

MIO-2262

Intel® Atom™ N2600/ N2800
Pico-ITX SBC, DDR3, 18/24-bit
LVDS, VGA, 1 GbE, Full-size Mini
PCIe, 4 USB, 2 COM, SMBus, I²C,
mSATA & MIOe

Copyright

The documentation and the software included with this product are copyrighted 2013 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

AMI is a trademark of AMI Software International, Inc.

Intel® is a trademark of Intel® Technologies, Inc.

IBM, PC/AT, PS/2 and VGA are trademarks of International Business Machines Corporation.

Microsoft Windows® is a registered trademark of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Packing List

Before installation, please ensure the following items have been shipped:

- 1 MIO-2262 SBC
- 1 Startup manual
- 1 SATA cable (P/N: 1700006291)
- 1 Heatsink (P/N: 1960055792T001)

1960055792T001	99.5 x 70.5 x 15.7 mm
----------------	-----------------------

- 1 x Stud and Screw Kit

Part Number	Description
9666226200E	Stud and screw pack, including:
1935031500	Screw R/S D=5.3 H=2 M3*15L, 4pcs
1910002303	POST F=M3*5.0L M=M3*4L B=5.0 H=8.0, 4pcs
193B0204C0	Screw F/S D=3.5 H=0.8 + M2*4L, 2 pcs

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Ordering Information

Model Number	Description
MIO-2262N-S6A1E	MIO-2262 Intel® Atom™ N2600 SBC
MIO-2262N-S8A1E	MIO-2262 Intel® Atom™ N2800 SBC

Optional Accessories

Part No.	Description
1960055791T001	Heat Spreader (99.5 x 70.5 x 11.2 mm)
MIOE-DB2000-00A1E	MIO-2262 Evaluation Board

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*



Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Chapter 1	General Introduction	1
1.1	Introduction	2
1.2	Specifications	2
1.2.1	General Specifications	2
1.2.2	Functional Specifications	3
1.2.3	Mechanical Specifications	4
1.2.4	Electrical Specifications	4
1.2.5	Environmental Specifications	5
1.3	Block Diagram	5
Chapter 2	Installation.....	7
2.1	Jumpers	8
2.1.1	Jumper Description	8
2.1.2	Jumper List	8
	Table 2.1: Jumper List	8
2.1.3	Jumper Settings	9
	Table 2.2: J1 LCD Power/Auto Power On	9
2.2	Connectors	9
2.2.1	Connector List	9
	Table 2.3:	9
	Table 2.4:	9
2.3	Mechanical	10
2.3.1	Jumper and Connector Locations	10
	Figure 2.1 Jumper and Connector Layout (Top Side)	10
	Figure 2.2 Jumper and Connector Layout (Bottom Side)	10
2.3.2	Board Dimensions	11
	Figure 2.3 MIO-2262 Mechanical Drawing (Top Side)	11
	Figure 2.4 MIO-2262 Mechanical Drawing (Bottom Side)	11
	Figure 2.5 MIO-2262 Mechanical Drawing (Side View with Heatsink)	12
	Figure 2.6 MIO-2262 Mechanical Drawing (Side View with Optional Heatspreader)	12
Chapter 3	BIOS Settings.....	15
3.1	BIOS Setup	16
	Figure 3.1 Setup Program Initial Screen	16
3.2	Entering Setup	17
3.2.1	Main Setup	17
	Figure 3.2 Main Setup Screen	17
3.2.2	Advanced BIOS Features Setup	18
	Figure 3.3 Advanced BIOS Features Setup Screen	18
	Figure 3.4 ACPI Settings	19
	Figure 3.5 TPM Configuration	20
	Figure 3.6 CPU Configuration	21
	Figure 3.7 SATA Configuration	22
	Figure 3.8 Intel Fast Flash Standby	23
	Figure 3.9 USB Configuration	24
	Figure 3.10 Super I/O Configuration	25
	Figure 3.11 HW Monitor Configuration	26
	Figure 3.12 AOAC Configuration	27
	Figure 3.13 PPM Configuration	28

3.2.3	Chipset.....	29
	Figure 3.14 Chipset Setup.....	29
	Figure 3.15 Intel IGD Configuration.....	30
	Figure 3.16 South Bridge.....	31
	Figure 3.17 TPT Device.....	32
3.2.4	Boot Settings	33
	Figure 3.18 Boot Setup Utility.....	33
3.2.5	Security Setup	34
	Figure 3.19 Password Configuration	34
3.2.6	Save & Exit	35
	Figure 3.20 Save & Exit.....	35
Chapter 4	S/W Introduction & Installation.....	37
4.1	S/W Introduction	38
4.2	Driver Installation	38
4.3	Value-Added Software Services	38
4.3.1	SUSI Introduction.....	38
4.3.2	SUSI Functions.....	39
4.3.3	Environments.....	41
4.3.4	SUSI Programs.....	42
Appendix A	PIN Assignments	51
A.1	Jumper and Connector Tables.....	52
Appendix B	WDT & GPIO	61
B.1	Watchdog Timer Sample Code.....	62
B.2	GPIO Sample Code	63
Appendix C	System Assignments.....	65
C.1	System I/O Ports.....	66
	Table C.1: System I/O Ports	66
C.2	DMA Channel Assignments	66
	Table C.2: DMA Channel Assignments	66
C.3	1st MB Memory Map.....	66
	Table C.3: 1st MB Memory Map	66
C.4	Interrupt Assignments	67
	Table C.4: Interrupt Assignments	67

Chapter 1

General Introduction

This chapter gives background information on the MIO-2262.

Sections include:

- Introduction
- Specifications
- Block Diagram

1.1 Introduction

MIO-2262 is a MI/O-Ultra SBC (Single Board Computer) with Embedded Intel® Atom™ N2600 1.6 GHz and N2800 1.86 GHz Processor. MIO-2262 can support DDR3 memory up to 4GB, and has one LVDS, one SATA connector and full size miniPCIe or mSATA slot on board. There is no rear I/O on the coastline; user expansion 7 USB2.0, 2 PCIe x1, LPC, HD audio line in/out, DP or HDMI, 5Vsb/12Vsb power, inverter, VGA, GbE, SMBus, I2C, HDD/Power LED, GPIO, 2 RS-232, and 12V DC input interfaces via two 64-pin internal connectors and MIOe extension slot. MIO-2262 is a cost-effective board-to-board solution with high integration flexibility.

Customers can efficiently make a carrier board or I/O module to expand I/O functions or specific I/O to fulfill different vertical market demands.

1.2 Specifications

1.2.1 General Specifications

- **CPU:** Intel® Atom™ processor N2600 / N2800
- **System Chipset** Intel® Atom™ N2600 / N2800 + NM10
- **BIOS:** AMI EFI 16 M-bit Flash BIOS
- **System Memory:** DDR3 800 MHz(N2600), 1066 MHz (N2800) up to 4 GB
- **Internal I/O Interface:** 1 x LVDS and 1 x SATA
- **Expansion Interface:**
 - 1 x Full-size Mini PCIe slot (Supports mSATA, Mini PCIe card or USB interface module, default support mSATA, selected by BIOS)
 - 1 x MIOe connector: supports 3 x USB 2.0, 2 x PCIe x1, LPC, HD Audio line-out, SMBus, DP (or HDMI, supported by request), 5 Vsb/12 Vsb power output
 - 1 x 64-pin connector A: 12V DC input, Inverter, VGA, 2 x USB2.0, 1GbE w/ LED
 - 1 x 64-pin connector B: SMBus, I2C, Power/Reset button, HDD/Power LED, 2 x USB2.0, 8-bit GPIO, HD Audio Line in/out, 2 x RS-232
- **Watchdog Timer:** Single chip Watchdog 255-level interval timer, setup by software
- **Battery:** Lithium 3 V / 210 mA

1.2.2 Functional Specifications

Processor

Processor	<ul style="list-style-type: none"> ■ Intel® Atom™ Dual Core Processor N2600/ N2800 ■ Frequency <ul style="list-style-type: none"> – - N2600 1.6 GHz – - N2800 1.86 GHz ■ Manufacturing Technology: 32 nm ■ L2 cache: 1 MB
Memory	<ul style="list-style-type: none"> ■ Supports DDR3 800 MHz (N2600), DDR3 1066 MHz (N2800), up to 4 GB ■ SODIMM Socket: 204-pin SODIMM socket type *1
Graphic Engine	<ul style="list-style-type: none"> ■ DirectX* 9 compliant Pixel Shader 2.0 and OGL 3.0 support ■ Full MPEG2 (VLD/ iDCT/MC), WMV, Fast video Composing support ■ Hardware decode/ acceleration for MPEG4 Part 10 (AVC/ H.264) and VC-1
Display	<ul style="list-style-type: none"> ■ VGA: 1920 x 1200 (WUXGA) @ 60Hz ■ LVDS: 18/24-bit, up to 1366 x 768 (WXGA) @ 60 Hz ■ Dual independent display: LVDS + VGA ■ DP or HDMI: by MIOe connector (HDMI supported by request)

Chipset

Control Hub	<ul style="list-style-type: none"> ■ Intel® NM10
Audio	<ul style="list-style-type: none"> ■ High Definition Audio (HD) ALC892 codec ■ Up to 2 channel of PCM (Pulse Code Modulation) audio output ■ Supports line IN and line OUT from 64-pin and MIOe connectors
PCI-Express Interface	<ul style="list-style-type: none"> ■ 4 PCI-Express x1 Lanes ■ Lane 1: Intel 82583V GbE controller ■ Lane 2: Full-size Mini PCIe connector ■ Lane 3 & 4: MIOe connector
SATA Interface	<ul style="list-style-type: none"> ■ 1 x mSATA by mini-PCIe socket (Integrates USB signal, supports mSATA, Mini PCIe card or USB interface module), selected by BIOS, default is mSATA) ■ 1 x SATAII (Max. Data transfer Rate 300 MB/s)
USB Interface	<ul style="list-style-type: none"> ■ 8 USB 2.0 ■ 7 x USB by 64-pin and MIOe connectors ■ 1 x USB by mini-PCIe socket ■ Transmission speed up to 480 Mbps
Power Management	<ul style="list-style-type: none"> ■ Full ACPI (Advanced Configuration and Power Interface) 3.0 ■ Supports S1, S3, S4, S5 ■ Supports wake on LAN
BIOS	AMI EFI 16 Mbit Flash BIOS via SPI
SMBus	2 SMBus by 64-pin and MIOe connectors
I ² C	64-pin connector support

LPC	MIOe connector
Others	
Ethernet	<ul style="list-style-type: none"> ■ Controller: Intel® 82583V (GbE1) ■ Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 8023y, IEEE 802.ab ■ Supports 10/100/1000 Mbps ■ 64-pin connector support ■ Supports wake on LAN
Serial ports	<ul style="list-style-type: none"> ■ Controller: SMSC SCH 3114 ■ 2 x RS-232 serial ports with ESD protection: air gap ± 15 kV, contact ± 8 kV
GPIO	<ul style="list-style-type: none"> ■ Controller: SMSC SCH 3114 ■ 8-bit (programming) through Super I/O, pin header ■ 5 V tolerance

1.2.3 Mechanical Specifications

1.2.3.1 Dimensions (mm)

L100 mm x W72 mm (3.9" x 2.8")

1.2.3.2 Height

Top Side: 17.3 mm (with PCB and heatsink); Bottom Side: 8.4 mm

1.2.3.3 Weight (g)

0.37g (0.82 lb, weight of total package)

1.2.4 Electrical Specifications

Power Supply Type: Single 12 V DC power input (needs power from carrier board by 64-pin connector)

1.2.4.1 Power Supply Voltage

- Single 12 V input ± 10%
- Total peripheral power supply output: 5 V @ 3 A for CPU board and MIOe module totally, 12 V @ 2 A for MIOe module

1.2.4.2 Power Consumption

- **Typical in Win7 Idle Mode:**
N2600: 0.437 A @ +12 V (5.244 W)
N2800: 0.505 A @ +12 V (6.06 W)
- **Max in Win7 HCT12 (10 minutes):**
N2600: 0.671 A @ +12 V (8.052 W)
N2800: 0.817 A @ +12 V (9.804 W)

1.2.4.3 RTC Battery

- **Typical Voltage:** 3.0 V
- **Normal discharge capacity:** 210 mAh

1.2.5 Environmental Specifications

1.2.5.1 Operating Humidity

40 °C @ 95% RH Non-Condensing

1.2.5.2 Operating Temperature

0 ~ 60 °C (32~140 °F)

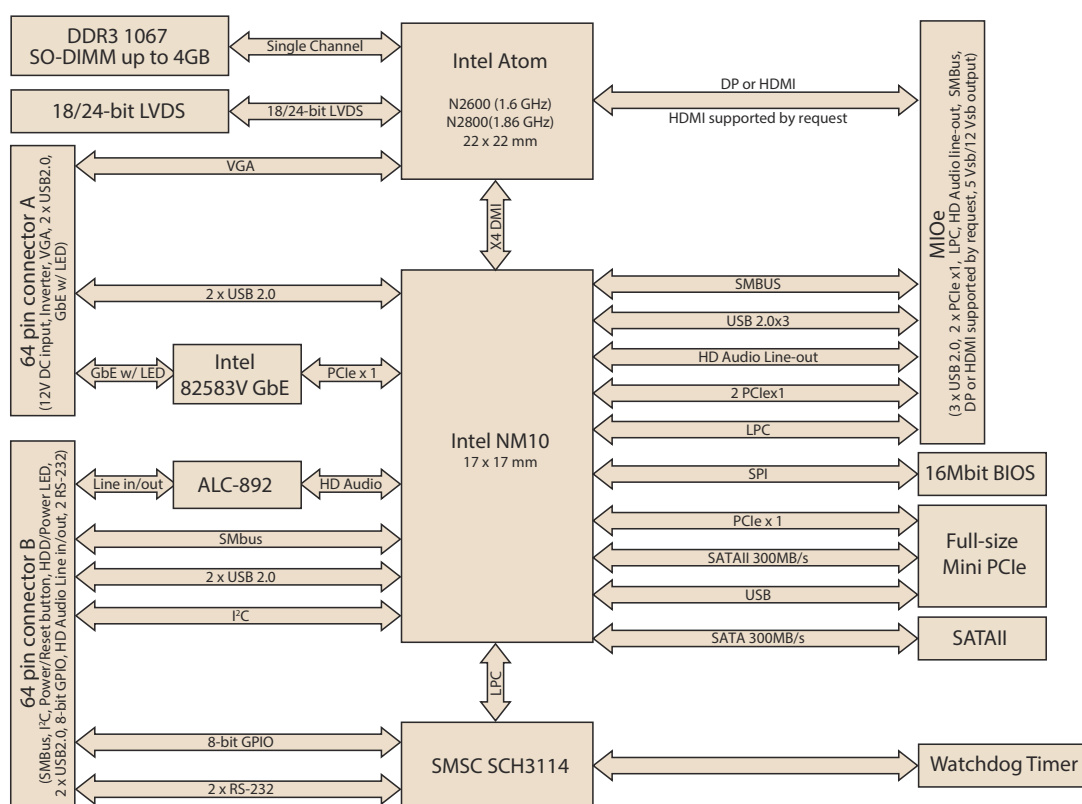
1.2.5.3 Storage Humidity

60 °C @ 95% RH Non-Condensing

1.2.5.4 Storage Temperature

-40 ~ 85 °C (-40 ~ 185 °F)

1.3 Block Diagram



Chapter 2

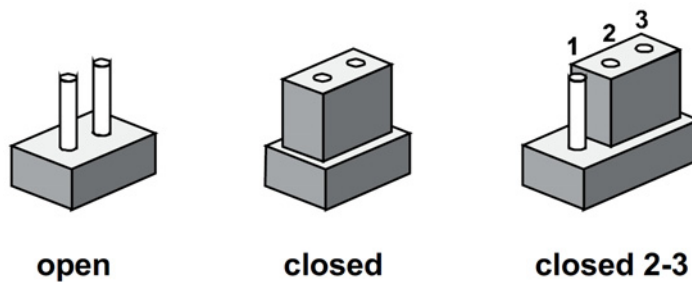
Installation

This chapter explains the setup procedures of the MIO-2262 hardware, including instructions on setting jumpers and connecting peripherals, as well as switches, indicators and mechanical drawings. Be sure to read all safety precautions before you begin the installation procedure.

