EMB-M4

INDUSTRIAL MOTHERBOARD

User`s Manual

Version 1.3

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Contents

Introduction

This manual is designed to give you information on the M4 Industrial MainBoard. The topics covered in this manual are as follows:

- ✓ **Features**
- ✓ **Specification**
- ✓ **Jumper setting and Connectors**
- ✓ **BIOS Setup**
- ✓ **Appendix**

Chapter 1
Features & Specifications

Features

- Support both VIA C7 and EDEN NanoBGA2 CPU in V4 bus for either High performance or Low Power.
- Compact design with Rich I/O functions for Panel PC, POS, Thin-client, Network PC, Set-Top Box.
- Multiple I/O support, up to 8 x USBs, 6x COM ports and 1 x 8-bits DIO. COM1, COM2 and COM6 are powered by either 5V or 12V.
- Support both TTL and LVDS LCD. The resolution can be up to 1600x1200. Dual Independent display and rotation supported by Drivers.
- LCD Brightness control with Software ready for Windows XP/2K.
- Support TV-OUT with 800x600, 1024x768.
- Single DC 12V Input power with external AC/DC Adapter, while internal +12V connector reserved.
- +5V and +12V output available for peripheral devices with standard 3.5" FDD power connector.
- Dual 10/100M LAN Design with Root Boot and Wake Up on LAN support.
- AC97 5.1CH Audio with internal connection and external audio jack.
- Support versatile storage devices: 3.5"HDD, 2.5"HDD, DOM module in 40pins and 44pins, CompactFlash and USB Flash disk.

Specifications

- **Processor Support:**
  - VIA nanoBGA2 V4 interface CPU mounted on board.
  - Support VIA C7 High performance CPU 1.5G, 1.6G, 1.8G and 2.0GHz.
  - Support VIA EDEN (V4) Low Power CPU 400M, 500M, 600M, 800M, 1.0G, 1.2G, 1.5GHz.

- **Major Chipset:**
  - VIA CN700 and VT8237RPlus chipset.
  - RealTek RTL8100BL LAN chip.
  - Winbond 83627HF Super I/O.
  - ALC655 AC97 Audio chip.

- **System Memory:**
  - One DDR DIMM 184-pins Sockets support DDR 266/333/400 unregistered non-ECC up to 1.0 GB.

- **Video Controller:**
  - CN700 Integrated S3 Graphic Engine.
  - One 15-Pins D-Sub Female connector for CRT Displays.
  - One 40-pins 1.25mm pitch connector for Dual 18/24-bits LVDS LCD displays.
  - One 40-pins 1.25mm pitch connector for TTL LCD displays.
  - One 7-pins Mini-DIN connector on rear support S-video and composite video signals for TV-OUT displays.
  - One 5-pins JST connector for Inverter power and brightness control.

- **Super I/O:**
  - Winbond 83627HF LPC I/F Super I/O chip.
  - Six RS-232 ports as COM1~COM6. COM1 and COM2 are D-Sub 9-pins male on Rear. COM6 is pin-header (2x5 pin-header/ 2mm pitch) for internal connection. Pin9 is powered with either 5V or 12V.
  - COM3~COM6 are pin-header (2x5 pin-header/ 2mm pitch) for internal connections. Both COM2 and COM4 are RS232/422/485 selectable by jumpers.
  - 1 x Parallel port supports SPP/ECP/EPP mode. (25-Pins D-Sub Female on Rear).
  - 1 x IrDA port; (5-pins pin-header with +5V).

- Four USB2.0 ports for front. (2x5 pin-header, 2mm).
- Four USB2.0 ports on rear. (Two 1x2 right-angle/stack-up USB ports on Rear).
- 1 x PS2 Keyboard/mouse connector. (6-pins/Mini-DIN/Stack-up on Rear).

- **Hardware Monitor:**
  - 83627HF integrated hardware monitor chip to monitor Voltages, temperatures and FAN speed.
  - Temperature Monitor: CPU thermal diode, one sensor close to CPU socket, one sensor close to 83627HF chip.
  - One CPU FAN for CPU cooler and one SYS FAN for chassis FAN. All FAN speed are monitored and can be controlled by CPU and System temperature to turn-on or turn-off.

- **10/100M Ethernet:**
  - Two RTL8100BL on board for dual 10/100M LAN.
  - Support Wake-on-LAN.
  - The LAN connector is RJ45+USBx2 combo connector on rear. RJ45 connector with Link/Act and Speed LED integrated.
  - Remote Boot Agent is supported with PXE protocol.

- **PIDE and SATA:**
  - PIDE controller build in VT8237 support up to UltraDMA mode 6 or ATA133 speed.
  - One standard 40-pins Box header to support 3.5” HDD, CDROM, DVD player or DOM Flash Disk.
  - One standard 44-pins Box-header support 2.5” HDD, Slim CD-ROM or DOM Flash Disk.
  - One Compact Flash-II socket share with Secondary IDE Channel. One 2-pins jumper/2mm to select as Master or Slave device.
  - Two SATA connectors from VT8237R support SATA-I and SATA-II devices. Two SATA HDDs can be configured as RAID0 or RAID1 through Option- ROM or Windows Utilities.

- **Watchdog Timer:**
  - The disable/enable selection can be programmed in BIOS setup. The timeout interval can be set up through programmed I/O address 300h/301h.
  - The timeout event will generate the RESET.

- **CMOS:**
  - On-board RTC with 242 bytes of Battery-back CMOS RAM.
  - One 3-pins Jumper/2mm to clear CMOS data.

- **Audio:**
  - RealTek ALC655 AC97 Audio chip on-board.
  - Two Audio-Jack on rear for Audio Line-OUT and MIC.
  - One 14-pins pin-header to provide internal audio device connection.

- **DIO:**
  - Use 83627HF GPIO port for Digital I/O control. Support 8-In and 8-out.

- **BIOS:**
  - Award Standard PnP Flash BIOS 6.0.
  - 4Mbit FlashROM with BootBlock for Fail-safe.
  - BIOS utility for field update.
  - VBIOS and LAN remote BootROM integrated.
  - 32-pins PLCC type socket. Use Firmware-Hub chip wired to VT8237.

- **PCI Expansion Slot:**
  - One PCI 120-pins connector with 3 sets of REQ/GNT/Clock signals integrated to support up to 3 PCI cards.

- **Power Connector:**
  - DC 12V input connector with 4-pins Mini-DIN connector on rear.
  - Supply +5V and +12V output power with 4-pins 3.5" FDD type power connector.

- **Software Compatibility:**
  - Microsoft windows: NT4.0, Win XP, Win 2K Prof, Win2K Server, Win2003, .NET.
  - Linux RedHat 7.2, 7.3, 8.0, 9.0.
  - DOS 6.0 and 6.22.
  - QNX v6.2, WinCE.

- **Cooling:**
  - Two cooling FAN connectors close to CPU for CPU cooler and System FAN.
  - Flat Heat-sink on top of CN700 and VT8237R chipset.
  - Customized Cooler for VIA nanoBGA2 CPU.

- **Others:**
  - One Buzzer (9mm) on-board for beep message.

- **Operating Temperature:**
  - 0~50˚C Operation Rage.
  - Relative Humility: 5~95%, non-condensing.

- **Dimensions:**
  - 190mm(W) x 135mm(L)
  - 4 screw holes on four corners.

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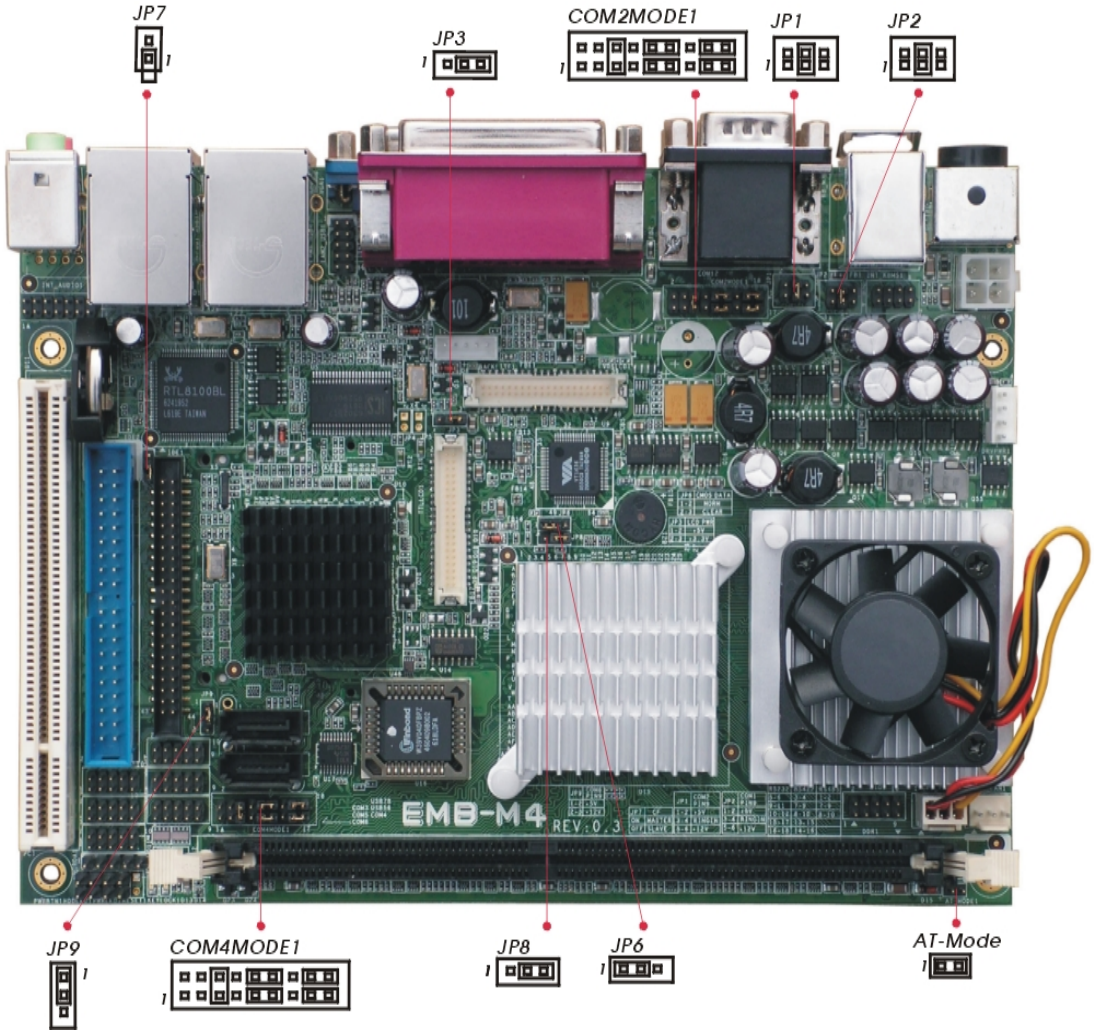
Chapter 2
Jumper setting & Connectors

Jumpers on the M4

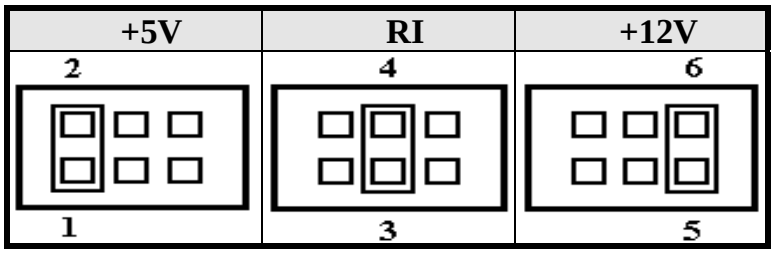
The jumpers on the M4 allow you to configure your Main Board according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative. The following table lists the jumpers on M4 and their respective functions.

