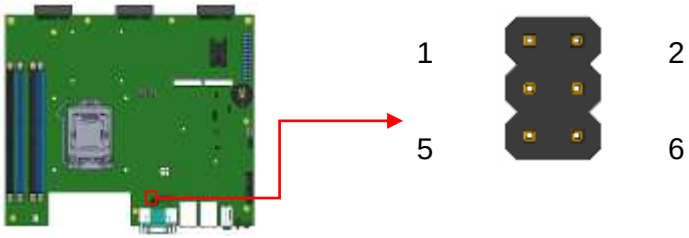

| JBAT1 | Setting | Function |
|---|---|---|
|   | Pin 1-2<br>Short/Closed | Normal |
|   | Pin 2-3<br>Short/Closed | Clear CMOS |

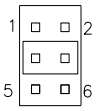
**JP1: COM2 RS232 RI/+5V/+12V Power Setting**



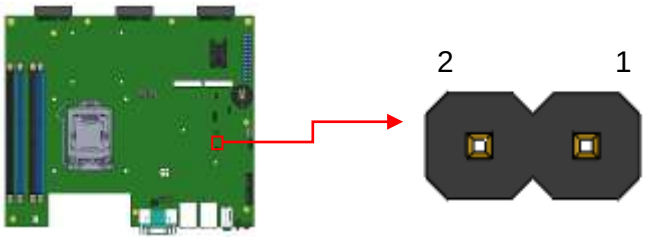

| JP1 | Setting | Function |
|---|---|---|
|   | Pin 1-3<br>Short/Closed | +12V |
| | Pin 3-4<br>Short/Closed | RI |
| | Pin 5-3<br>Short/Closed | +5V |

### JP2: COM1 RS232 RI/+5V/+12V Power Setting



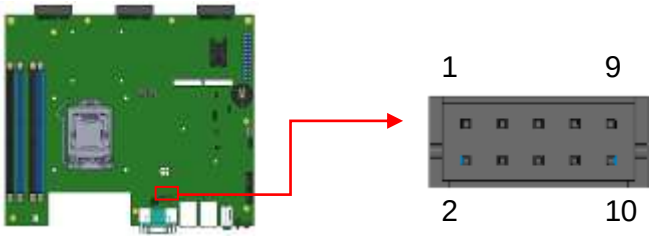

| JP2 | Setting | Function |
|---|---|---|
|   | Pin 1-3 Short/Closed | +12V |
| | Pin 3-4 Short/Closed | RI |
| | Pin 5-3 Short/Closed | +5V |

### JP3: Flash Descriptor Security Override (Factory use only)



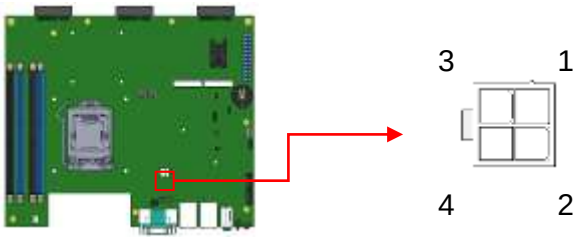
## 2.4 Connectors on MBD60E

### J1: COM2 Connector [HRS DF11-10DP-2DSA(08)]



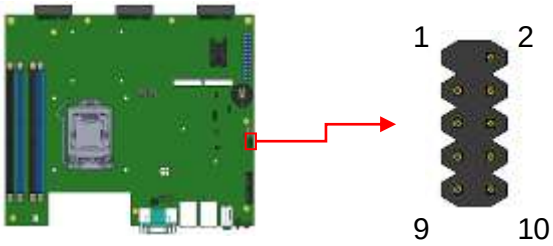

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Data carrier detect | 1 | 2 | Receive data |
| Transmit data | 3 | 4 | Data terminal ready |
| Ground | 5 | 6 | Data set ready |
| Request to send | 7 | 8 | Clear to send |
| Ring indicator | 9 | 10 | Not Used |

### J2: ATX +12V Jack [HAOGUO ATX4PT-NY46]

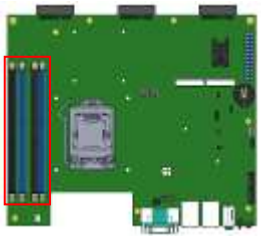



| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | Ground |
| 3 | DC_IN |
| 4 | DC_IN |

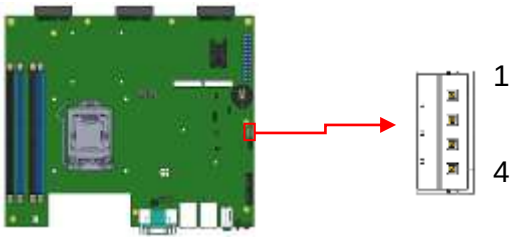
### J3: For SPI Debug tools Pin Header



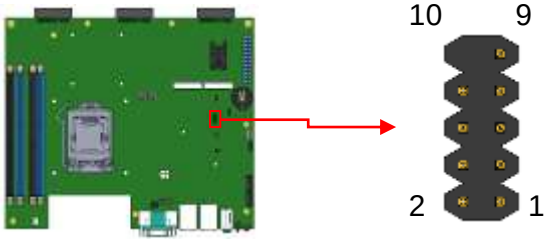
### J4, J5, J6, J7 DDR III Socket



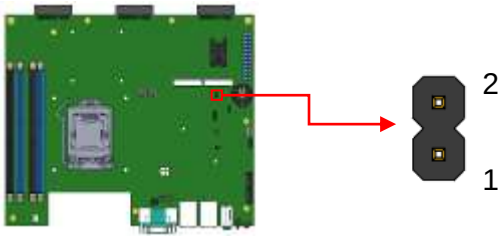
### J8: MCU Flash Connector (factory use only)



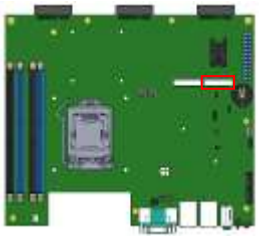

### J9: Debug Port Connector (Factory use only)



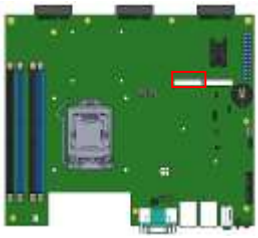

### J10: Reset Pin Header



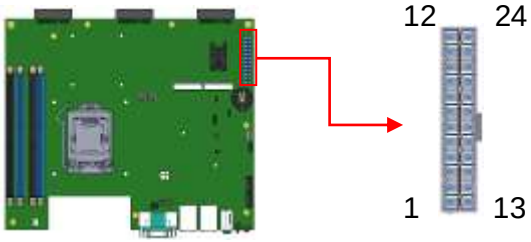

### J11: Mini PCIe Slot (Full size with SIM Card)



### J12: Mini PCIe Slot (Full size with mSATA)

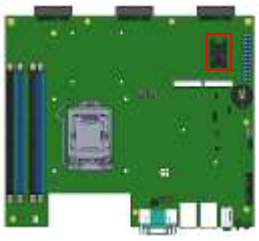


### J13: ATX Power Supply Connector

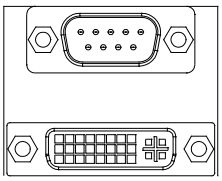



| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| 3.3V | 13 | 1 | 3.3V |
| -12V | 14 | 2 | 3.3V |
| Ground | 15 | 3 | Ground |
| PS-ON | 16 | 4 | +5V |
| Ground | 17 | 5 | Ground |
| Ground | 18 | 6 | +5V |
| Ground | 19 | 7 | Ground |
| -5V | 20 | 8 | Power good |
| +5V | 21 | 9 | 5VSB |
| +5V | 22 | 10 | +12V |
| +5V | 23 | 11 | +12V |
| Ground | 24 | 12 | +3.3V |

### J14: SIM Card Slot

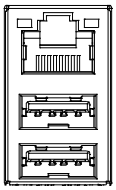


### CN1: COM1 / DVI-I Connector

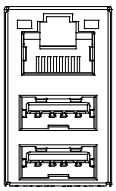


### CN2: Audio Jack

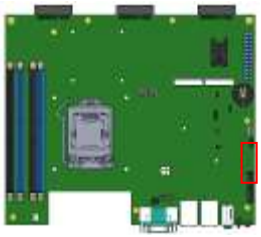
### CN3: RTL8111G-CG /USB3.0 Connector



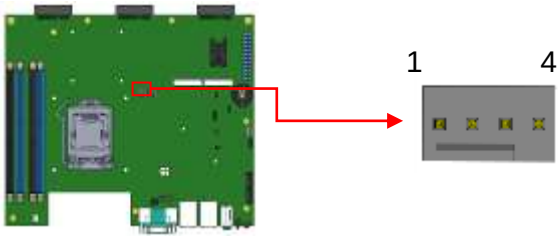
### CN4: I218LM / USB3.0 Connector



### CN5/6:SATA 3 Connector

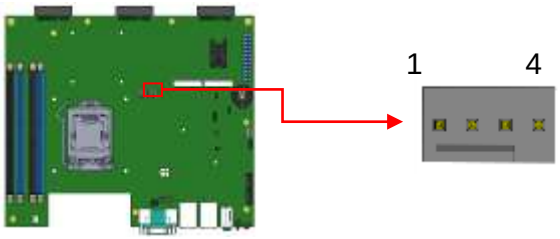


### CPU_FAN1: CPU Fan Power Connector



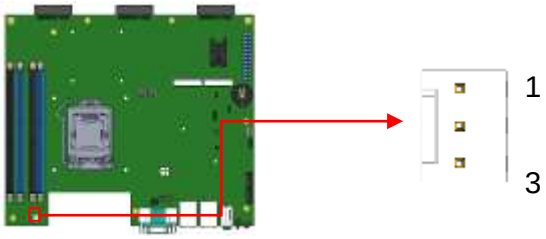

| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |
| 4 | Control |

### GPU_FAN1: GPU Fan Power Connector



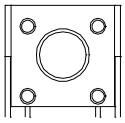

| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |
| 4 | Control |

### SYS_FAN1: System Fan1 Power Connector

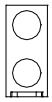



| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |

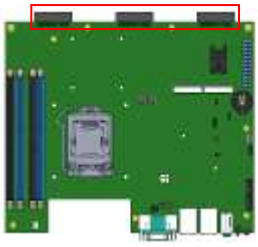
### SW1: Power On Button



### LED1: PWR (Green)/ HDD LED (Red)



### PCIE1, PCIE2, PCIE3: DP Signal from AMD E8860 to IDD100



# CHAPTER 3 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:

## 3.1 BIOS Introduction

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

## 3.2 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. Pressing 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 wish 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, you 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 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 cause the system to become unstable and crash in some cases.*

## Main Settings

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| System Language | | [English] | | | |
| System Date | | [Tue | | | |
| System Time | | 01/20/2009] | | | |
| | | [21:52:06] | | | |
| Access Level | | Administrator | | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### System Language

Choose the system default language.

### System Date

Set the Date. Use Tab to switch between Data elements.

### System Time

Set the Time. Use Tab to switch between Data elements.

## Advanced Settings

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

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|

► ACPI Settings
► Trusted Computing
► Wake up event setting
► CPU Configuration
► SATA Configuration
►Shutdown Temperature Configuration
► iSmart Controller 3.1
► AMT Configuration
► USB Configuration
► F81846 Super IO Configuration
► F81846 H/W Monitor

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

## ACPI Settings

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|

| | | |
|---|---|---|
| ACPI Settings | | → ←Select Screen<br>↑ ↓Select Item<br>Enter: Select<br>+- Change Opt.<br>F1:General Help<br>F2:Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| ACPI Sleep State | S3 only (Suspend to …) | |
| Lock Legacy Resources | Disabled | |
| S3 Video Repost | Disabled | |

### ACPI Sleep State

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

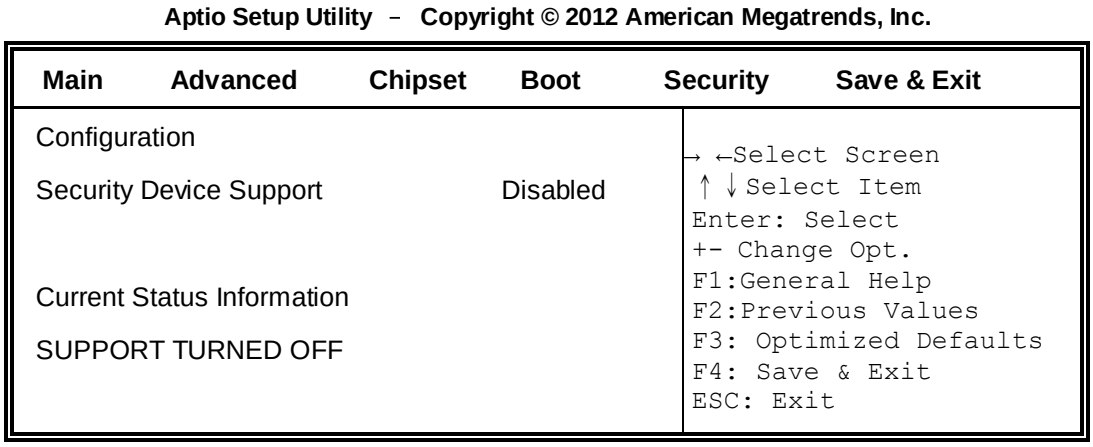
### Lock Legacy Resources

Enables or Disables Lock of Legacy Resources

### S3 Video Repost

Enable or Disable S3 Video Repost

## Trusted Computing




### Security Device Support

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

### TPM State

Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.

### Pending operation

Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

### Wake up event settings

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| Wake on PCIE Wake Event | | | Disabled | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### Wake on PCIE Wake Event

The options are Disabled and Enabled.

## CPU Configuration

This section shows the CPU configuration parameters.

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|

| | |
|---|---|
| CPU Configuration | |
| Intel(R) Core(TM) i7-4770S CPU @ 3.10GHz | |
| CPU Signature | 306c3 |
| Processor Family | 6 |
| Microcode Patch | 17 |
| FSB Speed | 100 MHz |
| Max CPU Speed | 3100 MHz |
| Min CPU Speed | 800 MHz |
| CPU Speed | 3500 MHz |
| Processor Cores | 4 |
| Intel HT Technology | Supported |
| Intel VT-x Technology | Supported |
| Intel SMX Technology | Supported |
| 64-bit | Supported |
| EIST Technology | Supported |
| Hyper-threading | Enabled |
| Active Processor Cores | All |
| Overclocking lock | Disabled |
| Limit CPUID Maximum | Disabled |
| Execute Disable Bit | Disabled |
| Intel Virtualization Technology | Disabled |
| Hardware Prefetcher | Disabled |
| Adjacent Cache Line Prefetch | Disabled |
| EIST | Enabled |
| Turbo Mode | Enabled |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### Hyper-threading

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

### Active Processor Cores

Number of cores to enable in each processor package.

