

# **P/I-P4BVLL**

Pentium 4 Full-Size CPU Card With VGA &  
Dual LAN

## **User`s Manual**

Version 1.3

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# 1

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## **Introduction**

This manual is designed to give you information on the P/I-P4BVLL SBC card. The topics covered in this chapter are as follows:

- ◆ Checklist
- ◆ Description
- ◆ Features
- ◆ Specifications
- ◆ Intelligence

## Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- ✓ The P/I-P4BVLL Industrial SBC Card
- ✓ 1 ATA66/100 IDE Ribbon Cable
- ✓ 1 Floppy Ribbon Cable
- ✓ 1 Serial Port Ribbon Cable and 1 Parallel Port attached to a Mounting Bracket
- ✓ 1 Serial Port Ribbon Cable attached to a Mounting Bracket
- ✓ 1 CD Disc Containing ATI Rage128 Drivers, Intel 82559 LAN Driver, Intel chipset drivers, BIOS Update Utility and this User`s manual.
- ✓ PS/2 Keyboard and Mouse 1-to-2 Y-cable
- ✓ PS/2 to AT Keyboard Cable

## Description

The P/I-P4BVLL is a Pentium 4 Industrial single board computer (SBC) card based on Intel 845D chipset and is fully designed for harsh industrial environment. It features one 478-pins Socket, that is compatible with Intel uFC-PGA package Pentium 4 processor. This card accommodates up to 2GB of DDR266 SDRAM memory.

The P/I-P4BVLL is a high integration design. Two Intel 82559 Fast Ethernet Controllers and ATI 3D Rage128 Ultra 4XL AGP VGA controller are integrated into the system. The high-integration design prevents the system compatibility issues and increases the PCI add-on cards scalability. This makes P/I-P4BVLL an ideal SBC card for CTI, ISP servers, workstations, automation as well as other industrial applications.

P/I-P4BVLL provides the most complete features needed for system operation. These include 10/100 TX LAN adapter, Ultra DMA 66/100 IDE drive controllers, high performance serial ports, enhanced parallel port, and the most updated BIOS. Four USB ports and a programmable watchdog timer are available on-board. The CPU card

also provides a reserved pin header for connecting a Panel Link Digital interface LCD Monitor (DVI or DFP interface). What's more, the Intel 845D on-board the CPU card incorporates the latest microprocessor technology to provide the increased bandwidth needed to operate your system bus at speeds up to 133 MHz.

The P/I-P4BVLL comes with integrated hardware monitoring device that monitors system and CPU temperature, voltages of all system power rails, and CPU fan speeds to prevent system crashes by warning the user of adverted conditions. The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen and stopping the HDD spindle motor.

## Features

- **High-Speed Processors:** Supports latest Intel Pentium 4 Processor from 1.4G to 2.2GHz or above with 400MT/s and 533MT/s FSB Speed.
- **Robust Heatsink retention:** Heatsink retention module with metal back plat to hold the heatsink firm on SBC.
- **Intel 845D Chipset:** Features Intel 845D Brookdale chipset with I/O subsystems and front-side bus (FSB) platform, which boosts the traditional 100/133MHz internal bus speed to 400/533MT/s.
- **PC2100/PC1600 DDR Memory Support:** Equipped with two DIMM sockets to support DDR200 or DDR266 SDRAMs with 128M, 256M, 512M or 1GB size each, Up to 2GB of PC2100 system memory.
- **ECC function support:** Processor front-side bus (FSB) and Memory subsystem support ECC function for Fault-tolerant application.
- **10/100Base-T Fast Ethernet:** Features two Intel Fast Ethernet controllers that boost network performance, increase the networking bandwidth and reliability, enhanced system manageability and offers the proven compatibility.
- **ATI AGP VGA Chipset:** Features ATI Rage128 4XL AGP chipset with 16MB SDRAM on board, that support high-performance 2D and 3D graphic as well as DVD / MPEG-2 decode assist
- **PCI Bus Master IDE Controller:** Two enhanced IDE channels for up to four devices, support PIO Mode 3/4 or Ultra ATA33/66/100 IDE Hard Disk, ATAPI CD-ROM and LS-120 drive.
- **Watch-Dog Timer:** 4 level programmable watchdog timer, from 10-80 seconds.
- **Super Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with SPP, EPP and ECP capabilities.
- **IrDA:** Support an optional infrared port module for wireless interface.
- **Concurrent PCI:** Allows multiple PCI transfers from PCI master buses and AGP bus to memory to CPU.

- **Hardware Monitoring:** Features integrated Hardware Monitor to monitor all the power rails as well as CPU and board temperature.
- **Enhanced ACPI:** Features a programmable BIOS (Flash EEPROM), Offering enhanced ACPI for Windows compatibility and auto-detection of most devices for virtually automatic setup.

## Specifications

- **Processor Socket:** Socket478 for latest Intel Pentium 4 CPU.
- **Processor:** Intel 478-pins Pentium 4 CPU. Support both Willamette(0.18u process) and Northwood(0.13u process) CPU.
- **Chipset:** Intel 845D Brookdale and ICH2 Chipset with EIDE, USB, and RTC built-in.
- **Secondary Cache:** 512K (Northwood) or 256KB (Willamette) L2 cache integrated in CPU and runs on CPU core frequency.
- **Memory Sockets:**  
Two 184-pin 2.5V DDR DIMM sockets  
Memory types: 2.5V DDR SDRAM (Synchronous DRAM)  
support 64MB to 1GB memory capacity.  
*NOTE: Only SDRAM modules that support SPD (Serial Presence Detect) should be use. Use PC2100 modules when running DDR266 Memory bus speed and use PC1600 or PC2100 modules when runningDDR200 memory bus speed.*
- **BIOS:** Award BIOS, PnP support
  - FLASH EEPROM (512KB) for BIOS update
  - Enhanced ACPI BIOS and DMI 2.0
  - ISA Plug and Play (PnP) extension
  - Power management
  - Anti-Boot Virus
  - Intel 82559 Boot-ROM
- **DMI BIOS Support:**  
Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.

