AEC-6821

Fanless Embedded Controller
AMD Geode LX800 Processor
Dual 10/100Base-TX Ethernet
4 COM/ Audio/ 4 USB

AEC-6821 Manual 1st Ed.
October 2009

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Packing List

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

- 1 AEC-6821 Embedded Controller
- 1 Keyboard & mouse cable
- 1 Phoenix Power Connector
- 2 Wallmount Brackets
- 2 RJ-45 to DB-9 Cables
- 1 Audio Cable
- 1 Screw Package
- 1 CD-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.

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.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 60°C (140°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

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚(PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外部信号连接器及线材	×	○	○	○	○	○
外壳	×	○	○	○	○	○
中央处理器与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
电源	×	○	○	○	○	○

O：表示该有毒有害物质在该部件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。

Contents

Chapter

1

General Information

1.1 Introduction

The AEC-6821 is an Embedded Control PC with PCMCIA slots that supports different interfaces. Multiple IO ports and Anti-vibration are the main design features of the AEC-6821. This allows the AEC-6821 to be installed in a rugged transportation environment despite high ambient vibration.

In addition to the fanless CPU, the AEC-6821 was use the AMD LX800 500MHz CPU, features one PCMCIA expansion slots for devices expansion. A DC power supply is commonly used in most vehicles and factory equipments. The AEC-6821 can powered by a DC 9~30V input with low power consumption and high performance. You can also choose an additional external AC power adapter for power redundancy purposes. AAEON provides flexible power choices for customers who choose the AEC-6821.

Transportation has become part of most people's life and forms a necessary part of their lifestyle. From cars to trains to ships and airplanes, we rely on those tools a lot. The AEC-6821 is designed to improve transportation control and enhance the quality of our lives.

1.2 Features

- Fanless Design with AMD Geode LX800 500MHz Processor
- 1 PCMCIA Slot for Expansion
- DC 9~30V Input with Phoenix Connector and Optional External AC power adapter
- CFD for B Version
- 2.5” Hard Disk Drive Kit
- Dual 10/100Base-TX Ethernet by RJ-45
- 4 COM / 4 USB / Audio
- Operating Temperature: -5˚C ~60˚C (23˚F~140˚F)
- Anti-vibration Up to 5 g rms / Anti-shock Up to 50g
- CE / FCC Class A Certified

1.3 Specifications

System

- CPU: AMD Geode LX800 500MHz
- Memory: DDR SDRAM SODIMM x 1, Max. 512MB; Installed 512MB.
- Expansion: PCMCIA x 1
- VGA: D-sub 15 VGA Connector
- Keyboard/Mouse: PS/2 Keyboard & Mouse
- Ethernet: 10/100Base-TX Ethernet RJ-45 connector x 2
- SSD: Type II CompactFlash™ slot (Only B version)
- Hard Disk Storage: 2.5” Slim HDD kit on the rear side
- Serial Port: RS-232 x 3 (2 ports by RJ-45) RS-232/422/485 x 1
- Audio: Mic-in / Line-in / Line-out, by an extension cable
- USB: USB 2.0 x 4
- Parallel Port: Parallel x 1
- Watchdog Timer: Generates a time-out system reset
- Power Supply: DC Input: 9V DC~30V DC
  AC Input: External Power Adapter

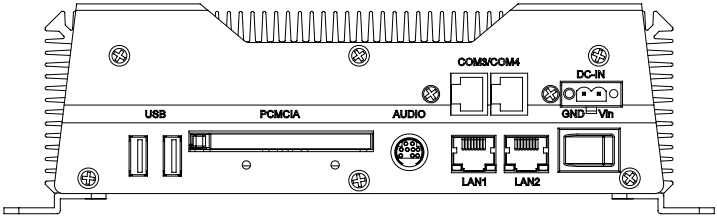
(Optional)

- System Control: Power on / off switch x 1;Reset button x 1
- Indicator: Power LED x 1
  HDD active LED x 1(IDE HDD use only)

Mechanical and Environmental

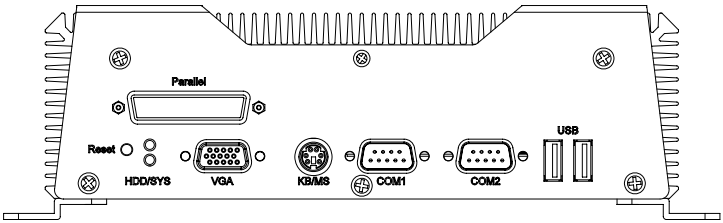
- Construction: Aluminum Alloy chassis
- Color: Dark Blue
- Mounting: Wallmount (Default), DIN-Rail
- Dimension: 8.35” (W) x 2.53” (H) x 4.21” (D) (212mm x 64.2mm x 107mm)
- Net Weight: 4.75lb (2.16kg)
- Gross Weight: 8.36lb (3.8kg)
- Operation Temperature:
  23°F ~ 140°F (-5°C~60°C)(CFD)
- Operation Humidity: 95% @ 40°C, non-condensing
- Vibration: 5g rms / 5~500Hz / random operation (CFD);
  1g / 5~500Hz / random operation (W/ HDD)
- Shock: 50g peak acceleration (11 msec. duration); CFD
- EMC: CE/FCC class A