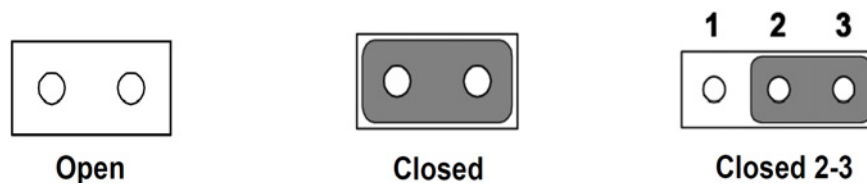
2.1 Jumpers

2.1.1 Jumper Description

Cards can be configured by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you connect the pins with the clip. To open a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



The jumper settings are schematically depicted in this manual as follows.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

Warning! To avoid damaging the computer, always turn off the power supply before setting jumpers.



2.1.2 Jumper List

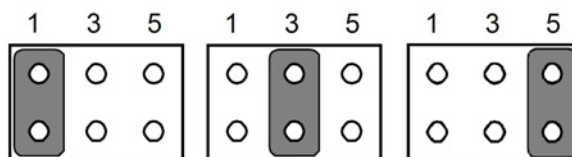
Table 2.1: Jumper List

J1	LCD Power / Auto Power On
----	---------------------------

2.1.3 Jumper Settings

Table 2.2: J1 LCD Power/Auto Power On

Part Number	1653003260
Footprint	HD_3x2P_79
Description	PIN HEADER 3*2P 180D(M) 2.0mm SMD SQUARE PIN
Setting	Function
(1-2)	+5V
(3-4) (default)	+3.3V
(5-6) (default)	Auto Power On



2.2 Connectors

2.2.1 Connector List

Table 2.3:	Table 2.4:
CN3	DDR3 SODIMM
CN6	Mini PCIe/mSATA
CN7	SATA
CN16	MIOe
CN18	24-bit LVDS Panel
CN30	64-pin Connector B
CN31	64-pin Connector A
BH1	Battery*

*MIO-2262 supports Lithium 3 V/210 mAH CR2032 battery with wire via battery connector (BH1).

Note! How to clear CMOS: (Must follow below steps)



1. Turn off system power
2. Unplug CR2032 battery cable on BH1
3. Wait for 15 sec or short BH1 pin1-2
4. Connect battery cable on BH1
5. Turn on system power

2.3 Mechanical

2.3.1 Jumper and Connector Locations

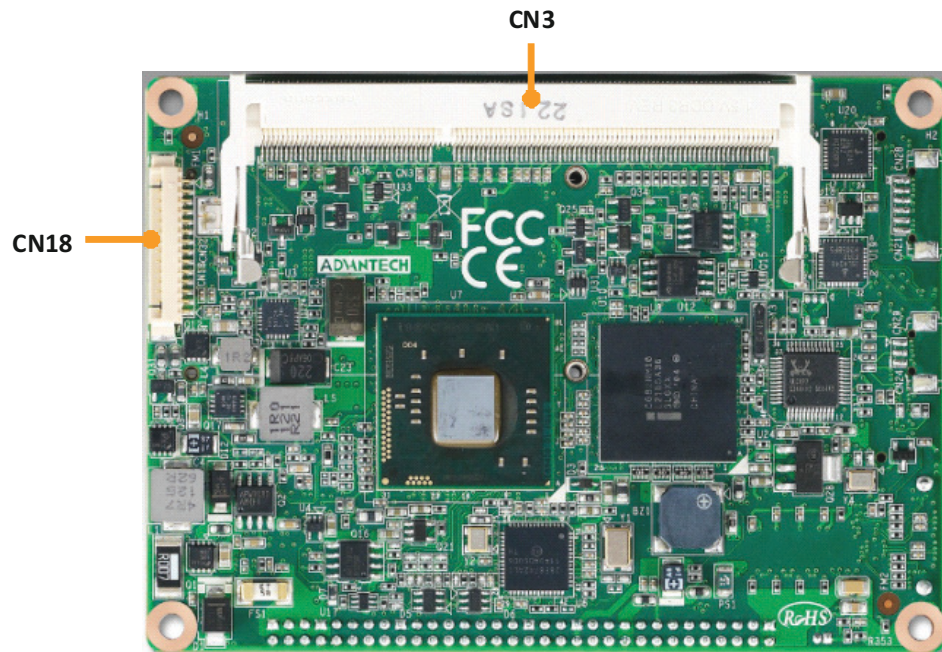


Figure 2.1 Jumper and Connector Layout (Top Side)

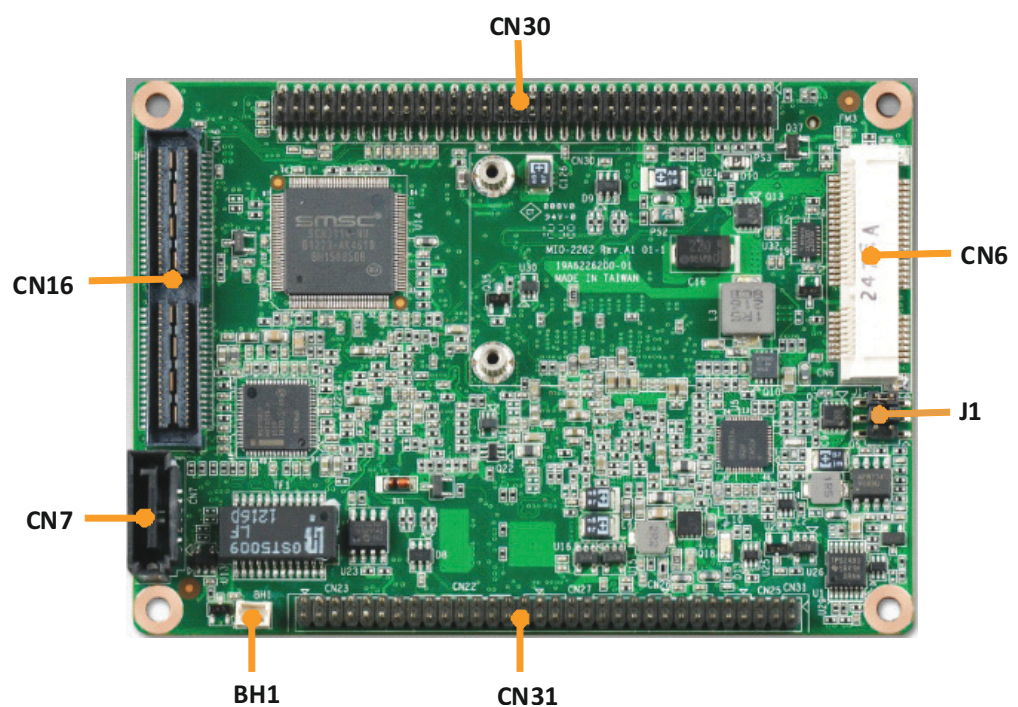


Figure 2.2 Jumper and Connector Layout (Bottom Side)

2.3.2 Board Dimensions

2.3.2.1 CPU Board Drawing

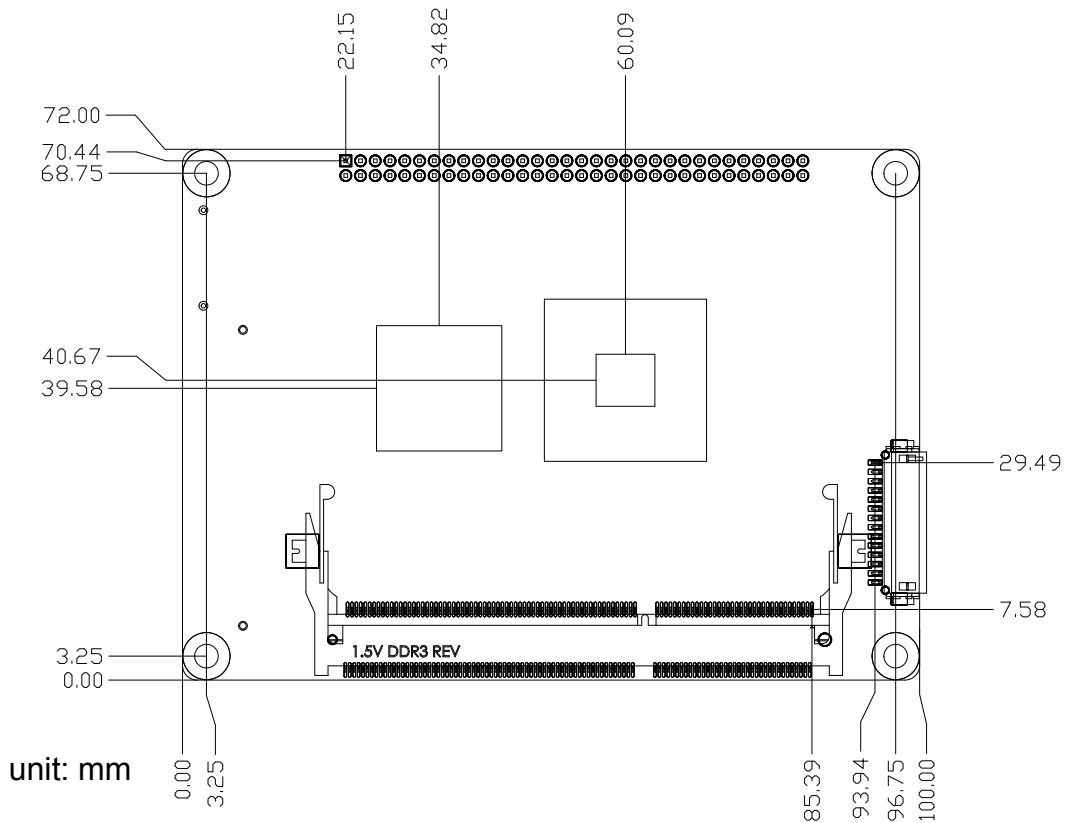


Figure 2.3 MIO-2262 Mechanical Drawing (Top Side)

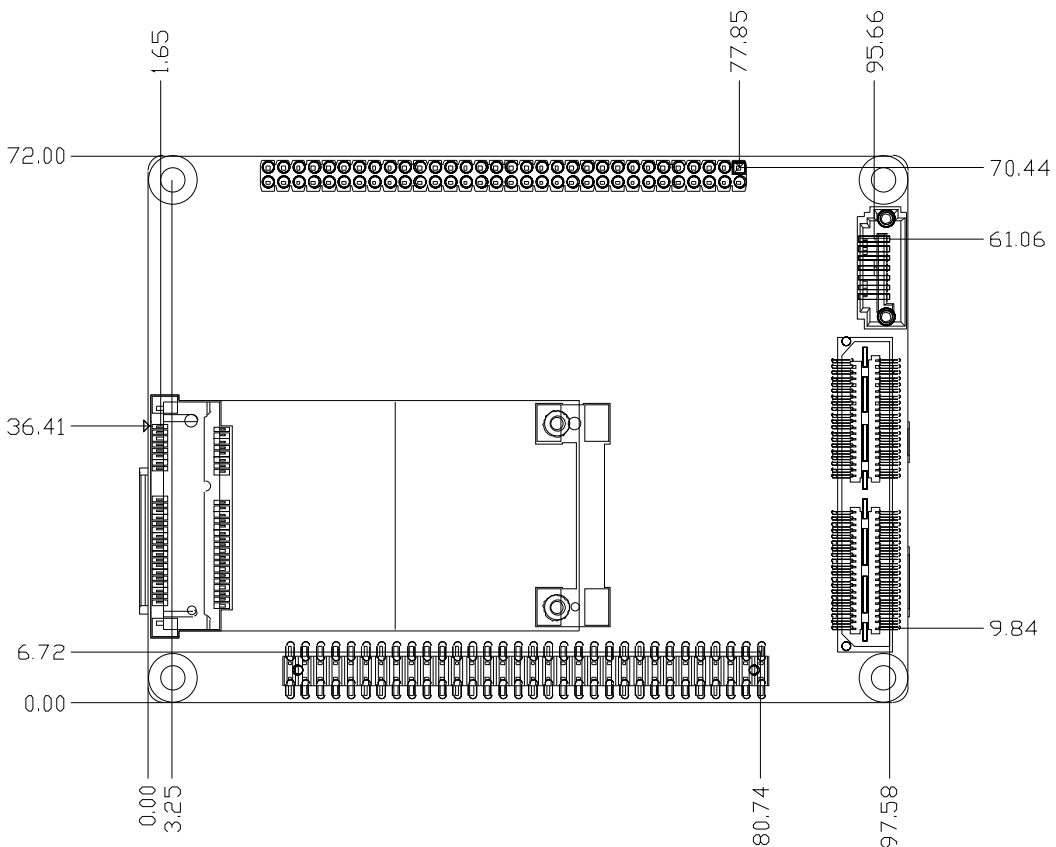


Figure 2.4 MIO-2262 Mechanical Drawing (Bottom Side)