- **Multi I/O:**
  - **Parallel Port:** One high-speed parallel port, SPP/EPP/ECP mode
  - **Serial Port:** Two 16550 UART compatible ports with COM1 and COM2 as RS232
  - **IrDA Interface:** Pin-header connector for the optional IrDA external connector
- **Enhanced IDE:** Two Bus Mastering EIDE mode, up to 4 devices, Two EIDE interfaces for up to four devices, support PIO Mode 3/4 or Ultra ATA33/66 /100 IDE Hard Disk, ATAPI CD-ROM and LS-120 drive
- **FDD Interface:** Two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB)
- **AGP bus VGA:** ATI RAGE128 Ultra 4XL chipset
  - Support 16MB SDRAM frame buffer, which runs on 133MHz speed and provides bandwidth up to 1GB/Sec.
  - 1.5V AGP 4X mode offers a peak bandwidth in excess of 1GB/s
  - Support DVD and video with enhanced motion compensation accelerator
  - Incorporated 2D and 3D acceleration engine
  - 300MHz DAC supports 90Hz refresh at 1600x1200x32bpp resolution
  - 2D display mode / refresh rates

Colors Depth	8 pbb	16 pbb	24 pbb	32 pbb
Buffer Size	16MB	16MB	16MB	16MB
640x480	200	200	200	200
800x600	200	200	200	200
1024x768	200	200	200	200
1152x864	160	160	160	160
1280x1024	130	130	130	130
1600x1200	90	90	90	90
1800x1440	75	75	75	NA
2048x1536	75	75	NA	NA

- Software supported

SOFTWARE SUPPORT	DOS	Win 3.x	Win 95	Win 98	NT 3.51	NT 4.0	Win2K
<b>2D Software Support</b> (Note 1)							
• Accelerated driver support	VESA <sup>2</sup>	✓	✓	✓	✓	✓	✓ <sup>6</sup>
• AutoCAD / MicroStation	✓						
<b>Video Software Support</b>							
• Microsoft DirectDraw			✓	✓		✓	✓
• Microsoft ActiveMovie/DirectShow			✓	✓			✓
• MPEG-1 software playback			✓	✓		✓	✓
• DVD/MPEG-2 software playback			✓	✓			✓
• QuickTime acceleration							
<b>3D Software Support</b>							
• Microsoft Direct3D			✓	✓			✓
• QuickDraw 3D RAVE							
• OpenGL (Note 3)			✓	✓		✓	✓
• ATI 3D CIF (Note 4)			✓	✓			
• AGP			✓	✓		5	✓

<sup>1</sup> Additional drivers available from 3rd parties (including SCO and UNIXWARE); <sup>2</sup> Direct BIOS Support; <sup>3</sup> OpenGL LCD; <sup>4</sup> ATI's 3D API for the 3D RAGE family; <sup>5</sup> NT 4.0 Service Pack 3 supports AGP devices, but does not provide support for AGP Texturing; <sup>6</sup> Includes QuickDraw support.

- **USB Interface:** Four USB pin-header connectors, compliant with USB Specification Rev. 1.1 and support USB Hot-Plug function.
- **DiskOnModule:** The DiskonModule(DOM) flask disk supports system boot and storage capacity from 8MB to 512MB.
- **ATX Power Supply support:**
  - On-board 4-pin ATX power supply header (requires the passive backplane supports ATX power supply)
  - On-board power button header for Soft power off, i.e. front panel turn off system power.
  - Support Win95 and Win98 shutdown automatically turn off the system power.
  - Instant-off or delay-4-seconds selectable via BIOS setup.
- **Hardware Monitor System:**
  - PC Health Monitoring ASIC supports system power voltages, FAN speed and system temperatures monitoring.
  - One FAN connector and one thermal couple header reserved for chassis FAN and temperature monitoring.

- **Watchdog Timer:**
  - Read I/O port 0843H to enable watchdog.
  - Read I/O port 043H to disable watchdog.
  - 10s, 20s, 30s and 80s timeout period selectable.
- **Green Function:** Power management via BIOS, activated through mouse/keyboard movement or SMI button
- **Keyboard and Mouse Connectors:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard and PS/2 mouse. A 5-pin on-board keyboard pin header connector is also available to support PC/AT style external keyboard connector on backplane.
- **PICMG Compliance:** Fully compliant to PICMG 2.0 standards.
- **Environmental and Mechanical:**
  - **Power Supply:** 12A@ +5v typical; 10A@ +12v typical  
100mA@ -12V typical; 200mA@ +5VSTB (Option)
  - **Temperature:** 0°C to 60°C operating; -40°C to 70°C storage
  - **Humidity:** 5% to 95%
  - **Dimensions:** 13.3"(L) x 4.8"(W) or  
338mm (L) x 124mm (W)



## Intelligence

- **Support 400MT/s and 533MT/s CPU:** The Intel 845D chipset boosts the CPU FSB bus speed to 400MT/s or 533MT/s.
- **Double-Data-Rate Memory Support:** Supports up to total 2GB of PC1600/PC2100 memory and the peak bandwidth of 2.1GB/s. The high bandwidth of Memory and PSB boost system performance.
- **Workstation class On-Board VGA:** The built-in ATI Rage128 VGA chip supports 1.5V AGP 4X mode with Sideband Addressing and AGP Texturing (Execute mode) to realize all the benefits of AGP. Superior 3D performance achieved through a floating point setup engine rated at 1.2 million triangles/sec. The 16MB SDRAM increases the display resolutions (2048 x 1024 x 32bpp max.)
- **Newest Intel Fast Ethernet built-in:** The Intel 82559 Fast Ethernet controller is integrated into the SBC card. The drivers for most popular Operation systems and NOS have been validated and proved the compatibility. It also supports latest network standards and protocols like speed auto-negotiation between 10Base-T and 100Base-T, half/full duplex (IEEE802.3u), flow-control (IEEE802.3X), VLAN(IEEE802.3Q), Priority packet(IEEE802.3P) and etc. The multi-protocols support ensures the best interoperability.
- **Dual LAN Design:** Two 10/100M Ethernet port can be configured as load-balancing mode or Fault-tolerance mode. This improves the networking bandwidth and reliability. The aggregated bandwidth can be up to 400Mbps while two ports working on full-duplex 100-BaseT. The dual port design fulfill the needs of emerging Internet , NAS as well as servers applications.
- **High Memory capacity and ECC functions:** The two DIMM slots support up to 2GBytes Memory. All the DIMM slots support ECC function. It ensure the system stability and reliability. The high memory capacity and ECC functions meet the requirement for servers applications.

