SBC84822 Series

Intel® Pentium® M/C-M
LV Intel® Pentium® M/ULV Celeron® M
All-In-One Capa Board

User's Manual

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

July 2007, Version A1
Printed in Taiwan

ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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C h a p t e r 1
Introduction

The **SBC84822**, a 3.5" Capa board, supports Socket 478 for Intel® Pentium® M and C-M processors at FSB 400/533MHz, LV Intel® Pentium® M 1.4GHz and ULV Celeron® M processor 600MHz/512K, 1GHz/0K, 1GHz/512K. The board integrates Intel® 915GME or Intel® 910GMLE + ICH6M chipsets that support LVDS + CRT, Gigabit/Fast Ethernet and AC'97 Codec Audio all in one single board. Additionally, it provides you with unique embedded features, such as 2 serial ports (1 x RS-232 and 1 x RS-232/422/485) and 3.5" Capa form factor for various applications in need of a compact size. It can achieve the best stability and reliability that makes your system perform the most endurable operation in any critical environments. The built-in Watchdog Timer has enhanced the system reliability that achieves a unique feature to distinguish itself from other boards.
Designed for the professional embedded developers, the Socket 478 embedded board SBC84822 Series is virtually ultimate one-step solution for embedded system applications.

1.1 Specifications

- **CPU: Socket 478 for Intel® Pentium® M/C-M, LV Intel® Pentium® M/ULV Celeron® M processors**

Processor	FSB
Intel® Pentium® M	400/533MHz
Intel® Pentium® M	400/533MHz
LV Intel® Pentium® M	1.4GHz
ULV Celeron® M	600MHz/512K, 1GHz/0K, 1GHz/512K

- **System Chipset: Intel® 915GME/910GMLE & ICH6M**
- **BIOS**
  - Phoenix-Award BIOS, Y2K compliant
  - 4Mbit Flash, DMI, Plug and Play
  - PXE Ethernet Boot ROM
  - SmartView for multiple LCD type selection, display mode option and application extension features
  - RPL/PXE Ethernet Boot ROM
  - "Load Optimized Default" customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One x 200-pin DDR2-400/533 SODIMM sockets
  - Maximum to 1GB DDR2 memory
- **L2 Cache:** integrated in CPU
- **Onboard IDE**
  - One PATA-100 with 44-pin 2.0 pitch box-header
  - One SATA-150 connector
- **Compact Flash Socket**
  - One Compact Flash Type II Socket
- **Onboard Multi-I/O**
  - One 26-pin box-header for shared FDD/LPT

- 1 x RS-232, 1x RS-232/422/485

- **USB Interface**
  - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Watchdog Timer**
  - 1~255 seconds; up to 255 levels
- **Graphics**
  - LVDS port from SDVO-B via CH7308 for 24/48-bit LVDS as 1* 40-pin connector and 1* 7-pin inverter connector; CRT from DAC port
- **Mini-PCI**
  - One Mini PCI Type-III B
- **Ethernet**
  - Co-layout RTL8111B/8111C via PCIe X1 for Gigabit/Fast Ethernet
  - Equipped with RJ-45 interface
- **Audio**
  - AC'97 codec audio
  - MIC-in, Line-out
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface)
- **Form Factor**
  - **3.5" Capa form factor**

***NOTE**: All specifications and images are subject to change without notice.*

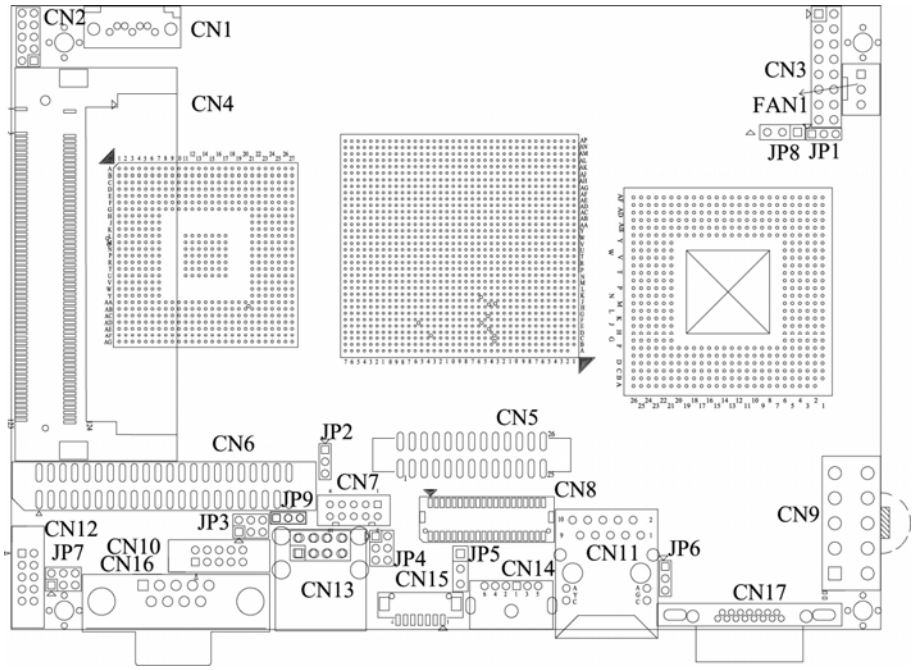
1.2 Utilities Supported

- Chipset Driver
- VGA Driver
- Ethernet Driver
- Audio Driver

MEMO

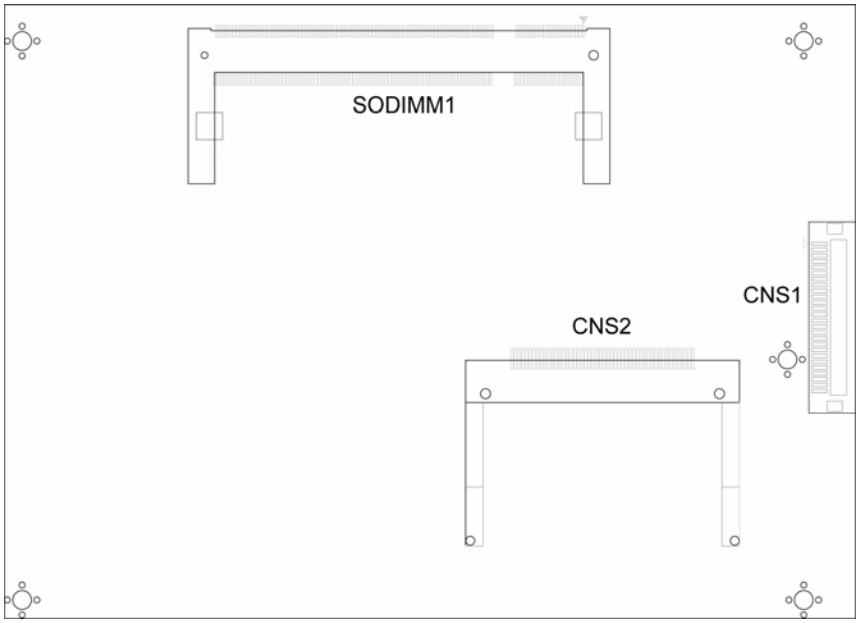
Chapter 2
Jumpers and Connectors

2.1 Board Layout and Fixing Holes



Component Side

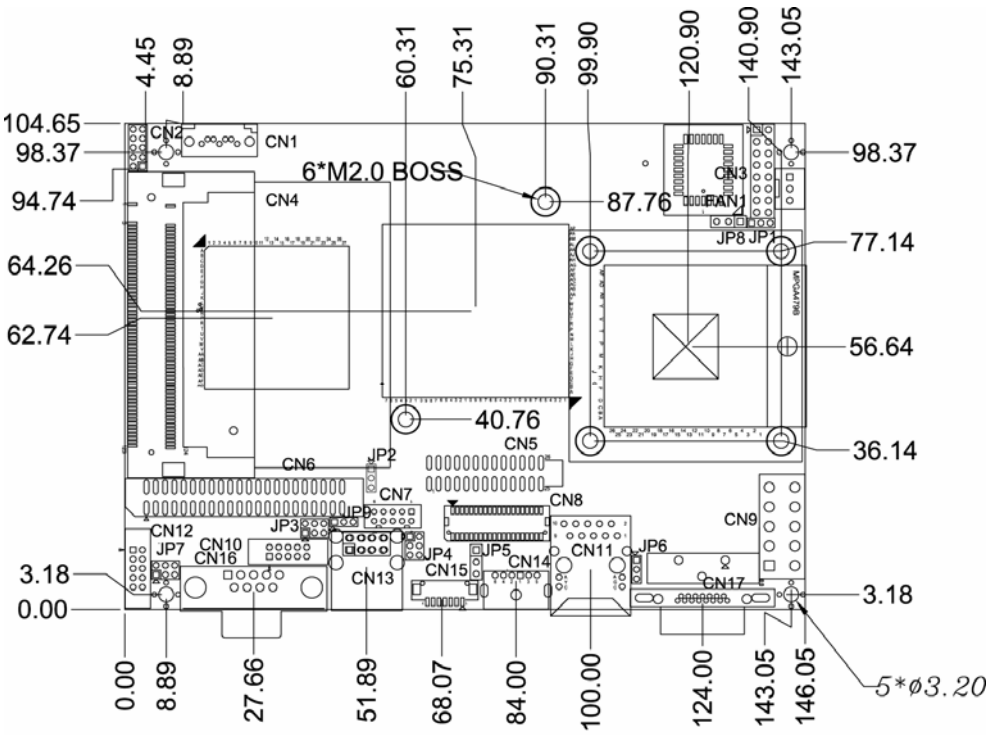
Note: *The Limited Height of Component Side is 30 mm.*



