AEC-6877

Fanless Embedded Controller Intel[®] Core[™] i7/ i5 Celeron[®] Processor with 2 Gigabit Ethernet 2 COM, 4 USB3.0, 2 DisplayPort[™] 2 PCI or 1 PCI-Express[x4] DVI-D, CFast[™], SATA 3.0Gb/s



AEC-6877 Manual 1st Ed. September 2012

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Packing List

Before you begin operating your PC, please make sure that the following materials have been shipped:

- 1 AEC-6877 Embedded Controller
- 1 Phoenix Power Connector
- 4 M3 x 4mm Screws
- 6 6# -32 x 10mm Screws
- 2 Wallmount Brackets
- 1 DVD-ROM for manual (in PDF format) and Drivers

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

Safety & Warranty

- 1. Read these safety instructions carefully.
- 2. Keep this user's manual for later reference.
- 3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
- 4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
- 5. Keep this equipment away from humidity.
- 6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could 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 over-voltage.
- 12. Never pour any liquid into an opening. This could cause fire or electrical shock.
- 13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
- 14. If any of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.

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- d. The equipment does not work well, or you cannot get it to work according to the user's manual.
- e. The equipment has been dropped and damaged.
- f. The equipment has obvious signs of breakage.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 70°C (158°F). IT MAY DAMAGE THE EQUIPMENT.

FCC



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the 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 and your local government's recycling or disposal directives.

Below Table for China RoHS Requirements 产品中有毒有害物质或元素名称及含量

AAEON Boxer/ Industrial System

	有毒有害物质或元素					
部件名称	铅	汞	镉	六价铬	多溴联苯	多溴二苯
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	醚(PBDE)
印刷电路板			0		0	0
及其电子组件		0	0		0	0
外部信号			0		0	0
连接器及线材			0		0	0
外壳	×	0	0	0	0	0
中央处理器			0		0	0
与内存		0	0		0	0
硬盘	×	0	0	0	0	0
电源	×	0	0	0	0	0
O: 表示该有毒有	害物质	在该部	化所有	均质材料	中的含量	均在

SJ/T 11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。

备注:

一、此产品所标示之环保使用期限,系指在一般正常使用状况下。 二、上述部件物质中央处理器、内存、硬盘、电源为选购品。

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Chapter

General Information

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1.1 Introduction

Due to the growing popularity from the IPC market, the newest Boxer series AEC-6877 has been introduced by AAEON.

The AEC-6877 is a fanless industrial grade embedded controller with superior thermal solution inside which is designed for harsh environment use.

With newly Intel[®] high performance 3rd generation processor provides customers powerful computing technology and AEC-6877 adopts Intel[®] QM77 power chipset support three independent displays which is convenient for customer in their applications.

Also with rich I/O ports with VGA, DVI, Display port, Ethernet, RS-232/422/485 and USB 3.0, it helps you shorten product development time to fulfill extensive needs in various projects. AEC-6877 is an ideal embedded platform for implementing custom applications for diversified applications.

Stable Design for Rugged Environment

The AEC-6877 is designed for rugged environments due to the following reasons; first, it can withstand tough vibration testing up to 5g rms. With the anti-vibration hard drive device option, the AEC-6877 can be used in high vibration environments. In addition, the AEC-6877 offers low power consumption system that while operating in ambient temperatures ranging from 0° to 55°C.

The AEC-6877 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

- Fanless Design
- Intel[®] Core[™] i7-3610QE/ i7-2710QE/ i5-2510E/ Celeron[®]-B810 Processor
- Intel[®] QM77 Chipset
- Gigabit Ethernet, RJ-45 x 2
- Three Independent Video Output for 2 DisplayPort[™] + VGA or DVI
- USB3.0 x 4
- PCI-Express[x4] Slot x 1 or PCI x 2
- COM x 2

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1.3 Specifications

• CPU		Intel [®] Core [™] i7-3610QE 2.3 GHz/		
		i7-2710QE 2.1 GHz/ i5-2510E 2.5 GHz/		
		Celeron [®] -B810 1.6 GHz Processor with		
		socket PGA988		
 Chipset 		Intel [®] QM77		
System Memo	ory	204-pin dual-channel DDR3 SODIMM		
		1066/1333/1600 MHz x 2, up to 16 GB		
 Display 	VGA	DB-15 x 1		
Interface	DVI	DVI-D x 1, support 1920 x 1080 @ 60		
		Hz		
	Others	DisplayPort™ x 2		
 Storage 	SSD	CFast™ slot		
Device	HDD	SATA 6.0Gb/s x 2 support RAID 0, 1, 5,		
		10		
Network LAN		Gigabit Ethernet, RJ-45 x 2		
	Wireless	Optional by Mini Card		
Front I/O	Serial Port	RS-232 x 1		
	Others	Push Power button x 1		
		Standard Antenna Hole x 2		
Rear I/O USB Host		USB3.0 x 4		
	LAN	RJ-45 x 2		
Serial Port		RS-232/422/485 x 1		
	Audio	Mic-in, Line-out, Line-out		

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	KB/MS	PS/2 Keyboard x 1 + Mouse x 1	
	Others	Power input x 1	
• Expansion	PCI-E	PCI-E[x4] x 1 (AxM series)	
		or PCI x 2 (BxM series)	
Indicator	Front	Power LED x 1, HDD active LED x 1	
Power Req	uirement	DC 9~30V with 3-pin terminal block	
System Co	oling	Passive cooling	
Mounting		Wallmount	
Operating T	emperature	32 °F ~ 122°F (0°C ~ 50°C)—with	
		airflow	
Storage Temperature		-4°F ~ 158°F (-20°C ~ 70°C)	
Storage Humidity		10%~95% @ 40°C, non-condensing	
Anti-Vibration		5 g rms/ 5~500 Hz/ operation-CFast™;	
		1 g rms/ 5~500 Hz/ operation-HDD	
Anti-Shock		20 G peak acceleration (11 msec.	
		duration) – HDD	
Certification	n EMC	CE/FCC Class A	
• Dimension (W x H x D)		8.19" x 4.02" x 9.37" (208mm x 102mm	
		x 238mm)	
Gross Wei	ght	13.2 lb (6 Kg)	
OS Support		$Windows^{\texttt{®}} XP Embedded, Windows^{\texttt{®}}$	
		XP, Windows [®] 7, Linux Fedora 10	

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Hardware Installation

Chapter 2 Hardware Installation 2-1

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2.1 Dimension



Front side



Rear side



2.2 COM1 ~ COM2 TX / RX LED (CN2)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	TX_LED_COM1	4	-TX_LED_COM1
5	RX_LED_COM1	6	-RX_LED_COM1
7	COM2_RS232_PWR	8	GND
9	TX_LED_COM2	10	-TX_LED_COM2
11	RX_LED_COM2	12	-RX_LED_COM2
13	COM2_RS485_PWR	14	COM2_RS422_PWR

<u>Note:</u> The COM port cannot support baud rate at 115200 since the hardware limitation of the motherboard EMB-QM77.