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# 2

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## Installations

This chapter provides information on how to use the jumpers and connectors on the P/I-P4BVLL in order to set up a workable system. The topics covered are:

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Memory Installation .....	13
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## CPU Installation

The P/I-P4BVLL Industrial SBC Card provides a 478-pins ZIF socket for Pentium 4 processors with FC-PAG2 package.

To Install a CPU, first turn off your system and remove its cover. Locate the ZIP socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree right angle. Insert the CPU with the correct orientation. Use the notched corner of the CPU with the white dot as your guide. The white dot should point towards the end of the lever. Notice that there is a blank area where one hole is missing from that corner of the square array of pin holds. Because the CPU has a corner pin for three of the four corners, the CPU will only fit in one orientation. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down on the fan and close the socket lever.

To disassembly the processor, simply pull the lever sideways away from the socket then upward to a 90-degree right angle. You can take the CPU out from the socket without help of any tool.

After installing the processor into the Socket, ensure that the CPU fan is installed first. Without a fan circulating air on the CPU, the CPU can overheat and cause damage to both CPU and SBC card.

**WARNING!:** If no FAN circulating Air on the CPU, the processor might been overheated and damage both CPU and SBC components.

**IMPORTANT:** You must set jumpers for “CPU FSB speed” depending on the CPU that you install.

## Memory Installation

The P/I-P4BVLL Industrial CPU Card provides two 184-pin DIMM sockets for a maximum total memory of 2GB SDRAM. The memory modules can come in sizes of 128MB, 256MB, 512MB and 1GB SDRAM.

The P/I-P4BVLL Industrial CPU Card supports two 184-pin DIMM (Dual In-line Memory Module) sockets. In populating the DIMM sockets, DIMM1 bank should be populated first for less signal reflection. However, we do not see any issue while populate DIMM2 only. Refer to the following table on how to configure the memory.

**NOTE:** Use SDRAM modules with PC2100 specification when running DDR266 Memory bus speed. With DDR200 Memory bus speed, SDRAM modules meet PC1600 or PC2100 specification can be used.

### 184-pin DIMM (2.5V) Unregistered SDRAM

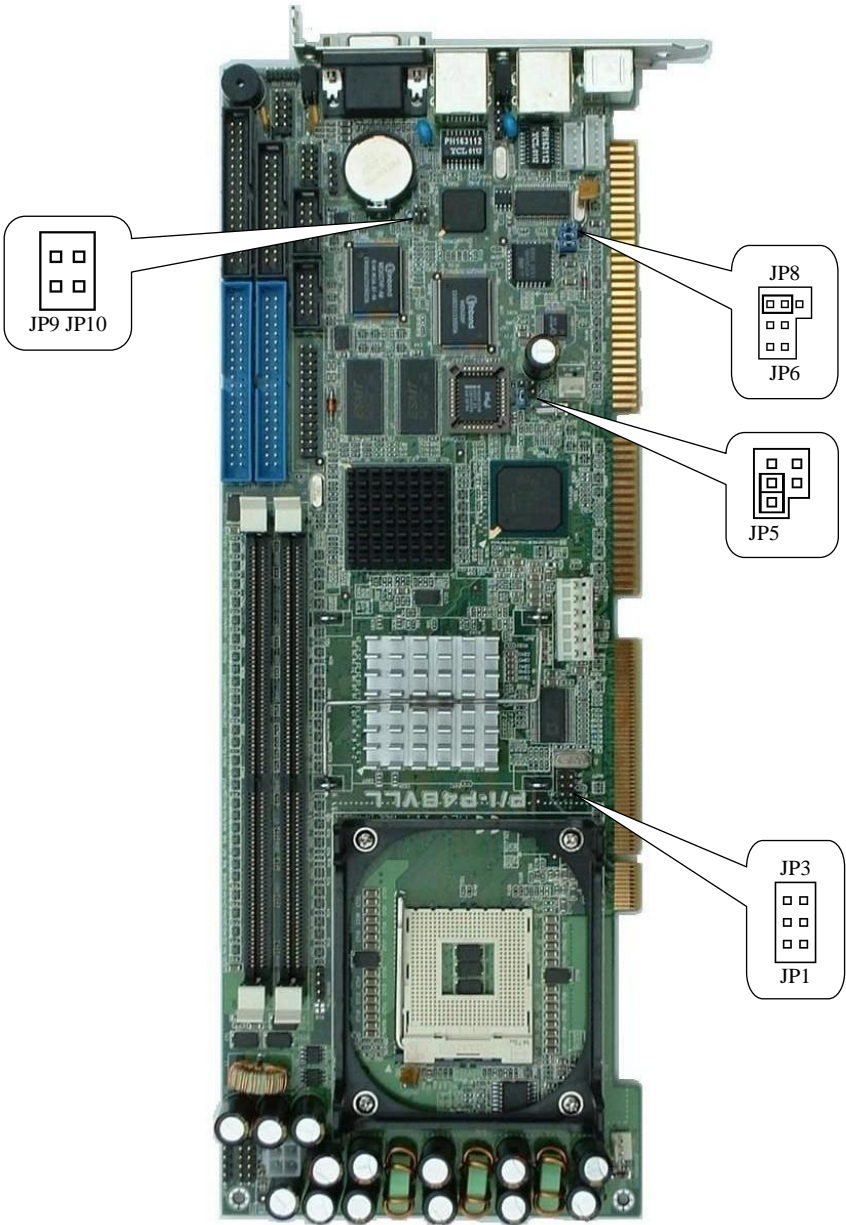
Bank0 (DIMM1)	Bank1 (DIMM2)	Total Memory
128MB	-----	128MB
256MB	-----	256MB
512MB	-----	512MB
1GB	-----	1GB
128MB	128MB	256MB
128MB	256MB	384MB
128MB	512MB	640MB
256MB	128MB	384MB
256MB	256MB	512MB
256MB	512MB	768MB
256MB	1GB	1280MB
512MB	128MB	640MB
512MB	256MB	768MB
512MB	512MB	1GB
512MB	1GB	1536MB
1GB	1GB	2GB

## Jumpers on the P/I-P4BVLL

The jumpers on the P/I-P4BVLL allow you to configure your SBC card 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 P/I-P4BVLL and their respective functions.


