AEC-6830

Fanless Embedded Control PC
Intel® ULV Celeron®
650MHz EBGA mobile CPU
With Ethernet, 2 COMs, Audio
TV-Out, CompactFlash™

AEC-6830 Manual 1st Ed.
Dec. 2004

Copyright Notice

Acknowledgments

All other product s' name or trademarks are properties of their respective owners.

- Award is a trademark of Award Software International, Inc.
- CompactFlash™ is a trademark of the Compact Flash Association.
- VIA Eden™ is a trademark of VIA Technology Inc.
- Microsoft Windows® is a registered trademark of Microsoft Corp.
- PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

Packing List

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

- 1 AEC-6830 Embedded Control PC
- 1 Keyboard & mouse cable
- 1 Phoenix Power Connector
- 2 Wall Mount Bracket
- 1 Audio Cable
- 1 S-video to RCA 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 reliable 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 users 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 Safety

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

Contents

Chapter 1

General Information

1.1 Introduction

AAEON has announced our newest Boxer AEC-68xx series and has showcased many samples in public exhibitions. Our Boxer series products, including AEC-6810, AEC-6820, AEC-6830 and AEC-6840, can be seen currently in all types of IPC (**I**ndustrial **P**ersonal **C**omputer) related exhibitions. We are glad that you are now a proud owner of this advanced embedded computing device.

The AEC-6830' s main application is in public multimedia entertainment services. This model uses an Intel© ULV Celeron© processor with high performance and low power consumption which is perfectly suited for the Industrial PC field. A built-in MPEG2 decoder supports the DVD format and 5.1 CH audio with SPDIF for surround-sound quality. Moreover, the Dual View function acts like two VGA cards which can show diverse broadcast content in two different displays. The CLE266 North Bridge chipset effectively raises computing power with fast I/O such as USB 2.0. The optional Ultra Cooling Kit helps lower the operating temperature, which makes the system more stable and reliable in rugged environments.

The compact size body offers the end user and system integrator more flexibility and gives alternatives that can spur new ideas on application arrangements. The increasingly-larger public service infrastructures in advanced-developed countries such as in Europe and in developing countries such as Mainland China will become prime markets for the

abilities of the AEC-6830 but any market throughout the world can benefit from its advanced multimedia capabilities, designed by AAEON.

1.2 Features

- Fanless System
- Onboard Intel® ULV Celeron® 650MHz EBGA processor
- MPEG2 Decoder / MPEG4 playing / 5.1CH AC97 2.0 / TV-out / SPDIF supports multimedia application Embedded OS WinCE.net 4.2 porting ready for application
- CRT/DVI, CRT/TV-out simultaneously display function
- Optional Dual Display function
- Supports CompactFlash™ Memory and lockable mechanism
- Anti-vibration up to 5 g rms / Anti-shock up to 100g

1.3 Specifications

System

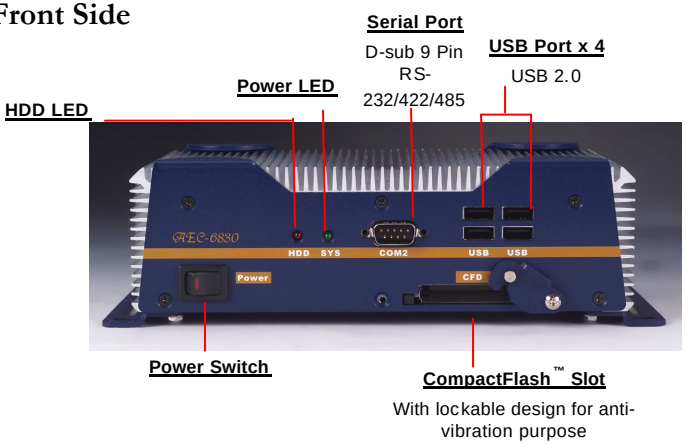
- CPU: Intel® ULV Celeron® 650MHz EBGA CPU
- Construction: Rugged Aluminum Alloy Chassis
- System Memory: DDR RAM SODIMM x 1, Max. 512MB
- VGA: D-sub 15 VGA Connector
- Keyboard/Mouse: PS/2 Keyboard & Mouse
- Ethernet: 10/100Base-T Ethernet RJ-45 connector x 1
- SSD: Type II CompactFlash™ slot
- Hard Disk Storage: Optional 2.5" Slim HDD Module
- Serial Port: 1 x RS-232, 1 x RS-232/422/485
- Audio: Mic In / Line In / Line Out, by extension cable SPDIF out
- USB: 4 USB 2.0 Ports
- TV-Out: S-video and RCA output
- DVI Standard DVI output
- Watchdog Timer: Generate 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

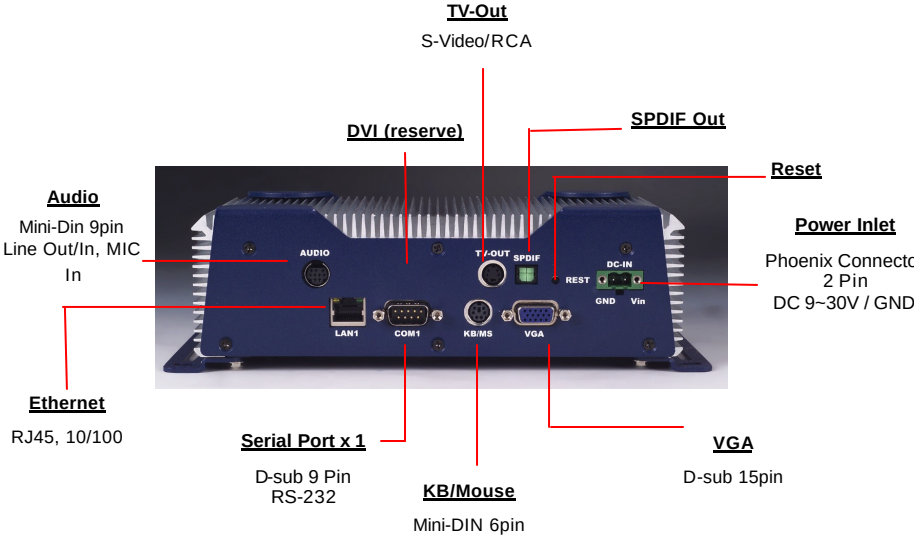
Mechanical and Environmental

• Construction:	Aluminum Alloy chassis
• Color:	Dark Blue
• Mounting:	Wall-mount (Default), Din Rail
• Dimension:	8.35" (W) x 2.53" (H) x 4.21" (D) 212.15mm x 64.2mm x 107mm
• Net Weight:	4.75lb (2.16kg)
• Gross Weight:	8.36lb (3.8kg)
• Operation Temperature:	5°F ~ 140°F (-15°C ~ 60°C)
• Operation Humidity:	5~95%@40C, non-condensing
• Vibration:	5 g rms / 5~500Hz / random operation (Without HDD Module) 1 g / 5~500Hz / random operation (With HDD Module)
• Shock:	100g peak acceleration (11 msec. duration)
• EMC:	CE/FCC class A