Jumper Locations on the M4



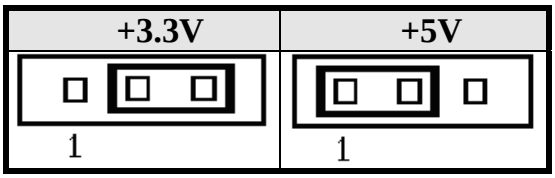
JP1, JP2: COM Power Selection

JP1, JP2 can be used to select the COM supple power: +5V,Ring-IN or +12V.
JP1: COM2 Pin9 power or Ring-IN
JP2: COM1 pin9 power or Ring-IN



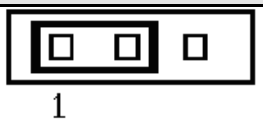
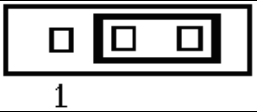
JP3: LCD PANEL Power Selection

JP3 can be used to select the Panel LCD supple power: +3.3V or +5V.The default setting is on +3.3V.User need to check the LCD panel spec and adjust this jumper to make Panel work in specified power rail. This Jumper serves both TTL and LVDS LCD connector.



JP6: Clear CMOS RAM Data

This 3-pin Jumper allows the user to disconnect the built-in 3V battery power to clear the information stored in the CMOS RAM. To clear the CMOS data: (1) Turn off the system power, (2) Remove Jumper cap from pin1&2, (3) Short the pin2 and pin3 for three seconds, (4) Put Jumper cap back to pin1 & 2. (5) Turn on your computer, (6) Hold Down <Delete> during boot up and enter BIOS setup to enter your preferences.

JP6	Setting	Function
	Pin 1-2 Short/Closed	Normal Operation (default)
	Pin 2-3 Short/Closed	Clear CMOS Content

JP7: CF Card Mode Selection

This Jumper is to select the CF works as Secondary Channel Master device or Slave device.

Master	Slave
	
JP7	JP7

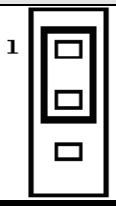
JP8: LCD Interface Type Selection

This Jumper is to select the CN700 driver Flat Panel in Legacy TTL interface or LVDS Interface. M4 will support either TTL or LVDS interface. Nevertheless, the Panel ID applies to both interface and can be chosen in BIOS setup.

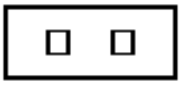
TTL	LVDS
	

JP9: COM6 Power Pin (Pin9)

JP9: COM6 Pin9 power.

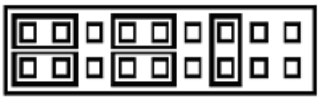
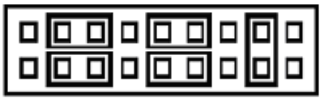
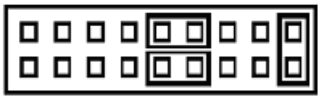
+5V	+12V
	

AT MODE: AT Mode Selection

AT Mode	ATX Mode
	

COM2MODE1 & COM4MODE1: RS232/RS422/RS485 Protocol Selection

COM2 and COM4 support multi-protocols includes RS232, RS422 and RS485, while COM1, COM3. COM5 and COM6 support diffused RS232 protocol.
The Protocols of COM2 and COM4 can be set up through jumpers.
COM2MODE1: COM2 Protocols selection.
COM4MODE1: COM4 Protocols selection.
The pin-out for each mode is illustrated on next chapter.

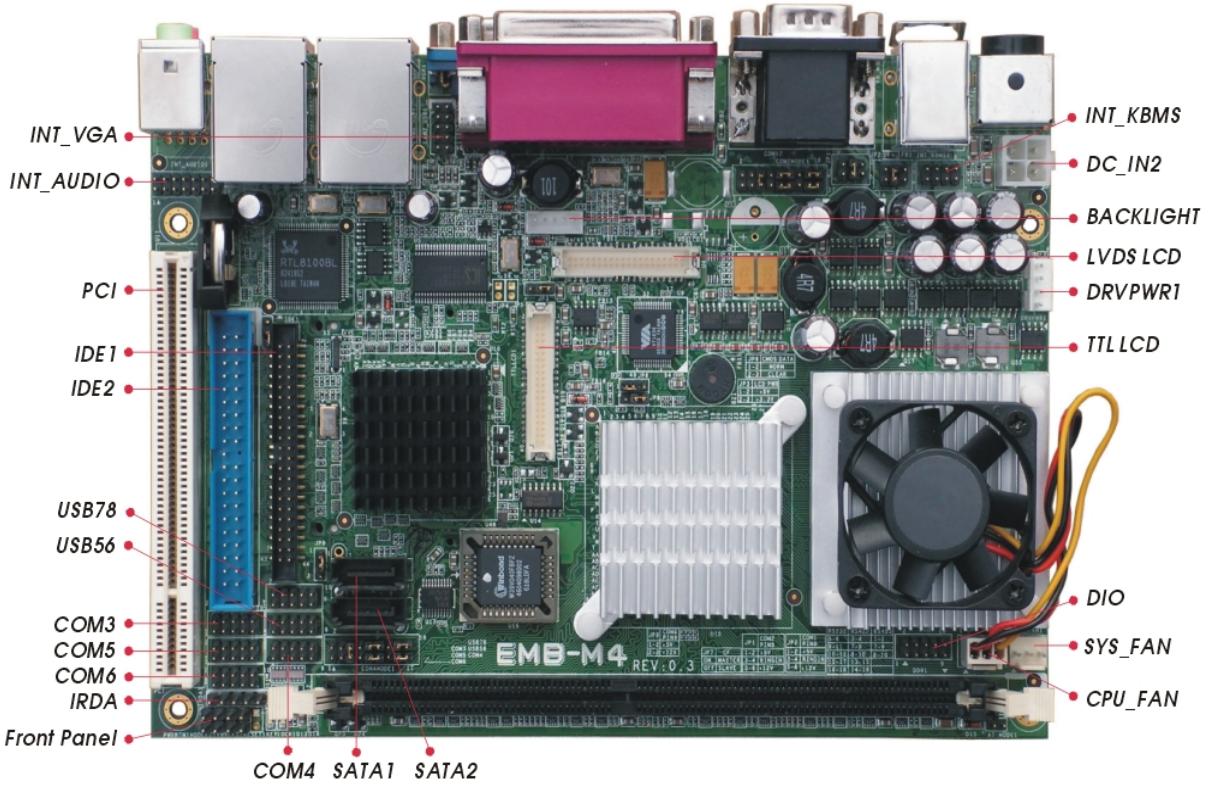
COM2MODE1 COM4MODE1	I/F TYPE
17 1  18 2	**RS-232**
17 1  18 2	**RS-422**
17 1  18 2	**RS-485**

Connectors on the M4

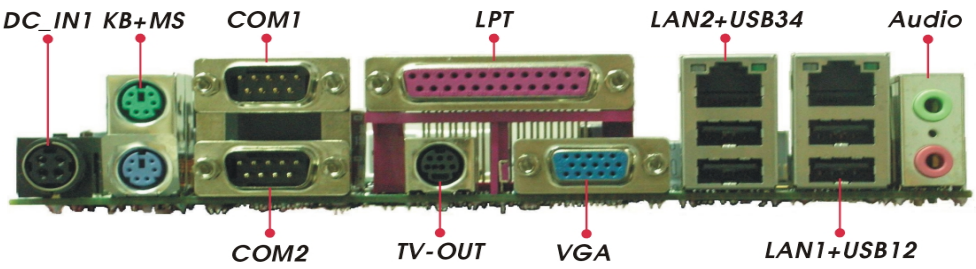
The connectors on the M4 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers and etc. The following table lists the connectors on M4 and their respective page number.

Connector Locations on the M4

（1）

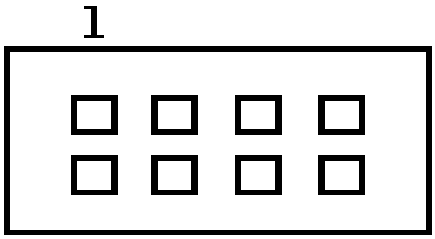


（2）



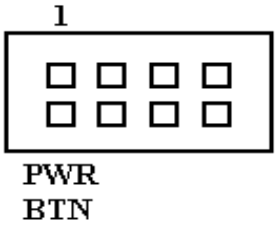
Front Panel Connector

The front panel of the case has a control panel, which provides light indication of the computer activities and switches to change the computer status.



- **ATX Power ON/OFF Button**

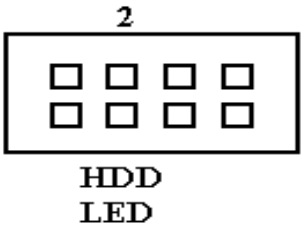
  This 2-pin connector acts as the "Power Supply On/Off Switch" on the M4 main board. When pressed, the switch will force the Main board to power on. When pressed again, it will force the main board to power off.



PWR BTN Pin #	Signal Name
1	PWR-BTN
5	GND

- **IDE Hard Disk LED Connector**

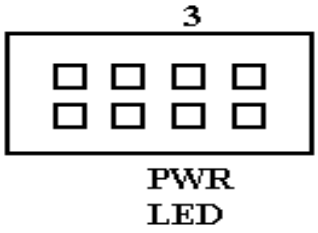
  This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



IDE LED Pin #	Signal Name
2	IDE_ACT
6	Ground

- **Power-On LED**

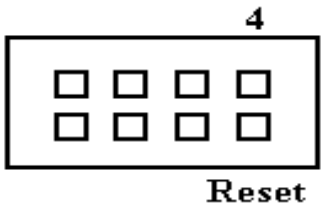
  This connector allows users to connect to Front Panel Power indicator.



PWR LED Pin #	Signal Name
3	+5V
7	Ground

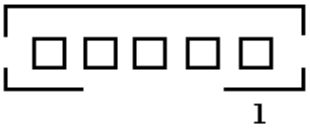
- **RESET Switch**

  The reset switch allows the user to reset the system without turning the main power switch off and then on. Orientation is not required when making a connection to this header.



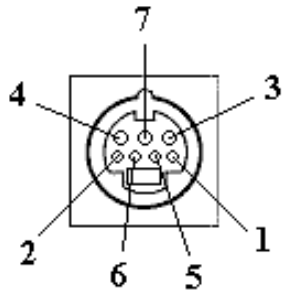
RESET Pin #	Signal Name
4	Reset
8	Ground

BACKLIGHT Connector



Pin #	Signal Name
1	+12V
2	GND
3	Brightness
4	ON/OFF
5	GND

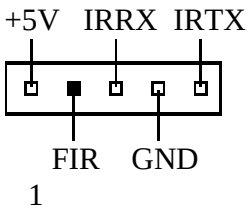
TV-OUT Connector



Pin #	Signal Name
1	GND
2	GND
3	LUMA
4	CHOMA
5	GND
6	GND
7	CVBS

IrDA Connector

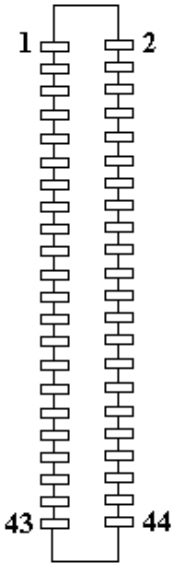
This connector is used for an IrDA connector for wireless communication.



IrDA Pin #	Signal Name
1	+5V
2	FIR
3	Ir RX
4	Ground
5	Ir TX

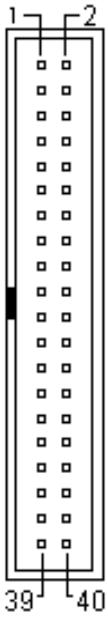
EIDE Connectors

Primary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	P66DET
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
+5V	41	42	+5V
GND	43	44	No connect

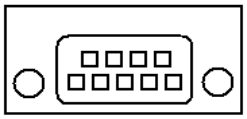
Secondary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ1	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
IRQ15	31	32	No connect
Address 1	33	34	S66DET
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

COM1 Serial Ports

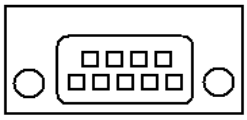
COM1, a 9-pin D-Sub male connector, is the onboard COM1 serial port of the M4. The following table shows its pin assignments.