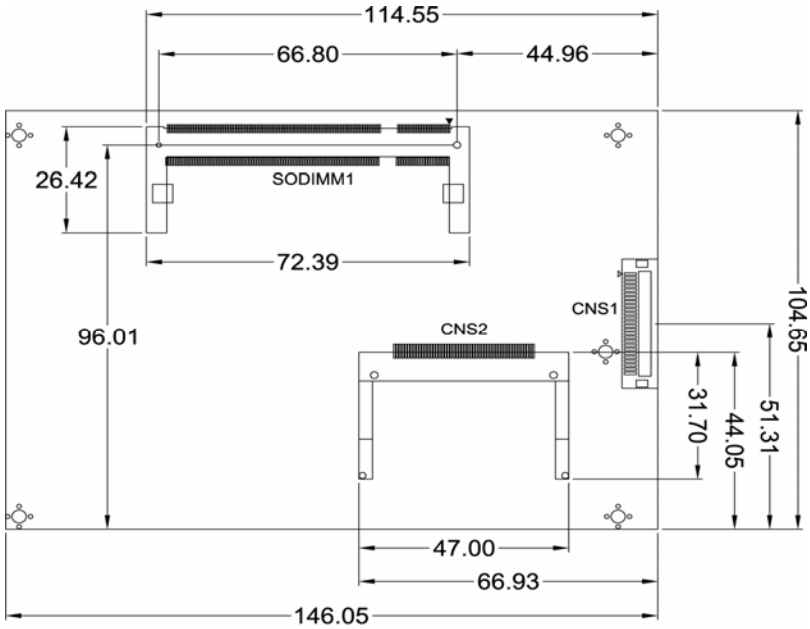
Solder Side

Note: *The Limited Height of Solder Side is 9 mm.*

2.2 Placement



Component Side


114.55
66.80
44.96
26.42
SODIMM1
72.39
96.01
CNS1
CNS2
104.65
31.70
44.05
51.31
47.00
66.93
146.05

Solder Side

2.3 Jumper Settings

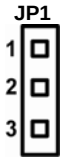
Proper jumer settings configure the **SBC84822** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Here is a list of jumper settings：

Jumper	Default Setting		Jumper Setting
JP1	FSB Setting		Short 1-2(Auto) Short 2-3(133) N/A (100)
JP2	Compact Flash Power Select : 3.3V		Short 1-2
JP3	COM1 Mode Select	CN16 Pin 1: DCD	Short 3-5
		CN16 Pin 9: RI	Short 4-6
JP4	COM2 Mode Select	CN10 Pin 1: DCD	Short 3-5
		CN10 Pin 8: RI	Short 4-6
JP5	LVDS Voltage select : 3.3V		Short 1-2
JP6	Clear CMOS Setting : Normal		Short 1-2
JP7	Audio Line Out/Speaker Out: Line Out		Short 1-3, 2-4
JP8	SM Bus Setting : Normal		N/A
JP9	Compact Flash Select		Short 1-2 (Slave) Short 2-3 (Master)

2.3.1 FSB Setting Jumper: JP1

This jumper helps you set the CPU frequency.

Description	Function	Jumper Setting
FSB Setting	Auto (Default)	
	133 MHz	
	100 MHz	

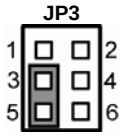
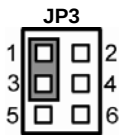
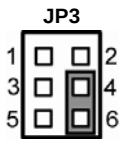
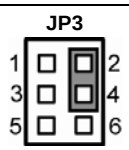
2.3.2 Compact Flash Power Selection Jumper: JP2

This jumper is to select the voltage for Compact Flash interface.

Description	Function	Jumper Setting
Compact Flash Power Select	3.3V (Default)	
	5V	

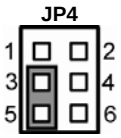
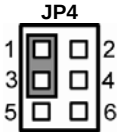
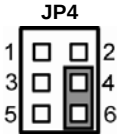
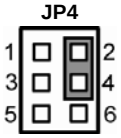
2.3.3 COM1 Mode Selection Jumper: JP3

This jumper selects the COM1 port's communication mode to operate RS-232 or RS-422/485.

Description	Function	Jumper Setting
COM1	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 9=RI (Default)	
	*Pin 9=+12V	

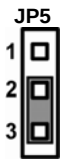
2.3.4 COM2 Mode Selection Jumper: JP4

This jumper selects the COM2 port's communication mode to operate RS-232 or RS-422/485.

Description	Function	Jumper Setting
COM2	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 8=RI (Default)	
	*Pin 8=+12V	

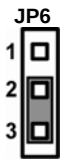
2.3.5 LVDS Voltage Selection Jumper: JP5

This jumper is to select the voltage for LVDS interface.

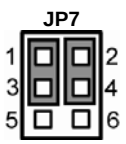
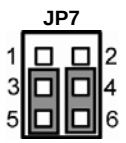
Description	Function	Jumper Setting
VDDM	3.3V (Default)	
	5V	

2.3.6 CMOS Clear Jumper: JP6

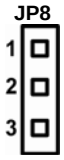
You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	
	Clear CMOS	

2.3.7 Audio Output Selection Jumper: JP7

Description	Function	Jumper Setting
Audio Output Selection	Line Out (Default)	
	Speak Out	

2.3.8 Audio Output Selection Jumper: JP8

Description	Function	Jumper Setting
Audio Output Selection	SM Bus Setting : Normal (Default)	

2.3.9 Compact Flash Select Jumper: JP9

Use this jumper to set Master/Slave Compact Flash interface.

Description	Function	Jumper Setting
Compact Flash Select	Slave (Default)	
	Master	

2.4 Connectors

Connectors connect the CPU card with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table shows you all connectors on the SBC84822 Series.

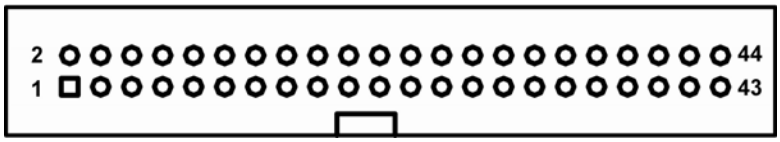
Connectors	Label
SATA Connector	CN1
Digital I/O Connector	CN2
Front Panel Bezel Connector	CN3
Mini-PCI Connector	CN4
Printer Port Connector	CN5
Parallel IDE Connector	CN6
USB Port2 & Port3 Connector	CN7
LVDS Connector	CN8
Power Connector	CN9
Serial Port2 Connector	CN10
LAN Connector	CN11
Audio Connector	CN12
USB Port0 & Port1 Connector	CN13
6-Pin Mini Dim Keyboard/Mouse Connector	CN14
LVDS Voltage Connector	CN15
Serial Port1 Connector	CN16
VGA Connector	CN17
FDD Connector	CNS1
Compact Flash Connector	CNS2
FAN Connector	FAN1
DDR Ⅱ SO-DIMM	SODIMM1

2.4.1 IDE Interface Connectors

There are two built-in IDE channels, one parallel ATA-100, and the other serial ATA-150, to support up to three IDE devices. **CN6** is a 44-pin IDE interface connector for standard 2.5" IDE device, **CN1** a serial ATA-150 IDE interface for up-to-date hard disk drives.

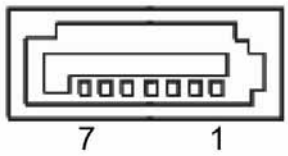
CN6: 44-pin IDE interface connector

Pin	Signal	Pin	Signal	Pin	Signal
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 15
19	GND	20	No connector	21	DREQ#
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	CSEL	29	DACK#	30	GND
31	Interrupt	32	No connector	33	SA1
34	PDIAG#	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #	39	HDD Active #
40	GND	41	Vcc	42	Vcc
43	GND	44	No connector		



CN1: 7-pin SATA Connector

Pin	Signal	Pin	Signal
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		



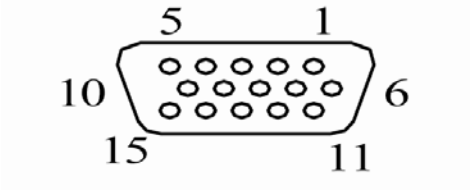
2.4.2 Display Interface

The 915GM Graphic Controller is a highly integrated graphics accelerator to deliver high performance 2D, 3D and video capabilities. It provides users with a complete graphics solution through an analog display (CRT port) and an optional second LVDS LCD interface (via CHRNTEL CH7308B converter). It also provides 2D hardware acceleration for block transfers of data (BLTs). These excellent hardware functions reduce the CPU load that improves the system performance. Meanwhile, the memory interface has a high bandwidth to access data. The 915GM uses Tiling architecture to increase system memory efficiency and thus maximize effective rendering bandwidth.