Front Side

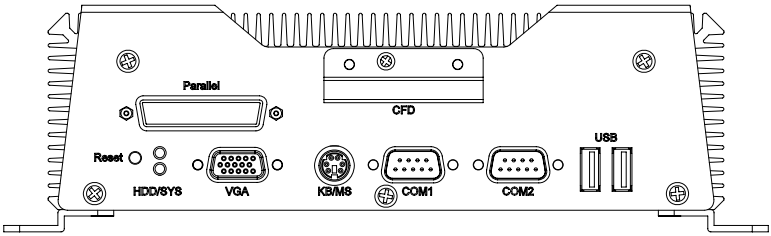


Rear Side

Rev. A



Rev. B

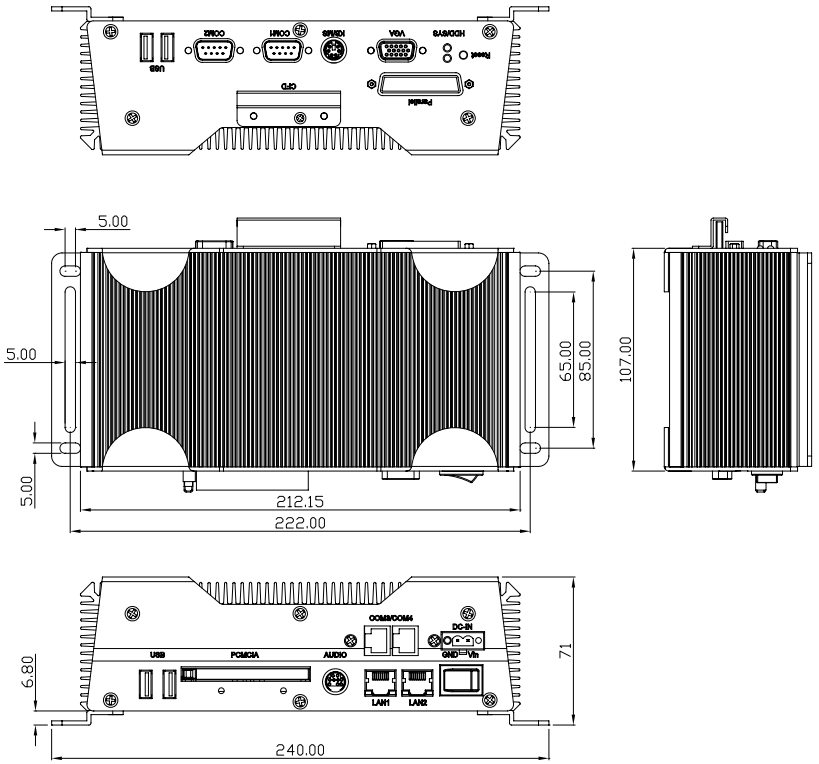


Chapter

2

Hardware Installation

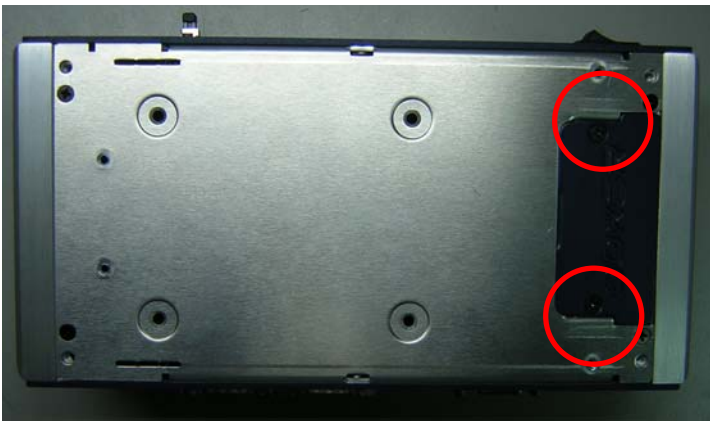
2.1 Dimension

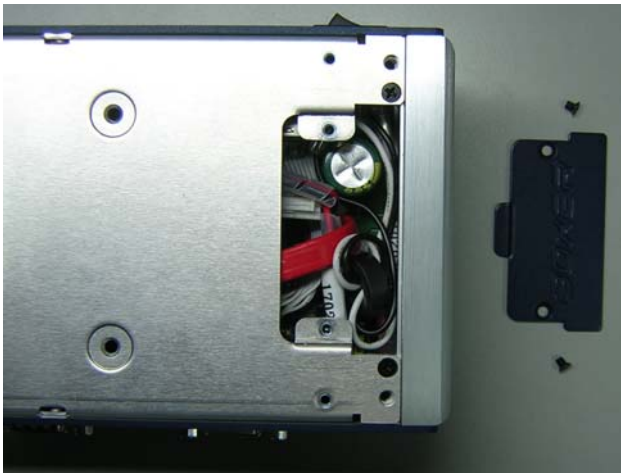


Units: mm

2.2 HDD Module Installation

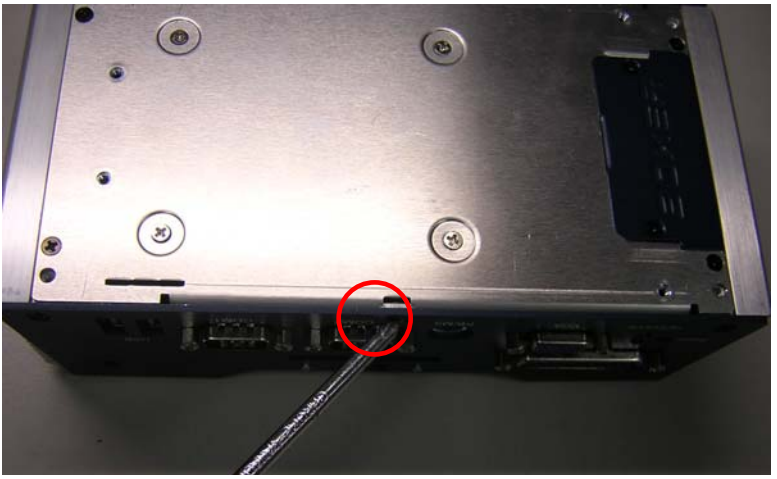
Step 1: Open the HDD cover by loosening the screws on the bottom of the chassis.





Step 2: Open the bottom cover of the AEC-6821 and loosening the four screws

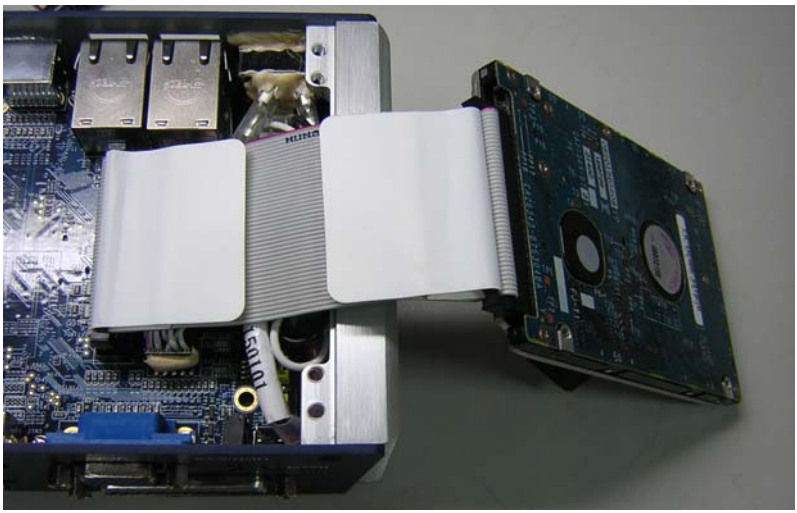
Step 3: Loosening the rear panel of AEC-6821



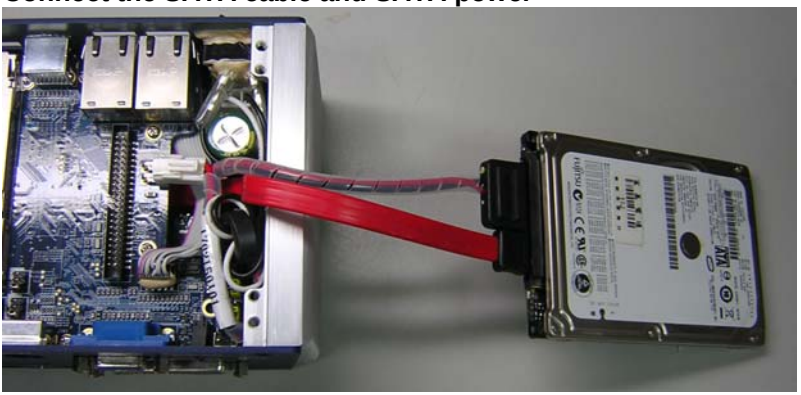
Step 4: Loosening the front panel of AEC-6821

Step 5: Connect IDE or SATA cable and SATA power

Connect the IDE cable



Connect the SATA cable and SATA power

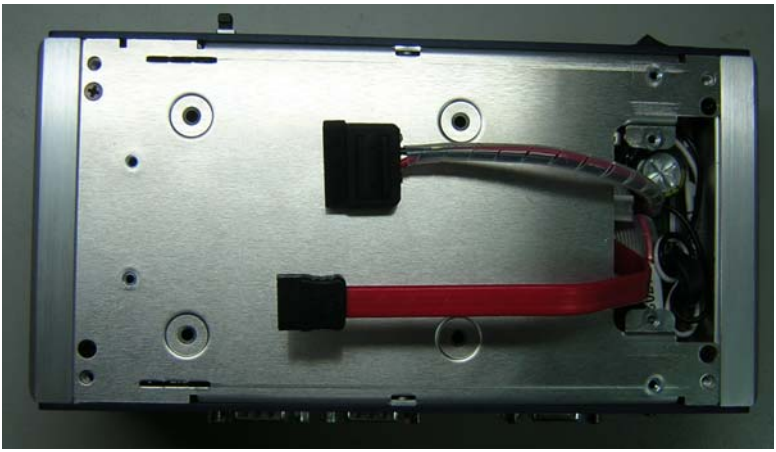


Step 6: Insert the Cable to the bottom of the chassis as the illustration below.

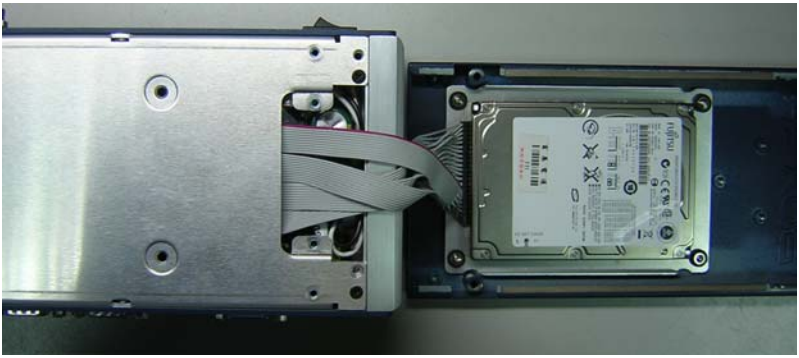
Note:
When installing the SATA HDD, the HDD LED will not active.