Pin #	Signal Name
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	+5V,Ring-IN or +12V

COM2 Serial Ports

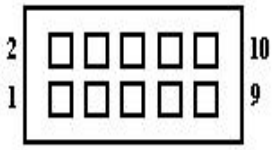
COM2, a 9-pin D-Sub male connector, is the onboard COM2 serial port of the M4. The following table shows its pin assignments.



Pin #	RS232 Mode Signal Name	RS422/RS485 Mode Signal Name
1	DCD, Data carrier detect	TX- (422/485)
2	RXD, Receive data	TX+ (422/485)
3	TXD, Transmit data	RX+ (422)
4	DTR, Data terminal ready	RX- (422)
5	GND, ground	GND
6	DSR, Data set ready	N.C.
7	RTS, Request to send	N.C.
8	CTS, Clear to send	N.C.
9	+5V,Ring-IN or +12V	N.C.

COM3, COM5 Serial Ports

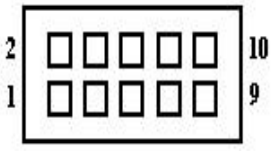
COM3, COM5, a 10-pin header connector, is the onboard COM3, COM5 serial port of the M4. The following table shows its pin assignments.



Pin #	RS232 Mode Signal Name
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	Ring-IN
10	NC

COM4 Serial Ports

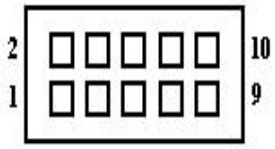
COM4, a 10-pin header connector, is the onboard COM4 serial port of the M4. The following table shows its pin assignments.



Pin #	RS232 Mode Signal Name	RS422/RS485 Mode Signal Name
1	DCD, Data carrier detect	TX- (422/485)
2	RXD, Receive data	TX+ (422/485)
3	TXD, Transmit data	RX+ (422)
4	DTR, Data terminal ready	RX- (422)
5	GND, ground	GND
6	DSR, Data set ready	N.C.
7	RTS, Request to send	N.C.
8	CTS, Clear to send	N.C.
9	Ring-IN	N.C.
10	N.C.	N.C.

COM6 Serial Ports

COM6, a 10-pin header connector, is the onboard COM6 serial port of the M4. The following table shows its pin assignments.

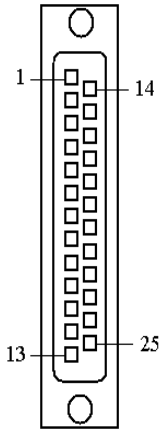


Pin #	RS232 Mode Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	+5V, +12V
10	NC

Pin9 is power pin to support devices required power. The voltage can be selected by jumper JP9.

LPT Port

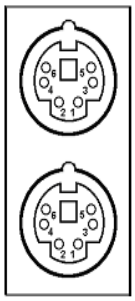
The LPT parallel port is a standard DSUB 25-pins Female connector . It can be configured as EPP or ECP or SPP mode.



Signal Name	Pin #	Pin #	Signal Name
Strobe	1	2	DATA0
DATA1	3	4	DATA2
DATA3	5	6	DATA4
DATA5	7	8	DATA6
DATA7	9	10	/ACK
BUSY	11	12	PE
SLCT	13	14	/AUTOFD
/ERROR	15	16	/INIT
SELIN	17	18	GND
GND	19	20	GND
GND	21	22	GND
GND	23	24	GND
GND	25		

PS/2 Keyboard & Mouse Connector

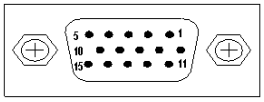
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector.



Pin #	Signal Name
1	Keyboard/Mouse data
2	NC
3	GND
4	5V
5	Keyboard/Mouse clock
6	GND

VGA Connector

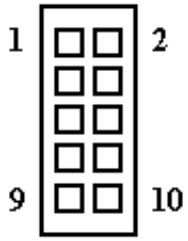
The pin assignments of VGA CRT connector are as follows:



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	DDC_DATA
HSYNC	13	14	VSYNC
DDC_CLK	15		

INT_VGA Connector

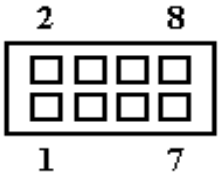
INT_VGA is for internal Video A/D board connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
RED	1	2	GND
GREEN	3	4	GND
BLUE	5	6	GND
HSYNC	7	8	DDC_DATA
VSYNC	9	10	DDC_CLK

INT_KBMS Connector

INT_KBMS is for internal input devices or MSR connection. The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
+5V	1	2	GND
KB-DATA	3	4	MS-CLOCK
KB-CLOCK	5	6	MS-DATA
GND	7	8	+5V

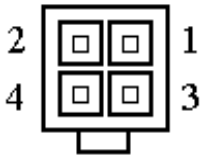
DC_IN1 Connector

DC_IN1 is for external power input connection to supply system power. It needs to be +12V input from AC/DC adapter within 5% tolerance. Users should calculate the total system power required and use sufficient rating adapter.

Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND

DC_IN2 Power Connector

The CD_IN2 power connector is for internal connection to +12V input power. If you already have external +12V power input connected on DC_IN1, please leave DC_IN2 unconnected.

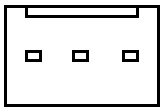


DC_IN2

Pin #	Signal Name
1	GND
2	GND
3	+12V
4	+12V

CPU Fan Power Connector

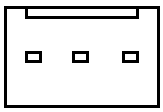
This is a 3-pin header for the CPU fan.



Pin #	Signal Name
1	Ground
2	FANPWR1
3	VCC

System FAN Power Connector

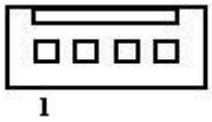
This is a 3-pin header for the system fan.



Pin #	Signal Name
1	Ground
2	FANPWR2
3	VCC

DRVPWR1 Connector

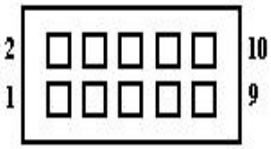
DRVPWR1 is output power connector to supply power required for peripheral device like Hard Disk, DOM, CDROM and etc.
The pin out is listed as below:



Signal Name	Pin #	Pin #	Signal Name
+5V	1	2	GND
GND	3	4	+12V

USB56 USB78 Connectors

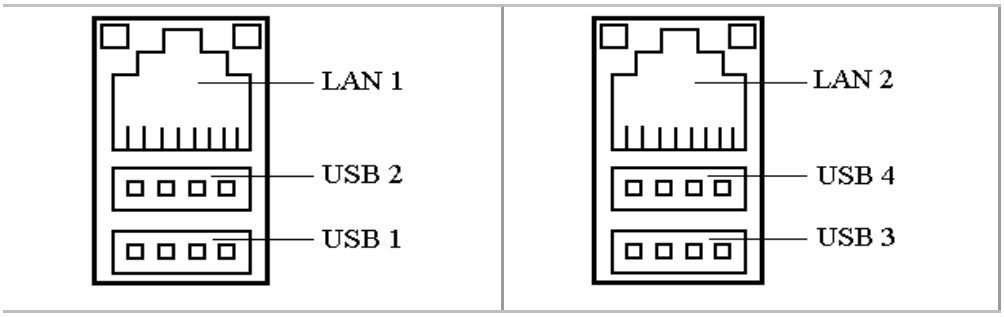
The following table shows the pin outs of the USB56 USB78 connectors.



USB6 USB8 Pin#	USB5 USB7 Pin #	Signal Name
10	1	N.C.
2	9	+5V
8	3	Ground
4	7	USB-
6	5	USB+

LANRJ45+USBx2 Connectors

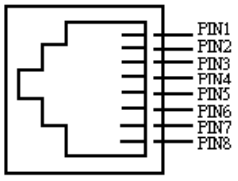
Below pictures show the location of LAN RJ45 ports and USB Type-A ports on the Combo RJ45+ USB connector.



Before you connect your device(s) into USB connector(s), please make sure your device(s) such as USB keyboard, mouse, scanner, zip, speaker and etc., Have a standard USB interface. Also make sure your OS supports USB controller.
If your OS does not support USB controller, please contact OS vendor for possible patch or driver upgrade. For more information please contact your OS or device(s) vendors.

LAN- RJ45 Connectors

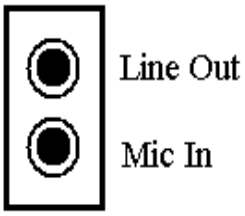
This connector is for the 10/100Mbps Ethernet capability. The figure below shows the pin out assignments of this connector and its corresponding input jack.



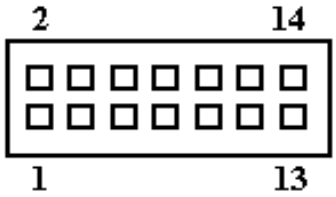
Pin #	Signal Name
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

Audio Connectors

After install onboard audio driver, you may connect speaker to Lin_Out jack, microphone to MIC_In jack.



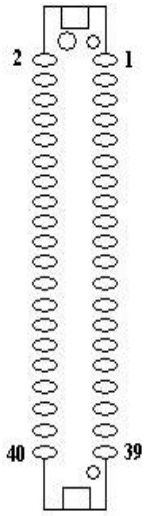
INT_AUDIO Connector



Pin #	Signal Name
1	LINE-IN-L
2	LINE-IN-R
3	GND
4	GND
5	LINEOUT-L
6	LINEOUT-R
7	GND
8	GND
9	MIC1-IN
10	MIC2-IN
11	CENTER OUT
12	LFE OUT
13	SURR OUTL
14	SURR OUTR

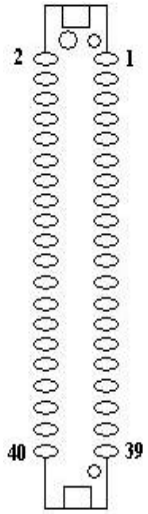
LVDS LCD Connector

The LCD panel, inverter for LCD LAMP, Touch-screen Serial Interface must be connected to this LVDS header, using the below described connector:



Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND
LCDVDD 5V/3.3V	5	6	LCDVDD 5V/3.3V
GND	7	8	GND
BRIGHTNES	9	10	BCKLITE_ON
LVDS_GND	11	12	LVDS_GND
CHA_TX0+	13	14	CHB_TX0+
CHA_TX0-	15	16	CHB_TX0-
LVDS_GND	17	18	LVDS_GND
CHA_TX1+	19	20	CHB_TX1+
CHA_TX1-	21	22	CHB_TX1-
LVDS_GND	23	24	LVDS_GND
CHA_TX2+	25	26	CHB_TX2+
CHA_TX2-	27	28	CHB_TX2-
LVDS_GND	29	30	LVDS_GND
CHA_TXC+	31	32	CHB_TXC+
CHA_TXC-	33	34	CHB_TXC-
LVDS_GND	35	36	LVDS_GND
CHA_TX3+	37	38	CHB_TX3+
CHA_TX3-	39	40	CHB_TX3-

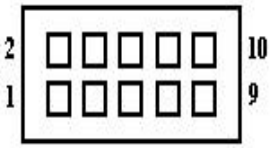
TTL LCD Connector



Signal Name	Pin #	Pin #	Signal Name
12V	1	2	12V
GND	3	4	GND
LCDVDD 5V/3.3V	5	6	LCDVDD 5V/3.3V
LCD_HS	7	8	LCD_VS
LCD_CLK	9	10	LCD_DE
LCD_GND	11	12	LCD_GND
LCD_D1	13	14	LCD_D0
LCD_D3	15	16	LCD_D2
LCD_D5	17	18	LCD_D4
LCD_D7	19	20	LCD_D6
LCD_GND	21	22	LCD_GND
LCD_D9	23	24	LCD_D8
LCD_D11	25	26	LCD_D10
LCD_D13	27	28	LCD_D12
LCD_D15	29	30	LCD_D14
LCD_GND	31	32	LCD_GND
LCD_D17	33	34	LCD_D16
LCD_D19	35	36	LCD_D18
LCD_D21	37	38	LCD_D20
LCD_D23	39	40	LCD_D22

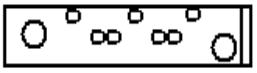
DIO Connector

DIO port supports 8 digital I/O bits. Each bit can be configured as Input or output individually. All bits are 5V tolerant.