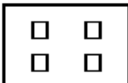
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JP1~2: CPU Bus Speed Selector .....	16
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JP5: Clear CMOS RAM Data .....	16
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Jumper Locations on the P/I-P4BVLL





**JP1 ~ 2: CPU Frequency Selector**

JP1 and JP2 allow users to select the CPU FSB speed. It can be 400MT/s or 533MT/s. User should select the correct FSB speed to make their CPU run on correct speed and ensure the system runs stably.

JP1~JP2	Setting	Function
	JP1: Pin 1-2 Short JP2: Pin 1-2 Short	533MT/s CPU FSB
	JP1: Pin 1-2 Open JP2: Pin 2-3 Open	400MT/s CPU FSB



**JP3: On-Board VGA Enable/Disable selection**

On-Board AGP VGA chip can be disabled by shorting the JP1 jumper.

Enable	Disable
	
<b>JP3</b>	<b>JP3</b>

**JP5: CMOS RAM Data**

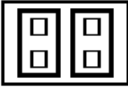
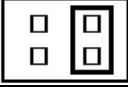
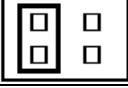

This 3-pin Jumper allows the user to disconnect the built-in 3V battery power to clear the information stored in the CMOS RAM. To clear the CMOS data: (1) Turn off the system power, (2) Remove Jumper cap from pin1&2, (3) Short the pin2 and pin3 for three seconds, (4) Put Jumper cap back to pin1& 2. (5)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

JP5	Setting	Function
 1	Pin 1-2 Short/Closed	Normal Operation (default)
 1	Pin 2-3 Short/Closed	Clear CMOS Content



### JP6, JP7: WatchDog Timer Period Selection

The WatchDog Timer time-out period can be set 10 sec, 20 sec, 30 sec and 80 sec. The following table describes the jumper settings for the period.



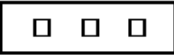
JP6 JP7	Time-out Period
	10 Sec
	20 Sec
	30 Sec
	80 Sec

### JP8: WatchDog Timer Mode Selection

The WatchDog Timer is enabled by reading I/O port 843H. It should be triggered before the Watch-Dog Timer time-out period ends, otherwise the Watch-Dog Timer assumes the program operation is abnormal and will issue either a reset signal to re-boot system again, or activate NMI (By pull-low IOCHK#) to the CPU.

The WatchDog Timer can be disabled by reading I/O port 043H.

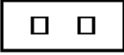

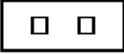

The JP8 jumper is used to select time-out signal. It can be RESET to re-boot system, NMI to signal CPU or disable this function.

JP8	Setting	Function
 1	Pin 1-2 Short/Closed	NMI to signal CPU
 1	Pin 2-3 Short/Closed	RESET to re-boot system
 1	No Jumper short	Disable WatchDogTimer

**JP9~ 10: On-Board LAN Enable/Disable selection**

---

On-Board Fast Ethernet LAN chips can be disabled by shorting the JP9 or/and JP10 jumper.

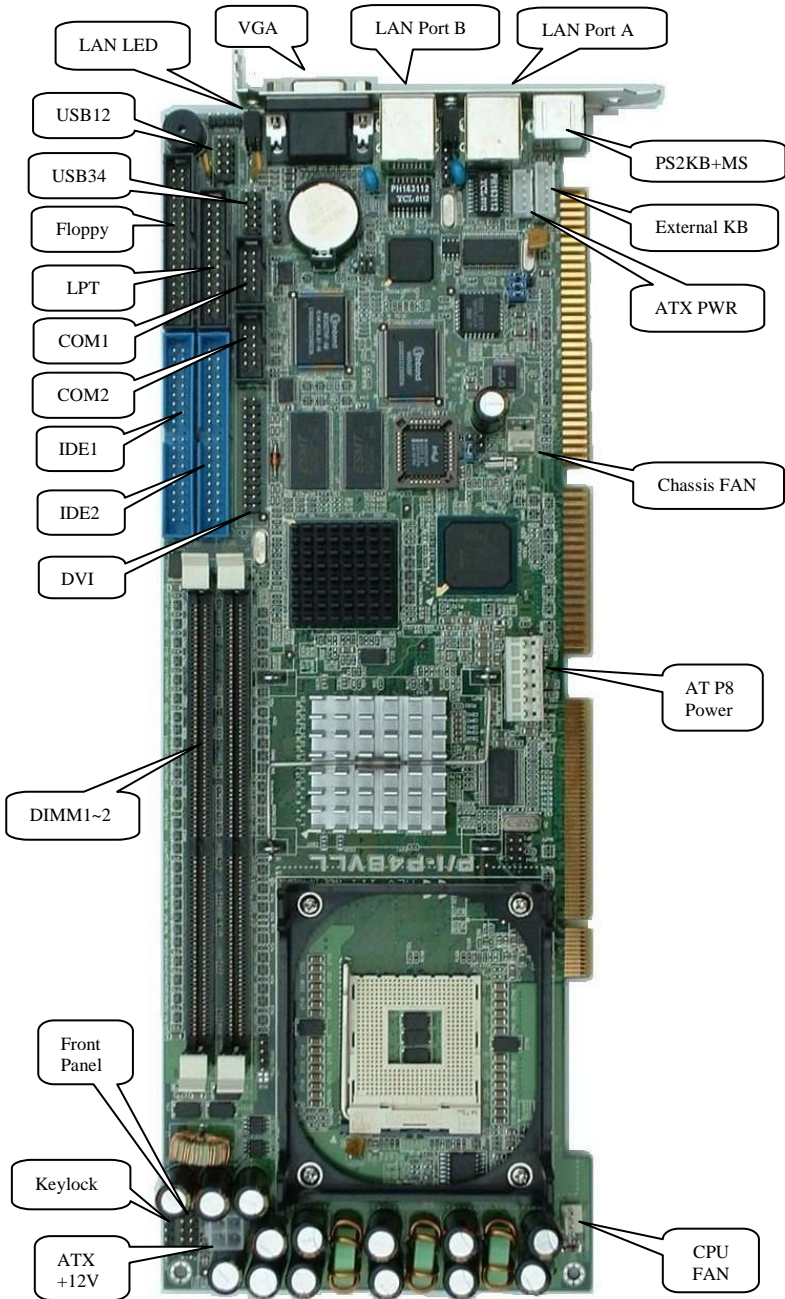
Port #	Enable	Disable
PORT A	 JP9	 JP9
PORT B	 JP10	 JP10