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

2.3 RS-232 Box Header (COM 1)

2.4 USB Box Header (USB1 ~ USB3)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD-	4	GND
5	USBD+	6	USBD+
7	GND	8	USBD-
9	GND	10	+5V

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2.5 HDD Installation

Step 1: Unfasten the four screws on the front and rear panels



Step 2: Place the HDD to the HDD bracket and fasten to the bottom lid of AEC-6877



Chapter 2 Hardware Installation 2 - 5

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Step 3: Fasten the screws on the front and rear panels, and the brackets of AEC-6877



2.6 CFast[™] Card Installation

Step 1: Unfasten the screws on the front and rear panels



Step 2: After installing the CFast[™] Card to the CFast[™] Slot, you have to use the cover to fix the CFast[™] Card by fastening the two screws



Chapter 2 Hardware Installation 2 - 7

2.7 PCI-Express Card Installation

Step 1: Unfasten the screws on the front and rear panels



Step 2: Install a hold-down bracket to fix the PCI or PCI-Express Card and make sure the PCI or PCI-Express Card installs properly



Chapter 2 Hardware Installation 2 - 8

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2.8 Wallmount Bracket Installation

Fasten the brackets with the appropriate screws.



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Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

- 1. You are starting your system for the first time
- 2. You have changed the hardware attached to your system
- 3. The system configuration is reset by Clear-CMOS jumper
- 4. The CMOS memory has lost power and the configuration information has been erased.

The AEC-6877 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Setup Menu

Setup submenu: Main



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Setup submenu: Advanced

Aptio Setup Utility – Copyright (C) 2011 American Main <mark>Advanced</mark> Chipset Boot Security Save & Exit	Megatrends, Inc.
AMI Debug Rx Enabled! > ACPI Settings > Trusted Computing > CPU Configuration > SATA Configuration > Intel TXT(LT) Configuation > PCH-FK Configuration > AMT Configuration > Super IO Configuration > H/W Monitor	System ACPI Parameters. ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American M	egatrends, Inc.

ACPI Settings

Aptio Setup Ut Advanced	ility – Copyright (C) 2011 American	Megatrends, Inc.
ACPI Settings ACPI Sleep State	[S3 only(Suspend to]	Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	1219. Copyright (C) 2011 American M	

ACPI Sleep State	Suspend Disabled		
	S1 (CPU Stop Clock)		
	S3 (Suspend to RAM)	Default	
Select the ACPI sleep state the system will enter when the SUSPEND			
button is pressed.			

Trusted Computing

Aptio Setup Utilit Advanced	y – Copyright (C) 2011 An	merican Megatrends, Inc.
Configuration Security Device Support	[Disable]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and
Current Status Information SUPPORT TURNED OFF		INTIA interface will not be available.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.1219	. Copyright (C) 2011 Amer	rican Megatrends, Inc.

TPM SUPPORT	Disable	Default
	Enable	
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.		

CPU Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2011 Americ	an Megatrends, Inc.
CPU Configuration		Enabled for Windows XP and
Intel(R) Core(IM) i5-3610ME CPU @	2 70GHz	Huner-Threading Technology)
CPU Signature	306a9	and Disabled for other OS (OS
Microcode Patch	c	not optimized for
Max CPU Speed	2700 MHz	Hyper-Threading Technology).
Min CPU Speed	1200 MHz	When Disabled only one thread
CPU Speed	2700 MHz	per enabled core is enabled.
Processor Cores	2	
Intel HT Technology	Supported	
Intel VT–x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
		++: Select Screen
L1 Data Cache	32 kB x 2	T4: Select Item
L1 Code Cache	32 KB X 2	Enter: Select
L2 Cache	256 KB X 2	+/-: Change Upt.
L3 Cache	3072 KB	F1: General Help
		F2: Previous values
Wunon_threading		F3. Optimized Deraults
Intel Vintualization Technology	[Disphied]	ECC. EVIT
Inter virtualization recimology	[DISabled]	LOC. LAIT
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.		

Hyper-threading	Disabled		
	Enabled	Default	
Enabled for Wind	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading		
Technology) and	Technology) and Disabled for other OS (OS not optimized for		
Hyper-Threading	Hyper-Threading Technology).		
When Disabled only one thread per enabled core is enabled.			
Intel	Disabled	Default	
Virtualization	Enabled		
Technology			
When enabled, a VMM can utilize the additional hardware capabilities			
provided by Vanderpool Technology			

SATA Configuration (IDE)

Aptio Setup Advanced	Utility – Copyright (C) 2011 A	merican Megatrends, Inc.
SATA Controller(s) SATA Mode Selection	[Enabled] [IDE]	Enable or disable SATA Device.
Serial ATA Port 0 Serial ATA Port 1 Serial ATA Port 2 Serial ATA Port 3 Serial ATA Port 4	Empty Empty Empty Empty Empty	
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.1	4.1219. Copyright (C) 2011 Ame	rican Megatrends, Inc.

SATA	Enabled	Default
Controller(s)	Disabled	
Enable or disable SATA Device.		
SATA Mode	IDE	Default
Selection	AHCI	
	RAID	
Determines how SATA controller(s) operate.		

IDE Configuration (AHCI)

Aptio Setup Utili Advanced	ty – Copyright (C) 2011 Am	erican Megatrends, Inc.
Advanced SATA Controller(s) SATA Hode Selection Serial ATA Port 0 Port 0 Hot Plug Serial ATA Port 1 Port 1 Hot Plug Serial ATA Port 2 Port 2 Hot Plug Serial ATA Port 3	(Enabled) (AHCI) Empty (Enabled) (Disabled) Empty (Enabled) (Disabled) Empty (Enabled) (Disabled) Empty Empty	Determines how SATA controller(s) operate.
Port 3 Hot Plug Serial ATA Port 4 Port 4 Hot Plug	Enabled) [Disabled] Empty [Enabled] [Disabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit ican Medatrends Inc.</pre>

SATA Controller(s)	Disabled	
	Enabled	Default
Enable or Disable SATA F	Port.	
SATA Mode Selection	IDE	
	AHCI	Selected
	RAID	
Determines how SATA controller(s) operate.		
Port 0 ~ Port 4	Disable	
	Enabled	Enabled
Enable or Disable SATA Port		
Serial ATA Port Hot Plug	Disable	Default
Port 0 ~ Port 4	Enabled	
Designates this port as Hot Pluggable.		

IDE Configuration (RAID)

Aptio Setup Utility - Advanced	– Copyright (C) 2011 American	Megatrends, Inc.
Aptio Setup Utility Advanced SATA Controller(s) SATA Mode Selection Serial ATA Port 0 Port 0 Hot Plug Serial ATA Port 1 Port 1 Hot Plug Serial ATA Port 2 Port 2 Hot Plug Serial ATA Port 3 Port 3 Hot Plug Serial ATA Port 4 Port 4 Hot Plug	- Copyright (C) 2011 American [Enabled] [RAID] Empty [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	<pre>Megatrends, Inc. Determines how SATA controller(s) operate. ++: Select Screen 14: Select Item Enter: Select Item Enter: Select Item F/-: Change Opt. F1: General Help</pre>
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.		

SATA Controller(s)	Disabled			
	Enabled	Default		
Enable or Disable SATA F	Port.			
SATA Mode Selection	IDE			
	AHCI			
	RAID	Selected		
Determines how SATA controller(s) operate.				
Port 0 ~ Port 4	Disable			
	Enabled	Enabled		
Enable or Disable SATA Port				
Serial ATA Port Hot Plug	Disable	Default		
Port 0 ~ Port 4	Enabled			
Designates this port as Hot Pluggable.				
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Intel TXT(LT) Configuration

Aptio Setup Utility - Advanced	Copyright (C) 2011 American	Megatrends, Inc.
Intel Trusted Execution Technology (configuration	
Intel TXT support only can be enable is enabled. VT and VT-d support must prior to TXT.	d∕disabled if SMX ≅also be enabled	
Secure Mode Extensons (SMX)	Enabled	
Intel TXT(LT) Support	[Disabled]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.14.1219. Co	pyright (C) 2011 American M	

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PCH-FW Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2011 American	n Megatrends, Inc.
ME FW Version ME Firmware Mode ME Firmware Type ME Firmware SKU HOES BIOS Status Code Firmware Update Configuration	8.0.3.1427 Normal Mode Full Sku Firmware 5MB [Disabled]	Enable/Disable MDES BIOS Status Code.
Version 2.14.1219.	Copyright (C) 2011 American M	Wegatrends, Inc.