### Overclocking lock

FLEX_RATIO(194) MSR

### Limit CPUID Maximum

Disabled for Windows XP

### Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

### Intel Virtualization Technology

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

### Hardware Prefetcher

Enable the Mid Level Cache (L2) streamer prefetcher.

### Adjacent Cache Line Prefetch

Enable the Mid Level Cache (L2) prefetching of adjacent cache lines.

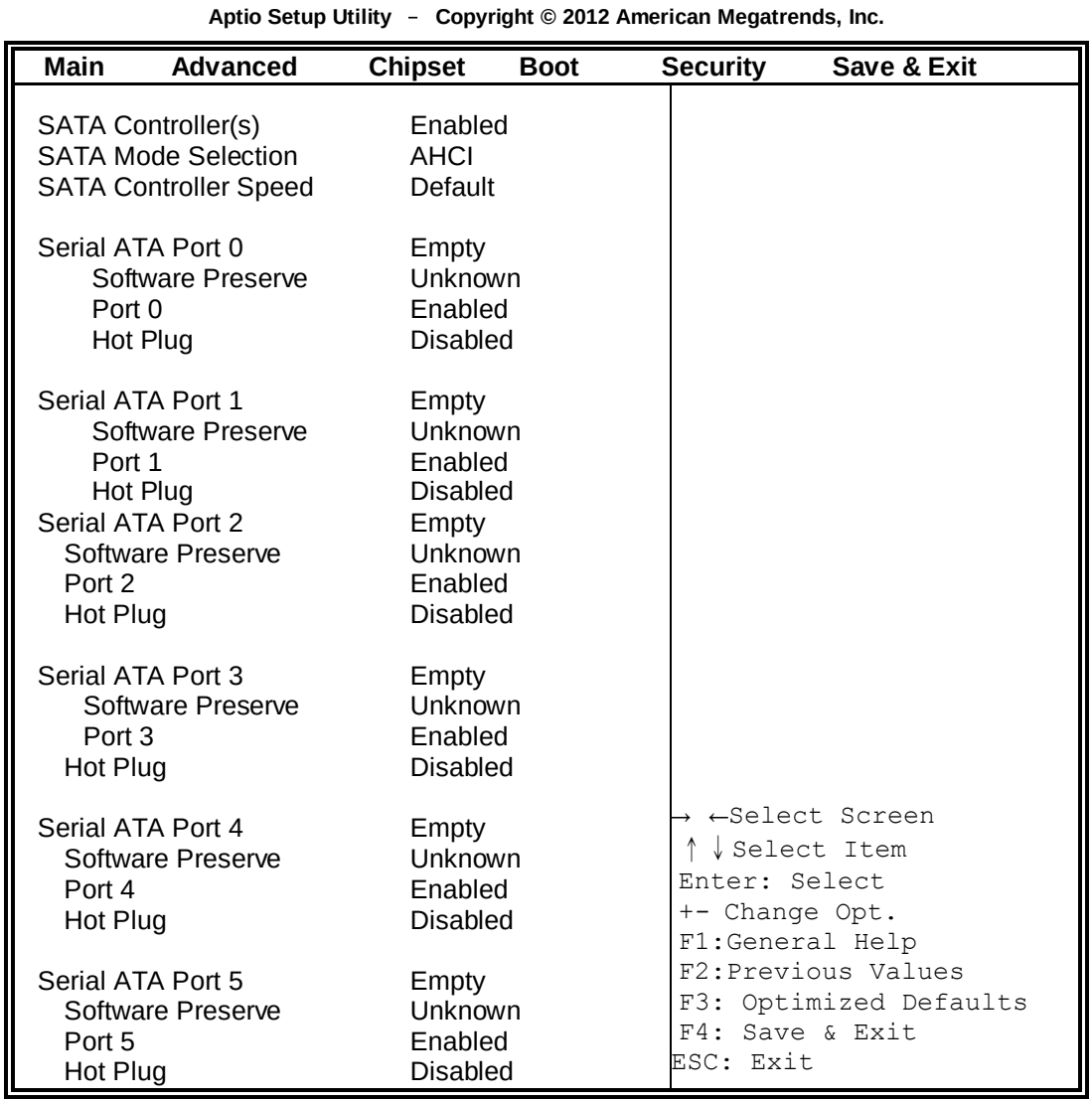
### EIST

Enable/Disable Intel Speedstep

### Turbo Mode

Turbo Mode.

## SATA Configuration




### SATA Controller(s)

Enable or disable SATA Device.

### SATA Mode Selection

Determines how SATA controller(s) operate.

(1) IDE Mode.

(2) AHCI Mode.

(3) RAID Mode.

### SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

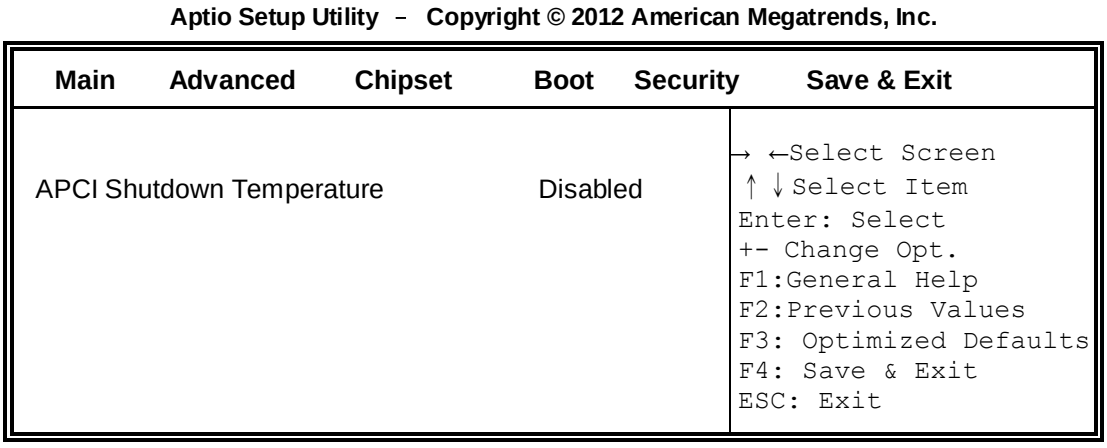
#### Port 0

Enable or Disable SATA Port

#### Hot Plug

Designates this port as Hot Pluggable.

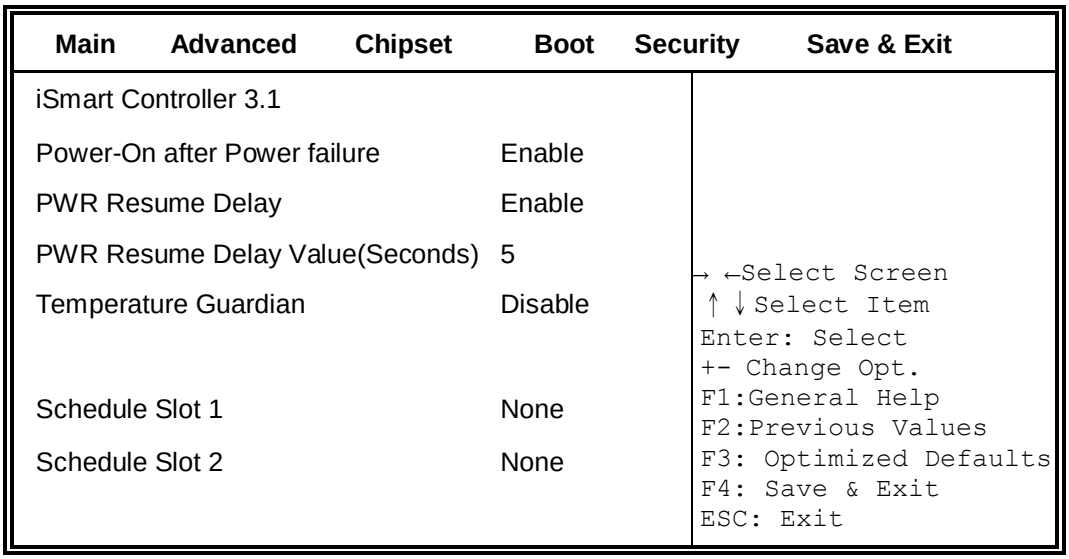
### Shutdown Temperature Configuration




### ACPI Shutdown Temperature

The default setting is Disabled.

### iSmart Controller 3.1




### Power-On after Power failure

This field sets the system power status whether Disable or Enable when power returns to the system from a power failure situation.

### Temperature Guardian

Generate the reset signal when system hangs up on POST.

### Schedule Slot 1 / 2

Setup the hour/minute for system power on.

## AMT Configuration

Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|

| | |
|---|---|
| Intel AMT | Enabled |
| BIOS Hotkey Pressed | Disabled |
| MEBx Selection Screen | Disabled |
| Hide Un-Configure ME Confirmation | Disabled |
| Un-Configure ME | Disabled |
| Amt Wait Timer | 0 |
| Activate Remote Assistance Process | Disabled |
| USB Configure | Enabled |
| PET Progress | Enabled |
| AMT CIRA Timeout | 0 |
| Watchdog | Disabled |
| OS Timer | 0 |
| BIOS Timer | 0 |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### Intel AMT

Enable/Disable Intel (R) Active Management Technology BIOS Extension.

Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution.

If enabled, this requires additional firmware in the SPI device.

### BIOS Hotkey Pressed

OEMFLag Bit 1:

Enable/Disable BIOS hotkey press.

### AMT Configuration

OEMFLag Bit 2:

Enable/Disable MEBx selection screen.

### Hide Un-Configure ME Configuration

OEMFlag Bit 6:

Hide Un-Configure ME without password Confirmation Prompt

### Un-Configure ME

OEMFlag Bit 15:

Un-Configure ME without password.

### Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

### Activate Remote Assistance Process

Trigger CIRA boot.

### USB Configure

Enable/Disable USB Configure function.

### PET Progress

User can Enable/Disable PET Events progress to receive PET events or not.

### Watchdog Timer

Enable/Disable Watchdog Timer.

## USB Configuration

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| USB Configuration | | | | | |
| USB Module Version | | | 8.10.28 | | |
| USB Devices: | | | | | |
| Legacy USB Support | | | Enabled | | |
| USB3.0 Support | | | Enabled | | |
| XHCI Hand-off | | | Enabled | | |
| EHCI Hand-off | | | Enabled | | |
| USB Mass Storage Driver Support | | | Enabled | | |
| USB hardware delays and time-outs: | | | | | |
| USB Transfer time-out | | | 20 sec | | |
| Device reset tine-out | | | 20 sec | | |
| Device power-up delay | | | Auto | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

### USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

### XHCI Hand-off

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

### EHCI Hand-off

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

### USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

### USB Transfer time-out

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

### Device reset tine-out

USB mass Storage device start Unit command time-out.

### Device power-up delay

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

## F81846 Super IO Configuration

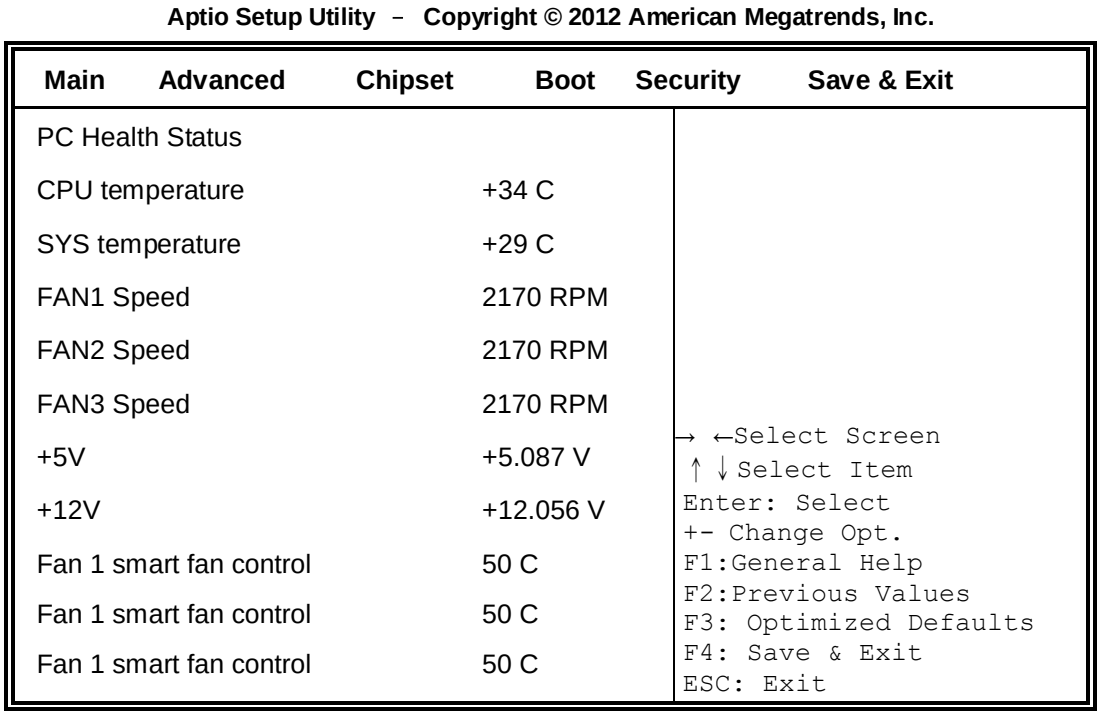
**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| F81846 Super IO Configuration | | | | | |
| F81846 Super IO Chip | | | F81846 | | → ←Select Screen<br>↑ ↓Select Item<br>Enter: Select<br>+- Change Opt.<br>F1:General Help<br>F2:Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| ► Serial Port 0 Configuration | | | | | |
| ► Serial Port 1 Configuration | | | | | |

### Serial Port Configuration

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

### F81846 H/W Monitor




### 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.

### Smart SYS_FAN1/CPU_FAN1 Function

This field enables or disables the smart fan feature.

