# AHM-6155/6175/6195

# (Human Machine Interface)
# User Manual

**“The Human Machine Interface is where people and technology meet.”**

| Release Date | Revision |
|---|---|
| Sep 2006 | V1.1 |
| Apr 2007 | V1.2 |
| Spet 2008 | V1.3 |



**Aplex Technology, Inc.**
**9F-5., No. 2, Jian Pa Road, Chung Ho City, Taipei County, Taiwan**
**Tel: 886-2-82262881 Fax: 886-2-82262883 E-mail: aplex@aplex.com.tw URL: www.aplex.com.tw**

# Warning!

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the workstation with its back cover removed. There are dangerous high voltages inside.

## Disclaimer

**This information in this document is subject to change without notice. In no event shall Aplex Technology Inc. be liable for damages of any kind, whether incidental or consequential, arising from either the use or misuse of information in this document or in any related materials.**

# Table of Contents

# Chapter 1 Getting Started

## 1.1 Features

- High performance Celeron M Pentium M CPU support
- 15” XGA TFT LCD / 17” SXGA / 19” SXGA with high luminance
- Fanless cooling system
- NEMA 4/IP 65 compliant front panel
- Panel mount and VESA 75 mounting support
- Resistive touch screen
- Input voltage range of 11~28V DC
- Support Windows 2000/XP, XP embedded

## 1.2 Specifications

### System

**CPU:**
Intel® Celeron M 1GHz up to Pentium M 1.8G CPU
**System Memory:**
1 x SO DIMM Socket, Support DDR/200/266/333 up to 1GB
**Storage:**
Space for 2.5-inch HDD and 1 compact flash slot (Optional)
**Power Supply:**
Input voltage range of 11~28V/DC
**Touch Screen**:
Touch screen with 8-wire, analog resistive,
light transmission of above 80%; and life of 1 million activations (minimum)
**I/O Connectors:**
4 x Serial ports: (COM1: RS-232, COM2: RS232/422/485, COM3: reserved, COM4: for touch screen)
1 x Ethernet port (Gigabit LAN)
4 x USB ports ( 2 x on rear panel, 2 internal USB pin-header
1 x Parallel port
1 x audio mic-in, line-in and line-out
1 x PS/2 keyboard
1 x PS/2 mouse
**EMC:**
Meet FCC, CE Class A

## Display

**Resolution, color, and luminance:**

15 inches TFT LCD with resolution of 1024x768, 262k colors, 400 cd/$m^2$

17 inches TFT LCD with resolution of 1280x1024, 262k colors, 300 cd/$m^2$

19 inches TFT LCD with resolution of 1280x1024,262k colors, 300 cd/$m^2$

## Mechanical

**Construction:**

Aluminum front bezel and metal chassis

**Color:**

Black front panel

**Dimensions:**

15 inch : 409(W) x 82(D) x 309(H)mm

17 inch : 439(W) x 86(D) x 348(H)mm

19 inch : 467(W) x 86(D) x 379(H)mm

## Environment

**Operating temperature:**

0~50° C

**Storage temperature:**

-20~60° C

**Relative humidity:**

10~90% @ 50° C non-condensing

**Vibration:**

5~17Hz, 0.1” double amplitude displacement

17~640Hz, 1.5G acceleration peak to peak

**Shock:**

10 to 25Hz (X,Y,Z direction 2G, 30 minutes)

# 1.3 Dimensions

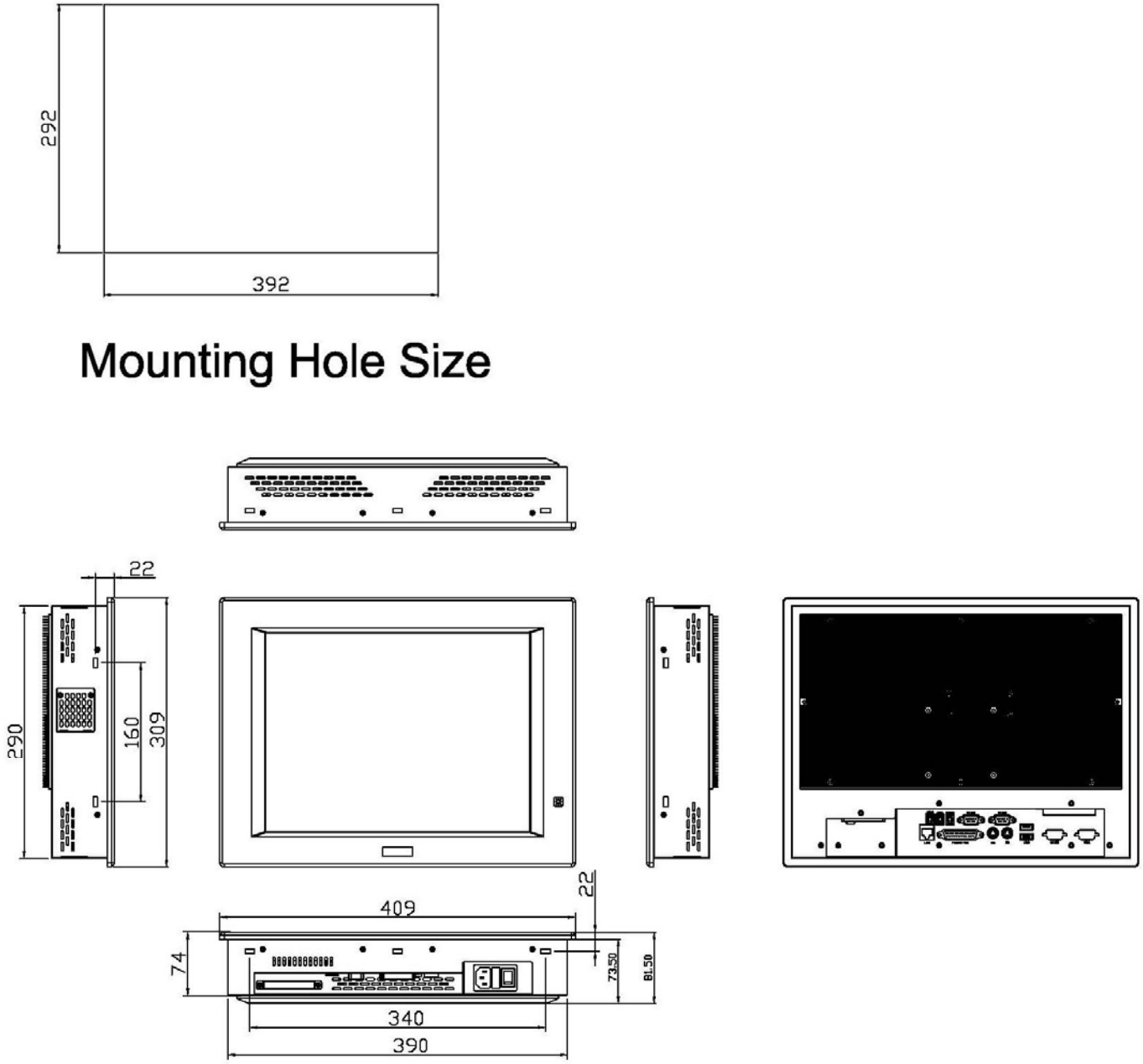
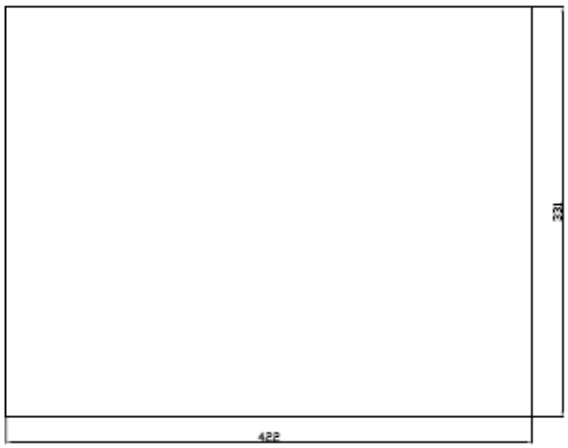



**Figure 1.1: Dimensions of the AHM-6155**




Mounting Hole Size

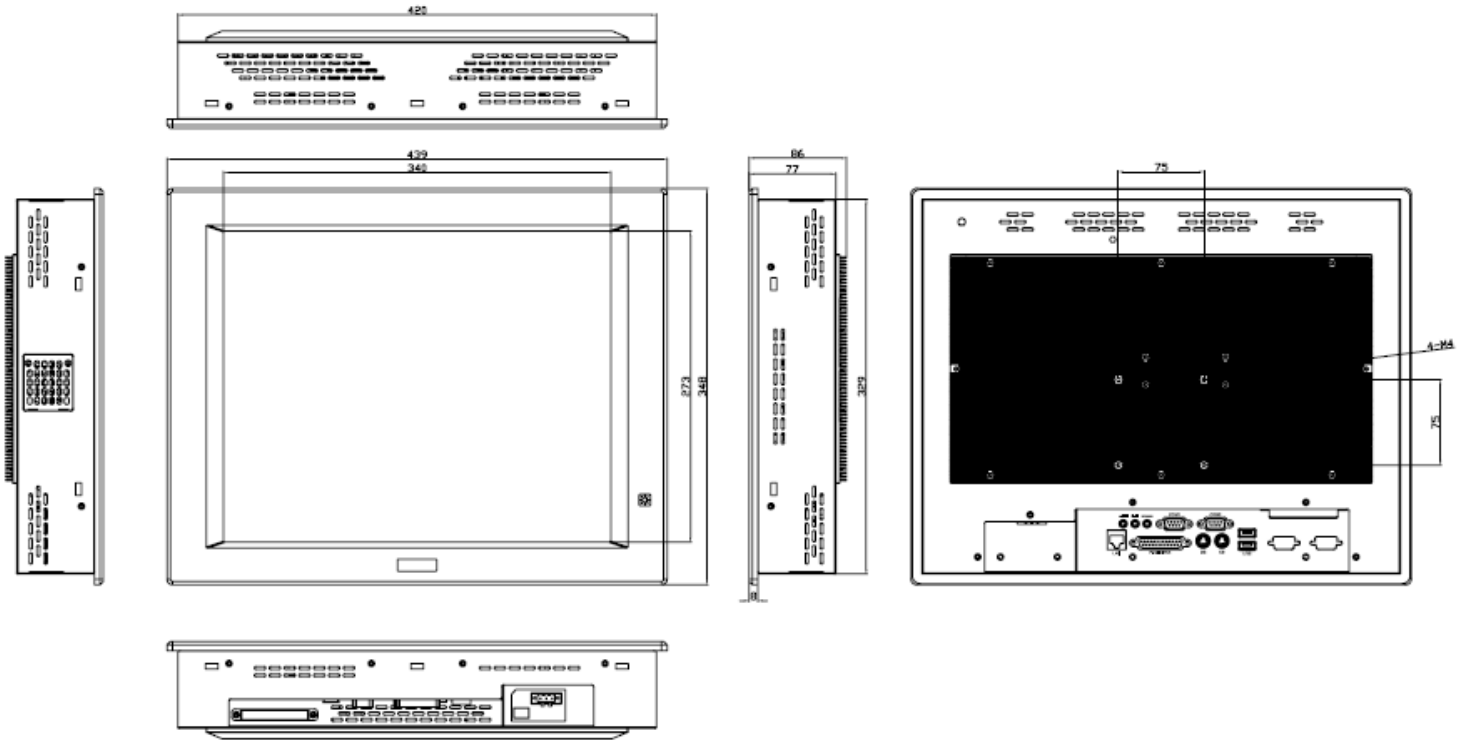
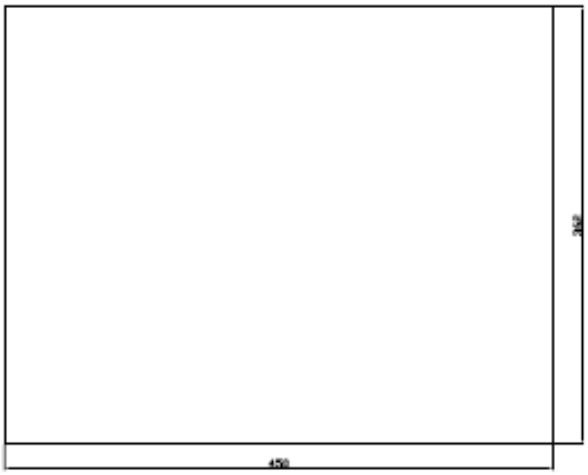



