

Full-size CPU Card

FSB-860B

FSB-860B

Intel® Pentium® 4 &
Celeron® Processors
Full-size CPU Card
With DDR, Ethernet,
CompactFlash™

FSB-860B Manual 1st Ed.
Dec. 2004

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Packing List

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

- 1 FSB-860B CPU Card
- 1 Floppy Cable
- 1 ATA-100 Cable
- 1 USB Cable
- 1 KB Cable
- 1 Serial + Parallel Cable
- 1 Serial Cable
- 1 ATX Cable
- 1 Quick Installation Guide
- 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.

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Chapter

1

**General
Information**

1.1 Introduction

Introducing AAEON' s new FSB-860B, powered by Intel[®] Pentium[®] 4 processor, full-size form factor single board computer (SBC) with an onboard CompactFlash Type II and five USB 2.0 ports.

FSB-860B successfully deployed Intel[®] most advanced 82845GV chipset, which supports high CPU frequency up to 3.06GHz Prescott with front side bus running at 400MHz/533MHz.

FSB-860B supports Intel[®] Hyper-Threading Technology gives you the best overall Pentium[®] 4 processor performance available.

FSB-860B also provides high memory capacity up to 2GB DDR DRAM (DDR266/333).

In addition to its powerful computing engine, the full functional design of the board includes features such as chipset integrated 2D/3D graphics engine with AGP 4x bandwidth, built-in USB2.0 and on board CompactFlash Type II socket. FSB-860B delivers super graphic performance without additional cost on integrated Intel[®] Extreme Graphics architecture to maximize VGA performance capability.

Five USB 2.0 ports provide an expandable, Plug and Play serial interface that ensures a standard low-cost connection for peripheral

devices. Industrial applications will benefit from the five USB 2.0 by two pin-headers, offering 480 Mbps high-speed efficiency and value without compromising performance.

Moreover, FSB-860B is also equipped with Dual Intel® Ethernet controllers. One of these provides superior 1Giga Mbps networking access ability for high speed networking applications such as gateway, VPN and Mini server. FSB-860B is a versatile Pentium®4 level compact board with the best cost-performance for CTI, networking and mini-server markets.

1.2 Feature

- Supports Intel® Pentium® 4 CPU up to 3.06GHz (Prescott CPU supports)
- Integrated AC-97 Codec Audio (Daughter Board optional)
- Support Ultra ATA100 & CompactFlash™ Type II Storage
- Supports 5 USB 2.0 Ports
- Supports RS-232 x 1, RS-232/422/485 x 1
- Supports 1 parallel port
- Supports 1 IrDA port
- Integrated AGP 4X 2D/3D Graphics Accelerator, VGA output support
- Supports DDR333 Memory up to 2GB
- Watchdog Function 1~255 sec.
- Supports Dual 10/100Base-TX Ethernet (one 10/100/1000Base-T optional)
- ISA High-driver supports up to 20 slot 64mA fan-out

1.3 Specification

System

- CPU: Support Intel[®] Pentium[®] and Celeron[®] Processors up to 3.06 GHz (400/533MHz FSB)
- Chipset: Intel[®] 845GV + Intel[®] 82801DB (ICH4)
- I/O Chipset: ITE-8712. Fully 16-bit I/O decoded
- Ethernet: 10/100Mb or 10/100/1000Mb LAN optional, RJ-45 x 2, Intel[®] 82562ET/ 82551QM / 82541GI controller
- System Memory: 184 pins 2.5V DDR DIMM Socket x 2, total up to 2GB Support DDR333 memory (DDR266/333)
- BIOS: Award Plug & Play Firmware Hub BIOS – 4Mb ROM
- Watchdog Timer: 1~255 sec., 64 level and can be set with software on Super I/O

- **SSD:** Type II CompactFlash™ slot
- **Expansion Interface:** PICMG
- **VGA Controller:** Integrated on Intel® 845GV, AGP, Core frequency up to 266Mhz
- **Audio Daughter board:** Realtek ALC655 AC97 Codec, MIC-in/ Line-in/ Line-out/CD-in (Optional)
- **IDE Interface:** ATA-100 x 2 channels (Supports two ATAPI devices)
- **Floppy Drive Interface:** One standard FDD port, supports up to two floppy devices
- **Serial Port:** Two COM ports: (Internal Pin Header, External D-sub x 2)
COM 1: RS-232
COM 2: RS-232/422/485
- **Parallel Port:** Support SPP/EPP/ECP mode
- **K/B & Mouse:** One Mini-DIM PS/2 KB & Mouse Connector
One internal keyboard pin header

- Universal Serial Bus: USB 2.0 Port x 5
5 x 2 pin header for internal x 2; Type-A connector onboard x 1
- IR Interface: Support IrDA header x 1
- RTC: Internal RTC

Display

- Chipset: Intel[®] 82845GV
- Display Memory: Share up to 8MB with Dynamic Video Memory Technology
- Display Type: Supports non-interlaced CRT
- Resolution: Up to 1600 x 1200 @ 16.7M colors

Mechanical and Environment

- Dimension: 13.3"(L) x 4.8"(W)
- Weight: 1.2lb (0.5kg)
- Operation Temp: 0 ~60 (32~140)
- Battery: Lithium battery
- Power Supply Voltage: ATX 12V, 5V

Chapter

2

Quick Installation Guide

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

Warning!