The board has several VGA/Flat Panel connectors that support CRT/ VGA. **CN17** is a 15-pin D-Sub connector for the CRT VGA display, **CN15** an inverter connector for LCD to support the system LCD backlight control with OS and driver independent, and **CN8** a 40-pin connector for LVDS Interface LCD.

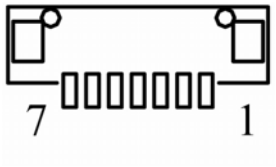
CN17: 15-pin CRT/VGA Connector

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	GND
7	GND	8	GND	9	VCC
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK



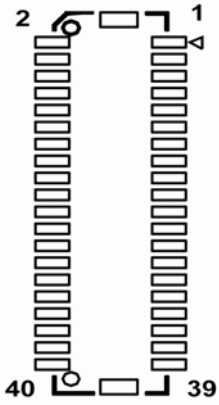
CN15: LVDS Connector for Inverter

Pin	Signal
1	+12V
2	+12V
3	VCC
4	BKLT_EN
5	GND
6	GND
7	GND



CN8: LVDS 40 pin connector

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	NC	8	NC
9	GND	10	GND
11	LVDSB_D3-	12	LVDSB_D0-
13	LVDSB_D3+	14	LVDSB_D0+
15	GND	16	GND
17	LVDSB_CLK-	18	LVDSB_D1-
19	LVDSB_CLK+	20	LVDSB_D1+
21	GND	22	GND
23	LVDSA_D0-	24	LVDSB_D2-
25	LVDSA_D0+	26	LVDSB_D2+
27	GND	28	GND
29	LVDSA_D1-	30	LVDSA_D3-
31	LVDSA_D1+	32	LVDSA_D3+
33	GND	34	GND
35	LVDSA_D2-	36	LVDSA_CLK-
37	LVDSA_D2+	38	LVDSA_CLK+
39	GND	40	GND

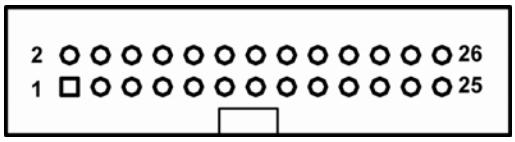


2.4.3 Floppy Disk Controller

The board provides a 26-pin FCC Z.I.F. type connector **CNS1** to support a single floppy drive. The floppy drive could be any one of the following types: 3.5" 720KB or 1.44MB/2.88MB.

Pin	Signal	Pin	Signal
1	+5V	14	STEP#
2	INDEX#	15	No connector
3	+5V	16	WDATA#
4	DSKSELA #	17	GND
5	+5V	18	WENABLE#
6	DSKCHG#	19	GND
7	No connector	20	TRACK0#
8	No connector	21	GND
9	No connector	22	WPROTECT#
10	MTR#	23	GND
11	No connector	24	RDATA#
12	DIR#	25	GND
13	DRVA#	26	HDSEL#

CNS1



2.4.4 Parallel Port Connector: CN2

There is a multi-mode parallel port LPT1 that supports the following modes:

1. **Standard mode:**
   IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port

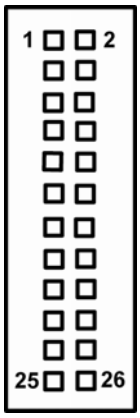
2. **Enhanced mode:**
   Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)

3. **High speed mode:**
   Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

Here is a list of CN2 pin assignment:

Pin	Signal	Pin	Signal
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error#
5	Data 1	6	Initialize#
7	Data 2	8	Printer Select In#
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge#	20	GND
21	Busy	22	GND
23	Paper Empty#	24	GND
25	Printer Select	26	NC

CN2



2.4.5 Serial Port Interface Connectors

The board has two onboard serial ports COM1, and COM2 jumper selectable with auto flow control features. COM1 and COM2 ports use +5V/12V power capability with DCD and RI jumper setting.

Serial Ports IRQ Selection

IRQ4 or IRQ3 can be selected as COM1 and COM2 IRQ. Both ports can be enabled or disabled through BIOS setting.

Serial Ports Power Selection

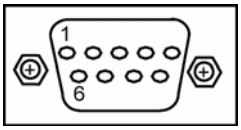
These two COM ports use +5V power capability with DCD jumper setting, and +12V power capability with RI.

The COM1 port is a DB-9 connector, and the following table shows the pin assignment of this connector.

COM1 Port Connector: CN16

Pin	Signal
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

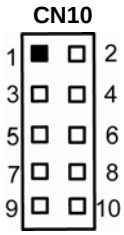
CN16



COM2 Port Connector: CN10

The RS-232 pin assignment is listed on the following table.

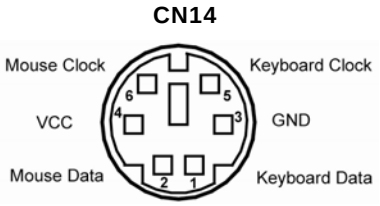
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	NC



2.4.6 Keyboard and PS/2 Mouse Connector

The board provides a keyboard and Mouse interface. CN14 is a DIM connector for PS/2 keyboard Connection VIA "Y" Cable.

Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock

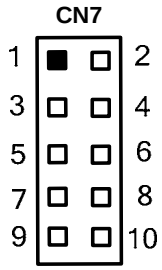


2.4.7 USB Connectors

The board features four Universal Serial Bus (USB) connectors compliant with USB 2.0 (480Mbps) using various USB peripherals, such as monitor, keyboard and mouse, etc. The board has a box-header connector **(CN7)** and two USB port connectors **(CN13)**. Please refer to the detailed USB connectors' pin assignments next page.

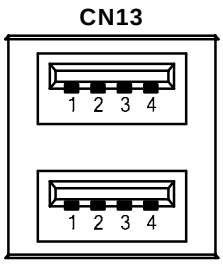
USB Connector: CN7

Pin	Signal	Pin	Signal
1	VCC	2	VCC
3	D2-	4	D3-
5	D2+	6	D3+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



USB Port Connector: CN13

Pin	Signal
1	USB Vcc
2	USB -
3	USB +
4	USB GND



2.4.8 Ethernet RJ-45 Connector

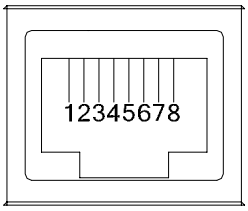
The board is equipped with a RJ-45 Ethernet connector. To connect the board to a Giga/100/10 Base-T hub, just plug one end of cable to the **CN11** connector.

Please refer to next page for the detailed list of the RJ-45 Ethernet connector pin assignment.

CN11: RJ-45 connector Pin Assignment

Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	Rx- (Data reception negative)
7	RJ45 termination
8	RJ45 termination

CN11

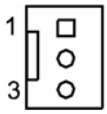


2.4.9 CPU Fan Connector

A CPU fan is always needed for cooling CPU heat. The CPU fan connector **FAN1** provides power to the CPU fan.

Pin	Signal
1	Ground
2	+12V
3	Sensor

FAN1

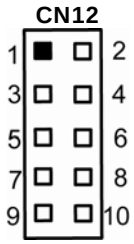


2.4.10 Audio Connector

The board supports an audio interface. **CN12** is a 10pin-header connector commonly used for the audio.

Pin	Signal	Pin	Signal
1	MIC-IN	2	GND
3	Line In L	4	GND
5	Line In R	6	GND
7	Audio Out L	8	GND
9	Audio Out R	10	GND

CN12

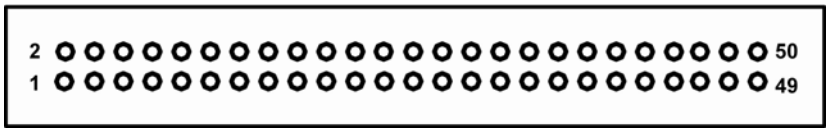


2.4.11 Compact Flash™ Socket (CNS2)

The board is equipped with a Compact Flash disk type-II socket on the solder side that supports the IDE interface Compact Flash disk card with DMA mode supported. The socket is especially designed to avoid any incorrect installation of the Compact Flash disk card.
When installing or removing the Compact Flash disk card, please make sure that the system power is off. The Compact Flash disk card is defaulted as the C: or D: disk drive in your PC system.