**Figure 1.2: Dimensions of the AHM-6175**



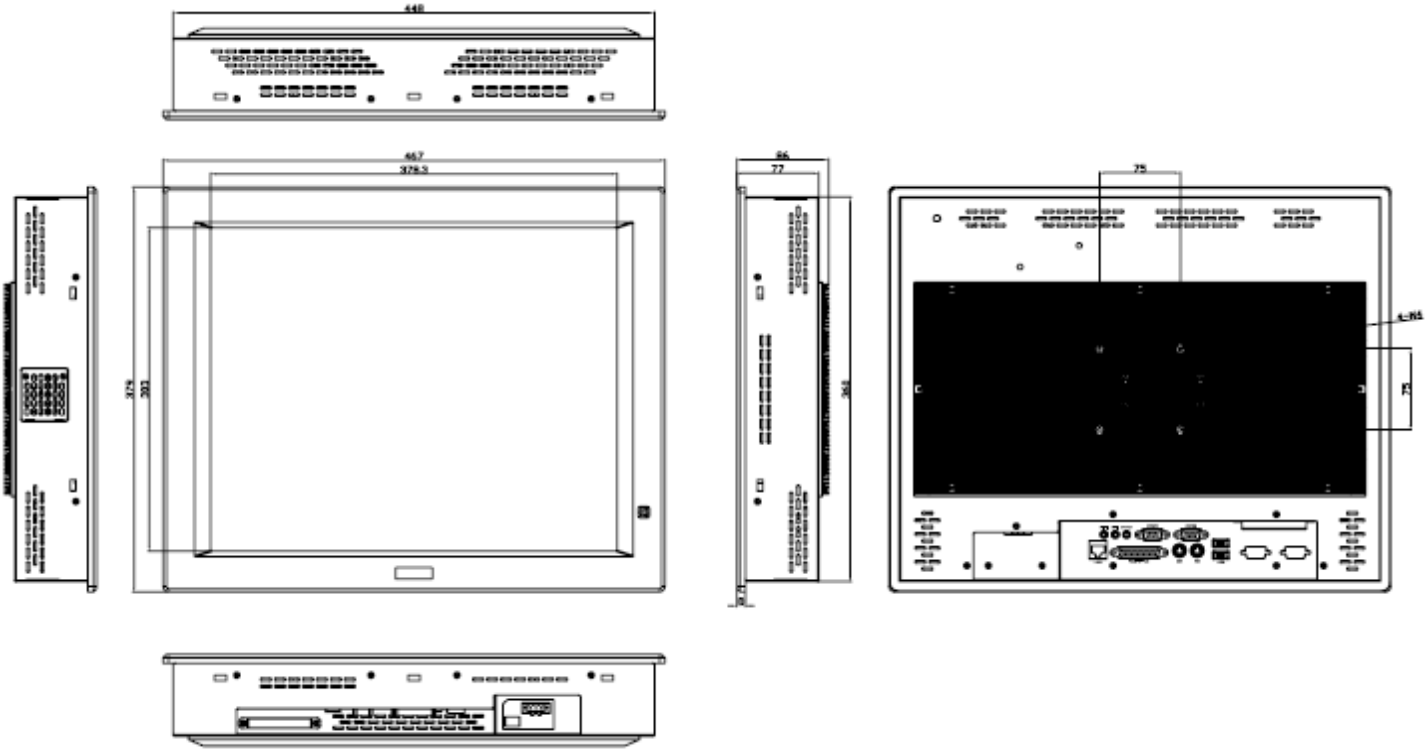



**Figure 1.3: Dimensions of the AHM-6195**

# 1.4 Block Diagram

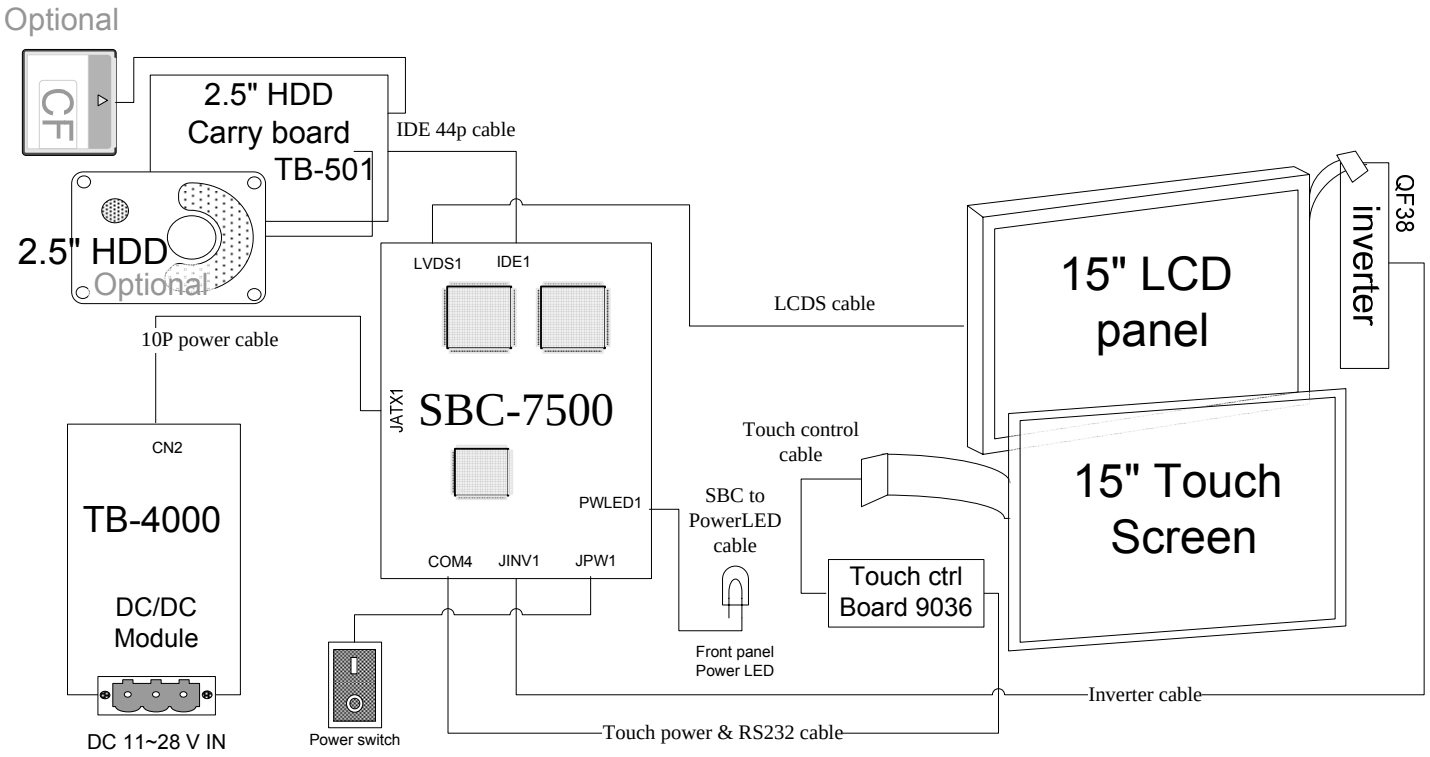



**Figure 1.3: Block Diagram of the AHM-6155/6175/6195**

# 1.5 Main board

## Specifications

**CPU:**
Socket 478 Intel Pentium® M/ Celeron® M up to 1.8GHz Auto detect voltage regulator.

**Chipset:**
Intel® 855GME+ICH4

**DRAM:**
One 200-pin DDRAM SO-DIMM up to 1Gb

**Cache:**
Built-in CPU

**BIOS:**
Phoenix-Award Flash BIOS for plug & play function. Memory size with 4MB and with VGA BIOS. Support S I/O Setup

**IDE Interface:**
One EIDE (UDMA-33/66/100) support 2 IDE devices, one compact flash type II onboard

**Serial Port:**
Four high speed 16550 Compatible UARTs with Send / Receive 16 Byte FIFOs.

**Parallel Port:**
One parallel (SPP/EPP/ECP)

**CMOS:**
Built-in chipset with external battery

**Keyboard and Mouse:**
PS/2 (mini DIN connector)

**Speaker:**
Internal buzzer and external speaker connector

**VGA:**
Integrated in Built-in Intel 855GME, share system memory, support CRT, LVDS
Brightness control on rear panel

**LAN:**
Intel 82541 Chip. RJ-45 jack onboard, Support for 10/100/1000 Base-T Ethernet.
Support Wake-On-LAN function.

**Sound:**
AC ’97 Codec, ALC202A, with line-in, line-out, mic

**USB:**
4 x USB ports ( 2 x on rear panel, 2 internal USB pin-header)

**Expansion Bus:**
One Mini-PCI

**Hardware Monitor:**
Voltage, CPU temperature and cooling fan

**Green Function:**
Controlled by hardware and software

**System Applications:**
Microsoft® Windows CE.NET 4.2, 2000/XP

## 1.6 Brief Description of the AHM-6155/6175/6195

The AHM-6155/6175/6195 is the compact, panel-mount industrial fanless touch panel computer with 15-inch/17-inch/19-inch TFT LCD. The AHM-6155/6175/6195 is powered by a Intel® Socket 478 Pentium Mobile/Celeron Mobile based processor up to 1.8GHz. It comes with a compact flash, 2.5-inch hard disk drive, 1 x DDR memory slot, 4 serial ports, audio, Ethernet, DC input, and optional USB ports. The unit supports Windows 2000 Professional, Windows XP, Windows XP and Embedded The compact, fanless touch panel computer is ideal for use as Web Browser, Terminal and HMI at all levels of automation control.


**Figure 1.3: Front View of AHM-6155/6175/6195**

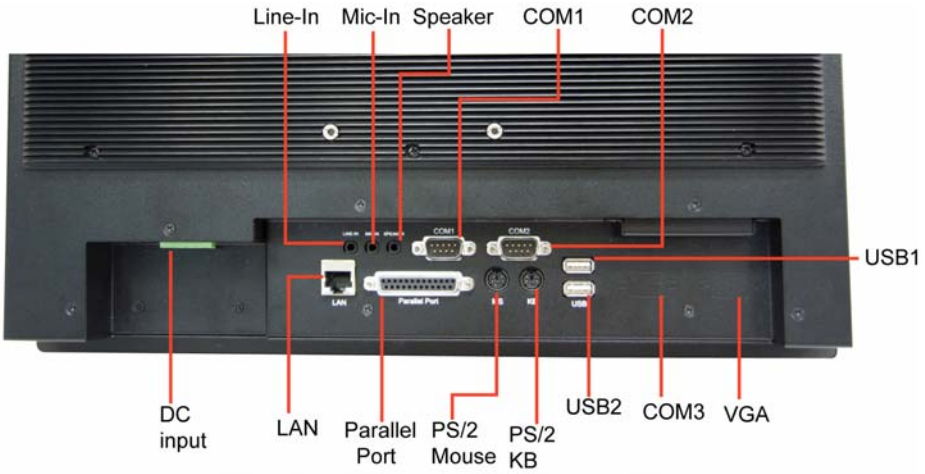



**Figure 1.4: Rear View of AHM-6155/6175/6195**

# Chapter 2 Installation

## 2.1 Installation of the AHM-6155/6175/6195 Fanless Touch Panel Computer

### 2.1 Removal of Chassis Cover

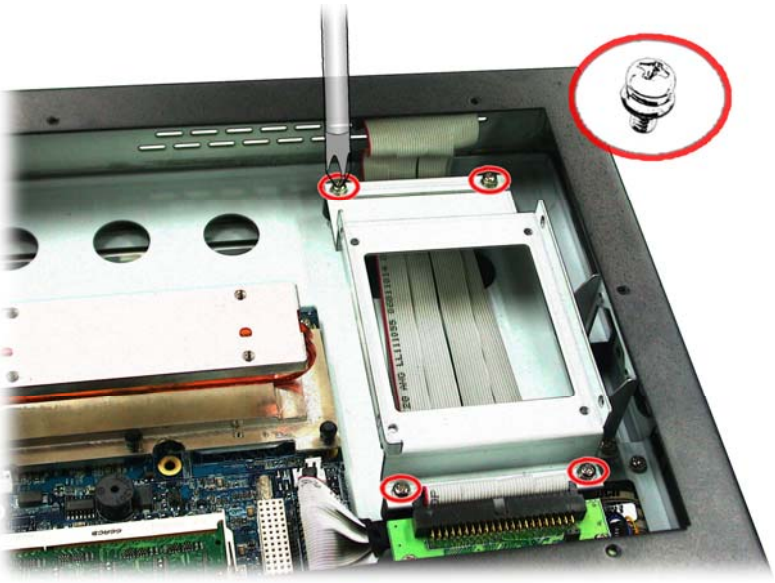
There are 12 screws to deal with when enclosing or removing the chassis. Six are on the its edges while the other six in the almost central part of it.


### 2.2 Removing Heat sink

Remove the Heat sink by loosened screws

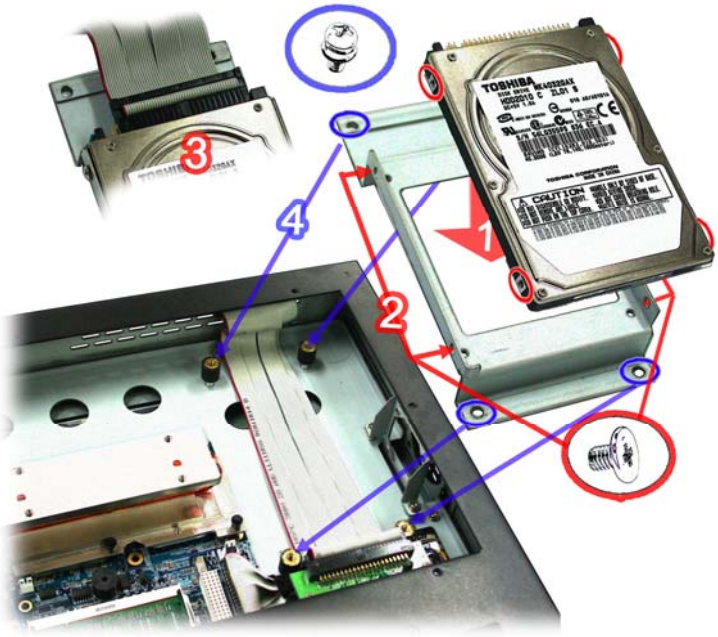
## 2.3 Removing HDD Rack from Its Place

Just take off the HDD rack from its place and get ready to install the HDD.



## 2.4 Enclosing the HDD

Enclose the HDD with the HDD rack as shown in the picture and Put the HDD in its place by tightening the four screws as circled.




## 2.5 Closing Chassis

Close the chassis in the same way as it was opened. Just tighten the 12 screws as circled and the installation of the AHM-6155 is completely done.

## 2.10 Panel Mounting

The AHM-6155/6175/6195 HMI Controller is designed to be panel-mounted as shown in Figure 2.1. Just carefully place the unit through the hole and tighten the given 9 screws from the rear to secure the mounting.