Front Side



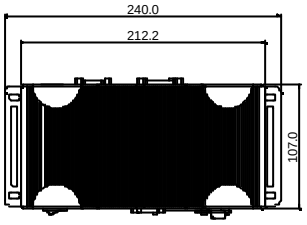
Rear Side



Chapter 2

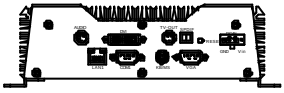
Hardware Installation

2.1 Dimension



AEC-6830

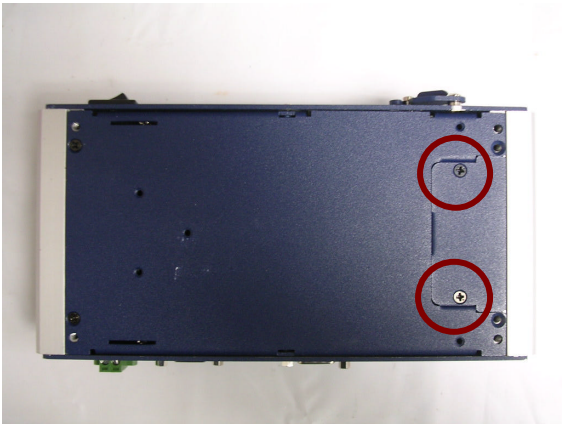
Units:mm

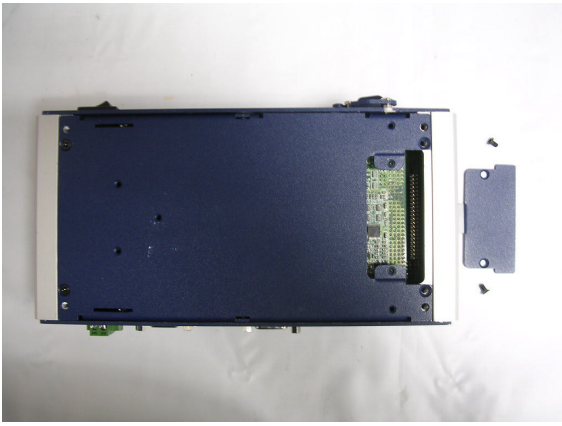


2.2 HDD Module Installation

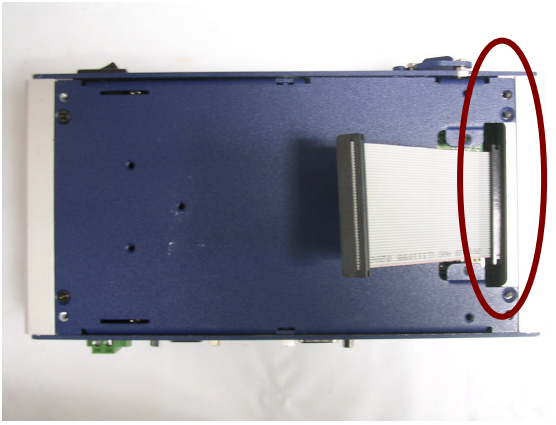
Cable Insertion

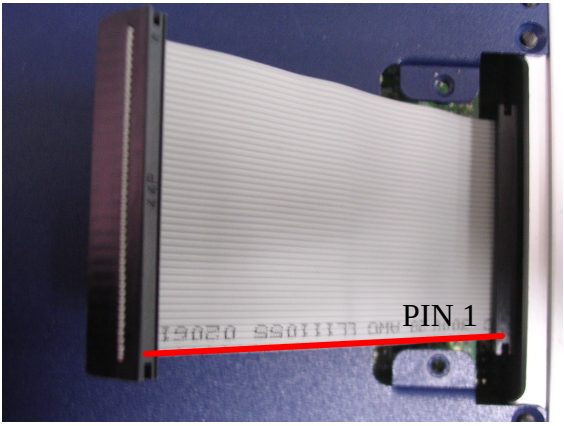
Step 1: Open the HDD cover by loosening the screws on the bottom of the chassis.





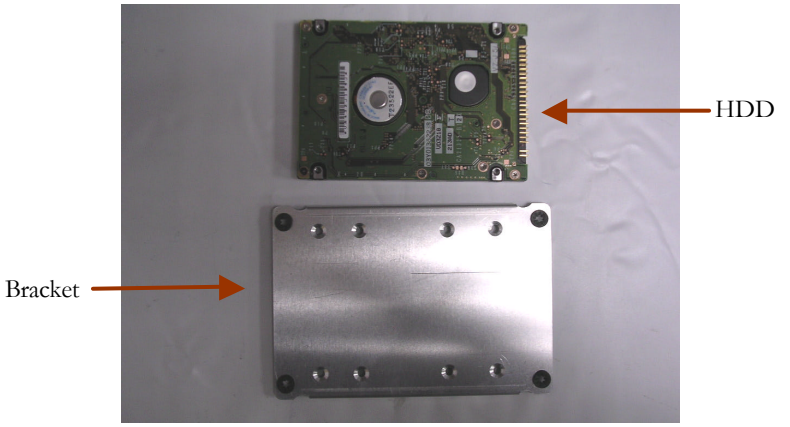
Step 2: Insert the Cable to the bottom of the chassis as the illustration below.



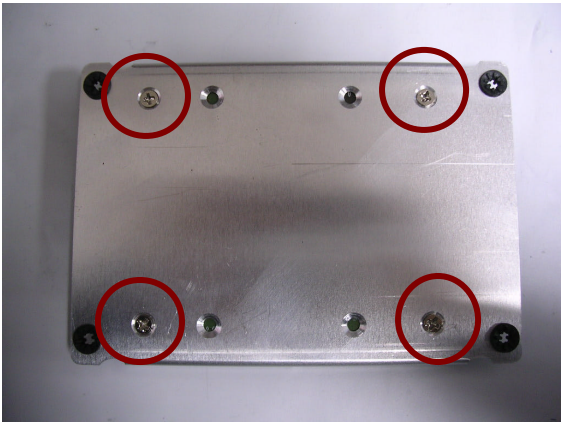


HDD Kit Combination

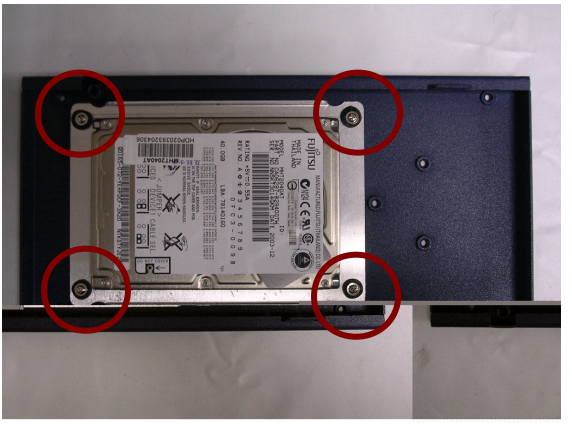
Get the HDD and bracket ready.



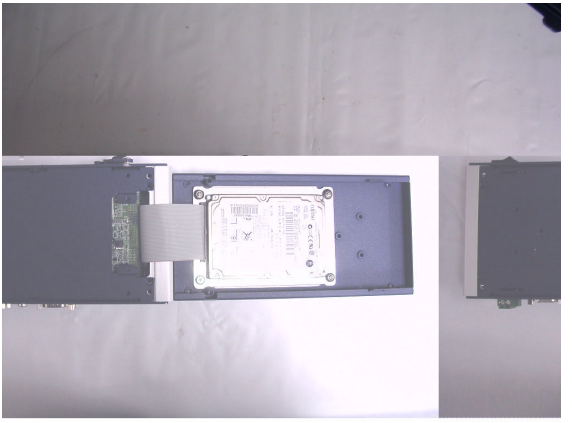
Step 1: Stack the HDD and bracket. Fasten HDD and bracket with the screws.