Disabled (default)

50 ℃

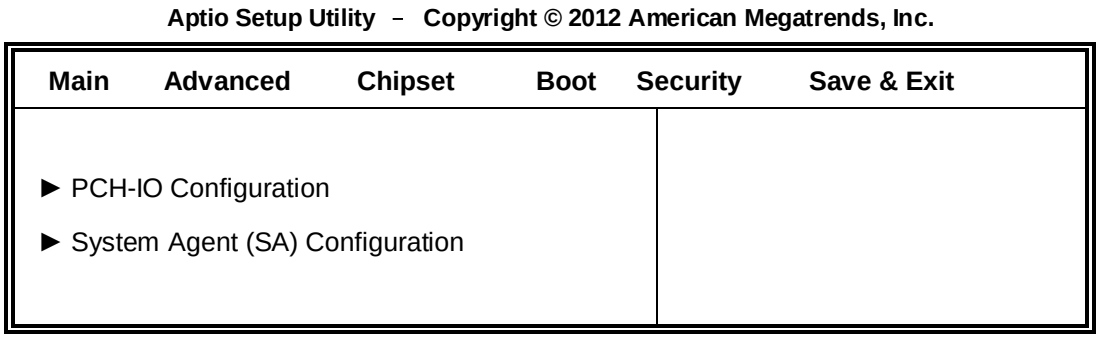
60 ℃

70 ℃

**80 ℃**

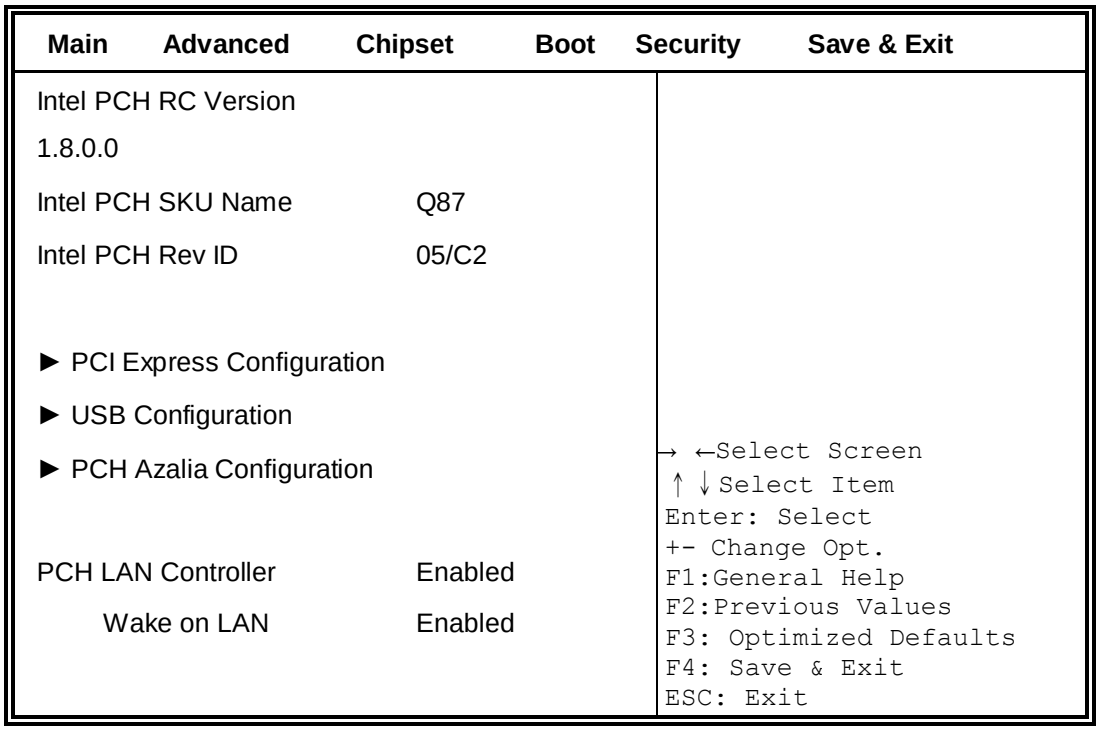
## Chipset Settings

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




### PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.



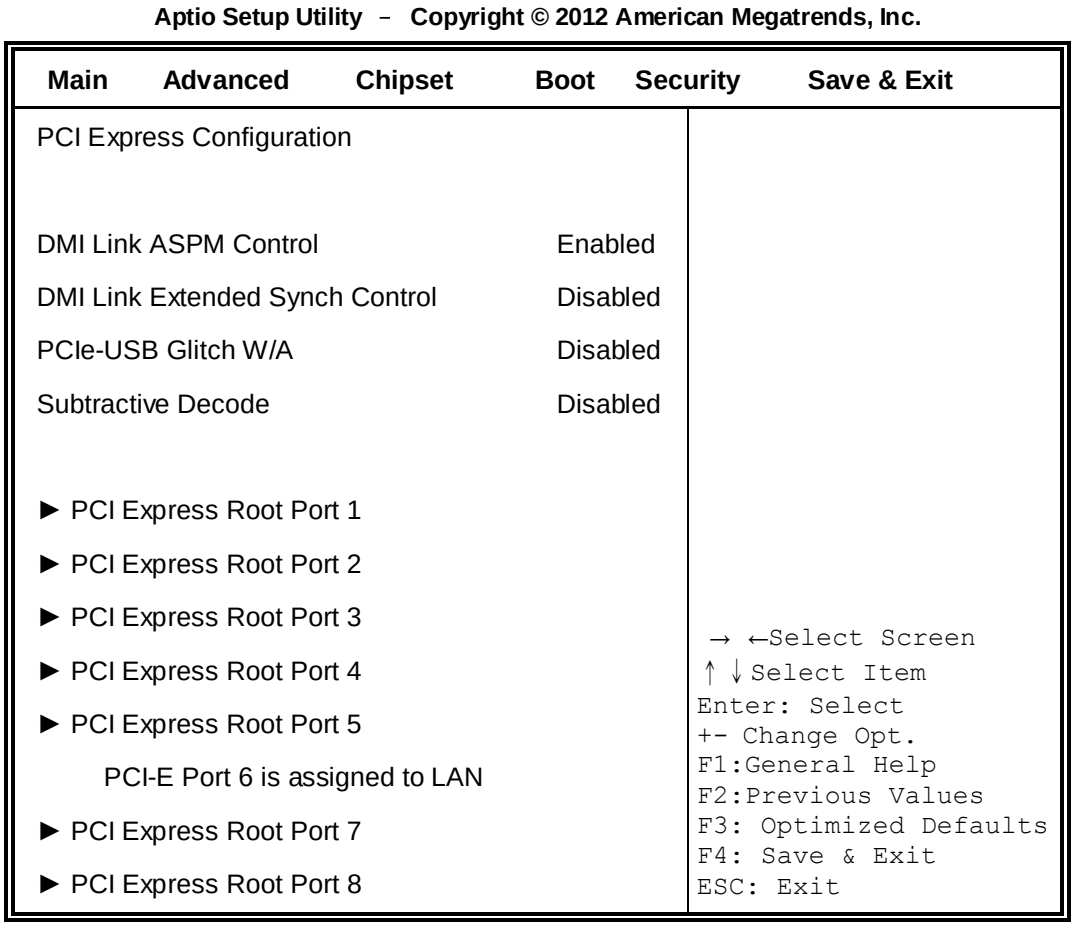

### PCH LAN Controller

Enable or disable onboard NIC.

### Wake on LAN

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

## PCI Express Configuration




### DMI Link ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI Link.

### DMI Link Extended Synch Control

The control of Extended Synch on SB side of the DMI Link.

### PCIe-USB Glitch W/A

PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG port.

### Subtractive Decode

Enable or disable PCI Express Subtractive Decode.

### USB Configuration

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| USB Configuration | | | | | |
| USB Precondition | | | Disabled | | → ←Select Screen<br>↑ ↓Select Item<br>Enter: Select<br>+- Change Opt.<br>F1:General Help<br>F2:Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| xHCI Mode | | | Auto | | |
| USB Ports Per-Port Disable Control | | | Disabled | | |

### USB Precondition

Precondition work on USB host controller and root ports for faster enumeration.

### xHCI Mode

Mode of operation of xHCI controller.

### USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

### PCH Azalia Configuration

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| PCH Azalia Configuration | | | | | |
| Azalia | | | Auto | | |

### Azalia

Control Detection of the Azalia device.

Disabled = Azalia will be unconditionally disabled.

Enabled Azalia will be unconditionally Enabled.

Auto = Azalia will be enabled if present, disabled otherwise.

## System Agent (SA) Configuration

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| System Agent Bridge Name | | | Haswell | | |
| System Agent RC Version | | | 1.8.0.0 | | |
| VT-d Capability | | | Supported | | |
| VT-d | | | Enabled | | |
| ► Graphics Configuration | | | | | |
| ► Memory Configuration | | | | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### VT-d

Check to enable VT-d function on MCH.

## Graphics Configuration

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| Graphics Configuration | | | | | |
| Primary Display | | | PEG | | |
| Primary PEG | | | Auto | | |
| Primary PCIE | | | Auto | | |
| Internal Graphics | | | Disabled | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

### Primary Display

Select which of IGFX/PEG/PCI graphics device should be Primary Display or select SG for switchable Gfx.

### Primary PEG

Select PEG0/PEG1/PEG2/PEG3 Graphics device should be Primary PEG.

### Primary PCIE

Select PCIE0/PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/PCIE6PCIE7 Graphics device should be Primary PCIE.

### Internal Graphics

Keep IGD enabled based on the setup options.

#### Memory Configuration

**Aptio Setup Utility**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| Memory Information | | | | | |
| Memory RC Version | | 1.8.0.0 | | | |
| Memory Frequency | | 1600 MHz | | | |
| Total Memory | | 32768MB (DDR3) | | | |
| Memory Voltage | | 1.50V | | | |
| DIMM#0 | | 8192 MB (DDR3) | | | |
| DIMM#1 | | 8192 MB (DDR3) | | | |
| DIMM#2 | | 8192 MB (DDR3) | | | |
| DIMM#3 | | 8192 MB (DDR3) | | | |

→ ←Select Screen
↑ ↓Select Item
Enter: Select
+- Change Opt.
F1:General Help
F2:Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

## Boot Settings

This section allows you to configure the boot settings.

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main Advanced Chipset Boot Security Save & Exit | | |
|---|---|---|
| Boot Configuration | | |
| Setup Prompt Timeout | 1 | |
| Bootup NumLock State | On | |
| Quiet Boot | Disabled | |
| Fast Boot | Disabled | |
| Boot Mode select | LEGACY | |
| FIXED BOOT ORDER Priorities | | |
| Boot Option #1 | Hard Disk | |
| Boot Option #2 | CD/DVD | |
| Boot Option #3 | USB Hard Disk | |
| Boot Option #4 | USB CD/DVD | → ←Select Screen |
| Boot Option #5 | USB Key | ↑ ↓Select Item |
| Boot Option #6 | USB Floppy | Enter: Select |
| Boot Option #7 | Network | +- Change Opt. |
| | | F1:General Help |
| | | F2:Previous Values |
| ► CSM16 parameters | | F3: Optimized Defaults |
| CSM parameters | | F4: Save & Exit |
| | | ESC: Exit |

### Setup Prompt Timeout

Number of seconds to wait for setup activation key.

65535(0xFFFF) means indefinite waiting.

### Bootup NumLock State

Select the keyboard NumLock state

### Quiet Boot

Enables or disables Quiet Boot option

### Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

### Boot Mode select

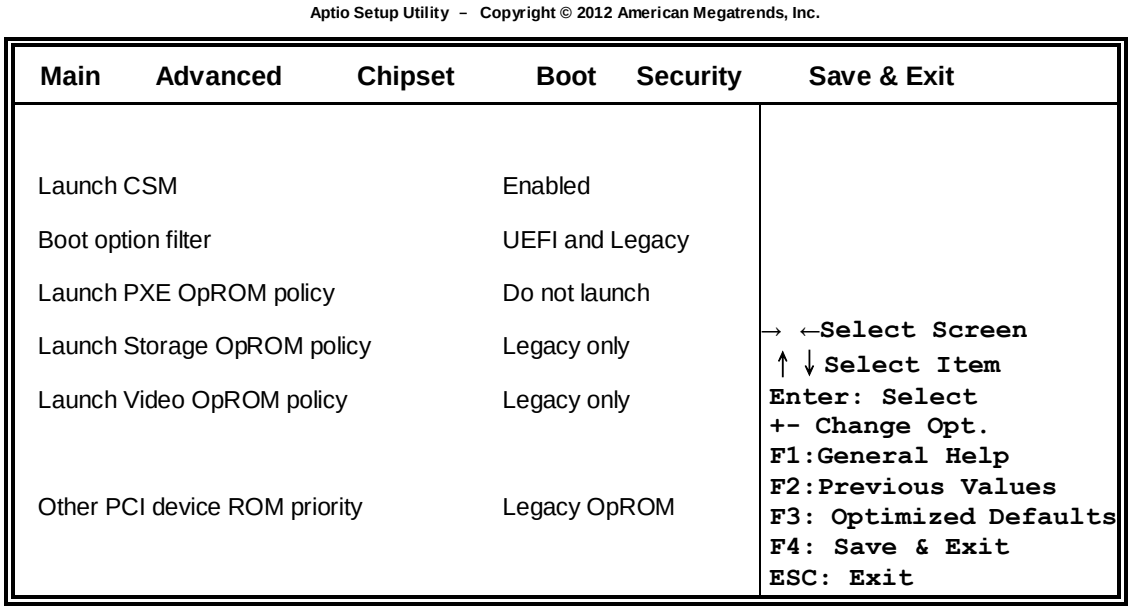
Select boot mode LEGACY/UEFI

### FIXED BOOT ORDER Priorities

Sets the system boot order

### CSM parameters

This section allows you to configure the boot settings.