MDES BIOS Status	Disabled	Default	
Code	Enabled		
Enable/Disable MDES BIOS Status Code.			
Firmware Update	Configure Management Engine Technology		
Configuration	Parameters		

Firmware Update Configuration

Advance	Aptio Setup Utility – C ed	opyright (C) 2011 American	Megatrends, Inc.
Havance	e-Flash	[Disabled]	Enable/Disable Me FW Image Re-Flash function. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.14.1219. Cop	yright (C) 2011 American Mu	egatrends, Inc.

Me FW Image	Disabled	Default
Re-Flash	Enabled	
Enable/Disable Me FW Image Re-Flash function.		

AMT Configuration

Advance	Aptio Setup Utility – Copyright (C d	2) 2011 American Megatrends, Inc.	
Intel AMT Un-Configure M	[Enabled] E [Disabled]	Enable/Disable Intel (R) Active Management Technology BIDS Extension. Note : iAMT H/W is always enabled. This option just controls the BIDS extension execution. If enabled, this requires additional firmware in the SPI device	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
	Version 2.14.1219. Copyright (C)	2011 American Megatrends, Inc.	

Intel AMT	Disabled		
	Enabled	Default	
Enable/Disable Intel ® Ac	tive Managemer	t Technology BIOS Extension.	
Note : iAMT H/W is alway	s enabled.		
This option just controls t	he BIOS extension	on execution.	
If enabled, this requires additional firmware in the SPI device			
Un-Configure ME	Disabled	Default	
	Enabled		
OEMFlag Bit 15:			
Un-Configure ME without password.			

USB Configuration

Aptio Setup Utility - (Advanced	Copyright (C) 2011 American	Megatrends, Inc.
USB Configuration USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 3	2 Hubs	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will
Legacy USB Support xHCI Mode	[Enabled] [Enabled]	Keep USB devices available only for EFI applications.
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.14.1219. Co	pyright (C) 2011 American M	egatrends, Inc.

Legacy USB Support	Enabled	Default
	Disabled	
	Auto	
Enable Legacy USB support.		
AUTO option disables legacy support if no USB devices are connected.		
DISABLE option will keep	USB devices av	ailable only for EFI applications.
xHCI Mode	Disabled	
	Enabled	
Mode of operation of xHCI controller.		

Super IO Configuration

Aptio Setup Uti: Advanced	lity – Copyright (C) 2011 (American Megatrends, Inc.
Super IO Configuration		Set Parameters of Serial Port
Super IO Chip • Serial Port 0 Configuration • Serial Port 1 Configuration	IT8728	0 (CDMA) +*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
version 2.14.12	119. COPYRIGHT (C) 2011 AM	erican megatrenus, inc.

Serial Port 0	Set Parameters of Serial Port 3 (COMA)
Configuration	
Serial Port 1	Set Parameters of Serial Port 4 (COMB)
Configuration	

Serial Port 0 Configuration

Serial Port O Configuration		Enable or Disable Serial Port
Serial Port [E Device Settings IO	nabled] =3F8h; IRQ=4;	
Change Settings [A	uto]	
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Vancian 2 14 1219 - Comun	ight (C) 2011 Amonicon M	gataonde. Toe

Serial Port	Disabled	
	Enabled	Default
Enable or Disable Ser	ial Port (COM)	
Change Settings	Auto	Default
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h; IRQ=3,4;	
	IO=2E8h; IRQ=3,4;;	
Select an optimal setting for Super IO device.		

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Serial Port 1 Configuration

Aptio Setup Utility - Advanced	- Copyright (C) 2011 America	n Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	(001)
Change Settings Device Mode	(Auto) [RS-232]	
		++: Select Screen †↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.14.1219. (Copyright (C) 2011American	Megatrends, Inc.

Serial Port	Disabled	
	Enabled	Default
Enable or Disable S	erial Port (COM)	
Change Settings	Auto	Default
	IO=3F8h; IRQ=3,4;	
	IO=2F8h; IRQ=3,4;	
	IO=3E8h;	
	IRQ=3,4;	
	IO=2E8h;	
	IRQ=3,4;;	
Select an optimal setting for Super IO device.		
Device Mode	RS-232	Default
	RS-422	
	RS-485	
Change the Serial Port mode.		
Select <rs-232> or</rs-232>	<pre><rs-422> or <rs-4< pre=""></rs-4<></rs-422></pre>	485> mode

H/W Monitor

Aptio Setup Utility - Advanced	· Copyright (C) 2011 Americar	n Megatrends, Inc.
Pc Health Status		For En/Disable CPU Fan1 Control
CPU Fan1 Control		accordance with user settings
SYS Fan1 Control	[Disabled]	Disabled: Fan is always running with full speed
CPU Temperature	: +44 C	
PCH Temperature	: +36 C	
System Temperature	: +31 C	
CPU Fan1 Speed	: N/A	
SYS Fan1 Speed	: 7941 RPM	
VCORE	: +0.900 V	
+v1.55	: +1.500 V	
+V3.35	. +5.360 V	++ · Calact Scheen
+V12S	: +11 904 V	fl: Select Item
VBAT	: +3.048 V	Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.14 1219 (Converight (C) 2011 American N	Megatrends. Inc.

A E C - 6 8 7 7

Setup submenu: Chipset

Main	Aptio Setup Utility – Copyrig Advanced Chipset Boot Security S	ht (C) 2011 American ave & Exit	Megatrends, Inc.
PCH-IO System	Configuration Agent (SA) Configuration		PCH Parameters +: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	vor o ton ett nitero, oopgi igne		

PCH-IO Configuration

Aptio Setup Utility - Chipset	Copyright (C) 2011 American	Megatrends, Inc.
PCH-IO Configuration		Select Power Supply Mode.
Power Mode Restore AC Power Loss	(ATX Type) [Last State]	
PCH LAN Controller Wake on LAN	[Enabled] [Enabled]	
Deep S5	[Disabled]	
Mini PCIe Speed	[Gen2]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.14.1219. Co	pyright (C) 2011 American M	legatrends, Inc.

Power Mode	ATX Type	Default	
	AT Type		
Select power supply mo	de.		
Restore AC Power	Power off		
Loss	Power on		
	Last State	Default	
Select AC power state when power is re-applied after a power failure.			
Notice: The system will power up after restore AC power if this item set to			
last state and shuts down via iAMT remote control.			
PCH LAN Controller	Enabled	Default	
	Disabled		
Enable or disable onboard NIC.			
Wake on LAN	Enabled	Default	
	Disabled		
Enable or disable integrated LAN to wake the system. (The Wake On LAN			
cannot be disabled if ME is on at Sx state.)			

Embedded Controller

Deep S5	Disabled	Default		
	Enabled			
Enabled/Disabled Deep	Enabled/Disabled Deep S5.			
Note : When Deep S5 is enabled, Intel ® AMT and Wake On PCH LAN				
functions are not available In system shut down.				
Mini PCIe Speed	Gen1			
	Gen2	Default		
Select Mini PCI Express	s port speed.			