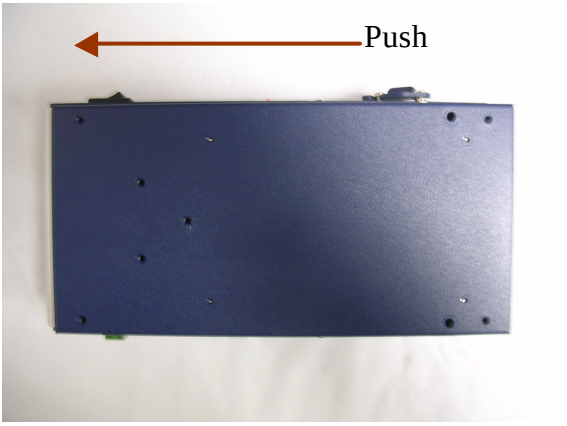
Step 2: Fasten the HDD module into the HDD kit house.



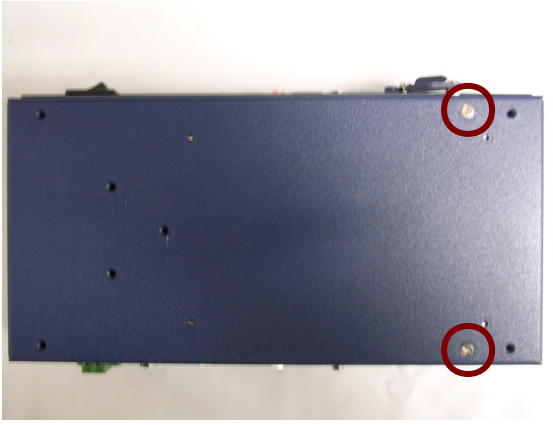
Step 3: Insert the other side of the cable to the HDD module.



Step 4: Combine the HDD kit house with the chassis and push as the illustration shown below.



Step 5: Lock with the screws.



2.3 SDRAM Installation

Step 1: Screw the lid off the chassis.

Step 2: Remove the lid after you screw the lid off the chassis and insert the DDR SDRAM SODIMM module into the slot.

SDRAM

SODIMM

module

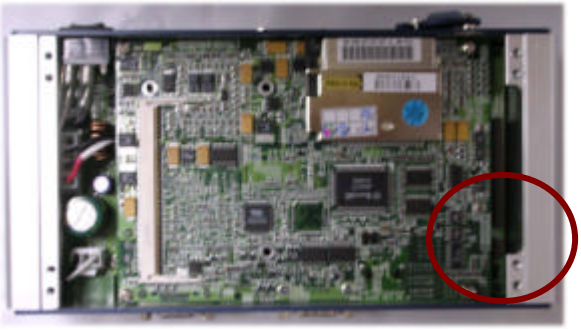
2.4 COM2 RS-232/422/485 Setting

RS-232/422/485 Selection (JP2 & JP3)

The following table provides the user to set up COM2 port.

JP2	Function
1-2, 4-5, 7-8, 10-11	RS-232 (Default)
2-3, 5-6, 8-9, 11-12	RS-422
2-3, 5-6, 8-9, 11-12	RS-485

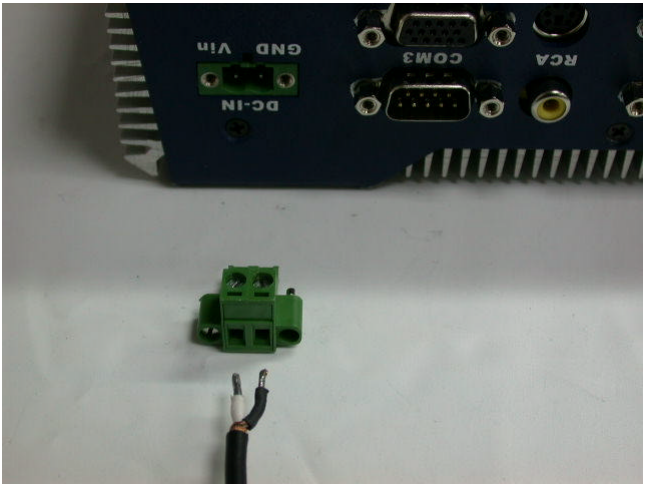
JP3	Function
1-2	RS-232 (Default)
3-4	RS-422
5-6	RS-485



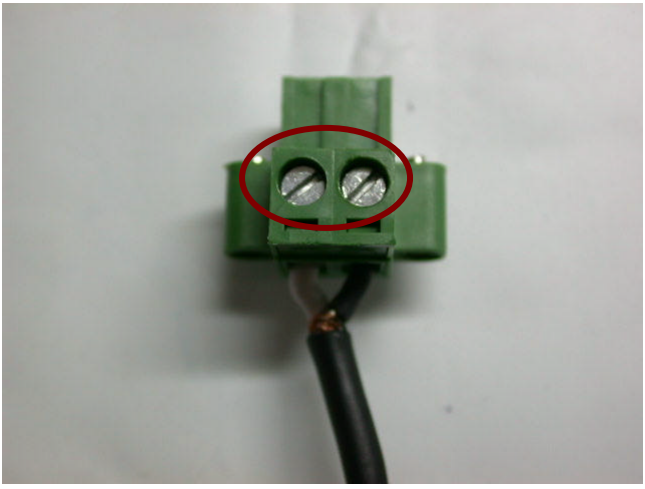
Magnificatior

2.5 Power Linkage Installation

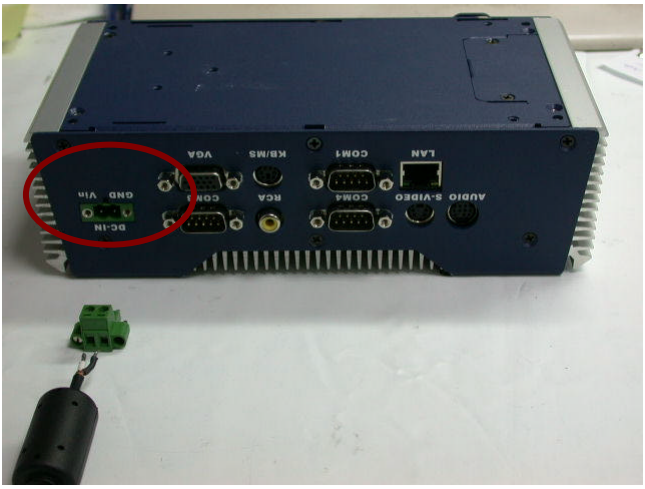
Step 1: Get the cable and connector ready



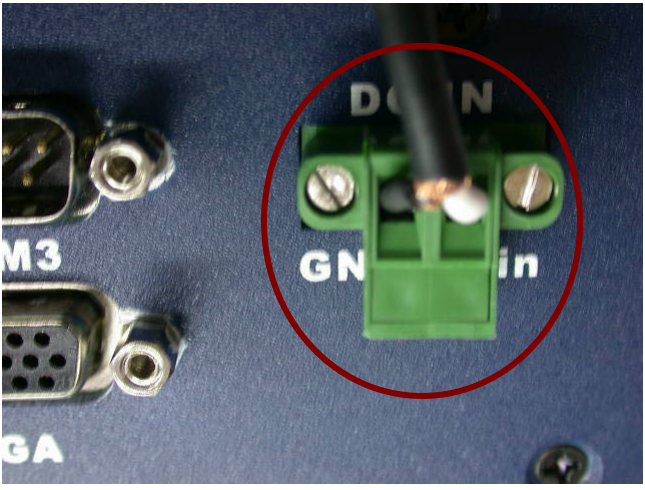
Step2: Fix the connector to the cable with the screws.



