IWILL P4E Series Motherboard

User's Manual

P4E Series Version 1.0

FB23623100

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and the receiver.

• Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables and shielded AC power cable must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

• This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

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Contents

What's In This Chapter:

1: Introduction

This is the User's Manual is for the P4ES, P4E and P4L motherboards. Anything in this manual that only applies to one board is clearly noted. Please read this chapter before you use your motherboard and identify which parts of the manual you will need to refer to. Please pay particular attention to the Critical Topics section.

Manual Structure

This manual has seven chapters covering the following topics:

Chapter 1: Introduction

Explains the manual structure and conventions and indicates the most important topics in the manual. In addition, there is a list of what you should find in the motherboard package and some pointers on things to do before you configure or install the board.

Chapter 2: Key Features & Components

Details the motherboard's hardware features and important components and indicates their locations. Describes the support software that comes with the board on the Power Installer support CD-ROM disc.

Chapter 3: Motherboard Configuration

Lists the motherboard's default configuration and configuration options.

Chapter 4: Installing The Motherboard

Has information on how to prepare and install the motherboard. Includes installing a CPU and system memory and housing installation considerations.

Chapter 5: System Configuration

Covers connecting system peripherals to the motherboard, initial BIOS configuration using the CMOS Setup utility, OS options and software installation.

Chapter 6: Using The Motherboard

Explains system operation features that derive from the motherboard. Has information on performance optimization and troubleshooting.

Chapter 7: Technical Information

Lists the motherboard's technical specifications.

Manual Features

This User's Manual is intended to be useful and informative while also making it easy to quickly find specific information or specifications. The manual has icons and notes in the sidebar to note important topics, indicate warnings or further explain and illustrate points. We suggest that most users review the manual to become familiar with the motherboard. Expert users may want to review topics selectively, as needed.

If The Motherboard Is Already Installed

You may receive the motherboard installed in a working system. If this is the case, you should still probably review the sections on configuring and using the board, especially if an Operating System is not installed yet.

If You Need To Install This Motherboard

We recommend that only experienced users and technicians install this motherboard. Otherwise, we suggest having a qualified computer technician install and configure the system. This service is usually provided at a nominal fee by better computer stores and service companies.

Critical Topics

Many users do not read through the entire User's Manual. While this may not be necessary for experienced users or if the motherboard is already installed, there are some topics which are particularly important and deserve your specific attention. Some topics cover information critical to the proper installation and use of the motherboard.

For this motherboard, please review the sections on the following topics:

- CPU installation & upgrading
  Please see Chapter 4.
- System memory installation & upgrading
  Please see Chapter 4.
- Serial-ATA installation
  Please see Chapter 4.
- ATA-133 installation
  Please see Chapter 4.
- AGP card installation
  Please see Chapter 5.
- Required BIOS configuration
  Please see Chapter 5.
- Support software installation
  Please see Chapter 5.

Packing List

The motherboard package includes the following items:

- P4E Series motherboard
- Rear I/O panel shield
- ATA-66/100 IDE connector cable

  Connects IDE devices to one of the onboard IDE connectors.
- ATA-133 IDE connector cable (P4E & P4ES only)

  Connects ATA-133 IDE devices to one of the onboard ATA-133 IDE connectors.
- Serial-ATA connector cable (P4ES only)

  Connects a Serial-ATA device to one of the onboard Serial-ATA connectors.
- Floppy Disk Drive connector cable

  Connects floppy disk drives to the onboard floppy disk connector.
- 3 Jumper Caps

  Extra caps in case original caps are lost.
- Power Installer support CD-ROM disc

  Includes support software, drivers and bundled software utilities.
- User's Manual

Pre-Use Checklist

Before you install and use the motherboard, please do the following:

- Check Package Contents

  Please compare the package contents to the Packing List on the previous page and confirm that all items are present and undamaged.
- Missing or Damaged Accessories

  If anything is missing, please contact your vendor.
- Motherboard Damage

  If the motherboard has been visibly damaged, return the complete package to your vendor with proof of purchase.

- Prepare Minimum System Components

  If you are installing the board in a new system, you'll need at least the following internal components;

  - Intel Pentium 4 478-pin processor
  - At least one DDR SDRAM memory module
  - Desired storage devices (hard disk, CD-ROM, etc.)

You will also need whatever external system peripherals you intend to use, which will normally include at least a keyboard, a pointing device and a video display monitor.

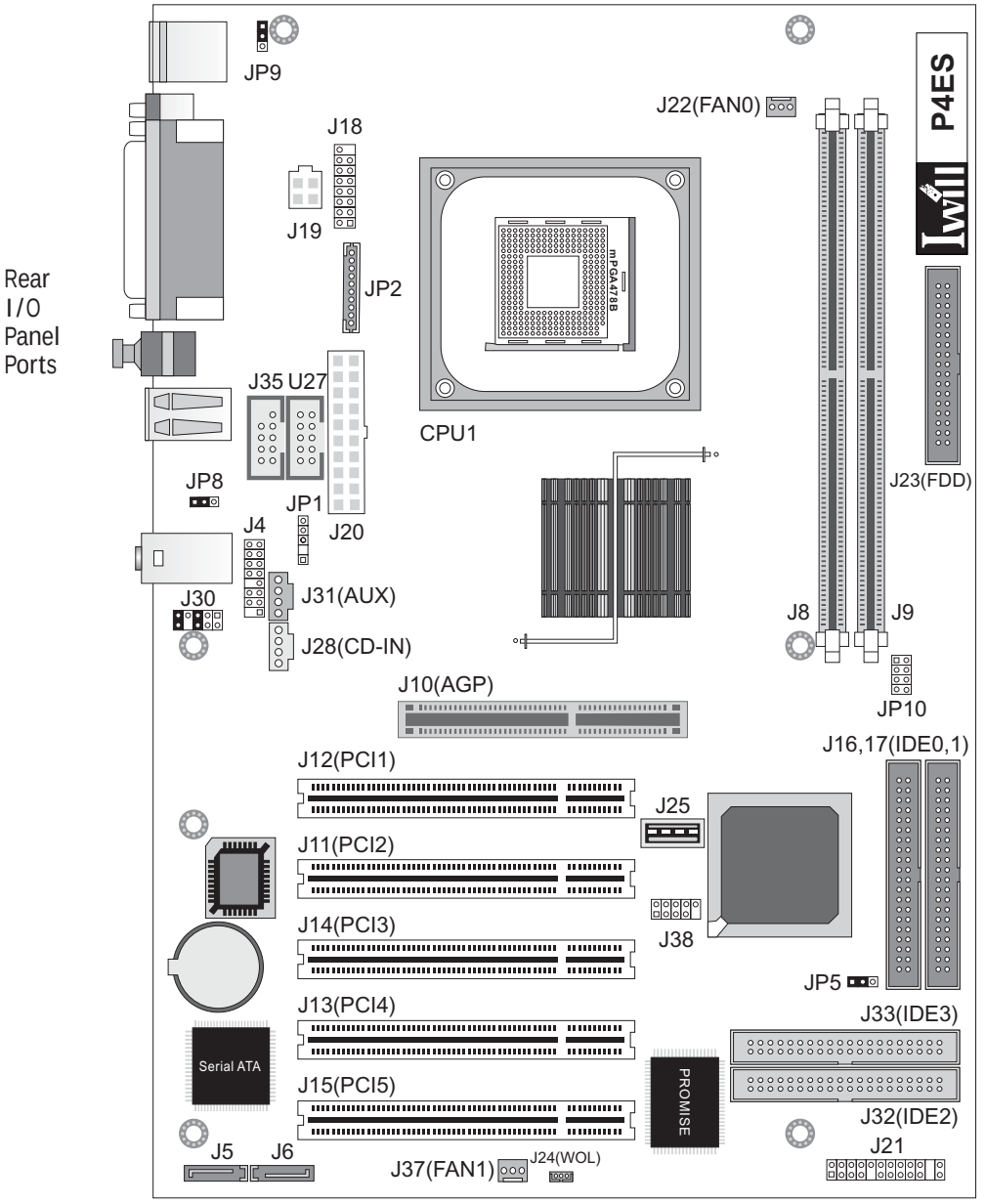
Chapter Topics:

2: Key Features & Components

This chapter explains the location and function of this motherboard's key features and components. In addition, it details the software that comes on the Power Installer support CD-ROM disc. Please review this chapter if you are installing the motherboard. It is also useful for reference regarding feature functions after the board is installed in a working system.

Motherboard Layout

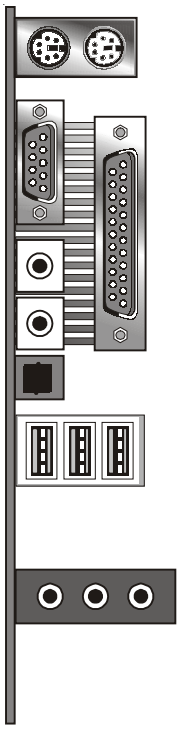
The diagram and key on these two pages shows the location of key components on the motherboard.



Motherboard Layout Key

Component	Function
CPU1	mPGA478 CPU socket
J20, J19	Main & 12V power connectors for ATX power supply
J8, J9	DIMM memory sockets for DDR SDRAM modules
J10	AGP connector for 1.5V AGP 4X display card
PCI 1 – 5	32-bit PCI expansion slots
J25	Onboard internal USB 2.0 port
Connectors	
IDE0, IDE1	IDE drive connectors
IDE2, IDE3	Promise ATA-133 IDE drive connectors
J5, J6	Serial-ATA drive connectors
J23	Floppy disk drive connector
J22	CPU cooling fan power connector
J37	Housing cooling fan connector
J35	COM2 port bracket connector
J18	Game/MIDI port bracket connector
JP1	IR port module connector
J4	Optional 6-channel audio port bracket connector
J28	CD–In CD-ROM drive audio-in connector
J31	AUX – auxiliary audio-in connector
J21	Housing front panel feature connector
FI Panel Connectors (Can also be used individually)	
J30	FI Panel audio feature connector
U27	Smart Card Reader connector
JP2	Memory Stick/Secure Digital card reader connector
J38	USB 2.0 ports 5 & 6 connector
Jumpers	
JP5	Clear CMOS jumper
JP10	DDR voltage jumper
JP8	USB Standby voltage
JP9	PS/2 Standby voltage
Rear panel I/O ports	See figure on next page

Rear I/O Panel Ports:
This figure show the ports on the rear I/O panel. The ports include, from top to bottom:
PS/2 ports
Serial, Parallel ports
Rear audio jack
Center/Subwoofer jack
SP/DIF audio port
Three USB ports
Audio ports
The ports have standard color-coding as follows:
PS/2 Keyboard: Purple
PS/2 Mouse: Green
Serial Port: Teal
Parallel Port: Burgundy
Rear Jack: Black
Center/Subw. Jack: Orange
SP/DIF Connector: Black
USB Ports: Black
Mic In Jack: Pink
Line Out Jack: Lime
Line In Jack: Light Blue



PS/2 Keyboard, Mouse

Serial (COM1)

Parallel

Rear

Center/Subwoofer

SP/DIF

USB1, USB2, USB3

Mic, Line Out, Line In

Key Features & Components

This section explains the function and use of key features and components on the motherboard. It also indicates where to look in the manual for additional information on configuring and using them.

This motherboard uses an ATX form factor PCB in a design that integrates many features onto the board including several external ports.

Intel 845E Chipset

The P4E Series motherboards use a version of the Intel 845 Chipset, the 845E, a multi-function chipset for higher-end performance and mainstream systems.

The components of the chipset include the following devices mounted on the board:

- North Bridge: 82845E Memory Controller Hub (533MHz or 400MHz FSB)
- South Bridge: 82801DB I/O Controller Hub (ICH4)

The chipset provides host bus, memory, AGP, and I/O interfaces including USB 2.0.

Winbond Super I/O

All P4E Series motherboards use the Winbond W83637HF Super I/O controller chip, which includes the following features:

- Hardware monitor
- Memory Stick/Secure Digital interface
- Smart Card interface

Promise ATA-133 IDE (P4E & P4ES)

The P4E and P4ES motherboards also use the Promise technologies PDC20275 ATA-133 controller chip, which has the following functions:

- Provides two additional IDE channels with support for up to four additional IDE devices
- Supports devices at transfer speeds up to ATA-133
- Requires ATA-133 IDE ribbon cables (one supplied)

Serial ATA (P4ES)

The P4ES motherboard also has a Silicon Image Serial-ATA controller chip, which has the following functions:

- Supports Serial-ATA interface devices
- Provides two connectors onboard for two devices
- Uses standard Serial-ATA cables (one supplied)

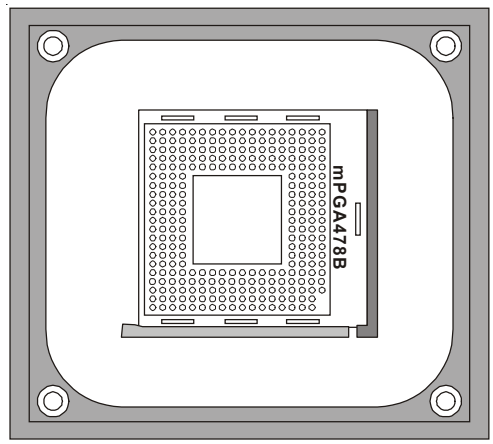
CPU Socket

Function: The system CPU installs in this socket.