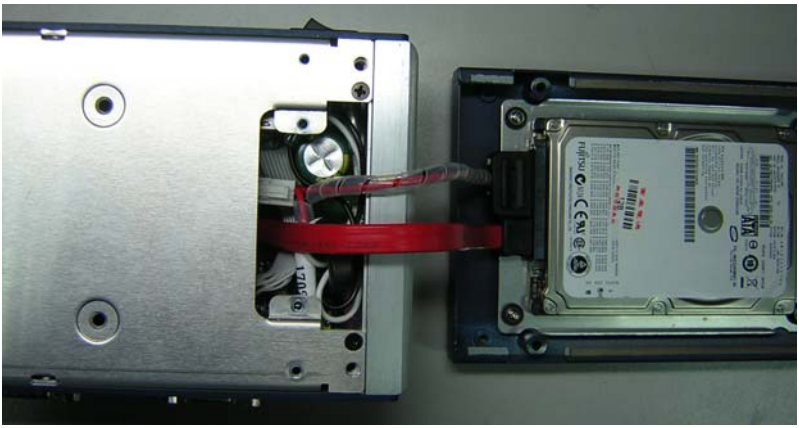
IDE Cable

SATA and Power Cables



Step 7: Connect the IDE/ SATA and power cables to the Hard Disk Drive kit

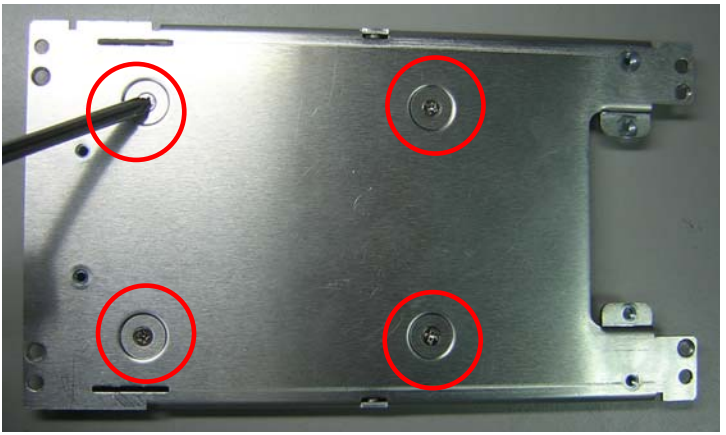




2.3 Built-in HDD Module Installation

Step 1: Get the built-in HDD kit ready

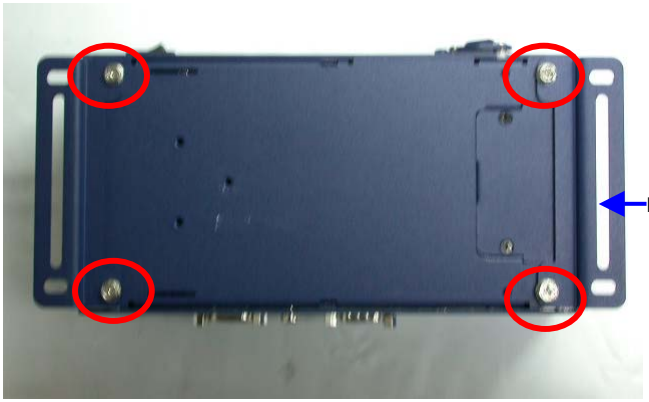
Step 2: Fasten the four screws with the bottom cover of AEC-6821



Step 3: Connect the IDE cable of AEC-6821 to the HDD kit

2.4 Wallmount Installation

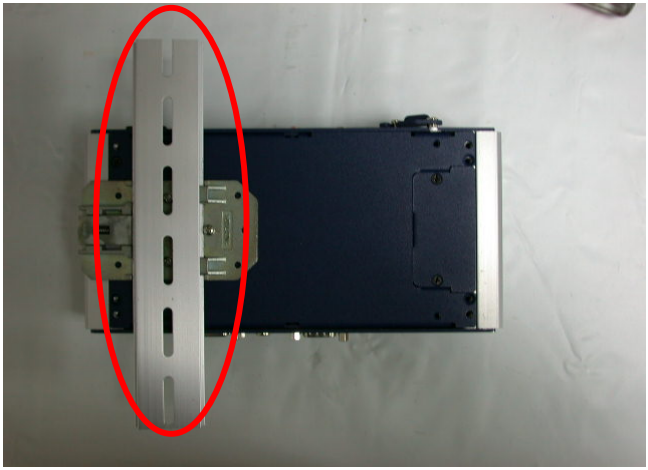
Fasten the brackets by screws.



2.5 DIN Rail Installation

Step 1: Fix the DIN Rail kit with the screws on the chassis as the illustration shown.

Step 2: Press the DIN Rail on the DIN Rail kit to fix it.



Chapter

3

Award 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. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

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

The AEC-6821 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 Award BIOS Setup

Awards 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 so that it retains the Setup information when the power is turned off.

Entering Setup

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

Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu allows you to set the shutdown temperature for your system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the "AAEON BIOS Item Description.pdf" file in the CD for the meaning of each setting in this chapter.

Chapter

4

Driver Installation

4.1 Software Drivers

This chapter describes the operation and installation of the display drivers supplied on the Supporting CD-ROM that are shipped with your product. The onboard VGA adapter is based on the AMD LX VGA Flat Panel/CRT controller. This controller offers a large set of extended functions and higher resolutions. The purpose of the enclosed software drivers is to take advantage of the extended features of the AMD LX VGA Flat Panel/CRT controller.

Hardware Configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.

2. If a high-resolution mode does not support your system, try to use a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode supports the most.

4.2 Necessary to Know

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-RO*M, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

  If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information before you proceed with the installation.

Before you begin

The Supporting CD-ROM contains different drivers for corresponding Windows OS, please choose the specific driver for your Windows OS.

4.3 Installing VGA Driver

Win XP / Win XPe VGA

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Video Controller (VGA Compatible)**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select "l**x_win"** file from CD-ROM **(Drivers/Step 1 – LX_Graphics)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Yes**
16. Click on **Finish**
17. Re-start the computer

Note: You have to install this VGA driver before installing other drivers. Moreover, when finish installing this VGA driver, you have to re-start the computer first, and then installing other drivers.

4.4 Installing AES Driver

Win XP / Win XPe AES

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Entertainment Encryption/Decryption Controller**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select **"LXAES"** file from CD-ROM **(Driver/Step 2 – AES)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Finish**

4.5 Installing PCI to ISA Bridge Driver

Win XP / Win XPe System

Place the Driver CD-ROM into your CD-ROM drive and follow the following steps to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Other PCI Bridge Device**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**
11. Click on **Browse**
12. Select "**Ite**" file from CD-ROM **(Driver/Step 3- PCI to ISA Bridge)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Finish**

4.6 Installing Ethernet Driver

1. Click on the ***Step 4 –lan*** folder
2. Double click on the ***Setup*** file located in the folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

4.7 Ethernet Software Configuration

The onboard Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the Insyde BIOS Setup. To configure the medium type, to view the current configuration, or to run diagnostics, please refer to the following instruction:

1. Power the main board on. Ensure that the RSET8139.EXE file is located in the working drive.
2. At the prompt, type RSET8139.EXE and press <ENTER>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and DOWN keys. To change a selected item, press <ENTER>, and a screen will appear with the available options. Highlight your option and press <ENTER>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.

4. After you have made your selections and the configuration is what you want, press <ESC>. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

There are three very useful diagnostic functions offered in the Ethernet Setup Menu as follows:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen, which shows the format and result of any diagnostic tests undertaken.

4.8 Installing LAN 82551er Driver

Win XP / Win XPe System

Place the Driver CD-ROM into your CD-ROM drive and follow the following steps to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager**...
6. Click on "**+**" of Network adapters
7. Double click on **Intel(R) 8255xER PCI Adapter**
8. Click on **Update Driver**...