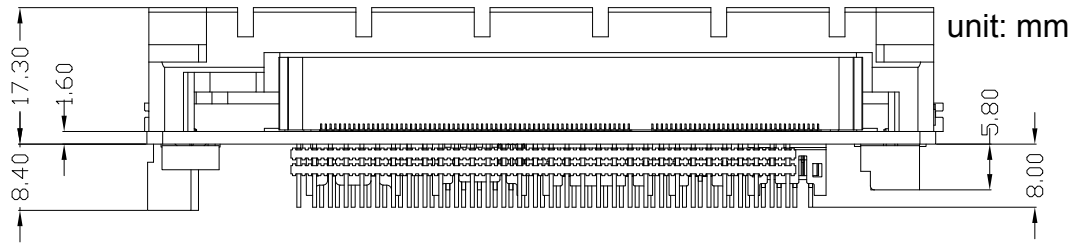


Figure 2.5 MIO-2262 Mechanical Drawing (Side View with Heatsink)

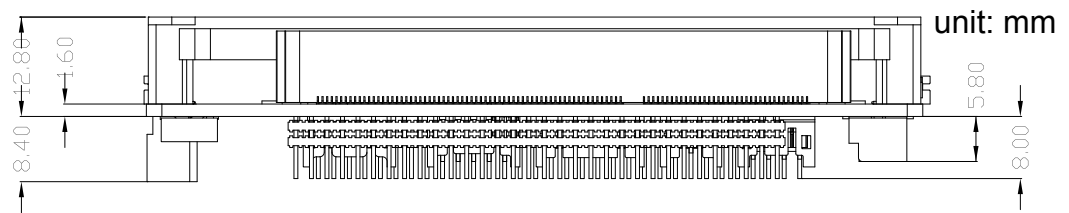
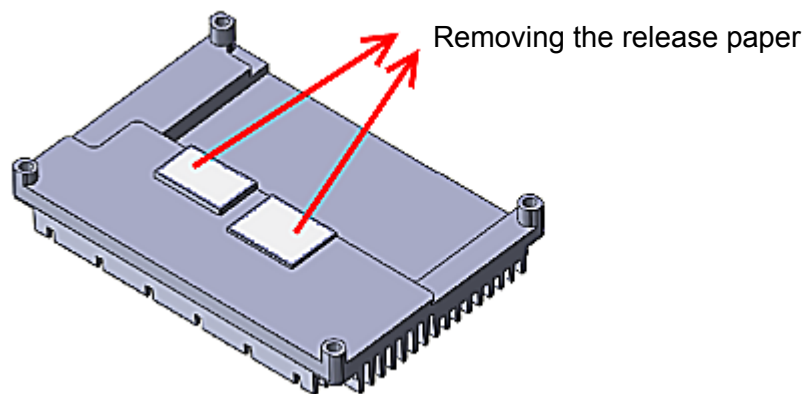


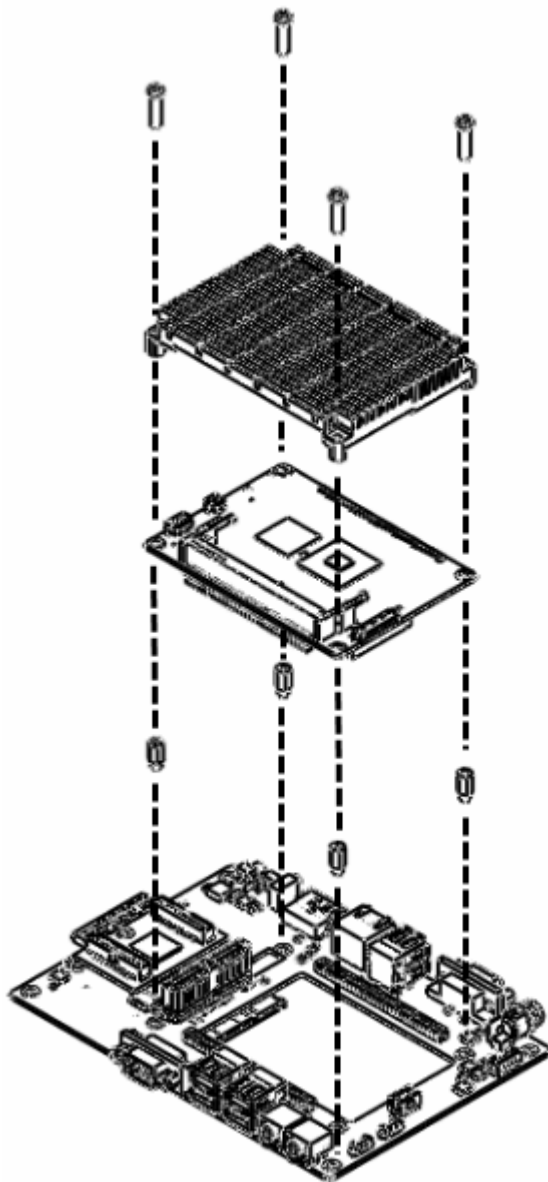
Figure 2.6 MIO-2262 Mechanical Drawing (Side View with Optional Heatspreader)

2.3.2.2 Quick Installation Guide

1. A heatsink / cooler is in the white box, please take it out and remove the release paper from the thermal pads.



2. There are also four screws inside the white box, please install the DRAM in the SODIMM socket first, then screw the heatsink into place as per illustration below:



2.3.2.3 Another Thermal Solution - Heat Spreader

MIO-2262 has an optional heat spreader to make the entire system more compact. Using a heat spreader to conduct heat to your chassis can help a lot when the system is extra compact or there is limited space for heat convection. Here are some guidelines for the heat spreader:

1. For best heat conduction, the gap between chassis and heat spreader should be smaller - the smaller the better.
2. The height of the existing heat spreader is 11.2mm (Advantech P/N: 1960055791T001). If you need some other height to fit chassis better, Advantech can customize it for you. (Please contact our sales team for details)
3. There are thermal grease and screws in the heat spreader kit. Thermal grease helps conduct better if chassis is quite close to the heat spreader. Another suggestion is to use a thermal pad if the chassis isn't close enough to the heat spreader. (The gap is suggested to be less than 3mm for better heat conduction)

Chapter 3

BIOS Settings

3.1 BIOS Setup

AMIBIOS has been integrated into many motherboards for over a decade. With the AMIBIOS Setup program, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the MIO-2262 BIOS setup screens.

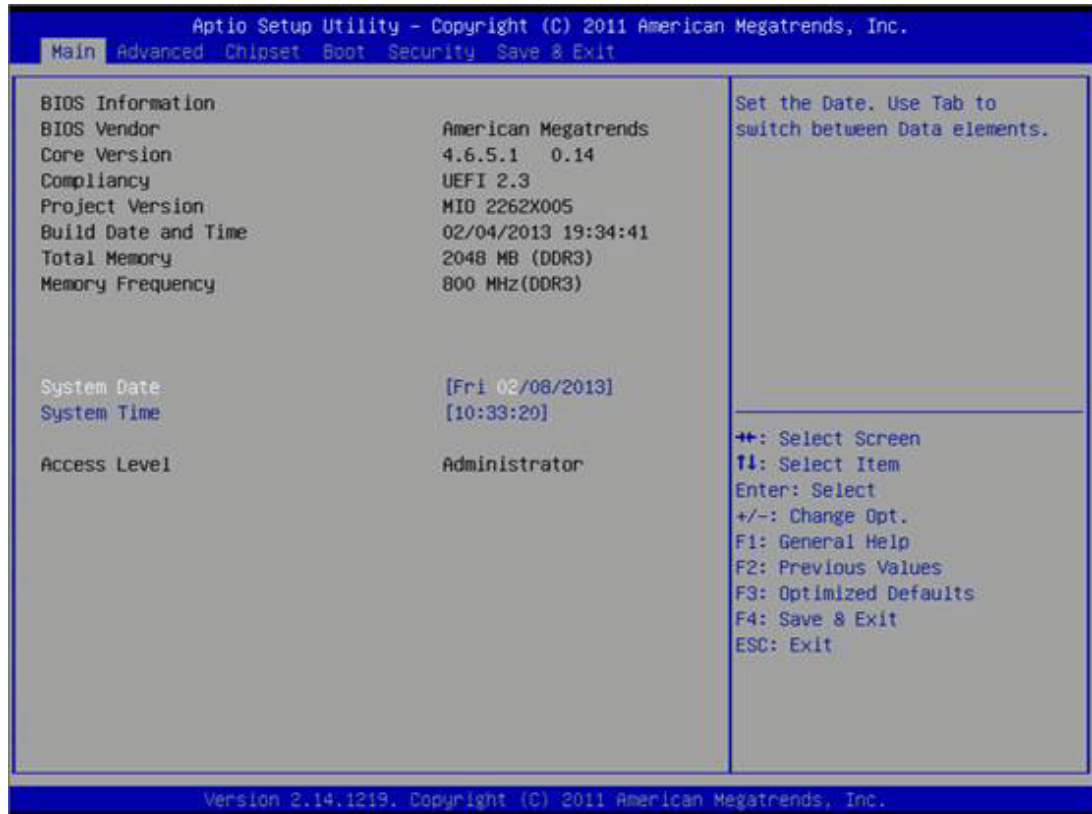


Figure 3.1 Setup Program Initial Screen

AMI's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains the setup information when the power is turned off.

3.2 Entering Setup

Turn on the computer and then press <F2> or to enter Setup menu.

3.2.1 Main Setup

When users first enter the BIOS Setup Utility, users will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

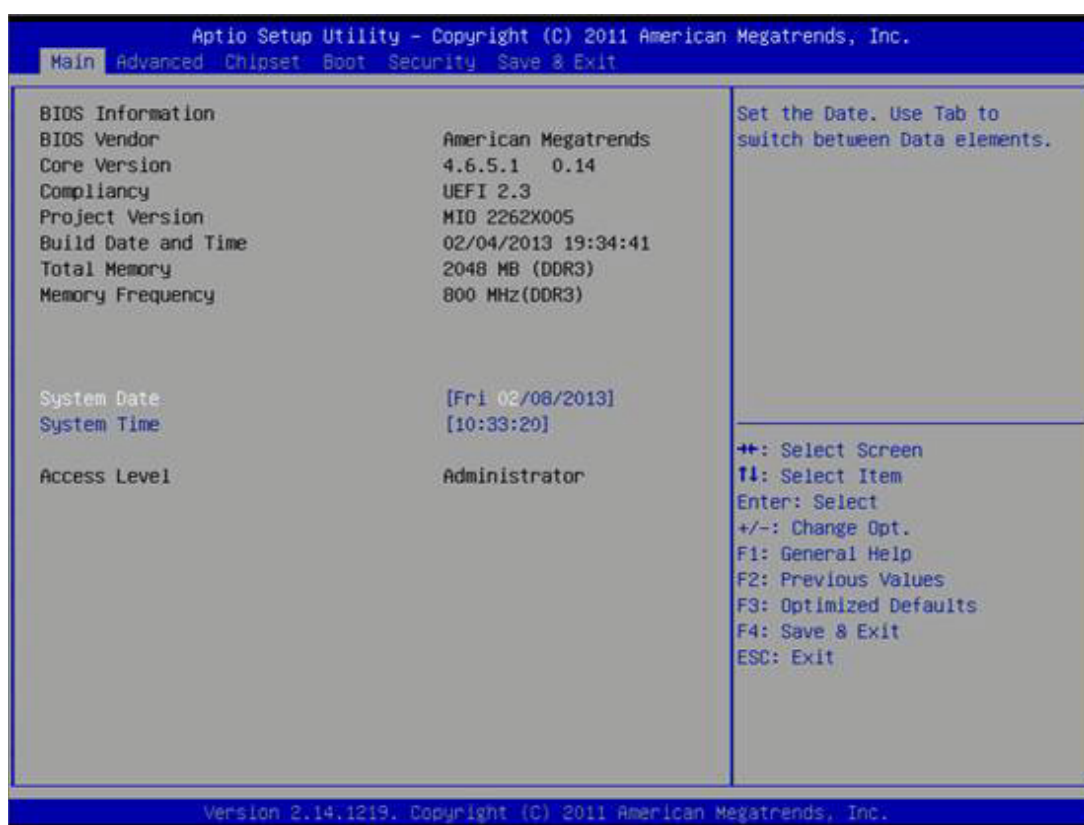


Figure 3.2 Main Setup Screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1.1 System Time / System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIO-520 setup screen to enter the Advanced BIOS Setup screen. Users can select any item in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. Users can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.



Figure 3.3 Advanced BIOS Features Setup Screen

- **Launch PXE OpROM**
This item allows users to enable or disable launch PXE OpROM if available.
- **Launch Storage OpROM**
This item allows users to enable or disable launch storage OpROM if available.

3.2.2.1 Advantech BIOS Update V1.3

This item allows users to flash BIOS.

3.2.2.2 ACPI Settings



Figure 3.4 ACPI Settings

- **Enable ACPI Auto Configuration**
This item allows users to enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
This item allows users to enable or disable hibernation.
- **ACPI Sleep State**
This item allows users to set the ACPI sleep state.
- **Lock Legacy Resources**
This item allows users to lock legacy device resources.
- **S3 Video Report**
This item allows users to enable or disable S3 resume for VBIOS.
- **Resume On RTC Alarm**
This item allows users to enable or disable RTC alarm function.