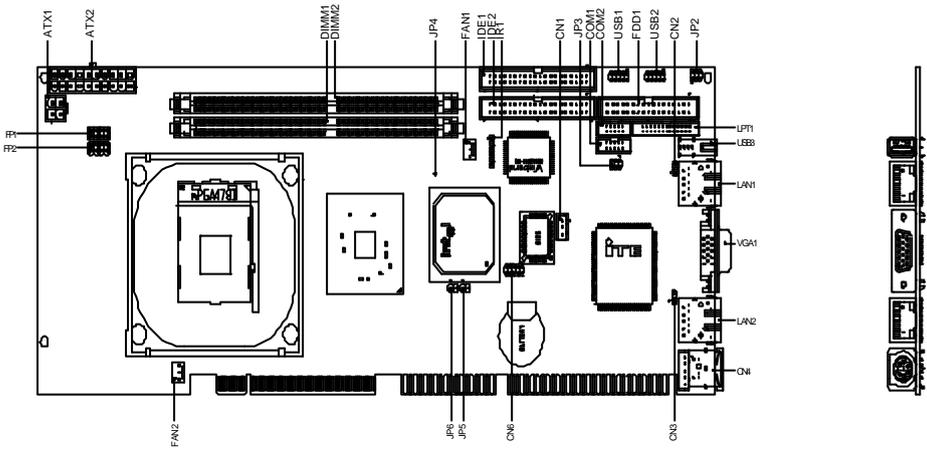
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

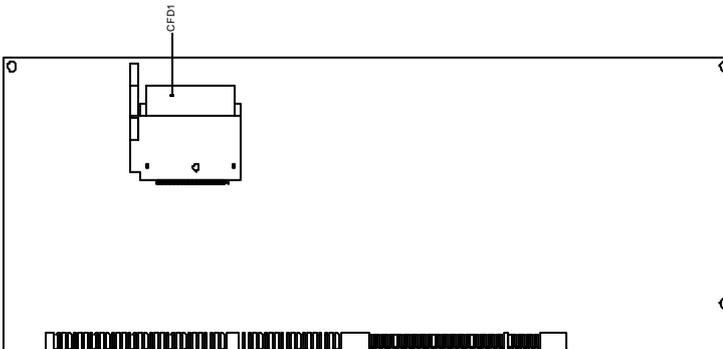
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

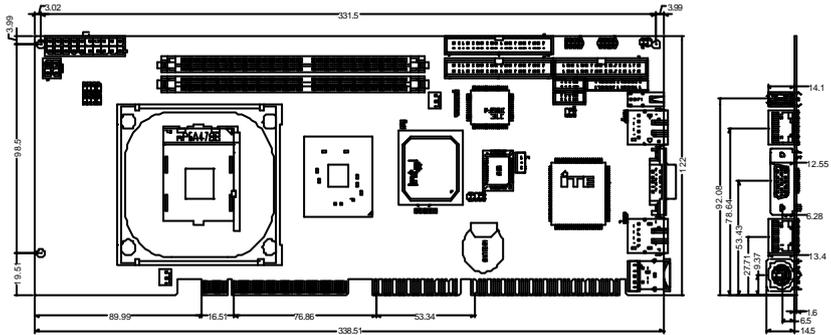


Solder Side

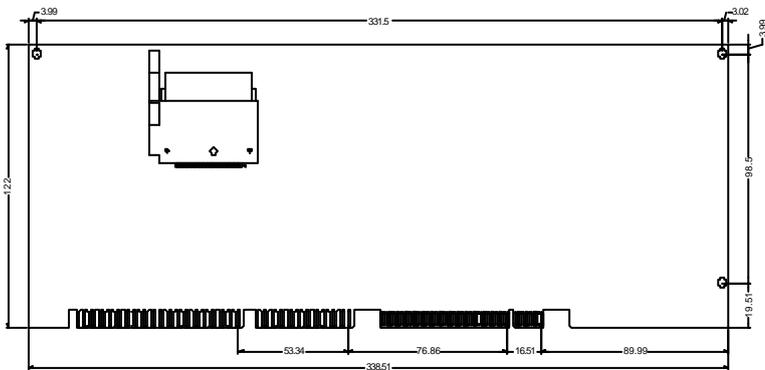


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP3	COM Port Ext. Power Selection
JP4	Clear CMOS
JP5	CPU Frequency Selection
JP6	CPU Frequency Selection