9. Click on **Next**
10. Select **Search for a suitable driver...,** then click on **Next**
11. Select **Specify a location**, then click on **Next**
12. Click on **Browse**
13. Select **"Net559ER.inf"** file from CD-ROM (**Driver/Step 5- Intel LAN 82551er Driver)** and then click on **Open**
14. Click on **OK**
15. Click on **Next**
16. Click on **Finish**

4.9 Installing Audio Driver

Win XP / Win XPe Audio

Place the Driver CD-ROM into your CD-ROM drive and follow the steps below to install.

1. Click on **Start** button
2. Click on **Settings** button
3. Click on **Control Panel** button
4. Click on **System** button
5. Select **Hardware** and click on **Device Manager…**
6. Double click on **Multimedia Audio Controller**
7. Click on **Update Driver…**
8. Click on **Next**
9. Select **Search for a suitable driver…**, then click on **Next**
10. Select **Specify a location**, then click on **Next**

11. Click on **Browse**
12. Select **"LXWDMAu"** file from CD-ROM **(Drivers/Step 6 – Audio)** then click on **Open**
13. Click on **OK**
14. Click on **Next**
15. Click on **Yes**
16. Click on **Finish**

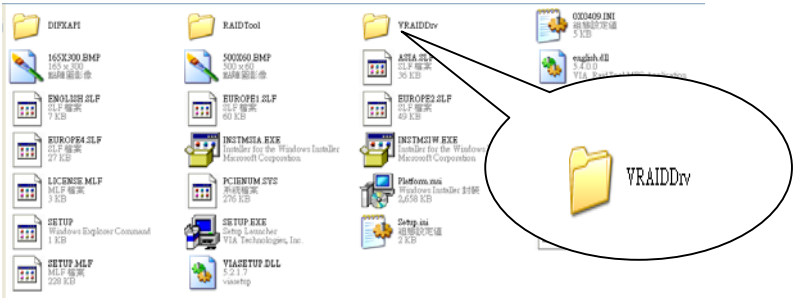
4.10 Installing RAID Driver (For AEC-6821 Rev.A only)

Application Note:

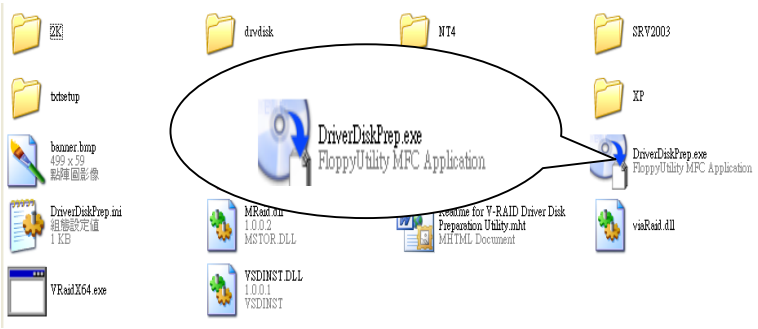
Window Operating System cannot recognize the driver of chip VT6421 and treat it as a third-part driver. Please follow below steps to install the driver with Operating System.

1. Creating a Drive Disk: copy the SATA driver from AAEON CD to floppy disk before install OS.

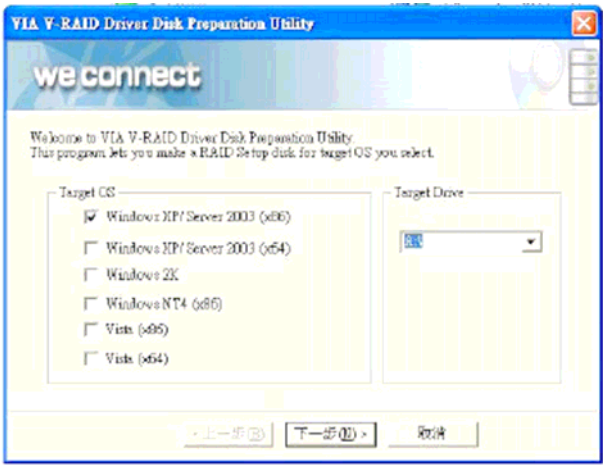
   - Click on ***Step 7-VIA_RAID_V580C***
   - Click on ***VRAIDDrv*** (see below picture)



- Click on ***DriverDiskPrep.exe*** (see below picture)

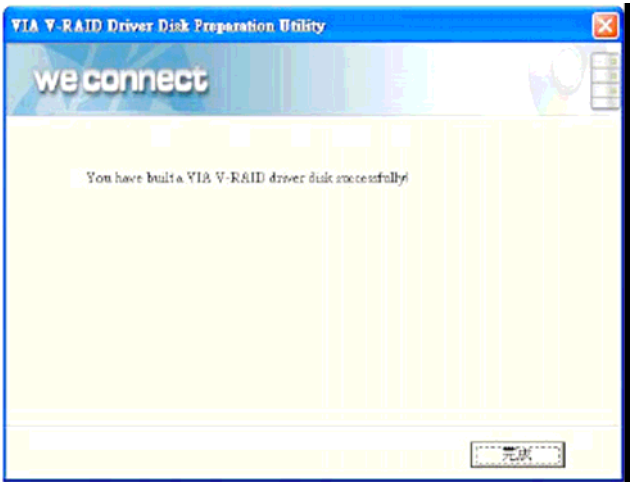


- Click on the OS what you are going to install.



- Install Floppy or USB Floppy

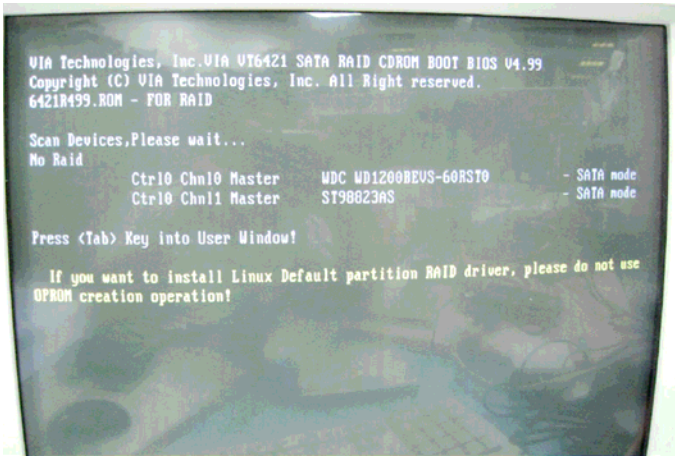
- Finish: driver disk ready.



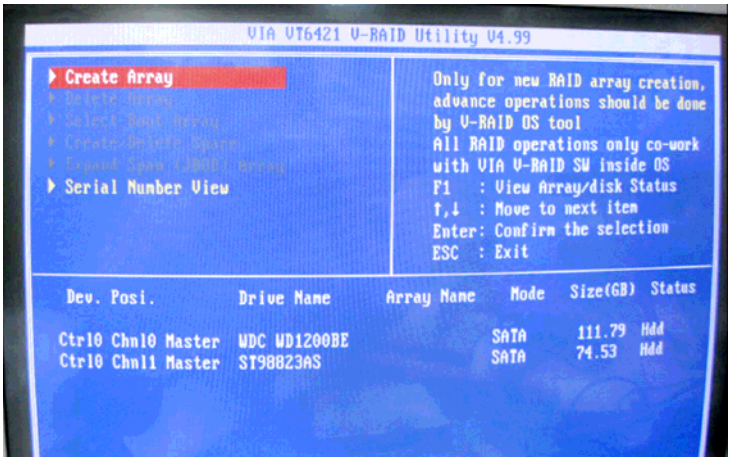
2. Following are the raid configuration steps.