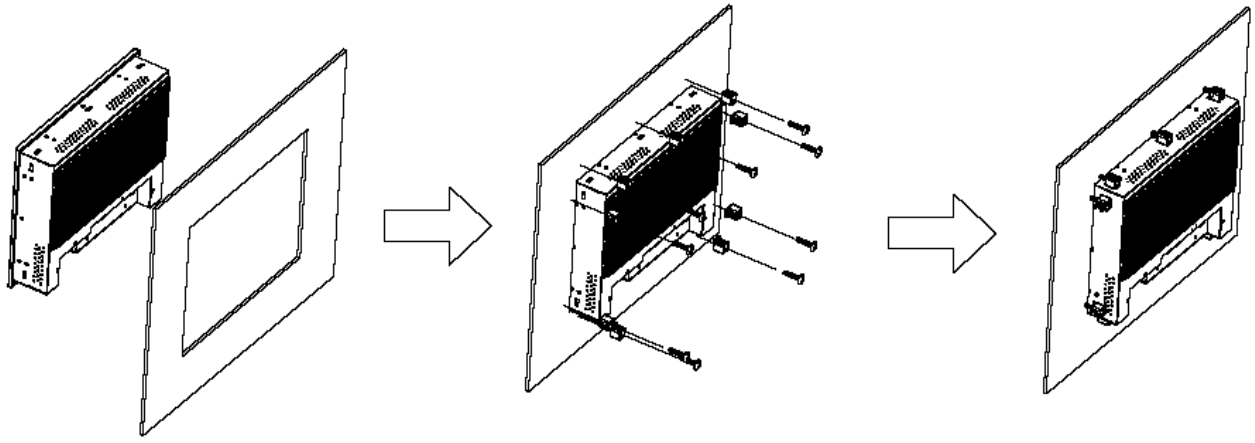


**Figure 2.1: Panel-mounting**

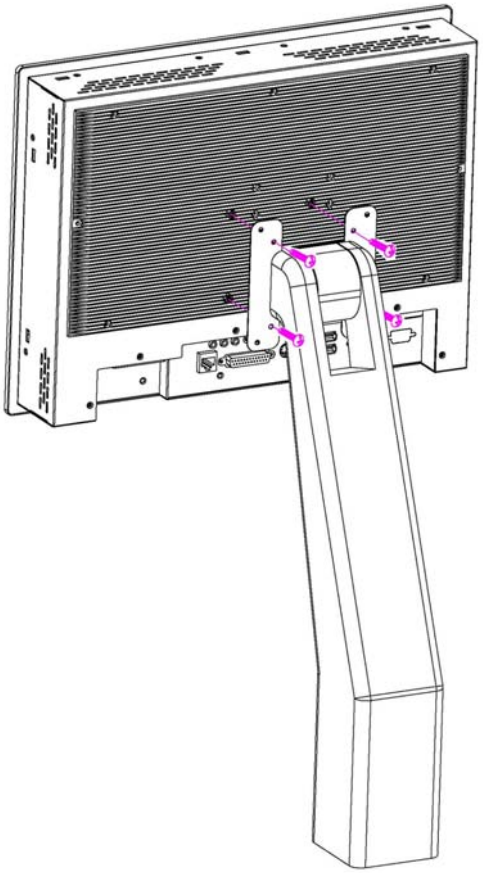


**Figure 2.2: VESA Mount of AHM-6155/6175/6195**

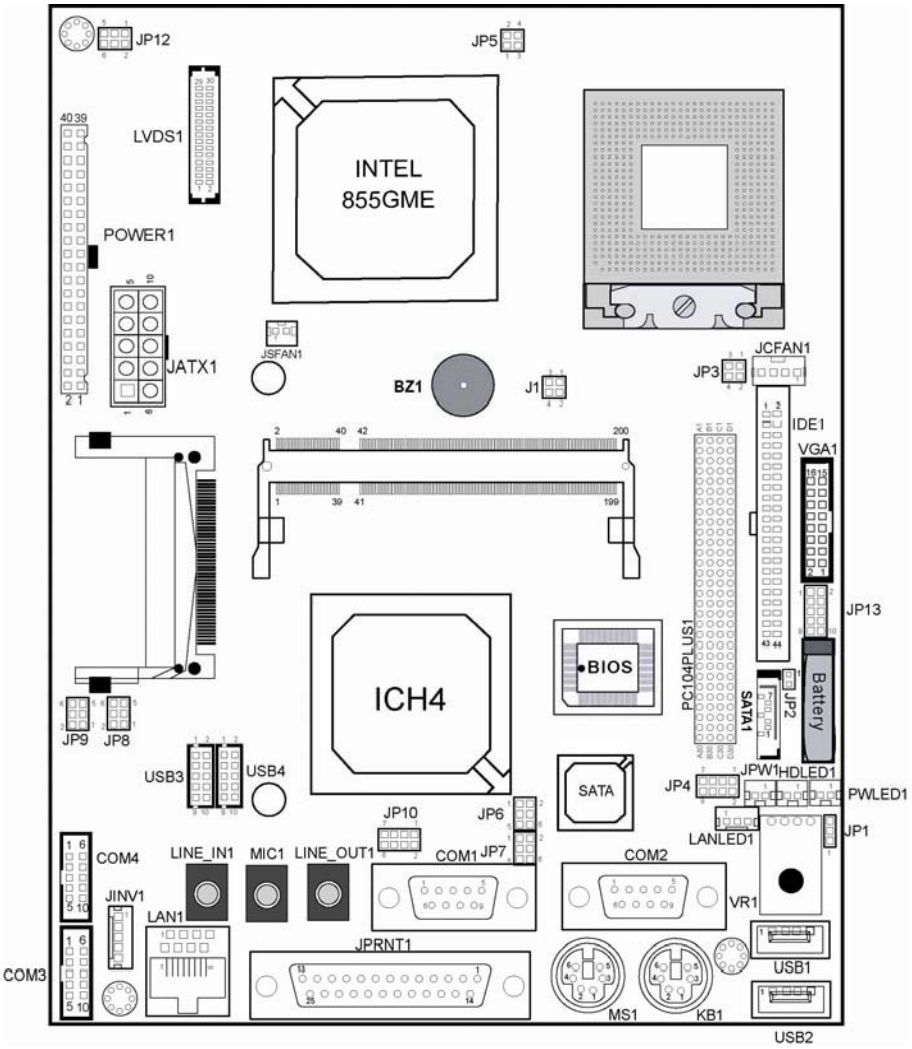
# Chapter 3 Mainboard

## 3.1 JUMPER & CONNECTOR QUICK REFERENCE TABLE

COM1 RI & Voltage Selection ……..…….. JP6
COM2 RI & Voltage Selection …… JP7
COM3 RI & Voltage Selection ……. …JP9
COM4 RI & Voltage Selection …… .JP8
RS232/422/485 (COM2) Selection .....……JP13
Brightness Voltage Selection ……..…… JP1
LVDS Voltage Selection …… ..JP12
LVDS Panel Resolution Selection …… JP10
CMOS Function Selection …… .JP2
Watchdog Reset/NMI Selection ……..…….. ...JP4
CPU_VCCA Voltage Selection …… JP5
CPU Frequency Selection …… JP3
VGA Connector …… VGA1
LVDS Connector .....…… LVDS1
COM Port Connector ……..COM1, COM2
…… COM3, COM4
Power Connector …… JATX1
Hard Disk Drive Connector ….....……IDE1
Printer Connector …… JPRNT1
LAN Connector ….....….....……LAN1
LAN LED Connector …… LANLED1
Keyboard Connector …… KB1
PS/2 Mouse Connector ….....……MS1
HDD LED Connector ……HDLED1
Power Button ……..…….. ..JPW1
Power LED Connector …… …PWLED1
USB Connector …… USB1, USB2, USB3, USB4
Memory Installation ….....…… DIMM1
Inverter Connector …… JINV1
IDE Power Module ……POWER1
Compact Flash Connector …….. CF1
PC104+ Connector ……PC104PLUS1
CPU Fan Connector …… ...JCFAN1
System Fan Connector …… ..JSFAN1
Serial ATA Connector …… …SATA1

Reset & Speaker Connector …….... J1

# 3.2 COMPONENT LOCATIONS



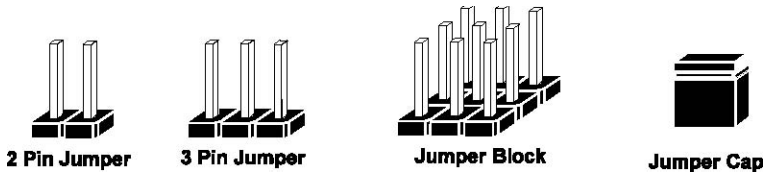

**Main Board Connector, Jumper and Component locations**

# 3.3 HOW TO SET THE JUMPERS

You can configure your board by setting the jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "opening" or "closing" pins.

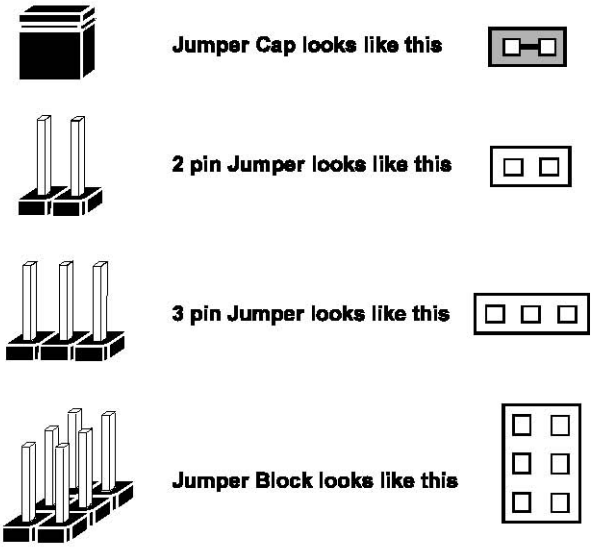
The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

**JUMPERS AND CAPS**

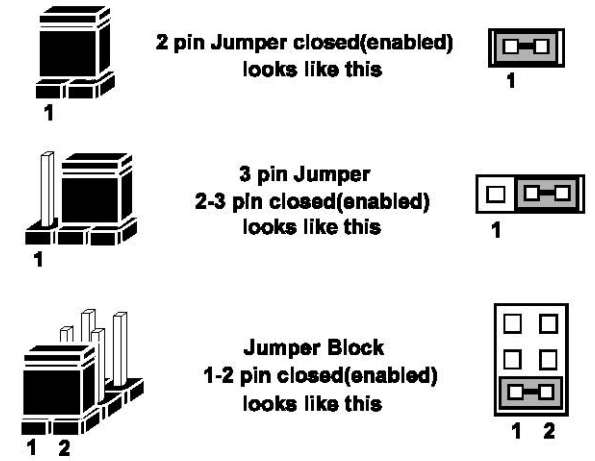



If a jumper has three pins for example, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

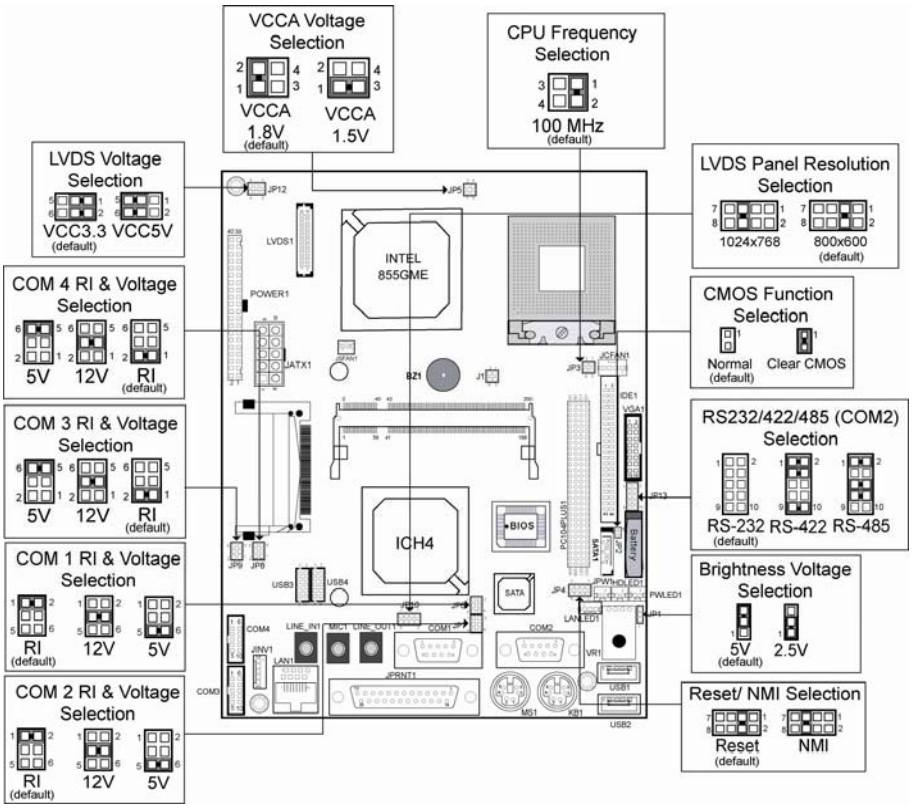
## JUMPER DIAGRAMS




## JUMPER SETTINGS



**Main Board Jumper Illustration**




# 3.4 COM 1 RI & VOLTAGE SELECTION

**JP6** : COM1 RI & Voltage Selection The selections are as follows:

# 3-5. COM 2 RI & VOLTAGE SELECTION

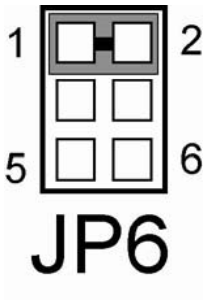
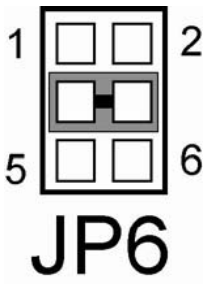
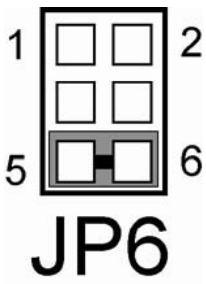
**JP7 :** COM2 RI & Voltage Selection The selections are as follows:

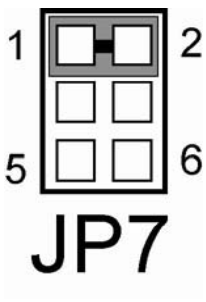
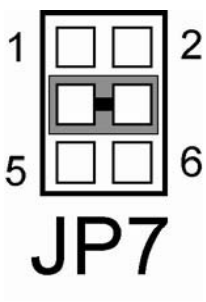
# 3-6. COM 3 RI & VOLTAGE SELECTION

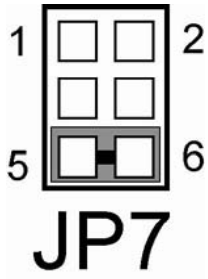
**JP9** : COM3 RI & Voltage Selection The selections are as follows:

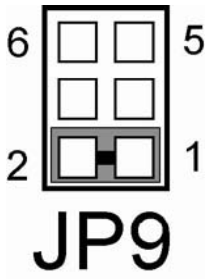
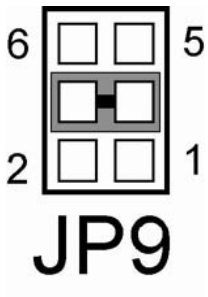
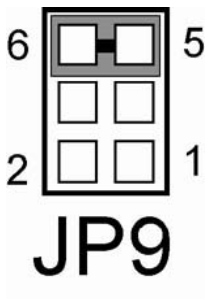
# 3-7. COM 4 RI & VOLTAGE SELECTION

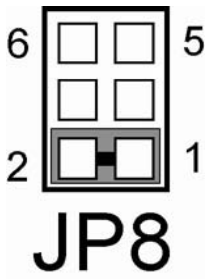
**JP8** : COM4 RI & Voltage Selection The selections are as follows:

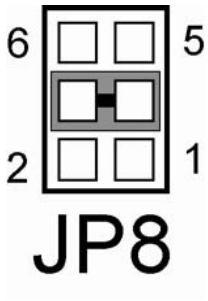
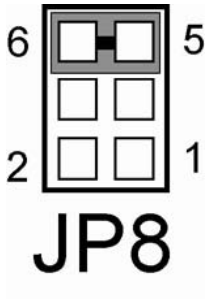
| SELECTION | | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|---|
| COM1 | RI (default) | 1-2 |  |
| | 12V | 3-4 |  |
| | 5V | 5-6 |  |

| SELECTION | | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|---|
| COM2 | RI (default) | 1-2 |  |
| | 12V | 3-4 |  |

| | | | |
|---|---|---|---|
| | 5V | 5-6 |  |

| SELECTION | | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|---|
| COM3 | RI (default) | 1-2 |  |
| | 12V | 3-4 |  |
| | 5V | 5-6 |  |

| SELECTION | | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|---|
| COM4 | RI (default) | 1-2 |  |

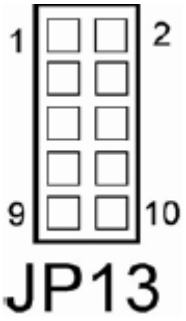
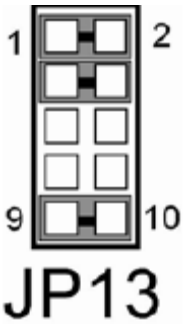
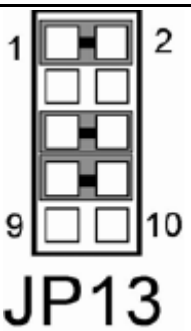
| | | | |
|---|---|---|---|
| | 12V | 3-4 |  |
| | 5V | 5-6 |  |

# 3.8 RS232/422/485 (COM2) SELECTION

**JP13 :** RS-232/422/485 (COM2) Selection

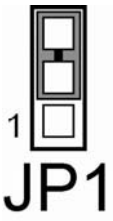
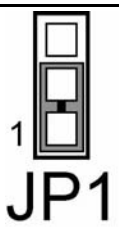
COM2 is selectable for RS-232, 422, 485 function.

The jumper settings are as follows :

| COM 2 FUNCTION | JUMPER SETTING (pin closed) | JUMPER ILLUSTRATION |
|---|---|---|
| RS-232 (default) | Open |  |
| RS-422 | 1-2, 3-4, 9-10 |  |
| RS-485 | 1-2, 5-6, 7-8 |  |

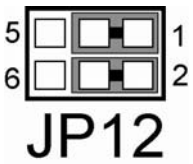
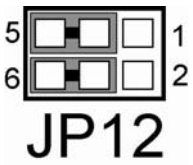
# 3.9 BRIGHTNESS VOLTAGE SELECTION

**JP1**: Brightness Voltage Selection The selections are as follows :

| SELECTION | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|
| 5V (default) | 2-3 |  |
| 2.5V | 1-2 |  |

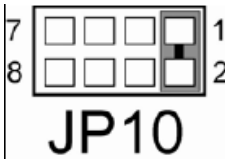
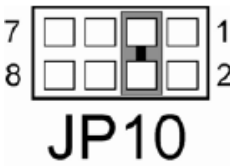
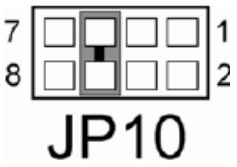
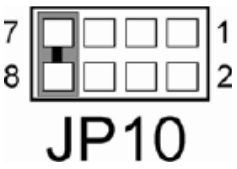
# 3.10 LVDS VOLTAGE SELECTION

**JP12**: LVDS Voltage Selection
The selections are as follows :

| SELECTION | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|
| VCC 3.3 | 1-3, 2-4 |  |
| VCC 5 | 3-5, 4-6 |  |

# 3.11 LVDS PANEL RESOLUTION SELECTION

**JP10 :** LVDS Panel Resolution Selection.
The selections are as follows:

| FUNCTION | JUMPER SETTING (pin closed) | JUMPER ILLUSTRATION |
|---|---|---|
| 640 x 480 | 1-2 |  |
| 800 x 600 (10.4”) (default) | 3-4 |  |
| 1024 x 768 (15”) | 5-6 |  |
| 1280 x 1024 | 7-8 |  |

# 3.12 CMOS FUNCTION SELECTION

**JP2**: CMOS Function Selection The selections are as follows:

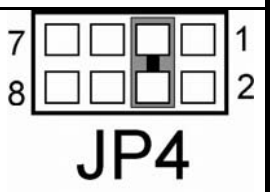
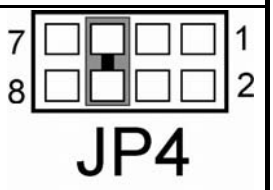
| FUNCTION | JUMPER SETTING (pin closed) | JUMPER ILLUSTRATION |
|---|---|---|
| NORMAL (default) | Open |  |

| | | |
|---|---|---|
| CLEAR CMOS | 1-2 |  |

To clear CMOS data, user must power-off the computer and set the jumper to “Clear CMOS” as illustrated above. After five to six seconds, set the jumper back to “Normal” and power-on the computer.