Pin	Signal	Pin	Signal
1	GND	26	CD1#
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC
14	Address 6	39	CSEL#
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK#
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10
25	CD2#	50	GND

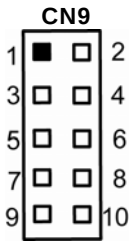
CNS2



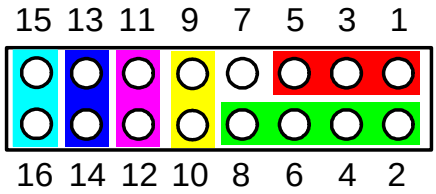
2.4.12 ATX Power Connector

CN9: ATX Power Connector

Pin	Signal	Pin	Signal
1	PS_ON	6	+5VSB
2	GND	7	+5V
3	GND	8	+5V
4	+12V	9	N.C.
5	N.C.	10	GND



2.4.13 Flat Panel Bezel Connector: CN3



- **Power LED**

This 3-pin connector named as Pin 1 and 5 connect the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON.

- **External Speaker and Internal Buzzer Connector**

Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the board to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **Power On/Off Button**

This 2-pin connector named as Pin 9 and 10 connect the front panel's power button to the board, which allows users to control the power supply to be power on/off state.

- **System Reset Switch**

Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer, not turns OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

- **HDD Activity LED**

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 15 and 16 connect the hard disk drive to the front panel HDD LED, Pin 15 assigned as -, and Pin 16 as +.

- **Keyboard Lock**

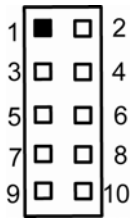
Pin 13 and 14 are for Keyboard Lock setting. You can short Pin 13 and 14 for the Keyboard Lock function.

2.4.14 Digital I/O Port (DIO) Connector: CN2

The board is equipped a digital I/O connector CN2 that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers, sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

Pin	Signal	Pin	Signal
1	Digital Input 1	2	Digital Output 1
3	Digital Input 2	4	Digital Output 2
5	Digital Input 3	6	Digital Output 3
7	GND	8	Digital Output 4
9	GND	10	Digital Output 5

CN5



2.4.15 Mini-PCI: CN4

CN4: Mini-PCI Connector

Pin	Signal	Pin	Signal
1	TIP	2	RING
3	LAN_RD+	4	LAN_TD+
5	LAN_RD-	6	LAN_TD-
7	RJ45 termination	8	RJ45 termination
9	RJ45 termination	10	RJ45 termination
11	LAN_LED1+	12	LAN_LED2+
13	LAN_LED1-	14	LAN_LED2-
15	CHGND	16	RESERVED
17	INTB#	18	5V
19	3.3V	20	INTA#
21	RESERVED	22	RESERVED
23	GND	24	3.3VAUX
25	CLK	26	RST#
27	GND	28	3.3V
29	REQ#	30	GNT#
31	3.3V	32	GND

Pin	Signal	Pin	Signal
33	AD31	34	PME#
35	AD29	36	RESERVED
37	GND	38	AD30
39	AD27	40	3.3V
41	AD25	42	AD28
43	RESERVED	44	AD26
45	C/BE3#	46	AD24
47	AD23	48	IDSEL
49	GND	50	GND
51	AD21	52	AD22
53	AD19	54	AD20
55	GND	56	PAR
57	AD17	58	AD18
59	C/BE2#	60	AD16
61	IRDY#	62	GND
63	3.3V	64	FRAME#
65	CLKRUN#	66	TRDY#
67	SERR#	68	STOP#
69	GND	70	3.3V
71	PERR#	72	DEVSEL#
73	C/BE1#	74	GND
75	AD14	76	AD15
77	GND	78	AD13
79	AD12	80	AD11
81	AD10	82	GND
83	GND	84	AD09
85	AD08	86	C/BE0#
87	AD07	88	3.3V
89	3.3V	90	AD06
91	AD05	92	AD04
93	RESERVED	94	AD02
95	5V	96	AD00
97	5V	98	RESERVED
99	AD01	100	RESERVED
101	GND	102	GND
103	RESERVED	104	RESERVED
105	RESERVED	106	RESERVED

Pin	Signal	Pin	Signal
107	RESERVED	108	RESERVED
109	RESERVED	110	RESERVED
111	RESERVED	112	RESERVED
113	RESERVED	114	GND
115	RESERVED	116	RESERVED
117	RESERVED	118	RESERVED
119	RESERVED	120	RESERVED
121	RESERVED	122	RESERVED
123	RESERVED	124	RESERVED

-- End of the Mini-PCI Connector (CN4) Table –

Chapter 3
Hardware Description

3.1 Microprocessors

The SBC84822 Series supports Socket 478 for Intel® Pentium® M and C-M processors at FSB 400/533MHz, LV Intel® Pentium® M 1.4GHz and ULV Celeron® M processor 600MHz/512K, 1GHz/0K, 1GHz/512K processors, which make your system operated under Windows 2000/XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

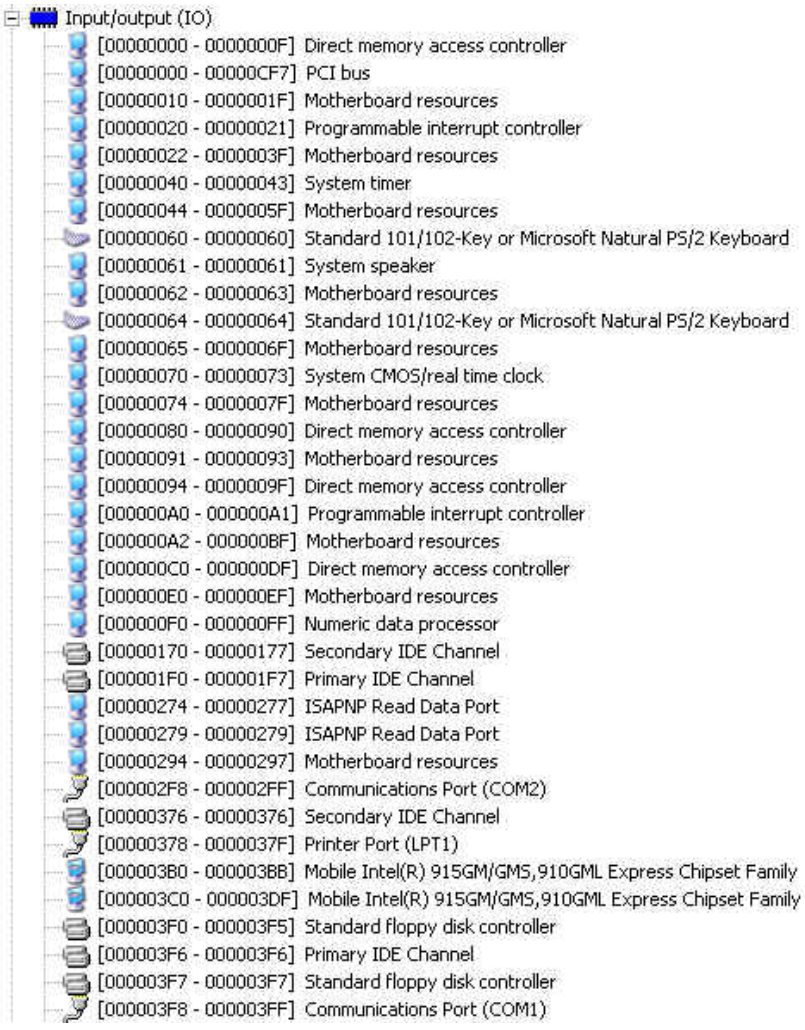
The SBC84822 Series uses Award Plug and Play BIOS with a single 4Mbit Flash EPROM.

3.3 System Memory

The SBC84822 Series industrial CPU card supports one 200-pin DDR2 DIMM sockets for a maximum memory of 1GB DDR2 SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB, 1GB and 2GB.

3.4 I/O Port Address Map

The Intel® Pentium® M/Celeron® M CPUs can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.

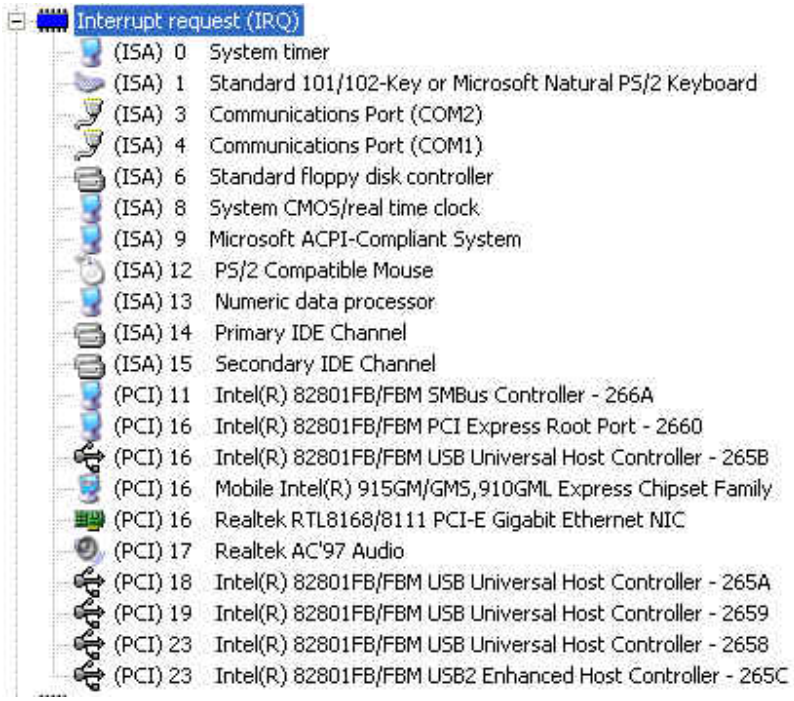


-- I/O Port Address Map under XP OS (1) --

-- I/O Port Address Map under XP OS (2) --

3.5 Interrupt Controller

The **SBC84822 Series** is a 100% PC compatible control board. The mapping list under XP OS is shown as the following screen.