Signal Name	Pin #	Pin #	Signal Name
DIO_0	1	2	DIO_1
DIO_2	3	4	DIO_3
DIO_4	5	6	DIO_5
DIO_6	7	8	DIO_7
GND	9	10	+5V

SATA1, SATA2 Connectors



1 7

Pin #	Signal Name
1	GND
2	SATARX+
3	SATARX-
4	GND
5	SATATX-
6	SATATX+
7	GND

Chapter 3 BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the M4 CPU card. The topics covered in this chapter are as follows:

BIOS Introduction

This Chapter discusses Award™ Setup program built into the M4 BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The AwardBIOS™ installed in M4 is a custom version of an industry standard BIOS. This means that it supports VIA C7/EDEN in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

It also adds non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or

2. by pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

   Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you

do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Navigating through the menu bar
Use the left and right arrow keys to choose the menu you want to be in.

To display a sub menu
Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings that you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and M4 manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

Main Menu

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Phoenix – AwardBIOS CMOS Setup Utility

➢ Standard CMOS Features	➢ Frequency/Voltage Control
➢ Advanced BIOS Features	Load Fail-Safe Defaults
➢ Advanced Chipset Features	Load Optimized Defaults
➢ Integrated Peripherals	Set Supervisor Password
➢ Power Management Setup	Set User Password
➢ PnP/PCI Configurations	Save & Exit Setup
➢ PC Health Status	Exit Without Saving
Esc : Quit	↑↓ →← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type….	

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories.

Standard CMOS Features
Use this menu for basic system configuration.

Advanced BIOS Features
Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PnP / PCI Configuration
Use this menu to set up the PnP/PCI configuration.

PC Health Status
Use this menu to display the CPU temperature, FAN speed and voltages.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

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

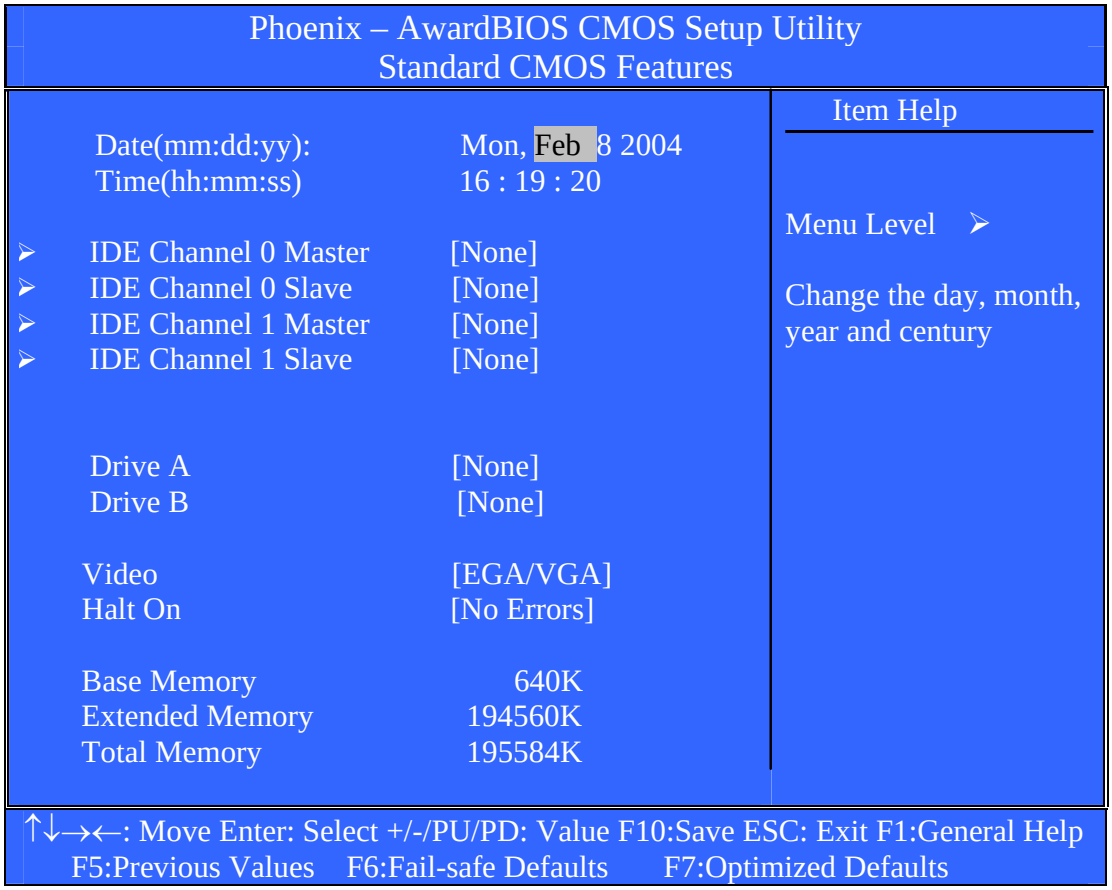
Supervisor / User Password
Use this menu to set User and Supervisor Passwords.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Save
Abandon all CMOS value changes and exit setup.

Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. 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.

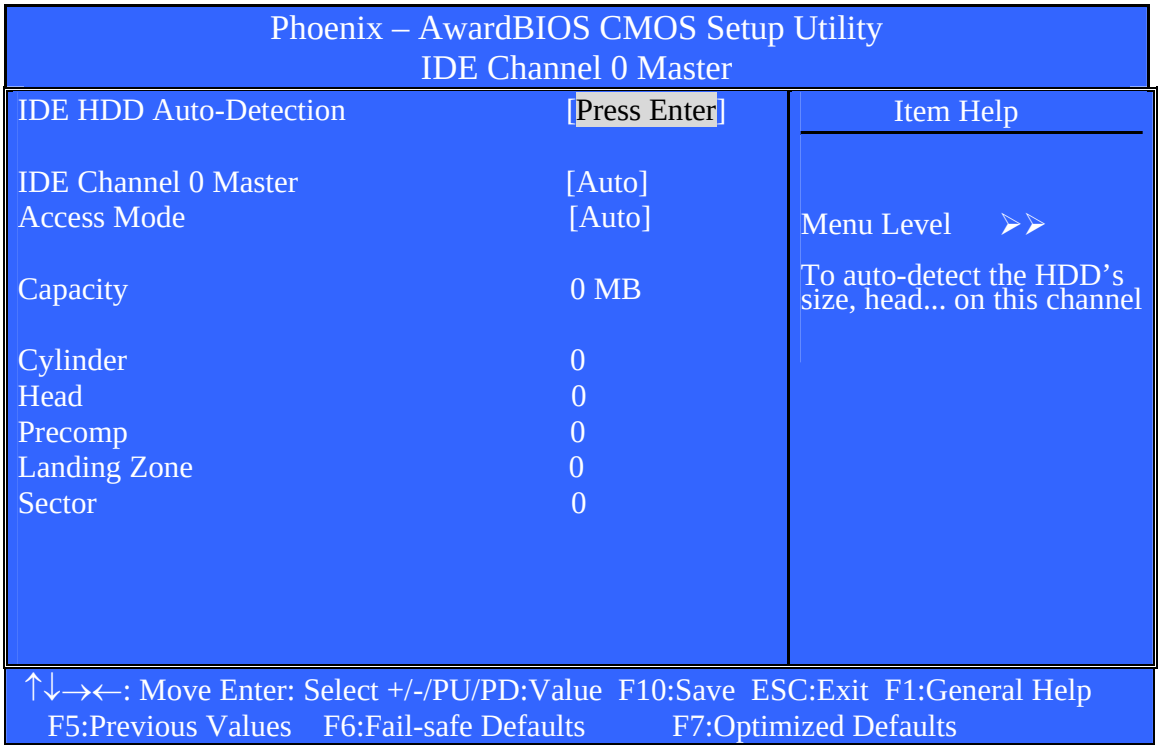


This table shows the selections that you can make on the Standard CMOS Menu

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 1 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 1 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

Channel 0 HDDs / Channel 1 HDDs

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. Figure 2 shows the IDE Channe 0 / Channel 1 master sub menu.



Use the legend keys to navigate through this menu and exit to the main menu. Use the Table listed below to configure the hard disk**.**

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Channel 0 Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

None	360KB 5.25 in.	1.2MB 5.25 in.	720KB 3.5 in.	1.44MB 3.5 in.	2.88MB 3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

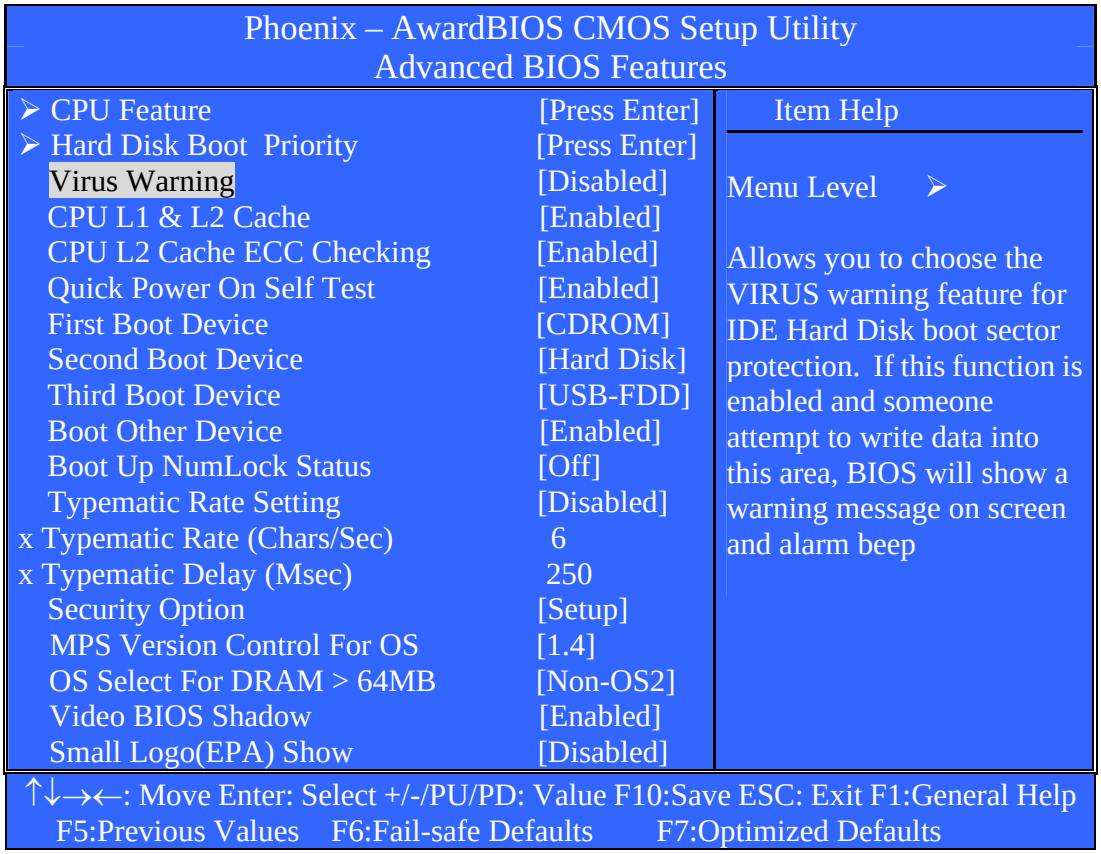
Halt On

This field determines whether the system will halt if an error is detected during power up.