3.2.2.3 TPM Configuration

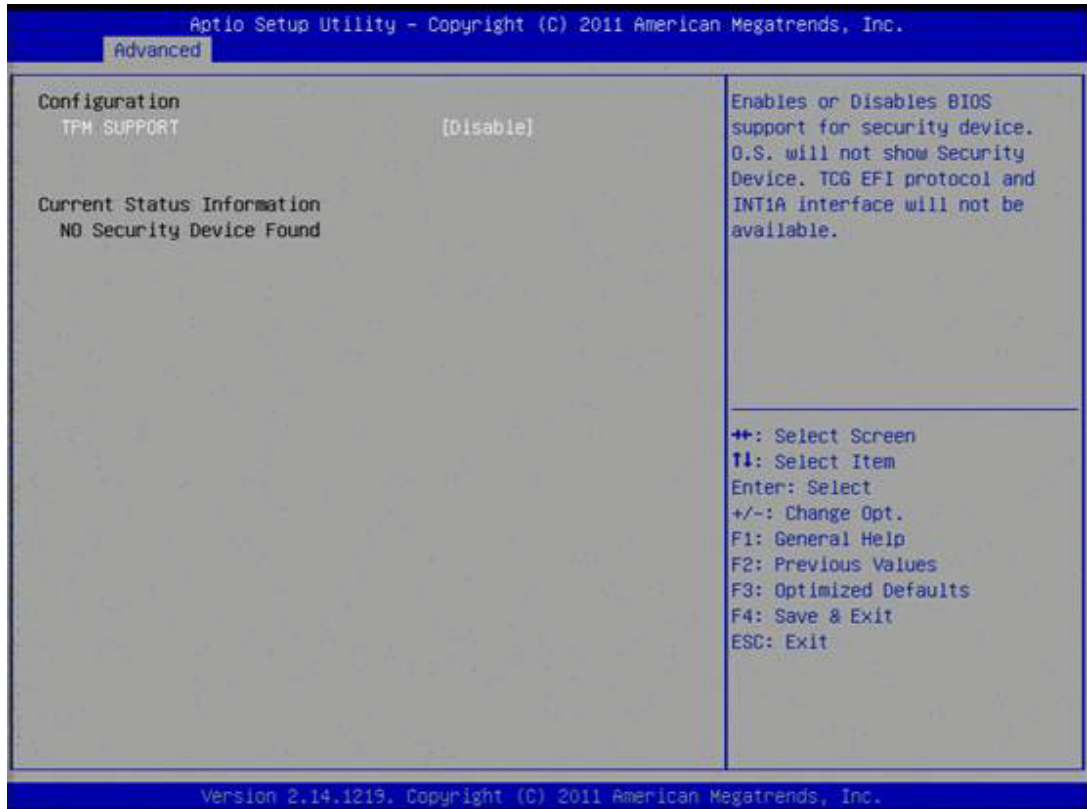


Figure 3.5 TPM Configuration

- **TPM Support**
Disable/Enable TPM if available.

3.2.2.4 CPU Configuration



Figure 3.6 CPU Configuration

- **Hyper Threading Technology**
This item allows users to enable or disable Intel Hyper Threading technology.
- **Execute Disable Bit**
This item allows users to enable or disable the No-Execution page protection.
- **Limit CPUID Maximum**
This item allows users to enable or disable limit CPUID maximum for Windows XP.

3.2.2.5 SATA Configuration

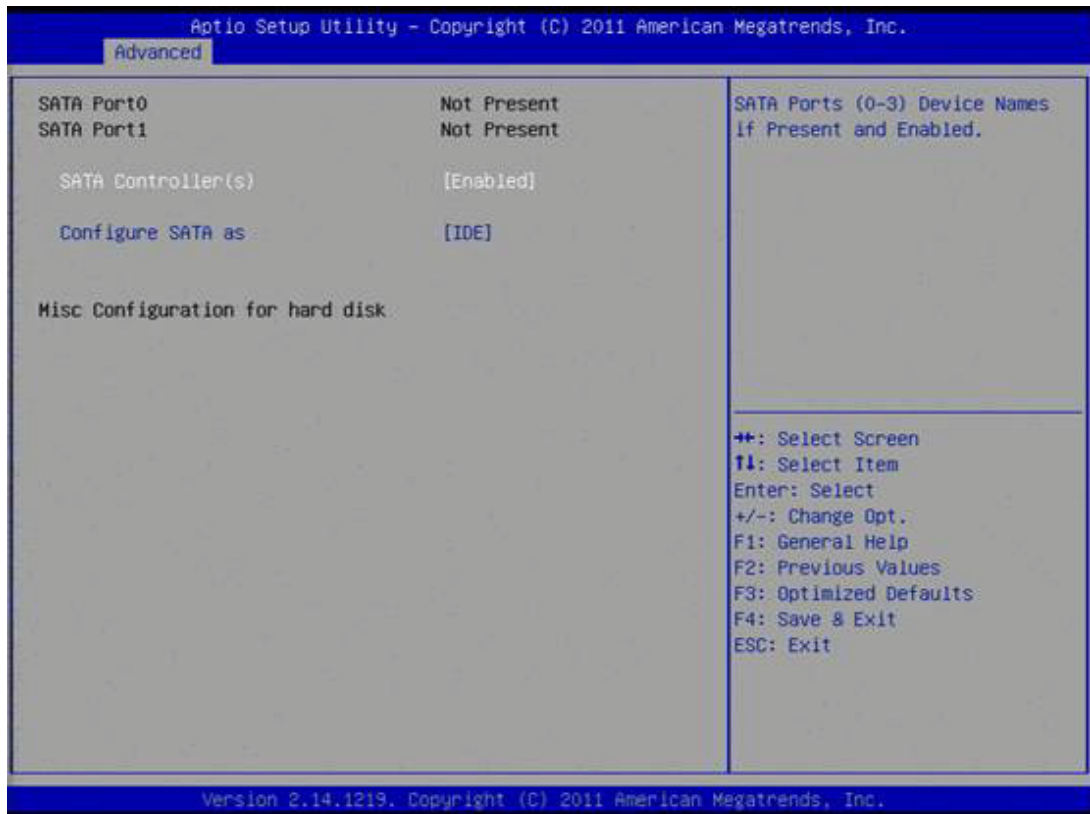


Figure 3.7 SATA Configuration

- **SATA Controller(s)**
This item allows users to enable or disable the SATA controller(s).
- **SATA Mode Selection**
This item allows users to select mode of SATA controller(s).

3.2.2.6 Intel Fast Flash Standby

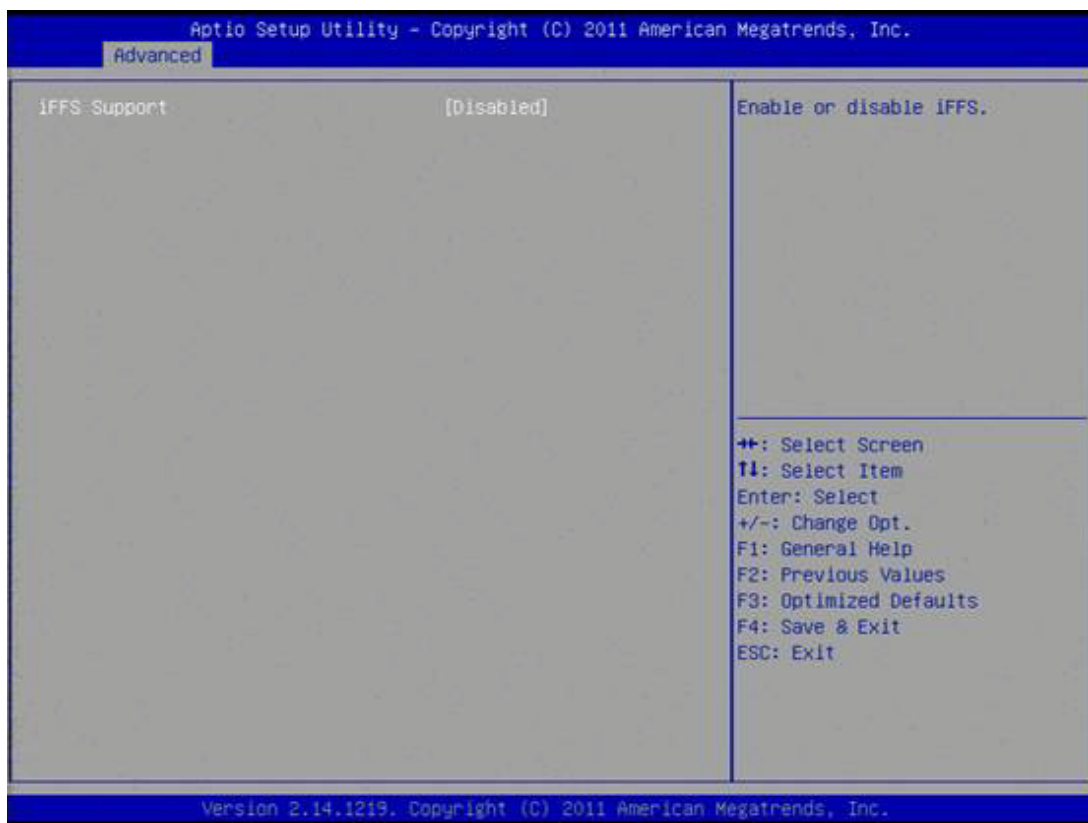


Figure 3.8 Intel Fast Flash Standby

- **iFFS Support**

This item allows users to enable or disable iFFS.

3.2.2.7 USB Configuration



Figure 3.9 USB Configuration

- **Legacy USB Support**
Enable support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
This is a workaround for the OS without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
- **USB Transfer Time-Out**
Set the time-out value for Control, Bulk, and Interrupt transfers.
- **Device Reset Time-Out**
Set USB mass storage device Start Unit command time-out value.
- **Device Power-Up Delay**
Sets the maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses a default value: for a Root port it is 100 ms, for a Hub port the delay is taken from the Hub descriptor.

3.2.2.8 Super I/O Configuration



Figure 3.10 Super I/O Configuration

- **Serial Port 1 Configuration**
This item allows users to configure serial port 1.
- **Serial Port 2 Configuration**
This item allows users to configure serial port 2.
- **Watch Dog Function Configuration**
This item allows users to configure watch dog settings.
- **Backlight Configuration**
This item allows users to configure backlight control settings.

3.2.2.9 H/W Monitor Configuration

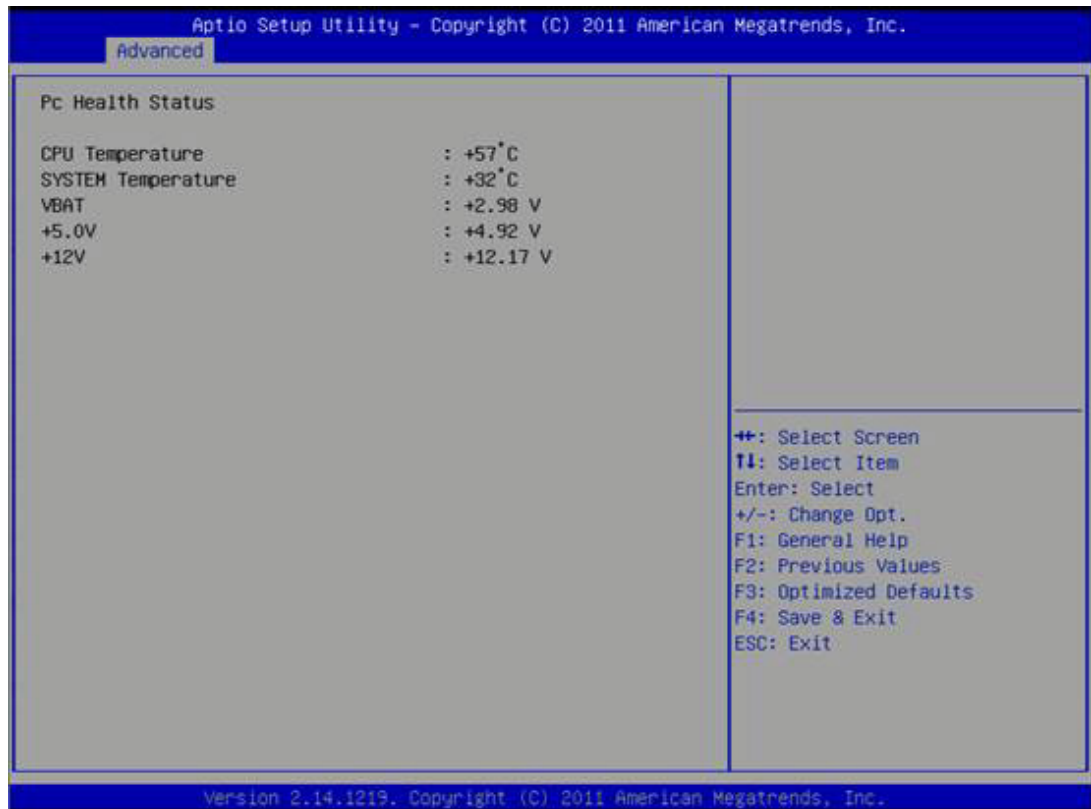


Figure 3.11 HW Monitor Configuration

This page display all information about system Temperature/Voltage/Current.

3.2.2.10 AOAC Configuration

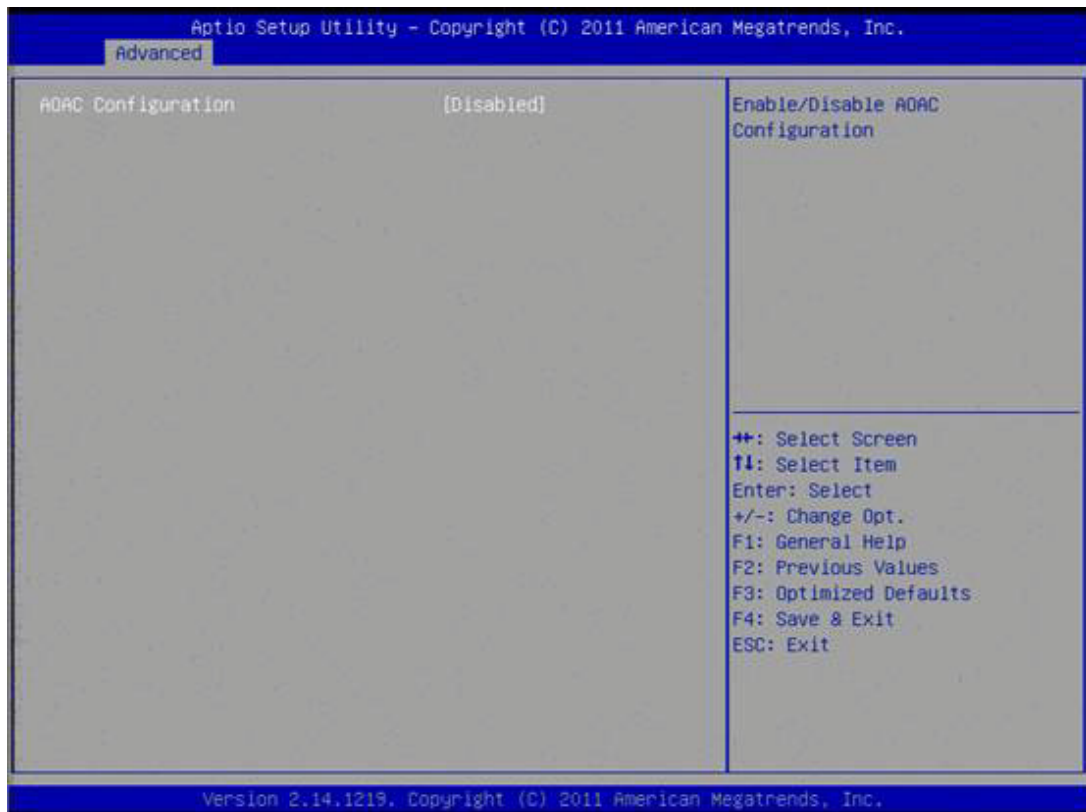


Figure 3.12 AOAC Configuration

- **AOAC Configuration**

This item allows users to enable or disabled AOAC function.