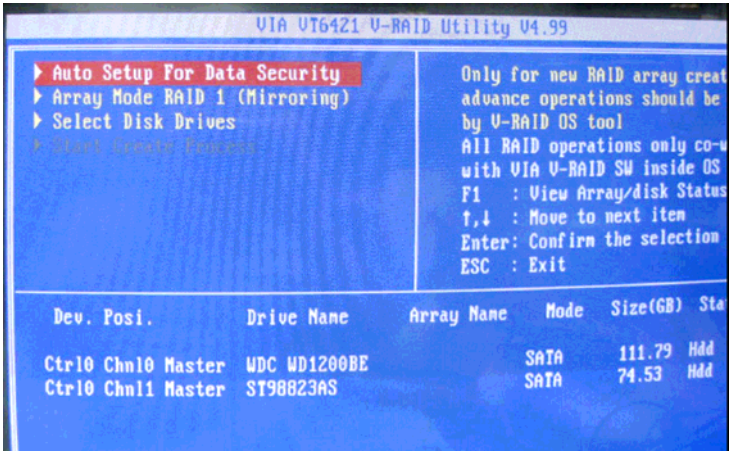
   A. Press <Tab> key to enter Raid BIOS setup

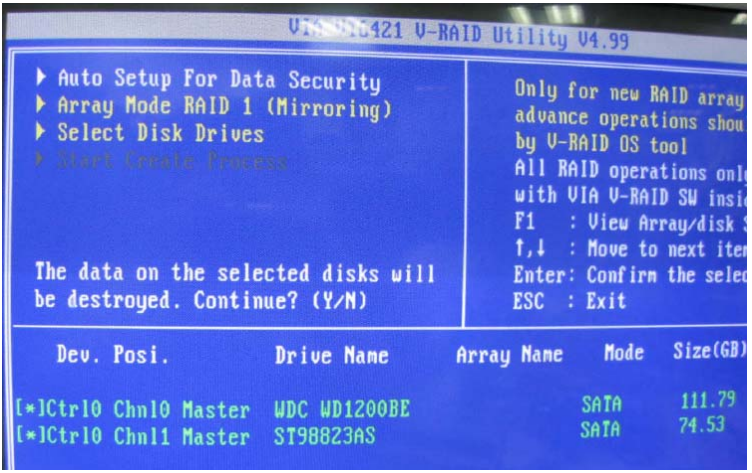
   (Raid BIOS only enable when SATA HDD connected)



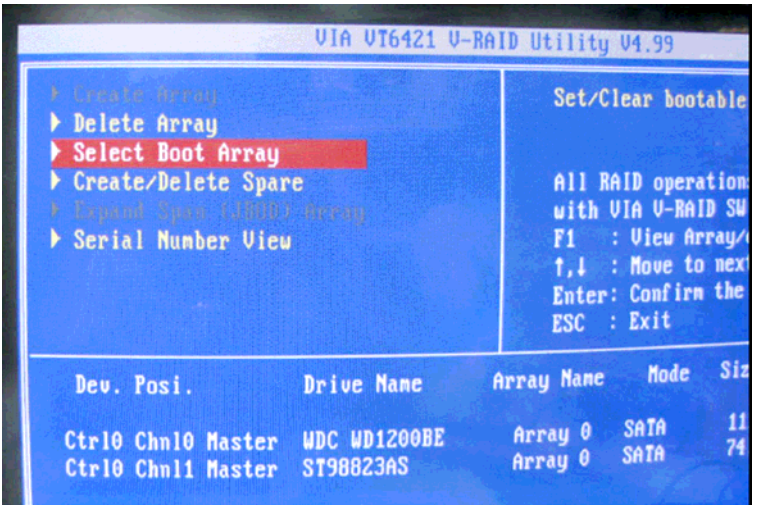
B. Create Array

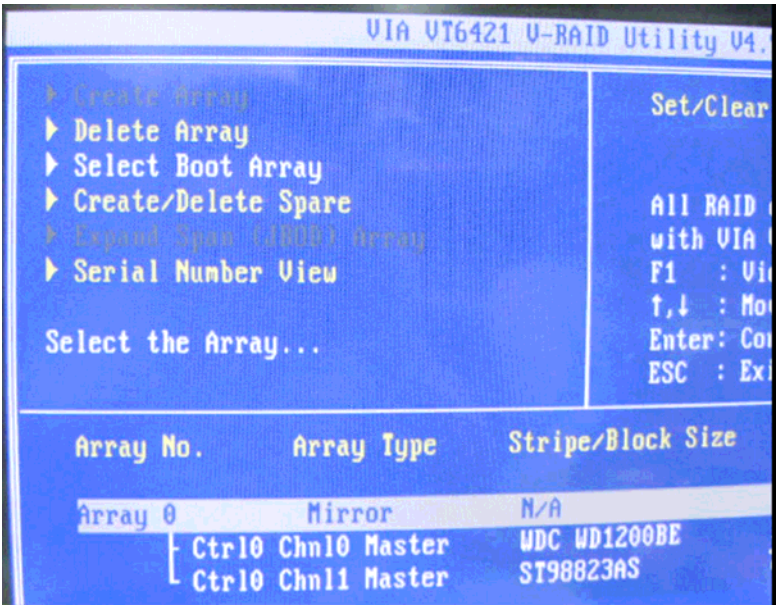




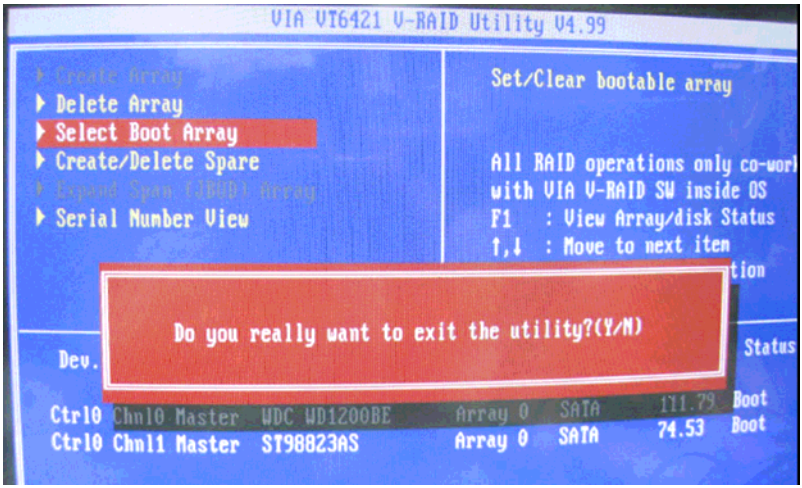


C. After Raid has been created, set this array bootable.

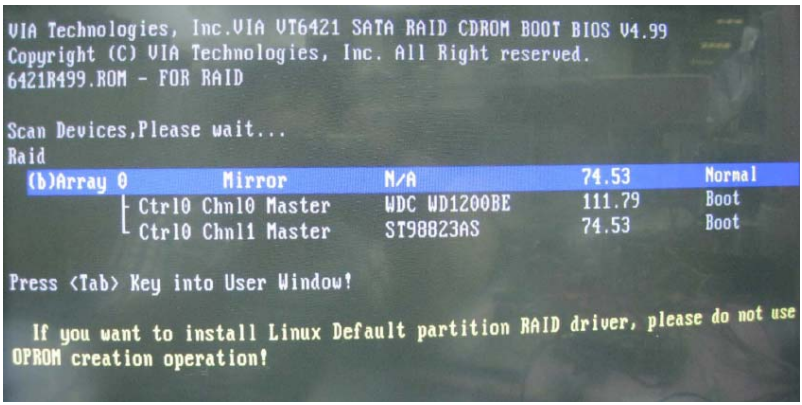



VIA VT6421 V-RAID Utility V4.
Create Array
Delete Array
Select Boot Array
Create/Delete Spare
Expand Span (JBOD) Array
Serial Number View
Select the Array...
Set/Clear
All RAID
with VIA
F1 : Vi
↑,↓ : Mo
Enter: Co
ESC : Ex
Array No.
Array Type
Stripe/Block Size
Array 0
Mirror
N/A
Ctrl0 Chnl0 Master
WDC WD1200BE
Ctrl0 Chnl1 Master
ST98823AS