## 3.13 RESET / NMI SELECTION

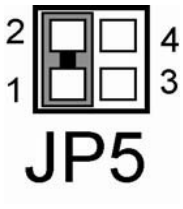
**JP4 :** Reset/NMI/Clear Watchdog Selection The selections are as follows:

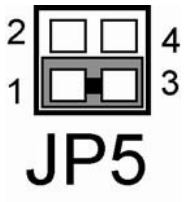
| FUNCTION | JUMPER SETTING | JUMPER ILLUSTRATION |
|---|---|---|
| Reset (default) | 3-4 |  |
| NMI | 5-6 |  |

User may select to use the Reset or NMI watchdog. NMI, also known as Non-Maskable Interrupt, is used for serious conditions that demand the processor’s immediate attention, it cannot be ignored by the system unless it is shut off specifically. To clear NMI command, user should short the “Clear Watchdog” pin via push button.

## 3.14 CPU_VCCA VOLTAGE SELECTION

**JP5**: CPU_VCCA Voltage Selection The selections are as follows :

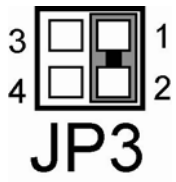
| SELECTION | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|
| VCCA 1.8V | 1-2 |  |

| | | |
|---|---|---|
| VCCA 1.5V | 1-3 |  |

*** Manufacturing Default: VCCA 1.8V.

# 3.15 CPU FREQUENCY SELECTION

**JP3**: CPU Frequency Selection
The selections are as follows :

| SELECTION | JUMPER SETTING (Pin Closed) | JUMPER ILLUSTRATION |
|---|---|---|
| 100 MHz | 1-2 |  |

*** Manufacturing Default: 100MHz.

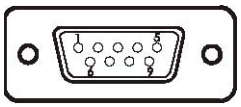
# 3.16 COM PORT CONNECTOR

There are four COM ports enhanced in this board namely: COM1, COM2, COM3 and COM4. COM1, COM3 and COM4 are fixed for RS-232, while COM2 is selectable for RS-232/422/485.

**COM1 :** COM1 Connector
The COM1 Connector assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | DCD1 |
| 2 | RX1 |

| | |
|---|---|
| 3 | TX1 |
| 4 | DTR1 |
| 5 | GND |
| 6 | DSR1 |
| 7 | RTS1 |
| 8 | CTS1 |
| 9 | RI1 |

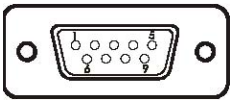


**COM1**

**COM2 :** COM2 Connector

The COM2 Connector assignments are as follows :

| PIN | ASSIGNMENT | | |
|---|---|---|---|
| | **RS-232** | **RS-422** | **RS-485** |
| 1 | DCD2 | TX- | TX- |
| 2 | RX2 | TX+ | TX+ |
| 3 | TX2 | RX+ | RX+ |
| 4 | DTR2 | RX- | RX- |
| 5 | GND | GND | GND |
| 6 | DSR2 | RTS- | NC |
| 7 | RTS2 | RTS+ | NC |
| 8 | CTS2 | CTS+ | NC |
| 9 | RI2 | CTS- | NC |

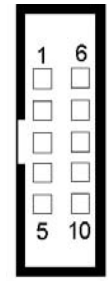


**COM2**

**COM3 :** COM3 Connector

The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | DCD3 |
| 2 | RX3 |
| 3 | TX3 |
| 4 | DTR3 |
| 5 | GND |
| 6 | DSR3 |
| 7 | RTS3 |
| 8 | CTS3 |
| 9 | RI3 |
| 10 | NC |

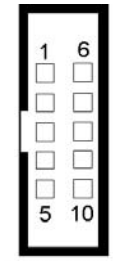


COM3

**COM4 :** COM4 Connector

The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | DCD4 |
| 2 | RX4 |
| 3 | TX4 |
| 4 | DTR4 |
| 5 | GND |
| 6 | DSR4 |
| 7 | RTS4 |
| 8 | CTS4 |
| 9 | RI4 |
| 10 | NC |



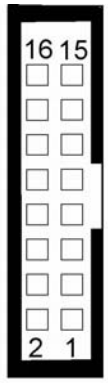
COM4

All COM port's pin 9 is selectable for RI, +5V or +12V. For more information, please refer to our "2-5 COM RI and Voltage Selection".

# 3.17 VGA CONNECTOR

**VGA1 :** VGA Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT |
|---|---|
| 1 | RED |
| 2 | GREEN |
| 3 | BLUE |
| 4 | NC |
| 5 | GND |
| 6 | GND |
| 7 | GND |
| 8 | GND |
| 9 | VCC |
| 10 | GND |
| 11 | NC |
| 12 | VGA DDC DATA |
| 13 | HSYNC |
| 14 | VSYNC |
| 15 | VGA DDC CLK |
| 16 | NC |



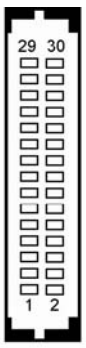

VGA1

## 3.18 LVDS CONNECTOR

**LVDS1 :** LVDS Connector

The pin assignments are as follows :

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | LVDS_VCC | 2 | GND |
| 3 | ZCN | 4 | ZCP |
| 5 | GND | 6 | Z2N |
| 7 | Z2P | 8 | GND |
| 9 | Z1N | 10 | Z1P |
| 11 | Z3P | 12 | Z3N |
| 13 | Z0P | 14 | Z0N |
| 15 | GND | 16 | YCP |
| 17 | YCN | 18 | GND |
| 19 | Y2P | 20 | Y2N |
| 21 | GND | 22 | Y1P |
| 23 | Y1N | 24 | GND |
| 25 | Y0P | 26 | Y0N |
| 27 | Y3P | 28 | Y3N |
| 29 | LVDS_VCC | 30 | LVDS_VCC |

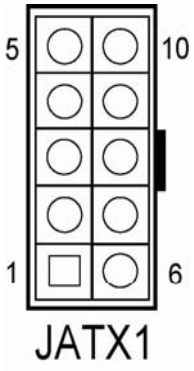



LVDS1

# 3.19 POWER CONNECTOR

**JATX1**: Power Connector
The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| | 5V |
| | 5V |
| | GND |
| | GND |
| | 12V |
| | 5VSB |
| | 5V |
| | GND |
| | PS_ON |
| | -12V |

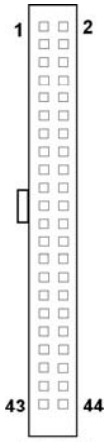



# 3.20 HARD DISK DRIVE CONNECTOR

**IDE1 :** Hard Disk Drive Connector
The pin assignments are as follows:

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | IDERSTJ | 2 | GND |
| 3 | PDD7 | 4 | PDD8 |
| 5 | PDD6 | 6 | PDD9 |
| 7 | PDD5 | 8 | PDD10 |

| | | | |
|---|---|---|---|
| 9 | PDD4 | 10 | PDD11 |
| 11 | PDD3 | 12 | PDD12 |
| 13 | PDD2 | 14 | PDD13 |
| 15 | PDD1 | 16 | PDD14 |
| 17 | PDD0 | 18 | PDD15 |
| 19 | GND | 20 | NC |
| 21 | DDREQA | 22 | GND |
| 23 | DIOWAJ | 24 | GND |
| 25 | DIORAJ | 26 | GND |
| 27 | HDRDYA | 28 | PULL LOW |
| 29 | DDACKAJ | 30 | GND |
| 31 | IDE_IRQ14 | 32 | NC |
| 33 | PDA1 | 34 | PD_80P |
| 35 | PDA0 | 36 | PDA2 |
| 37 | PDCSJ1 | 38 | PDCSJ3 |
| 39 | HDLEDJ1 | 40 | GND |
| 41 | 5V | 42 | 5V |
| 43 | GND | 44 | NC |



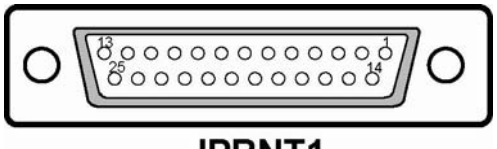
IDE1

# 3.21 PRINTER CONNECTOR

**JPRNT1 :** Printer Connector

As to link the Printer to the card, you need a cable to connect both DB25 connector and parallel port.

The pin assignments are as follows :



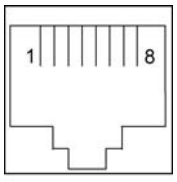
JPRNT1

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | STROBE | 14 | AFDJ |
| 2 | PPD0 | 15 | ERRORJ |
| 3 | PPD1 | 16 | INITJ |
| 4 | PPD2 | 17 | SLINJ |
| 5 | PPD3 | 18 | GND |
| 6 | PPD4 | 19 | GND |
| 7 | PPD5 | 20 | GND |
| 8 | PPD6 | 21 | GND |
| 9 | PPD7 | 22 | GND |
| 10 | ACKJ | 23 | GND |
| 11 | BUSY | 24 | GND |
| 12 | PE | 25 | GND |
| 13 | SLCT | | |

## 3.22 LAN CONNECTOR

**LAN1:** LAN Connector.
The pin assignment is as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | MDI_0P |
| 2 | MDI_0N |
| 3 | MDI_1P |
| 4 | MDI_2P |
| 5 | MDI_2N |
| 6 | MDI_1N |
| 7 | MDI_3P |
| 8 | MDI_3N |

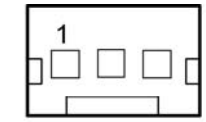


LAN1

## 3.23 LAN LED CONNECTOR

**LANLED1 :** LAN LED Connector The pin assignment is as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | LED100 |
| 2 | CONTROL |
| 3 | LED1000 |

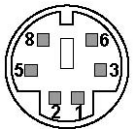



LANLED1

## 3.24 KEYBOARD CONNECTOR

**KB1 :** PC/AT Keyboard Connector The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | KB DATA |
| 2 | NC |
| 3 | GND |
| 5 | 5VSB |
| 6 | KB CLK |
| 8 | NC |

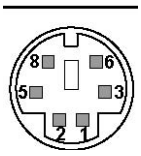



**KB1**

## 3.25 PS/2 MOUSE CONNECTOR

**MS1 :** PS/2 Mouse Connector
The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | MS DATA |
| 2 | NC |
| 3 | GND |
| 5 | 5VSB |
| 6 | MS CLK |
| 8 | NC |

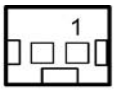



**MS1**

## 3.26 HDD LED CONNECTOR

**HDLED1 :** HDD LED Connector The pin assignment is as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | HD_LED+ |
| 2 | HD_LED- |

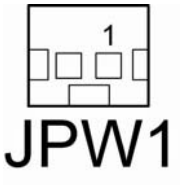



HDLED1

## 3.27 POWER BUTTON

**JPW1** : Power Button
The pin assignments are as follows:

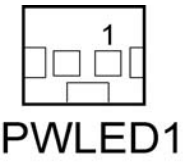
| PIN | ASSIGNMENT |
|---|---|
| 1 | PWR_BN1 |
| 2 | PWR_BN2 |




## 3.28 POWER LED CONNECTOR

**PWLED1:** Power LED Connector. The pin assignments are as follows :

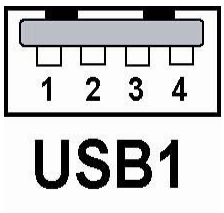
| PIN | ASSIGNMENT |
|---|---|
| 1 | PW_LED+ |
| 2 | GND |




## 3.29 UNIVERSAL SERIAL BUS CONNECTOR

**USB1:** Universal Serial Bus Connector. The pin assignments are as follows :

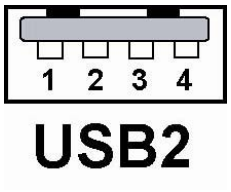
| PIN | ASSIGNMENT |
|---|---|
| 1 | 5V_USB0 |
| 2 | USB0N |
| 3 | USB0P |
| 4 | GND |




**USB2:** Universal Serial Bus Connector. The pin assignments are as follows :

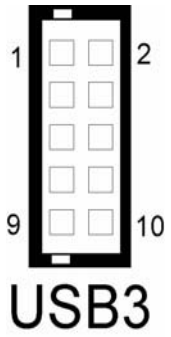
| PIN | ASSIGNMENT |
|---|---|
| 1 | 5V_USB1 |
| 2 | USB1N |

| | |
|---|---|
| 3 | USB1P |
| 4 | GND |




**USB3 :** Universal Serial Bus Connector. The pin assignments are as follows :

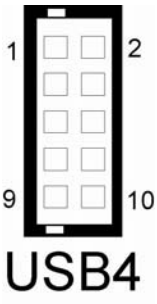
| PIN | ASSIGNMENT |
|---|---|
| 1 | 5V_USB2 |
| 3 | USB2N |
| 5 | USB2P |
| 7 | GND |
| 9 | GND |
| 2 | 5V_USB3 |
| 4 | USB3N |
| 6 | USB3P |
| 8 | GND |
| 10 | GND |




**USB4 :** Universal Serial Bus Connector. The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | 5V_USB4 |
| 3 | USB4N |
| 5 | USB4P |
| 7 | GND |
| 9 | GND |
| 2 | 5V_USB5 |

| | |
|---|---|
| 4 | USB5N |
| 6 | USB5P |
| 8 | GND |
| 10 | GND |




# 3.30 MEMORY INSTALLATION

This system is enhanced with 1 DDR DRAM banks, which support up to 1G.