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Connectors

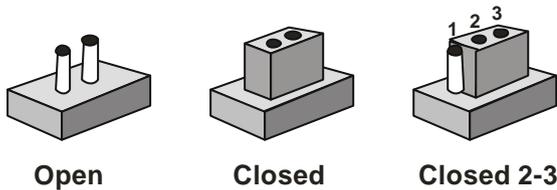
Label	Function
CN1	ATX Power Control Connector
CN2	LAN 1 Active LED Connector
CN3	LAN 2 Active LED Connector
CN4	PS/2 keyboard/Mouse Connector
CN5	Internal keyboard Connector
CN6	AC97 Connector
FP 1	Front Panel Connector 1
FP 2	Front Panel Connector 2
ATX 2	ATX Power Connector
ATX 1	ATX Power_12V Connector
VGA 1	VGA Display Connector
FDD 1	Floppy Connector
IDE 1~2	EIDE Connector
CFD 1	CompactFlash Slot
COM 1	RS-232 Serial Port Connector
COM 2	RS-232/422/485 Serial Port Connector
IR 1	IrDA Connector

LPT 1	LPT Port Connector
USB 1~2	USB Connector
USB 3	USB Connector
LAN 1	10/100M Base-Tx Ethernet Connector
LAN 2	10/100M or 100/1000Base-Tx Ethernet Connector
DIMM 1~2	DIMM Slot
FAN 1~2	Fan Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

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

2.7 COM Port Ext. Power Selection (JP3)

JP3	Function
1-2	12 V
3-4	5 V
5-6	RI (Default)

2.8 Clear CMOS (JP4)

JP4	Function
Open	Normal (Default)
Closed	Clear

2.9 CPU Frequency Selection (JP5, JP6)

FSB Frequency	JP5	JP6
Auto	Close	Open

2.10 Front Panel Connector (FP1)

Pin	Signal	Pin	Signal
1	Power On Button (+)	2	Reset Switch (+)
3	Power On Button (-)	4	Reset Switch (-)
5	IDE LED (+)	6	Power LED (+)
7	IDE LED (-)	8	Power LED (-)

2.11 Front Panel Connector (FP2)

Pin	Signal	Pin	Signal
1	External Speaker (+)	2	Keyboard Lock (+)
3	N.C.	4	GND
5	Internal Buzzer (-) Default	6	I2C Bus SMB Clock
7	External Speaker (-) Default	8	I2C Bus SMB Data

* Internal Buzzer enable: Close Pin 5, 7

2.12 RS-232 Serial Port Connector (COM 1)

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.

2.13 RS-232/422/485 Serial Port Connector (COM 2)

Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR

7	RTS	8	CTS
9	RI/+12V	10	N.C.

2.14 IrDA Connector (IR1)

Pin	Signal
1	+5V
2	N.C.
3	IRRX
4	GND
5	IRTX
6	N.C.

2.15 LPT Port Connector (LPT1)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR
5	DATA1	6	#INIT
7	DATA2	8	#SLIN
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	#ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND

25	SELECT	26	N.C.
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2.16 USB Connector (USB 1~2)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+
7	GND	8	USBD2-
9	GND	10	+5V

2.17 Fan Connector (FAN1, FAN2)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.18 ATX Power Control Connector (CN1)

Pin	Signal
1	PS-ON
2	+5V
3	5VSB

* AT Power Use: Close Pin 2, 3

2.19 LAN LED Connector (CN2~3)

Pin	Signal	Pin	Signal
1	Link_LED(-)	2	Active_LED(+)

2.20 PS/2 Keyboard/Mouse Connector (CN4)

Pin	Signal
1	KB_DATA
2	MS-DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

2.21 Internal Keyboard Connector (CN5)

Pin	Signal
1	KB_CLK
2	KB_DATA
3	N.C
4	GND
5	+5V

2.22 AC97 Connector (CN6)

Pin	Signal	Pin	Signal
1	AC_RST-	2	AC_SYNC
3	AC_DAIN2	4	AC_DAOOUT
5	GND	6	AC_BCLK
7	GND	8	+5V
9	Lock	10	+3.3V

2.23 VGA Display Connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	N.C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N.C	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK	16	GND

2.24 Floppy Drive Connector (FDD1)

Pin	Signal	Pin	Signal
1	GND	2	DRV DEN 0
3	GND	4	NC

5	GND	6	DRV DEN 1
7	GND	8	INDEX#
9	GND	10	MTR#0
11	GND	12	DS#1
13	GND	14	DS#0
15	GND	16	MTR#1
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRAK#0
27	GND	28	WRTPRT#
29	GND	30	RDATA#
31	GND	32	HDSEL#
33	GND	34	DSKCHG#

2.25 IDE Hard Drive Connector (IDE1~2)

Pin	Signal	Pin	Signal
1	IDERST#	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA9	10	DATA11

11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	NC
21	REQ	22	GND
23	Disk I/O Write	24	GND
25	Disk I/O Read	26	GND
27	I/O Channel Ready	28	CABLE SELECT
29	DMA Acknowledge:	30	GND
31	Interrupt Request	32	NC
33	Device Address1	34	PD_80P
35	Device Address0	36	Device Address2
37	Chip Selects for 100 Range:	38	Chip Select for 300 Range:
39	HDD DLED#	40	GND

2.26 Compact Flash Connector (CFD1)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14

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6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	VCC
12	GND	37	IRQ15
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	IDERST#
17	GND	42	SDRDY
18	SDA2	43	NC
19	SDA1	44	VCC
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/A	49	SDD10
25	GND	50	GND