Description: The mPGA478B CPU socket supports all 478-pin Intel Pentium 4 CPUs that use this socket. The motherboard comes with a "retention mechanism" mounting frame on the board to attach the heatsink and cooling fan assembly required by the Pentium 4 CPU.

More Information: See the section in Chapter 4 on "Installing CPUs" for information supported CPUs and their installation procedure. Technical specifications are listed in Chapter 7.

mPGA478B Socket:
This socket is for 478-pin Pentium 4 CPUs only.
Note;
Both 400MHz and 533MHz Frontside Bus Pentium 4 CPUs are supported.



Fan/Heatsink assembly retention mechanism

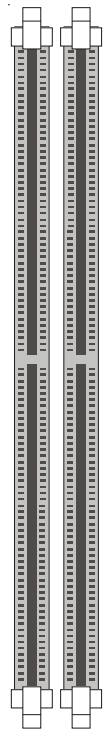
System Memory Sockets

Function: The DIMM system memory sockets are for installing DDR SDRAM system memory modules.

Description: There are two DIMM memory module sockets on the motherboard. These sockets are for 200MHz (PC1600) or 266MHz (PC2100) DDR SDRAM memory modules. The sockets function independently, allowing a variety of memory configurations up to a total of 2GB.

More Information: See the section on Installing System Memory in Chapter 4 for configuration specifications and installation instructions. Technical specifications are listed in Chapter 7.

DIMM Sockets:
System memory sockets are for:
• PC1600: 200MHz
• PC2100: 266MHz
unbuffered DDR SDRAM modules.
See Chapter 4 for important installation information.



J8, J9 DDR DIMM memory sockets

The AGP Slot

Function: The AGP slot is for installing an AGP interface video display card.

Description: The AGP slot is a high-speed slot exclusively designed for an AGP video display card. The AGP slot supports the following type of AGP card:

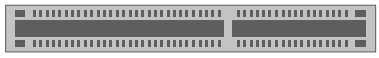
- AGP 4X – 266MHz data transfer, maximum 1064MB/ second data throughput

The slot only supports 1.5V devices. Do not use a 3.3V AGP card with this motherboard.

More Information: See the section "Connecting & Installing Internal Peripherals" in Chapter 4. Technical specifications are listed in Chapter 7. Also, see the Advanced Chipset Features section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on setting the AGP memory aperture size.

AGP Slot:
For AGP 4X 1.5V cards only. Do not use 3.3V cards.

J10(AGP)



AGP slot is for a AGP 4X card

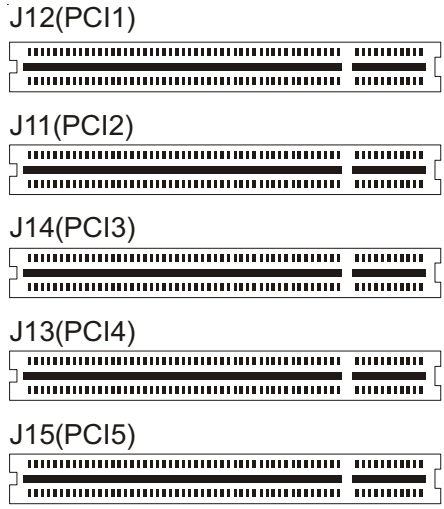
PCI Expansion Slots

Function: The PCI expansion slots are for installing system expansion or "add-on" cards to add additional system hardware.

Description: This motherboard has five Bus Master capable PCI expansion slots. The slots are 32-bit, 33MHz slots and are PCI 2.2-compliant. The slots provide a fast high-bandwidth pathway between the motherboard and expansion cards.

More Information: See the section "Connecting & Installing Internal Peripherals" in Chapter 4. Technical specifications are listed in Chapter 7.

PCI Expansion Slots
All slots are Bus Master capable and PCI 2.2 compliant



PCI slots are numbered on the board

Drive Connectors

There are three drive connectors on the motherboard for connecting IDE and floppy disk drives.

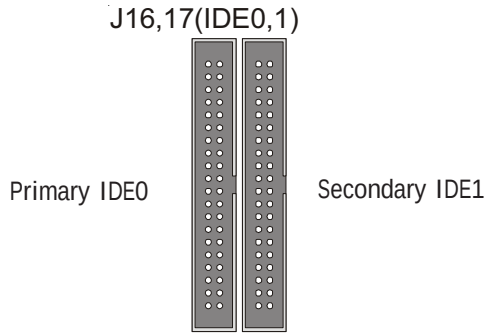
IDE Drive Connectors

Function: The two IDE connectors, marked 'IDE0' and 'IDE1', are for connecting IDE drives to the motherboard.

Description: The IDE controller on the motherboard supports IDE devices running in all modes up through ATA-100. There are two of these IDE drive connectors. IDE0 is the Primary channel and IDE1 is the Secondary. Each connector supports two drives, a 'Master' and a 'Slave' which connect to the motherboard with a ribbon cable. The ribbon cable supplied for these channels supports transfer modes through ATA-100.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 5 for instructions on connecting IDE drives. Technical specifications are listed in Chapter 7.

IDE Drive Connectors
The channels are labeled on the board.



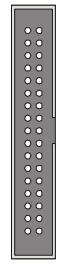
Floppy Disk Drive Connector

Function: The floppy disk drive connector, marked 'Floppy', is for connecting one floppy disk drive to the motherboard.

Description: The floppy disk drive connector supports connecting one floppy disk drive to the motherboard. The 'Floppy' drive connector uses a standard FDD ribbon cable. The floppy disk drive connected to the end of the cable will function as Drive A:. A second drive can be added as Drive B: if required.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 4 for instructions on connecting a floppy disk drive. Technical specifications are listed in Chapter 7.

Floppy Drive Connector



J23(FDD)

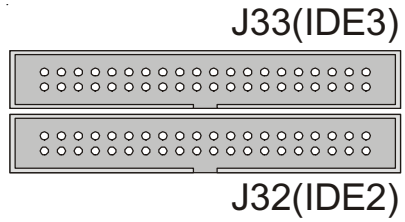
Promise ATA-133 IDE Drive Connectors

Function: The two IDE connectors, marked 'IDE2' and 'IDE3', are for connecting ATA-133 IDE drives to the motherboard.