System Agent (SA) Configuration

Aptio Setup Ut Chipset	ility – Copyright (C) 2011 Ame	rican Megatrends, Inc.
VT-d Capability Memory Frequency Total Memory DIMM#O DIMM#2	Supported 1067 Mhz 4096 MB (DDR3) 4096 MB (DDR3) Not Present	Check to enable VT-d function on MCH.
VT-d PEGO - Gen X	[Enabled] [Auto]	
▶ Graphics Configuration		
		<pre>++: Select Screen fl: Select Item Enter: Select</pre>
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2.14.	1219. Copyright (C) 2011 Ameri	can Megatrends, Inc.

VT-d	Disabled	
	Enabled	Default
Check to enable	VT-d function on MCH	
PEG0 – Gen X	Auto	Default
	Gen1	
	Gen2	
	Gen3	
Configure PEG0 B0:D1:F0 Gen1-Gen3		
Graphics	Config Graphics Settings.	
Configuration		

Graphics Configuration

Aptio Setup Chipset	Utility – Copyright (C) 2011	American Megatrends, Inc.
Graphics Configuration Primary Display Internal Graphics	[Auto] [Auto]	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
DVMT Pre-Allocated DVMT Total Gfx Mem	[64M] [MAX]	
 Displag control 		
		++: Select Screen 11: Select Item
		Enter: Select +/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.1	14.1219. Copyright (C) 2011 An	merican Megatrends, Inc.

Primary Display	Auto	Default
	lGfx	
	PEG	
Select which of IGFX/P	EG/PCI Graphics dev	rice should be Primary Display
Or select SG for Switch	able Gfx	
Internal Graphics	Auto	Default
	Disabled	
	Enabled	
Keep IGD enabled based on the setup options.		าร.
DVMT Pre-Allocated	OM	
	32M	
	64M	Default
	96M	
	128M	
	160M	
	192M	

Embedded Controller

	224M	
	256M	
	288M	
	320M	
	352M	
	384M	
	416M	
	448M	
	480M	
	512M	
Select DVMT 5.0 Pre-A	llocated (Fixed) Grap	hics Memory size used by the
Internal Graphics Devic	e.	
DVMT Total Gfx Men	128M	
	256M	
	MAX	Default
Select DVMT5.0 Total C	Graphic Memory size	used by the Internal Graphics
Device.		

Display Control

	Aptio Setup Utility - Chipset	- Copyright (C) 2011 American	Megatrends, Inc.
Display Contro	1		Select the Video Device during
Boot Display S	elect	[VBIOS Default]	POST and DOS. This has no effect if external graphics present. ++: Select screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.14.1219. 0	Copyright (C) 2011 American M	egatrends, Inc.

Boot Display Select	VBIOS Default	Default	
	CRT		
	DisplayPort 1		
	DVI		
	DisplayPort 2		
Select the Video Device during POST and DOS.			
This has no effect if external graphics present.			

Setup submenu: Boot

Aptio Setup Uti Main Advanced Chipset <mark>Boo</mark> t	lity – Copyright (C) 2011 Americar T Security Save & Exit	Megatrends, Inc.
Boot Configuration Quiet Boot Launch 182579LM PXE OpROM Launch RTL8111E PXE OpROM	[Enabled] [Disabled] [Disabled]	Enables or disables Quiet Boot option
Boot Option Priorities Boot Option #1 Boot Option #2	[Skymedi USB3_Pen_D] [UEFI: Skymedi USB3]	
Hand Unive BBS Phionities		
		++: Select Screen tl: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.12	219. Copyright (C) 2011American M	legatrends, Inc.

Quiet Boot	Disabled			
	Enabled	Defa	ault	
Enables or disables Qui	et Boot option			
Launch I82579LM PXE	Disabled	Defa	Default	
OpROM	Enabled			
Enable or Disable Legacy Boot Option for I82579LM.			579LM.	
Launch RTL8111E	Disabled		Default	
PXE OpROM	Enabled			
Enable or Disable Legacy Boot Option for RTL8111E				
Boot options #X	Your storage/disk	dev	rices	
Sets the system boot order				

Hard Drives BBS Priorities

Aptio Se	tup Utility – Copyright (C) 20: Boot	011 American Megatrends, Inc.	
Boot Option #1	(Skymedi USB3_P≀	<pre>**: Select Screen **: Select Screen **: Select Item Enter: Select */-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Default F4: Save & Exit ESC: Exit</pre>	s
Version	2.14.1219. Copyright (C) 2011	. American Megatrends, Inc.	

Embedded Controller

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Submenu: Security

Aptio Setup Ut Main Advanced Chipset Bo	ility – Copyright (C) 2011 ot Security Save & Exit	American Megatrends, Inc.
Password Description If ONLY the Administrator's then this only limits access only asked for when entering If ONLY the User's password is a power on password and m boot or enter Setup. In Setu have Administrator rights. The password length must be	password is set, to Setup and is Setup. is set, then this ust be entered to p the User will	Set Administrator Password
in the following range: Minimum length	3	
Maximum length	20	++: Select Screen 11: Select Item
Administrator Password User Password		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.	1219. Copyright (C) 2011 Am	erican Megatrends, Inc.

Change User/Supervisor Password

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Exit

Aptio Setup Utility – Copyright (C) 2011 American Main Advanced Chipset Boot Security Save & Exit	Megatrends, Inc.
Save Changes and Reset Discard Changes and Reset Restore Defaults Save as User Defaults Restore User Defaults	Reset the system after saving the changes.
	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American M	

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Chapter

Driver Installation

Chapter 4 Driver Installation 4-1

The AEC-6877 comes with an AutoRun DVD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver DVD, the driver DVD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver
Step 2 – Install VGA Driver
Step 3 – Install LAN Driver
Step 4 – Install Audio Driver
Step 5 – Install USB3.0 Driver
Step 6 – Install RAID & AHCI Driver
Step 7 – Install ME Driver

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the AEC-6877 DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 7 in order.

Step 1 – Install Chipset Driver

- Click on the Step 1-Chipset folder and double click on the infinst_autol.exe file
- 2. Follow the instructions that the window shows
- 3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

- Click on the Step 2-VGA folder and select the OS folder your system is
- 2. Double click on the **Setup.exe** file located in each OS folder
- 3. Follow the instructions that the window shows
- 4. The system will help you install the driver automatically
- Step 3 –Install LAN Driver
 - Click on the Step 3-LAN folder and select the folder of LAN chip the system adopted
 - 2. Select the OS folder your system is and double click on the **.exe** file located in each OS folder
 - 3. Follow the instructions that the window shows
 - 4. The system will help you install the driver automatically

Step 4 –Install Audio Driver

- 1. Click on the **Step 4- Audio** folder and select the OS folder your system is
- 2. Double click on the .exe located in each OS folder
- 3. Follow the instructions that the window shows
- 4. The system will help you install the driver automatically

Step 5 – Install USB3.0 Driver

- Click on the Step 5-USB3.0 folder and double click on the Setup.exe file
- 2. Follow the instructions that the window shows
- 3. The system will help you install the driver automatically
- Step 6 Install RAID & AHCI Driver

Please refer to the Appendix C RAID & AHCI Settings

- Step 7 Install ME Driver
 - 1. Click on the *Step 7-ME* folder and double click on the *setup.exe* file
 - 2. Follow the instructions that the window shows
 - 3. The system will help you install the driver automatically