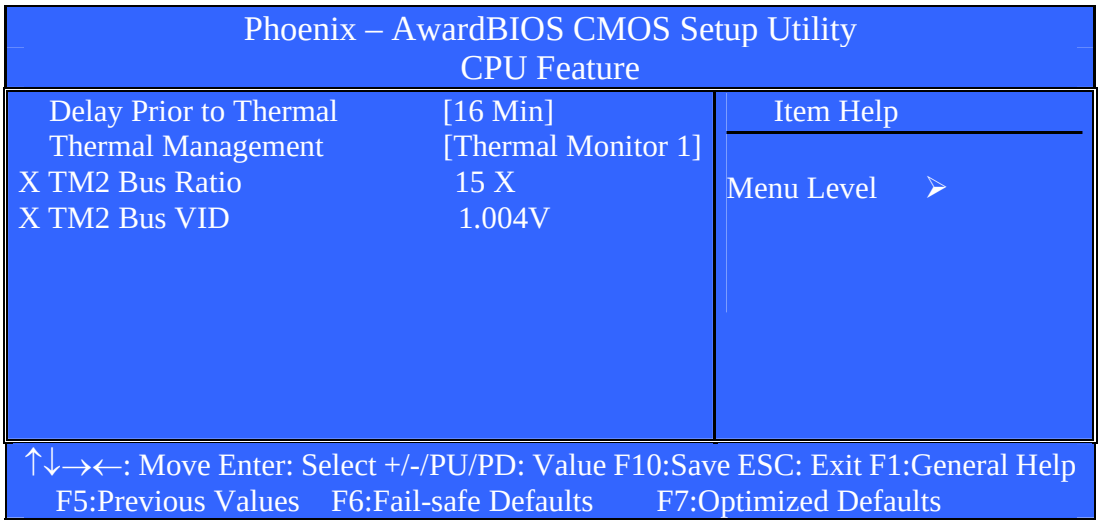
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
No errors	The system boot will not be halted for any error that may be detected. (default)
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors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

Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



CPU Feature



Delay Prior to Thermal

Delay Prior To Thermal is set at 16 minutes as default, which means the board will wait 16 minutes before it activates the processor's integrated thermal control circuit.

The choice: 4 Min , 8 Min, 16 Min, 32 Min.

Thermal Management

The CPU Thermal Management is as TM1 as default.
Thermal Monitor 1: When CPU over-heated, the CPU internal clock begin on die frequency throttling.
Thermal Monitor 2: When CPU over-heated, the CPU output VID will adjust Vcore to designated voltage. In the mean time, the core frequency speed will also slow down to (FSB MHz X Bus Ratio) MHz.

The choice: Thermal Monitor 1, Thermal Monitor 2.

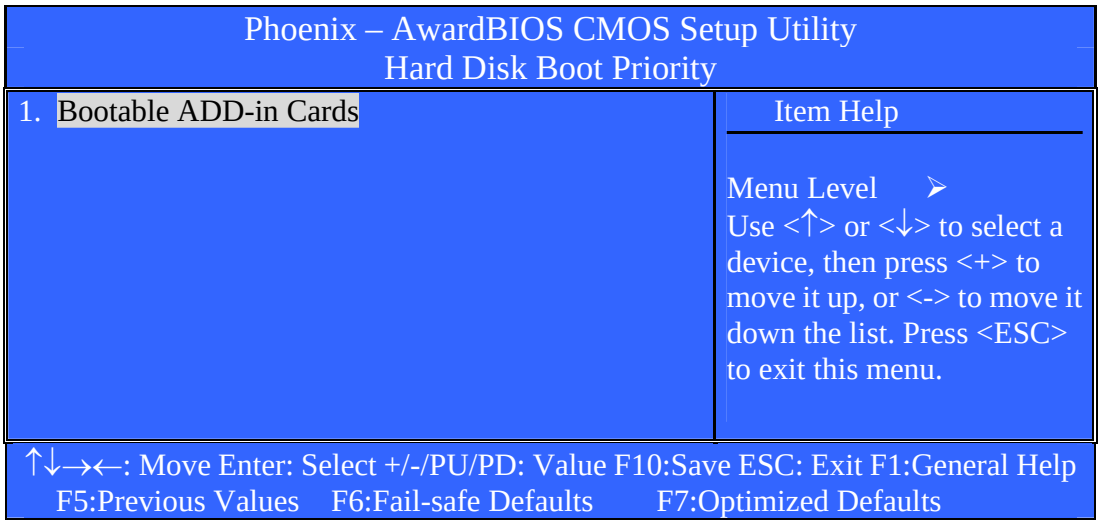
TM2 Bus Ratio

The choice: 15X.

TM2 Bus VID

The choice: 1.004V.

Hard Disk Boot Priority



Bootable ADD-in Cards

Use <↑> or <↓> to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.

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.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 & L2 Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

CPU L2 Cache ECC Checking

The choice: Enabled, Disabled.

Quick Power On Self Test

Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

The Choice: Floppy, LS120, Hard-Disk, ZIP100, CDROM, Disabled, Enabled, USB-FDD, USB-ZIP, USB-CDROM, Legacy LAN.

Boot Up NumLock Status

Selects power on state for NumLock.

The choice: On, Off.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled, Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a keystroke when you hold the key down.

The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

The choice: 250, 500, 750, 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter 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.

Note: 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.

MPS Version Control For OS

The choice: 1.1, 1.4.

OS Select For DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Video BIOS Shadow

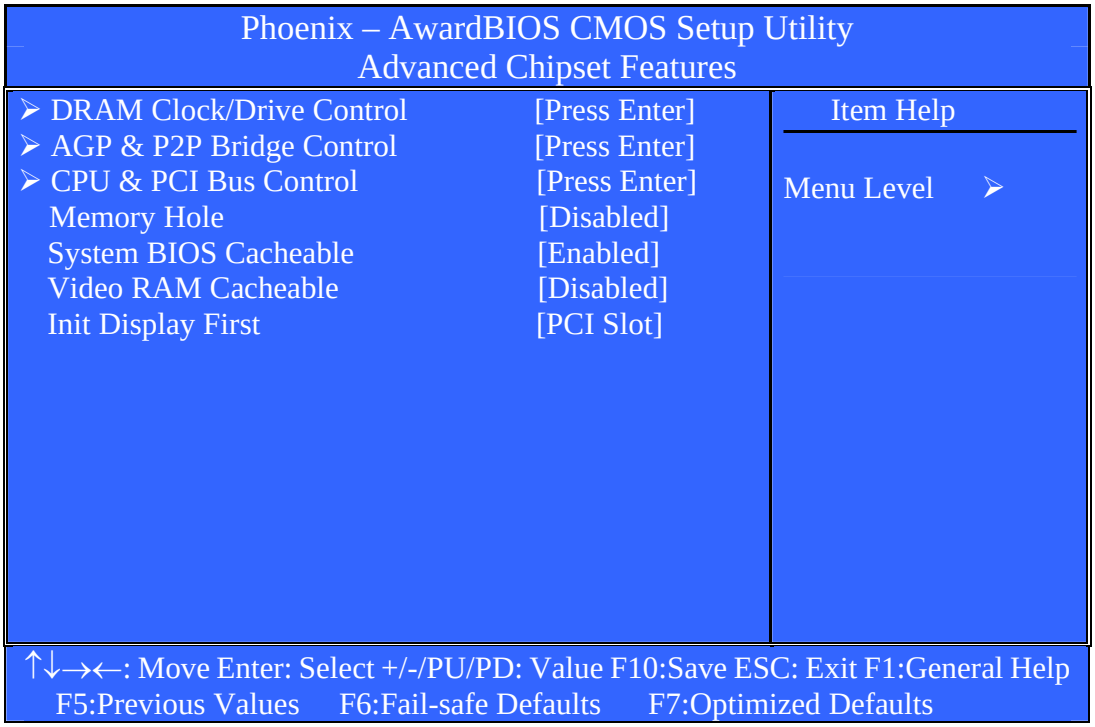
Enabled copies Video BIOS to shadow RAM Improves performance.

The choice: Enabled, Disabled.

Small Logo(EPA) Show

The choice: Enabled, Disabled.

Advanced Chipset Features

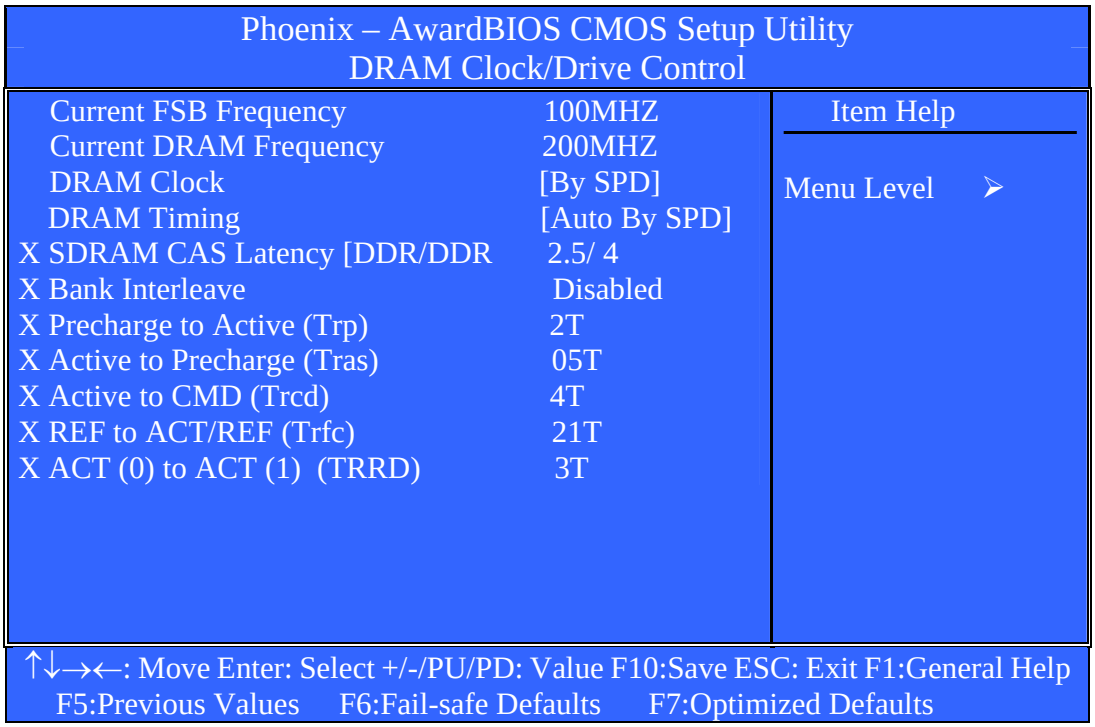


This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It 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 your 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 Settings

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

DRAM Clock/Drive Control



Current FSB Frequency

The choice: 100MHz.

Current DRAM Frequency

The choice: 200MHz.

DRAM Clock

The choice: By SPD, 100MHz, 133MHz, 166MHz, 200MHz.

DRAM Timing

The choice: Manual, Auto By SPD.

SDRAM CAS Latency [DDR/DDR

The choice: 2.5/ 4.

Bank Interleave

The choice: Disabled.

Precharge to Active(Trp)

The choice: 2T.

Active to Precharge(Tras)

The choice: 05T.

Active to CMD(Trcd)

The choice: 4T.