Description: The Promise ATA-133 IDE controller on the motherboard supports IDE devices running in all modes up through ATA-133. There are two ATA-133 IDE drive connectors. Each connector supports two drives, a 'Master' and a 'Slave' which connect to the motherboard with an ATA-133 ribbon cable. The supplied ATA-133 cable supports all IDE transfer modes through ATA-133.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 5 for instructions on connecting IDE drives. Technical specifications are listed in Chapter 7.

IDE Drive Connectors
The channels are labeled on the board.



Serial-ATA Drive Connectors

Function: The two connectors, marked 'J5' and 'J6', are for connecting Serial-ATA drives to the motherboard.

Description: The Serial-ATA controller on the motherboard supports two Serial-ATA devices. There are two Serial-ATA drive connectors. Each connector supports one drive, which connects to the motherboard with a Serial-ATA cable. The motherboard comes with one Serial-ATA cable.

More Information: See the section on "Connecting Internal Peripherals" in Chapter 5 for instructions on connecting IDE drives. Technical specifications are listed in Chapter 7.

IDE Drive Connectors
The channels are labeled on the board.

Other Internal Connectors

There are several other connectors on the motherboard.

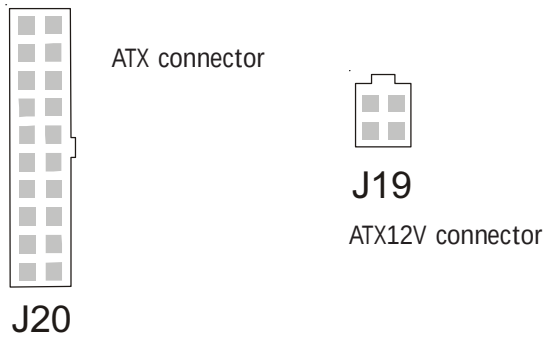
ATX Power Connectors

Function: Connectors for leads from a system ATX power supply.

Description: There are two power connectors on the motherboard for leads from an ATX power supply. The power supply leads plug into the connectors. The connector designs prevent incorrect orientation. There are two connectors, the standard 20-pin ATX connector and the extra ATX12V 4-pin connector which supplies additional 12-volt current.

More Information: Please refer to Chapter 4, "Installing the Board in a System Housing". Chapter 7 lists technical specifications.

ATX Power Connectors:
An ATX power supply with two power leads is required for this board.



CPU & System Fan Connectors J22/FAN0, J37/FAN1

Function: Power connectors for CPU and system housing cooling fans.

Description: There is one CPU cooling fan connector and two system housing cooling fan connectors on the motherboard. All the connectors are 3-pin headers.

Both the CPU and system fan connectors support fan speed monitoring.

A temperature monitor detects the CPU and internal system temperatures, which are displayed in the PC Health section of the CMOS Setup Utility. You can set a system shutdown temperature in that section that will automatically shut down the computer to protect the CPU if it reaches one of the three temperature options listed.

More Information: Please see the PC Health Status section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.

Cooling Fan Connectors: The cooling fan power connectors are 3-pin connectors.

J22(FAN0)  CPU Fan power connector

J37(FAN1)  System Fan power connectors

CD-In & AUX Audio Connectors J28 & J31

Function: Connectors for audio-in cables from internal peripherals.

Description: The two audio-in connectors on the motherboard are for audio cables from optical drives such as a CD-ROM or DVD-ROM drive. The connectors provide an audio input connection between a device and the integrated audio subsystem.

More Information: Please see the Connecting internal peripherals section in Chapter 5.

Audio-In Connectors: The J28 CD-In connector is for CD-ROM or other optical drives. Use the J31 AUX connector for an additional drive.

 J28(CD-IN) CD-In audio-in connector

 J31(AUX) AUX audio-in connector

Onboard USB Port Connector J25 & Connector J38

Function: Connector for the additional two USB ports port bracket. J25 is an onboard internal USB 2.0 port.

Description: Connecting an external 2-port USB port bracket to J38 provides two additional Hi-Speed USB 2.0 ports that have their own Root Hub.

J25 is a port mounted directly on the board for connecting internal USB 2.0 devices.

More Information: See the "Connecting Internal Peripherals" section of Chapter 5.

Other USB Ports:
Connecting a port bracket to J38 provides two additional USB ports.
J25 is a single port for connecting internal devices.

JUSB3 USB internal port

JUSB1 USB port bracket pin-header connector

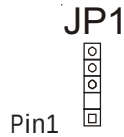
IR Connector JP1

Function: Connector for an Infrared (IR) port module.

Description: The IR connector supports both IrDA and ASKIR infrared port modules. Follow the module's instructions to install it.

More Information: Please see the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.:

IR Connector JP1:
The IR connector is for both IrDA and ASKIR port modules. You must use the CMOS Setup Utility to configure the board to use the IR feature.



IR connector JP1

6-Channel Audio Option Connector J4

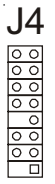
Function: Connector for the optional 6-channel audio port bracket.

Description: The 6-channel audio connector supports any of the three optional 6-channel audio port brackets, 6CH, 6CHG and SuperAudio. The port bracket provides additional audio connections for a 5.1 speaker system.

More Information: Please see "Connecting Internal Peripherals" section in Chapter 5 and the "System Features" section in Chapter 6.

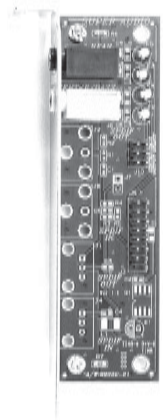
6-Channel Audio:
This combined connector is for either of the optional audio port brackets which provide additional audio connections for a 5.1 speaker system.

J4 Connector:
SP/DIF
Sub-Woofer & Rear Speakers



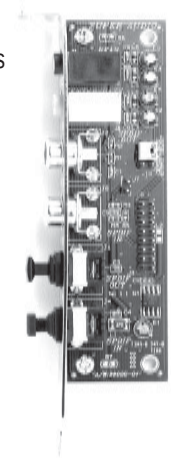
6CH Audio Port Bracket

Rear Speakers
Center/Bass



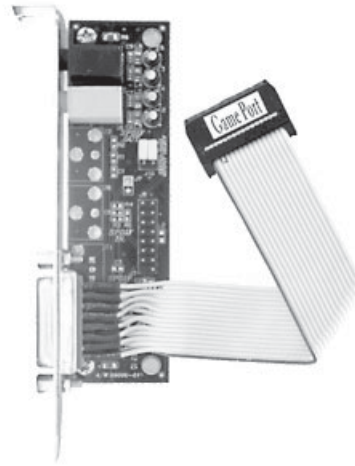
SuperAudio Port Bracket

Rear Speakers
Center/Bass
RCA Out
RCA In
SP/DIF Out
SP/DIF In



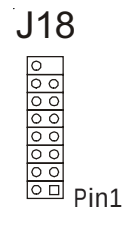
6CHG Audio Port Bracket

Rear Speakers
Center/Bass



Game Port

JGAME1 Game port connector



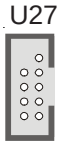
Smartcard Reader Connector U27

Function: Connector for a Smartcard reader module.