2.27 LAN Connector (LAN1)

Pin	Signal	Pin	Signal
1	TRD2+ (Gigabit)	13	YLED-
2	TRD0+	14	YLED+
3	TRD0-	15	CGND
4	VCC	16	CGND
5	TRD2- (Gigabit)	12	GLED-
6	TRD3+ (Gigabit)	11	GLED+
7	VCC	10	TRD3- (Gigabit)
8	TRD1+	9	TRD1-

2.28 LAN Connector (LAN2)

Pin	Signal	Pin	Signal
1	NC	13	YLED-
2	TRD0+	14	YLED+
3	TRD0-	15	CGND
4	VCC	16	CGND
5	NC	12	GLED-
6	NC	11	GLED+
7	VCC	10	NC
8	TRD1+	9	TRD1-

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 FSB-860B 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 CMOS RAM so that it retains the Setup information when the power is turned off.

Entering setup

Power on the computer and press 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 available advanced features of the system.

Advanced Chipset Features

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

Integrated Peripherals

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

Power Management Setup

Use this menu to specify the settings for power management. (HDD power down, power on by ring etc.)

PnP/PCI Configurations

This entry appears if the system supports PnP/PCI.

PC Health Status

This menu shows you the status of PC.

Frequency/Voltage Control

This menu shows you the display of Frequency/Voltage Control.

Load Optimized Defaults

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

Save and Exit Setup

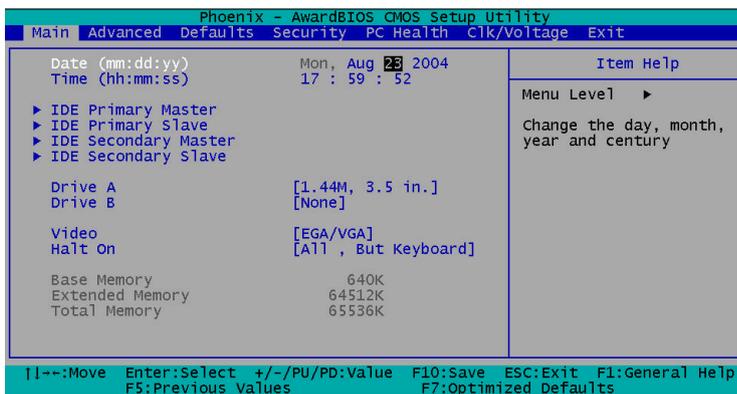
Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

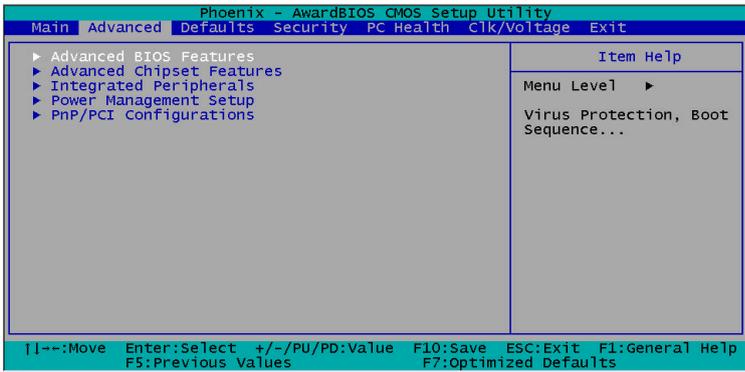
3.3 Standard CMOS Features

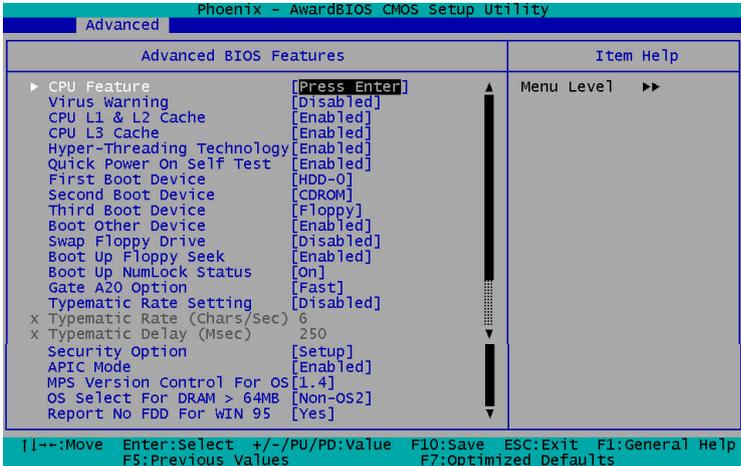
When you choose the Standard CMOS Features option from the INITIAL SETUP SCREEN menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system, such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the right box of the Menu screen.



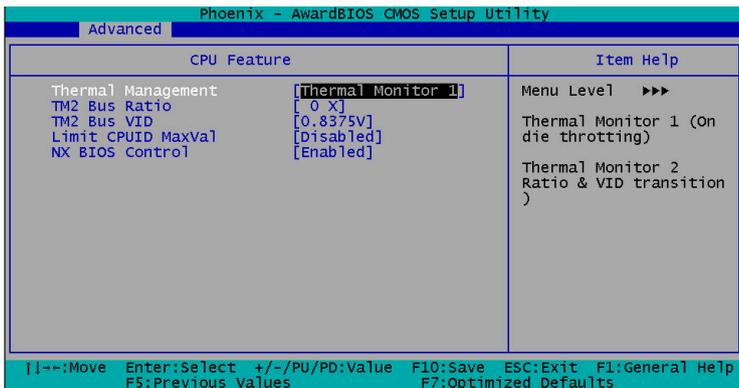
3.4 Advanced BIOS Features

By choosing the Advanced BIOS Features option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.