## Connectors on the P/I-P4BVLL

The connectors on the P/I-P4BVLL allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on P/I-P4BVLL and their respective page number.

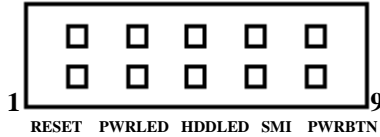
Front Panel Connector.....	21
Keylock & Power-On LED Connector .....	22
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Connector Locations on the P/I-P4BVLL



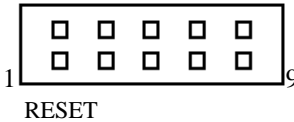
## Front Panel Connector

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.



### ➤ RESET Switch

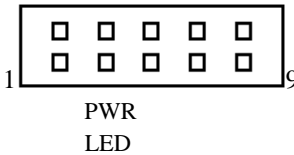
The reset switch allows the user to reset the system without turning the main power switch Off and then On. Orientation is not required when making a connection to this header.



RESET Pin #	Signal Name
1	Reset
2	Ground

### ➤ Power-On LED

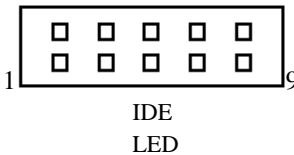
This connector allows users to connect to Front Panel Power indicator.



SMI Pin #	Signal Name
3	+5V
4	GND

### ➤ IDE Hard Disk LED Connector

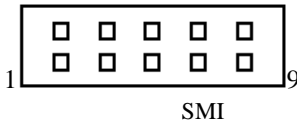
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



IDE LED Pin #	Signal Name
5	IDE_ACT
6	Ground

➤ **SMI/Hardware Switch**

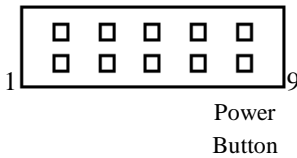
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.



SMI Pin #	Signal Name
7	Sleep
8	Ground

➤ **ATX Power ON/OFF Button**

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



PWR BTN Pin #	Signal Name
9	PWR-BTN
10	GND

**Keylock and Power-ON LED Connector**

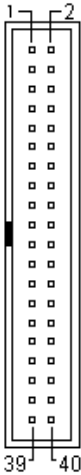
The Power LED provide a interface to wire the system power on signal to front panel. The keylock switch, when closed, will disable the keyboard function.



Power LED Pin #	Signal Name
1	Power_on
2	NC
3	Ground
4	Keylock
5	Ground

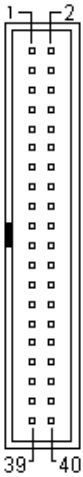
## EIDE Connectors

## 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	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

**Secondary IDE Connector**

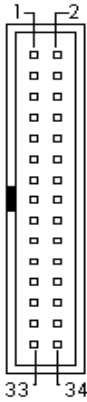


Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	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	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground



## Floppy Drive Connector

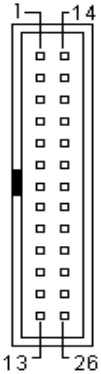
Floppy connector is a 34-pin header and will support up to 2.88MB floppy drives.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

**Parallel Port Connector**

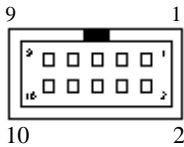
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

## COM1 Serial Port

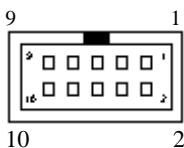
COM1, a 10-pin header connector, is the onboard COM1 serial port of the P/I-P4BVLL. The following table shows its pin assignments.



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	RI, Ring indicator
10	N.C.

## COM2 Serial Port

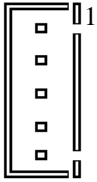
COM2, a 10-pin header connector, is the onboard COM2 serial port of the P/I-P4BVLL. The following table shows its pin assignments while it is configured as RS-232 interface.



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	RI, Ring indicator
10	N.C.

### External Keyboard Connector

---

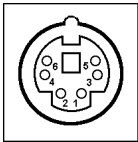


Pin #	Signal Name
1	Keyboard clock
2	Keyboard data
3	PG
4	GND
5	+5V

### PS/2 Keyboard & Mouse Connector

---

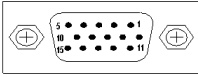
The following table describes the pin assignment of PS/2 Keyboard and Mouse connector, which is mount on button of bracket. To attach PS/2 Keyboard and mouse, users need to connect trough a PS/2 1-to-2 Y-cable and plug into this Mini-Din connector. All the P3BVLL SBC boards come with a Y-cable. Contact with your dealer if the Y-cable is missing.