VIA VT6421 V-RAID Utility V4.99
Create Array
Delete Array
Select Boot Array
Create/Delete Spare
Expand Span (JBOD) Array
Serial Number View
Set Boot OK!
Set/Clear bootable ar
All RAID operations o
with VIA V-RAID SW in
F1 : View Array/dis
↑,↓ : Move to next i
Enter: Confirm the se
ESC : Exit
Array No.
Array Type
Stripe/Block Size
Cap.(GB)
(b)Array 0
Mirror
N/A
74.53
Ctrl0 Chnl0 Master
WDC WD1200BE
111.79
Ctrl0 Chnl1 Master
ST98823AS
74.53

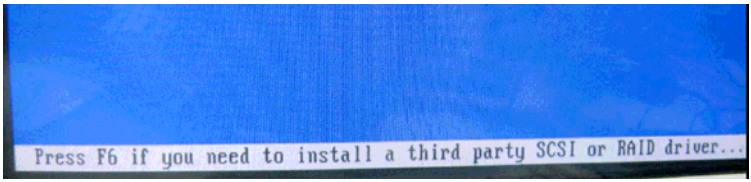


D. Now the Raid Array is ready for OS installation



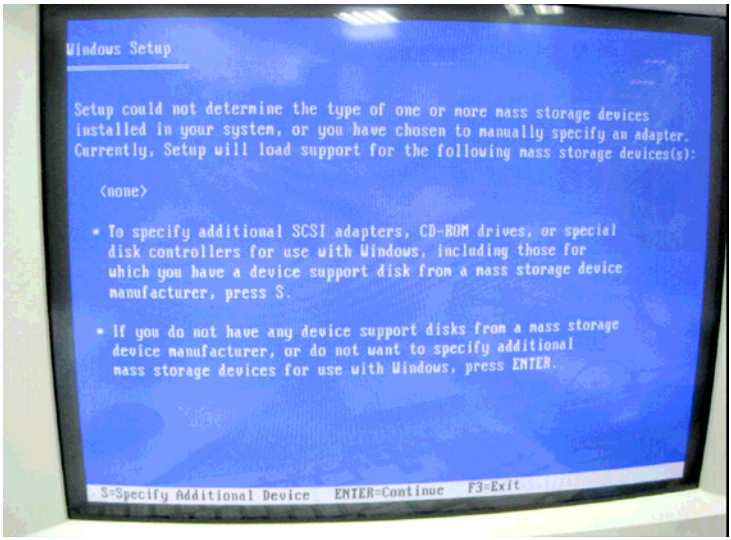
3. Insert your Windows CD, and then restart the computer
4. Follow the on-screen instructions to begin the Windows installation.
5. When prompted to install a third-party driver, press **F6**.

Note: When F6 is active, a prompt appears at the bottom of the screen for only 5 seconds. If you miss your chance to press F6, restart your computer.

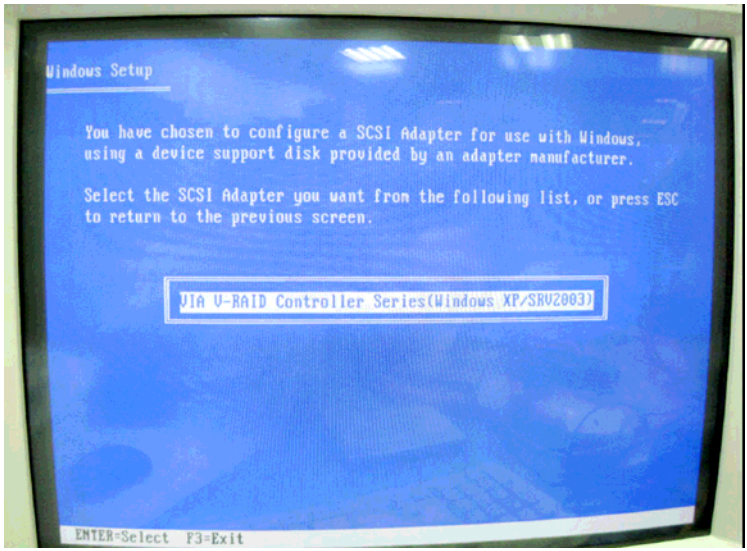


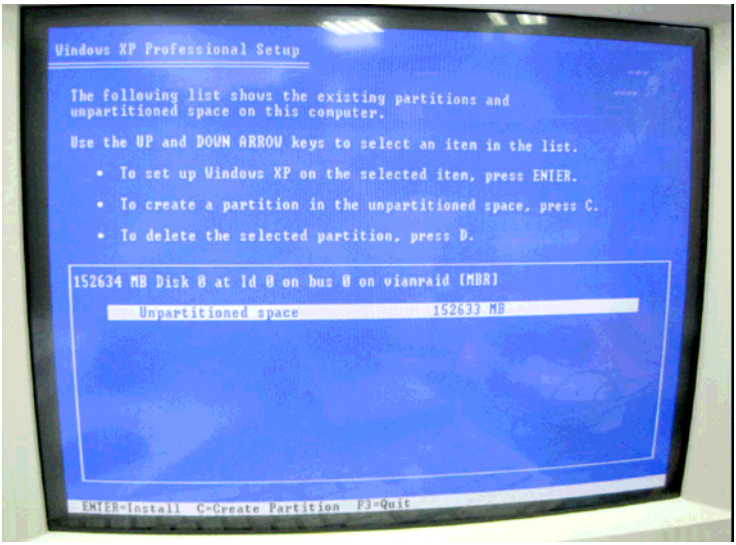
6. Insert the driver disk, and then wait until you are prompted to install a driver.

7. Press **S** to specify the driver is on a floppy disk, and then press **Enter**.



8. The computer reads the disk
9. When the SATA driver is found, press **Enter**.



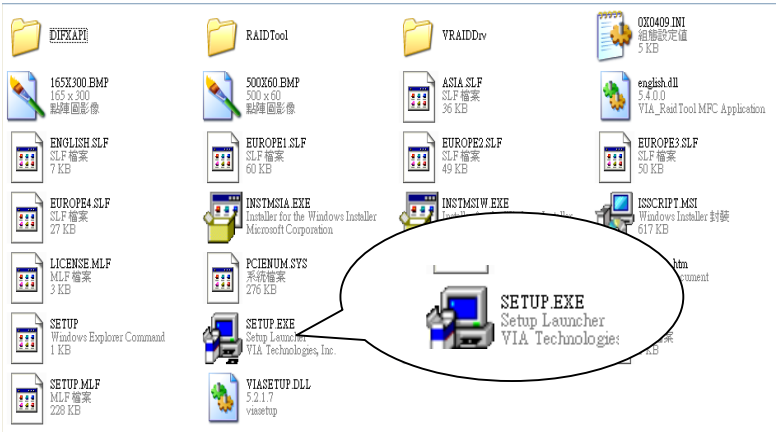


10. Follow the on-screen instructions to complete the installation.

After finish installing OS, you have to install VIA Raid management Utility.

Setup RAID Management

A. Click on ***Step 7-VIA_RAID_V580C***
B. Click on ***SETUP.exe*** (see below picture)
C. Follow the instructions that the window shows
D. The system will help you install the driver automatically


DIFXAPI
RAIDTool
VRAIDDrv
0X0409.INI
組態設定值
5 KB
165X300.BMP
165 x 300
點陣圖影像
500X60.BMP
500 x 60
點陣圖影像
ASIA.SLF
SLF 檔案
36 KB
english.dll
5.4.0.0
VIA_RaidTool MFC Application
ENGLISH.SLF
SLF 檔案
7 KB
EUROPE1.SLF
SLF 檔案
60 KB
EUROPE2.SLF
SLF 檔案
49 KB
EUROPE3.SLF
SLF 檔案
50 KB
EUROPE4.SLF
SLF 檔案
27 KB
INSTMSIA.EXE
Installer for the Windows Installer
Microsoft Corporation
INSTMSIW.EXE
ISSCRIPT.MSI
Windows Installer 封裝
617 KB
LICENSE.MLF
MLF 檔案
3 KB
PCIENUM.SYS
系統檔案
276 KB
SETUP
Windows Explorer Command
1 KB
SETUP.EXE
Setup Launcher
VIA Technologies, Inc.
SETUP.MLF
MLF 檔案
228 KB
VIASETUP.DLL
5.2.1.7
viasetup
SETUP.EXE
Setup Launcher
VIA Technologies

Appendix

A

Programming the Watchdog Timer

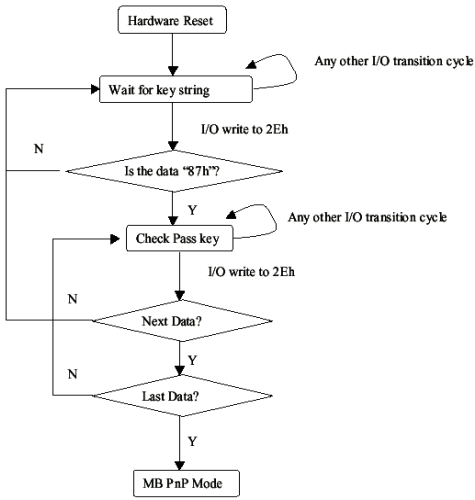
A.1 Programming for AEC-6821 Rev.A

AEC-6821 Rev.A utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON intial 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 8712 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.