Step3: Insert the power cable in.



Step 4: Screw the power cable into the chassis.

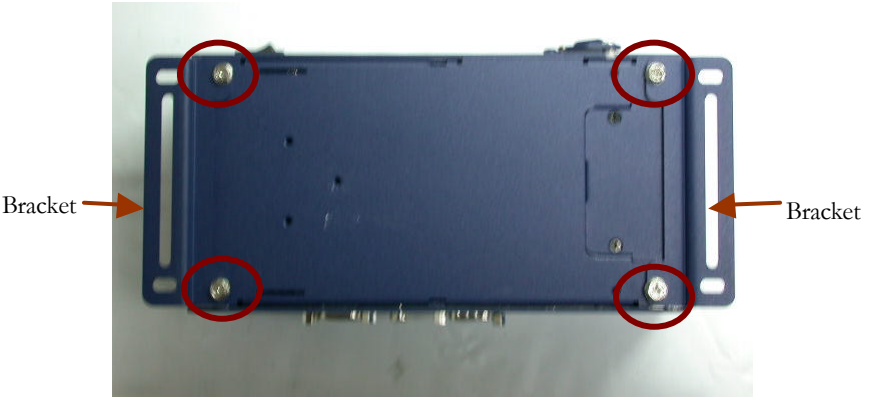


Notice:

Please make sure that pin assignment of **Power** *and* **Ground** *on the accurate location.*

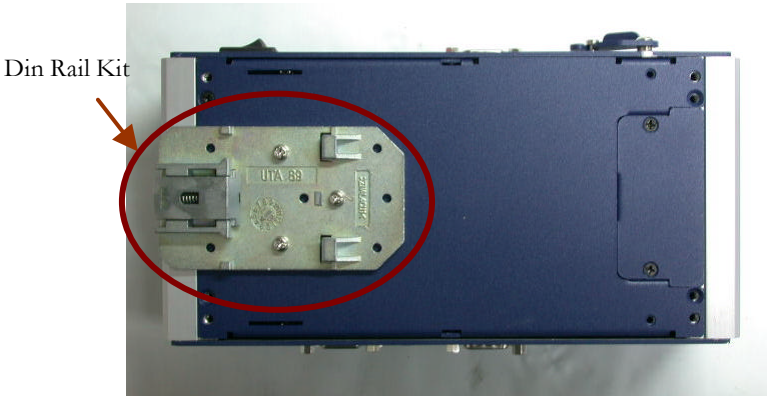
2.6 Wall-mount Installation

Fasten the brackets with the screws.

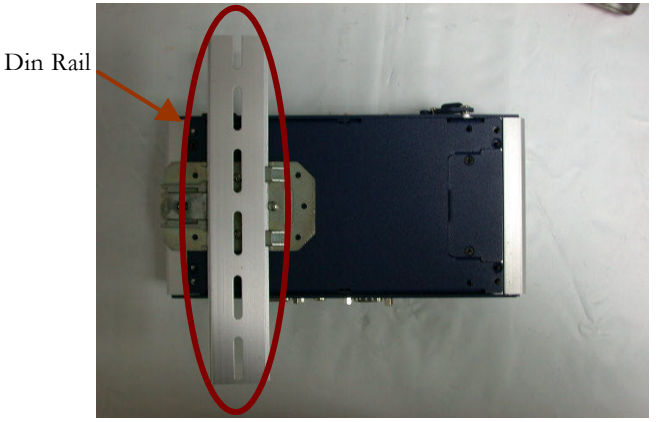


2.7 Din Rail Installation

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

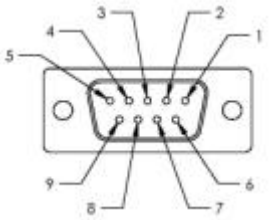


Step 2: Press the Din Rail on the Din Rail kit to fix it.



2.8 COM2 RS-232/422/485 Serial Port Connector

Different devices implement the RS-232/422/485 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments below for the connector.



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	10	N.C.

2.9 COM1 RS-232 Serial Port Connector

.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.

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-6830 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.

Main Menu

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

Advanced BIOS Features

Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Advanced Chipset Features

DRAM timings, AGP functions etc.

Integrated Peripherals

Use this menu to specify your settings for integrated p eripherals. (Onchip IDE device, Onchip PCI device, Super IO device, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management.

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu shows you the status of PC.

Clk/Voltage Control

This menu shows you the display of Clock and Spread Spectrum Control.

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 ch ange these defaults to meet their needs.

Set Password

Change / Set / Disable password.

Save and Exit Setup

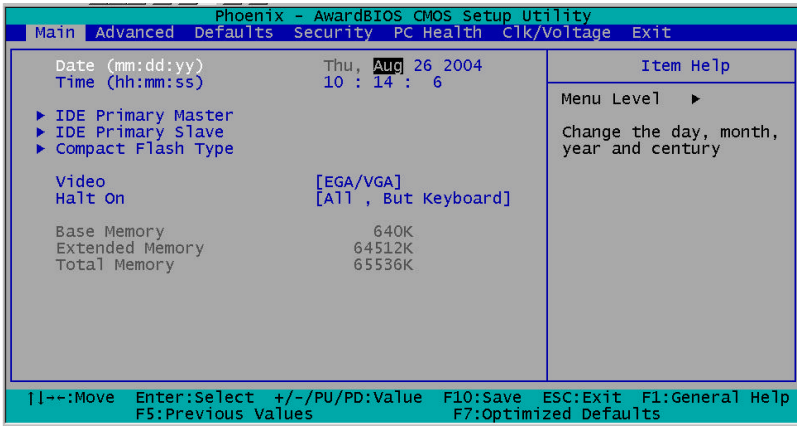
Save the changes you' ve made to CMOS and exit setup.

Exit Without Saving

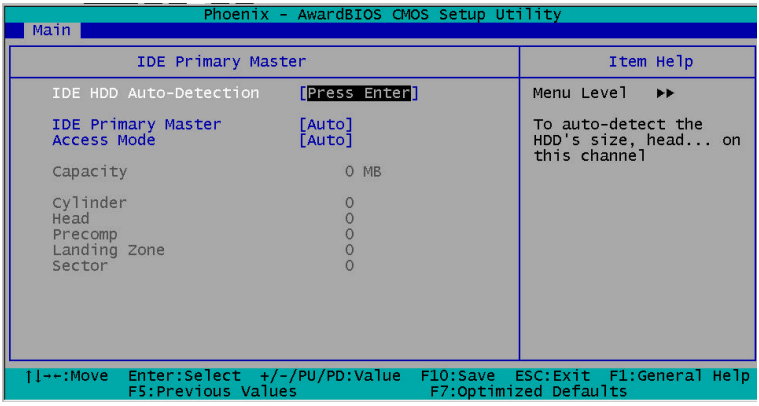
Abandon all CMOS value changes and exit setup.