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

## VGA Connector

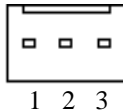
The pin assignments of VGA CRT connector are as follows:



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	N.C.
HSYNC	13	14	VSYNC
NC	15		

## CPU Fan Power Connector

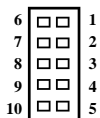
This is a 3-pin header for the CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

## USB Connectors

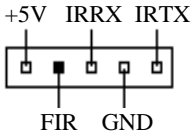
The following table shows the pin outs of the USB connectors.



USB1 Pin#	USB0 Pin #	Signal Name
10	1	+5V
9	2	USB-
8	3	USB+
7	4	Ground
6	5	N.C.

### 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

### ATX Power Connector

This is a four-pin connector to support the ATX power and corresponding back-plane. When your back-plane is configured to perform ATX power supply Soft-on/off function, you have to connect the control signals and stand-by power on this connector to your back-plane by a corresponding cable.

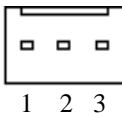


ATX-PWR

Pin #	Signal Name
1	PWR_GD
2	5V_SB (standby +5V)
3	PS-ON (soft on/off)
4	GND

### Chassis Fan Power Connector

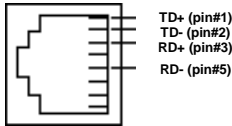
This is a 3-pin header for the chassis fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

## LAN- RJ45 Connector

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



## LAN LEDs

The LAN LEDs on top of bracket are to display the current network connection status. The green color LED on the left-hand side shows the link status and TX/RX activity. The Yellow color on the right-hand side indicates the operation mode, i.e. 10Base-T or 100Base-T.



LNK/ACT	STATUS
ON	Link
OFF	Disconnected
FLASH	Packets TX/RX



SPEED	MODE
ON	100Base-T
OFF	10Base-T

### LAN LED Connectors

---

A LAN LED connector is designed for each LAN port for applications need to display LAN port status on front panel or the places administrators are easy to access.



LAN LED Pin #	Signal Name
1	LINKLED+
2	LINKLED-
3	SPEEDLED+
4	SPEEDLED-

### AT Power P8 Connector

---

The following table describes the pin assignment of on-board AT Power P8 connector. This connector is for the applications which do not require a backplane. Users can connect it to an AT SPS P8 connector to supply the system power. The Power good signal will be generated by the circuit on the SBC card. Pin 1 is replace with +5V power to increase supply current.



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



## Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0843H. To enable the watchdog timer and allow the system to reset, read I/O port 0443H. To disable the timer, read I/O port 043H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

### **Enabling Watchdog**

```
MOV  DX, 0843H
IN   DX, AX
```

### **Disabling Watchdog**

```
MOV  DX, 043H
OUT  DX, AX
```

# 3

---

## BIOS Configuration

This chapter describes the different settings available in the Award BIOS that comes with the P/I-P4BVLL CPU card. The topics covered in this chapter are as follows:

BIOS Introduction .....	35
Main Menu .....	38
Standard CMOS Setup .....	40
Advanced BIOS Features .....	45
Advanced Chipset Features .....	49
Integrated Peripherals .....	53
Power Management Setup .....	57
PnP/PCI Configurations .....	60
PC Health Status .....	62
Frequency/Voltage Control .....	63
Load Fail-Safe Defaults .....	64
Load Optimized Defaults .....	64
Supervisor/User Password Setting .....	65
Exit Selecting .....	66

## BIOS Introduction

This Chapter discusses Award™ Setup program built into the P4BVLL 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 P4BVLL SBC is a custom version of an industry standard BIOS. This means that it supports Intel PentiumIV 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 P4BVLL 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 Feature	➤ Frequency/Voltage Control
➤ Advanced BIOS Feature	Load Fail-Safe Defaults
➤ Advanced Chipset Feature	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.

Phoenix – AwardBIOS CMOS Setup Utility		Item Help
Standard CMOS Features		
Date:	Mon, Feb 8 2002	
Time:	16 : 19 : 20	
➤ IDE Primary Mast	[ST313620A]	Menu Level ➤
➤ IDE Primary Slave	[None]	
➤ IDE Secondary Master	[ATAPICDROM]	Change the day, month, year and century
➤ IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt On	[All Errors]	
Based Memory	640K	
Extended Memory	261120K	
Total Memory	261120K	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		



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

<b>Item</b>	<b>Options</b>	<b>Description</b>
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 Primary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary 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

**Primary HDDs / Secondary 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 primary master sub menu.

Phoenix – AwardBIOS CMOS Setup Utility		Item Help
IDE Primary Master		
IDE HDD Auto-Detection	[Press Enter]	
IDE Primary Master Access Mode	[Auto]	Menu Level >>
Capacity	13667 MB	To auto-detect the HDD's size, head... on this channel
Cylinder	26480	
Head	16	
Precomp	0	
Landing Zone	26479	
Sector	63	
↑↓←→Move Enter: Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

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.

<b>Item</b>	<b>Options</b>	<b>Description</b>
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 Primary 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	Normal LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Primary 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:

360KB    1.2MB    720KB    1.44MB    2.88MB  
5.25 in.    5.25 in.    3.5 in.    3.5 in.    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.

No errors	The system boot will not be halted for any error that may be detected. (default)
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
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.

Phoenix – AwardBIOS CMOS Setup Utility		
Advanced BIOS Features		
Virus Warning	[Disabled]	Item Help
CPU L1 and L2 Cache	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot device	[Floppy]	Menu Level ➤
Second Boot device	[HDD-0]	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
Third Boot device	[CD-ROM]	
Boot other device	[Disabled]	
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Disabled]	
Boot Up NumLock Status	[Off]	
Gate A20 Option	[Normal]	
Typematic Rate Setting	[Disabled]	
x Typematic Rate (Chars/Sec)	[6]	
x Typematic Delay (Msec)	[250]	
Security Option	[Setup]	
OS Select For DRAM > 64MB	[Non-OS2]	
Report No FDD for Win95	[Enabled]	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

### 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

**Quick Power On Self Test**

---

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

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, ZIP100, HDD, SCSI, CDROM, LAN, Disabled.

**Swap Floppy Drive**

---

If the system has two floppy drives, you can swap the logical drive name assignments.