Appendix

Programming the Watchdog Timer

Appendix A Programming the Watchdog Timer A-1

A.1 Programming

AEC-6877 utilizes ITE IT8728 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8728 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



Embedded Conti	oll	er
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There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN Index R/W Reset Configuration Register or Action

All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W ter	00H	WatchDog Timer Configuration Regis-
07H	73H	R/W Regi	00H ster	WatchDog Timer Time-out Value

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	t Description WDT is reset upon a CIR interrupt		
7			
6	WDT is reset upon a KBC (mouse) interrupt		
5	WDT is reset upon a KBC (keyboard) interrupt		
4	WDT is reset upon a read or a write to the Game Port base address		
3-2	Reserved		
1	Force Time-out. This bit is self-clearing		
0	WDT Status		
	1: WDT value reaches 0.		
	0: WDT value is not 0		

WatchDog Timer Configuration Register (Index=72h, Default=00h)

Bit	Description		
7	WDT Time-out value select		
	1: Second		
	0: Minute		
6	WDT output through KRST (pulse) enable		
5-4	Reserved		
3-0	Select the interrupt level ^{Note} for WDT		

WatchDog Timer Time-out Value Register (Index=73h,

Default=00h)

Bit Description

7-0 WDT Time-out value 7-0

A.2 ITE8728 Watchdog Timer Initial Program

.MODEL SMALL

Main:

CALL Enter_Configuration_mode

CALL Check_Chip

mov cl, 7

call Set_Logic_Device

;time setting

mov cl, 10 ; 10 Sec

dec al

Watch_Dog_Setting:

;Timer setting mov al, cl mov cl, 73h call Superio_Set_Reg ;Clear by keyboard or mouse interrupt mov al, 0f0h mov cl, 71h call Superio_Set_Reg ;unit is second. mov al, 0C0H mov cl, 72h call Superio_Set_Reg ; game port enable mov cl, 9 call Set_Logic_Device

Initial_OK: CALL Exit_Configuration_mode MOV AH,4Ch INT 21h

Enter_Configuration_Mode PROC NEAR MOV SI,WORD PTR CS:[Offset Cfg_Port]

MOV DX,02Eh MOV CX,04h Init_1: MOV AL,BYTE PTR CS:[SI] OUT DX,AL INC SI LOOP Init_1 RET Enter_Configuration_Mode ENDP Exit_Configuration_Mode PROC NEAR

MOV AX,0202h

CALL Write_Configuration_Data

Appendix A Programming the Watchdog Timer A-7

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h CALL Read_Configuration_Data CMP AL,87h JNE Not_Initial

MOV AL,21h CALL Read_Configuration_Data CMP AL,12h JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg_Port+04h]

OUT DX,AL

MOV DX,WORD PTR CS:[Cfg_Port+06h] IN AL,DX RET Read_Configuration_Data ENDP

Write_Configuration_Data PROC NEAR MOV DX,WORD PTR CS:[Cfg_Port+04h] OUT DX,AL XCHG AL,AH MOV DX,WORD PTR CS:[Cfg_Port+06h] OUT DX,AL RET Write_Configuration_Data ENDP

Superio_Set_Reg proc near push ax MOV DX,WORD PTR CS:[Cfg_Port+04h] mov al,cl out dx,al pop ax inc dx out dx,al ret Superio_Set_Reg endp.Set_Logic_Device proc near Set_Logic_Device proc near push ax push cx xchg al,cl mov cl,07h call Superio_Set_Reg pop cx pop ax ret Set_Logic_Device endp

;Select 02Eh->Index Port, 02Fh->Data Port Cfg_Port DB 087h,001h,055h,055h

DW 02Eh,02Fh

.

END Main

Note: Interrupt level mapping 0Fh-Dh: not valid 0Ch: IRQ12

03h: IRQ3 02h: not valid 01h: IRQ1 00h: no interrupt selected

Appendix B

I/O Information

Appendix B I/O Information B-1

A E C - 6 8 7 7

B.1 I/O Address Map

4 -	🛛 Inp	out/output (IO)
		[00000000 - 0000001F] Direct memory access controller
	j	[00000000 - 00000CF7] PCI bus
	j	[00000010 - 0000001F] Motherboard resources
	, I	[00000020 - 00000021] Programmable interrupt controller
	<u>1</u>	[00000022 - 0000003F] Motherboard resources
	<u>j</u>	[00000024 - 00000025] Programmable interrupt controller
		[00000028 - 00000029] Programmable interrupt controller
		[0000002C - 0000002D] Programmable interrupt controller
	, I	[0000002E - 0000002F] Motherboard resources
	<u>j</u>	[00000030 - 00000031] Programmable interrupt controller
	····]	[00000034 - 00000035] Programmable interrupt controller
	<u>1</u>	[00000038 - 00000039] Programmable interrupt controller
	<u>1</u>	[0000003C - 0000003D] Programmable interrupt controller
	<u>I</u>	[00000040 - 00000043] System timer
	····1	[00000044 - 0000005F] Motherboard resources
	<u>1</u>	[0000004E - 0000004F] Motherboard resources
	····]	[00000050 - 00000053] System timer
		[00000060 - 00000060] Standard PS/2 Keyboard
		[00000061 - 00000061] Motherboard resources
	····{1	[00000062 - 00000063] Motherboard resources
	····]	[00000063 - 00000063] Motherboard resources
	@	[00000064 - 00000064] Standard PS/2 Keyboard
	····]	[00000065 - 00000065] Motherboard resources
	<u>1</u>	[00000065 - 0000006F] Motherboard resources
	····1	[00000067 - 00000067] Motherboard resources
	1 <u>F</u>	[00000070 - 00000070] Motherboard resources
	····1	[00000070 - 00000077] System CMOS/real time clock
	····1	[00000072 - 0000007F] Motherboard resources
	1 <u>F</u>	[00000080 - 00000080] Motherboard resources
	1 <u>F</u>	[00000080 - 00000080] Motherboard resources
	····1	[00000081 - 00000091] Direct memory access controller
	1	[00000084 - 00000086] Motherboard resources
	1 <u>F</u>	[00000088 - 00000088] Motherboard resources
	1	[0000008C - 0000008E] Motherboard resources
	····1	[00000090 - 0000009F] Motherboard resources
	1	[00000092 - 00000092] Motherboard resources
	1	[00000093 - 0000009F] Direct memory access controller
	1	[000000A0 - 000000A1] Programmable interrupt controller
	1	[000000A2 - 000000BF] Motherboard resources
		[000000A4 - 000000A5] Programmable interrupt controller
		[000000A8 - 000000A9] Programmable interrupt controller
		[000000AC - 000000AD] Programmable interrupt controller
	1	[00000080 - 00000081] Programmable interrupt controller
	1	[UUUUUUB2 - UUUUUUB3] Motherboard resources
	1	UUUUUUUB4 - 000000B5] Programmable interrupt controller
		[UUUUUUUB8 - UUUUUUB9] Programmable interrupt controller
		[UUUUUUBC - UUUUUUBD] Programmable interrupt controller
	(1	[UUUUUUUU - UUUUUUDF] Direct memory access controller