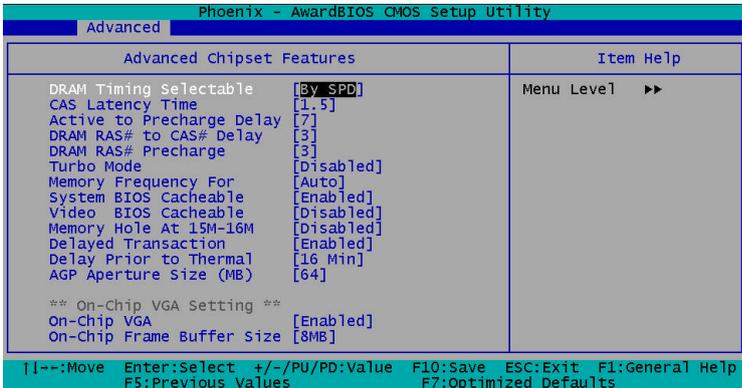


● CPU Feature



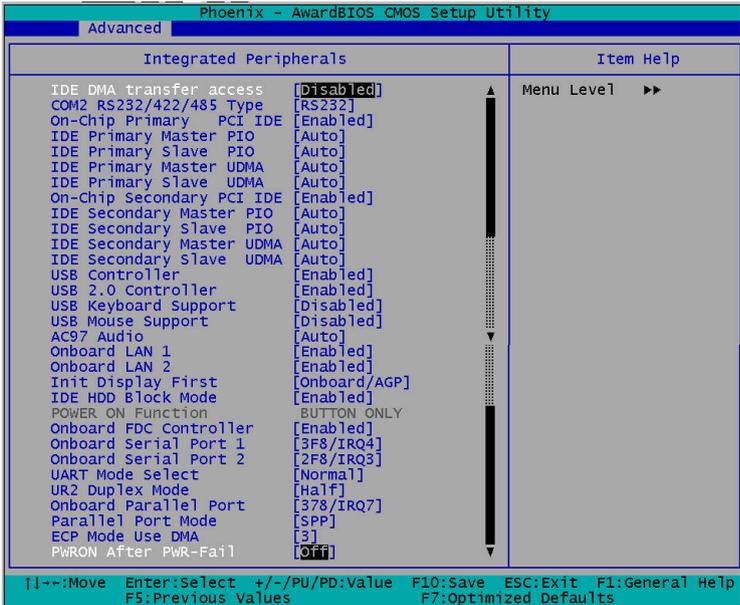
3.5 Advanced Chipset Features

By choosing the Advanced Chipset Features option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.



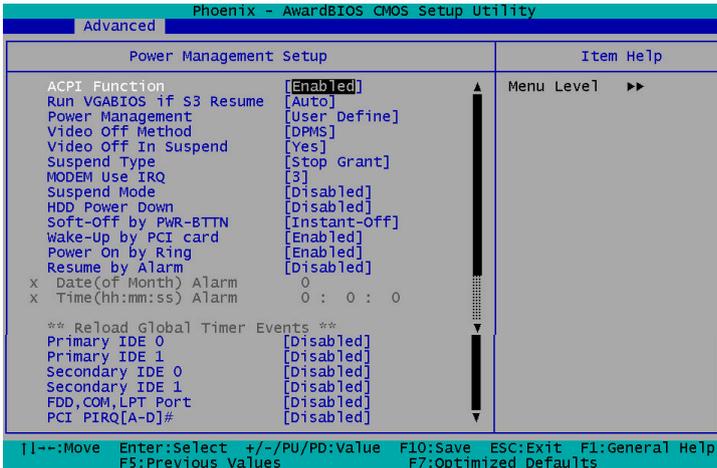
3.6 Integrated Peripherals

By choosing the Integrated Peripherals from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.



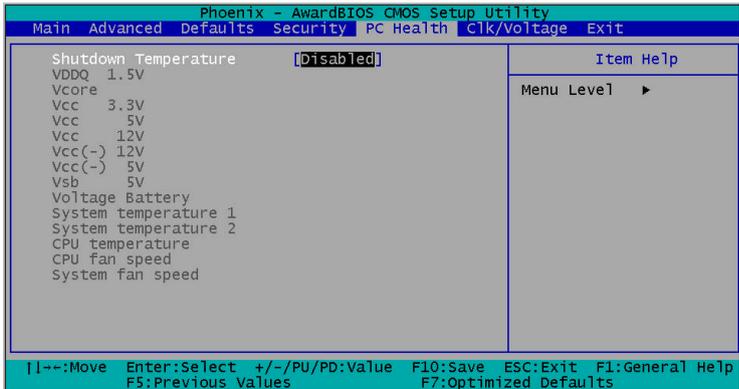
3.7 Power management Setup

By choosing the Power Management Setup from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.