The choice: Enabled/Disabled.

**Boot Up Floppy Seek**

---

Seeks disk drives during boot up. Disabling speeds boot up.

The choice: Enabled/Disabled.

**Boot Up NumLock Status**

---

Select power on state for NumLock.

The choice: Enabled/Disabled.

---

### Gate A20 Option

---

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

---

### Typematic Rate Setting

---

Key strokes 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 key stroke 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.

**OS Select For DRAM > 64MB**

---

Select the operating system that is running with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

**Report No FDD For WIN 95**

---

This option allows Windows 95 to share with other peripherals IRQ6 which is assigned to a floppy disk drive if the drive is not existing. The default setting is *No*.



## Advanced Chipset Features

Phoenix – AwardBIOS CMOS Setup Utility		
Advanced Chipset Features		
		Item Help
DRAM Timing Selectable	[By SPD]	
x CAS Latency Time	[2.5]	
x Active to Precharge Delay	[7]	Menu Level ➤
x DRAM RAS# to CAS# Delay	[3]	
x DRAM RAS# Precharge	[3]	
x DRAM Data Integrity Mode	[Non-ECC]	
Memory Frequency	[Auto]	
DRAM Read Thermal Mgmt	[Disabled]	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Enabled]	
Video RAM Cacheable	[Enabled]	
Memory Hole At 15M-16M	[Disabled]	
Delayed Transaction	[Enabled]	
AGP Aperture Size (MB)	[64]	
↑↓←→Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

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 Timing Selectable**

---

This item allows you to select the DRAM timing determined by the timing information stored in SPD or set by the User manually. The default is By SPD. When this field is set as By SPD, the DRAM Timing items below will become read-only.

The Choice: By SPD, Manual.

### **CAS Latency Time**

---

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

The Choice: 3, 2.5, 2, 1.5.

### **Active to Precharge Delay**

---

This item allows you to set the Active to Precharge Delay of DRAM timing. Do not reset this field from the default value specified by the system designer.

The Choice: 7, 6, 5.

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

---

When DRAM is refreshed, both rows and columns are addressed separately. This field allows you to determine the timing of transition from Row Address Strobe (RAS) to Column Address Strobe (CAS).

The Choice: 3, 2.

### **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.

The Choice: 3, 2.

### **Memory Data Integrity Mode**

---

This item allows you to Enable/Disable Memory ECC function. Users must install the ECC supported DRAM module to select this feature.

The BIOS will show Non-ECC only when Non-ECC supported DRAM module is installed.

The Choice: ECC, Non-ECC

### **Memory Frequency For**

---

This item allows user to set the DDR DRAM operation frequency. The Auto is default.

The Choice: DDR200, DDR266, Auto.

### **DRAM Read Thermal Mgmt**

---

This item allows you to enable/disable the DDR DRAM Thermal Management feature.

The Choice: Enabled, Disabled

### **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 BIOS Cacheable**

---

Selecting *Enabled* allows caching of the Video BIOS ROM, 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**

---

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

The Choice: Enabled, Disabled.

### **Memory Hole at 15MB - 16MB**

---

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: Enabled, Disabled.

### **Delayed Transaction**

---

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The default setting is *Disabled*.

The Choice: Enabled, Disabled.

### **AGP Aperture Size**

---

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

The Choice: 4M, 8M, 16M, 32M, 65M, 128M, 256M.

## Integrated Peripherals

Phoenix – AwardBIOS CMOS Setup Utility		
Integrated Peripherals		
OnChip Primary PCI IDE	[Enabled]	Item Help
IDE Primary Master PIO	[Auto]	
IDE Primary Salve PIO	[Auto]	
IDE Primary Master UDMA	[Auto]	Menu Level ➤
IDE Primary Salve UDMA	[Auto]	
OnChip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Salve PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Salve UDMA	[Auto]	
USB Controller	[Enabled]	
USB Keyboard Support	[Enabled]	
Init Display First	[PCI Slot]	
IDE HDD Block Mode	[Enabled]	
Onboard FDC Controller	[Enabled]	
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard Serial Port 2	[2F8/IRQ3]	
UART Mode Select	[Standard]	
x RxD, TxD Active	Hi, Lo	
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

### OnChip Primary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

The choice: Enabled, Disabled.

### OnChip Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the secondary IDE interface. Select Disabled to deactivate this interface

The choice: Enabled, Disabled.

**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 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

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

**Primary/Secondary Master/Slave UDMA**

---

Ultra DMA/33/66/100 implementation is possible only if your IDE hard drive and cable supports it and the operating environment includes a UDMA driver. If your hard drive and your system software both support Ultra DMA/33/66/100, select Auto to enable BIOS support. The System BIOS will also check the IDE cable. Only if the 80-way ATA66/100 cable is installed, the ATA66/100 models can be enabled by the OS driver. Otherwise, the system will be limited to run up to ATA33 mode.

The Choice: Auto, Disabled.

**USB Controller**

---

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

The choice: Enabled, Disabled.

**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.

**Init Display First**

---

This item allows you to decide to active whether PCI Slot or AGP first

The choice: PCI Slot, AGP.

**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.

The choice: Enabled, Disabled

### **Onboard FDC Controller**

---

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.

The choice: Enabled, Disabled.

### **Onboard Serial Port 1/Port 2**

---

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

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

### **UART Mode Select**

---

This item allows you to select which mode for the Onboard Serial Port 2.

The choice: Standard, HPSIR, ASKIR.

### **RxD, TxD Active**

---

This item allows you to choose Hi-Active or Low-Active of TX and RX signal, which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system

The Choice: Hi, Hi / Hi, Lo (Default) / Lo, Hi / Lo, Lo.

### **IR Transmission Delay**

---

This item allows you to Enable/Disable IR transmission delay.

The choice: Enabled, Disabled.

### **IR Duplex Mode**

---

This item allows you to select the IR half/full duplex function.

### ***Chapter 3 BIOS Configuration***

---

The Choice: Half, Full.