Appendix B I/O Information B-2
A E C - 6 8 7 7

🚏 [000003F8 - 000003FF] Communications Port (COM1)	
👰 [0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller #3	
🔆 [0000F060 - 0000F07F] Intel(R) 7 Series Chipset Family SATA AHCI Controller	
🔆 [0000F0A0 - 0000F0A3] Intel(R) 7 Series Chipset Family SATA AHCI Controller	
🔆 [0000F0B0 - 0000F0B7] Intel(R) 7 Series Chipset Family SATA AHCI Controller	
🔆 [0000F0C0 - 0000F0C3] Intel(R) 7 Series Chipset Family SATA AHCI Controller	
🗲 [0000F0D0 - 0000F0D7] Intel(R) 7 Series Chipset Family SATA AHCI Controller	
🚏 [0000F0E0 - 0000F0E7] Intel(R) Active Management Technology - SOL (COM3)	
10000FFFF - 0000FFFF1 Motherboard resources	

B.2 Memory Address Map

📳 Me	mory
	[000A0000 - 000BFFFF] Intel(R) HD Graphics 4000
	[000A0000 - 000BFFFF] PCI bus
	[000D0000 - 000D3FFF] PCI bus
	[000D4000 - 000D7FFF] PCI bus
, 🖳	[000D8000 - 000DBFFF] PCI bus
<u>1</u>	[000DC000 - 000DFFFF] PCI bus
<u>1</u>	[000E0000 - 000E3FFF] PCI bus
<u>1</u>	[000E4000 - 000E7FFF] PCI bus
<u>1</u>	[20000000 - 201FFFFF] System board
I	[40004000 - 40004FFF] System board
<u>1</u>	[DFA00000 - DFA00FFF] Motherboard resources
1	[DFA00000 - FEAFFFFF] PCI bus
	[E0000000 - EFFFFFFF] Intel(R) HD Graphics 4000
- 🖻	[F0000000 - F0003FFF] Realtek PCIe GBE Family Controller #3
····]	[F0000000 - F00FFFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	[F7800000 - F7BFFFFF] Intel(R) HD Graphics 4000
	[F7C00000 - F7C00FFF] Realtek PCIe GBE Family Controller #3
1	[F7C00000 - F7CFFFFF] Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	[F7D00000 - F7D1FFFF] Intel(R) 82579LM Gigabit Network Connection
···· 🖣	[F7D20000 - F7D2FFFF] Intel(R) USB 3.0 eXtensible Host Controller
1	[F7D30000 - F7D33FFF] High Definition Audio Controller
	[F7D35000 - F7D350FF] Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
¢	[F7D36000 - F7D367FF] Intel(R) 7 Series Chipset Family SATA AHCI Controller
Ÿ	[F7D37000 - F7D373FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
· · · · · · · · · · · · · · · · · ·	[F7D38000 - F7D383FF] Intel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
- <u>-</u>	[F7D39000 - F7D39FFF] Intel(R) 82579LM Gigabit Network Connection
	[F7D3A000 - F7D3AFFF] Intel(R) Active Management Technology - SOL (COM3)
1	[F7D3C000 - F7D3C00F] Intel(R) Management Engine Interface
15	[F8000000 - FBFFFFFF] Motherboard resources
15	[FED00000 - FED003FF] High precision event timer
15	[FED10000 - FED17FFF] Motherboard resources
1	[FED18000 - FED18FFF] Motherboard resources
1	[FED19000 - FED19FFF] Motherboard resources
1	[FED1C000 - FED1FFF] Motherboard resources
1	[FED20000 - FED3FFFF] Motherboard resources
1	[FED40000 - FED4FFF] System board
- 12	[FED45000 - FED8FFFF] Motherboard resources
····]=	[FED90000 - FED93FFF] Motherboard resources
	[FEEDUDUD - FEEFFFFF] MIOTNERDOARD RESOURCES
	[FF000000 - FFFFFFF] Intel(K) 82802 Firmware Hub Device
····1	[FF000000 - FFFFFFF] Motherboard resources

A E C - 6 8 7 7

B.3 IRQ Mapping Chart

4	Interrupt request (IRQ)	
	ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
	(ISA) 0x00000003 (03)	Communications Port (COM2)
	(ISA) 0x00000004 (04)	Communications Port (COM1)
	(ISA) 0x00000008 (08)	System CMOS/real time clock
	(ISA) 0x000000C (12)	Microsoft PS/2 Mouse
	(ISA) 0x0000000 (13)	Numeric data processor
	(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
	(ISA) 0x0000052 (82)	Microsoft ACPI-Compliant System
	(ISA) 0x0000052 (82)	Microsoft ACPI-Compliant System
	ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
	(ISA) 0x00000054 (04)	Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
	(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
	(ISA) 0x000005D (93)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
	1 (ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
	19 (ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
	📲 (ISA) 0x0000063 (99)	Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
	19 (ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
	19 (ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
		Microsoft ACPI-Compliant System
	(ISA) 0x000006C (108)	Microsoft ACPI-Compliant System
	(ISA) 0x000006D (109)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
	(ISA) 0x000006F (111)	Microsoft ACPI-Compliant System
	(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
	(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
	(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
	(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
	(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
	(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
	(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
	ISA) 0x0000077 (119)	Microsoft ACPI-Compliant System
	[ISA) 0x0000077 (III)	Microsoft ACPI-Compliant System
1	· ····································	

A E C - 6 8 7 7

····]	(ISA)) 0x00000079 (121)	Microsoft ACPI-Compliant System	n
		0,00000078 (122)	Microsoft ACPI-Compliant System	
		0x00000076 (123)	Microsoft ACPI-Compliant System	
	(ISA)	0x0000007C (124)	Microsoft ACPI-Compliant System	
	(ISA)	0x0000007D (125)	Microsoft ACPI-Compliant System	
	(ISA)	0x0000007E (126)	Microsoft ACPI-Compliant System	
	(ISA)	0x000007F (127)	Microsoft ACPI-Compliant System	
1	(ISA)	0x0000080 (128)	Microsoft ACPI-Compliant System	
1 -	(ISA)	0x00000081 (129)	Microsoft ACPI-Compliant System	
1 -	(ISA)	0x0000082 (130)	Microsoft ACPI-Compliant System	
1 -	(ISA)	0x0000083 (131)	Microsoft ACPI-Compliant System	
1 <u>1</u>	(ISA)	0x00000084 (132)	Microsoft ACPI-Compliant System	
1 <u>m</u>	(ISA)	0x00000085 (133)	Microsoft ACPI-Compliant System	
	(ISA)	0x00000086 (134)	Microsoft ACPI-Compliant System	
	(ISA)	0x00000087 (135)	Microsoft ACPI-Compliant System	
] L	(ISA)	0x00000088 (136)	Microsoft ACPI-Compliant System	
<u>, I</u>	(ISA)	0x00000089 (137)	Microsoft ACPI-Compliant System	
<u>, I</u>	(ISA)	0x000008A (138)	Microsoft ACPI-Compliant System	
j u	(ISA)	0x000008B (139)	Microsoft ACPI-Compliant System	
<u>j</u>	(ISA)	0x0000008C (140)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x0000008D (141)	Microsoft ACPI-Compliant System	
<u>j</u>	(ISA)	0x0000008E (142)	Microsoft ACPI-Compliant System	
····]	(ISA)	0x0000008F (143)	Microsoft ACPI-Compliant System	
j	(ISA)	0x00000090 (144)	Microsoft ACPI-Compliant System	
j	(ISA)	0x00000091 (145)	Microsoft ACPI-Compliant System	
, I	(ISA)	0x00000092 (146)	Microsoft ACPI-Compliant System	
<u>1</u>	(ISA)	0x00000093 (147)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x00000094 (148)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x00000095 (149)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x00000096 (150)	Microsoft ACPI-Compliant System	
<u>j</u>	(ISA)	0x00000097 (151)	Microsoft ACPI-Compliant System	
<u>, P</u>	(ISA)	0x00000098 (152)	Microsoft ACPI-Compliant System	
<u>, I</u>	(ISA)	0x00000099 (153)	Microsoft ACPI-Compliant System	
<u>, I</u>	(ISA)	0x0000009A (154)	Microsoft ACPI-Compliant System	
<u>1</u>	(ISA)	0x0000009B (155)	Microsoft ACPI-Compliant System	
<u>1</u>	(ISA)	0x0000009C (156)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x0000009D (157)	Microsoft ACPI-Compliant System	
<u>j</u> Ę	(ISA)	0x0000009E (158)	Microsoft ACPI-Compliant System	
<u>j</u>	(ISA)	0x0000009F (159)	Microsoft ACPI-Compliant System	
j	(ISA)	0x000000A0 (160)	Microsoft ACPI-Compliant System	
····]	(ISA)	0x000000A1 (161)	Microsoft ACPI-Compliant System	
j	(ISA)	0x000000A2 (162)	Microsoft ACPI-Compliant System	
j	(ISA)	0x000000A3 (163)	Microsoft ACPI-Compliant System	
;1	(ISA)	0x000000A4 (164)	Microsoft ACPI-Compliant System	
	(ISA)	0x000000A5 (165)	Microsoft ACPI-Compliant System	
<u>, I</u>	(ISA)	0x000000A6 (166)	Microsoft ACPI-Compliant System	
j u	(ISA)	0x000000A7 (167)	Microsoft ACPI-Compliant System	
	(ISA)	0x000000A8 (168)	Microsoft ACPI-Compliant System	
;	(ISA)	0x000000A9 (169)	Microsoft ACPI-Compliant System	
	(ISA)	0x000000AA (170)	Microsoft ACPI-Compliant System	