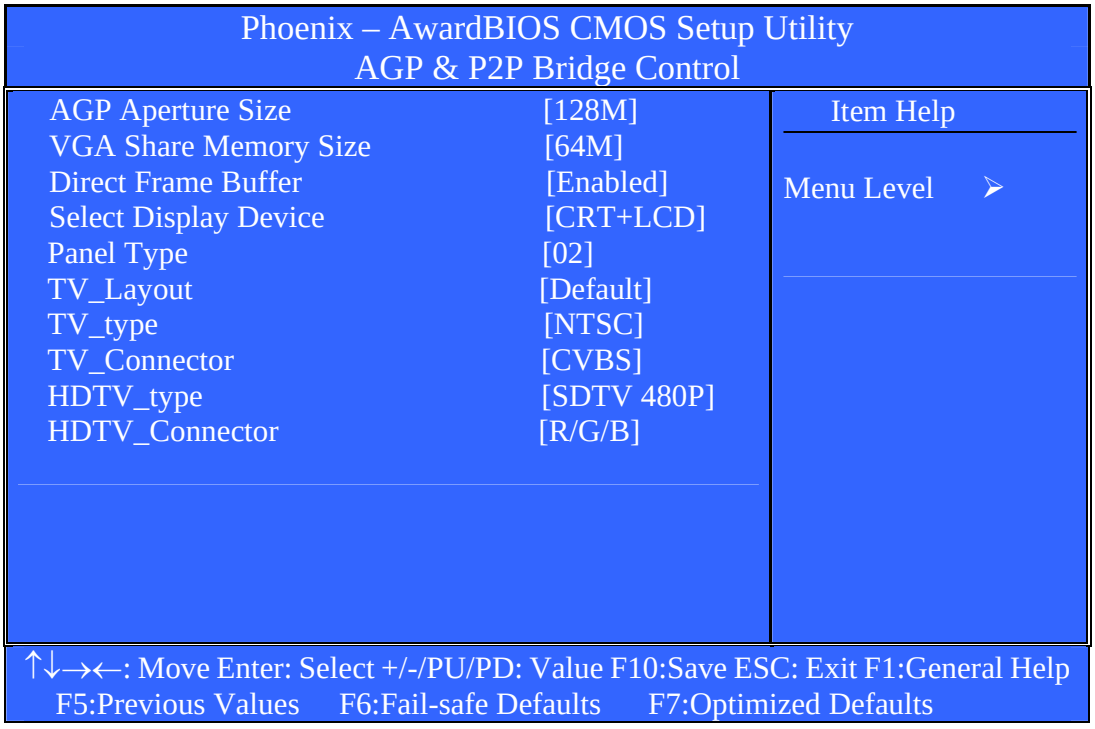
REF to ACT/REF (Trfc)

The choice: 21T.

ACT(0) to ACT(1) (TRRD)

The choice: 3T.

AGP & P2P Bridge Control



AGP Aperture Size

The choice: 32M, 64M, 128M, 256M, 512M, 1G.

VGA Share Memory Size

The choice: Disabled, 16M, 32M, 64M.

Direct Frame Buffer

The choice: Enabled, Disabled.

Select Display Device

The choice: CRT, LCD, TV, DVI, HDTV, CRT+LCD, CRT+TV, CRT+DVI, CRT+HDTV, DVI+HDTV, LCD+DVI, TV+DVI.

Panel Type

The choice: Min=0000
Max=000F

Key in HEX number:

TV_Layout

The choice: Default, COMP.+S-Video, S-Video+S-Video, COMP.+R/G/B, COMP.+Y/Cb/Cr, COMP.+SDTV-R,G,B, COMP.+SDTV-Y,Pb,Pr, COMPOSITE, S-Video, R,G,B, Y,Cb,Cr, SDTV-R,G,B, SDTV-Y,Pb,Pr, S-Video+R,G,B, S-Video+Y,Cb,Cr.

TV_type

The choice: NTSC, PAL/PAL B/PAL G/PAL H, PALM, PALN, PALNc, PAL I, PAL D, NTSC Japan.

TV_Connector

The choice: CVBS, S-Video 0, R/G/B, Cr/Y/Cb, SDTV-R/G/B, SDTV-Pr/Y/Pb, S-Video 1.

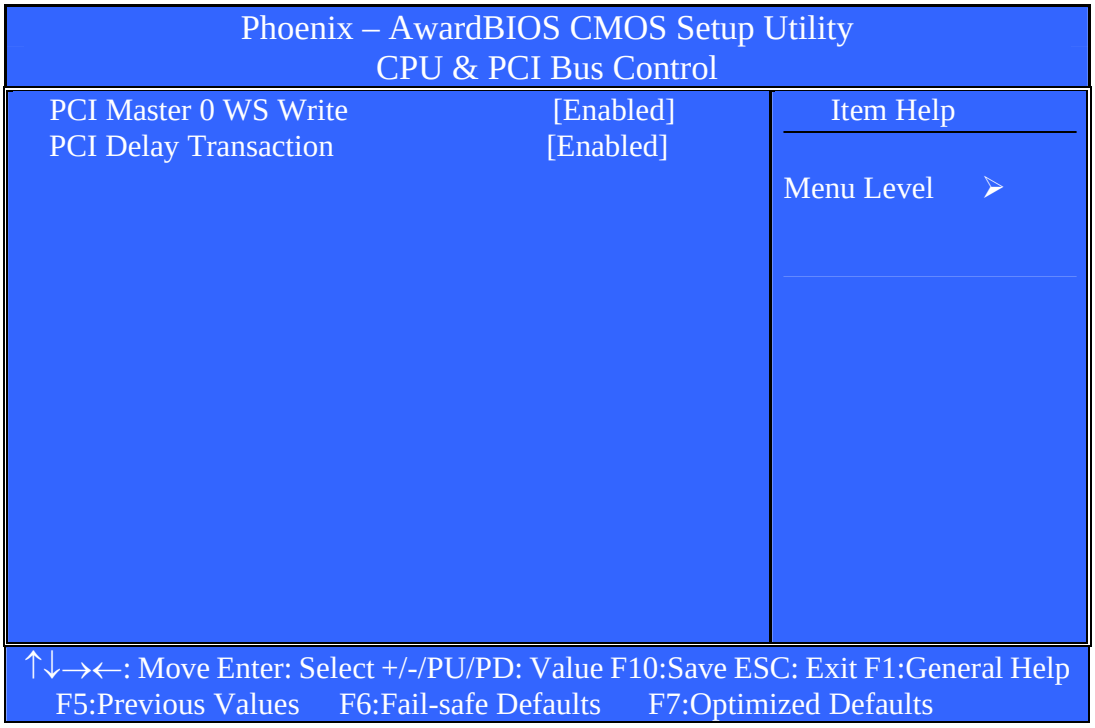
HDTV_type

The choice: SDTV 480P, HDTV 720P, HDTV 1080I, HDTV 1080P.

HDTV_Connector

The choice: R/G/B, Pr/Y/Pb.

CPU & PCI Bus Control



PCI Master 0 WS Write

The choice: Enabled, Disabled.

PCI Delay Transaction

The choice: Enabled, Disabled.

Memory Hole

In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default of this field is set to ***Disabled***.

The choice: Disabled, 15M-16M.

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 choice: Enabled, Disabled.

Video RAM Cacheable

The choice: Enabled, Disabled.

Init Display First

The choice: PCI Slot, AGP.

Integrated Peripherals

Phoenix – AwardBIOS CMOS Setup Utility Integrated Peripherals		
➢VIA OnChip IDE Device	[Press Enter]	Item Help
➢VIA OnChip PCI Device	[Press Enter]	
➢SuperIO Device	[Press Enter]	
PWRON After PWR-Fail	[Off]	Menu Level ➢
Onboard Serial Port 3	[3E8]	
Serial Port 3 Use IRQ	[IRQ4]	
Onboard Serial Port 4	[2E8]	
Serial Port 4 Use IRQ	[IRQ3]	
Onboard Serial Port 5	[4F8]	
Serial Port 5 Use IRQ	[IRQ4]	
Onboard Serial Port 6	[4E8]	
Serial Port 6 Use IRQ	[IRQ3]	
Watch Dog Timer Select	[Disabled]	
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe Defaults F7:Optimized Defaults		

VIA OnChip IDE Device

Phoenix – AwardBIOS CMOS Setup Utility VIA OnChip IDE Device		
OnChip SATA	[Enabled]	Item Help
SATA Mode	[IDE]	
IDE DMA transfer access	[Enabled]	
OnChip IDE Channel0	[Enabled]	Menu Level ➢
OnChip IDE Channel1	[Enabled]	
IDE Prefetch Mode	[Enabled]	
Primary Master PIO	[Auto]	
Primary Slave PIO	[Auto]	
Secondary Master PIO	[Auto]	
Secondary Slave PIO	[Auto]	
Primary Master UDMA	[Auto]	
Primary Slave UDMA	[Auto]	
Secondary Master UDMA	[Auto]	
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		

OnChip SATA

The choice: Enabled, Disabled.

SATA Mode

The choice: IDE, RAID.

IDE DMA transfer access

The choice: Enabled, Disabled.

OnChip IDE Channel0

The choice: Enabled, Disabled.

OnChip IDE Channel1

The choice: Enabled, Disabled.

IDE Prefetch Mode

The choice: Enabled, Disabled.

Primary/Secondary Master/Slave PIO

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

Primary/Secondary Master/Slave UDMA

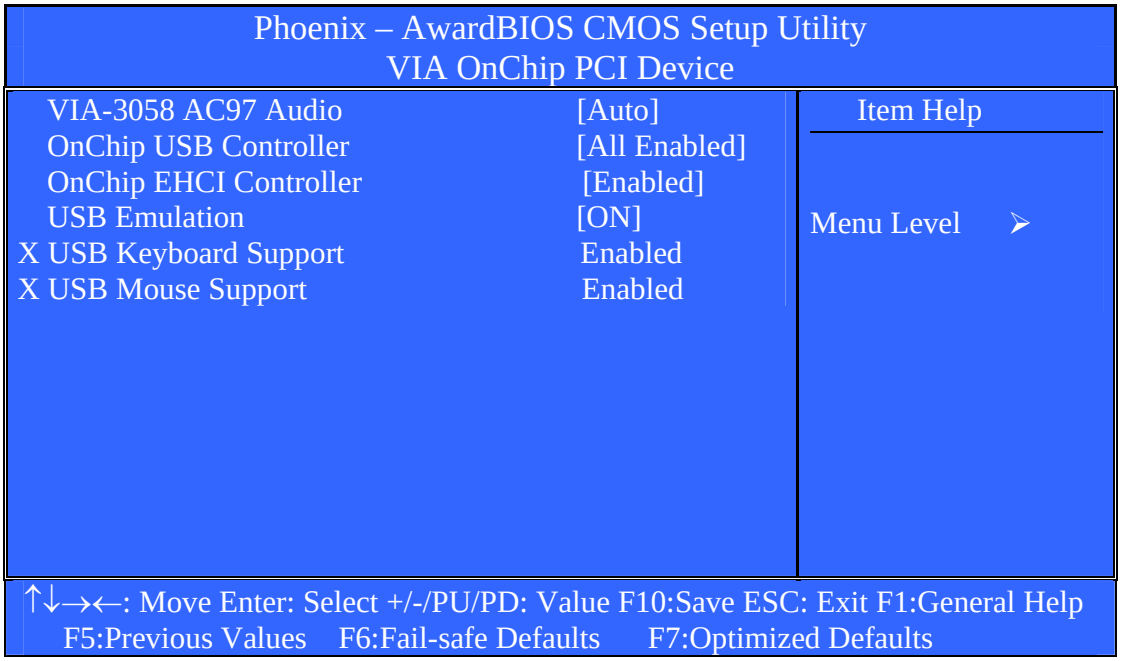
The choice: Auto, Disabled.

IDE HDD Block Mode

If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled.

VIA OnChip PCI Device



VIA-3058 AC97 Audio

The choice: Auto, Disabled.

OnChip USB Controller

The choice: All Disabled, All Enabled, 1&2 USB Port, 2&3 USB Port, 1&3 USB Port, 1 USB Port, 2 USB Port, 3 USB Port.

OnChip EHCI Controller

The choice: Enabled, Disabled.

USB Emulation

OFF	Don't support any USB device on DOS.
KB/MS	Support USB legacy Keyboard and Mouse, No Support USB Storage.
ON	Support USB legacy Keyboard, Mouse and Storage.

The choice: OFF, KB/MS, ON.