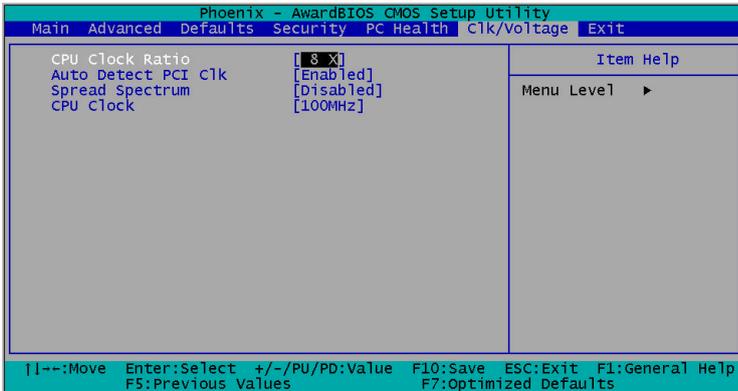
3.9 PC Health Status

By choosing the PC Health Status from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.



3.10 Frequency / Voltage control

By choosing the Frequency/Voltage Control from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the factory defaults of the FSB-860B.

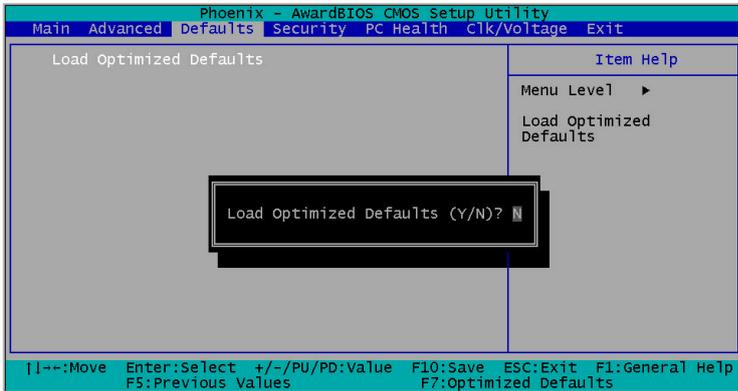


3.11 Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

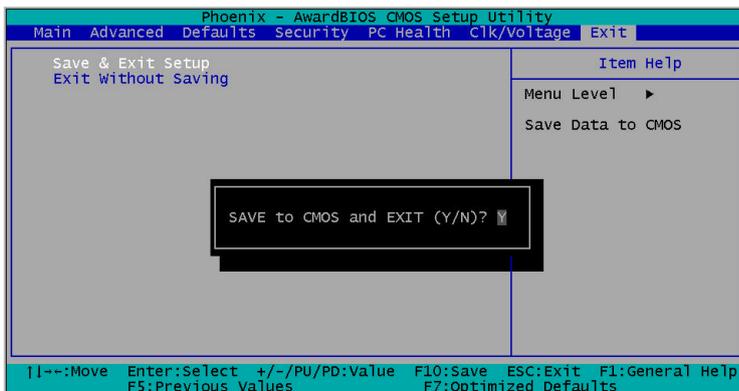
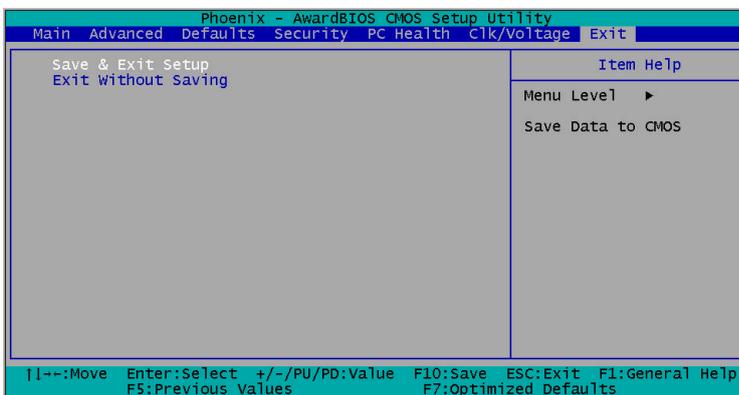
Load Optimized Defaults (Y/N)?

Pressing "Y" loads the defaults that are factory settings for optimal performance system operations.



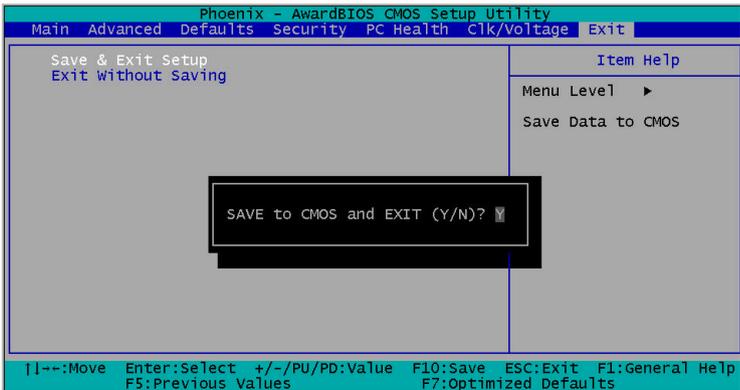
3.12 Save & Exit Setup

If you select this option and press <Enter>, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn on your system and compare this to what it finds as it checks the system. This record is required for the system to operate.