3.3 Main Menu

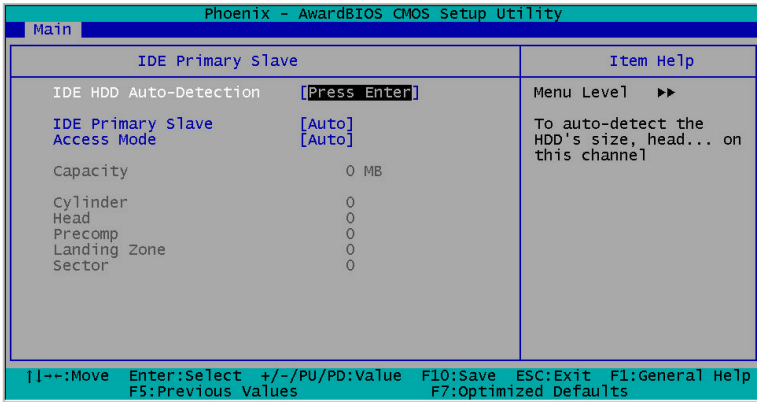
When you choose Main Menu, the screen shown below is displayed. This Main Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the right box of the Menu screen.



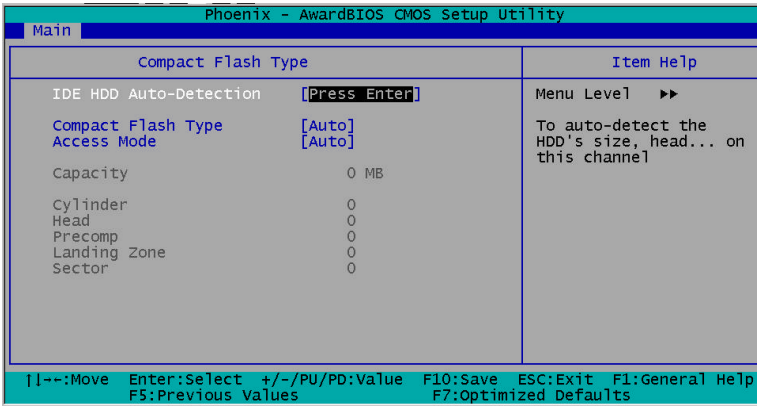
- **IDE Primary Master**



➢ **IDE Primary Slave**

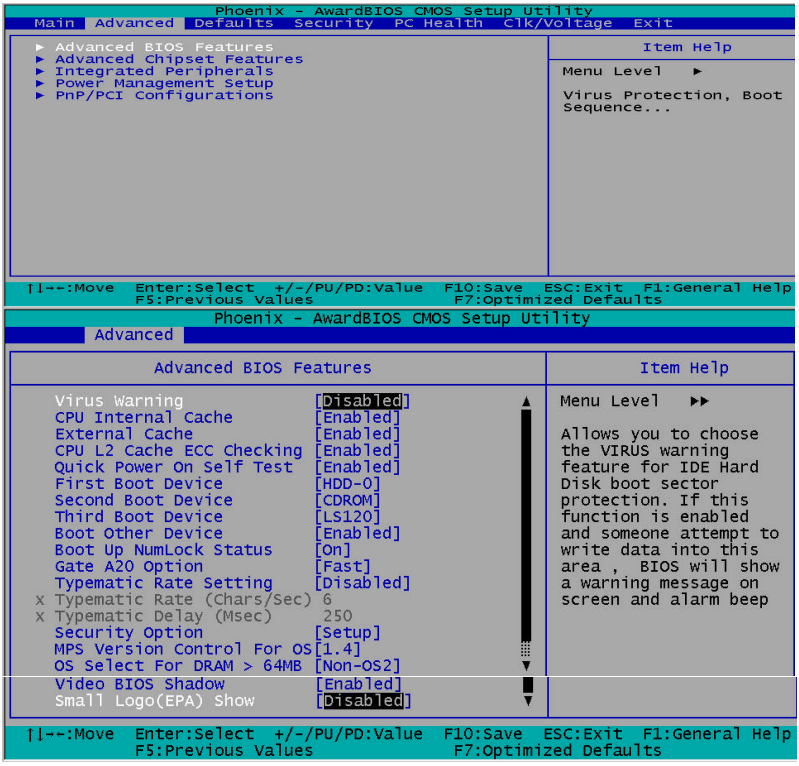


➢ **CompactFlash™ Type**



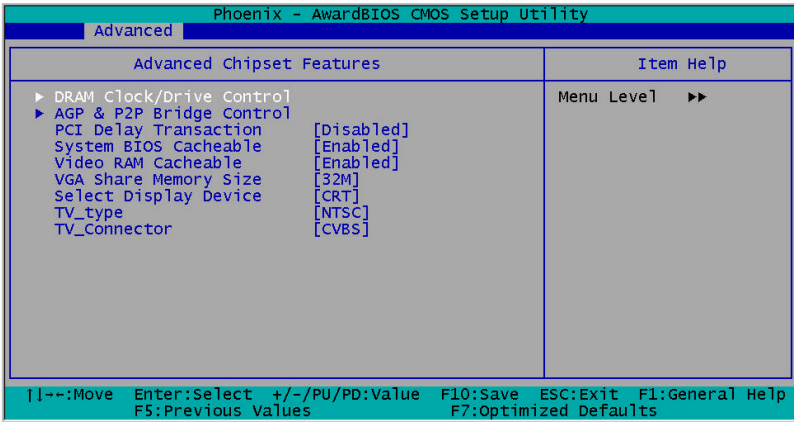
3.4 Advanced BIOS Features

By choosing Advanced BIOS Features, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.

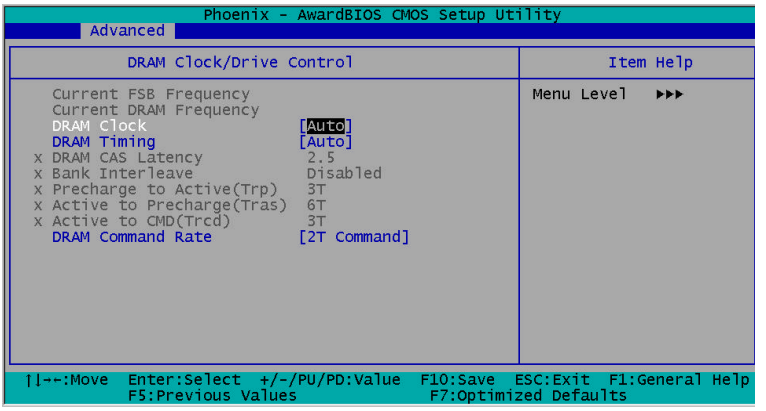


3.5 Advanced Chipset Features

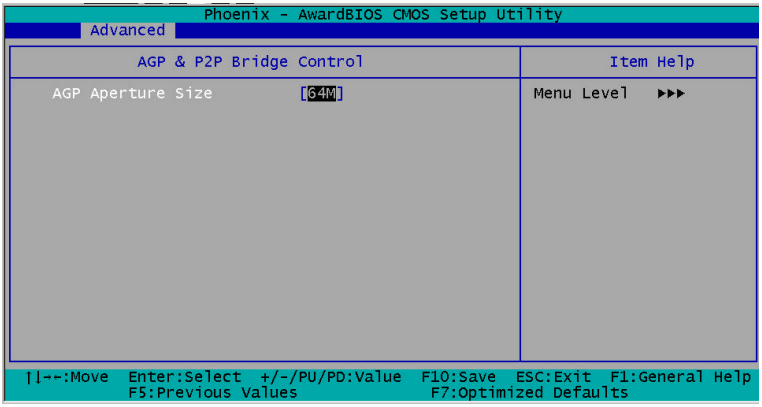
By choosing the Advanced Chipset Features, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