**DRAM BANK CONFIGURATION**

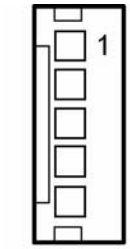
| DIMM 1 | TOTAL MEMORY |
|---|---|
| 128M | 128MB |
| 256M | 256MB |
| 512M | 512MB |
| 1G | 1G |

# 3.31 INVERTER CONNECTOR

**JINV1:** Inverter Connector.
The pin assignments are as follows :

| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC12 |

| | |
|---|---|
| 2 | GND |
| 3 | BRCTR |
| 4 | NC |
| 5 | ENVEE (Inverter backlight On/Off control signal) |




JINV1

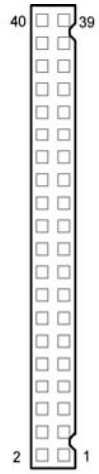
# 3.32 POWER MODULE

**POWER1 :** Power Module.

The pin assignments are as follows :

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | +5V | 2 | 5VSB |
| 3 | +5V | 4 | 5VSB |
| 5 | +5V | 6 | 5VSB |
| 7 | +5V | 8 | +5V |
| 9 | +5V | 10 | +5V |
| 11 | +5V | 12 | +5V |
| 13 | GND | 14 | GND |
| 15 | GND | 16 | GND |
| 17 | GND | 18 | GND |
| 19 | PS-ON | 20 | GND |
| 21 | NC | 22 | GND |
| 23 | NC | 24 | GND |
| 25 | -12V | 26 | +12V |
| 27 | -12V | 28 | +12V |

| | | | |
|---|---|---|---|
| 29 | -12V | 30 | +12V |
| 31 | NC | 32 | NC |
| 33 | NC | 34 | NC |
| 35 | NC | 36 | NC |
| 37 | NC | 38 | NC |
| 39 | NC | 40 | NC |



POWER1

# 3.33 COMPACT FLASH CONNECTOR

**CF1 :** Compact Flash Connector. The pin assignments are as follows :

| PIN | ASSIGNMENT | PIN | ASSIGNMENT |
|---|---|---|---|
| 1 | GND | 26 | GND |
| 2 | D03 | 27 | D11 |
| 3 | D04 | 28 | D12 |
| 4 | D05 | 29 | D13 |
| 5 | D06 | 30 | D14 |
| 6 | D07 | 31 | D15 |
| 7 | CSJ1 | 32 | CSJ3 |
| 8 | GND | 33 | GND |
| 9 | GND | 34 | SDIORDJ |
| 10 | GND | 35 | SDIOWRJ |
| 11 | GND | 36 | +5V |
| 12 | GND | 37 | IRQ15 |
| 13 | +5V | 38 | +5V |
| 14 | GND | 39 | -CSEL |
| 15 | GND | 40 | NC |

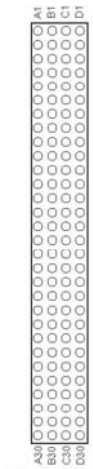
| | | | |
|---|---|---|---|
| 16 | GND | 41 | RESETJ |
| 17 | GND | 42 | IORDY |
| 18 | A02 | 43 | REQ |
| 19 | A01 | 44 | ACKJ |
| 20 | A00 | 45 | CF_LEDJ |
| 21 | D00 | 46 | -PDIAG |
| 22 | D01 | 47 | D08 |
| 23 | D02 | 48 | D09 |
| 24 | NC | 49 | D10 |
| 25 | GND | 50 | GND |

# 3.34 PCI-104 CONNECTOR

**PC104PLUS1 :** PCI-104 Connector. The pin assignments are as follows :

| A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|
| PIN | ASSIGNMENT | PIN | ASSIGNMENT | PIN | ASSIGNMENT | PIN | ASSIGNMENT |
| A1 | GND | B1 | SERIR | C1 | +5V | D1 | AD00 |
| A2 | NC | B2 | AD02 | C2 | AD01 | D2 | +5V |
| A3 | AD05 | B3 | GND | C3 | AD04 | D3 | AD03 |
| A4 | CBEJ0 | B4 | AD07 | C4 | GND | D4 | AD06 |
| A5 | GND | B5 | AD09 | C5 | AD08 | D5 | GND |
| A6 | AD11 | B6 | NC | C6 | AD10 | D6 | M66EN |
| A7 | AD14 | B7 | AD13 | C7 | GND | D7 | AD12 |
| A8 | +3.3V | B8 | CBEJ1 | C8 | AD15 | D8 | +3.3V |
| A9 | SERRJ | B9 | GND | C9 | NC | D9 | PAR |
| A10 | GND | B10 | PERRJ | C10 | +3.3V | D10 | SDONE |
| A11 | STOPJ | B11 | +3.3V | C11 | LOCKJ | D11 | GND |
| A12 | +3.3V | B12 | TRDYJ | C12 | GND | D12 | DEVSELJ |
| A13 | FRAMEJ | B13 | GND | C13 | IRDYJ | D13 | +3.3V |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A14 | GND | B14 | AD16 | C14 | +3.3V | D14 | CBEJ2 |
| A15 | AD18 | B15 | +3.3V | C15 | AD17 | D15 | GND |
| A16 | AD21 | B16 | AD20 | C16 | GND | D16 | AD19 |
| A17 | +3.3V | B17 | AD23 | C17 | AD22 | D17 | +3.3V |
| A18 | IDSEL0 | B18 | GND | C18 | IDSEL1 | D18 | IDSEL2 |
| A19 | AD24 | B19 | CBEJ3 | C19 | NC | D19 | IDSEL3 |
| A20 | GND | B20 | AD26 | C20 | AD25 | D20 | GND |
| A21 | AD29 | B21 | +5V | C21 | AD28 | D21 | AD27 |
| A22 | +5V | B22 | AD30 | C22 | GND | D22 | AD31 |
| A23 | REQJ0 | B23 | GND | C23 | REQJ1 | D23 | NC |
| A24 | GND | B24 | REQJ2 | C24 | +5V | D24 | GNTJ0 |
| A25 | GNTJ1 | B25 | NC | C25 | GNTJ2 | D25 | GND |
| A26 | +5V | B26 | PCLK1 | C26 | GND | D26 | PCLK2 |
| A27 | PCLK3 | B27 | +5V | C27 | PCLK4 | D27 | GND |
| A28 | GND | B28 | INTDJ | C28 | +5V | D28 | RSTJ |
| A29 | +12V | B29 | INTAJ | C29 | INTBJ | D29 | INTCJ |
| A30 | -12V | B30 | NC | C30 | NC | D30 | GND |



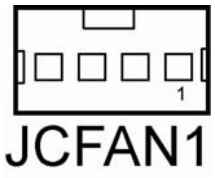
PC104PLUS1

# 3.35 CPU FAN CONNECTOR

**JCFAN1 :** CPU Fan Connector

| PIN | ASSIGNMENT |
|---|---|

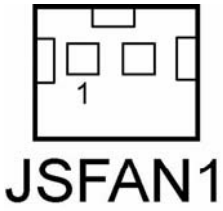
| | |
|---|---|
| 1 | GROUND |
| 2 | FAN_VCC12 |
| 3 | FAN_SPEED OUT |
| 4 | FAN_PWM |




## 3.36 SYSTEM FAN CONNECTOR

**JSFAN1 :** System FAN Connector

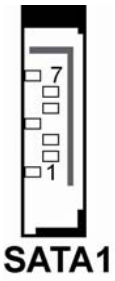
| PIN | ASSIGNMENT |
|---|---|
| 1 | VCC12 |
| 2 | GND |




## 3.37 SERIAL ATA CONNECTOR

**SATA1 :** Serial ATA Connector

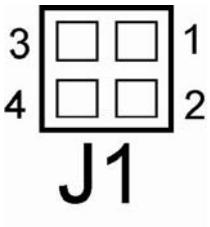
| PIN | ASSIGNMENT |
|---|---|
| 1 | GND |
| 2 | SATAHDR_TXP0 |
| 3 | SATAHDR_TXN0 |
| 4 | GND |
| 5 | SATAHDR_RXN0 |
| 6 | SATAHDR_RXP0 |
| 7 | GND |




# 3.38 RESET & SPEAKER CONNECTOR

**J1 :** Reset and Speaker Connector

| PIN | ASSIGNMENT |
|---|---|
| 1 | SPK_VCC |
| 2 | SPK |
| 3 | RST_SW |
| 4 | GND |



# Chapter 4 Software Utility

## 4.1 INTRODUCTION TO SOFTWARE UTILITIES

Enclosed with our AHM-6155 package is our driver utility, which may comes in a form of a CD ROM disc or floppy diskettes. For CD ROM disc user, you will only need some of the files contained in the CD ROM disc, please kindly refer to the following chart:

## 4.2 VGA DRIVER UTILITY

The VGA interface embedded with our AHM-6155 can support a wide range of display. You can display CRT, LVDS simultaneously with the same mode.

### 4.2.1 Installation of VGA Driver:

To install the VGA Driver, simply follow the following steps:

Click "intel® VGA 855GME Chipset"

# 4.3 FLASH BIOS UPDATE

### 4-3-1. Introduction

Users of AHM-6085 can use the program “Awdflash.exe” contained in the Utility Disk for system BIOS update.

### 4-3-2. Installation of system BIOS

1 Copy “Awdflash.exe” from Driver Disk to Drive C.
2 Type the path to Awdflash.exe and execute the system BIOS AWDFLASH 7500xxxx.bin
3 The screen will display the table below:

| |
|---|
| FLASH MEMORY WRITER V7.XX (C) Award Software 2001 All Rights Reserved |
| Flash Type -49LF004B File Name to Program: 7500xxxx.bin |
| Error Message : Do You Want To Save BIOS (Y/N) |

If you want to save up the original BIOS, enter "Y" and press < Enter > . If you choose "N", the following table will appear on screen.

| |
|---|
| FLASH MEMORY WRITER V7.XX (C) Award Software 2001 All Rights Reserved |
| Flash Type - 49LF004B File Name to Program: 7500xxxx.bin |
| Error Message : Are You Sure To Program (Y/N) |

Select "Y", and the BIOS will be renewed. When you are refreshing the BIOS, do not turn off or reset the system, or you will damage the BIOS. After you have completed all the programming, the screen displays the table below:

| |
|---|
| FLASH MEMORY WRITER V7.XX (C) Award Software 2001 All Rights Reserved |

| |
|---|
| Flash Type –49LF004B File Name to Program: 7500xxxx.bin<br>Verifying Flash Memory – 7FFFF OK Write OK No Update<br>Write Fail |
| F1: Reset F10: Exit |

Please reset or power off the system, then the Flash BIOS is fully implemented.

# 4.4 LAN DRIVER UTILITY

### 4-4-1. Introduction

The AHM-6085 Panel PC is enhanced with LAN function that can support various network adapters. Installation programs for LAN drivers are listed as follows:

To install the LAN Driver, simply follow the following steps:

Click “intel® Network Adapter”

# 4.5 SOUND DRIVER UTILITY

### 4-5-1. Introduction

The Realtek ALC202A sound function enhanced in this system is fully compatible with Windows 98, Windows NT 4.0, Windows 2000, Windows XP and Linux. Below, you will find the content of the Sound driver :

To install the Sound Driver, simply follow the following steps:

Click "Realtek AC97 Sound System"


# 4.6 INTEL® C HIPSET SOFTWARE INSTALLATION UTILITY

### 4-6-1. Introduction

The Intel® Chipset Software Installation Utility installs to the target system the Windows* INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

-Core PCI and ISAPNP Services -AGP Support -IDE/ATA33/ATA66/ATA100 Storage Support -USB Support -Identification of Intel® Chipset Components in Device Manager

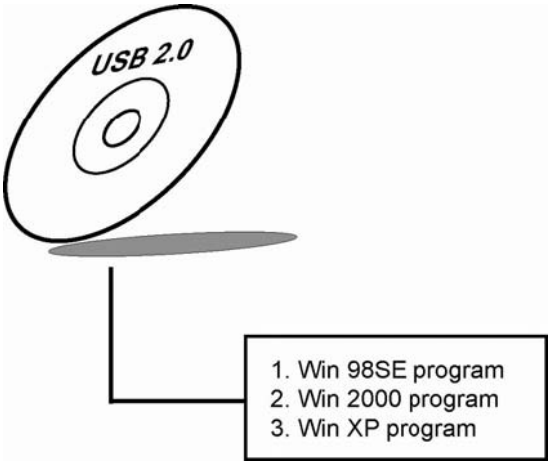
To install the Chipset  Driver, simply follow the following steps:

Click “intel® Chipset software installation Utility”


# 4.7 USB2.0 SOFTWARE INSTALLATION UTILITY

### 4-7-1. Installation of Utility for Windows 98SE/ 2000/XP

Intel USB 2.0 Enhanced Host Controller driver can only be used on Windows 98SE, Windows 2000 and Windows XP on Intel Desktop boards.



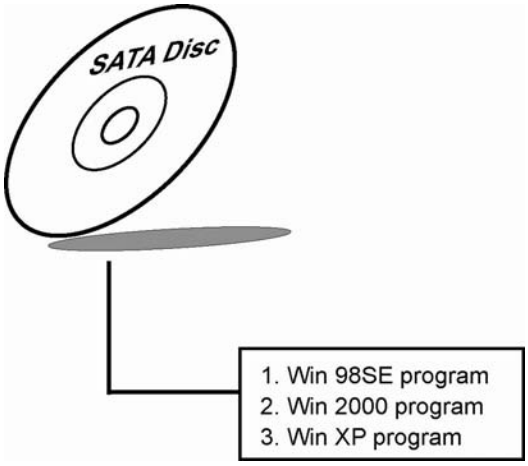

It should be installed right after the OS installation, kindly follow the following steps:

1 Place insert the Utility Disk into Floppy Disk Drive A/B or CD ROM drive.
2 Under Windows 98SE, 2000, and XP system, go to the directory where Utility Disc is located.
3 Start the “System” wizard in control panel. (Click Start/Settings/Control Panel).
4 Select “Hardware” and click “Device Manager ” button.
5 Double Click “USB Root Hub”.
6 Select “Driver”.
7 Click “Install” to install the driver.
8 Follow the instructions on the screen to complete the installation.
9 Click “Finish” after the driver installation is complete.

# 4.8. SERIAL ATA DRIVER UTILITY

### 4-8-1. Installation of Utility for Windows 98SE/ 2000/ XP

Silicon Image SATA Sil3512 Controller driver can only be used on Windows 98SE, Windows 2000 and Windows XP on Intel Desktop boards. It should be installed right after the OS installation, kindly follow the following steps:



1 Please insert the Utility Disk into Floppy Disk Drive A/B or CD ROM drive.
2 Under Windows 98SE, 2000, and XP system, go to the directory where Utility Disc is located.
3 Start the “System” wizard in control panel. (Click Start/Settings/ Control Panel).
4 Select “Hardware” and click “Device Manager” button.
5 Double click “RAID Controller”.
6 Select “Driver”.
7 Click “Si3112r” to install the driver.
8 Follow the instructions on the screen to complete the installation.
9 Click “Finish” after the driver installation is complete.

# 4.9 WATCHDOG TIMER CONFIGURATION

The Watch-dog Timer has a programmable time-out ranging from 1 to 255 minutes with one minute resolution, or 1 to 255 seconds with 1 second resolution. The units of the WDT timeout value are selected via bit[7] of the WDT_TIMEOUT register, which is located on I/O Port address 0x865h. The WDT time-out value is set through the WDT_VAL Runtime register, which is located on I/O Port address 0x866h. Setting the WDT_VAL register to 0x00 disables the WDT function Setting the WDT_VAL to any other non-zero value will cause the WDT to reload and begin counting down from the value loaded. Setting the Register located on I/O address 0x867h and 0x868h as 00h to finish timer configuration.

**Example Program**

```
Example Code:
(1)
;------------------------------------------------------
;Enable Watch-Dog Timer
;------------------------------------------------------
                mov     dx,(800h+65h)   ;Time counting Unit minute or second
                mov     al,80h          ;al = 00h : minute, or al = 80h :
second
          out           dx,al

                mov     dx,(800h+66h)
                mov     al,20           ;al=Watch Dog Timer Second(s) , 20
sec(s)
          out           dx,al

          mov           dx,(800h+67h)
          mov           al,00h
                out     dx,al


                mov     dx,(800h+68h)   ;Start Watch Dog Timer
          mov           al,00h
          out           dx,al

(2)
;------------------------------------------------------
;Disable Watch-Dog Timer
;------------------------------------------------------
                mov     dx,(800h+66h)   ;Disabled Watch Dog
          mov           al,00h
          out           dx,al

          mov           dx,(800h+67h)
          mov           al,00h
          out           dx,al

                mov     dx,(800h+68h)   ;Clear Status Bit
          mov           al,00h
          out           dx,al
```

# Chapter 5 AWARD BIOS SETUP

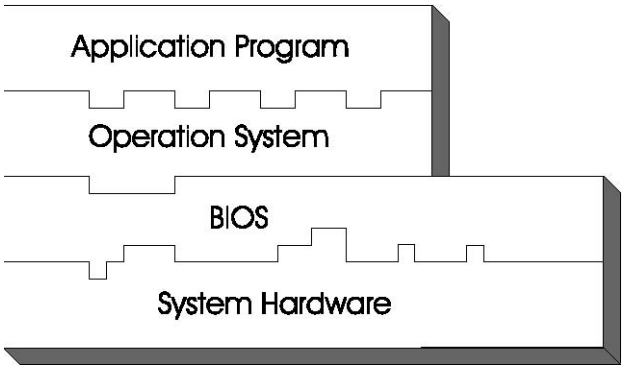
## 5.1 INTRODUCTION TO AWARD BIOS SETUP

This chapter will show you the function of the BIOS in managing the features of your system. The AHM-6085 Panel PC is equipped with the BIOS for system chipset from Award Software Inc. This page briefly explains the function of the BIOS in managing the special features of your system. The following pages describe how to use the BIOS for system chipset Setup menu.