### Launch CSM

This option controls if CSM will be launched

### Boot option filter

This option controls what devices system can boot to

### Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM

### Launch Storatge OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM

### Launch Video OpROM policy

Controls the execution of UEFI and Legacy Video OpROM

### Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch

## Security Settings

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

**Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.**

| Main | Advanced | Chipset | Boot | Security | Save & Exit |
|---|---|---|---|---|---|
| Password Description | | | | | |
| If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: | | | | | →←Select Screen ↑↓Select Item Enter: Select +- Change Opt. F1:General Help F2:Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit |
| Minimum length | | | 3 | | |
| Maximum length | | | 20 | | |
| Administrator Password | | | | | |
| User Password | | | | | |

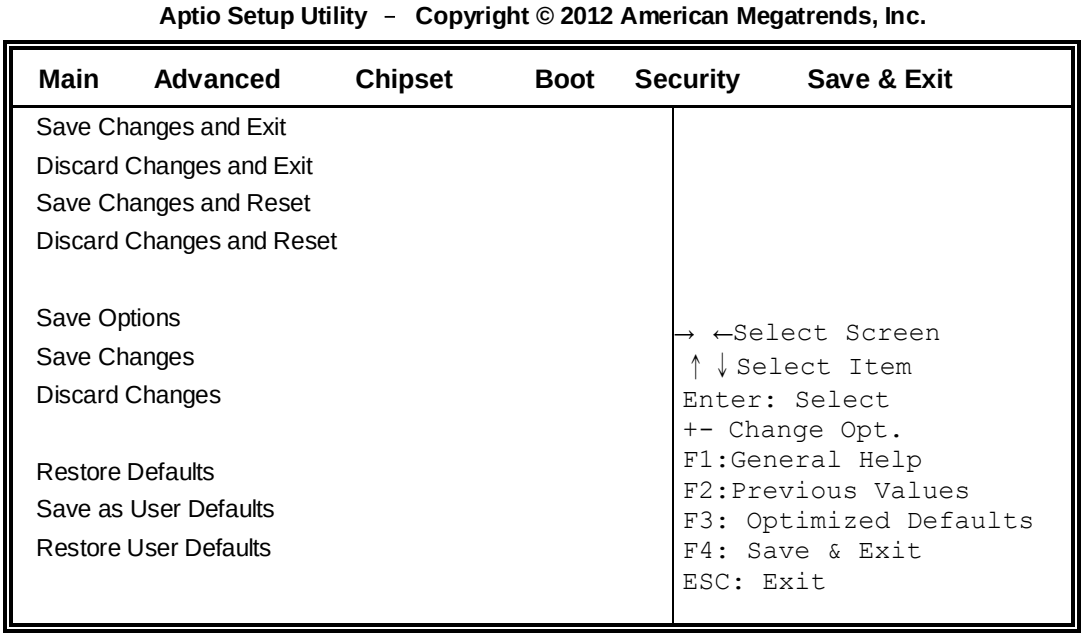
### Administrator Password

Set Administrator Password

### User Password

Set User Password

## Save & Exit Settings




### Save Changes and Exit

Exit system setup after saving the changes.

### Discard Changes and Exit

Exit system setup without saving any changes.

### Save Changes and Reset

Reset the system after saving the changes.

### Discard Changes and Reset

Reset system setup without saving any changes.

### Save Changes

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

### Discard Changes

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

### Restore Defaults

Restore/Load Defaults values for all the setup options.

### Save as User Defaults

Save the changes done so far as User Defaults.

### Restore User Defaults

Restore the User Defaults to all the setup options.

# CHAPTER 4 DRIVERS INSTALLATION

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

**IMPORTANT NOTE:**

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

## 4.1 Intel Chipset Software Installation Utility

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***.


2. Click ***Intel(R) Chipset Software Installation Utility.***

3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.


4. Click ***Accept*** to accept the software license agreement and proceed with the installation process.

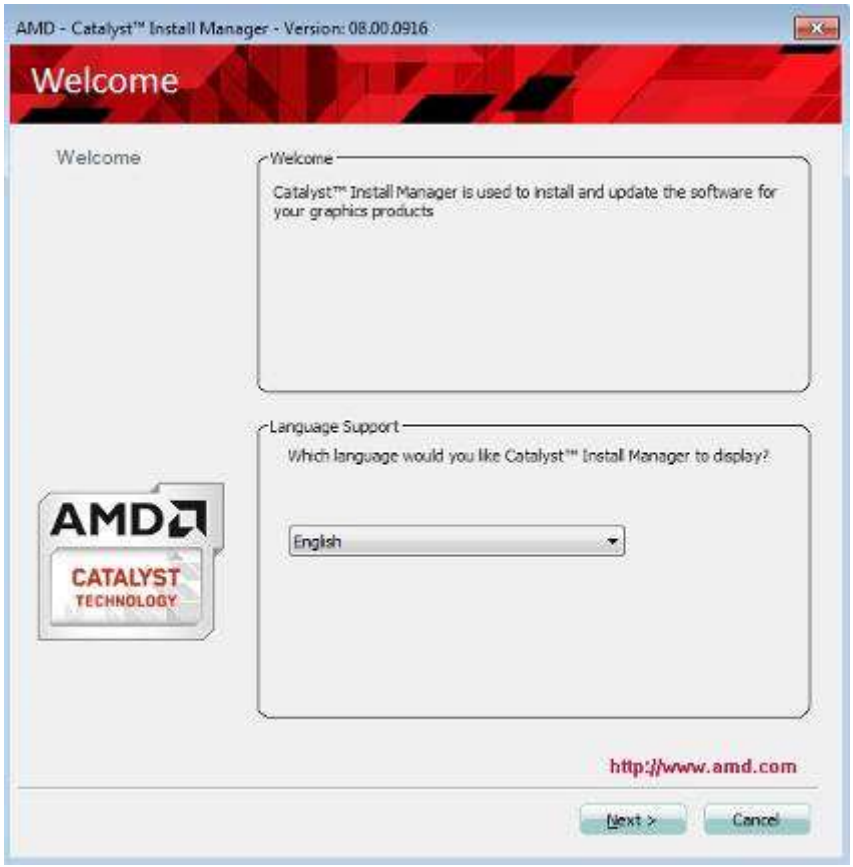
5. On the Readme File Information screen, click ***Install*** to continue the installation.


6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

## 4.2 AMD Radeon E8860 Graphics Driver

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***. Click ***AMD Radeon E8860 Graphics Driver***.

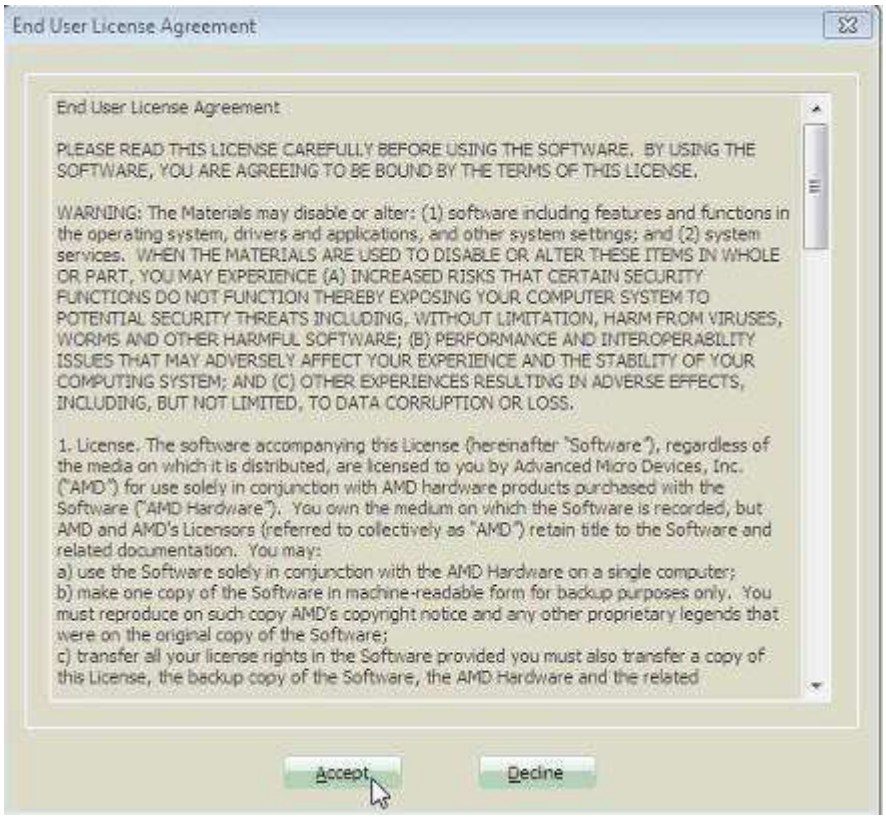

2. When the Welcome screen appears, click ***Next*** to continue.
3. Select the language you would like to be displayed and click ***Next***.



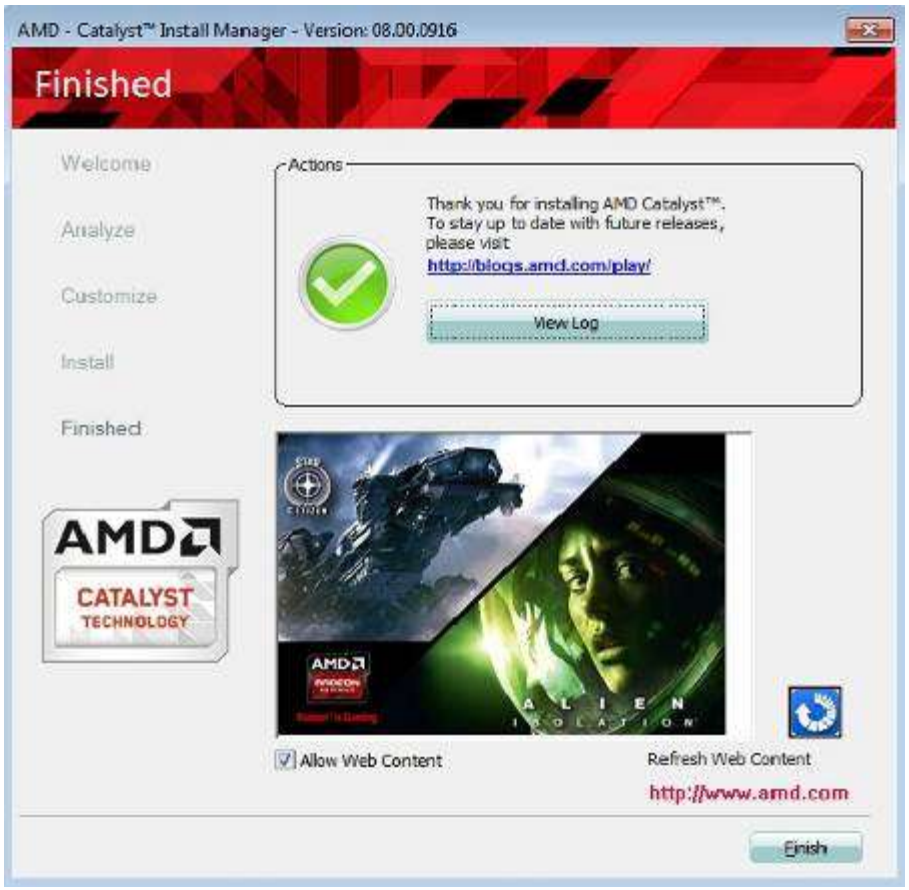
4. Click ***Install*** to continue the installation process.

5. Select Express and the installation location and click Next.

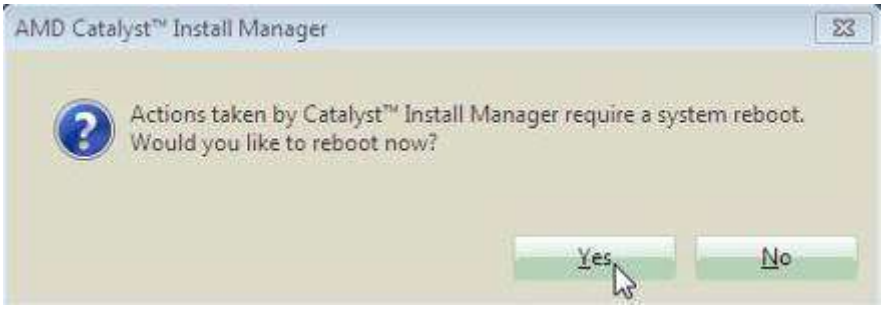

6. Click ***Accept*** to accept the End User License Agreement.



7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.




8. To reboot the system, click ***Yes***.



## 4.3 Realtek High Definition Audio Driver

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***.


2. Click ***Realtek High Definition Audio Driver.***

3. On the Welcome to the InstallShield Wizard screen, click ***Yes*** to proceed with and complete the installation process.


4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.

## 4.4 Intel® I21x Gigabit Network Driver

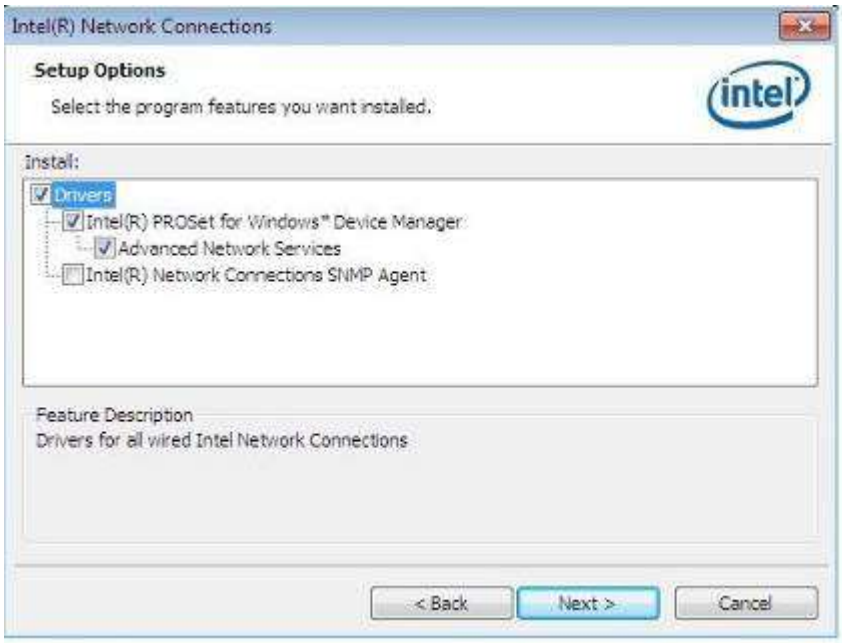
1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***.