➢ **DRAM Clock/Drive Control**

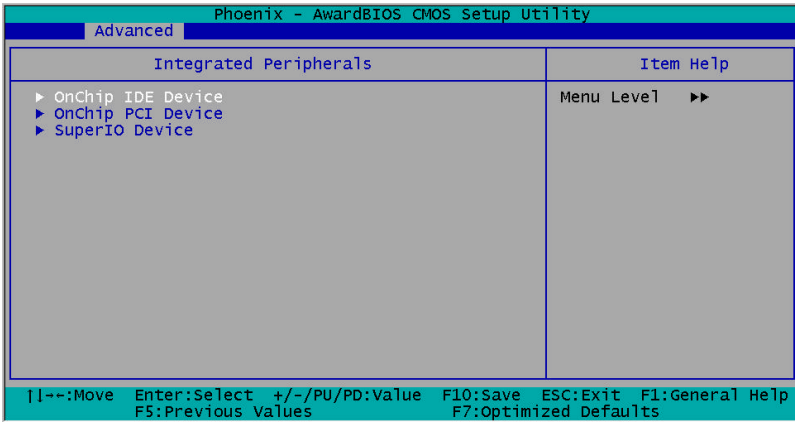


➢ **AGP & P2P Bridge Control**

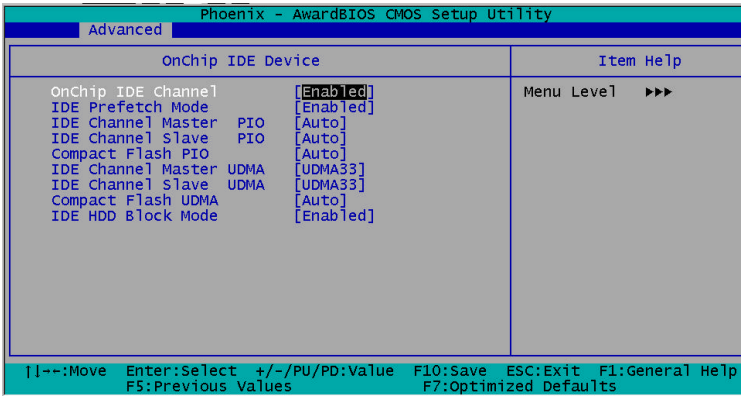


3.6 Integrated Peripherals

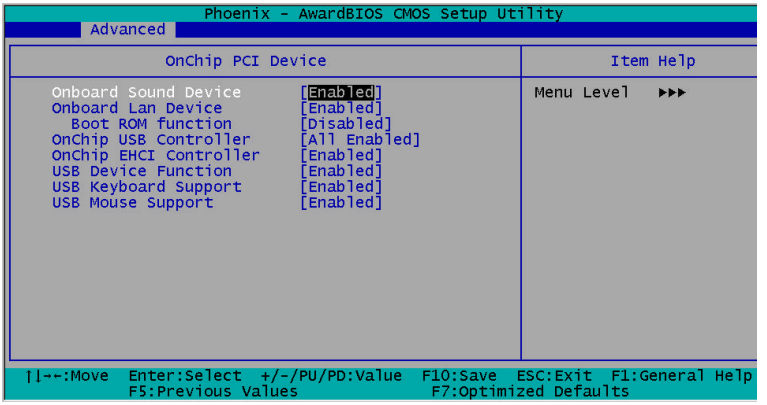
By choosing the Integrated, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



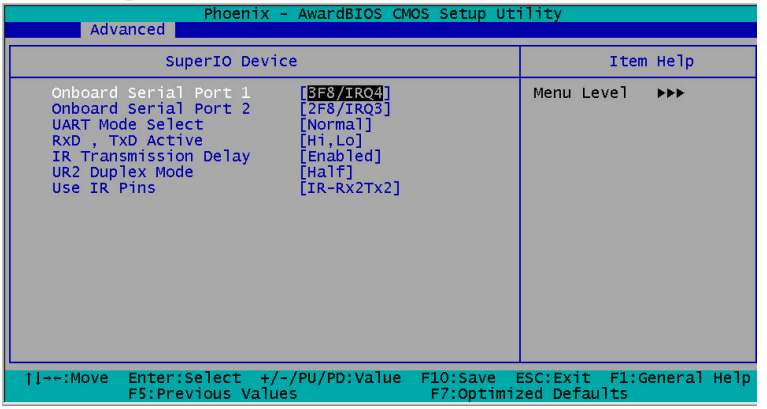
➢ **OnChip IDE Device**



➢ OnChip PCI Device

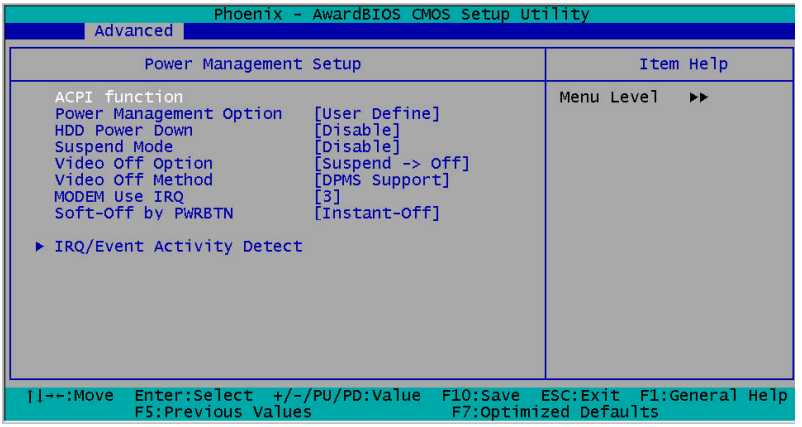


➢ Super IO Device

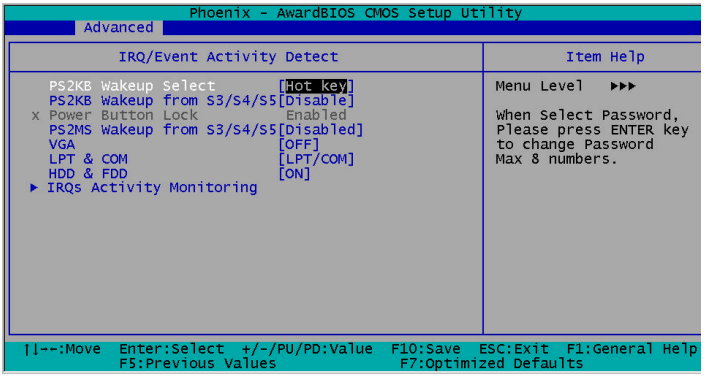


3.7 Power Management Setup

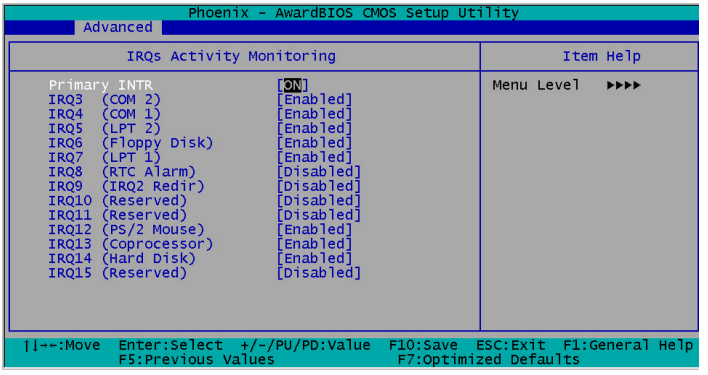
By choosing the Power Management Setup, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