3.2.2.11 PPM Configuration

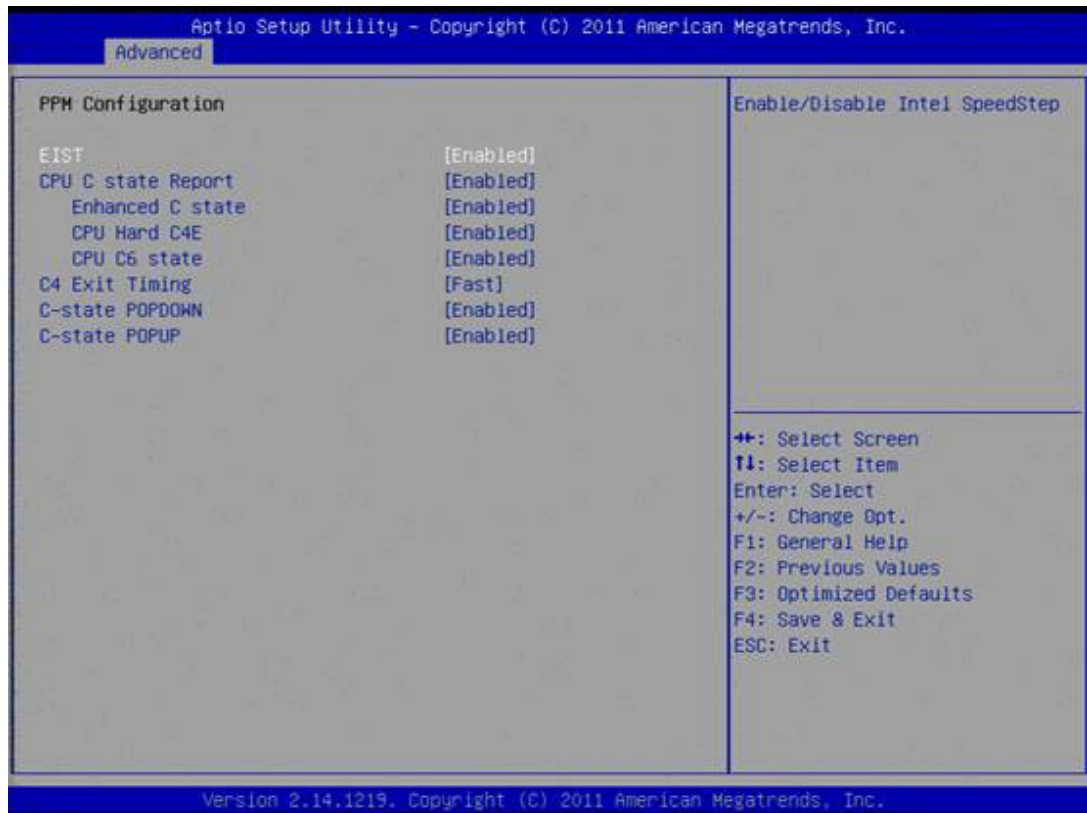


Figure 3.13 PPM Configuration

- **EIST**
This item allows users to enable or disable Intel SpeedStep function.
- **CPU C state Report**
This item allows users to enable or disable CPU C state report to OS.
- **Enhanced C State**
This item allows users to enable or disable Enhanced CPU C state.
- **CPU Hard C4E**
This item allows users to enable or disable CPU Hard C4E function.
- **CPU C6 State**
This item allows users to enable or disable CPU C6 state.
- **C4 Exit Timing**
This item allows users to control a programmable time for the CPU voltage to stabilize when exiting from a C4 state.
- **C-state POPDOWN**
This item allows users to enable or disable Intel C-state POPDOWN function.
- **C-state POPUP**
This item allows users to enable or disable Intel C-state POPUP function.

3.2.3 Chipset

Select the Chipset tab from the MIO-2262 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section.

The Plug and Play BIOS Setup screen is shown below.

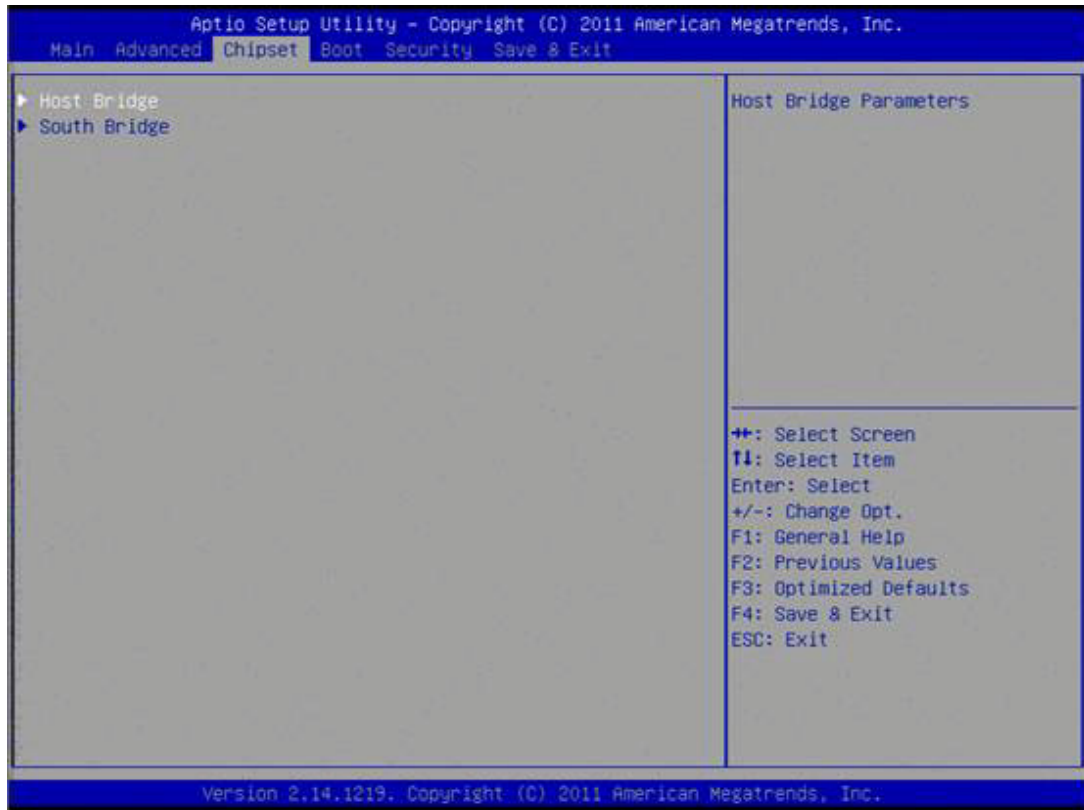


Figure 3.14 Chipset Setup

3.2.3.1 Host Bridge/Intel IGD Configuration



Figure 3.15 Intel IGD Configuration

- **Auto Disable IGD**
This item allows users to auto disable IGD upon external GFX detected.
- **IGFX - Boot Type**
This item allows users to select which output device during POST.
- **LCD Panel Type**
This item allows users to select LCD panel by internal graphic device.
- **Panel Scaling**
This item allows users to select LCD panel scaling by internal graphic device.
- **Backlight Control**
This item allows users to select backlight control setting.
- **Active LFP**
This item allows users to select the active LFP configuration.
- **IGD Clock Source**
This item allows users to select IGD clock.
- **Fixed Graphics Memory Size**
This item allows users to configure fixed graphic memory size.
- **ALS Support**
This item allows users to select ASL support for ACPI.

3.2.3.2 South Bridge



Figure 3.16 South Bridge

- **PCI Express Root Port 0/1/2**
This item allows users to config PCIe port 0/1/2 settings.
- **DMI Link ASPM Control**
This item enables or disables control of active state power management on both NB and SB side of DMI link.
- **High Precision Timer**
Enables or disables the high precision timer.
- **SLP_S4 Assertion Width**
This item allows users to set a delay in seconds.
- **Restore AC Power Loss**

■ **TPT Device**

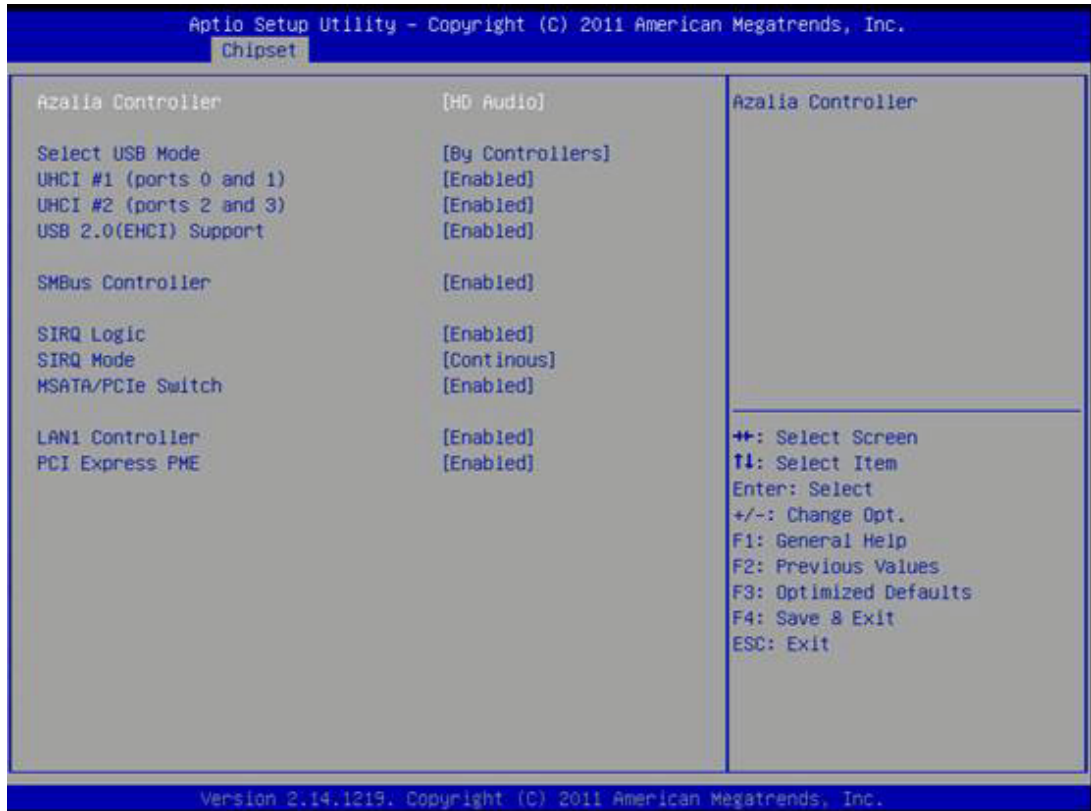


Figure 3.17 TPT Device

- **Azalia Controller**
Enables or disables the azalia controller.
- **Select USB Mode**
Select USB mode by controllers or ports.
- **SMBus Controller**
Enables or disables the on chip SMBus controller.
- **SIRQ Logic**
Enables or disables the SIRQ logic.
- **SIRQ Mode**
Set SIRQ mode.
- **MSATA/PCIe Switch**
Enables for MSATA disables for PCIe.
- **LAN1 Controller**
This item enables or disables LAN device.
- **PCI Express PME**
This item enables or disables PCIe PME function.

3.2.4 Boot Settings

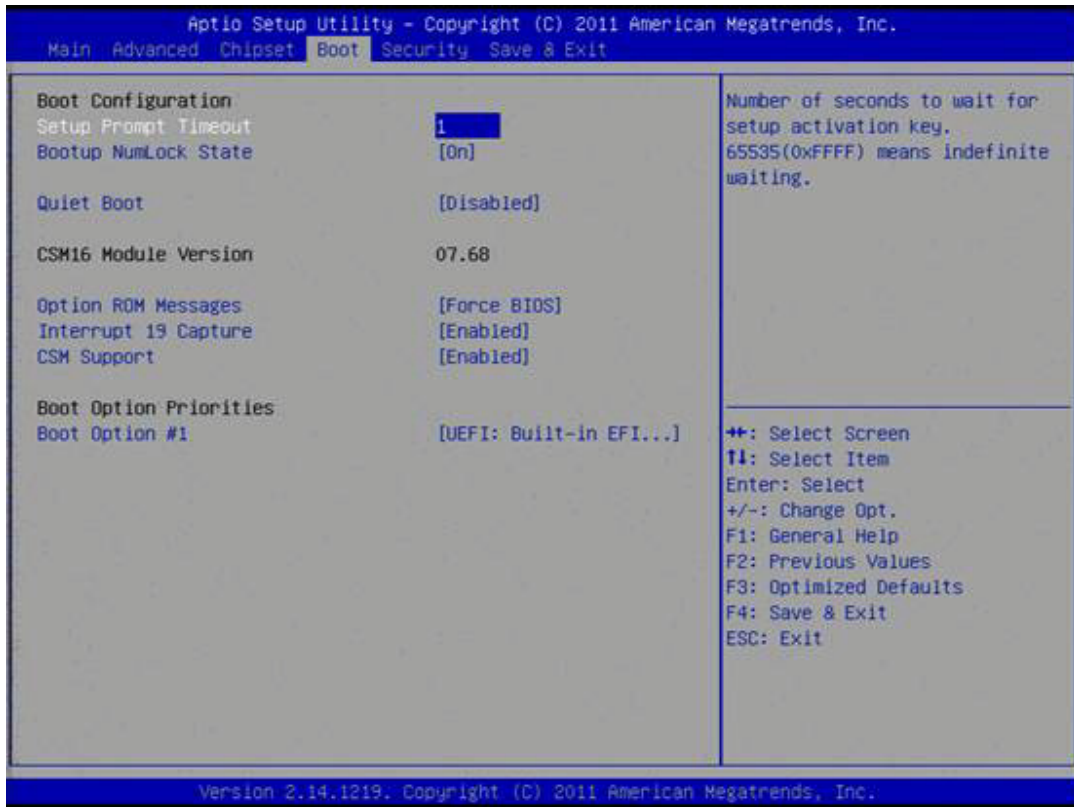


Figure 3.18 Boot Setup Utility

- **Setup Prompt Timeout**
This item allows users to select the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
Select the Power-on state for Numlock.
- **Quiet Boot**
If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **Option ROM Message**
Set display mode for option ROM.
- **Interrupt 19 Capture**
This item allows option ROMs to trap interrupt 19.
- **1st/2nd/3rd/4th/5th/6th/7th Boot**
This item allows users to set boot device priority.