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,🌉	(ISA)	0x000000	4B (17	1)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	AC (17	2)	Microsoft ACPI-Compliant System
	(ISA)	0x00000	4D (17	3)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	4E (17	4)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	4F (17	5)	Microsoft ACPI-Compliant System
, L	(ISA)	0x000000	30 (17	6)	Microsoft ACPI-Compliant System
, L	(ISA)	0x000000	31 (17)	7)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	32 (17)	8)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	33 (17	9)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	34 (18)	0)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	35 (18:	1)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	36 (18)	2)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	37 (18	3)	Microsoft ACPI-Compliant System
j	(ISA)	0x000000	38 (184	4)	Microsoft ACPI-Compliant System
,🖳	(ISA)	0x000000	39 (18	5)	Microsoft ACPI-Compliant System
,🖳	(ISA)	0x000000	3A (18	6)	Microsoft ACPI-Compliant System
,🌉	(ISA)	0x000000	3B (18	7)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	3C (18	8)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	3D (18	9)	Microsoft ACPI-Compliant System
	(ISA)	0x000000	BE (19	0)	Microsoft ACPI-Compliant System
	(PCI)	0x000000	DB (11) 1	Intel(R) 7 Series/C216 Chipset Family SMBus Host Controller - 1E22
🏺	(PCI)	0x000000	LO (16)) I	ntel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E2D
	(PCI)	0x000000	LO (16)) I	ntel(R) Management Engine Interface
	(PCI)	0x000000	13 (19)) I	ntel(R) Active Management Technology - SOL (COM3)
j	(PCI)	0x000000	16 (22)) I	High Definition Audio Controller
🏺	(PCI)	0x000000	17 (23)) I	ntel(R) 7 Series/C216 Chipset Family USB Enhanced Host Controller - 1E26
···· 😰	(PCI)	0xFFFFFF	F8 (-8)) F	Realtek PCIe GBE Family Controller #3
···· 😰	(PCI)	0xFFFFFF	F9 (-7)) I	ntel(R) 82579LM Gigabit Network Connection
📋	(PCI)	0xFFFFFF	FA (-6)]	Intel(R) USB 3.0 eXtensible Host Controller
	(PCI)	0xFFFFFF	FB (-5)) I	ntel(R) HD Graphics 4000
¢	(PCI)	0xFFFFFF	FC (-4)]	Intel(R) 7 Series Chipset Family SATA AHCI Controller
, L	(PCI)	0xFFFFFF	FD (-3)]	Intel(R) 7 Series/C216 Chipset Family PCI Express Root Port 2 - 1E12
	(PCI)	0xFFFFFF	FE (-2)) I	ntel(R) 7 Series/C216 Chipset Family PCI Express Root Port 1 - 1E10

B.4 DMA Channel Assignments

- Direct memory access (DMA)
- 4 Direct memory access controller



RAID & AHCI Settings

Appendix C RAID & AHCI Settings C-1

A E C - 6 8 7 7

C.1 Setting RAID

OS installation to setup RAID Mode

Step 1: Copy the files below from "Driver CD ->Step 6 - RAID&AHCI -> F6

Floppy - x86" to Disk



Step 2: Connect the USB Floppy (disk with RAID files) to the board



Step 3: The setting procedures " In BIOS Setup Menu" A: Advanced -> SATA Configuration -> SATA Mode -> RAID Mode

	Copyright (C) 2009 American
SATA Configuration SATA Port1 SATA Port2 SATA Port3	FUJITSU MHZ208 (80.06B) ST9120823AS (120.06B) Not Present
SATA Mode	[RAID Mode]
Supports Staggered Spin-up Port 1 Hot Plug Port 2 Hot Plug Port 3 Hot Plug	[Disable] [Disable] [Disable] [Disable]

Step 4: The setting procedures "In BIOS Setup Menu" B: Advanced -> Launch Storage OpROM -> Enabled

Advand		Utility – Copyright (C)	2009 America Exit
Legacy OpROM Launch 82577 Launch 82574	Support PXE OpROM PXE OpROM	[Disabled] [Disabled] [Eachled]	
COM2 Type Se Backlight Cor	ntroller	[nacaz] [100%]	
 PCI Subsystem ACPI Settings CPU Configura Digital IO SATA Configura Intel VGA Set 	n Settings s ation ration tting		

Step 5: The setting procedures "In BIOS Setup Menu" C: Boot -> Boot Option #1 -> DVD-ROM Type

Aptio Setup Utilit	y – Copyright (C) 2009 American
Boot Configuration Quiet Boot Setup Prompt Timeout	[Disabled] 1
Bootup NumLock State	[0n]
CSM16 Module Verison	07.60
GateA20 Active Option ROM Messages	[Upon Request] [Force BIOS]
Boot Option #1	[SATA: PIONEER DV]
Boot Option #2 Boot Option #3 Boot Option #4	[IEAC FD-05PUB 3000] [UEFI: FAT File S] [SATA: FUJITSU MH]

Step 6: The setting procedures "In BIOS Setup Menu" D: Save & Exit -> Save Changes and Exit

Aptio Setup Ut: Main Admondel Chipsets Bo	lity – Copyri	ght (C) 2009 Save & Exit	American
Save Changes and Exit			
Discard Changes and Exit			
Save Changes and Reset			
Discard changes and Reset			
Save Ontions			
Save Changes			
Discard Changes			
Restore Defaults			
Save as User Defaults			
Restore User Defaults			
Boot Override			