Description: A housing mounted Smartcard reader module plugs into to this connector.

More Information: See the "Connecting Internal Peripherals" and "Configuring the CMOS Setup Utility" sections in Chapter 5.

Smartcard Reader:
The connector cable from a Smartcard Reader module plugs into U27. This is also the connector for the FI Panel Smartcard reader.



U27 Smartcard Reader connector

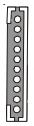
Memory Stick/Secure Digital Reader Connector JP2

Function: Connector for a Memory Stick™ or Secure Digital™ memory card reader module.

Description: A housing-mounted reader module plugs into to this connector.

More Information: See the "Connecting Internal Peripherals" and "Configuring the CMOS Setup Utility" sections in Chapter 5.

MS/SD Reader:
The connector cable from a MS/SD Reader module plugs into JP2. This is also the connector for the FI Panel MS/SD reader.



JP2 Memory Stick/Secure Digital Reader connector

WOL: Wake On LAN Connector J24

Function: A connector for the lead from a Network Interface Card that supports the Wake On LAN feature.

Description: This feature enables the system to "wake up" from Suspend mode when it receives a signal over a LAN it is connected to. It works with a PCI NIC that supports this feature by connecting the card to the WOL connector on the motherboard.

The motherboard supports Wake on LAN through a PCI bus signal. This signal will wake up the computer only when it is plugged into an AC power source and the system is in a supported suspend state.

More Information: Please see the Power Management Setup section of "Configuring the CMOS Setup Utility" in Chapter 5 for information.

Wake On LAN Connector:
This connector is for a PCI Network Interface Card that supports WOL.

J24 Wake On LAN connector

FI Panel Audio Connector J30

Function: Connector for the audio features on the Smart Panel.

Description: The audio cable from the Smart Panel plugs into to this connector.

More Information: See the "Connecting Internal Peripherals" and "Configuring the CMOS Setup Utility" sections in Chapter 5.

J30 Connector:
The cable from the audio features on the FI Panel plugs into this connector.

J30 connector

Front Panel Connector J21

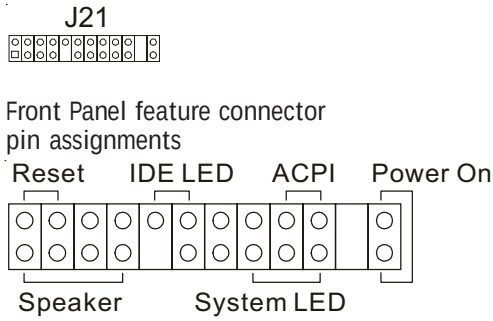
Function: Multifunction pin header connector for system housing front panel features.

Description: This connector supports the following front panel features:

- Reset Switch (Reset below)
- IDE device activity LED (IDE LED in diagram)
- System ACPI Suspend LED (ACPI in diagram)
- System Power Switch (Power On in diagram)
- System Activity LED (System LED in diagram)
- Housing-mounted speaker (Speaker in diagram)

More Information: See Chapter 4 “Installing the Board In A System Housing” and Chapter 6, “System Features”.

Front Panel Connector:
Leads from the front panel features connect to this header.



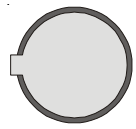
Battery Housing

Function: Housing for system support battery.

Description: An external lithium coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery.

More Information: See the Standard CMOS Features section of “Configuring the CMOS Setup Utility” in Chapter 5 to adjust the real-time clock settings.

Battery & Housing:
The battery is a CR2032 Lithium coin cell.


System support battery

External I/O Ports

There are several external Input/Output ports on the rear edge of the motherboard and connectors for more on the board. Please refer to the Rear I/O Panel Ports illustration for the port locations. The ports are color-coded for easy identification.

PS/2 Ports

Function: Connecting PS/2 devices to the system.

Description: The PS/2 ports are for a system keyboard and mouse or other pointing device. Do not connect or disconnect PS/2 devices when the system is turned on.

More Information: See the Advanced BIOS Features section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting related settings.

PS/2 Ports:
Do not plug or unplug devices when the system is turned on.

PS/2 Mouse

PS/2 Keyboard

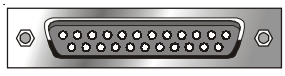
Parallel Port

Function: Connecting a device with a parallel interface to the system.

Description: The parallel port is generally used to connect a printer to the system. The port supports common parallel port modes and allows bidirectional communication. Use an IEEE 1284 compliant cable with the default ECP mode configuration.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

Parallel port:
The default mode is ECP, configured as EPP 1.9, DMA 3. 1284 compliant.



Parallel port

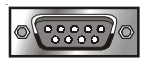
Serial (COM) Ports

Function: Connecting Serial devices.

The external serial port has a 9-pin connector. It can operate at speeds up to 115,200bps. You can configure the port speed via the computer's Operating System. Do not connect or disconnect a serial cable when the system is turned on. The second serial port is a connector on the motherboard.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

Serial Ports:
Default configuration –
External port is COM1
Onboard port is COM2
Installing an IR port requires disabling COM2.



COM1 Serial Port

6-Channel Audio Jacks

Function: Provides Rear and Center channel/Subwoofer connections including an SP/DIF connector.

These external port include jacks for a 5.1 speaker system's Rear and Center channels and the Subwoofer. One jack is for the Left and Right rear speakers and the other is for Center channel and Subwoofer. There is also and SP/DIF connector to connect the audio signal out to a digital decoder.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for more information.

6-Channel Audio Jacks:
Rear Left/Right and Center channel jacks. SP/DIF connector is for an optical cable.

Rear, Center/Subwoofer & SP/DIF connectors

USB Ports

Note:
You must install the supplied USB 2.0 drivers for use with Windows 2000 or Windows XP or the USB ports will only work in USB 1.1 mode. Other operating systems are not supported.

Function: Connecting USB 2.0 devices to the system.

Description: These are Hi-Speed USB 2.0 ports for connecting either USB 1.1 or 2.0 devices. The ports are for "Type A" USB cable connectors. You can connect or disconnect USB cables when the system is turned on.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

USB Ports:
There are three USB ports on the rear panel. The J25 USB port shares a root hub with the third external USB port.