3.13 Exit without saving

Selecting this option and pressing <Enter> allows you to exit the Setup program without recording any new value or changing old one.



Chapter

4

**Driver
Installation**

The FSB-860B comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Install Intel INF Update

Step 2 –Install Intel Application Accelerator 2.3

Step 3 – Install Graphic Driver

Step 4 – Install Ethernet Driver

Step 5 – Install AC97 Audio Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the FSB-860B CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Intel INF Update

1. Click on the **Intel INF Update** folder and then double click on the **Setup**.
2. Follow the instructions that the window shows.
3. The system will help you install the driver automatically.
4. Please re-start your computer.

Step 2 – Install Application Accelerator driver

1. Click on the **Application Accelerator** folder
2. Double click on **Setup** file
3. Follow the instructions that the window shows.
4. The system will help you install the driver automatically.
5. Please re-start your computer.

Step 3 – Install Graphic Driver

1. Click on the **Graphic Driver** folder.
2. Choose the OS your system is.
3. Double click on the **Setup** located in each OS folder.
4. Follow the instructions that the window shows.
5. The system will help you install the driver automatically.
6. Please re-start your computer.

Step 4 – Install Ethernet Driver

1. Click on the **Ethernet Driver** folder
2. Choose the OS your system is.

For the OS of Win 98:

- a. Go to 'My Computer' and click on right button.
- b. Select 'Device Manager' and click on 'PCI Ethernet Controller.'
- c. Go to 'Properties' and select 'Reinstall Driver.'
- d. Follow the installation instructions and select the driver located at.
- e. Select 'Pro 1000' and 'Win_98me'
- f. Click on 'Next' and 'Finish.' You have installed the driver successfully.

Note: Same procedures for installing 'Pro 100.'

For the OS of Win 2000/XP:

- a. Double click on the **Setup**.
 - b. Follow the instructions that the window shows.
 - c. The system will help you install the driver automatically.
3. Please re-start computer.

Step 5 – Install AC97 Audio Driver

1. Click on the **AC97 Audio Driver** folder.

2. Choose the OS your system is.
3. Double click on the **Setup** located in each OS folder.
4. Follow the instructions that the window shows.
5. The system will help you install the driver automatically.
6. Please re-start your computer.

Note:

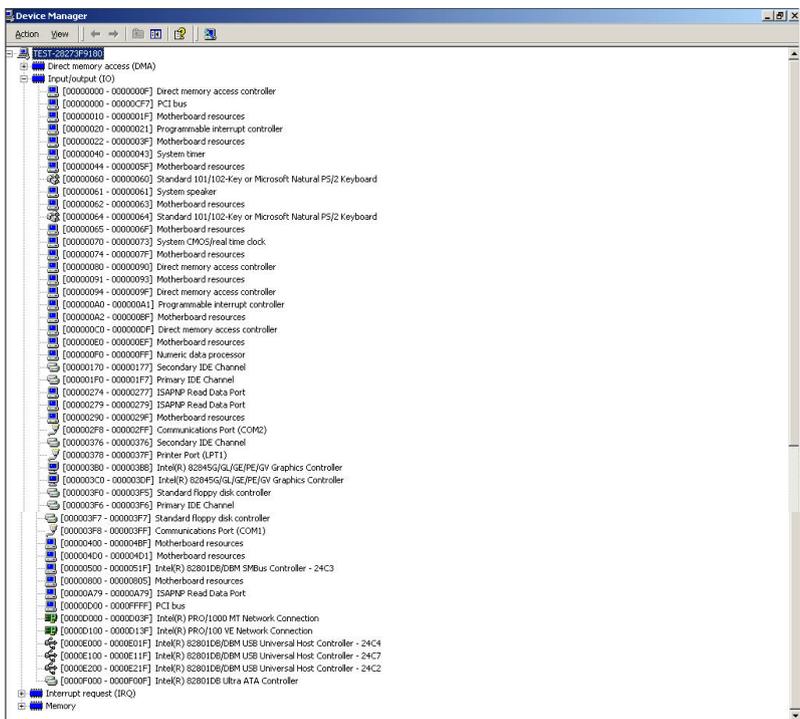
Under the Window OS environment, if the CRT connector is connected to display monitor by the data switch device, the user need to set the color and resolution from Intel Graphic utility (VGA driver) instead of setting from the control panel in case of the wrong display appearance.