USB Keyboard Support

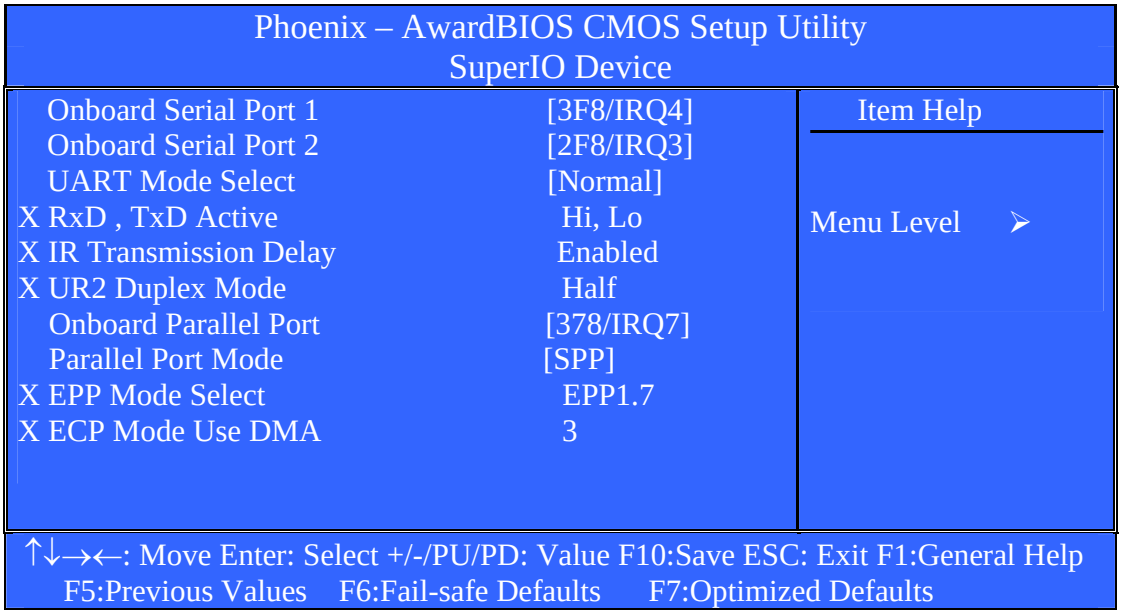
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

The choice: Enabled, Disabled.

USB Mouse Support

The choice: Enabled, Disabled.

SuperIO Device



Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled, Auto.

UART Mode Select

The choice: IrDA, ASKIR, Normal.

RxD, TxD Active

The choice: Hi, Lo.

IR Transmission Delay

The choice: Enabled.

UR2 Duplex Mode

The choice: Half.

Onboard Parallel Port

This item allows you to determine onboard parallel port controller I/O address setting.

The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled.

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.

The choice: SPP, EPP, ECP, ECP+EPP, Normal.

EPP Mode Select

Select EPP port type 1.7 or 1.9.

The choice: EPP1.7, 1.9.

ECP Mode Use DMA

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

The choice: 3, 1.

PWRON After PWR-Fail

The choice: Off, On, Former-Sts.

Onboard Serial Port 3/Port 4/Port 5/Port 6

The choice: 4F8, 3F8, 2F8, 4E8, 3E8, 2E8, Disabled.

Serial Port 3/Port 4/Port 5/Port 6 Use IRQ

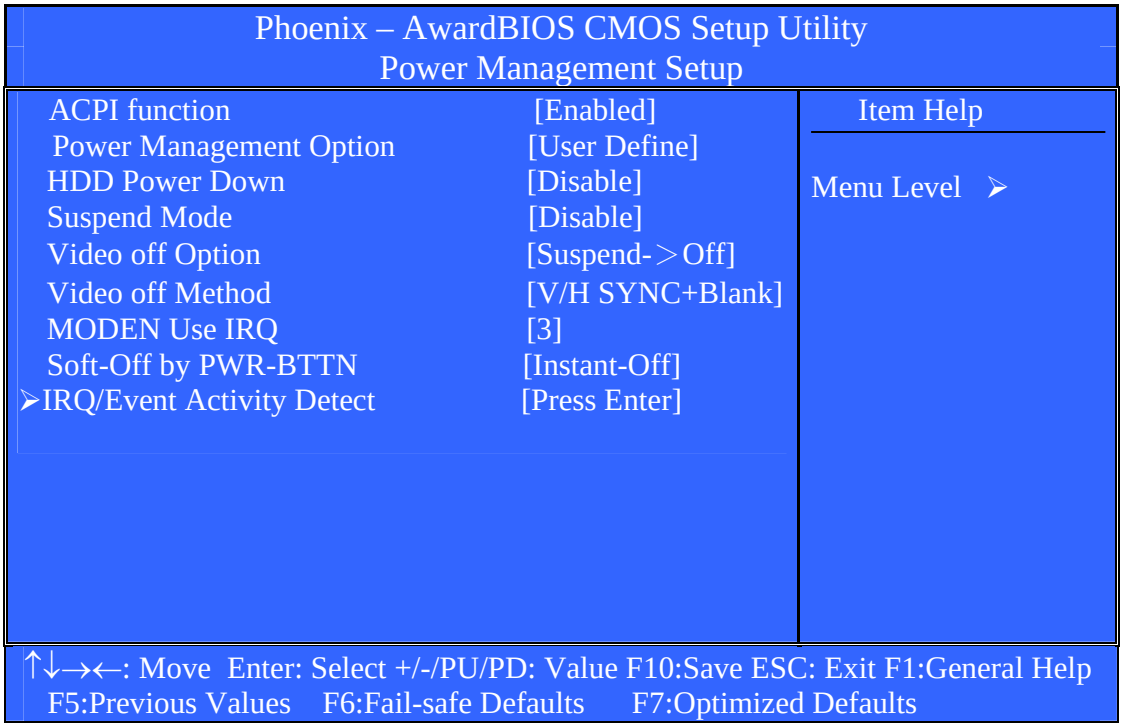
The choice: IRQ3, IRQ4, IRQ5, IRQ7, IRQ10, IRQ11.

Watch Dog Timer Select

The choice: Enable, Disabled.

Power Management Setup

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



ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

Power Management Option

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down

2. Suspend Mode

There are three selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Define	Allows you to set each mode individually. The Suspend mode ranges are from 1 min. to 1 hr. The HDD Power Down ranges are from 1 min. to 15 min. and disable.

HDD Power Down

The choice: Disable, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min.

Suspend Mode

The choice: 1Min, 2Min, 4Min, 6 Min, 8Min, 10Min, 20Min, 30Min, 40Min, 1Hour, Disable.

Video Off Option

The choice: Always On, Suspend -> Off.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Support	Initial display power management signaling. Allows the BIOS to control video display card if it supports the DPMS feature.

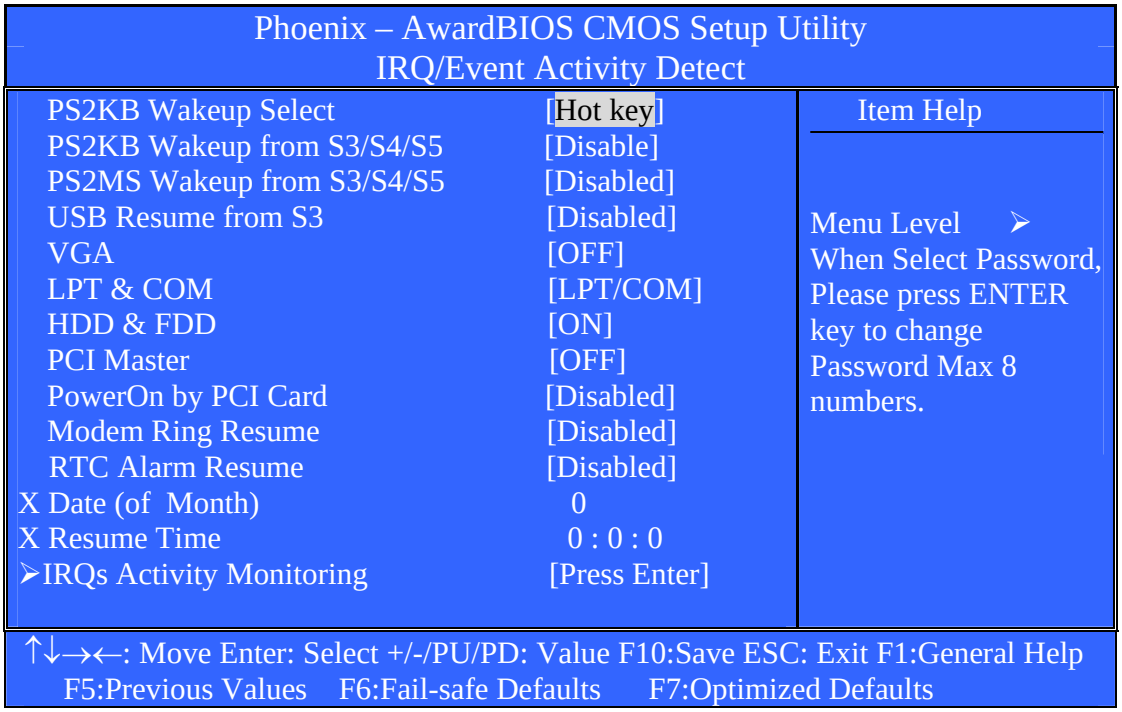
MODEM Use IRQ

The choice: NA, 3, 4, 5, 7, 9, 10, 11.

Soft-Off by PWRBTN

The choice: Instant-Off, Delay 4 Sec.

IRQ/Event Activity Detect



PS2KB Wakeup Select

When Select Password, Please press ENTER key to change Password Max 8 numbers.

The choice: Hot key, Password.

PS2KB Wakeup from S3/S4/S5

The choice: Disable, Ctrl+F1, Ctrl+F2, Ctrl+F3, Ctrl+F4, Ctrl+F5, Ctrl+F6, Ctrl+F7, Ctrl+F8, Ctrl+F9, Ctrl+F10, Ctrl+F11, Ctrl+F12, Power, Wake, Any Key.

PS2MS Wakeup from S3/S4/S5

The choice: Enabled, Disabled.

USB Resume from S3

The choice: Enabled, Disabled.

VGA

The choice: OFF, ON.

LPT & COM

The choice: NONE, LPT, COM, LPT/COM.

HDD & FDD

The choice: OFF, ON.

PCI Master

The choice: OFF, ON.

PowerOn by PCI Card

The choice: Enabled, Disabled.

Modem Ring Resume

The choice: Enabled, Disabled.

RTC Alarm Resume

The choice: Enabled, Disabled.

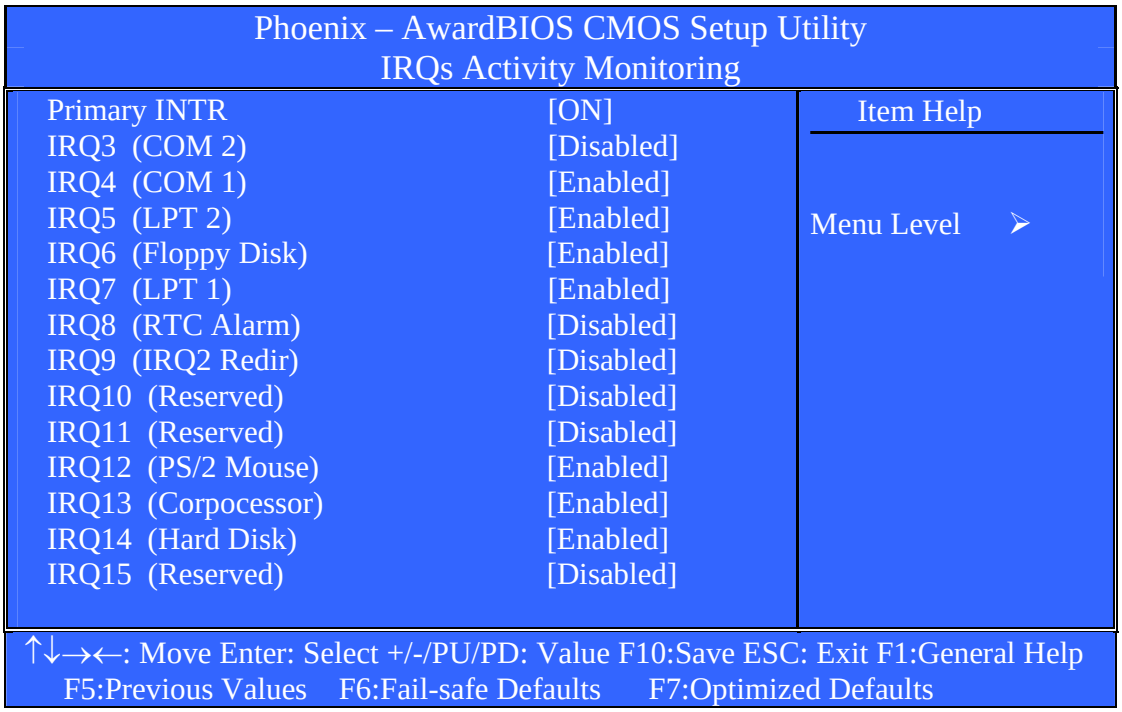
Date (of Month)

The choice: Date (of Month).