3.2.5 Security Setup

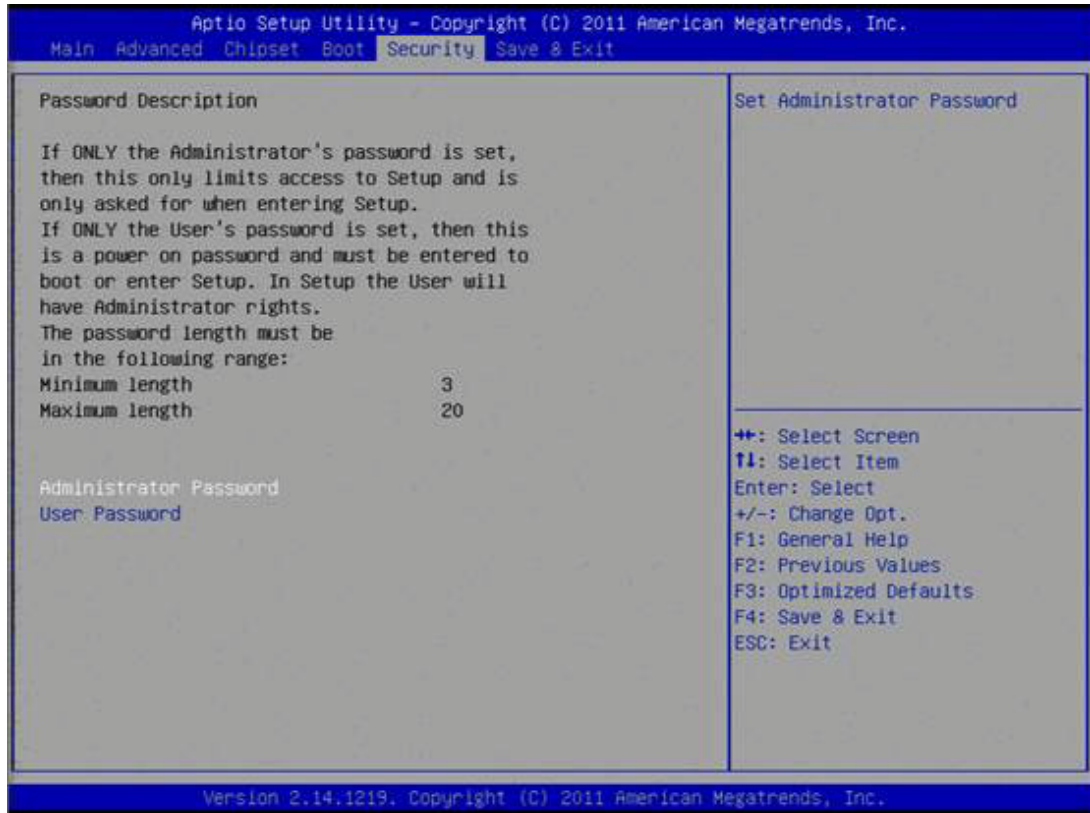


Figure 3.19 Password Configuration

Select Security Setup from the MIO-2262 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>:

■ Change Administrator / User Password

Select this option and press <ENTER> to access the sub menu, and then type in the password.

3.2.6 Save & Exit

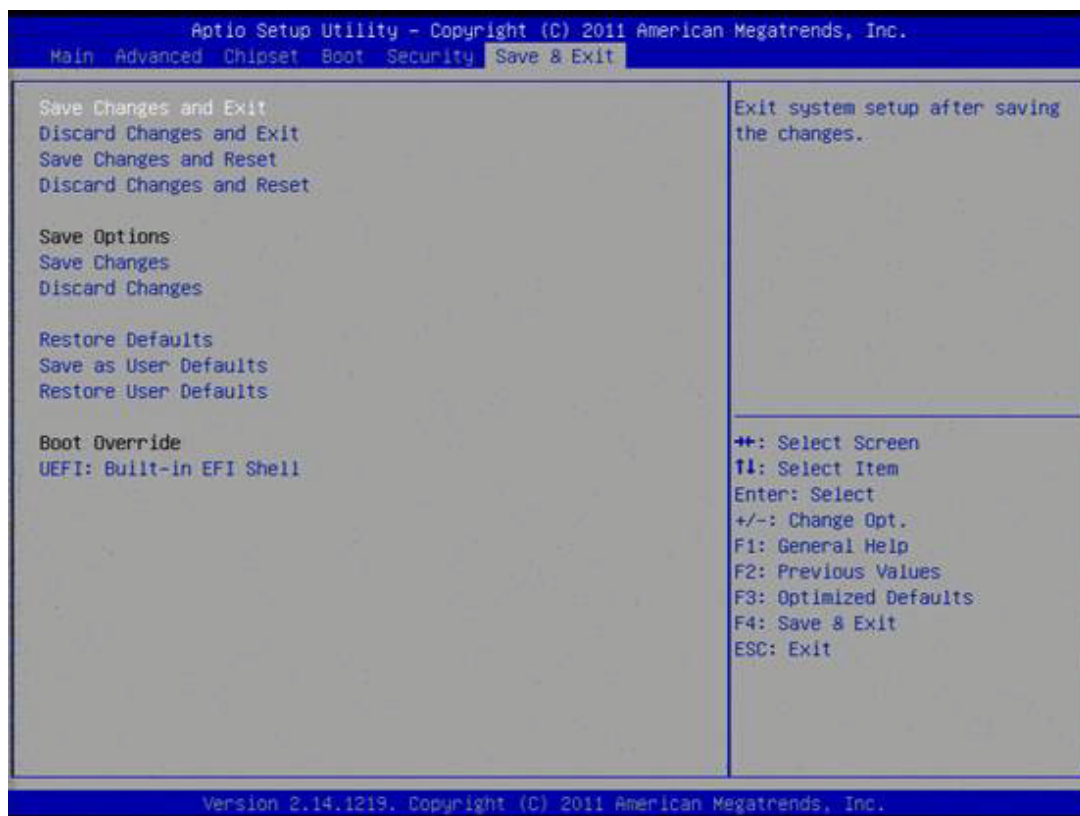


Figure 3.20 Save & Exit

3.2.6.1 Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer if necessary to take effect of all system configuration parameters.

3.2.6.2 Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

3.2.6.3 Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit the BIOS setup menu and reboot the computer to take effect of all system configuration parameters.

3.2.6.4 Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer.

3.2.6.5 Save Changes

When users have completed system configuration, select this option to save changes without exiting the BIOS setup menu.

3.2.6.6 Discard Changes

Select this option to discard any current changes and load previous system configuration.

3.2.6.7 Restore Defaults

The MIO-2262 automatically configures all setup items to optimal settings when users select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if the user's computer is experiencing system configuration problems.

3.2.6.8 Save User Defaults

When users have completed system configuration, select this option to save changes as user defaults without exit BIOS setup menu.

3.2.6.9 Restore User Defaults

The users can select this option to restore user defaults.

3.2.6.10 Boot Override

Select device to perform boot override.

Chapter 4

S/W Introduction &
Installation

4.1 S/W Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows embedded software solutions easily and widely available to the embedded computing community.

4.2 Driver Installation

To install the drivers, please download drivers that need to be installed from Advantech web site at www.advantech.com/support, then launch setup file under each function folder and follow Driver Setup instructions to complete the process.

4.3 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms.

4.3.1 SUSI Introduction

To make hardware easier and more convenient to access for programmers, Advantech has released a suite of APIs (Application Programming Interface) in the form of a program library. The program Library is called Secured and Unified Smart Interface or SUSI for short.

In modern operating systems, user space applications cannot access hardware directly. Drivers are required to access hardware. User space applications access hardware through drivers. Different operating systems usually define different interface for drivers. This means that user space applications call different functions for hardware access in different operating systems. To provide a uniform interface for accessing hardware, an abstraction layer is built on top of the drivers and SUSI is such an abstraction layer. SUSI provides a uniform API for application programmers to access the hardware functions in different Operating Systems and on different Advantech hardware platforms.

Application programmers can invoke the functions exported by SUSI instead of calling the drivers directly. The benefit of using SUSI is portability. The same set of APIs is defined for different Advantech hardware platforms. Also, the same API set is implemented in different Operating Systems. This user's manual describes some sample programs and the API in SUSI. The hardware functions currently supported by SUSI can be grouped into a few categories including Watchdog, I²C, SMBus, GPIO, and VGA control. Each category of API in SUSI is briefly described below.

4.3.2 SUSI Functions

4.3.2.1 Control

■ GPIO



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It supports various Digital I/O devices – input devices like buttons, switches; output devices such as cash drawers, LED lights, etc. And, allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provide Programmable GPIO, allows developers to dynamically set the GPIO input or output status

■ SMBus



SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. Today, SMBus is used in all types of embedded systems. The SMBus API allows a developer to interface a Windows XP PC to a downstream embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

■ I²C



I²C is a bi-directional two-wire bus that was developed by Phillips for use in their televisions in the 1980s. Today, I²C is used in all types of embedded systems.

The I²C API allows a developer to interface a Windows XP PC to a downstream embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

4.3.2.2 Monitor

- **Watchdog**



A watchdog timer (WDT) is a device or electronic card that performs a specific operation after a certain period of time if something goes wrong with an electronic system and the system does not recover on its own.

A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds during which a program or computer fails to respond following the most recent mouse click or keyboard action.

- **Hardware Monitor**



The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

- **Hardware Control**



The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust Fan Speed or other devices; can also be used to adjust the LCD brightness.

4.3.2.3 Display

- **Brightness Control**



The Brightness Control API allows a developer to interface Windows XP to easily control brightness.

- **Backlight**



The Backlight API allows a developer to control the backlight (screen) on/off in Windows XP.

4.3.2.4 Power Saving

■ CPU Speed



Makes use of Intel SpeedStep technology to save power consumption (Windows XP only). The system will automatically adjust the CPU Speed depending on the system loading.

■ System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow a user to lower the clock from 87.5% to 12.5%.

4.3.3 Environments

Operating Systems that SUSI supports include:

- Windows XP Embedded
- Windows XP Pro or Home Edition 32-bit
- Windows 7
- WES7
- Linux (Project based, request from your local FAE)
- QNX (Project based, request from your local FAE)
- VxWorks (Project based, request from your local FAE)

Note that the list may be changed without notice. For the latest support list, please check: http://www.advantech.com.tw/embcore/software_apis.aspx

For any questions feel free to contact your local Advantech representative.

4.3.4 SUSI Programs

4.3.4.1 Demo Program

The SUSI demo program demonstrates how to incorporate SUSI library into users' own applications. The program is written in C# programming language and based upon .NET Compact Framework 2.0, Visual Studio 2005. If you plan to write your own application you can refer to the source code of the Demo program. If you want to write an application for Windows 7 x64 but use our SUSI standard you need to set your application to "Platform Target = x86" at build options. If you have received a custom x64 SUSI version this is not necessary. Ask your local FAE if you are not sure about this.

SusiDemo.exe

The execution file, SusiDemo.exe, released with source code can be run on both Windows XP. It is written to demonstrate how to access all the functions provided by Advantech SUSI. It also allows you a first test after installing if the functions you want to use are working. Advantech SusiDemo.exe is made for demonstration and testing. Engineers can use it for evaluation too. Keep in mind: SusiDemo.exe is not made as a consumer product and it's not made for production.

The following pages are a detailed introduction to the SusiDemo.exe program. It will explain how to use all the functions with Advantech SusiDemo.exe program.

Note! *The following sections explain all possible settings for SUSI. Depending on your Hardware you may have not have all these options available.*



I. Boot Logger

The screenshot shows the 'BootLogger' configuration window. It features a tabbed interface with the following tabs: BootLogger, Watchdog, Programmable GPIO, SMBus, IIC, Display, Hardware Monitor, Power Saving, and About. The 'BootLogger' tab is selected. The window is divided into two main sections:

- Boot Count:** Contains two checked checkboxes: 'Enable' and 'BootTimes'. Each has an adjacent input field. The 'Enable' field is labeled '(boolean)'. Below these are 'Get' and 'Set' buttons.
- Run Timer:** Contains four checked checkboxes: 'Running', 'Aautorun', 'ContinualOn', and 'TotalOn'. Each has an adjacent input field. The 'Running' and 'Aautorun' fields are labeled '(1 or 0)'. The 'ContinualOn' and 'TotalOn' fields are labeled 'min'. Below these are 'Get' and 'Set' buttons.

This part belongs to the feature Core in SUSI APIs.

- Select or clear the check box to select the information to get or set in its text box.
- In Boot Counter
- To enable the Bootcounter write '**true**' and click set To disable the Bootcounter write '**false**' and click set
- To reset the BootTimes parameter to 0, just type 0 in the **BootTimes** text box with its check box selected, and then click the "Set" button.
- In Run Timer
- Set the **Running** text box to 1 to start the timer, or 0 to stop the timer.
- Set the **Autorun** text box to 1 to start the timer when the system restarts.