➢ IRQ/Event Activity Detect

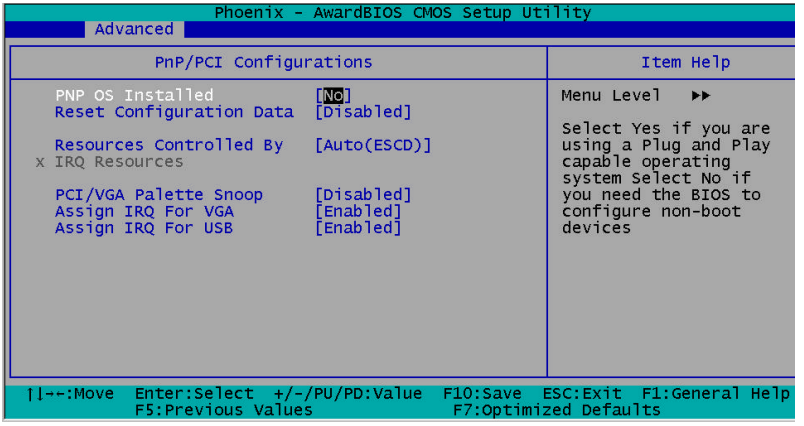


▪ IRQ Activity Monitoring



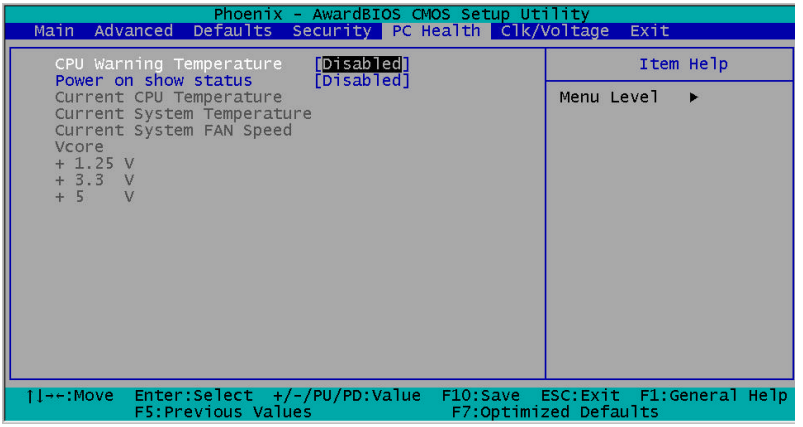
3.8 PnP/PCI configuration

By choosing the PnP/PCI configurations, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



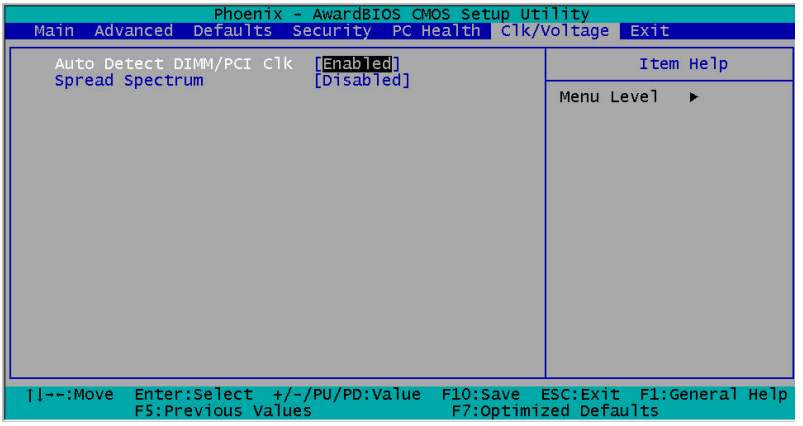
3.9 PC Health Status

By choosing the PC Health Status, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



3.10 Clk/Voltage control

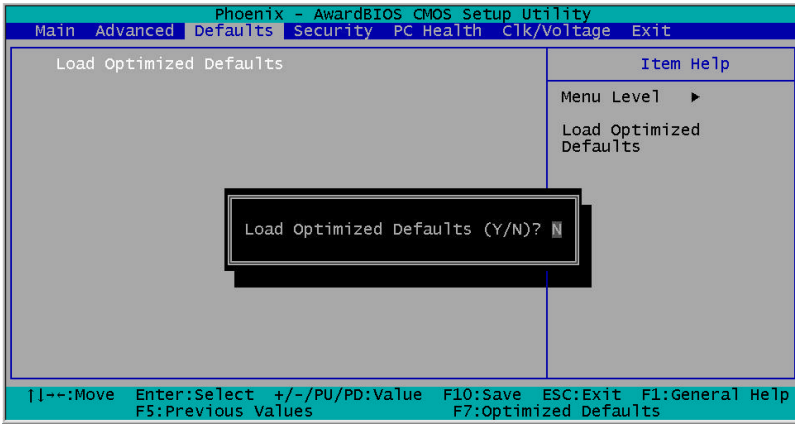
By choosing the Clk/Voltage Control, the screen below is displayed. This sample screen contains the manufacturer' s default values for the AEC-6830.



3.11 Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box: Load Optimized Defaults (Y/N)?

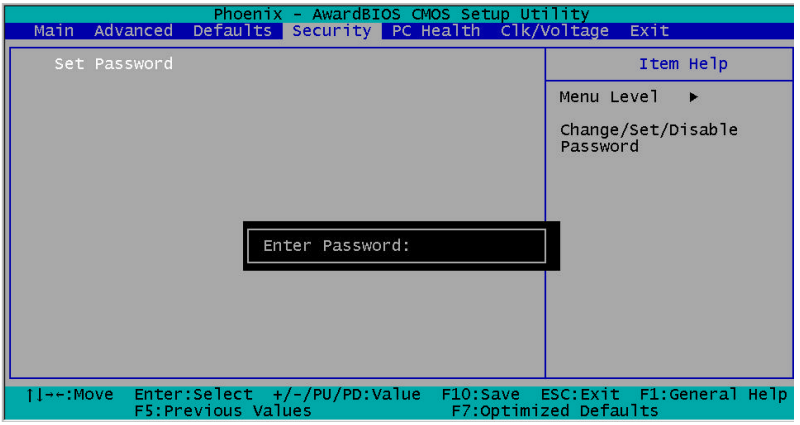
Pressing "Y" loads the default values that are manufacturer's settings for optimal performance system operations.



3.12 Set Password

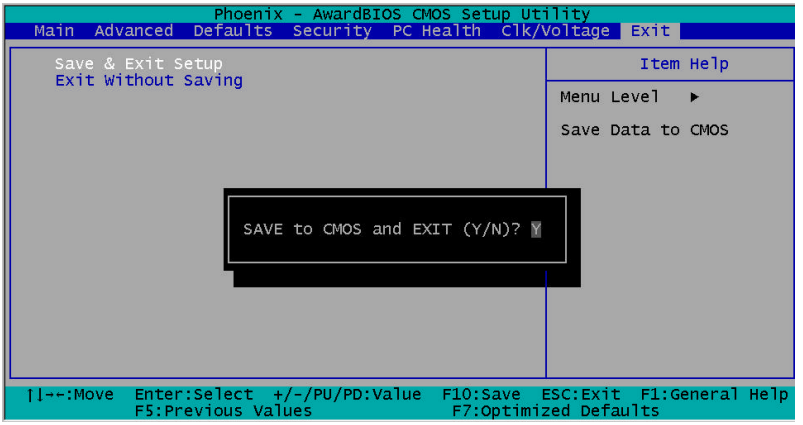
In the Security, there' s a function for the users to set up the password. All you need to do is enter the password and then the system will ask you to confirm the password that you' ve typed to double check. Press ESC key if you want to exit the screen where you have been.