Appendix

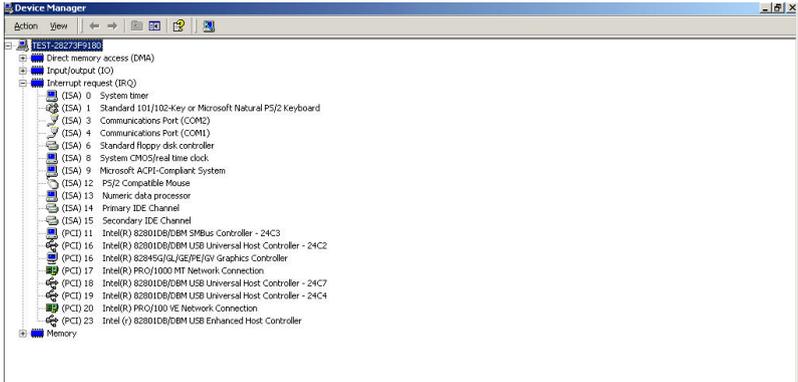
A

I/O Information

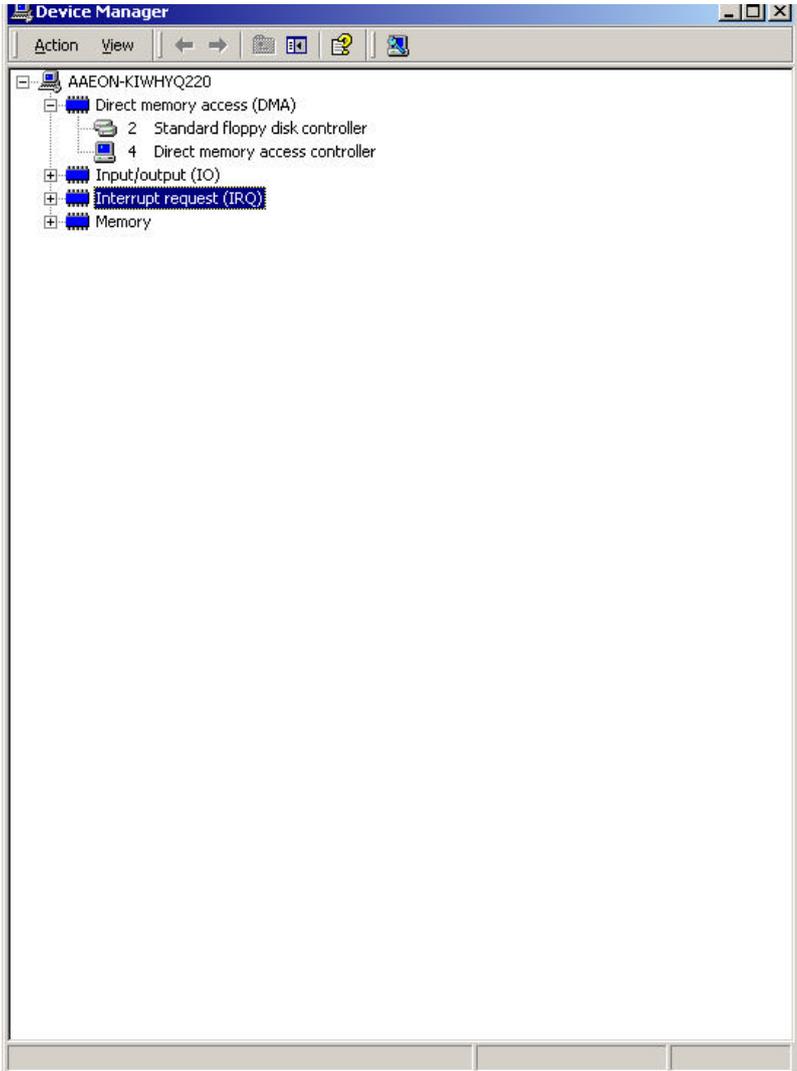
A.1 I/O Address Map



A.3 IRQ Mapping Chart



A.4 DMA Channel Assignments



Appendix

B

Programming the Watchdog Timer

B.1 How to program the watchdog timer

FSB-860B utilizes ITE 8712 chipset as its watchdog timer controller.

Please follow the procedures below to complete its configuration.

1. Enter the MB PnP mode
2. Select logical device
3. Configure the watchdog timer controller registers
4. Exit the MB PnP mode

To enter the MB PnP mode is to write value 87h, 1h, 55h, 55h to configuration port - 2Eh.

To exit the MB PnP mode is to set bit 1 of configure control register (index 02h) to 1.

The AAeon initial watchdog timer program is illustrated below. This program is applied only to DOS and Win 9x.

Example :

```

;=====
; Enter the MB PnP mode
;=====
        mov     al, 87h
        out    2eh, al

```

```

mov     al, 1
out     2eh, al
mov     al, 55h
out     2eh, al
mov     al, 55h
out     2eh, al

```

```

;=====

```

```

; Select logical device

```

```

;=====

```

```

mov     al, 7           ;index 7 for logical device
out     2eh, al
mov     al, 7
out     2fh, al

```

```

;=====

```

```

; Configure the watchdog timer controller registers

```

```

;=====

```

```

mov     al, 73h
out     2eh, al
mov     al, 0ah        ;index 73h for watchdog
                       ;timer time-out value (01~0ff)
out     2fh, al
mov     al, 72h
out     2eh, al
mov     al, 0c0h      ;time-out value use second
                       ;& enable WDT output

```

through KRST

out 2fh, al

;=====

; Exit the MB PnP mode

;=====

```
mov    al, 2
out    2eh, al
mov    al, 01h
out    2fh, al
```