2. Click ***Intel® I21x Gigabit Network Driver.***

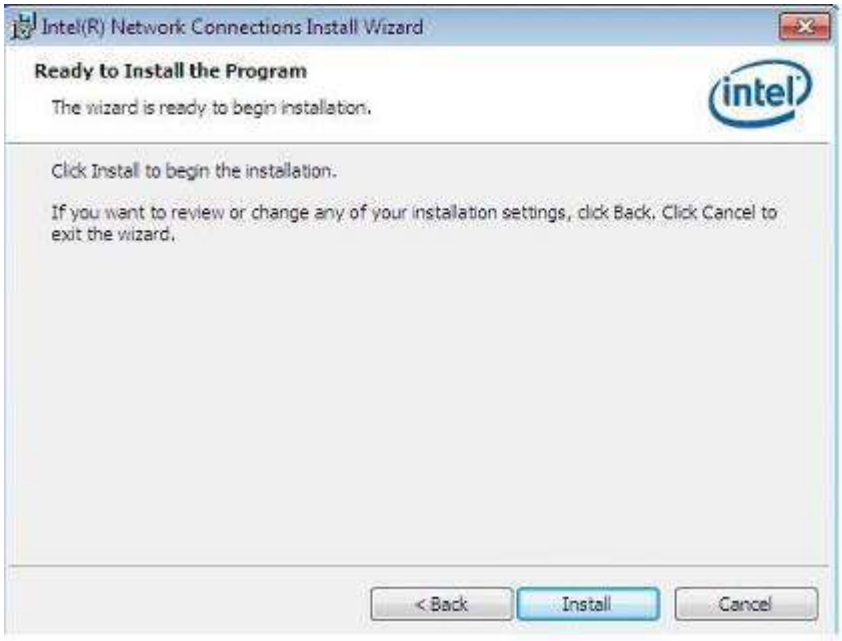
3. When the Welcome screen appears, click ***Next***.


4. Click ***Next*** to to agree with the license agreement.

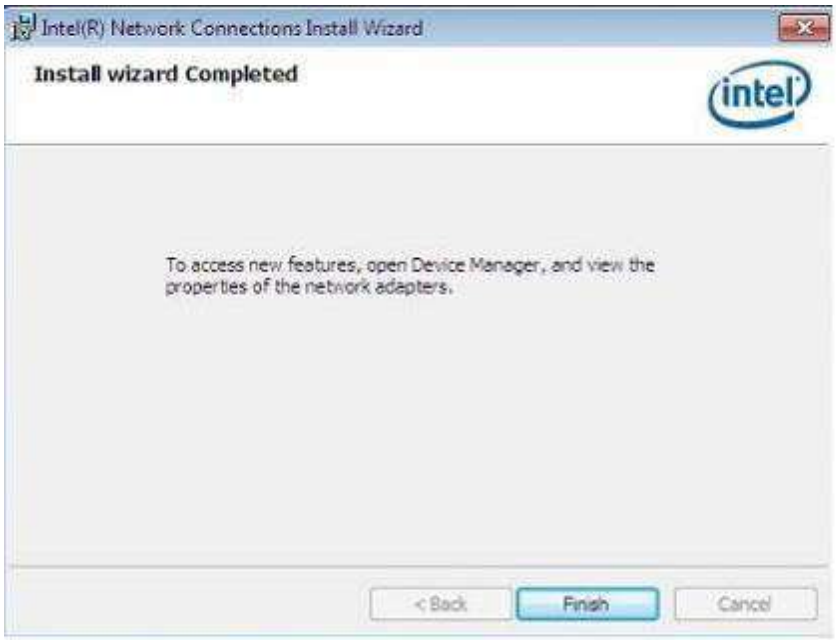
5. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.




6. The wizard is ready to begin installation. Click ***Install*** to begin the installation.



7. When InstallShield Wizard is complete, click ***Finish***.

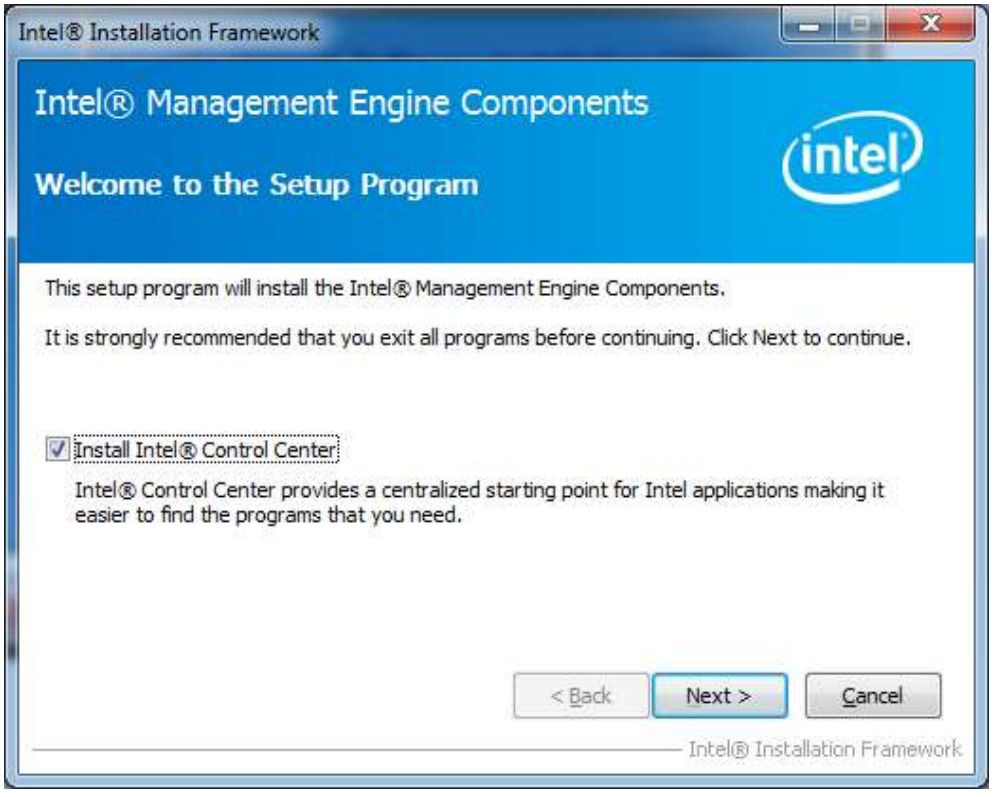


## 4.5 Intel® Management Engine(ME) Driver

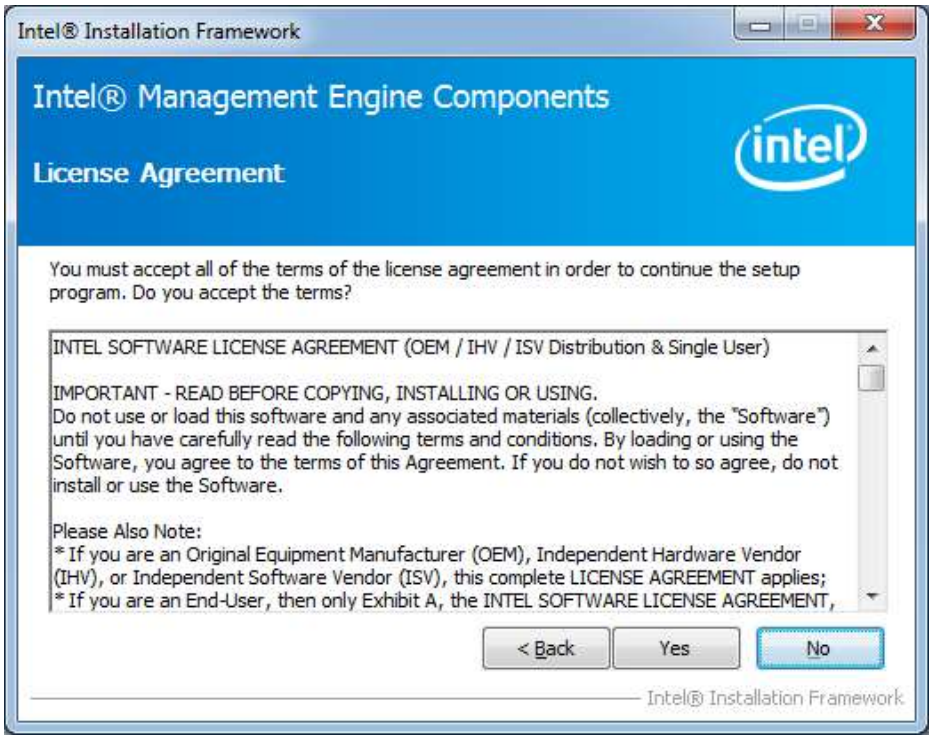

**Follow the steps below to install the Intel Management Engine.**

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***.and then ***Intel® Management Engine(ME) Driver***.

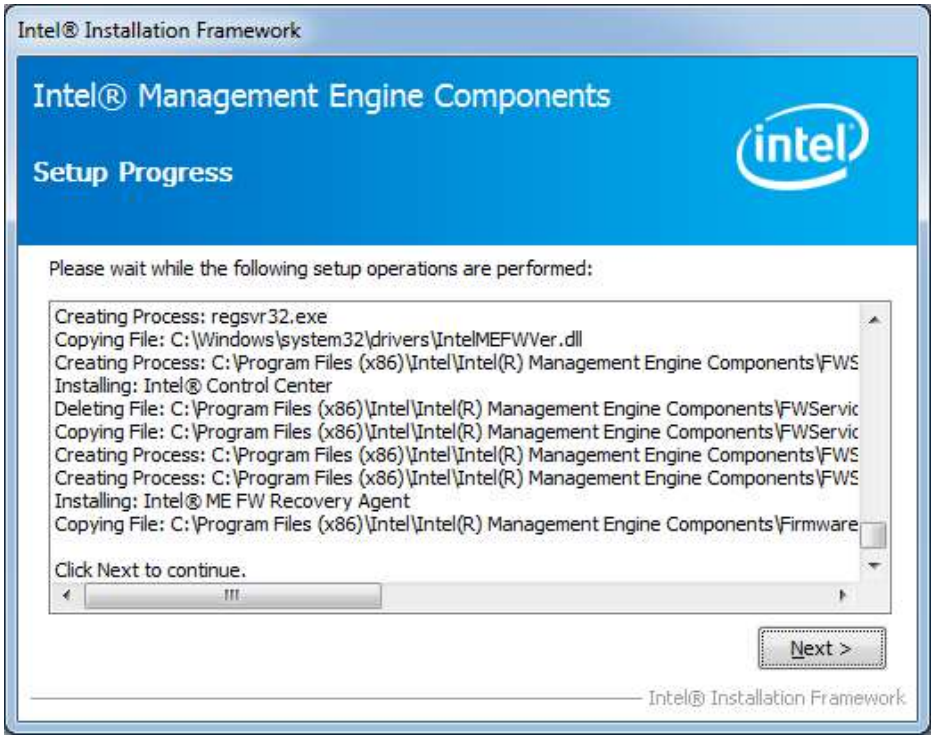

2. When the Welcome screen for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.



3. Click ***Yes*** to to agree with the license agreement.




4. When the Setup Progress screen appears, click ***Next***. Then, click ***Finish*** when the setup progress has been successfully installed.




Intel® Installation Framework
Intel® Management Engine Components
Setup Is Complete
intel
The setup program successfully installed the following components:
- Intel® Management Engine Interface
- Intel® Dynamic Application Loader
- Intel® Identity Protection Technology (Intel® IPT)
- Serial Over LAN
- Intel® Management and Security Status
- Local Management Service
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

## 4.6 Intel® USB 3.0 eXtensible Host Controller Driver

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***. Click ***Intel® USB 3.0 eXtensible Host Controller Driver.***


2. When the Welcome screen to the InstallShield Wizard for Intel® USB 3.0 eXtensible Host Controller Driver, click ***Next***.

3. Click ***Yes*** to to agree with the license agreement and continue the installation.

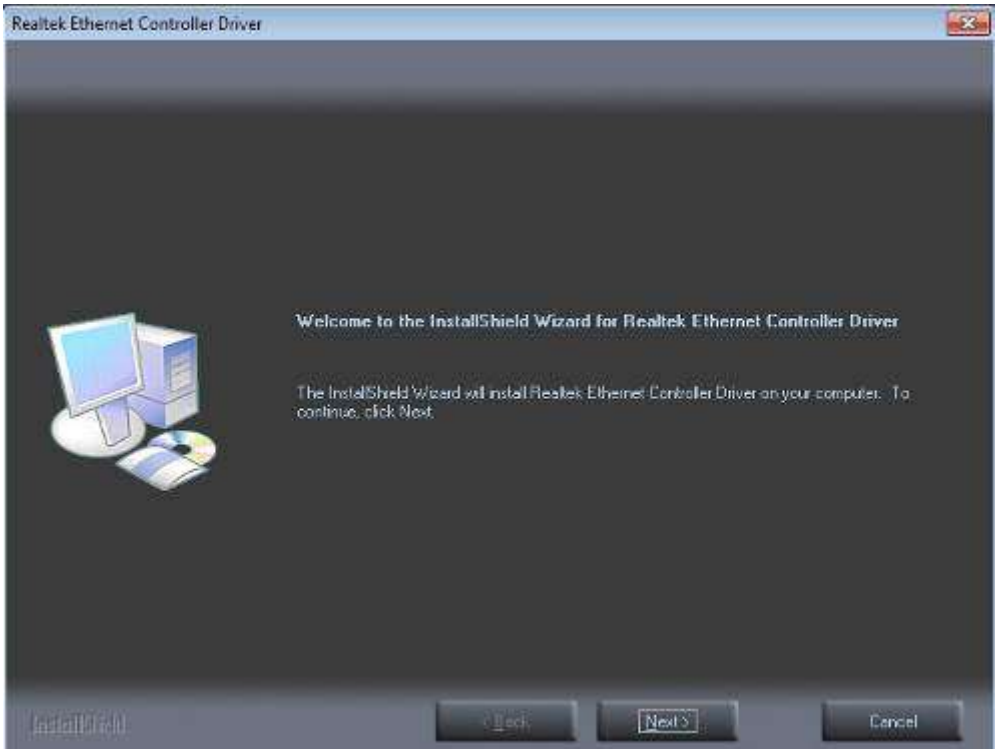

4. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® USB 3.0 eXtensible Host Controller Driver.

5. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

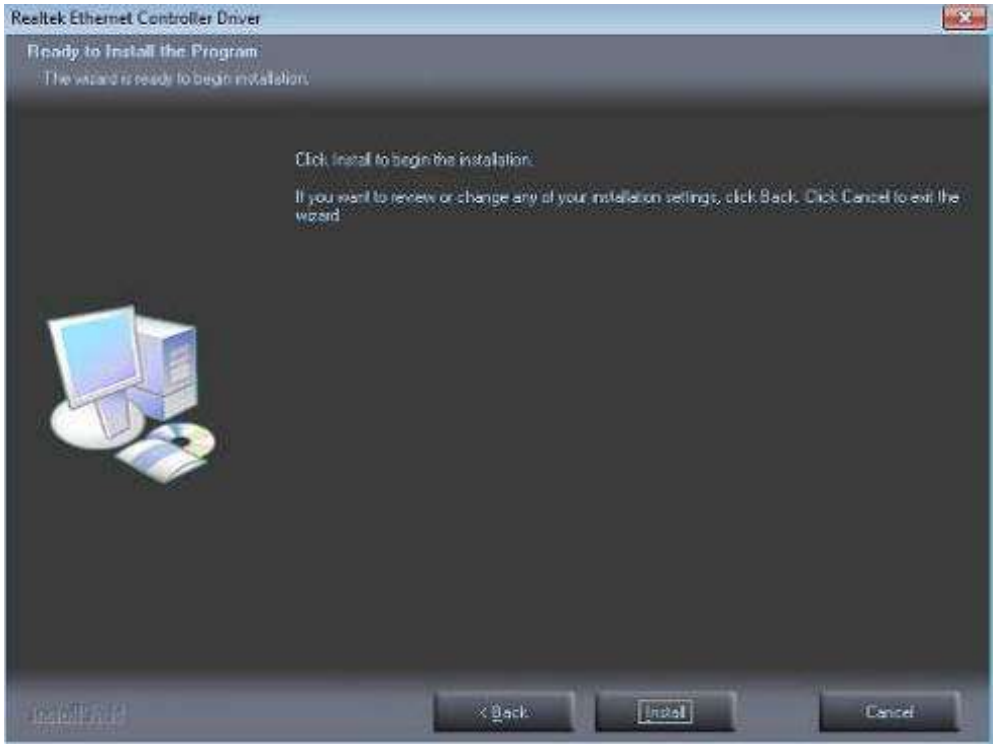
## 4.7 Realtek RTL8111G LAN Driver

1. Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***. Click ***Realtek RTL8111G LAN Driver.***

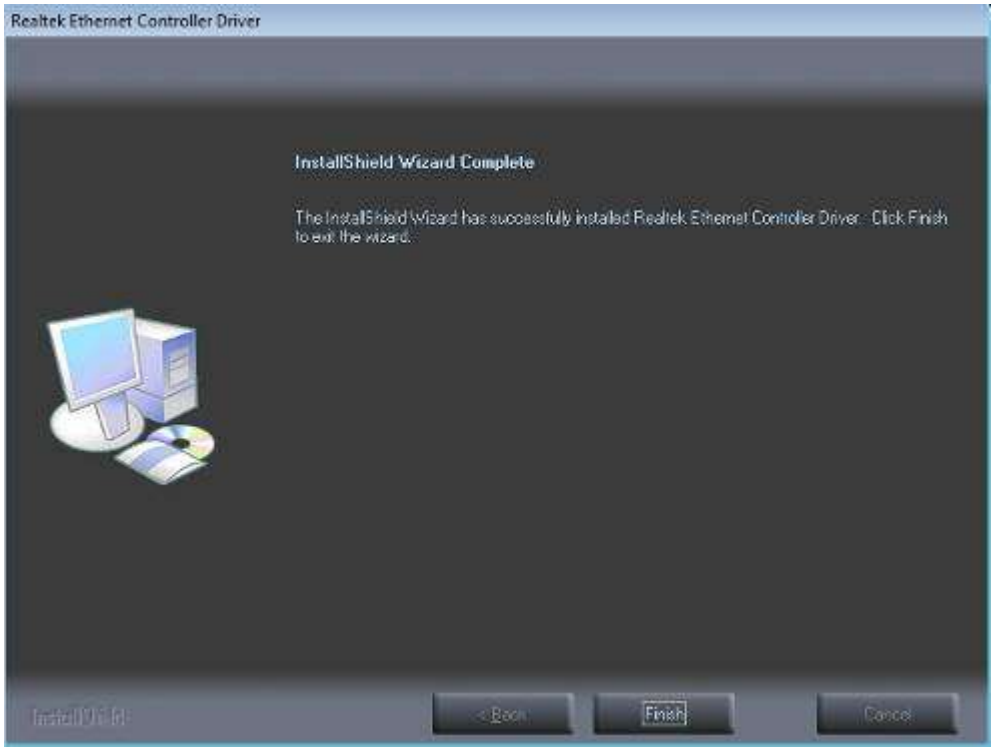

2. In the Welcome screen, click ***Next***.



3. When the Ready to Install the Program screen appears, click ***Install*** to continue.




4. When InstallShield Wizard is complete, click ***Finish***.



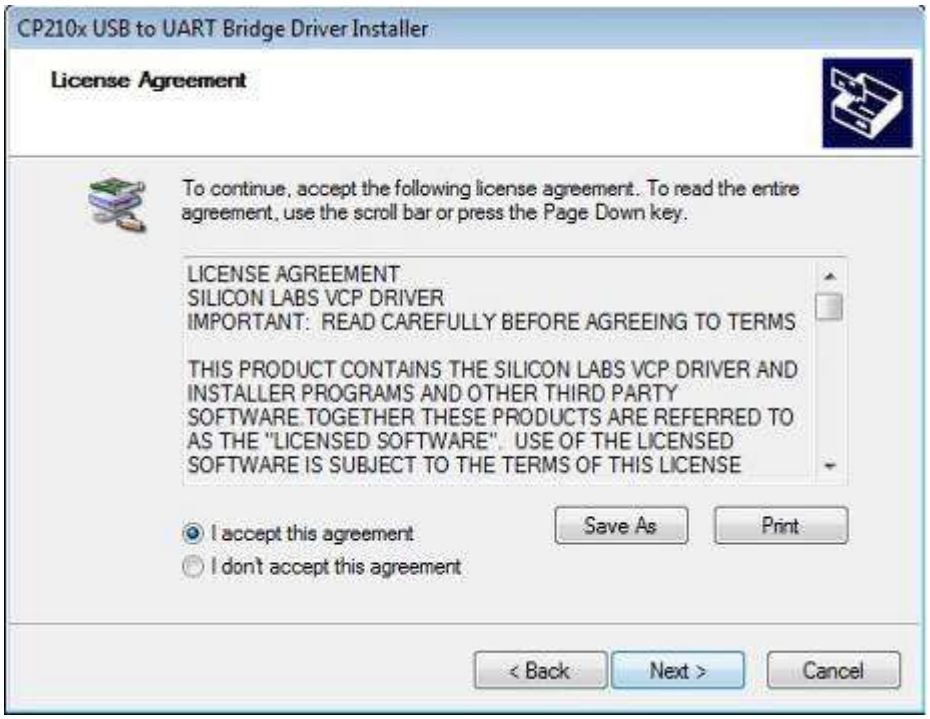
## 4.8 IDD100 Driver and Utility

1.Insert the DVD that comes with the board. Click ***System*** and then ***SI-60E Series Products***. Click ***IDD100 Driver and Utility.***


2. Click ***CP210x Installer***

3. In the Welcome screen, click ***Next***.


4. When the License Agreement the Program screen appears, click ***I accept this agreement and Next.***



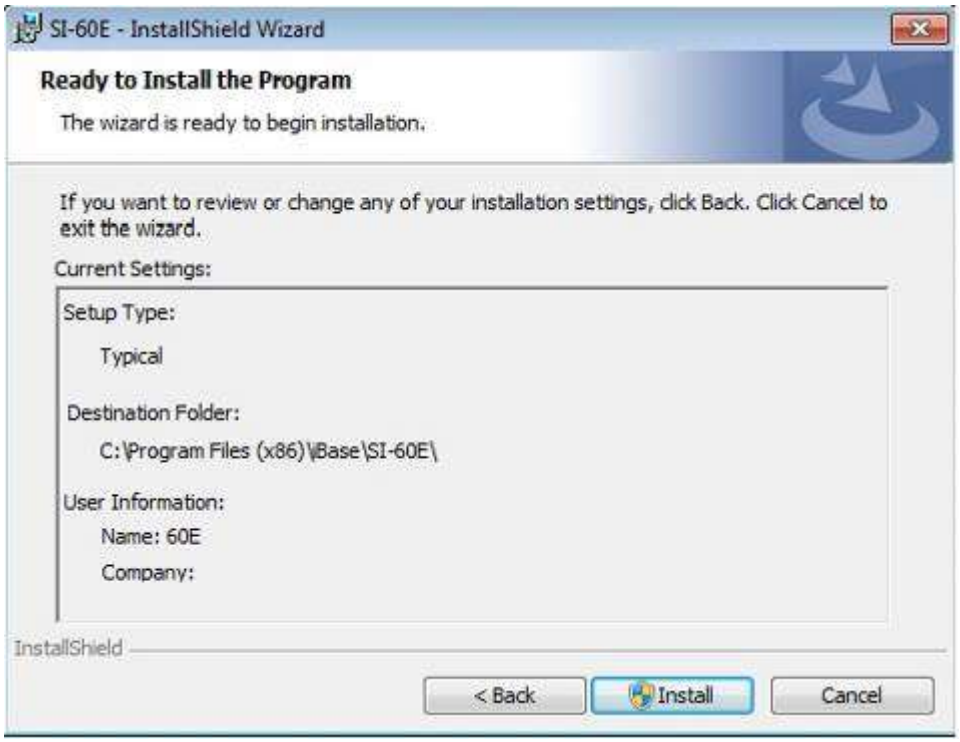
5.When complete the Installation of the CP210x USB to UART Bridge Driver, click ***Finish***.


6.Click ***SI-60E Installer***.

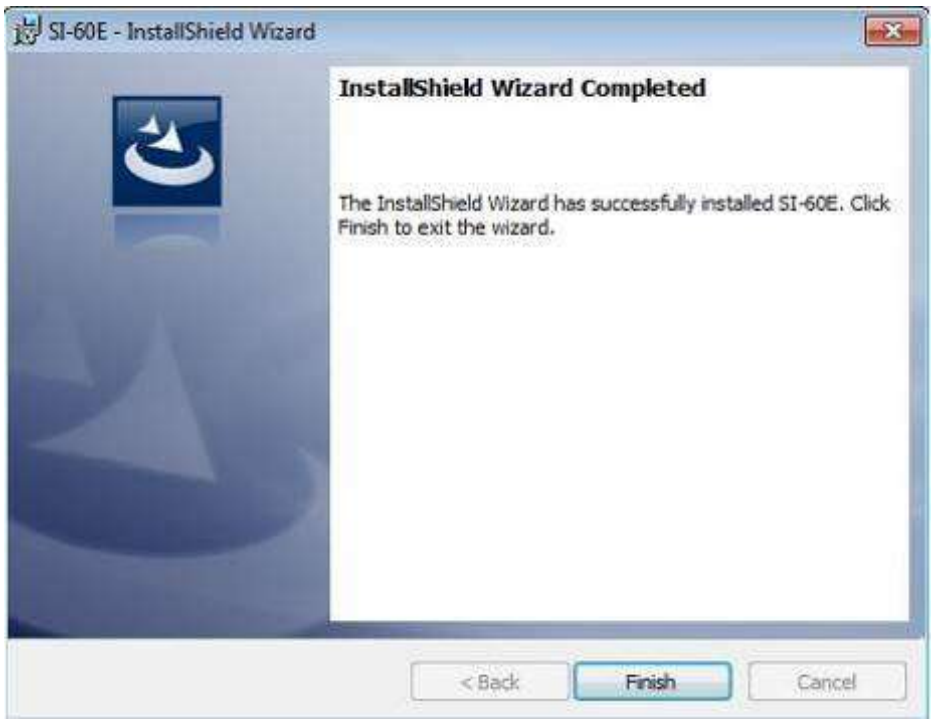
7. In the Welcome screen, click ***Next***.


8. When the Destination Folder screen appears, click ***Next***.

9. When the Ready to Install the Program screen appears, click ***Install***.




10.When InstallShield Wizard Complete, click Finish.