-- Interrupt Request Map under XP OS --

Chapter 4
Award BIOS Utility

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the Setup information whenever the power is turned off.

4.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

4.2 Control Keys

Up arrow	Move cursor to the previous item
Down arrow	Move cursor to the next item
Left arrow	Move cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+" key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

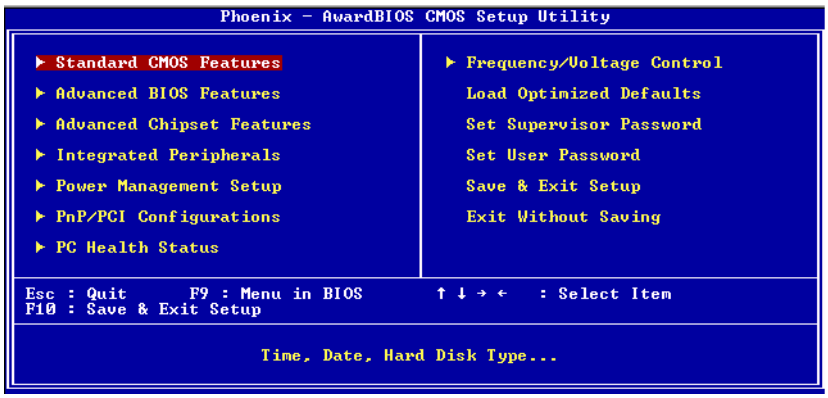
4.3 Getting Help

- **Main Menu**
  The online description of the highlighted setup function is displayed at the bottom of the screen.

- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop out a small Help window that provides the description of using appropriate keys and possible selections for highlighted items. Press <F1> or <Esc> to exit the Help Window.

4.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.

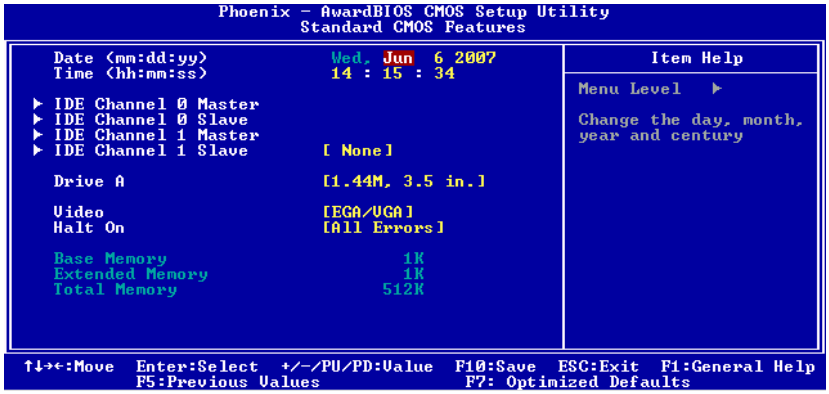


NOTE: *If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.5 Standard CMOS Setup Menu

The Standard CMOS Setup Menu displays basic information about your system. Use arrow keys to highlight each item, and use <PgUp> or <PgDn> key to select the value you want in each item.



- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	It is determined by the BIOS and read only, from Sunday to Saturday.
date	It can be keyed with the numerical/ function key, from 1 to 31.
month	It is from January to December.
year	It shows the current year of BIOS.

- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **IDE Primary Master/Primary Slave**
  These items identify the types of each IDE channel installed in the computer. There are 45 predefined types (Type 1 to Type 45) and 2 user's definable types (Type User) for Enhanced IDE BIOS. Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type, or directly type the number and press <Enter>. Please be noted your drive's specifications must match the drive table. The hard disk will not work properly if you enter improper information. If your hard disk drive type does not match or is not listed, you can use Type User to manually define your own drive type.
  If selecting Type User, you will be asked to enter related information in the following items. Directly key in the information and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the HDD interface controller supports ESDI, select "Type 1".
  If the HDD interface controller supports SCSI, select "None".
  If the HDD interface controller supports CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

- **Dive A type/Drive B type**
  The item identifies the types of floppy disk installed in the computer, as drive A or drive B.

None	No floppy drive installed
360K, 3.5 in	3.5 inch PC-type standard drive; 360Kb Mini ITXcity
1.2M, 3.5 in	3.5 inch AT-type high-density drive; 1.2MB Mini ITXcity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb Mini ITXcity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB Mini ITXcity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB Mini ITXcity

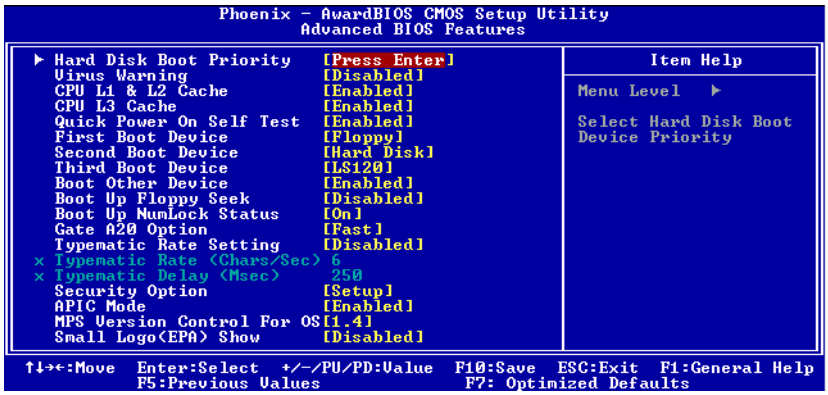
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.
All, But Diskette	The system booting will not stop for a disk error; it will stop for other errors.
All, But Disk/Key	The system booting will not stop for a keyboard or disk error; it will stop for other errors.

Press <Esc> to return to the Main Menu page.

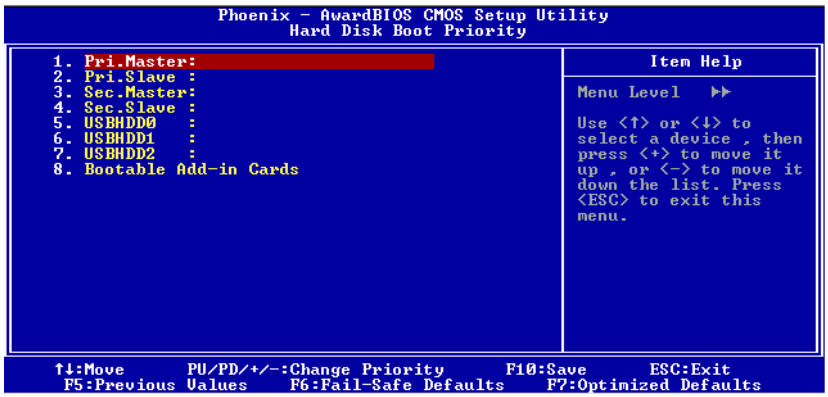
4.6 Advanced BIOS Features

This section allows you to configure and improve your system, to set up some system features according to your preference.



- **Hard Disk Boot Priority**

  Scroll to this item and press <Enter> to view the sub menu to decide the disk boot priority.



Press <Esc> to return to the Advanced BIOS Features page.

- **Virus Warning**
  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is "*Disabled*".

! WARNING !
Disk boot sector is to be modified *Type "Y" to accept write or "N" to abort write* *Award Software, Inc.*

Enabled	It automatically activates while the system boots up and a warning message appears for an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear for attempts to access the boot sector or hard disk partition table.

***NOTE**: This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU L1 & L2 Cache**
  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is *"Enabled"*. CPUs without built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **CPU L3 Cache**
  Use this item to enable L3 cache only for the CPUs with such a function.
- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Quick Power On Self Test

Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.

- **Boot Other Device**

  This item allows the user to enable/disable the boot device not listed on the First/Second/Third boot devices option above. The default setting is "*Enabled"*.

- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks. The 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is "*Enabled*".

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Please be noted BIOS can not differentiate 720K, 1.2M or 1.44M drive type as they all are 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the installed drive is 360K.

- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is *"On"*.

- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This item determines the typematic rate of the keyboard. The default value is *"Disabled"*.

Enabled	Enable typematic rate and typematic delay programming.
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items, controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to character numbers typed per second by the keyboard. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option defines how many milliseconds must elapse before a held-down key begins generating repeat characters. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	If a wrong password is entered at the prompt, the system will not boot, the access to Setup will be denied, either.
Setup	If a wrong password is entered at the prompt, the system will boot, but the access to Setup will be denied.

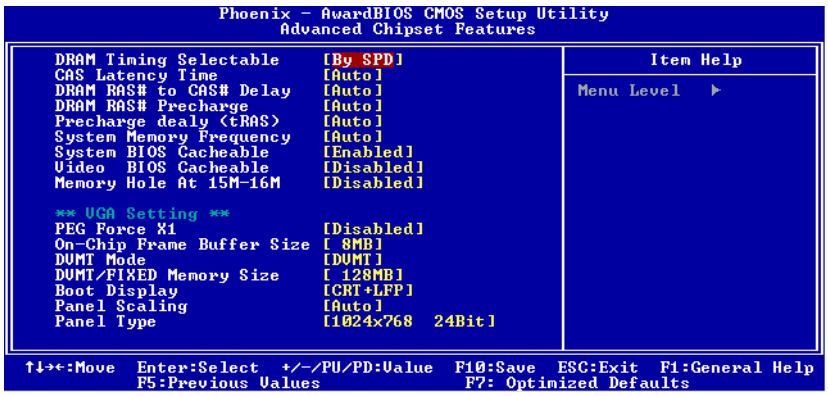
NOTE: *To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **APIC Mode**
  Use this item to enable or disable APIC (Advanced Programmable Interrupt Controller) mode that provides symmetric multi-processing (SMP) for systems.
- **MPS Version Control For OS**
  This item specifies the version of the Multiprocessor Specification (MPS). Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability.
- **Small Logo(EPA) Show**
  If enabled, the EPA logo will appear during system booting up; if disable, the EPA logo will not appear.

Press <Esc> to return to the Main Menu page.

4.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.



- **DRAM Timing Selectable**

  Use this item to increase the timing of the memory. This is related to the cooling of memory.

- **CAS Latency Time**
  You can select CAS latency time to HCLKs 2, 3, or Auto. The board designer should have set up these values in accordance with the installed DRAM. Do not change these values unless you have to change the specifications of the installed DRAM or CPU.

- **DRAM RAS# to CAS# Delay**

  When DRAM is refreshed, both rows and columns are addressed separately. This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed.

- **DRAM RAS# Precharge**

  The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

- **Precharge Delay <tRAS>**
  The precharge time is the number of cycles it takes for DRAM to accumulate its charge before refresh.
- **System Memory Frequency**
  This item helps you set main memory frequency. When using an external graphics card, it can be adjusted to enable the best performance for your system.
- **System BIOS Cacheable**
  Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is *"Disabled"*.
- **Video BIOS Cacheable**
  This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.
- **Memory Hole At 15M-16M**
  You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

***** VGA Setting *****

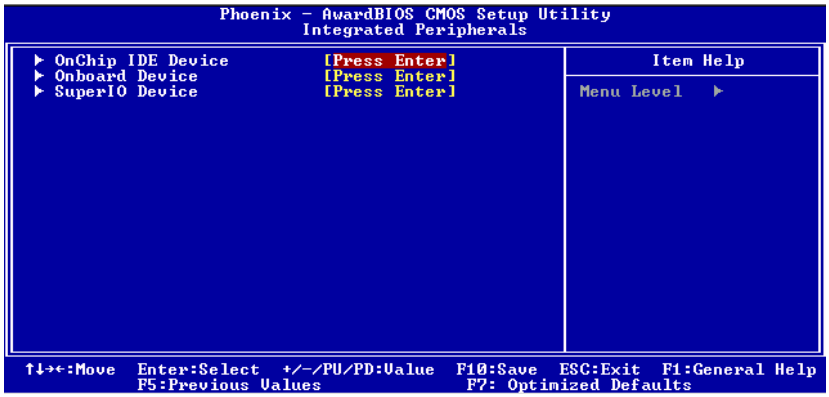
- **PEG Force X1**
  Use this item to select PCI Express X1 forcedly.
- **On-Chip Frame Buffer Size**
  Use this item to set the VGA frame buffer size.
- **DVMT Mode**
  DVMT (Dynamic Video Memory Technology) helps you select the video mode.
- **DVMT/Fixed Memory Size**
  DVMT (Dynamic Video Memory Technology) allows you to select a maximum size of dynamic amount usage of the video memory. The system would configure the video memory dependent on your application.

- **Boot Display**
  This item is for Intel define ADD card only.

Press <Esc> to return to the Main Menu page.

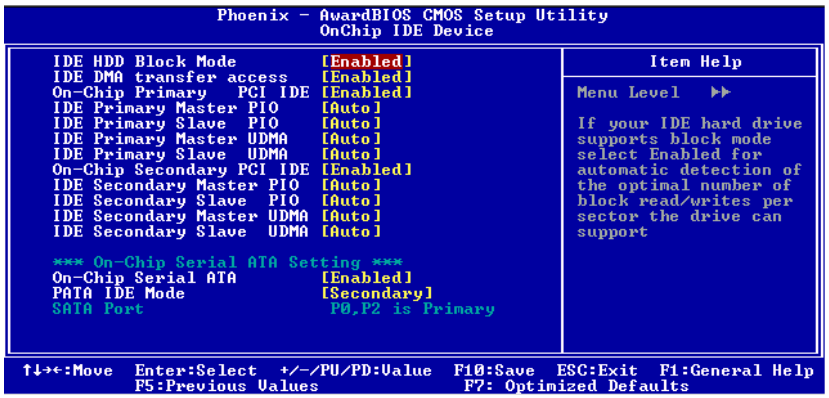
4.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.



- **OnChip IDE Device**

  Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.



- **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.
- **IDE DMA transfer access**
  Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.
- **On-Chip Primary/Secondary PCI IDE**
  The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately. The default value is *"Enabled"*.

  
  ***NOTE**: Choosing Disabled for these options will automatically remove the IDE Primary Master/ Slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.*
- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
- **IDE Primary/Secondary Master/Slave UDMA**
  Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.

***** On-Chip Serial ATA Setting *****

- **On-Chip Serial ATA**

  Use this item to enable or disable the built-in on-chip serial ATA.
- **PATA IDE Mode**
  Use this item to set the PATA IDE mode. When set to Primary, P1

and P3 are Secondary; on the other hand, when set to Secondary, P0 and P2 are Primary.

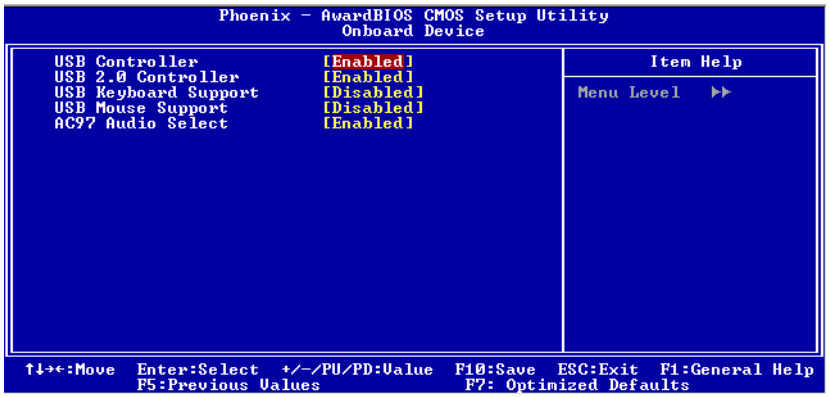
- **Onboard Parallel Port**
  This item is used to assign the I/O address and interrupt request (IRQ) for the onboard parallel port.

- **SATA Port**
  If the "PATA IDE Mode" is Primary, it will show " P1, P3 is Secondary" which means SATA 2 and SATA 4 are Secondary. If the "PATA IDE Mode " is Secondary, it will show " P0, P2 is Primary " which means SATA 1 and SATA 3 are Primary.

Press <Esc> to return to the Integrated Peripherals page.

- **Onboard Device**

Scroll to this item and press <Enter> to view the sub menu Onboard Device.