Appendix C RAID & AHCI Settings C-4

Step 7: Press Ctrl-I to enter MAIN MENU

tel(F pyrig	l) Matrix Storage Jht(C) 2003-09 Int	Manager option el Corporation	n ROM v8.9.0 n. All Righ	1023 PCI ts Reserv	H-M ved.	
RA I D None	Volunes: defined.					
Phys Port 0 1 Press	ical Disks: Drive Model FUJITSU MH22080B ST9120823AS <u>(CTRL-12</u> to enter	Serial # K60FT972B7NN 5NJ0S2A0 Configuration	Utility	Size 74.5GB 111.7GB	Type/Status(Vo Non-RAID Disk Non-RAID Disk	1 ID

Step 8: Choose "1.Create RAID Volume"

Intel(R) Matrix Copyright(C) 200 I <mark>. Create RAID</mark> 2. Delete RAID	Storage Manager 13-89 Intel Corpo Main Volume 5. Exi	option ROM v8.9.0.1023 PCH-M ration, All Rights Reserved. ENU 1 3. Reset Disks to Non-RAID 4. Recovery Volume Options t
RAID Volunes: None defined. Physical Disks: Port Drive Model S 0 FUJITSU MHZ2000B K 1 ST9120023AS 5	—[DISK∕VOLUME [erial ■ GØFT972874N NJØSZAØ	NFORMATION J Size Type/Status(Vol ID) 74.508 Non-RAID Disk 111.708 Non-RAID Disk
[†+]-Select	(ESC)-Exit	[ENTER]-Select Menu

Appendix C RAID & AHCI Settings C-5

Step 9: RAID Level -> RAID0(Stripe)

Intel(R) Matrix St Copyright(C) 2003- I	orage Manager option ROM v8.9.8.1023 PCH-M 89 Intel Corporation. All Rights Reserved. —[CREATE VOLUME MENU]————————————————————————————————————
Na RAID Lev	ane: volumes vel: phila(Stripe)
Strip S Capac S	ize: 128KB ity: 149.1 GB ync: N/A Create Volume
	L HELP]
BAIL	Choose the RAID level: D 0: Stripes data (performance). D 1: Mirrors data (redundancu).
Recovery: Copies	s data between a master and a recovery disk.

Step 10: Choose "Create Volume"



Step 11: Choose "Y"

Into Cop	el(R) Hatrix Storage Manager option ROM v8.9.8.1823 PCH-H yright(C) 2003-09 Intel Corporation. All Rights Reserved. [CREATE VOLUME MENU] Name: Volume0 RAID Level: RAID0(Stripe) Disks: Select Disks
ſ	Strip Size: 128KB Capacity: 149.1 GB Sync: N/A HARNING: ALL DATA ON SELECTED DISKS HILL BE LOST.
	Are you sure you want to create this volume? (Y/N):

Step 12: Choose "5. Exit"

	Intel(R) Matrix Copyright(C) 26	: Storage Manage 103-09 Intel Cor	r option poration.	ROM v8.9.0.1023 PC All Rights Reser	H-M ved.
	1. Create RAII 2. Delete RAII) Volume) Volume 5. E	3. xit	Reset Disks to Non Recovery Volume Opt	-RAID tions
		E DISK/VOLUNE	INFURMAT	10N 3	
RAID ID 0	Volunes: Name VolumeØ	Level RAIDO(Stripe)	Strip 128KB	Size Status 149.1GB Normal	Bootable Yes
Phys Port 0 1	ical Disks: Drive Model FUJITSU MH22080B ST9120823AS	Serial # K60FT972B7WN 5NJ0SZA0		Size Type/Status 74.5GB Menber Disk 111.7GB Menber Disk	(Vol ID) (0) (0)

Step 13: Choose "Y"



Step 14: Setup OS



Step 15: Press "F6"



Step 16: Choose "S"



Step 17: Choose "Intel(R) Mobile Express Chipset SATA RAID Controller"

ndows Setup		10000000
You have chosen to configure a S(using a device support disk provi	SI Adapter for us ded by an adapter	e uith Hindous, nanufacturer.
Select the SCSI Adapter you want to return to the previous screen.	from the following	g list, or press ES
Intel(R) ICH7R/DH SATA RAID Contro Intel(R) ICH7MDH SATA RAID Contro	ller ller	COTO DOLD Controll
Intel(R) Mobile Express Chipset Sf	TA RAID Controller	RAID Controli
ENTER=Select F3=Exit		

Step 18: It will show the model number you select and then press "ENTER"



Appendix C RAID & AHCI Settings C-10

Step 19: Setup is starting Windows



C.2 Setting AHCI

OS installation to setup AHCI Mode

Step 1: Copy the files below from "*Driver CD -> Raid Driver -> F6 Floppy - x86*" to Disk



Step 2: Connect the USB Floppy (disk with AHCI files) to the board



Appendix C RAID & AHCI Settings C-12

Step 3: The setting procedures " In BIOS Setup Menu" A: Advanced -> SATA Configuration -> SATA Configuration -> SATA Mode -> AHCI Mode

Aptio Setup Utility - Advanced	Copyright (C) 2009 American
SATA Configuration	FUJITSU MHZ208 (80.0GB)
SATA Port2 SATA Port3	ST9120823AS (120.0GB) Not Present
SATA Mode	[AHCI Mode]
Supports Staggered Spin-up Port 1 Hot Plug Port 2 Hot Plug Port 3 Hot Plug	[Disable] [Disable] [Disable] [Disable]
External SATA Port 1 External SATA Port 2 External SATA Port 3	(Disable) [Disable] [Disable]

Step 4: The setting procedures "In BIOS Setup Menu" B: Boot -> Boot Option #1 -> DVD-ROM Type

Boot Configuration Quiet Boot Setup Prompt Timeout	[Disabled] 1
Bootup NumLock State	[0n]
CSM16 Module Verison	07.60
GateA20 Active Option ROM Messages	[Upon Request] [Force BIOS]
Boot Option Priorities	
Boot Option #1	[SATA: PIONEER DV]
Boot Option #3 Boot Option #4	[UEFI: FAT File S] [SATA: FUJITSU MH]

Appendix C RAID & AHCI Settings C-13

Step 5: The setting procedures "In BIOS Setup Menu" C: Save & Exit -> Save Changes and Exit

Aptio Setup Maine Anna Cell. Ch. poets	Utility -	Copyrig S	ht (C) ave & E	2009 xit	American
Save Changes and Exit					
Save Changes and Reset					
Discard Changes and Reset					
Save Options					
Save Changes					
Discard Changes					
Restore Defaults					
Save as User Defaults					
Restore User Defaults					
Boot Override					

Step 6: Setup OS



Appendix C RAID & AHCI Settings C-14

Step 7: Press "F6"



Step 8: Choose "S"



Step 9: Choose "Intel(R) 7 Series Chipset Family SATA AHCI Controller"

You have chosen to configure a SCSI Adapter for use with Hindows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.
Intel(R) Desktop/Horkstation/Server Express Chipset SATA AHCI Controller Intel(R) Mobile Express Chipset SATA AHCI Controller Intel(R) 2 Series/C216 Chipset Family SATA AHCI Controller Intel(R) 7 Series Chipset Family SATA AHCI Controller
ENTER=Select F3=Exit

Step 10: It will show the model number you select and then press "ENTER"

Alndows Setup
Setup will load support for the following mass storage device(s):
Intel(R) 7 Series Chipset Family SATA AHCI Controller
 To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S-Specify Hdditional Device ENTER=Continue F3=Exit

Appendix C RAID & AHCI Settings C-16



Step 11: Setup is loading files