# Appendix

## A. IBASE Display Matrix User Manual

Software UART Control Application interface

Function Description

1. Device List: Max support up to 6 Box
2. Auto Loop Pattern (Button/Hot Key)
3. RGBW Pattern (Button/Hot Key)
4. HW RESET (Button/Hot Key)
5. MODE Clone/1x2/1x4/2x2
6. Support CLK SYNC
7. Support 60Hz/120Hz Modes
8. Support Multi-Box ID
9. Support Multi-Box Device Setting
10. Support H and V Bezel Adjustment
11. H Blanking Setting
12. V Blanking Setting
13. Apply Key
14. Program On/Off

Display Mode Table

| Stretch (1x2) | Stretch (1x4) | Stretch (2x2) | Clone |
|---|---|---|---|
| 3840x1200 | 7680x1200 | 3840x2400 | 1920x1200 |
| 3840x1080 | 7680x1080 | 3840x2160 | 1920x1080 |
| 3360x1050 | 6720x1050 | 3360x2100 | 1680x1050 |
| 3200x1200 | 6400x1200 | 3200x2400 | 1600x1200 |
| 3200x0900 | 6400x0900 | 3200x1800 | 1600x0900 |
| 2880x1050 | 5760x1050 | 2880x2160 | 1440x1050 |
| 2880x0900 | 5760x0900 | 2880x1800 | 1440x0900 |
| 2800x1050 | 5600x1050 | 2800x2100 | 1400x1050 |
| 2732x0768 | 5464x0768 | 2732x1536 | 1366x0768 |
| 2560x1024 | 5120x1024 | 2560x2048 | 1280x1024 |
| 2560x0800 | 5120x0800 | 2560x1600 | 1280x0800 |
| 2560x0768 | 5120x0768 | 2560x1536 | 1280x0768 |
| 2560x0720 | 5120x0720 | 2560x1440 | 1280x0720 |
| 2048x0768 | 4096x0768 | 2048x1536 | 1024x0768 |

Bezel Limit with Blanking Parameter Table

| H Limit | V Limit |
|---|---|
| 50 | 15 |
| 100 | 30 |
| 150 | 45 |
| 200 | 60 |
| 250 | TBD |

How to Setting Clone Display

Step 1: Enter to Display Control Page

Step 2: Go to Mode Status Press Enter

Step 3: Press Up / Down Key Select to Clone

Step 4: Go to UP PORT to select a Display Mode

Step 5: Go to Display Driver Control Page

Step 6: Setting the two Monitor to Duplicate Mode

How to Setting 1x4 Display

Step 1: Enter to Display Control Page
Step 2: Go to Mode Status Press Enter
Step 3: Press Up / Down Key Select to Stretch
Step 4: Go to Display Layout to Select 1x4
Step 5: Go to UP or DOWN Port select a Display Resolution
Step 6: Go to Display Driver Control Page
Step 7: Setting the two Monitor to H Combine Condition
Step 8: Adjustment H Bezel

How to Setting 2x2 Display

Step 1: Enter to Display Control Page
Step 2: Go to Mode Status Press Enter
Step 3: Press Up / Down Key Select to Stretch
Step 4: Go to Display Layout to Select 2x2
Step 5: Go to UP or DOWN Port select a Display Resolution
Step 6: Go to Display Driver Control Page
Step 7: Setting the two Monitor to V Combine Condition
Step 8: Adjustment H Bezel Value
Step 9: Adjustment V Bezel Value

## B. IBASE Multiple-Display Matrix Technology Utility for 4 x 3 Video Wall

## Display configuration setting

### 1.1 What is ATI Eyefinity Technology?

ATI Eyefinity Technology from AMD provides advanced multiple monitor technology delivering an incredibly immersive graphic and computing experience with innovative display capabilities, supporting massive desktop workspaces and super-high resolution signage applications. ATI Eyefinity technology with SI-58 6 X HDMI connectivity enables a single GPU to support up to six independent display outputs simultaneously. For the purposes of this document an “ATI Eyefinity system” means a computer system employing ATI Eyefinity technology and an “ATI Eyefinity resolution” means a resolution achievable using ATI Eyefinity technology.

### 1.2 Product Description

IBASE offers user-friendly and powerful video solution in the form of SI-60E (Signature Book) with IBASE Multiple-Display Matrix Technology Utility & AMD Eyefinity function. Each IBASE SI-60E (Signature Book) with IBASE Multiple-Display Matrix Technology Utility & Eyefinity function can drive up to 12 displays with different display configuration.

| SI-60E | Version |
|---|---|
| BIOS | MBD60E-D1B-D1A-150317 |
| Utility | SI-60E V 1.0 |
| VGA driver | 14.301.1001-140915a-177267C-AES |

### 1.3 Driver Installation

Before using SI-60E (Signature Book)'s IBASE Multiple-Display Matrix Technology Utility & AMD Eyefinity function, the user must install both SI-60EInstaller V 1.0 for (CP210xVCPInstaller/ SI-60EControlCenter) and AMD VGA driver completely.

### 1.4 IBASE Multiple-Display Matrix Technology Utility

Click SI-60E Icon  on the Desktop, to have Software UART Control Application interface as shown:

**“Turn on”** Device List

On the above Device List item, please confirm and check each IDD 100 Device with the different ID. If the Device has the same ID (the above two Device with the same ID 2), please select and click one of the same ID device, then select "**Set DeviceID**" function to change its ID number, and click "**Apply**" to finish the setting.


Each IDD100 Device supports 4x HDMI output, and maximum resolution is 1920 X 1200 per HDMI. You have to check the display resolution first, then choose the suitable resolution accordingly.

The following is an example for FHD displays. Choose “**Mode**” as Stretch 2x2 and “**DP1**” resolution is 3840 X 2160 (IDD100 Device with 4 x HDMI output as 2 x 2 combination mode).

Please choose “**Clock Sync**” as DP1 and enable “**Device Setting Sync**”, then click “**Apply**”.

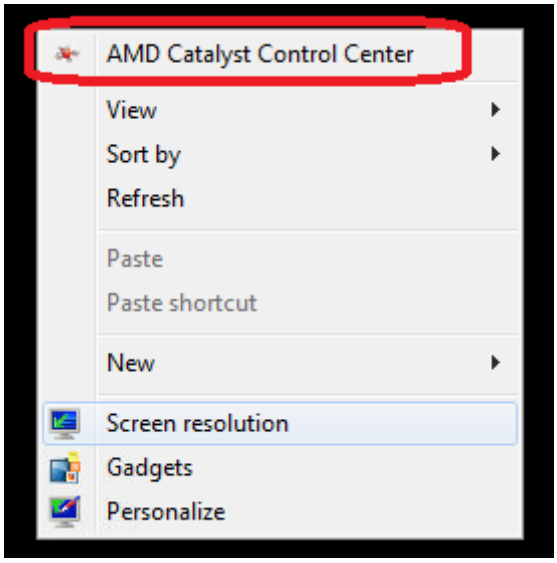
3 x IDD100 Device (Each with 4 x HDMI) will have the same setting at the same time.

**Remarks**: The reason we let 3 x IDD100 device “**Clock Sync**” to be the same as DP1

is because it can avoid differences in SYS GPU signal output to reduce tearing issues,

as well as keeps the SYS signal output stable.

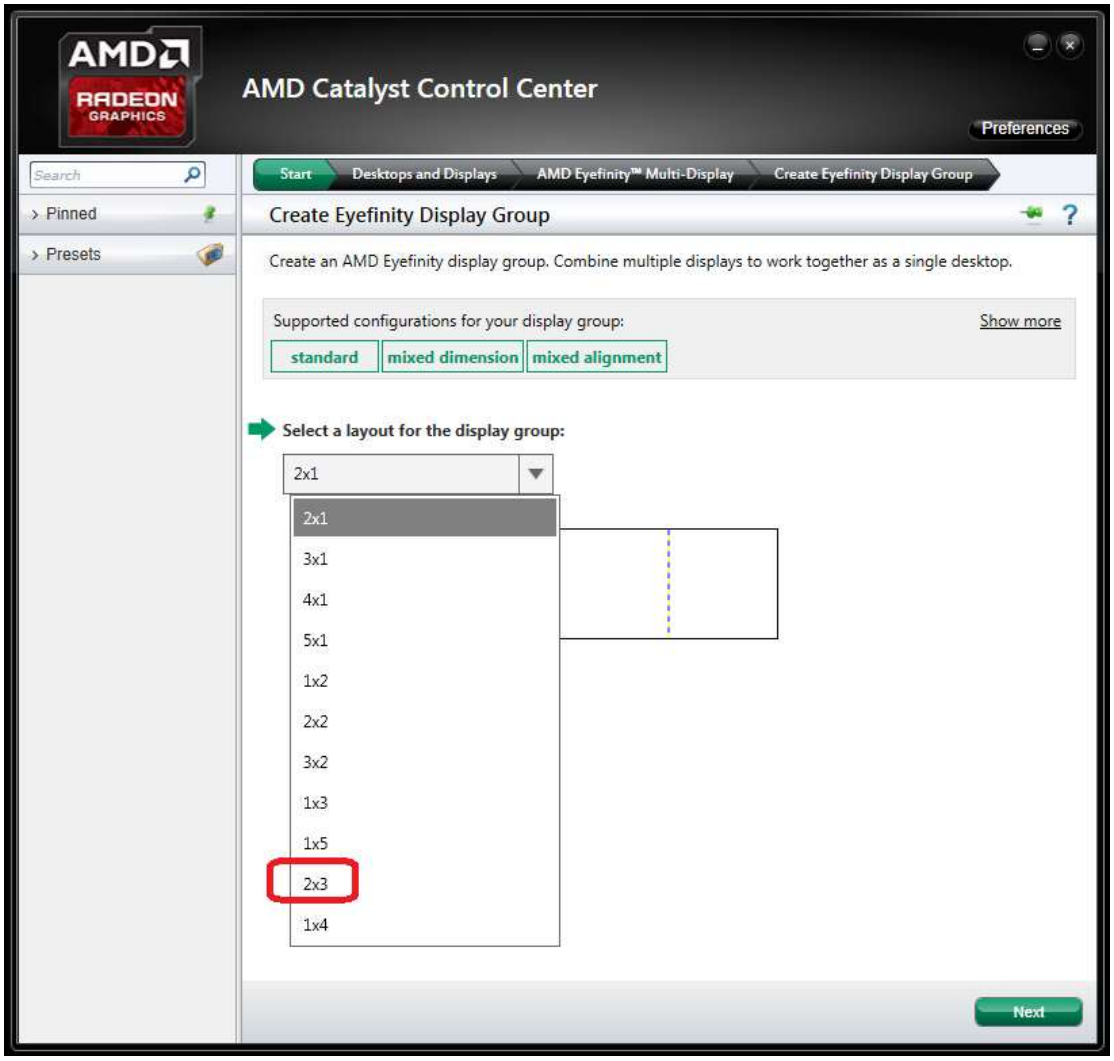
Now you can leave IBASE SI-60E control center V1.0 utility, and start using "**AMD Catalyst Control Center**"



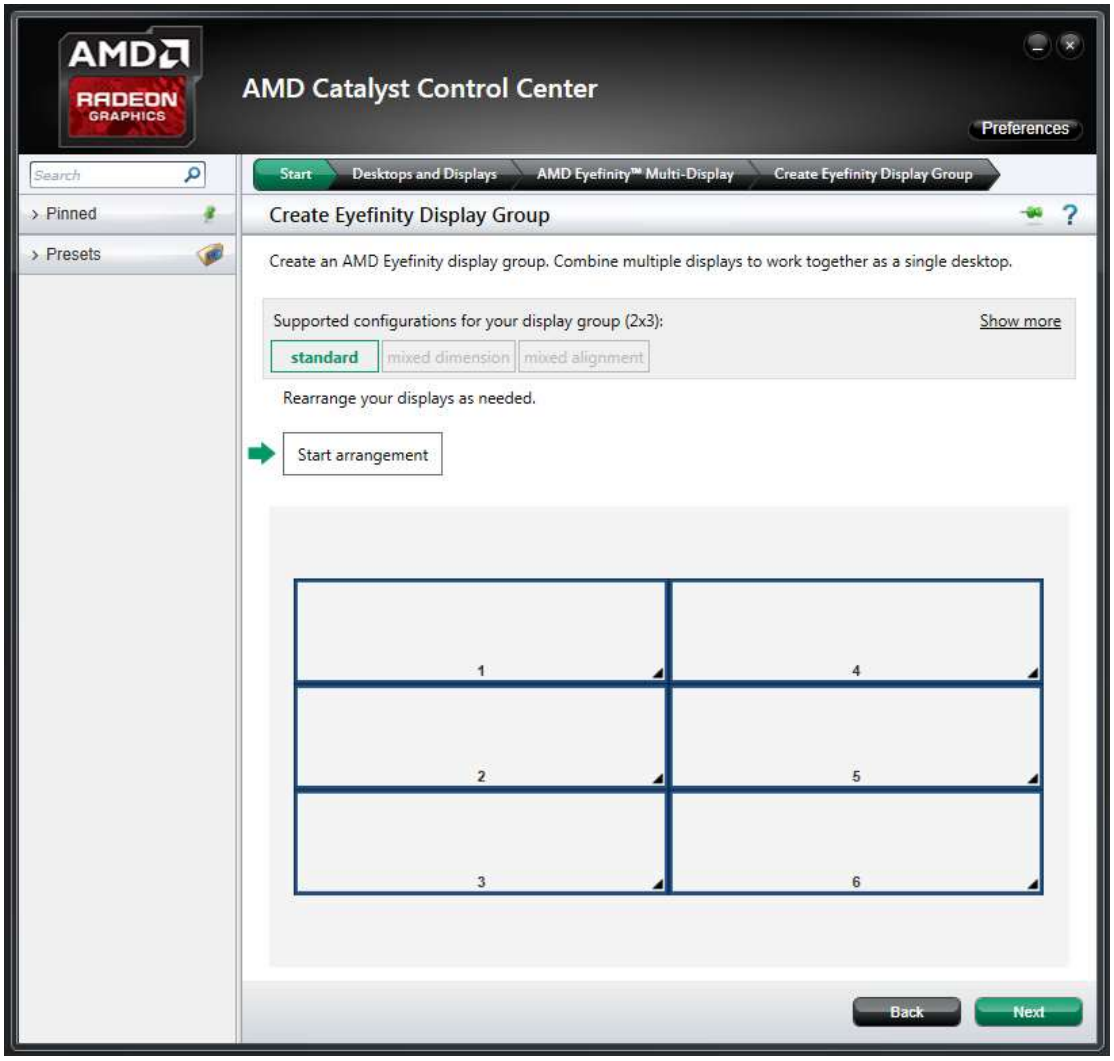
Choose “**AMD Eyefinity Multi-Display**” for Video wall display configuration setting.