Your application programs (such as word processing, spreadsheets, and games) rely on an operating system such as DOS or OS/2 to manage such things as keyboard, monitor, disk drives, and memory.

The operating system relies on the BIOS (Basic Input and Output system), a program stored on a ROM (Read-only Memory) chip, to initialize and configure your computer's hardware. As the interface between the hardware and the operating system, the BIOS enables you to make basic changes to your system's hardware without having to write a new operating system.

The following diagram illustrates the interlocking relationships between the system hardware, BIOS, operating system, and application program:



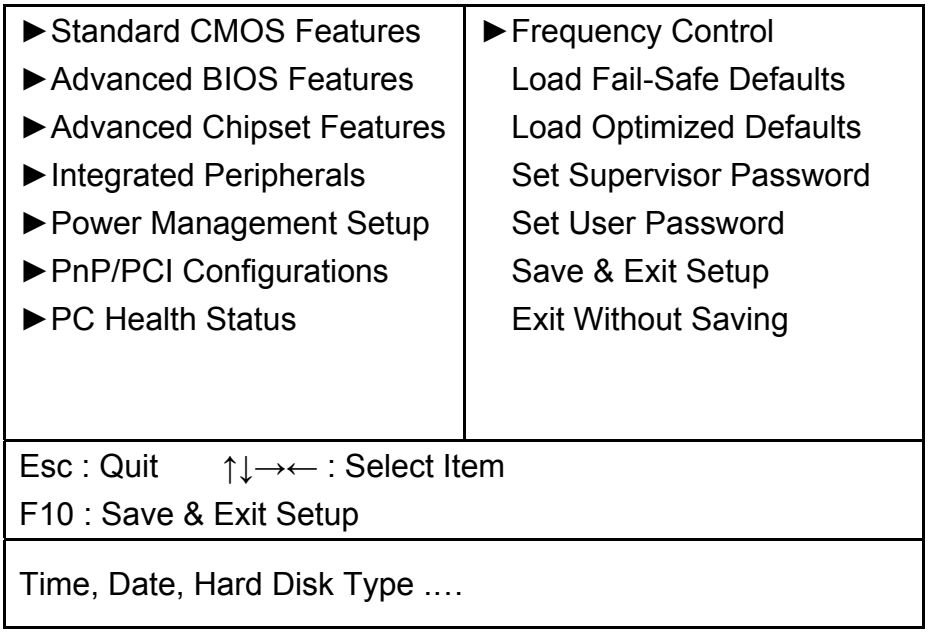

## 5.2 ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines and the following message will appear on the lower screen:

**PRESS <DEL> TO ENTER SETUP, ESC TO SKIP MEMORY TEST**

As long as this message is present on the screen you may press the <Del> key (the one that shares the decimal point at the bottom of the number keypad) to access the Setup program. In a moment, the main menu of the Award SETUP program will appear on the screen:

Phoenix - AwardBIOS CMOS Setup Utility




**Setup program initial screen**

You may use the cursor the up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the bottom of the screen.

# 5.3 THE STANDARD CMOS FEATURES

Highlight the 〝STANDARD CMOS FEATURES 〞 and press the <ENTER> key and the screen will display the following table:

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

| | | |
|---|---|---|
| Date (mm:dd:yy) | Wed, Feb 23 2005 | Item Help |
| Time (hh:mm:ss) | 9 : 32 : 52 | |
| ► IDE Primary Master | [ None] | Menu Level ► |
| ► IDE Primary Slave | [ None] | |
| ► IDE Secondary Master | [ None] | Change the day, month, year and century |
| ► IDE Secondary Slave | [ None] | |
| Video | [EGA/VGA] | |
| Halt On | [All, But Keyboard] | |
| Base Memory | 640K | |
| Extended Memory | 1013760K | |
| Total Memory | 1014784K | |

| |
|---|
| ↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help<br>F5: Previous Values F6: Fail-Safe Defaults F7:Optimized Defaults |

**CMOS Setup screen**

In the above Setup Menu, use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

**Date:** < Month >, < Date > and <Year >. Ranges for each value are in the CMOS Setup Screen, and the week-day will skip automatically.

**Time:** < Hour >, < Minute >, and < Second >. Use 24 hour clock format, i.e., for PM numbers, add 12 to the hour. For example: 4: 30 P.M. You should enter the time as 16:30:00.

**IDE Primary Master / Slave:**

**IDE Secondary Master / Slave:**

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select type AUTO for a hard drive, the BIOS detect its specifications during POST, every time system boots.

If you do not want to select drive type AUTO, other methods of selecting drive type are available:

1.Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for hard drive types 1 through 45.

2 Select USER and enter values into each drive parameter field.

3.Use the IDE HDD AUTO DETECTION function in Setup.

Here is a brief explanation of drive specifications:

Type: The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any predefine type are classified as type USER.

•Size: Disk drive capacity (approximate). Note that this size is usually greater than the size of a formatted disk given by a disk-checking program.

•Cyls: number of cylinders.

•Head: number of heads.

•Precomp: write precompensation cylinders.

•Landz: landing zone.

•Sector: number of sectors.

•Mode: Auto, Normal, Large or LBA.

Auto: The BIOS automatically determines the optimal mode.

- •Normal: Maximum number of cylinders, heads, sectors supported are 1024, 16 and 63.
- •Large: For drives that do not support LBA and have more than 1024 cylinders.
- •LBA (Logical Block Addressing): During drive accesses, the IDE controller transforms the data address described by sector, head and cylinder number into a physical block address, significantly improving data transfer rates. For drives greater than 1024 cylinders.

**DRIVE A AND DRIVE B:** Select the type of floppy disk drive installed in your system. The available options are 360KB 5.25in, 1.2KB 5.25in, 720KB 3.5in, 1.44MB 3.5in, 2.88MB 3.5in and None.

**VIDEO:**

This category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup. Available Options are as follows:

| | |
|---|---|
| EGA/VGA | Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters. |
| CGA 40 | Color Graphics Adapter, power up in 40 column mode. |
| CGA 80 | Color Graphics Adapter, power up in 80 column mode. |
| MONO | Monochrome adapter, includes high resolution monochrome adapters. |

**HALT ON:** This category allows user to choose whether the computer will stop if an error is detected during power up. Available options are “All errors”, “No errors”, “All, But keyboard”, “All, But Diskette”, and “All But Disk/Key”.

**BASE MEMORY:**

Displays the amount of conventional memory detected during boot up.

**EXTENDED MEMORY:**

Displays the amount of extended memory detected during boot up.

**TOTAL MEMORY:**

Displays the total memory available in the system.

**HARD DISK ATTRIBUTES:**

| Type | Cylinders | Heads | V-P comp | LZone | Sect | Capacity |
|---|---|---|---|---|---|---|
| 1 | 306 | 4 | 128 | 305 | 17 | 10 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 615 | 4 | 300 | 615 | 17 | 20 |
| 3 | 615 | 6 | 300 | 615 | 17 | 30 |
| 4 | 940 | 8 | 512 | 940 | 17 | 62 |
| 5 | 940 | 6 | 512 | 940 | 17 | 46 |
| 6 | 615 | 4 | 65535 | 615 | 17 | 20 |
| 7 | 642 | 8 | 256 | 511 | 17 | 30 |
| 8 | 733 | 5 | 65535 | 733 | 17 | 30 |
| 9 | 900 | 15 | 65535 | 901 | 17 | 112 |
| 10 | 820 | 3 | 65535 | 820 | 17 | 20 |
| 11 | 855 | 5 | 65535 | 855 | 17 | 35 |
| 12 | 855 | 7 | 65535 | 855 | 17 | 49 |
| 13 | 306 | 8 | 128 | 319 | 17 | 20 |
| 14 | 733 | 7 | 65535 | 733 | 17 | 42 |
| 15 | 000 | 0 | 0000 | 000 | 00 | 00 |
| 16 | 612 | 4 | 0000 | 663 | 17 | 20 |
| 17 | 977 | 5 | 300 | 977 | 17 | 40 |
| 18 | 977 | 7 | 65535 | 977 | 17 | 56 |
| 19 | 1024 | 7 | 512 | 1023 | 17 | 59 |
| 20 | 733 | 5 | 300 | 732 | 17 | 30 |
| 21 | 733 | 7 | 300 | 732 | 17 | 42 |
| 22 | 733 | 5 | 300 | 733 | 17 | 30 |
| 23 | 306 | 4 | 0000 | 336 | 17 | 10 |
| 24 | 977 | 5 | 65535 | 976 | 17 | 40 |
| 25 | 1024 | 9 | 65535 | 1023 | 17 | 76 |
| 26 | 1224 | 7 | 65535 | 1223 | 17 | 71 |
| 27 | 1224 | 11 | 65535 | 1223 | 17 | 111 |
| 28 | 1224 | 15 | 65535 | 1223 | 17 | 152 |
| 29 | 1024 | 8 | 65535 | 1023 | 17 | 68 |
| 30 | 1024 | 11 | 65535 | 1023 | 17 | 93 |
| 31 | 918 | 11 | 65535 | 1023 | 17 | 83 |
| 32 | 925 | 9 | 65535 | 926 | 17 | 69 |
| 33 | 1024 | 10 | 65535 | 1023 | 17 | 85 |
| 34 | 1024 | 12 | 65535 | 1023 | 17 | 102 |
| 35 | 1024 | 13 | 65535 | 1023 | 17 | 110 |
| 36 | 1024 | 14 | 65535 | 1023 | 17 | 119 |
| 37 | 1024 | 2 | 65535 | 1023 | 17 | 17 |
| 38 | 1024 | 16 | 65535 | 1023 | 17 | 136 |
| 39 | 918 | 15 | 65535 | 1023 | 17 | 114 |
| 40 | 820 | 6 | 65535 | 820 | 17 | 40 |
| 41 | 1024 | 5 | 65535 | 1023 | 17 | 42 |
| 42 | 1024 | 5 | 65535 | 1023 | 26 | 65 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 43 | 809 | 6 | 65535 | 852 | 17 | 40 |
| 44 | 809 | 6 | 65535 | 852 | 26 | 61 |
| 45 | 776 | 8 | 65335 | 775 | 33 | 100 |
| 47 | | | | AUTO | | |

**Award Hard Disk Type Table**

# 5.4 THE ADVANCED BIOS FEATURES

Choose the 〝ADVANCED BIOS FEATURES〞 in the main menu, the screen shown as below.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

| | | |
|---|---|---|
| Virus Warning | [Enabled] | Item Help |
| CPU L1 & L2 Cache | [Enabled] | |
| CPU L3 Cache | [Enabled] | Menu Level ► |
| Quick Power On Self Test | [Enabled] | |
| First Boot Device | [SATA/SCSI] | |
| Second Boot Device | [HDD-0] | |
| Boot Up Floppy Seek | [Enabled] | |
| Boot Up NumLock Status | [On] | |
| Typematic Rate Setting | [Disabled] | |
| x Typematic Rate (Chars/Sec) | 6 | |
| x Typematic Delay (Msec) | 250 | |
| Security Option | [Setup] | |

↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

**BIOS Features Setup Screen**

The “BIOS FEATURES SETUP” allow you to configure your system for basic operation. The user can select the system’s default speed, boot-up sequence, keyboard operation, shadowing and security.

A brief introduction of each setting is given below.

**Virus Warning:** Allows 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.

**CPU L1 & L2 CACHE:**

This item allows you to enable L1 & L2 cache.

**QUICK POWER ON SELF-TEST:** This item allows you to speed up Power On Self Test (POST) after power-up the computer. When enabled, the BIOS will shorten or skip some check items during POST.

**FIRST/SECOND/BOOT DEVICE:** The BIOS attempt to load the operating system from the devices in the sequence selected in these items.

**BOOT UP FLOPPY SEEK:** You may enable / disable this item to define whether the system will look for a floppy disk drive to boot at power-on, or proceed directly to the hard disk drive.

**BOOT UP NUMLOCK STATUS:**

Select power on state for NumLock.

**TYPEMATIC RATE SETTING:** Enable this item if you wish to be able to configure the characteristics of your keyboard. Typematic refers to the way in which characters are entered repeatedly if a key is held down. For example, if you press and hold down the "A" key, the letter "a" will repeatedly appear on your screen on your screen until you release the key. When enabled, the typematic rate and typematic delay can be selected.

**TYPEMATIC RATE (CHARS/SEC):** This item sets the number of times a second to repeat a key stroke when you hold the key down.

**TYPEMATIC DELAY (MSEC):** The item sets the delay time after the key is held down before it begins to repeat the keystroke.

**SECURITY OPTION**:

This category allows you to limit access to the system and Setup, or just to Setup.

| | |
|---|---|
| System | The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt. |
| Setup | The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt. |

🔔To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

# 5.5 ADVANCED CHIPSET FEATURES

Choose the 〝ADVANCED CHIPSET FEATURES〞 from the main menu, the screen shown as below.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

| | | |
|---|---|---|
| DRAM Timing Selectable | [By SPD] | Item Help |
| X CAS Latency Time | [2.5] | |
| Active to Precharge Delay | [7] | Menu Level ► |
| X DRAM RAS# to CAS# Delay | [3] | |
| X DRAM RAS# Precharge | [3] | |
| DRAM Data Integrity Mode | [Non-ECC] | |
| System BIOS Cacheable | [Enabled] | |
| Video BIOS Cacheable | [Disabled] | |
| Memory Hole At 15M-16M | [Enabled] | |
| Delayed Transaction | [Enabled] | |
| AGP Aperture Size (MB) | [64] | |
| | | |
| ** VGA Setting ** | | |
| On-Chip VGA | [Enabled] | |
| On-Chip Frame Buffer Size | [32MB] | |
| Boot Display | [CRT+LFP] | |
| PCI SERR# NMI | [Disabled] | |

↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7:Optimized Defaults

**Chipset Features Setup Screen**

This parameter allows you to configure the system based on the specific features of the installed chipset. The chipset manages bus speed and access to system memory resources, such as DRAM and the external cache.

It also coordinates communications between conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

**DRAM TIMEING SELECTABLE:**

The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.

**CAS LATENCY TIME:**

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

**DRAM RAS# TO CAS# DELAY:**

This item let you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The choices are 2 and 3.

**DRAM RAS# PRECHARGE TIME:**

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The choices are 2 & 3.

**SYSTEM BIOS CACHEABLE:**

Selecting Enabled allows caching of the system BIOS ROM at F0000hFFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

**VIDEO BIOS CACHEABLE:**

Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

**On-Chip VGA**

To Enable/Disable the onboard display chip.

**Boot Display**

To select the boot-up display type.

**PCI SERR# NMI**

To Enable/Disable the PCI SERR# interrupt

# 5.6 INTEGRATED PERIPHERALS

Choose〝INTEGRATED PERIPHERALS〞from the main setup menu, a display will be shown on screen as below:

Phoenix - AwardBIOS CMOS Setup Utility

Integrated Peripherals

| | | |
|---|---|---|
| ▶ OnChip IDE Device | [Press Enter] | Item Help |
| ▶ Onboard Device | [Press Enter] | |
| ▶ SuperIO Device | [Press Enter] | Menu Level ▶ |
| Onboard Serial Port 3 | [3E8/IRQ10] | |
| Onboard Serial Port 4 | [2E8/IRQ11] | |
| WatchDog Support | [Disabled] | |

↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

**Integrated Peripherals Setup Screen**

By moving the cursor to the desired selection and by pressing the <F1> key, the all options for the desired selection will be displayed for choice.