Resume Time (hh:mm:ss)

The choice: hh:mm:ss.

IRQs Activity Monitoring



Primary INTR

The choice: OFF, ON.

IRQ3 (COM 2)

The choice: Enabled, Disabled.

IRQ4 (COM 1)

The choice: Enabled, Disabled.

IRQ5 (LPT 2)

The choice: Enabled, Disabled.

IRQ6 (Floppy Disk)

The choice: Enabled, Disabled.

IRQ7 (LPT 1)

The choice: Enabled, Disabled.

IRQ8 (RTC Alarm)

The choice: Enabled, Disabled.

IRQ9 (IRQ2 Redir)

The choice: Enabled, Disabled.

IRQ10 (Reserved)

The choice: Enabled, Disabled.

IRQ11 (Reserved)

The choice: Enabled, Disabled.

IRQ12 (PS/2 Mouse)

The choice: Enabled, Disabled.

IRQ13 (Coprocessor)

The choice: Enabled, Disabled.

IRQ14 (Hard Disk)

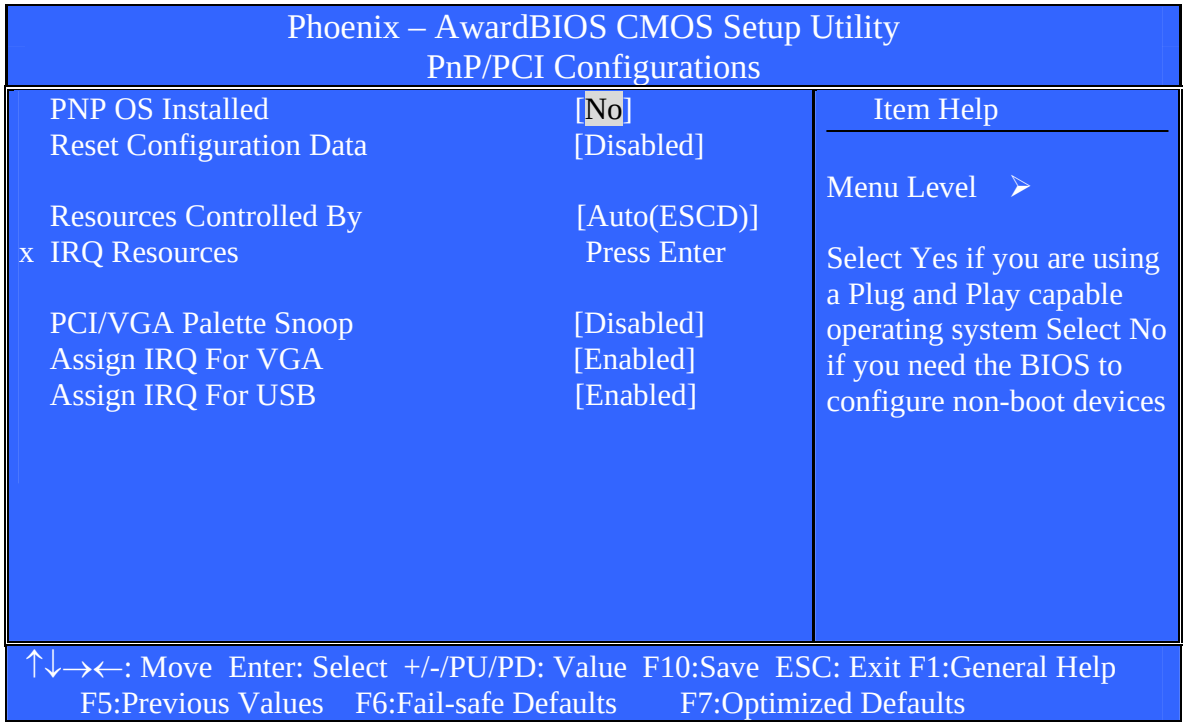
The choice: Enabled, Disabled.

IRQ15 (Reserved)

The choice: Enabled, Disabled.

PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



PNP OS Installed

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.

The choice: No, Yes.

Reset Configuration Data

Default is 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 reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

Resources controlled by

BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot. Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

The Choice: Legacy ISA and PCI/ISA PnP.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.

The choice: Enabled, Disabled.

Assign IRQ For VGA

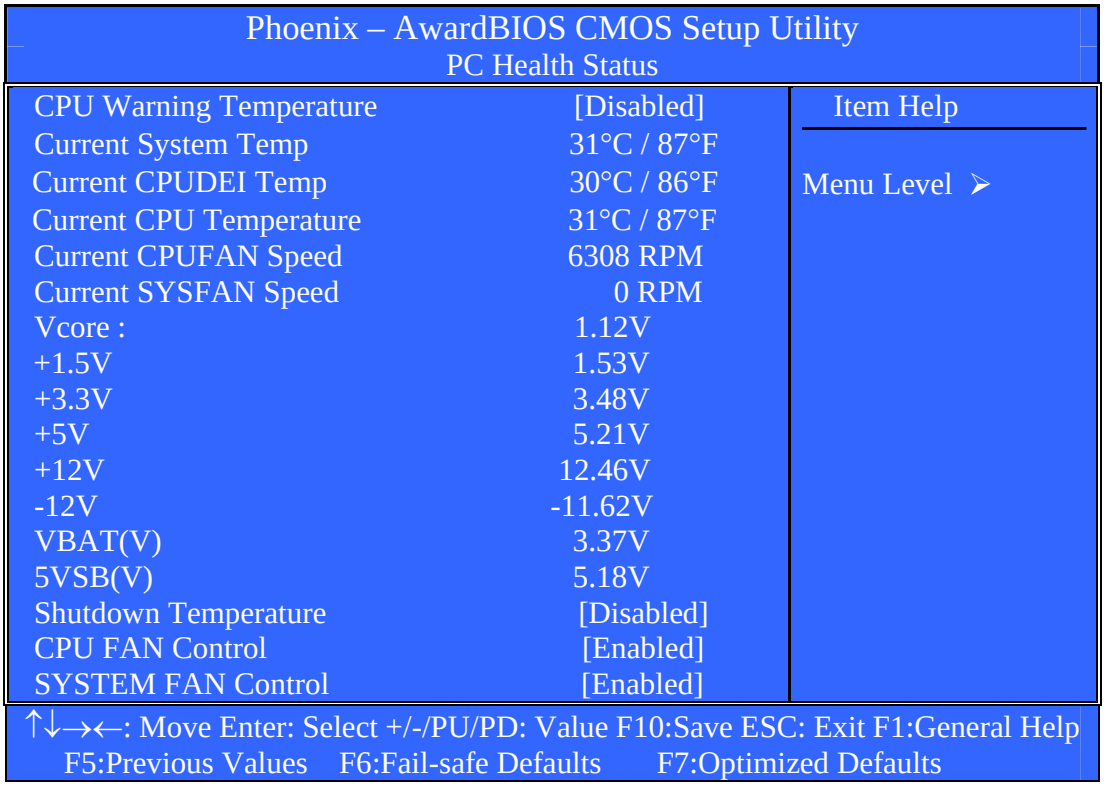
The choice: Enabled, Disabled.

Assign IRQ For USB

The choice: Enabled, Disabled.

PC Health Status

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact with your motherboard supplier to get proper value about your setting of the CPU temperature.



CPU Warning Temperature

Select the CPU over-heated warning temperature.

The choice: Disabled, 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F, 70°C/158°F.

Current System Temp

Show System Temperature.

Current CPUDEI Temp

Shows CPUDEI Temp.

Current CPU Temperature

Shows Board Temperature.

Current CPUFAN Speed

Shows CPUFAN speed.

Current SYSFAN Speed

Shows SYSFAN speed.

Vcore/1.5V/3.3V/5V/12V/-12V/VBAT/5VSB Voltages

Shows Power rails voltage.

Shutdown Temperature

The choice: Disabled, 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F.

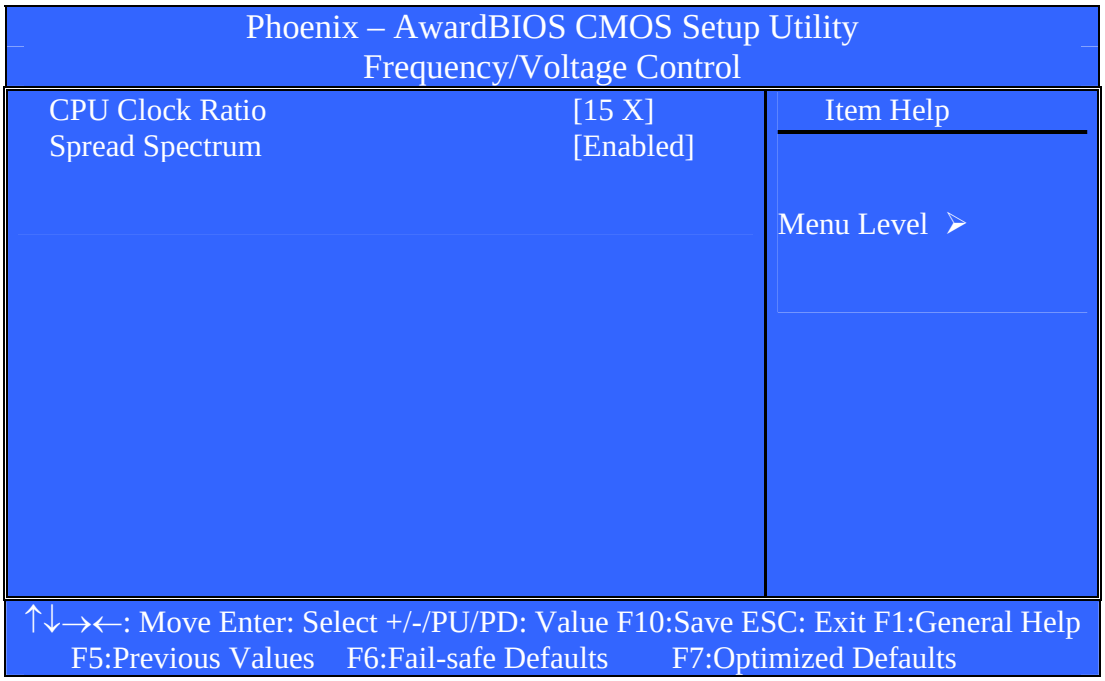
CPU FAN Control

The choice: Enabled, Disabled.

SYSTEM FAN Control

The choice: Enabled, Disabled.

Frequency/Voltage Control



CPU Clock Ratio

The choice: Min= 8
Max= 15

Key in DEC number:

Spread Spectrum

The choice: Disabled, 0.20%, 0.25%, 0.35%.

Load Fail-Safe Defaults

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

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

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

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

Load Optimized Defaults (Y/N) ? N

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

Supervisor/User Password Setting

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

supervisor password : can enter and change the options of the setup menus.

user password : just can only enter but do not have the right to change the options of the setup menus. 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 <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

Exit Selecting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? N

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

CHAPTER 4 Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There are a total of 1K port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. POST Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a **video error** has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

The other code indicates that your **DRAM error** has occurred. This beep code consists of a single long beep repeatedly.