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 opera-tions 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	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

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	Description
7	WDT is reset upon a CIR interrupt
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 ITE8712 Watchdog Timer Initial Program

```
        .MODEL SMALL
        .CODE
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
```

```
        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

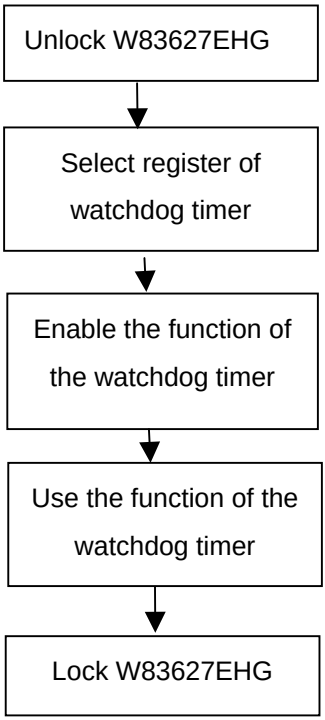
00h: no interrupt selected

A.1 Programming for AEC-6821 Rev.B

AEC-6821 Rev.B utilizes W83627EHG chipset as its watchdog timer controller.

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

Configuring Sequence Description



There are three steps to complete the configuration setup:

(1) Enter the W83627EHG config Mode

(2) Modify the data of configuration registers

(3) Exit the W83627EHG config Mode. Undesired result may occur if the config Mode is not exited normally.

(1) Enter the W83627EHG config Mode

To enter the W83627EHG config Mode, two 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 two write operations to the Special Address port (2EH). The different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

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

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the config 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 W83627EHG config Mode

The exit key is provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
0aah:	2Eh	2Fh

WatchDog Timer Register I (Index=F5h, Default=00h)

CRF5 (PLED mode register. Default 0 x 00)

Bit 7-6 : select PLED mode

= 00 Power LED pin is tri-stated.

= 01 Power LED pin is drived low.

= 10 Power LED pin is a 1Hz toggle pulse with 50 duty cycle.

= 11 Power LED pin is a 1/4Hz toggle pulse with 50 duty cycle.

Bit 5-4 : Reserved

Bit 3 : select WDTO count mode.

= 0 second

= 1 minute

Bit 2 : Enable the rising edge of keyboard Reset (P20) to force Time-out event.

= 0 Disable

= 1 Enable

Bit 1-0 : Reserved

WatchDog Timer Register II (Index=F6h, Default=00h)

Bit 7-0 = 0 x 00 Time-out Disable

= 0 x 01 Time-out occurs after 1 second/minute

= 0 x 02 Time-out occurs after 2 second/minutes

= 0 x 03 Time-out occurs after 3 second/minutes

……..

= 0 x FF Time-out occurs after 255 second/minutes

WatchDog Timer Register III (Index=F7h, Default=00h)

Bit 7 : Mouse interrupt reset Enable or Disable

= 1 Watchdog Timer is reset upon a Mouse interrupt

= 0 Watchdog Timer is not affected by Mouse interrupt

Bit 6 : Keyboard interrupt reset Enable or Disable

= 1 Watchdog Timer is reset upon a Keyboard interrupt

= 0 Watchdog Timer is not affected by Keyboard interrupt

Bit 5 : Force Watchdog Timer Time-out. Write Only

= 1 Force Watchdog Timer time-out event: this bit is self-clearing

Bit 4 : Watchdog Timer Status. R/W

= 1 Watchdog Timer time-out occurred

= 0 Watchdog Timer counting

Bit 3-0 : These bits select IRQ resource for Watchdog. Setting of 2 selects SMI.

A.4 W83627EHG Watchdog Timer Initial Program

Example: Setting 10 sec. as Watchdog timeout interval

```
;////////////////////////////////////////////////////////////////////////////////
Mov dx,2eh              ;Enter W83627EHG config mode
Mov al,87h              (out 87h to 2eh twice)
Out dx,al
Out dx,al
;////////////////////////////////////////////////////////////////////////////////
Mov al,07h
Out dx,al
Inc dx
Mov al,08h              ;Select Logical Device 8 (GPIO Port
2)
Out dx,al
;////////////////////////////////////////////////////////////////////////////////
Dec dx
Mov al,30h              ;CR30 (GP20~GP27)
Out dx,al
Inc dx
Mov al,01h              ;Activate GPIO2
Out dx,al
```