- If bios setup menu item supports USB device boot, it will cause Win9x detects the same storages twice when the system is rebooted, and USB HDD will fail. Note: this cause just happen under Win9x, the phenomenon is a limitation.

**VIA ONCHIP IDE DEVICE:** The options for these items are found in its sub menu. By pressing the <ENTER> key, you are prompt to enter the sub menu of the detailed options as shown below:

Phoenix – Award CMOS Setup Utility

OnChip IDE Device

| | | |
|---|---|---|
| OnChip Primary PCI IDE | [Enabled] | Item Help |
| IDE Primary Master PIO | [Auto] | |
| IDE Primary Slave PIO | [Auto] | Menu Level ▶ |
| IDE Primary Master UDMA | [Auto] | |
| IDE Primary Slave UDMA | [Auto] | |
| OnChip Secondary PCI IDE | [Enabled] | |
| IDE Secondary Master PIO | [Auto] | |
| IDE Secondary Slave PIO | [Auto] | |
| IDE Secondary Master UDMA | [Auto] | |
| IDE Secondary Slave UDMA | [Auto] | |
| IDE HDD Block Mode | [Enabled] | |

↑↓→←:Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help F5: Previous Values F6:Fail-Safe Defaults
F7:Optimized Defaults

Descriptions on each item above are as follows:

**1. OnChip Primary PCI IDE** The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

**2**. **Primary Master/Slave PIO Secondary Master/Slave PIO** The four IDE PIO fields allow you to set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

**3**. **Primary Master/Slave UDMA Secondary Master/Slave UDMA** Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If you hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

**4. IDE HDD Block Mode:**

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

**ONBOARD DEVICE:** The options for these items are found in its sub menu. By pressing the <ENTER> key, you are prompt to enter the sub menu of the detailed options as shown below:

Phoenix – Award CMOS Setup Utility
Onboard Device

| | | |
|---|---|---|
| USB Controller | [Enabled] | Item Help |
| USB 2.0 Controller | [Enabled] | |
| USB Keyboard Support | [Disabled] | Menu Level ► |
| USB Mouse Support | [Disabled] | |
| AC97 Audio | [Auto] | |
| PCI Option ROM Support | [Enabled] | |
| Init Display First | [Onboard/AGP] | |
| ↑↓→←:Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit<br>F1:General Help F5: Previous Values F6:Fail-Safe Defaults<br>F7:Optimized Defaults | | |

Descriptions on each item above are as follows:

**1. USB Controller** This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

**2. USB Keyboard Support** Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

**3. USB Mouse Support** Select Enabled if your system contains a Universal Serial Bus (USB)

controller and you have a USB Mouse.

**4. AC97 Audio:**

This item allows you to enable/disable to support AC97 Audio.

**5. PCI Option ROM Support**

To Enabled/Disable the LAN PXE ROM

**6.Init Display First**

Select the initial Display type

**SUPER IO DEVICE:** The options for these items are found in its sub menu. By pressing the <ENTER> key, you are prompt to enter the sub menu of the detailed options as shown below:

Phoenix – Award CMOS Setup Utility
SuperIO Device

| | | |
|---|---|---|
| Onboard FDC Controller | [Enabled] | Item Help |
| Onboard Serial Port 1 | [3F8/IRQ4] | Menu Level ► |
| Onboard Serial Port 2 | [2F8/IRQ3] | |
| Onboard Parallel Port | [378/IRQ7] | |
| Parallel Port Mode | [SPP] | |
| ECP Mode Use DMA | [3] | |
| ↑↓→←:Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit | | |
| F1:General Help F5: Previous Values F6:Fail-Safe Defaults | | |
| F7:Optimized Defaults | | |

Descriptions on each item above are as follows:

1. **Onboard FDC Controller** Select Enabled if the system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled.
2. **Onboard Serial Port 1/2** Select an address and corresponding interrupt for the first and second serial ports.
3. **Onboard Parallel Port** This item allows you to determine access onboard parallel port controller with which I/O address.
4. **Parallel Port Mode** Select an operating mode for the onboard parallel (printer) port. Select *Normal, Compatible,* or *SPP* unless you are certain your hardware and software both support one of the other available modes.
5. **ECP Mode Use DMA**

Select a DMA channel for the parallel port for use during ECP mode.

**ONBOARD SERIAL PORT 3:**

**ONBOARD SERIAL PORT 4:**

Select a logical COM port name and matching address for the third and forth serial ports.
Select an address and corresponding interrupt for third and forth serial port.

# 5.7 POWER MANAGEMENT SETUP

Choose 〝POWER MANAGEMENT SETUP〞 option on the main menu, a display will be shown on screen as below :

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

| | | |
|---|---|---|
| ACPI Function | [Enabled] | Item Help |
| Power Management | [User Define] | |
| Video Off Method | [DPMS] | |
| Video Off In Suspend | [Yes] | |
| MODEM Use IRQ | [3] | |
| Suspend Mode | [Disabled] | |
| | | Menu Level ► |
| Soft-Off by PWR-BTTN | [Instant-Off] | |
| PWRON After PWR-Fail | [Off] | |
| Wake on LAN | [Enabled] | |
| Power On by Ring | [Disabled] | |
| Resume by Alarm | [Disabled] | |
| x Date (of Month) Alarm | 0 | |
| x Time (hh:mm:ss) Alarm | 0 : 0 : 0 | |
| ** Reload Global Timer Events ** | | |
| FDD,COM,LPT Port | [Disabled] | |
| PCI PIRQ[A-D]# | [Disabled] | |

↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

**Power Management Setup Screen**

The “Power Management Setup” allows the user to configure the system to the most effectively save energy while operating in a manner consistent with your own style of computer use.

**ACPI FUNCTION:**

Users are allowed to enable or disable the Advanced Configuration and Power Management (ACPI).

**POWER MANAGEMENT:**

This item allows you to select the Power Management mode.

**SOFT-OFF BY PWR-BTTN:**

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has “hung”. The choices are Delay 4 Sec and Instant-Off.

**PWRON After PWR-Fail:** This item allows you to select if you want to power on the system after power failure. The choice: Off, On, Former-Sts.

**WAKE ON LAN:**

An input signal from PME on the PCI card awakens the system from a soft off state.

**RESUME BY ALARM:** When *Enabled,* your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

# 5.8 PNP/PCI CONFIGURATION

Choose 〝PNP/PCI CONFIGURATION〞 from the main menu, a display will be shown on screen as below:

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

| | |
|---|---|
| Reset Configuration Data [Disabled] | Item Help |
| Resources Controlled By [Auto (ESCD)]<br>x IRQ Resources Press Enter | Menu Level ► |
| PCI/VGA Palette Snoop [Disabled] | Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices |
| ↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit<br>F1:General Help F5: Previous Values F6: Fail-Safe Defaults<br>F7:Optimized Defaults | |

**PNP/PCI Configuration Setup Screen**

The PNP/PCI Configuration Setup describes how to configure PCI bus system. PCI, also known as Personal Computer Interconnect, is a system, which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components.

This section covers technical items, which is strongly recommended for experienced users only.

.

**RESET CONFIGURATION DATA:** Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system configuration has caused such a serious conflict that the operating system

cannot boot.

**RESOURCE CONTROLLED BY:** The Award Plug and Play Bios can automatically configure all of the booth and Plug and Play-compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows 95. By choosing "manual", you are allowed to configure the *IRQ Resources and DMA Resources*.

**IRQ RESOURCES:** The options for these items are found in its sub menu. By pressing the <ENTER> key, you are prompt to enter the sub menu of the detailed options as shown below:

Phoenix – Award CMOS Setup Utility
IRQ Resources

| | | |
|---|---|---|
| IRQ-3 assigned to | [PCI Device] | Item Help |
| IRQ-4 assigned to | [PCI Device] | |
| IRQ-5 assigned to | [PCI Device] | Menu Level ► |
| IRQ-7 assigned to | [PCI Device] | Legacy ISA for devices compliant |
| IRQ-9 assigned to | [PCI Device] | with the original PC AT bus |
| IRQ-10 assigned to | [PCI Device] | specification, PCI/ISA PnP for |
| IRQ-11 assigned to | [PCI Device] | devices compliant with the Plug |
| IRQ-12 assigned to | [PCI Device] | and Play standard whether |
| IRQ-14 assigned to | [PCI Device] | designed for PCI or ISA bus |
| IRQ-15 assigned to | [PCI Device] | architecture |
| ↑↓→←:Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit | | |
| F1:General Help F5: Previous Values F6:Fail-Safe Defaults | | |
| F7:Optimized Defaults | | |

Descriptions on each item above are as follows:

**IRQ-n Assigned to:** You may assign each system interrupt a type, depending on the type of device using the interrupt.

# 5.9 PC HEALTH STATUS

Choose 〝PC HEALTH STATUS〞 from the main menu, a display will be shown on screen as below:

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

| | | |
|---|---|---|
| Shutdown Temperature | [Disabled] | Item Help |

| | |
|---|---|
| +2.5V<br>VCore<br>VCC3<br>VBAT<br>5 V<br>12 V<br>Fan1 Speed | Menu Level ► |
| ↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit<br>F1:General Help F5: Previous Values F6: Fail-Safe Defaults<br>F7:Optimized Defaults | |

**PC Health Status Setup Screen**

The PC Health Status Setup allows you to select whether to choose between monitoring or to ignore the hardware monitoring function of your system.

**SHUTDOWN TEMPERATURE:** This item allows you to set up the CPU shutdown Temperature. This function is only effective under Windows 98 ACPI mode.

**CURRENT CPU TEMPERATURE:**

This item shows you the current CPU temperature.

**CURRENT SYSTEM FAN SPEED:**

This item shows you the current System FAN speed.

**+2.5/Vcore/Vcc3/VBAT/5V/12V**

Show you the voltage of +2.5/Vcore/Vcc3/VBAT/5V/12V

# 5.10 FREQUENCY CONTROL

Choose 〝FREQUENCY CONTROL〞 from the main menu, a display will be shown on screen as below:

Phoenix - AwardBIOS CMOS Setup Utility

Frequency Control

| | | |
|---|---|---|
| Auto Detect PCI Clk<br>Spread Spectrum | [Enabled]<br>[Enabled] | Item Help<br>Menu Level ► |

↑↓→←: Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit
F1:General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

**Frequency Control Setup Screen**

This setup menu allows you to specify your settings for frequency control.

**AUTO DETECT PCI CLK:**

This item allows you to enable or disable auto detect PCI Clock.

**SPREAD SPECTRUM:** When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices such as a clock-sensitive SCSI device.

## 5.11. LOAD FAIL-SAFE DEFAULTS

By pressing the <ENTER> key on this item, you get a confirmation dialog box with a message similar to the following:

Load Fail-Safe Defaults ( Y/N ) ? N

To use the BIOS default values, change the prompt to "Y" and press the <Enter > key. CMOS is loaded automatically when you power up the system.

## 5.12. LOAD OPTIMIZED DEFAULTS

When you press <Enter> on this category, you get a confirmation dialog box with a message similar to the following:

Load Optimized Defaults ( Y/N ) ? N

Pressing "Y" loads the default values that are factory setting for optimal performance system operations.

## 5.13. PASSWORD SETTING

User is allowed to set either supervisor or user password, or both of them. The difference is that the supervisor password can enter and change the options of the setup menus while the user password can enter only but do not have the authority to change the options of the setup menus.

**TO SET A PASSWORD**

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

| Enter Password: |
|---|

Type the password up to eight characters in length, and press < Enter >. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press the < Enter > key. You may also press < Esc > to abort the selection and not enter a password.

_ User should bear in mind that when a password is set, you will be asked to enter the password everything you enter CMOS setup Menu.

**TO DISABLE THE PASSWORD**

To disable the password, select this function (do not enter any key when you are prompt to enter a password), and press the <Enter> key and a message will appear at the center of the screen:

| PASSWORD DISABLED!!!<br>Press any key to continue... |
|---|

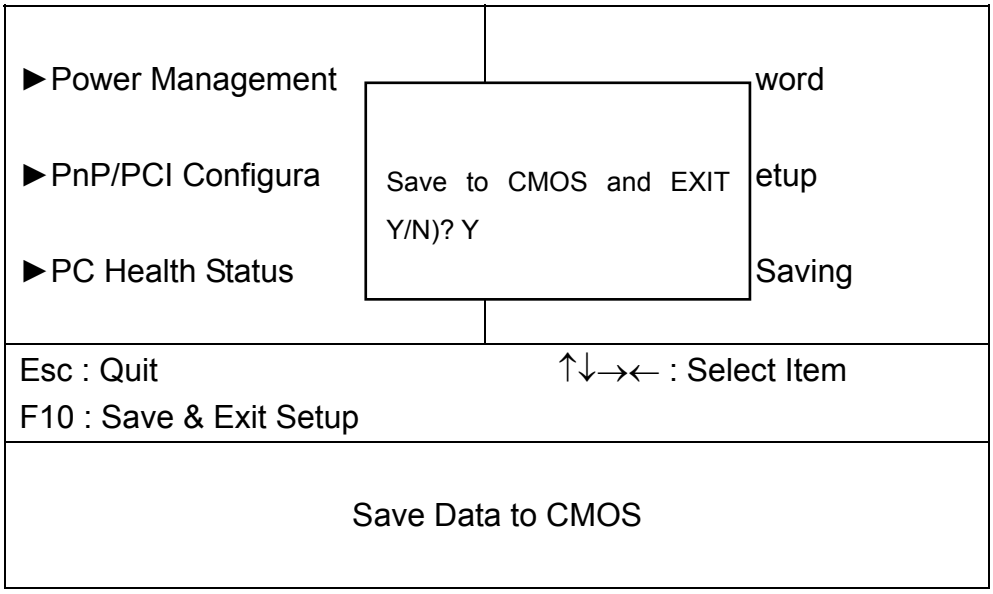
Press the < Enter > key again and the password will be disabled. Once the password is disabled, you can enter Setup freely.

## 5.14 SAVE & EXIT SETUP

After you have completed adjusting all the settings as required, you must remember to save these setting into the CMOS RAM. To save the settings, select “SAVE & EXIT SETUP” and press <Enter>, a display will be shown as follows:

Phoenix - AwardBIOS CMOS Setup Utility

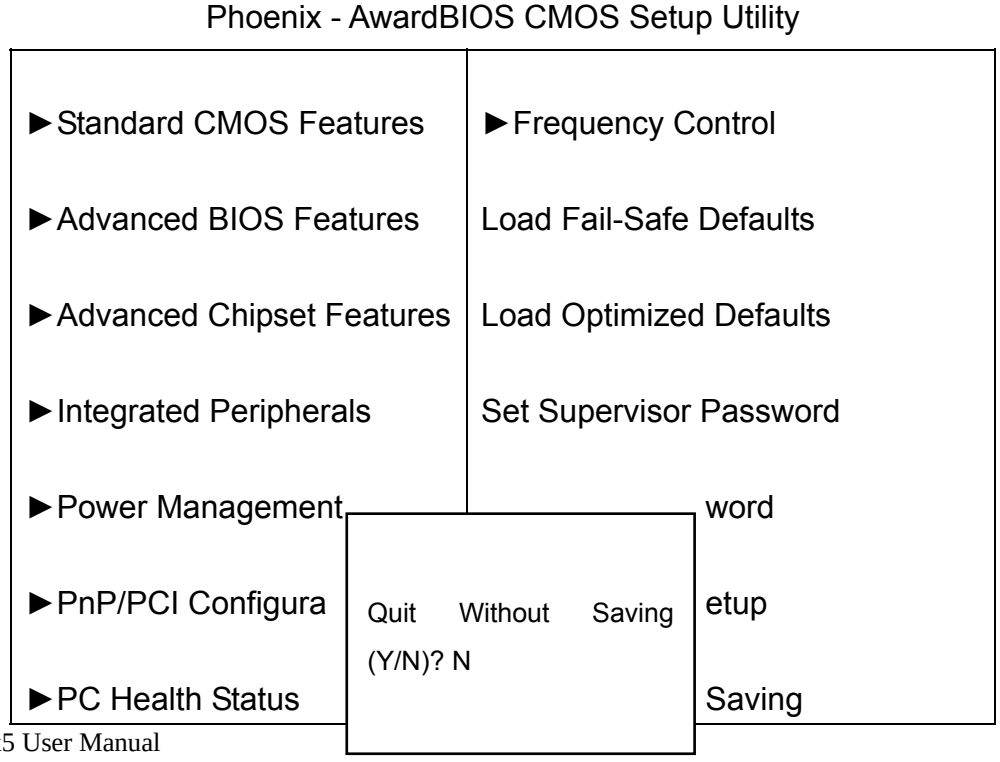
| | |
|---|---|
| ►Standard CMOS Features | ►Frequency Control |
| ►Advanced BIOS Features | Load Fail-Safe Defaults |
| ►Advanced Chipset Features | Load Optimized Defaults |
| ►Integrated Peripherals | Set Supervisor Password |




When you confirm that you wish to save the settings, your system will be automatically restarted and the changes you have made will be implemented. You may always call up the setup program at any time to adjust any of the individual items by pressing the <Del> key during boot up.