USB ports 1, 2, 3

Audio Jacks

Function: Jacks for connecting external audio devices to the onboard audio subsystem.

Description: There are three audio jacks:

- Line In

  Audio input connector for an external audio source.
- Line Out

  For the two stereo speakers.
- Mic

  Microphone connector for a computer microphone.

More Information: See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on audio settings.

External Audio Jacks:
The onboard audio supports stereo or 5.1 Front channel speakers, audio input and a microphone.

Line In (Light Blue)

Line Out (Lime) - Front Channel L/R

Mic (Pink)

Jumpers

There are five jumper switches on this motherboard. Jumpers function like switches to establish a hardware configuration setting.

JP5 Clear CMOS:
Default – Normal

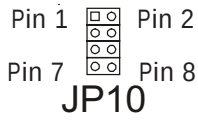
JP5 Clear CMOS

Function: Clears the CMOS Setup Utility configuration record stored in the real-time clock's CMOS memory.

Description: A 3-pin jumper. Default Setting: Normal

More Information: See Chapter 3 for configuration information and the Troubleshooting section in Chapter 6.

JP10
DDR Voltage:
Default – 2.5V



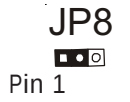
JP10 DDR Voltage

Function: Sets the voltage supplied to the DIMM DDR memory sockets.

Description: An 8-pin jumper. Default Setting: 2.5V

More Information: See Chapter 3 for configuration information and "System Features" in Chapter 6.

JP8 USB Voltage:
Default – 5V



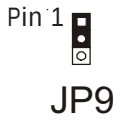
JP8 USB Standby Voltage

Function: Sets the voltage status for the USB ports.

Description: A 3-pin jumper. Default Setting: 5V

More Information: See Chapter 3 for information on configuring this jumper.

JP9 PS/2 Voltage:
Default – 5V



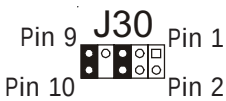
JP9 PS/2 Standby Voltage

Function: Sets the voltage status for the PS/2 ports.

Description: A 3-pin jumper. Default Setting: 5V

More Information: See Chapter 3 for information on configuring this jumper.

JP30 Audio Channels:
Default – Rear ports



JP30 Audio Channel Configuration

Function: Assigns the Left/Right audio channels to the rear panel audio ports or functions as the audio connector for the optional FI Panel.

Description: A 10-pin jumper (one removed), uses two jumper caps. Default Setting: Rear

More Information: See Chapter 3 for information on configuring this jumper.

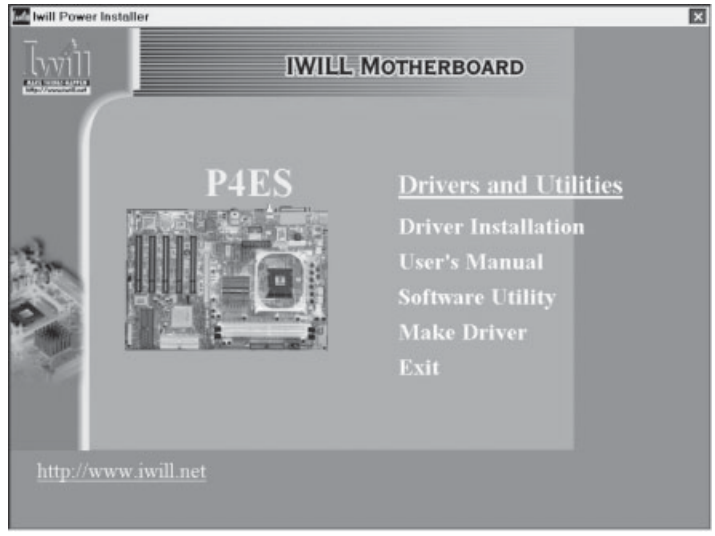
Software Features

This motherboard comes with driver software and bundled utility software on the supplied Power Installer CD-ROM disc. The Installing OS & Support Software section in Chapter 5 explains how to install the software required to support this motherboard and profiles the bundled utilities.

Using the Power Installer Disc

You can run the Power Installer CD-ROM install interface under Microsoft Windows 9X, NT 4.0, 2000 or XP. The disc's install interface should load automatically and you then click on the model name of this motherboard.

Power Installer:
P4ES section
Manual Installation screen



Driver Software

This motherboard requires that you install driver software to support the onboard hardware. You will need to install the following:

- Intel 845E chipset support software

  Driver that supports the chipset and the Intel Application Accelerator that enhances system performance.

- Audio driver software

  Audio driver and utilities for the Realtek onboard audio subsystem.

- Installation Guides

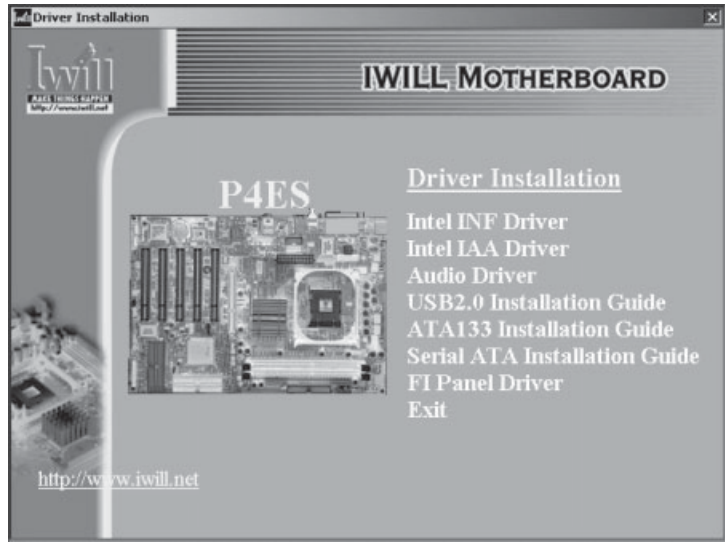
  Acrobat PDF files that explain how to install the supplied USB 2.0, ATA-133 and Serial-ATA drivers.

- FI Panel Driver

  Drivers for Smart Card, Memory Stick and Secure Digital Card readers. Can be used for the optional FI Panel or individual devices.

Please see “Installing OS & Support Software” in Chapter 5 for more information.

Power Installer:
P4ES section
Driver installation screen



Utility Software

The Power Installer disc also has several Windows utility programs on it.