II. Watchdog

When the SusiDemo program executes, it shows watchdog information in the "Time-out Information" fields - "Min", "Max", and "Step" in milliseconds. For example, for a range of 1 ~ 255 seconds, 1000 appears in the "Min" text box, 255000 appears in the "Max" text box, and 1000 appears in the "Step" text box.

Here is an example of how to use the watchdog timer:

- Type 3000 (3 sec.) in the "Timeout" text box and optionally type 2000 (2 sec.) in the "Delay" text box. Click the "Start" button. The "Left" text box will show the approximate countdown value the watchdog timer. (This is a software timer in the demo program, not the actual watchdog hardware timer so it is not very accurate.)
- Before the timer counts down to zero, you may reset the timer by clicking the "Refresh" button, stop it by clicking the "Stop" button.

III. Programmable GPIO

Pin Number

- Get the numbers of input pins and output pins respectively. Each number may vary with the direction of current pins, but the sum remains the same.

MASK

- Choose the mask of interest by selecting or clearing its check box, then clicking “Get Mask”.

Direction Change / RW Access

- Choose either “Single Pin” or “Multiple Pin”.
- The possible values that the “Single Pin” text box can be set to ranges from 0 to the total number of GPIO pins minus 1.

Single Pin Operation – “IO Write” / “Set Direction”

- Give a value of “1” (output status high / input direction) or “0” (output status low / output direction) to set the pin then click the “IO Write” or “Set Direction” button.

Single Pin Operation – “IO Read”

- Click “IO Read” to get the pin input status.

Multiple Pin Operation – “IO Write” / “Set Direction”

If there are 8 GPIO pins:

- To write the status of GPIO output pins 0, 1, 6 and 7, give the “Multiple Pin” text box the value 11000011. Bit 0 stand for GPIO 0, bit 1 stand for GPIO 1, and so on.
To set pin 0 as high, pin 1 as low, pin 6 as high and pin 7 as low, give the “Value” text box the value 01XXXX01, where X stands for a don’t care pin.
Please simply assign a 0 for don’t care pins, e.g. 10000001.
- To set the direction of GPIO pins 0, 1, 6 and 7, give the “Multiple Pin” text box the value 11000011. Again bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, and so on. To set pin 0 as an input, pin 1 as an output, pin 6 as an input and pin 7 as

an output, give the “Value” text box with 01XXXX01, where X is for don’t care. Please simply assign a 0 for don’t care pins, e.g. 10000001.

Multiple Pin Operation – “IO Read”

- For example, if you want to read the status of GPIO pins 0, 1, 6 and 7, give the “Multiple Pin” text box the value 11000011. Bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, and so on. Again, if the pin is in status high, the value in the relevant bit of the “Value” text box will be 1. If the pin status is low, the “Value” text box will be 0.

- Note!**
1. “IO Write” can only be performed on pins in the output direction.
 2. “Set Direction” can only be performed on bidirectional pins.
 3. “IO Read” can get the status of both input and output pins. Please get the information first in the “MASK” field.



IV. SMBus

Protocols

- Choose one of the protocol operations by selecting a radio button.
- Give the proper value to the “Slave address” and “Register offset” text boxes. Some protocol operations don’t have register offsets. Slave addresses must be converted from 7-bit to 8-bit (e.g. if datasheet says device has 7-bit address 0x20, then you have to type in 0x40)
- Click the “Read” button for read/receive operations, and the “Write” button for write/send operations. Slave addresses must be converted from 7-bit to 8-bit (e.g. if datasheet says device has 7-bit address 0x20, then you have to type in 0x40)
- The values read or to be written are in the “Result (Hex)” text box.

“Scan” Button (Scan Address Occupancy)

- Click this button to get the addresses currently used by slave devices connected to the SMBus.
- The occupied addresses will be shown in the “Result (Hex)” text box. The addresses are already in an 8-bit format (that means if your device has the address 0x20 it will show 0x40).

V. Multi-byte IIC

The screenshot shows a software interface for IIC configuration. At the top, there are several tabs: BootLogger, Watchdog, Programmable GPIO, SMBus, IIC (highlighted), Display, Hardware Monitor, Power Saving, and About. Below the tabs, the 'IIC Type' section contains two radio buttons: 'Primary' and 'SMBus-IIC', with 'SMBus-IIC' selected. The 'Multi-bytes Access' section includes three input fields: 'Slave address' (containing '0x0'), 'Read num' (containing '0'), and 'Write num' (containing '0'). Below these fields is a large text area labeled 'Input Data (ex. 00 ff 7f...) (Hex)'. At the bottom of the interface is a 'Result (Hex)' text area and three buttons: 'Read', 'Write', and 'WR Combine'.

Select the “Primary” or “SMBus-IIC” radio button. If one of them is not supported, its radio button will be unavailable.

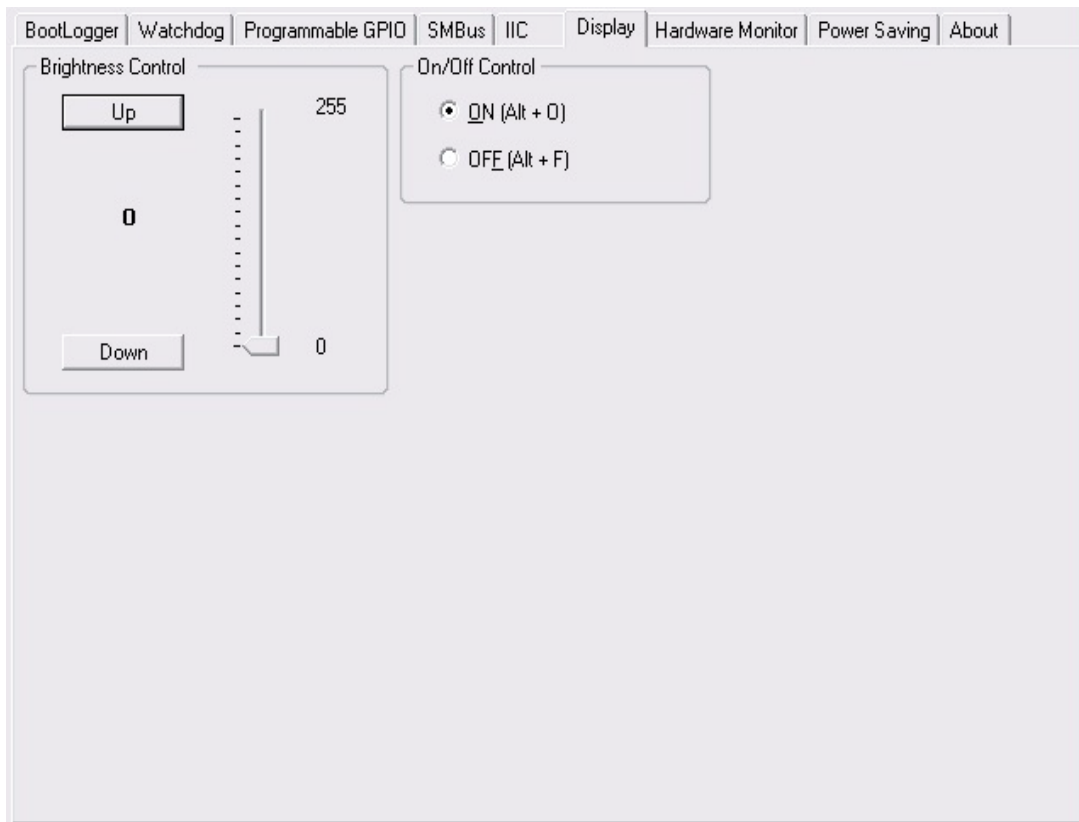
Primary

- Connect the IIC devices to the IIC connector.
- Type in the data bytes to be written in the “Input Data” text box.
- The bytes read will be shown in the “Result” text box.

SMBus-IIC

- Connect the IIC devices to the SMBus connector.
- In AMD platforms, all the IIC functions are fully supported.
- In Intel or VIA platforms, only Read and Write with “Read num” = 1 or “Write num” = 1 are supported. “WR Combine” is not supported.

VI. VGA Control



You may control VGA functions from the “Display” tab or directly by hotkey. If the brightness control is not supported, the control parts are unavailable (grayed-out).

VII. Hardware Monitor

Voltage		Temperature	
V CORE	0 V	CPU	0 C
V CORE2	0 V	CPU 2	0 C
V25	0 V	SYS	0 C
V33	0 V	AUX	0 C
V50	0 V		
V120	0 V		
V3SB	0 V		
V5SB	0 V		
VBAT	0 V		
VN50	0 V		
VN120	0 V		

Fan Speed	
CPU	0 RPM
CPU 2	0 RPM
SYS	0 RPM
Other	0 RPM

Fan Speed Control

Fan Type:


Speed: (0~255)

Set

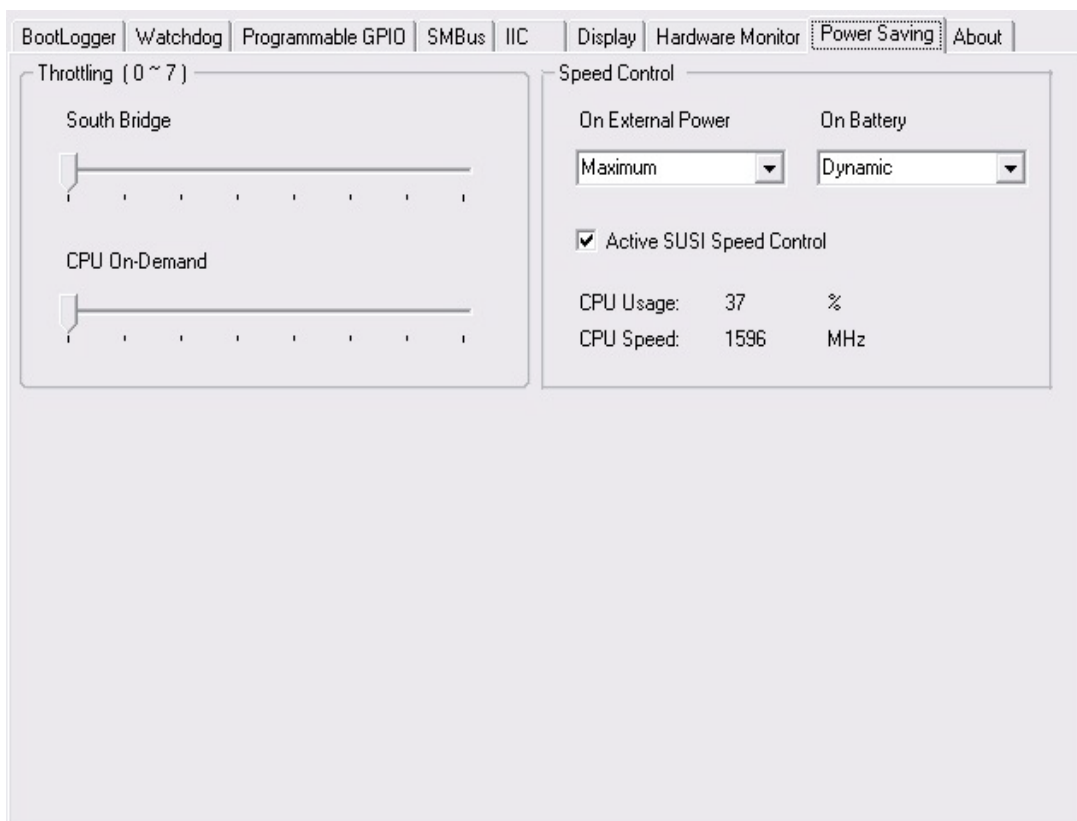
Monitor

Click “Monitor” to get and display the hardware monitor values. If a data value is not supported on the platform, its text box will be unavailable (grayed-out).

The Fan Speed Control function includes Pulse Width Modulation (PWM) control. With Speed you determinate the duty cycle. Higher value means longer duty cycle and therefore higher speed.

Note!  Some FAN’s are going to operate at full speed if the input signal is too low. This is a security feature of the FAN. You can slowly decrease FAN speed to find out what the minimum FAN speed for your system is.

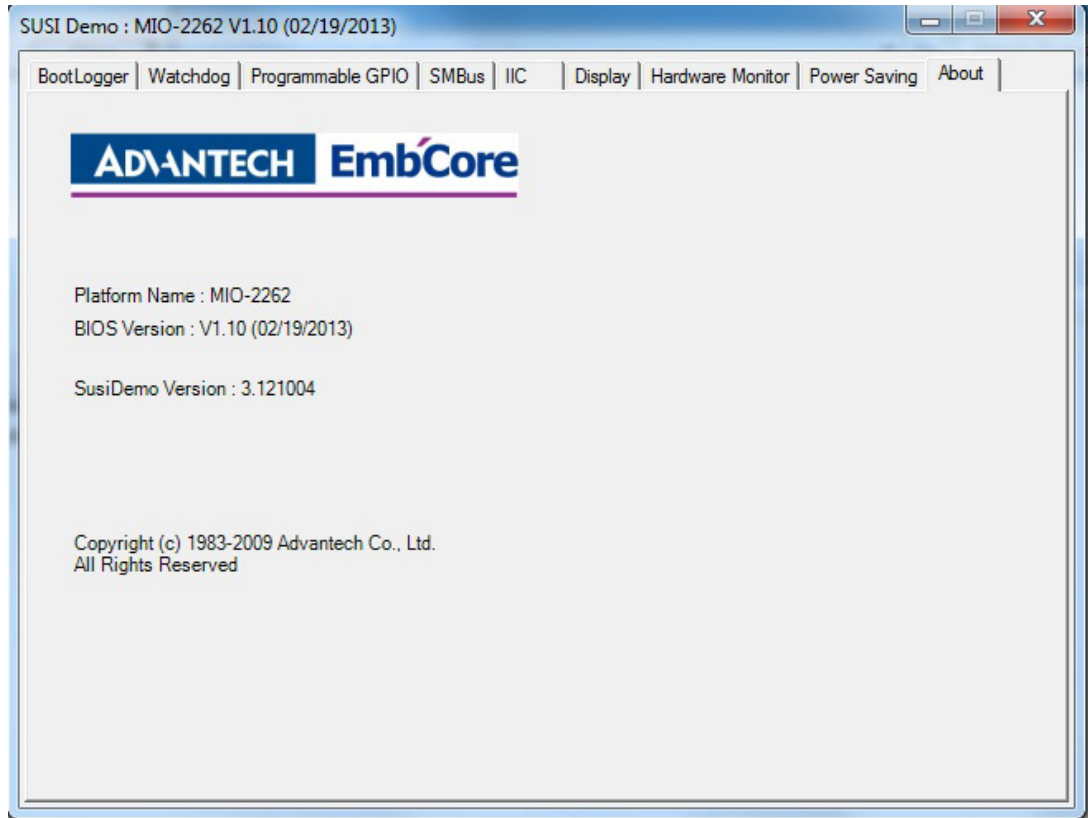
VIII. Power Saving



MIO-2262 use CPU on-demand to control throttling configuration.