## 5.15 EXIT WITHOUT SAVING

If you wish to cancel any changes you have made, you may select the “EXIT WITHOUT SAVING” and the original setting stored in the CMOS will be retained. The screen will be shown as below:



| | |
|---|---|
| Esc : Quit<br>F10 : Save & Exit Setup | ↑↓→← : Select Item |
| Abandon all Datas | |

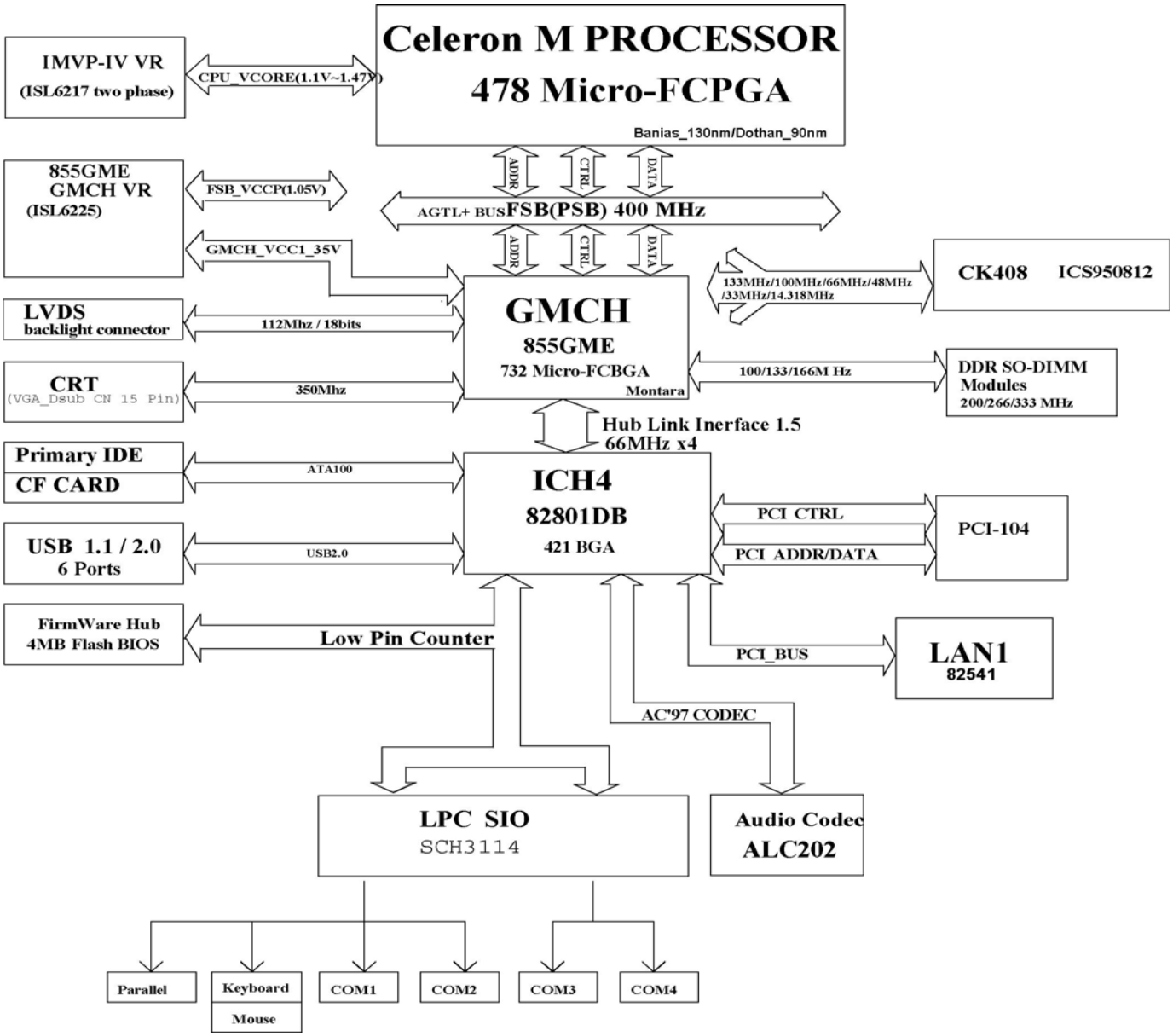
# Appendix: Mainboard Technical Summary

This section introduce you the maps concisely.

Sections include:

- Block Diagram
- Interrupt Map
- RTC (Standard) RAM Bank
- Timer & DMA Channels Map
- I / O & Memory Map

## BLOCK DIAGRAM



**INTERRUPT MAP**

| IRQ | ASSIGNMENT |
|---|---|
| 0 | System TIMER interrupt from TIMER-0 |
| 1 | Keyboard output buffer full |
| 2 | Cascade for IRQ 8-15 |
| 3 | Serial port 2 |
| 4 | Serial port 1 |
| 5 | Available |
| 6 | Floppy Disk adapter |
| 7 | Parallel port 1 |
| 8 | RTC clock |
| 9 | ACPI-Compliant System |
| 10 | Serial port 3 |
| 11 | Serial port 4 |
| 12 | PS/2 Mouse |
| 13 | Math coprocessor |
| 14 | Hard Disk adapter |
| 15 | Hard Disk adapter |

## RTC (STANDARD) RAM BANK

| CODE | ASSIGNMENT |
|---|---|
| 00h | Seconds |
| 01h | Second alarm |
| 02h | Minutes |
| 03h | Minutes alarm |
| 04h | Hours |
| 05h | Hours alarm |
| 06h | Day of week |
| 07h | Day of month |
| 08h | Month |
| 09h | Year |
| 0Ah | Status register A |
| 0Bh | Status register B |
| 0Ch | Status register C |
| 0Dh | Status register D |
| 0Eh-7Fh | 114 Bytes of User RAM |

## TIMER & DMA CHANNELS MAP

### Timer Channel Map :

| Timer Channel | Assignment |
|---|---|
| 0 | System timer interrupt |
| 1 | DRAM Refresh request |
| 2 | Speaker tone generator |

### DMA Channel Map :

| DMA Channel | Assignment |
|---|---|
| 0 | Available |
| 1 | Available |
| 2 | Floppy Disk adapter |
| 3 | Available |
| 4 | Cascade |
| 5 | Available |
| 6 | Available |
| 7 | Available |

## I/O & MEMORY MAP

### Fixed I/O Ranges Decoded by ICH2 :

| I/O Address | Read Target | Write Target | Internal Unit |
|---|---|---|---|
| 00h-08h | DMA Controller | DMA Controller | DMA |
| 09h-0Eh | Reserved | DMA Controller | DMA |
| 0Fh | DMA Controller | DMA Controller | DMA |
| 10h-18h | DMA Controller | DMA Controller | DMA |
| 19h-1Eh | Reserved | DMA Controller | DMA |
| 1Fh | DMA Controller | DMA Controller | DMA |
| 20h-21h | Interrupt Controller | Interrupt Controller | Interrupt |
| 24h-25h | Interrupt Controller | Interrupt Controller | Interrupt |
| 28h-29h | Interrupt Controller | Interrupt Controller | Interrupt |
| 2Ch-2Dh | Interrupt Controller | Interrupt Controller | Interrupt |
| 2Eh-2Fh | LPC SIO | LPC SIO | Forwarder to LPC |
| 30h-31h | Interrupt Controller | Interrupt Controller | Interrupt |
| 34h-35h | Interrupt Controller | Interrupt Controller | Interrupt |
| 38h-39h | Interrupt Controller | Interrupt Controller | Interrupt |
| 3Ch-3Dh | Interrupt Controller | Interrupt Controller | Interrupt |
| 40h-42h | Timer/Counter | Timer/Counter | PIT (8254) |
| 43h | Reserved | Timer/Counter | PIT |
| 4E-4F | LPC SIO | LPC SIO | Forwarder to LPC |
| 50h-52h | Timer/Counter | Timer/Counter | PIT |
| 53h | Reserved | Timer/Counter | PIT |
| 60h | Microcontroller | Microcontroller | Forwarder to LPC |
| 61h | NMI Controller | NMI Controller | Processor I/F |
| 62h | Microcontroller | Microcontroller | Forwarder to LPC |
| 63h | NMI Controller | NMI Controller | Processor I/F |
| 64h | Microcontroller | Microcontroller | Forwarder to LPC |
| 65h | NMI Controller | NMI Controller | Processor I/F |
| 66h | Microcontroller | Microcontroller | Forwarder to LPC |
| 67h | NMI Controller | NMI Controller | Processor I/F |
| 70h | Reserved[5] | NMI & RTC controller | RTC |
| 71h | RTC Controller | RTC Controller | RTC |
| 72h | RTC Controller | NMI & RTC controller | RTC |
| 73h | RTC Controller | RTC Controller | RTC |
| 74h | RTC Controller | NMI & RTC controller | RTC |
| 75h | RTC Controller | RTC Controller | RTC |

| | | | |
|---|---|---|---|
| 76h | RTC Controller | NMI & RTC controller | RTC |
| 77h | RTC Controller | RTC Controller | RTC |

| I/O Address | Read Target | Write Target | Internal Unit |
|---|---|---|---|
| 80h | DMA Controller | DMA controller & LPC/PCI | DMA |
| 81h-83h | DMA Controller | DMA Controller | DMA |
| 84h-86h | DMA Controller | DMA Controller & LPC or PCI | DMA |
| 87h | DMA Controller | DMA Controller | DMA |
| 88h | DMA Controller | DMA Controller & LPC or PCI | DMA |
| 89h-8Bh | DMA Controller | DMA Controller | DMA |
| 8Ch-8Eh | DMA Controller | DMA Controller & LPC or PCI | DMA |
| 08Fh | DMA Controller | DMA Controller | DMA |
| 90h-91h | DMA Controller | DMA Controller | DMA |
| 92h | Reset Generator | Reset Generator | Processor I/F |
| 93h-9Fh | DMA Controller | DMA Controller | DMA |
| A0h-A1h | Interrupt Controller | Interrupt Controller | Interrupt |
| A4h-A5h | Interrupt Controller | Interrupt Controller | Interrupt |
| A8h-A9h | Interrupt Controller | Interrupt Controller | Interrupt |
| ACh-ADh | Interrupt Controller | Interrupt Controller | Interrupt |
| B0h-B1h | Interrupt Controller | Interrupt Controller | Interrupt |
| B2h-B3h | Power Management | Power Management | Power Management |
| B4h-B5h | Interrupt Controller | Interrupt Controller | Interrupt |
| B8h-B9h | Interrupt Controller | Interrupt Controller | Interrupt |
| BCh-BDh | Interrupt Controller | Interrupt Controller | Interrupt |
| C0h-D1h | DMA Controller | DMA Controller | DMA |
| D2h-DDh | Reserved | DMA Controller | DMA |
| DEh-DFh | DMA Controller | DMA Controller | DMA |
| F0h | See Note 3 | FERR# /IGNNE#/ Interrupt Controller | Processor interface |
| 170h-177h | IDE Controller[1] | IDE Controller[1] | Forwarded to IDE |
| 1F0h-1F7h | IDE Controller[2] | IDE Controller[2] | Forwarded to IDE |
| 376h | IDE Controller[1] | IDE Controller[1] | Forwarded to IDE |
| 3F6h | IDE Controller[2] | IDE Controller[2] | Forwarded to IDE |
| 4D0h-4D1h | Interrupt Controller | Interrupt Controller | Interrupt |
| CF9h | Reset Generator | Reset Generator | Processor interface |

Notes:

1. Only if IDE Standard I/O space is enabled for Primary Drive. Otherwise, the target is PCI.

2. Only if IDE Standard I/O space is enabled for Secondary Drive. Otherwise, the target is PCI.

**3. If POS_DEC_EN bit is enabled, reads from F0h will not be decoded by the ICH2. If POS_DEC_EN is not enabled, reads from F0h will forward to LPC.**

**Memory Decode Ranges From Processor Perspective :**

| Memory Range | Target | Dependency/Comments |
|---|---|---|
| 0000 0000h-000D FFFFh<br>0010 0000-TOM (Top of Memory) | Main Memory | TOM registers in Host Controller |
| 000E 0000h-000F FFFFh | FWH | Bit 7 in FWH Decode Enable Register is set |
| FEC0 0000h-FEC0 0100h | I/O APIC inside ICH2 | |
| FFC0 0000h-FFC7 FFFFh<br>FF80 0000h-FF87 FFFFh | FWH | Bit 0 in FWH Decode Enable Register |
| FFC8 0000h-FFCF FFFFh<br>FF88 0000h-FF8F FFFFh | FWH | Bit 1 in FWH Decode Enable Register |
| FFD0 0000h-FFD7 FFFFh<br>FF90 0000h-FF97 FFFFh | FWH | Bit 2 in FWH Decode Enable Register is set |
| FFD8 0000h-FFDF FFFFh<br>FF98 0000h-FF9F FFFFh | FWH | Bit 3 in FWH Decode Enable Register is set |
| FFE0 0000h-FFE7 FFFFh<br>FFA0 0000h-FFA7 FFFFh | FWH | Bit 4 in FWH Decode Enable Register is set |
| FFE8 0000h-FFEF FFFFh<br>FFA8 0000h-FFAF FFFFh | FWH | Bit 5 in FWH Decode Enable Register is set |
| FFF0 0000h-FFF7 FFFFh<br>FFB0 0000h-FFB7 FFFFh | FWH | Bit 6 in FWH Decode Enable Register is set |
| FFF8 0000h-FFFF FFFFh<br>FFB8 0000h-FFBF FFFFh | FWH | Always Enabled.<br>The top two 64K blocks of this range can be swapped as described in Section 6.4.1. |
| FF70 0000h-FF7F FFFFh<br>FF30 0000h-FF3F FFFFh | FWH | Bit 3 in FWH Decode Enable 2 Register is set |
| FF60 0000h-FF6F FFFFh<br>FF20 0000h-FF2F FFFFh | FWH | Bit 2 in FWH Decode Enable 2 Register is set |
| FF50 0000h-FF5F FFFFh<br>FF10 0000h-FF1F FFFFh | FWH | Bit 1 in FWH Decode Enable 2 Register is set |
| FF40 0000h-FF4F FFFFh<br>FF00 0000h-FF0F FFFFh | FWH | Bit 0 in FWH Decode Enable 2 Register is set |
| Anywhere in 4GB range | D110 | Enable via BAR in Device |

| | | |
|---|---|---|
| | LAN Controller | 29:Function 0 (D110 LAN Controller) |
| All Other | PCI | None |