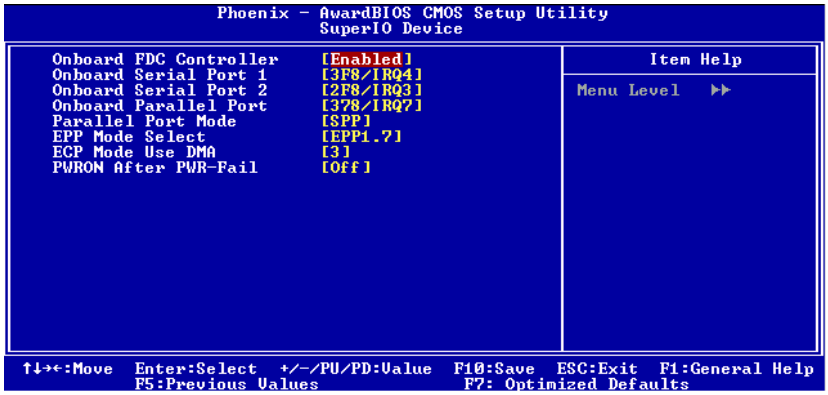
- **USB Controller**
  Enable this item if you are using the USB in the system. You should disable this item if a higher-level controller is added.
- **USB 2.0 Controller**
  Enable this item if you are using the EHCI (USB2.0) controller in the system.
- **USB Keyboard Support**
  Enable this item if the system has a Universal Serial Bus (USB) controller, and you have a USB keyboard.

- **USB Mouse Support**
  Enable this item to boot the hard drive by a USB mouse.
- **AC'97 Audio Select**
  Use this item to enable or disable the onboard AC'97 Audio function.

Press <Esc> to return to the Integrated Peripherals page.

- **Super IO Device**

  Scroll to this item and press <Enter> to view the sub menu Super IO Device.



- **Onboard FDC Controller**
  Select Enabled, if your system has a floppy disk controller (FDC) installed on the system board and you want to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Options: Enabled and Disabled.
- **Onboard Serial Port 1 / 2**
  Select an address and corresponding interrupt for the serial port. Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.
- **Onboard Paralellel Port**
  This item allows you to determine the I/O address for onboard parallel port. Options: 378H/IRQ7, 278H/IRQ5, 3BC/IRQ7 and Disabled.
- **Parallel Port Mode**

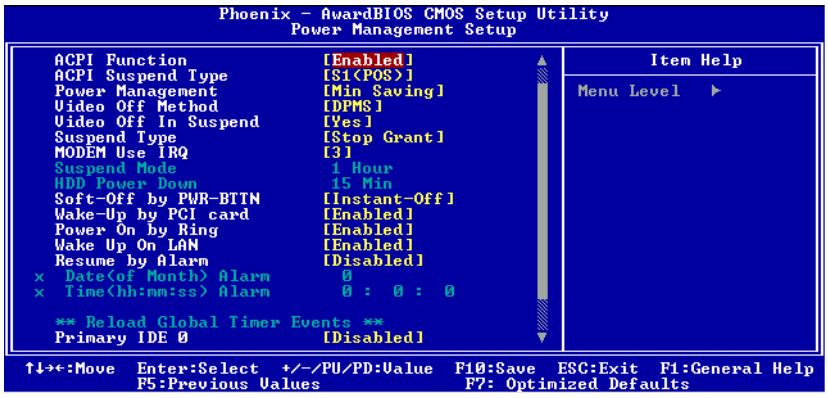
Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field. Options: EPP1.9, ECP, SPP, ECPEPP1.7, EPP1.7.

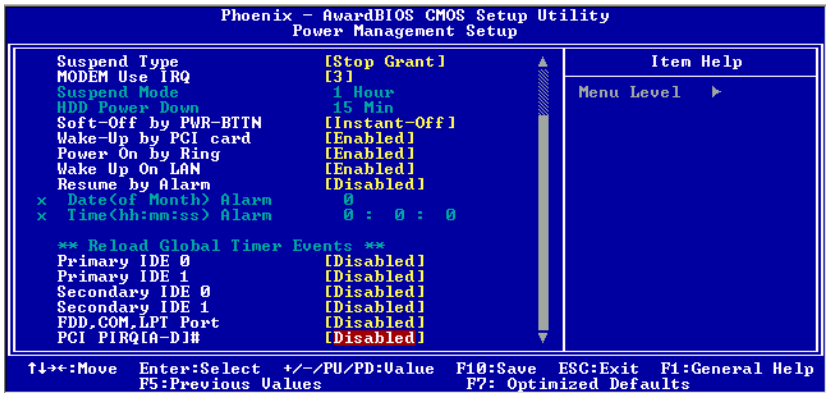
- **EPP Mode Select**
  Select EPP port type 1.7 or 1.9.
- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port while using the ECP mode.
- **PWRON After PWR-Fail**
  This item enables your computer to automatically restart or return to its operating status.

Press <Esc> to return to the Integrated Peripherals page, and press it again to the Main Menu.

4.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.





- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always "*Enabled*".
- **ACPI Suspend Type**
  This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:
  [S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.
  [S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.
- **Power Management**
  This option allows you to select the type of power Management. Options: APM, ACPI.
- **Video Off Method**
  This setting determines the manner in which the monitor is blanked.

Video Off Method

V/H SYNC+Blank	It turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the supplied software for your video subsystem to select video power management values.
Blank Screen	The System only writes blanks to the video buffer.

- **Suspend Type**
  If this item is set to the default Stop Grant, the CPU will go into Idle Mode during power saving mode.

- **Moden Use IRQ**
  If you want an incoming call on a modem to automatically resume the system from a powersaving mode, use this item to specify the interrupt request line (IRQ) used by the modem. You might have to connect the fax/modem to the board Wake On Modem connector for working this feature.

- **Suspend Mode**
  After a selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	The System will never enter the SUSPEND mode.
1/2/4/6/8/10/20/30/40 Min/1 Hr	It defines continuous idle time before the system entering the SUSPEND mode. If any item defined in (J) is enabled and active, the SUSPEND timer will be reloaded.

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.

- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows users to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

Soft-Off by PWR-BTTN

Instant-Off	This option follows the conventional manner of system performance when turning the power to OFF. Instant-Off is a software power OFF sequence requiring the power supply button is switched to OFF.
Delay 4 Sec.	Upon the system's turning OFF through the power switch, this option will delay the complete system power OFF sequence approximately 4 seconds. Within this delay period, the system will temporarily enter into the Suspend Mode enabling you to restart the system at once.

- **Wake-Up by PCI card**
  If enable this item, the system can automatically resume when the PCI Modem or PCI LAN card receives an incoming call.
- **Power On by Ring**
  This option allows the system to resume or wake up upon detecting any ring signals coming from an installed modem. The default value is *"Enabled"*.
- **Wake Up On LAN**
  When this option is enabled, a wake up event will awaken the system from the power-down state.
- **Resume by Alarm**
  If enable this item, the system can automatically resume after a fixed time in accordance with the system's RTC (realtime clock).

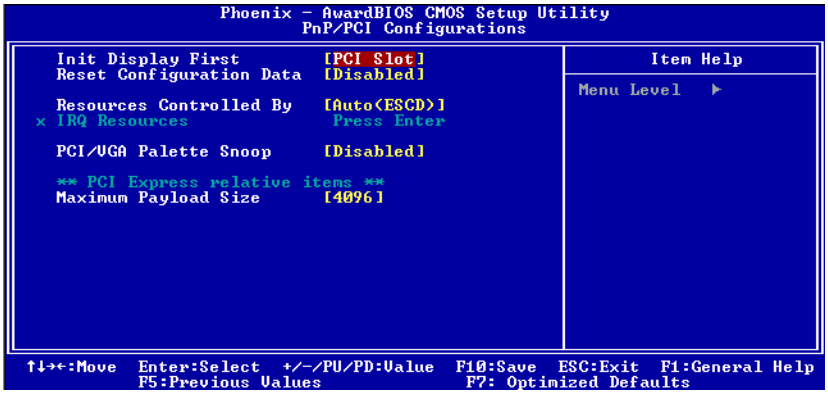
**** Reload Global Timer Events ****

Global Timer (power management) events can prevent the system from entering a power saving mode or can awaken the system from such a mode.

- **Primary/Secondary IDE 0/1**
  Use this item to configure the IDE devices monitored by the system.
- **FDD, COM, LPT Port**
  Use this item to configure the FDD, COM and LPT ports monitored by the system.
- **PCI PIRQ[A-D]#**
  This item can be used to detect PCI device activities; if no activity, the system will enter the sleep mode.

4.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.



- **Init Display First**
  This item allows you to decide whether PCI Slot or AGP to be the first primary display card.

- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options: Enabled, Disabled.

- **Resources Controlled By**
  The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is *"Manual"*.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:

1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

The default value is *"PCI/ISA PnP"*.