- Acrobat Reader

  Acrobat Reader allows you to read documents in the Adobe PDF format, including online documents on the Power Installer disc and a wide range of other content. The reader is free and can be upgraded at the Adobe web site – www.adobe.com – when new versions become available.

- McAfee Anti-Virus

  This is anti-virus software from one of the leading vendors.

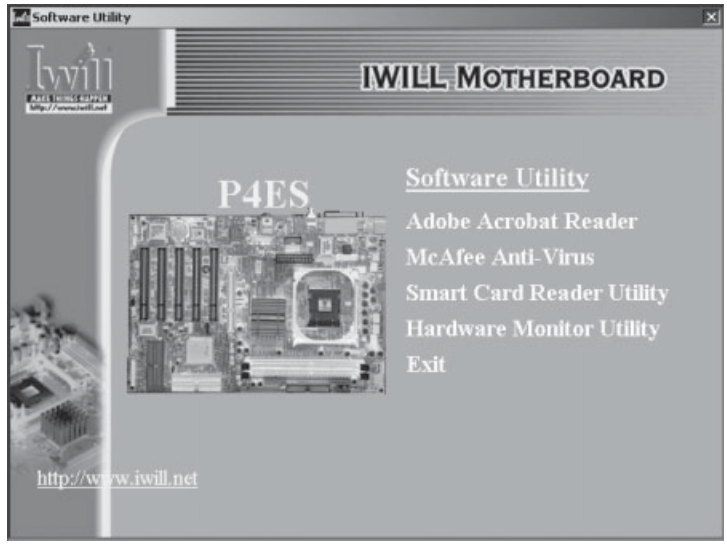
- Smart Card Reader Utility

  Software utility for accessing smart cards inserted in a smart card reader connected to the motherboard.

- Hardware Monitor Utility

  Hardware Doctor is a Winbond utility that allows you monitor the system hardware and obtain information about voltage levels, internal housing and CPU temperatures and CPU and system memory specifications.

Power Installer :
P4ES section
Utility installation screen



In This Chapter:

3: Motherboard Configuration

This chapter details the motherboard's default configuration and configuration options. Please review the contents of this chapter to find out information on the default configuration or alternative configuration options to change the default configuration.

The motherboard will operate properly in the default configuration. Please make certain that any configuration changes you make will not adversely affect system operation.

The Default Configuration

The default configuration is set at the time of manufacture. The configuration is comprised of the hardware configuration settings and the default firmware settings in the BIOS CMOS Setup Utility.

Hardware Configuration: Jumper Settings

This motherboard is mainly configured in firmware, which simplifies configuration. There are also a few hardware settings. The hardware settings are configured using standard jumper switches. The first section is about the a BIOS-related jumper and the second about the hardware configuration jumpers.

The BIOS-Related Jumper

Jumper JP5: Clear CMOS Memory

JP5 is a jumper switch, but it does not set a hardware configuration setting. The BIOS CMOS Setup Utility creates a system configuration record that is stored in CMOS memory in the real-time clock chip. If the configuration record data becomes corrupted or is destroyed, or if the CMOS Setup Utility settings are changed to an unusable configuration, the motherboard may not run properly or at all. JP5 provides a means to delete the configuration data stored in CMOS memory and reset the configuration to the CMOS Setup Utility's Optimized Defaults.

Follow this procedure to clear CMOS memory. If necessary, refer to the motherboard diagram and key in Chapter 2 for the jumper location.

1. Turn off and unplug the system. Remove the system housing cover (see documentation if necessary).
2. Set JP5 to the Clear CMOS position by placing the jumper cap over pins 2 and 3 for one minute.
3. Return the jumper cap to the Normal position.
4. Replace the system housing cover, plug in the system and turn it on.
5. Run the CMOS Setup utility and load the Optimized Defaults. You can then enter any custom settings you require.
6. Save the settings as you exit the program and restart the computer.

The system should now operate normally.

JP5 Clear CMOS:
Default – Normal

JP5 : Clear CMOS Memory

Setting	Function
Short 1-2	Normal operation [Default]
Short 2-3	Clear CMOS memory – see instructions