#### **Onboard Parallel Port**

---

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

The choice: 378H/IRQ7, 278H/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.

#### **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.



## 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.

Phoenix – AwardBIOS CMOS Setup Utility		
Power Management Setup		
		Item Help
Power-Supply Type	[AT]	
ACPI Function	[Enabled]	
Power Management	[User Define]	Menu Level ➤
Video Off Method	[DPMS]	
Video Off In Suspend	[No]	
MODEM Use IRQ	[3]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Power On by Ring	[Disabled]	
Resume by Alarm	[Disabled]	
x Date (of Month) Alarm	0	
x Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	[Disabled]	
Primary IDE 1	[Disabled]	
Secondary IDE 0	[Disabled]	
Secondary IDE 1	[Disabled]	

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

### Power-Supply Type

This should be AT if you use AT power supply or ATX power supply but force to AT mode. This selection help BIOS provide the information to OS what kind power-supply the system use. The correct information provide to OS can avoid the Windows Shutdown issue.

The choice: AT, ATX.

### ACPI Function

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

The choice: Enabled, Disabled.

**Power Management**

---

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 Defined	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.

**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	Initial display power management signaling. Allows the BIOS to control video display card if it supports the DPMS feature.

**Video Off In Suspend**

---

This determines the if the turn off the video display when system enter suspend mode.

The choice: Yes, No.

**MODEM Use IRQ**

---

This determines the IRQ in which the MODEM can use.

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

### **Suspend Mode**

---

When enabled and after the set time of system inactivity, CPU will be put into the suspend mode.

The choice: Disabled, 1 min, 2 min, 4 min, ..... 1 hour.

### **HDD Power Down**

---

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Disabled, 1 min, 2 min, 4 min, ..... 15 min.

### **Power On By Ring**

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

### **Resume by Alarm**

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

### **Reload Global Timer Events**

---

PM events are I/O events whose occurrence can prevent the system from entering a suspend mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *Enabled*, even when the system is in a Suspend down mode.

### **Primary/Secondary IDE 0/1**

When *Enabled*, any activity from one of the listed system peripheral devices or IRQs wakes up the system.

### **FDD, LPT & COM**

When Enabled, any activity from one of the listed system peripheral devices or IRQs wakes up the system.

### **PCI PIRQ[A-D]#**

When Enabled, any activity from one of the listed PCI IRQ signals wakes up the system.

## PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **Personal Computer Interconnect**, 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.

Phoenix – AwardBIOS CMOS Setup Utility		
PnP/PCI Configurations		
		Item Help
PnP OS Installed	[Yes]	
<b>Reset Configuration Data</b>	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	Menu Level ➤
x IRQ Resources	Press Enter	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
PCI/VGA Palette Snoop	[Disabled]	
INTA(SL4) Assignment	[Auto]	
INTB(SL1) Assignment	[Auto]	
INTC(SL2) Assignment	[Auto]	
INTD(SL3) Assignment	[Auto]	

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

### **PNP OS Installed**

This item allows you to determine install PnP OS or not.

The choice: Yes, No.

### **Reset Configuration Data**

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup.

The choice: Enabled, Disabled.

### **Resource controlled by**

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using

a Plug and Play operating system such as Windows®98 or Windows®2000. If you set this field to “manual” choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a “>”).

The choice: Auto, 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*.

Choices are Enabled, Disabled.

### **Assign IRQ Number for PCI Slots**

---

**INTA(Slot4): Uses AD28**

**INTB(Slot1): Uses AD31**

**INTC(Slot2): Uses AD30**

**INTD(Slot3): Uses AD29**

Some special PCI Add-on card may need to use a specific IRQ number. These items allow you to assign an IRQ to PCI bus Interrupt signals. The SLOT numbers showed are not necessarily match with the SLOT number marked on the backplane you use. Please contact with your backplane dealer to get backplane design information.

Choices are Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15.

## 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.

Phoenix – AwardBIOS CMOS Setup Utility		
PC Health Status		
		Item Help
CPU Warning Temperature	[Disabled ]	
Current CPU Temperature	52°C / 125°F	
Current System Temperature	35° C / 95°F	Menu Level >
Current CPU FAN Speed	4500 RPM	
Current SYS FAN Speed	0 RPM	
Vcore	1.75V	
1.8V	1.8V	
3.3V	3.32V	
5V	5.01V	
12V	12.00V	
VBAT(V)	3.28V	
5VSB(V)	4.95V	
Shutdown Temperature	[Disabled]	

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

---

### CPU Warning Temperature

Select the CPU over-heated warning temperature.

---

### Current CPU Temperature

Shows CPU Temperature.

---

### Current System Temperature

Show System Temperature.

---

### Current CPU FAN Speed

Shows CPU FAN speed.

---

### Current SYS FAN Speed

Shows System FAN speed.

**Vcore/1.8V/3.3V/5V/12V /VBAT/5VSB Voltages**

Shows Power rails voltage.

**Shutdown Temperature**

Select the CPU over-heated shutdown temperature.

**Frequency/Voltage Control**

Phoenix – AwardBIOS CMOS Setup Utility		Item Help
Frequency/Voltage Control		
Auto Detect PCI Clk	[Disabled]	
Spread Spectrum	[Enabled]	
		Menu Level >
↑↓←→ Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit F1:General Help F5:Previous Values F6:Fail-safe defaults F7:Optimized Defaults		

**Auto Detect PCI CLK**

This item allows you to enable/disable auto detect PCI Clock. Turning off the un-used PCI clocks may help to EMI issue. Since there is no PCI clock routing specification for PICMG backplane, some system may have PCI card detect issue. In that case, please disable this item.

The choice: Enabled, Disabled.

**Spread Spectrum**

This item allows you to enable/disable the spread spectrum modulate. The spread spectrum technology also helps to alleviate the EMI.

The choice: Enabled, Disabled.

## 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 them. 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)?**  **Y**

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.

## **Appendix**

- ◆ **I/O Port Address Map**
- ◆ **Interrupt Request Lines (IRQ)**
- ◆ **POST Beep**

## 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.