```
;////////////////////////////////////////////////////////////////////////////////////////
Dec dx
Mov al,0f5h             ;CRF5 (PLED mode register)
Out dx,al
Inc dx
In al,dx
And al,not 08h          ;Set second as counting unit
Out dx,al
;////////////////////////////////////////////////////////////////////////////////////////
Dec dx
Mov al,0f6h             ; CRF6
Out dx,al
Inc dx
Mov al,10               ;Set timeout interval as 10 sec.
Out dx,al
;////////////////////////////////////////////////////////////////////////////////////////
Dec dx                  ;Exit W83627EHG config mode
Mov al,0aah                     (out 0aah to 2eh once)
Out dx,al
;////////////////////////////////////////////////////////////////////////////////////////
```

Appendix

B

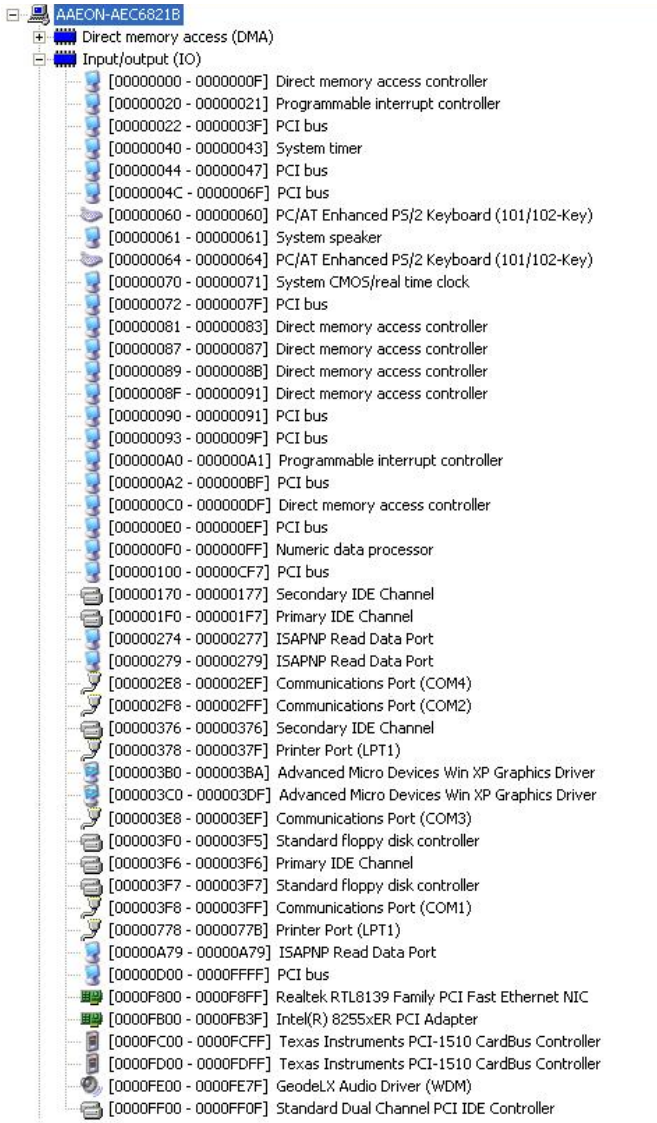
I/O Information

B.1 I/O Address Map

AEC-6821 Rev.A

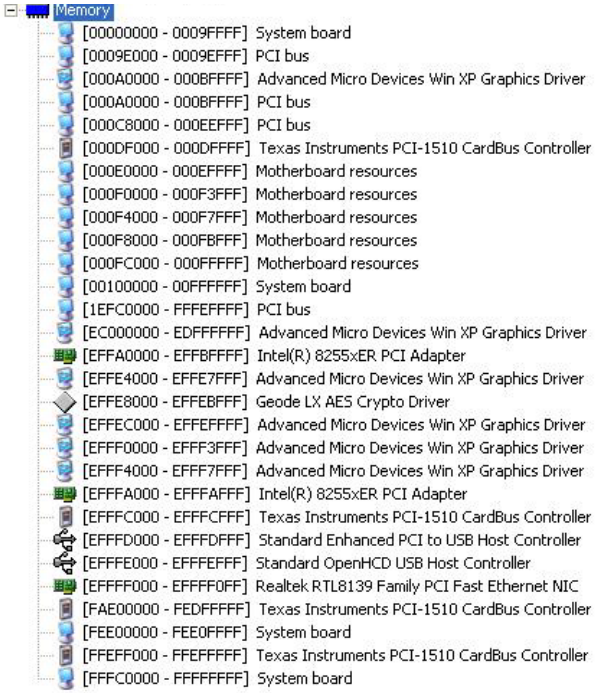
- AAEON-AEC6821
  - Direct memory access (DMA)
  - Input/output (IO)
    - [00000000 - 0000000F] Direct memory access controller
    - [00000020 - 00000021] Programmable interrupt controller
    - [00000022 - 0000003F] PCI bus
    - [00000040 - 00000043] System timer
    - [00000044 - 00000047] PCI bus
    - [0000004C - 0000006F] PCI bus
    - [00000060 - 00000060] PC/AT Enhanced PS/2 Keyboard (101/102-Key)
    - [00000061 - 00000061] System speaker
    - [00000064 - 00000064] PC/AT Enhanced PS/2 Keyboard (101/102-Key)
    - [00000070 - 00000071] System CMOS/real time clock
    - [00000072 - 0000007F] PCI bus
    - [00000081 - 00000083] Direct memory access controller
    - [00000087 - 00000087] Direct memory access controller
    - [00000089 - 0000008B] Direct memory access controller
    - [0000008F - 00000091] Direct memory access controller
    - [00000090 - 00000091] PCI bus
    - [00000093 - 0000009F] PCI bus
    - [000000A0 - 000000A1] Programmable interrupt controller
    - [000000A2 - 000000BF] PCI bus
    - [000000C0 - 000000DF] Direct memory access controller
    - [000000E0 - 000000EF] PCI bus
    - [000000F0 - 000000FF] Numeric data processor
    - [00000100 - 00000CF7] PCI bus
    - [00000170 - 00000177] Secondary IDE Channel
    - [000001F0 - 000001F7] Primary IDE Channel
    - [00000274 - 00000277] ISAPNP Read Data Port
    - [00000279 - 00000279] ISAPNP Read Data Port
    - [000002E8 - 000002EF] Communications Port (COM4)
    - [000002F8 - 000002FF] Communications Port (COM2)
    - [00000376 - 00000376] Secondary IDE Channel
    - [00000378 - 0000037F] Printer Port (LPT1)
    - [000003B0 - 000003BA] Advanced Micro Devices Win XP Graphics Driver
    - [000003C0 - 000003DF] Advanced Micro Devices Win XP Graphics Driver
    - [000003E8 - 000003EF] Communications Port (COM3)
    - [000003F0 - 000003F5] Standard floppy disk controller
    - [000003F6 - 000003F6] Primary IDE Channel
    - [000003F7 - 000003F7] Standard floppy disk controller
    - [000003F8 - 000003FF] Communications Port (COM1)
    - [00000778 - 0000077F] Printer Port (LPT1)
    - [00000A79 - 00000A79] ISAPNP Read Data Port
    - [00000D00 - 0000FFFF] PCI bus
    - [0000F200 - 0000F2FF] Realtek RTL8139 Family PCI Fast Ethernet NIC
    - [0000F400 - 0000F4FF] VIA VT6421 RAID Controller
    - [0000F600 - 0000F63F] Intel(R) 8255xER PCI Adapter
    - [0000F700 - 0000F7FF] Texas Instruments PCI-1510 CardBus Controller
    - [0000F800 - 0000F8FF] Texas Instruments PCI-1510 CardBus Controller
    - [0000F900 - 0000F97F] GeodeLX Audio Driver (WDM)
    - [0000FA00 - 0000FA0F] Standard Dual Channel PCI IDE Controller
    - [0000FB00 - 0000FB1F] VIA VT6421 RAID Controller
    - [0000FC00 - 0000FC0F] VIA VT6421 RAID Controller
    - [0000FD00 - 0000FD0F] VIA VT6421 RAID Controller

AEC-6821 Rev.B

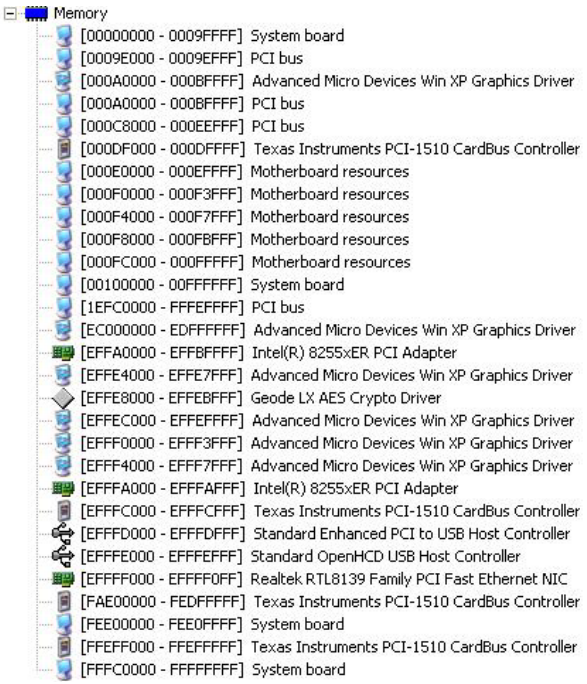


B.2 1st MB Memory Address Map

AEC-6821 Rev.A

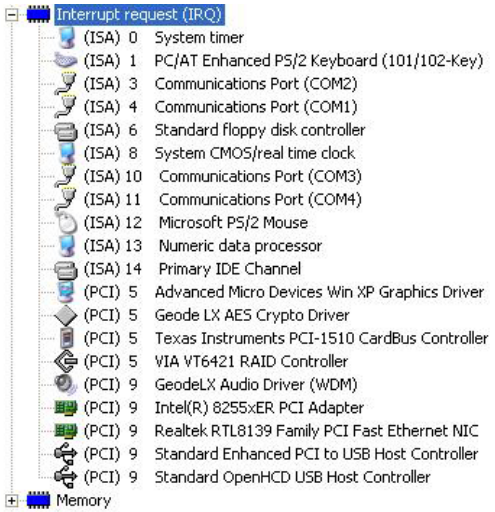


AEC-6821 Rev.B



B.3 IRQ Mapping Chart

AEC-6821 Rev.A



AEC-6821 Rev.B

B.4 DMA Channel Assignments

AEC-6821 Rev.A

AEC-6821 Rev.B