NOTE: To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.



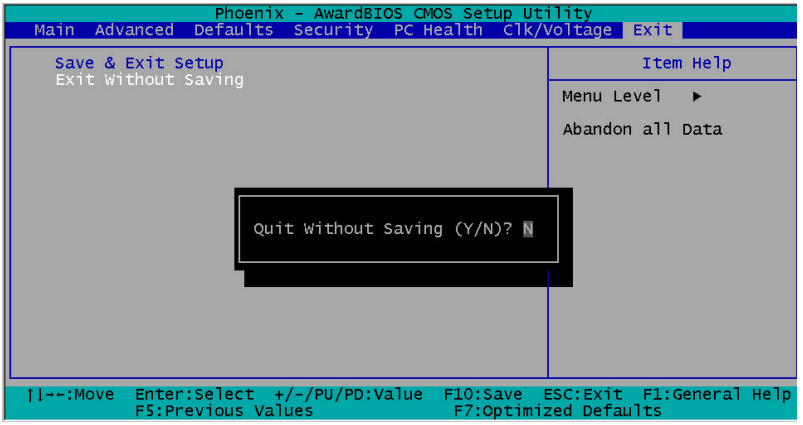
3.13 Save & Exit Setup

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.



3.14 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 AEC-6830 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:

Step 1 – Install VIA 4 in 1 driver

Step 2 – Install Graphic Driver

Step 3 – Install Audio Driver

Step 4 – Install USB 2.0 Driver

Step 5 – Install Ethernet Driver

USB 2.0 Drivers are available for download using Windows Update for both Windows XP and Windows 2000. For additional information regarding USB 2.0 support in Windows XP and Windows 2000, please visit www.microsoft.com/hwdev/usb/.

The latest step is to install VIA USB 2.0 driver after you complete Windows Service Pack Installation. We recommend you to install VIA USB 2.0 driver due to the compatibility issue.

Please read instructions below for further detailed installations.

Insert the AEC-6830 CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

4.1 Installation procedure

Step 1

Install VIA 4 in 1 for Windows 98SE/2000/XP

1. Double click on the **".exe"** file**.**
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.

Step 2

Install Graphic Driver for Windows 98SE/2000/XP

1. Click on the "**CLE266_98ME_160108_wIShld_logod"** folder or **"CLE266_XP2K_16943209_wIShld_logod"** folder according to the OS you used and then double click on the setup.exe.
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.
4. Please re-start your computer.

Step 3

Install Audio Driver for Windows 98SE/2000/XP

1. Click on the "**ComboAudio_A1u390a"** folder or "**ALC650 codec driver"** folder and then double click on the **".exe".**
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.
4. Please re-start your computer.

Step 4

Install USB 2.0 Driver for Windows 98SE/2000/XP

Please refer to page 55 remark first

1. Double click on the **setup.exe.**
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.

Step 5

Install Ethernet Driver for Windows 98SE/2000/XP

For Windows 98SE

1. Click on the "**Auto Setup"** folder and then double click on the **setup.exe.**
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.

For Windows 2000/XP

Please follow the steps:

1. **Start** → **Setting** → **Control Panel**
2. **System** → **Hardware** → **Device Manager**
4. **Network Adapter** → **Ethernet Chipset Name**
5. **Driver** → **Update Driver**
6. Follow the wizard and then mark "**Specify a location**" only.
7. Browse the path to

CD-ROM: \ Driver\ Step 5 - Ethernet Driver \ **Manual Setup - W2K** (For Windows 2000) OR **winxp – rtlnic (611)** (For Windows XP)

Appendix

A

Programming the Watchdog Timer

A.1 Programming

AEC-6830 utilizes Winbond W83697UF 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.

WatchDog Timer Configuration Registers

Logical Device 8

CRF3---Select WDTO count mode

CRF4---Default 0X00

CRF5—Watch Dog Timer status

CRF3 (PLED mode register. Default 0 x 00)

Bit Reserved

[7:3]:

Bit 2: select WDTO count mode.

0 Second

1 Minute

CRF4---Default 0X00

Watchdog Timer Time-out value. Writing a non-zero value to this register causes the counter to load the value to watchdog counter and start counting down. Reading this register returns current value in watchdog counter instead of watchdog timer time-out value.

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

CF5 (Default 0 x 00)

Bit [7]: Reserved.

Bit [6]: invert Watchdog Timer Status

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

.

You can use DEBUG commands to test watchdog function. Some examples are listed as below：

-o 4e 87 Enter W83697UF configuration mode

-o 4e 87

-o 4e 07 logic device register

-o 4f 08 logic device number

-o 4e f3 select register CRF3

-i 4f read F1 value

-00 F3 value；Bit 2=0 ----second

1 ----minute

-o 4e f4 select register CRF4

-i 4f 0a input timeout value, example:10 seconds

Digital IO control process:

The AEC-6830 digital IO interface are controlled by the W83697UF.The GPIO port locates on Logical Device 7.The CRF1 register can read or write the data of digital I/O, and please read the following information for your reference.

F1 register	Digital IO interface
Bit0	Port 1 in
Bit1	Port 2 in
Bit2	Port 3 in
Bit3	Port 4 in
Bit4	Port 5 out
Bit5	Port 6 out
Bit6	Port 7 out
Bit7	Port 8 out

You can try the AEC-6830 digital IO interface with some simple tests using DEBUG commands. Some examples are listed as below:

-o 4e 87 Enter W83697UF configuration mode

-o 4e 87

-o 4e 7 logic device register

-o 4f 7 logic device number

-o 4e f1 select register CRF1

-i 4f read F1 value

-0f F1 value

-o 4f,1f output "high" to port 5

-o 4f,3f output "high" to port 5 and port 6

-i 4f

-0e if input port 1 to "low",then you can read data become to 0e

-0d if input port 2 to "low",then you can read data become to 0d

The another method: You and setup a base address to digital IO in BIOS ,and have four selection：280h， 290h， 2A0h， 2B0h。

Example: select 280h

-o 280 1f output "high" to port 5

-o 280 3f output "high" to port 5 and port 6

-i 280

-0e if input port 1 to "low", then you can read data become to 0e

-0d if input port 2 to "low", then you can read data become to 0d

A.2 W83697UF Watchdog Timer Initial Program

```
------Enter W83697UF configuration mode
      mov    al,87h    ;Unlock 83697UF register
      out    4eh,al
      out    4eh,al
------Select Logic device 8(Watch dog device)
      mov    al,07     ; logic device register
      out    4eh,al
      mov    al,8      ;logic device 8
      out    4fh,al

------Select CRF3   (Set unit to minute or second)
      mov    al,0f3h
      out    4eh,al
      in     al,4fh
      or     al,11111011b    ;bit 2 :0-> second
                        ;    :1-> minute
                        ;Select second in this example
------Select CRF4  (Set timeout value)
      mov    al,0f4h
      out    4eh,al
      mov    al,0ah  ;10 seconds in this example
                ;Set this value to 0 disable timeout
      out    4fh,al
```

```
------Exit configuration mode
      mov     al,0aah
      out     4eh,al
```