Speed control uses windows XP internal scheme for power management configuration.

IX. About



This page contains the platform name, the BIOS version etc., i.e. the information retrieved by the SUSI APIs. You can use this page to check if your installation is okay. If there is not a valid product name, contact your local FAE.

SUSI demo versions show you the major SUSI version (here 3.0) and the minor revision. The minor revision (here 110701) is also the compiling date of your SUSI.DLL in the format YY/MM/DD.

If you have any problems, it is recommended to send your local FAE a screenshot of this site or at least the data which are shown here.

Appendix **A**

PIN Assignments

A.1 Jumper and Connector Tables

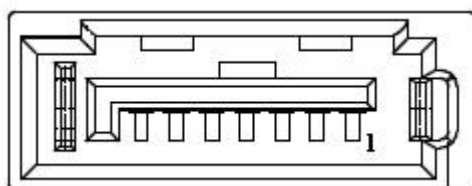
J1	LCD Power/Auto Power On
Part Number	1653003260
Footprint	HD_3x2P_79
Description	PIN HEADER 3*2P 180D(M) 2.0mm SMD SQUARE PIN
Setting	Function
(1-2)	+5 V
(3-4) (default)	+3.3 V
(5-6) (default)	Auto Power On

CN3	SODIMDDR3RVS_204
Part Number	1651002083
Footprint	DDR3_204P_AS0A626-JA
Description	DDR3 SODIMM H=9.2mm 204P SMD AS0A626-HARN-7H

CN6	Mini PCIe/mSATA
Part Number	1654002538
Footprint	MINIPCIE_HALF_PICO_ITX
Description	MINI PCI E 52P 6.8mm 90D SMD AS0B226-S68Q-7H
Pin	Pin Name
1	PCIE_WAKE#
2	+3.3V
3	NC
4	GND
5	NC
6	+1.5V
7	CLKREQ#
8	NC
9	GND
10	NC
11	PCIE_CLK -
12	NC
13	PCIE_CLK +
14	NC
15	GND
16	NC
17	NC
18	GND
19	NC
20	WIFI_DISABLE#
21	NC
22	PLTRST
23	mSATA_mPCIE_RX-
24	+3.3V
25	mSATA_mPCIE_RX+

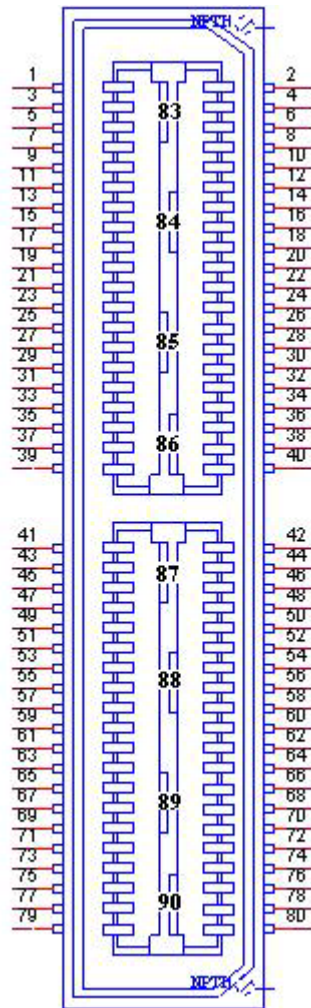
26	GND
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	mSATA_mPCIE_TX-
32	SMB_DAT
33	mSATA_mPCIE_TX+
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3V
40	GND
41	+3.3V
42	NC
43	GND
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3V

CN7	SATA
Part Number	1654007578
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	Serial ATA 7P 1.27mm 180D(M) SMD WATF-07DBN6SB1U
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

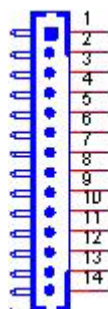


CN16	MIOe
Part Number	1654006235
Footprint	BB_40x2P_32_1625x285_2HOLD
Description	B/B Conn. 40x2P 0.8mm 180D(F) SMD QSE-040-01-L-D
Pin	Pin Name
1	GND
2	GND
3	PCIE_RX0+
4	PCIE_TX0+
5	PCIE_RX0-
6	PCIE_TX0-
7	GND
8	GND
9	PCIE_RX1+
10	PCIE_TX1+
11	PCIE_RX1-
12	PCIE_TX1-
13	GND
14	GND
15	NC
16	NC
17	NC
18	NC
19	GND
20	GND
21	NC
22	NC
23	NC
24	NC
25	GND
26	GND
27	PCIE_CLK+
28	LOUTL
29	PCIE_CLK-
30	LOUTR
31	GND
32	AGND
33	SMB_CLK
34	NC
35	SMB_DAT
36	NC
37	PCIE_WAKE#
38	NC
39	RESET#
40	NC
41	SLP_S3#
42	CLK33M

43	NC
44	LPC_AD0
45	DDP_HPD
46	LPC_AD1
47	GND
48	LPC_AD2
49	DDP_AUX+
50	LPC_AD3
51	DDP_AUX-
52	LPC_DRQ#0
53	GND
54	LPC_SERIRQ
55	DDP_D0+
56	LPC_FRAME#
57	DDP_D0-
58	GND
59	GND
60	USB0_D+
61	DDP_D1+
62	USB0_D-
63	DDP_D1-
64	GND
65	GND
66	USB1_D+
67	DDP_D2+
68	USB1_D-
69	DDP_D2-
70	GND
71	GND
72	USB2_D+
73	DDP_D3+
74	USB2_D--
75	DDP_D3-
76	GND
77	GND
78	USB_OC#
79	+12VSB
80	+12VSB
83	GND
84	GND
85	GND
86	GND
87	+5VSB
88	+5VSB
89	+5VSB
90	+5VSB



CN18	24-bit LVDS Panel
Part Number	1655000753
Footprint	WF14P_49_BOX_RA_85204-14001
Description	WAFER BOX 14x1P 1.25mm 90D(M) SMD 85204-14001
Pin	Pin Name
1	+5V or +3.3V
2	+5V or +3.3V
3	LVDS0_D0+
4	LVDS0_D0-
5	LVDS0_D1+
6	LVDS0_D1-
7	LVDS0_D2+
8	LVDS0_D2-
9	LVDS0_D3+
10	LVDS0_D3-
11	LVDS0_CLK+
12	LVDS0_CLK-
13	GND
14	GND



CN30	64-pin Connector B
Part Number	1653005293-01
Footprint	HD_32x2P_79_2HOLD_21N20250
Description	PIN HEADER 2x32P 2.0mm 180D(M) SMD 21N20250-64M
Pin	Pin Name
1	PSIN#
2	GND
3	Reset
4	GND
5	Power LED+
6	Power LED-
7	HD LED+
8	HD LED-
9	GND
10	+V5_SMB
11	SMB_DAT
12	SMB_CLK
13	I2C_DAT
14	I2C_CLK
15	GND
16	GND
17	+V5_USB23
18	+V5_USB23
19	USB3_z_P-
20	USB2_z_P-
21	USB3_z_P+
22	USB2_z_P+
23	GND
24	GND
25	+V5SB
26	GPIO4
27	GPIO0
28	GPIO5
29	GPIO1
30	GPIO6
31	GPIO2
32	GPIO7
33	GPIO3
34	GND
35	GND
36	GND
37	LOUTR
38	LINR
39	GND_AUD
40	GND_AUD
41	LOUTL_MIO
42	LINL

43	GND
44	GND
45	COM0_DCD#
46	COM0_DSR#
47	COM0_RXD
48	COM0_RTS#
49	COM0_TXD
50	COM0_CTS#
51	COM0_DTR#
52	COM0_RI#
53	GND
54	GND
55	COM1_DCD#
56	COM1_DSR#
57	COM1_RXD
58	COM1_RTS#
59	COM1_TXD
60	COM1_CTS#
61	COM1_DTR#
62	COM1_RI#
63	GND
64	GND

CN31	64-pin Connector A
Part Number	1653005294-01
Footprint	HD_32x2P_79_21N22050-64S22B
Description	PIN HEADER 2x32P 2.0mm 180D(M) DIP 21N22050-64S2
Pin	Pin Name
1	+V12_DC_IN
2	GND
3	+V12_DC_IN +
4	GND
5	+V12_DC_IN
6	GND
7	+V12_DC_IN
8	GND
9	GND
10	GND
11	GND
12	GND
13	+V5_INVERTER
14	NC
15	LVDS0_ENABKL
16	LVDS0_VBR
17	+V12_INVERTER
18	GND
19	GND

20	GND
21	GND
22	GND
23	VGA_DDAT
24	VGA_DCLK
25	GND
26	GND
27	VGA_R
28	VGA_G
29	VGA_B
30	GND
31	GND
32	GND
33	VGA_HS
34	VGA_VS
35	GND
36	GND
37	GND
38	GND
39	+V5_USB01
40	+V5_USB01
41	USB0_z_P-
42	USB1_z_P-
43	USB0_z_P+
44	USB1_z_P+
45	GND_USBE
46	GND_USBE
47	GND_IO
48	NC
49	GND
50	GND
51	LINK100#_LED
52	LINK1000#_LED
53	ACT_LED+
54	ACT#_LED
55	LAN0_M0+
56	LAN0_M0-
57	LAN1_M0+
58	LAN1_M0-
59	LAN2_M0+
60	LAN2_M0-
61	LAN3_M0+
62	LAN3_M0-
63	GNDT1
64	GNDT1

Appendix **B**

WDT & GPIO

B.1 Watchdog Timer Sample Code

Watchdog function:

The SCH3114 Runtime base I/O address is 600h

Setting WatchDog time value location at offset 66h

If set value "0", it is mean disable WatchDog function.

Superio_GPIO_Port = 600h

```
mov dx,Superio_GPIO_Port + 66h
```

```
mov al,00h
```

```
out dx,al
```

```
.model small
```

```
.486p
```

```
.stack 256
```

```
.data
```

```
SCH3114_IO EQU 600h
```

```
.code
```

```
org 100h
```

```
.STARTup
```

```
=====
```

```
;47H
```

```
;enable WDT function bit [0]=0Ch
```

```
=====
```

```
mov dx,SCH3114_IO + 47h
```

```
mov al,0Ch
```

```
out dx,al
```

```
=====
```

```
;65H
```

```
;bit [1:0]=Reserved
```

```
;bit [6:2]Reserve=00000
```

```
;bit [7] WDT time-out Value Units Select
```

```
;Minutes=0 (default) Seconds=1
```

```
=====
```

```
mov dx,SCH3114_IO + 65h ;
```

```
mov al,080h
```

```
out dx,al
```

```
=====
```

```
;66H
```

```
;WDT timer time-out value
```

```
;bit[7:0]=0~255
```

```
=====
```

```
mov dx,SCH3114_IO + 66h
```

```
mov al,01h
```

```
out dx,al
```

```
=====
```

```
;bit[0] status bit R/W
```

```
;WD timeout occurred =1
```



```

;WD timer counting = 0
;=====
mov dx,SCH3114_IO + 68h
mov al,01h
out dx,al
.exit
END

```

B.2 GPIO Sample Code

The SCH3114 Runtime base I/O address is 600h

```

.model small
.486p
.stack 256
.data
SCH3114_IO EQU 600h
.code
org 100h
.STARTUp
;=====
; Configuration GPIO as GPI or GPO by below register:
; GPIO0 = 23H, GPIO4 = 27H
; GPIO1 = 24H, GPIO5 = 29H
; GPIO2 = 25H, GPIO6 = 2AH
; GPIO3 = 26H, GPIO7 = 2BH
; Set 00H as output type, set 01H as input type
;=====
;=====
; Register 4BH configuration GPO value as high or low:
; 1 = HIGH
; 0 = LOW
;=====

mov dx,SCH3114_IO + 23h ;GPIO 0
mov al,00h ;Set GPIO 0 as output type
out dx,al

mov dx,SCH3114_IO + 4Bh
mov al,01h ;Set GPIO 0 as high value.
out dx,al

.exit
END

```


Appendix **C**

System Assignments

C.1 System I/O Ports

Table C.1: System I/O Ports

Addr. Range (Hex)	Device
000-01Fh	DMA Controller
20h-2Dh	Interrupt Controller
50h-52h	Timer/Counter
060h-06Fh	8042 (keyboard controller)
070h-07Fh	Real-time clock, non-maskable interrupt (NMI) mask
080h-09Fh	DMA page register
0A0h-0BFh	0A0-0BF
0C0h-0DFh	DMA controller
170h-177h	IDE Controller
1F0h-1F7h	IDE Controller
2F8h-2FFh	Communications Port (COM2)
3C0h-3DFh	Motherboard resources
3F8h-3FFh	Communications Port (COM1)
400h-4FFh	Motherboard resources
500h-53Fh	Motherboard resources
600h-67Fh	Motherboard resources

C.2 DMA Channel Assignments

Table C.2: DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Available
3	Available
4	Direct memory access controller
5	Available
6	Available
7	Available

C.3 1st MB Memory Map

Table C.3: 1st MB Memory Map

Addr. Range (Hex)	Device
E0000h - FFFFFh	System board
D0000h - DFFFFh	PCI Bus
C0000h - CFFFFh	System board
A0000h - BFFFFh	PCI Bus
A0000h - BFFFFh	Intel® HD Graphic
00000h - 9FFFFh	System board

C.4 Interrupt Assignments

Table C.4: Interrupt Assignments

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ0	System timer
IRQ1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	Communications Port (COM2)
IRQ4	Communications Port (COM1)
IRQ5	Available
IRQ6	Available
IRQ7	Available
IRQ8	System CMOS/real time clock
IRQ9	Microsoft ACPI-Compliant System
IRQ10	Available
IRQ11	Available
IRQ12	PS/2 Compatible Mouse
IRQ13	Numeric data processor
IRQ14	Primary IDE
IRQ15	Secondary IDE

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2013