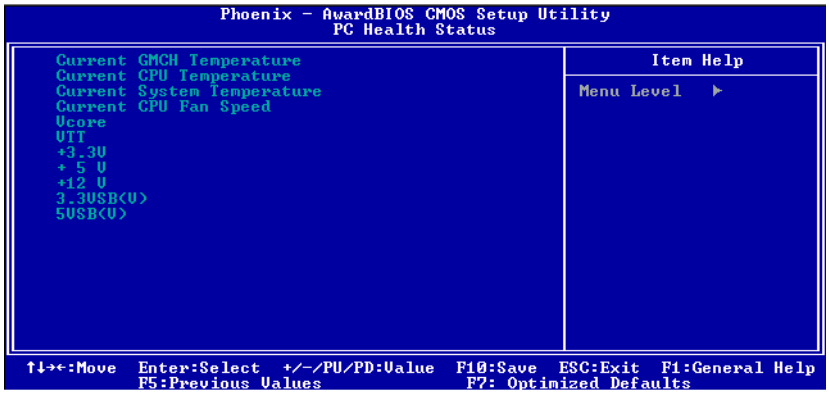
- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

**** PCI Express relative items ****

- **Maximum Payload Size**
  When using DDR SDRAM and Buffer size selection, another consideration in designing a payload memory is the size of the buffer for data storage. Maximum Payload Size defines the maximum TLP (Transaction Layer Packet) data payload size for the device.

4.11 PC Health Status

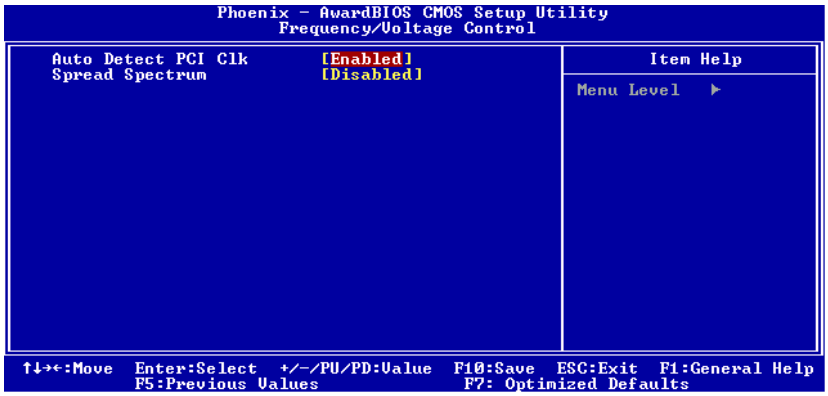
This section supports hardware monitering that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.



- **Current GMCH Temperature**
  The current GMCH temperature will be automatically detected by the system.
- **Current CPU Temperature**
  The current system CPU temperature will be automatically detected by the system.
- **Current SYSTEM Temperature**
  Show you the current system1 temperature.
- **Current CPU FAN Speed**
  These optional and read-only items show current speeds in RPM (Revolution Per Minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.
- **Vcore +3.3V/+5V/+12V/VBAT(V)/5VSB**
  Show you the voltage of +3.3V/+5V/+12V.

4.12 Frequency/Voltage Control

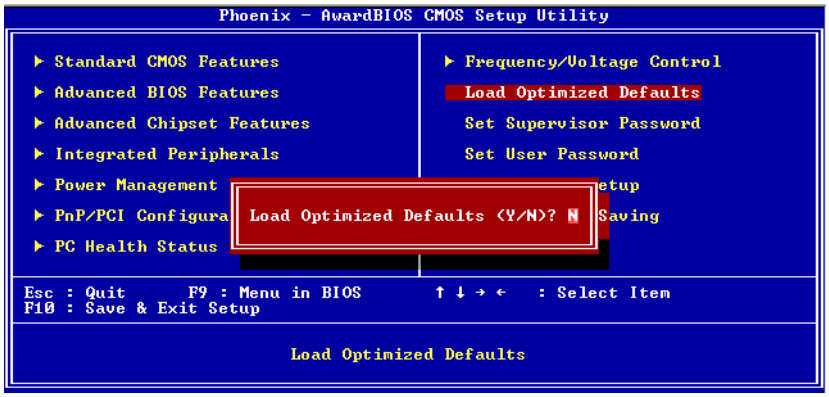
This section is to control the CPU frequency and Supply Voltage, DIMM OverVoltage and AGP voltage.



- **Auto Detect PCI Clk**
  The enabled item can automatically disable the clock source for a PCI slot without a module, to reduce EMI (ElectroMagnetic Interference).
- **Spread Spectrum**
  If spread spectrum is enabled, EMI (ElectroMagnetic Interference) generated by the system can be significantly reduced.

4.13 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

4.14 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1. **Supervisor password:** You can enter and change the options on the setup menu.
2. **User password:** You can just enter, but have no right to change the options on the setup menu.

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 a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

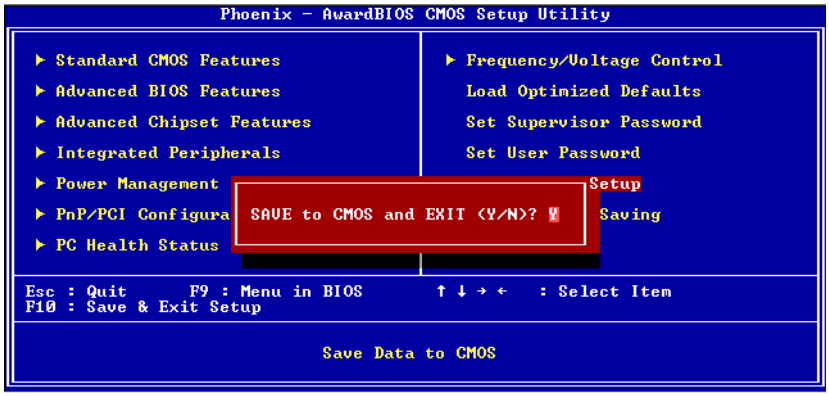
When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

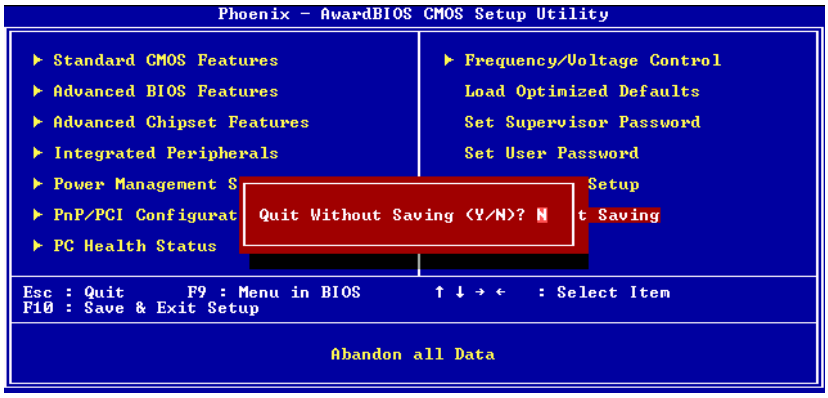
4.15 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Setup utility.



4.16 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications. Type "N" to return to the Setup utility.



A p p e n d i x A
Watch Dog Timer

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start
↓
Un-Lock WDT:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
Select Logic device:
O 2E 07
O 2F 08
↓
Activate WDT:
O 2E 30
O 2F 01
↓
Set Second or Minute :
O 2E F5
O 2F N N=00 or 08(See below table)
↓
Set base timer :
O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓

WDT counting re-set timer :
O 2E F6
O 2F M ; M=00,01,02,…FF(See below table)

; IF to disable WDT:

O 2E 30
O 2F 00 ; Can be disable at any time

- Timeout Value Range
  - 1 to 255
  - Minute / Second
- Program Sample

  Watchdog Timer can be set to system reset after 5-second timeout.

2E, 87	
2E, 87	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F5	
2F, N	Set Minute or Second N=08 (Min),00(Sec)
2E, F6	
2F, M	Set Value M = 00 ~ FF

Appendix B
Digital I/O

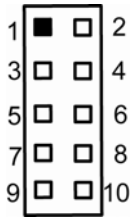
Using the Digital Input Function

Start
↓
Un-Lock SuperI /O:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
SelectMultiplexed pin to GPIO Function :
O 2E 2A
O 2F FF
↓
Select Logic device:
O 2E 07
O 2F 07
↓
Activate Logic Device:
O 2E 30
O 2F 01
↓
Select GPI Function:
O 2E F0
O 2F E0 (for 3IN / 5OUT)

When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.

Pin	Signal	Pin	Signal
1	Digital Input 1(BIT5)	2	Digital Output 1(BIT0)
3	Digital Input 2(BIT6)	4	Digital Output 2(BIT1)
5	Digital Input 3(BIT7)	6	Digital Output 3(BIT2)
7	GND	8	Digital Output 4(BIT3)
9	GND	10	Digital Output 5(BIT4)

CN2



↓
Read Data:
O 2E F1
I 2F
XX (XX is input Data;
if no input source,the value is E0)

Using the Digital Output Function

Start
↓
Un-Lock Superl /O:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
SelectMultiplexed pin to GPIO Function :
O 2E 2A
O 2F FF
↓
Select Logic device:
O 2E 07
O 2F 07
↓
Activate Logic Device:
O 2E 30
O 2F 01
↓
Select GPO Function:
O 2E F0
O 2F E0 (for 3IN / 5OUT)
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.
↓
Output Data:
O 2E F1
O 2F XX=00,01,02,...FF(XX is Output Data)