Select “**Create Euefinity Display Group**”

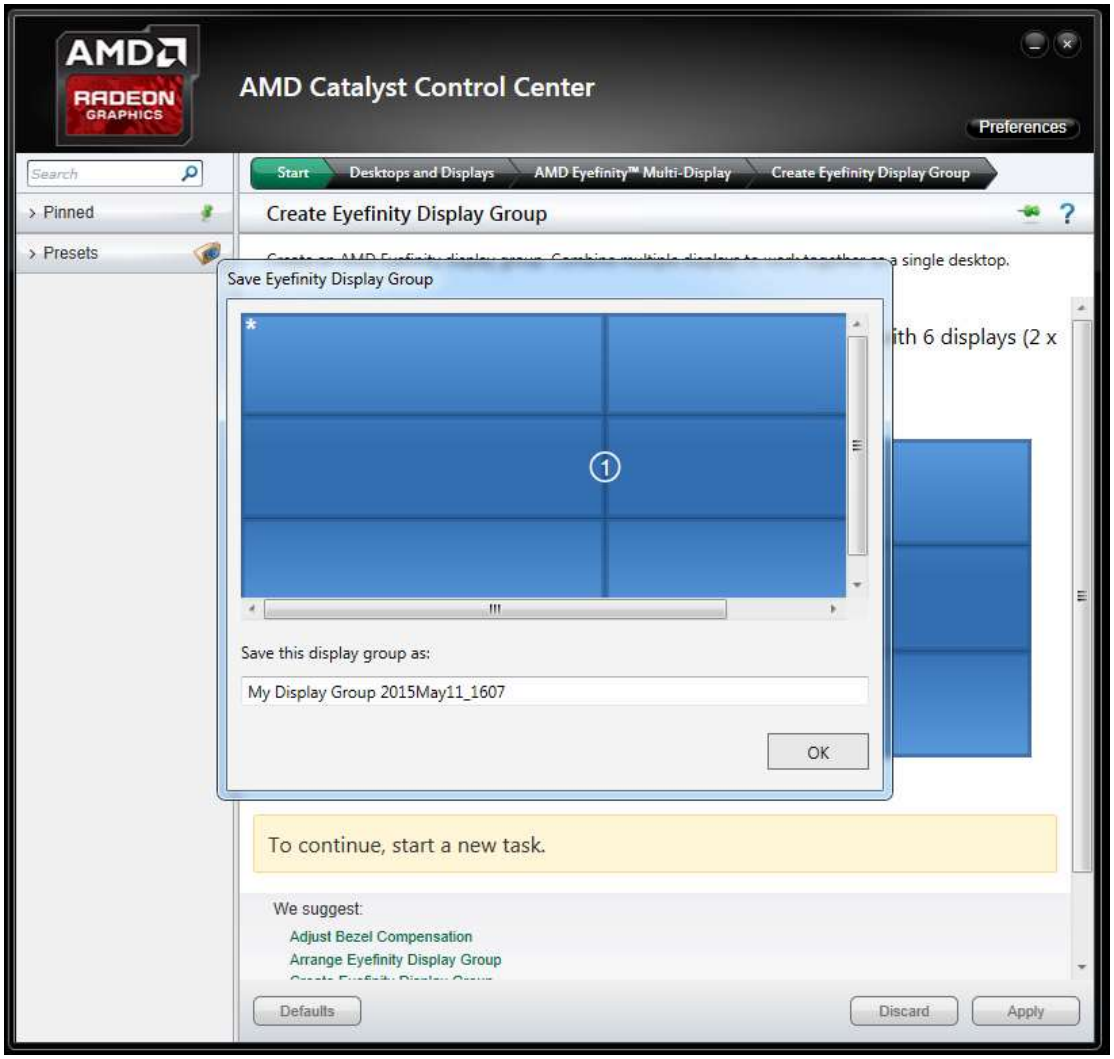
Select “**2 x 3**” for 4 x 3 Display configuration



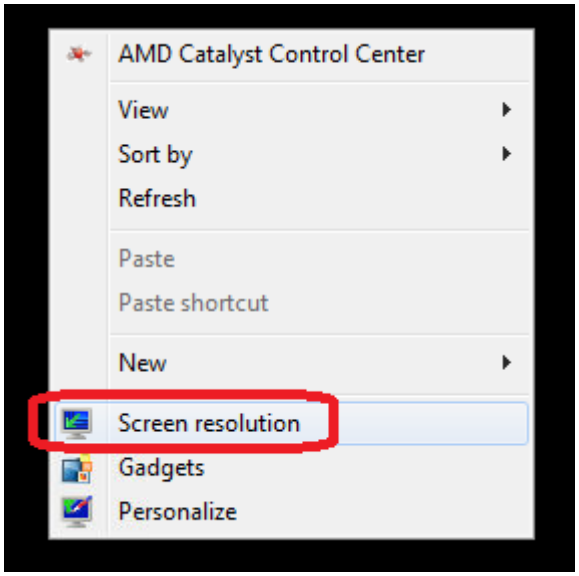
Make the displays arrangement



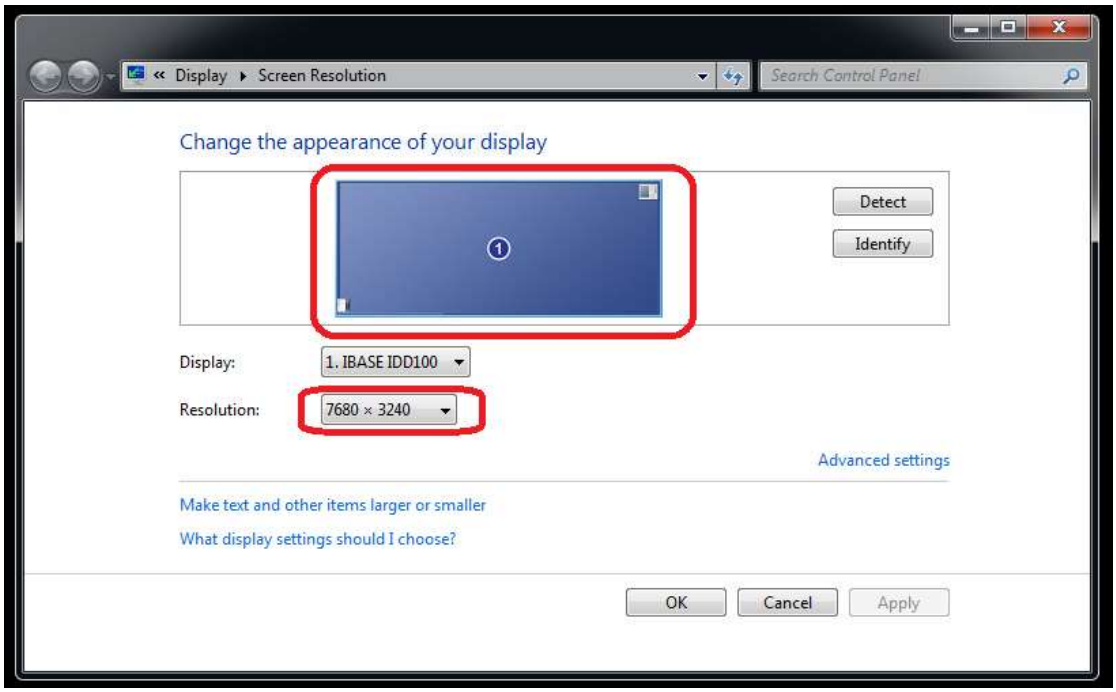
Complete the settings.



Now, you can use Screen resolution to check your setting.

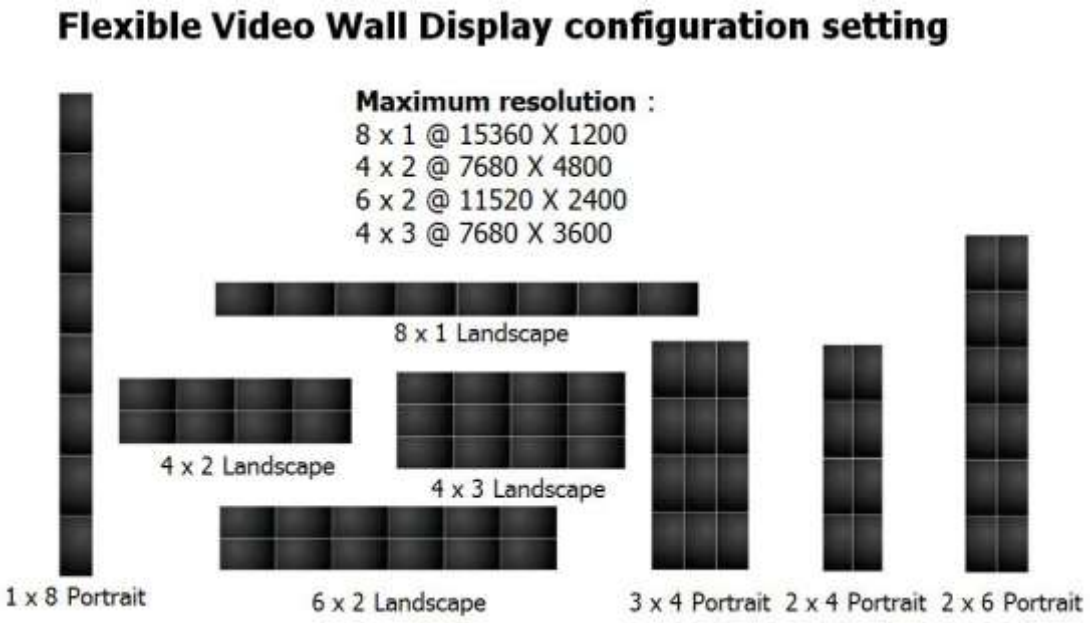



A screen with 7680 X 3240 is the correct setting for 4 x 3 Display configuration with FHD (1920 X 1080) resolution supported displays.



**Remark**:

8 and 12 Displays configurations



## C. 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 |
|---|---|
| 0000h-001Fh | Direct memory access controller |
| 0000h-0CF7h | PCI bus |
| 0040h-0043h | System timer |
| 0050h-0053h | System timer |
| 0070h-0077h | System CMOS/real time clock |
| 0081h-0091h | Direct memory access controller |
| 0093h-009Fh | Direct memory access controller |
| 00C0h-00DFh | Direct memory access controller |
| 00F0h-00F0h | Numeric data processor |
| 02F8h-02FFh | Communications Port (COM2) |
| 03B0h-03BBh | AMD Radeon E8860 |
| 03C0h-03DFh | AMD Radeon E8860 |
| 03F8h-03FFh | Communications Port (COM1) |
| 0D00h-FFFFh | PCI bus |
| D000h-DFFFh | Intel(R) 8 Series/C220 Series PCI Express Root Port #7 - 8C1C |
| E000h-E0FFh | AMD Radeon E8860 |
| F040h-F05Fh | Intel(R) 8 Series/C220 Series SMBus Controller - 8C22 |
| F060h-F07Fh | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| F0A0h-F0A3h | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| F0B0h-F0B7h | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| F0C0h-F0C3h | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| F0D0h-F0D7h | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| F0E0h-F0E7h | Intel(R) Active Management Technology - SOL (COM3) |

## D. 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 |
|---|---|
| IRQ0 | System Timer |
| IRQ3 | Serial Port #2 |
| IRQ4 | Serial Port #1 |
| IRQ 5 | Intel(R) 8 Series/C220 Series SMBus Controller - 8C22 |
| IRQ 13 | Numeric data processor |
| IRQ 16 | High Definition Audio Controller |
| IRQ 16 | Intel(R) 8 Series/C220 Series USB EHCI #2 - 8C2D |
| IRQ 19 | Intel(R) 8 Series/C220 Series SATA AHCI Controller - 8C02 |
| IRQ 19 | Intel(R) Active Management Technology - SOL (COM3) |
| IRQ 22 | High Definition Audio Controller |
| IRQ 23 | Intel(R) 8 Series/C220 Series USB EHCI #1 - 8C26 |

## E. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for 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, the user will 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 "F81846.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_F81846();
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_F81846_Reg(0x2B);
bBuf &= (~0x20);
Set_F81846_Reg(0x2B, bBuf);



                                                        //Enable WDTO

Set_F81846_LD(0x07);



                                                        //switch to logic device 7
Set_F81846_Reg(0x30, 0x01);

                                                        //enable timer

bBuf = Get_F81846_Reg(0xF5);
bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81846_Reg(0xF5, bBuf);

                                                        //count mode is second

Set_F81846_Reg(0xF6, interval);

                                                        //set timer

bBuf = Get_F81846_Reg(0xFA);
bBuf |= 0x01;
Set_F81846_Reg(0xFA, bBuf);

                                                        //enable WDTO output

bBuf = Get_F81846_Reg(0xF5);
bBuf |= 0x20;
Set_F81846_Reg(0xF5, bBuf);

                                                        //start counting

}
//-----------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;

Set_F81846_LD(0x07);
```

```
                                                        //switch to logic device 7
bBuf = Get_F81846_Reg(0xFA);
bBuf &= ~0x01;
Set_F81846_Reg(0xFA, bBuf);

                                                        //disable WDTO output
bBuf = Get_F81846_Reg(0xF5);
bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81846_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 "F81846.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81846_BASE;
void Unlock_F81846 (void);
void Lock_F81846 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81846(void)
{
unsigned int result;
unsigned char ucDid;

F81846_BASE = 0x4E;
result = F81846_BASE;

ucDid = Get_F81846_Reg(0x20);
if (ucDid == 0x07)



                                                        //Fintek 81866
{                                                       goto Init_Finish;
                                                        }

F81846_BASE = 0x2E;
result = F81846_BASE;

ucDid = Get_F81846_Reg(0x20);
if (ucDid == 0x07)



                                                        //Fintek 81866
{                                                       goto Init_Finish;
                                                        }

F81846_BASE = 0x00;
result = F81846_BASE;

Init_Finish:
return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81846 (void)
{
outportb(F81846_INDEX_PORT, F81846_UNLOCK);
outportb(F81846_INDEX_PORT, F81846_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81846 (void)
{
outportb(F81846_INDEX_PORT, F81846_LOCK);
}
```

```
//---------------------------------------------------------------------------
void Set_F81846_LD( unsigned char LD)
{
Unlock_F81846();
outportb(F81846_INDEX_PORT, F81846_REG_LD);
outportb(F81846_DATA_PORT, LD);
Lock_F81846();
}
//---------------------------------------------------------------------------
void Set_F81846_Reg( unsigned char REG, unsigned char DATA)
{
Unlock_F81846();
outportb(F81846_INDEX_PORT, REG);
outportb(F81846_DATA_PORT, DATA);
Lock_F81846();
}
//---------------------------------------------------------------------------

unsigned char Get_F81846_Reg(unsigned char REG)
{
unsigned char Result;
Unlock_F81846();
outportb(F81846_INDEX_PORT, REG);
Result = inportb(F81846_DATA_PORT);
Lock_F81846();
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 __F81846_H
#define __F81846_H


                                                    1
//---------------------------------------------------------------------------
#define                                             F81846_INDEX_PORT

                                                    (F81846_BASE)
#define                                             F81846_DATA_PORT

                                                    (F81846_BASE+1)
//---------------------------------------------------------------------------
#define                                             F81846_REG_LD


                                                    0x07
//---------------------------------------------------------------------------
#define F81846_UNLOCK

                                                    0x87
#define                                             F81846_LOCK



                                                    0xAA
//---------------------------------------------------------------------------
unsigned int Init_F81846(void);
void Set_F81846_LD( unsigned char);
void Set_F81846_Reg( unsigned char, unsigned char);
unsigned char Get_F81846_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif                                              //__F81846_H
```