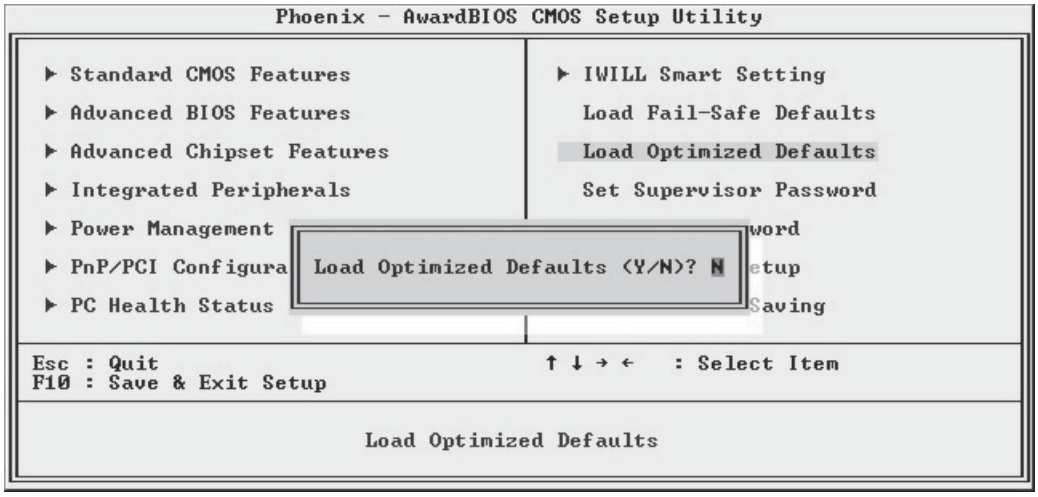
BIOS CMOS Setup Utility – Main Screen

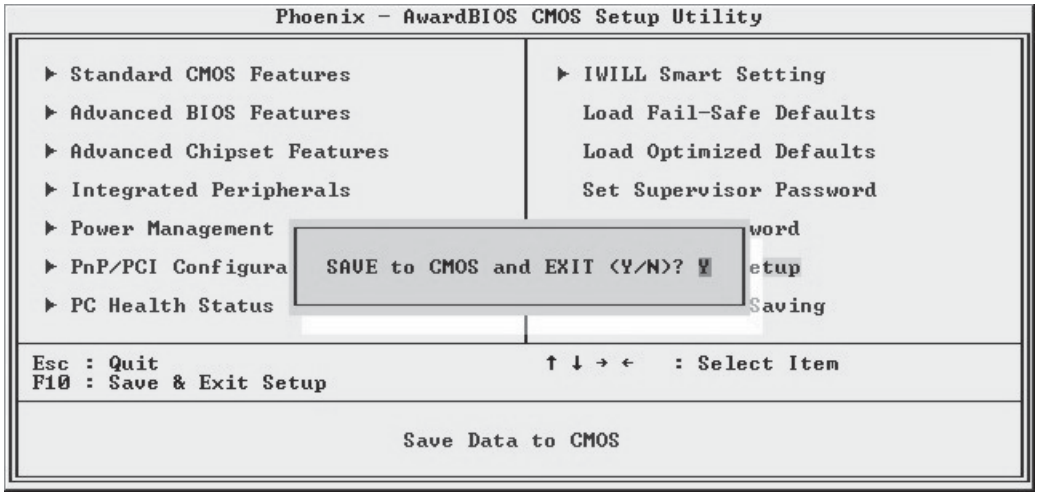
The main screen of the CMOS Setup Utility has a Load Optimized Defaults item that loads the default operation settings. After you perform the Clear CMOS procedure, load the defaults as follows:

1. Select Load Optimized Defaults and press the Enter key.
2. A message will appear asking you to confirm.
3. Type a Y to confirm and press the Enter key again.
4. Make other settings you require.
5. Select Save & Exit Setup and press the Enter key.

The system will restart and use the new settings.

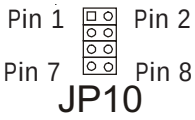
See the section on "Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.





Hardware Configuration Jumpers

JP10
DDR Voltage:
Default – 2.5V



Jumper JP10: DDR Memory Voltage

This jumper sets the operating voltage supplied to DDR DIMMs installed in the board's DIMM sockets. The default setting is the normal voltage. The alternate voltage settings are for use in overclocking. If you are not overclocking the system, you don't need to change this jumper setting.

JP10: DDR Memory Voltage

Setting	Function
Open	2.5-Volt [Default]
Short 1-2	2.6-Volt
Short 3-4	2.7-Volt
Short 5-6	2.8-Volt
Short 7-8	2.9-Volt

JP8 USB Voltage:
Default – 5V

Jumper JP8: USB Standby Voltage

This jumper controls the voltage to the USB ports. The default setting is for standard 5V operation. The alternate setting configures the USB ports to also operate with a standby voltage of 5V that allows 5V devices to wake up the system from an S3 Suspend state. If you anticipate using Suspend mode with 5V USB devices, you can set this jumper to the alternate setting.

JP8: USB Standby Voltage

Setting	Function
Short 1-2	USB Voltage 5-Volt [Default]
Short 2-3	USB Standby Voltage 5-Volt

JP9 PS/2 Voltage:
Default – 5V

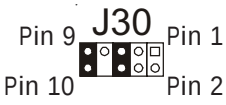
Jumper JP9: PS/2 Standby Voltage

This jumper controls the voltage to the PS/2 keyboard and mouse ports. The default setting is for standard 5V operation. The alternate setting configures the PS/2 ports a standby voltage of 5V that allows 5V devices to wake up the system from an S3 Suspend state. If you anticipate using Suspend mode with 5V devices, you can set this jumper to the alternate setting.

JP9: PS/2 Standby Voltage

Setting	Function
Short 1-2	PS/2 Voltage 5-Volt [Default]
Short 2-3	PS/2 Standby Voltage 5-Volt

JP30 Audio Channels:
Default – Rear ports



Jumper JP30: Audio Channel Configuration

This jumper controls audio left/right channel port assignment. In the default configuration, the left and right channel audio are assigned to the rear audio ports. If you will install the optional FI Panel, you must remove the jumper caps from this jumper and the panel's audio connector plugs onto it.

JP9: PS/2 Standby Voltage

Setting	Function
Short 5-6, 9-10	Left/Right audio channels assigned to rear ports [Default]
Open	Connect FI Panel audio connector (for front panel audio ports)

Firmware Configuration: The CMOS Setup Utility

The BIOS CMOS Setup Utility a configuration record of system settings. This record is based on the "Optimized Defaults that are stored with the utility in Flash memory and can be reloaded at any time.

Many of these settings are either recommended or required for the motherboard to operate properly. Other settings are customizable and can be changed to suit your specific system configuration and operation requirements.

A number of the variable settings, such as CPU and IDE device settings are set to be automatically detected in the default configuration. While these settings can also be established manually, automatic detection is more convenient, safe and reliable. We strongly recommend that you leave all auto-detection settings undisturbed unless you have a specific reason not to and you are certain of what you are doing. Incorrect configuration of the CMOS Setup Utility can result in unreliable operation or a failure of the motherboard to work at all.

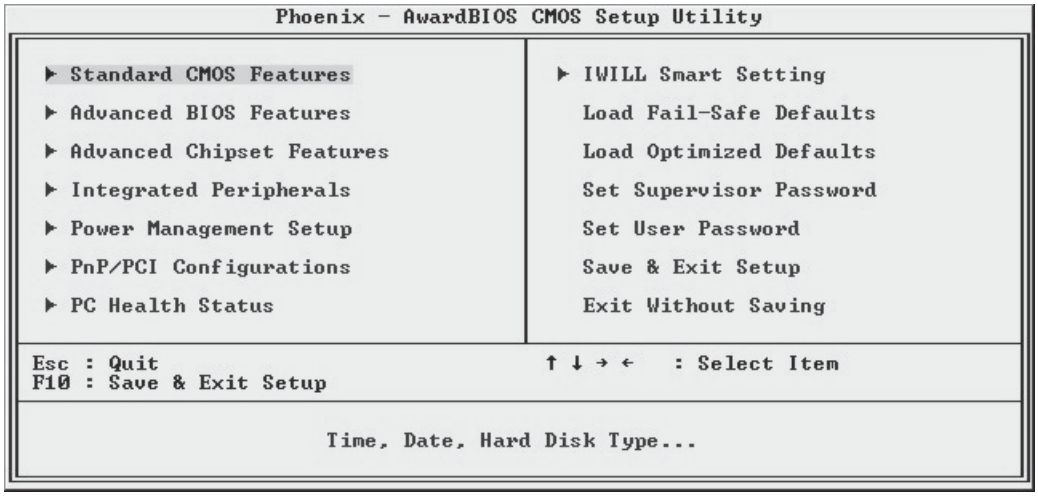
Using the CMOS Setup Utility

Please refer to the "Configuring the CMOS Setup Utility" section in Chapter 5 for information on using the utility and some settings you might want to customize. The utility does not run under an Operating System. You must load it during the Power On Self Test (POST) while the computer is starting up by press the Delete key or the Del key on the system keyboard's numeric keypad.

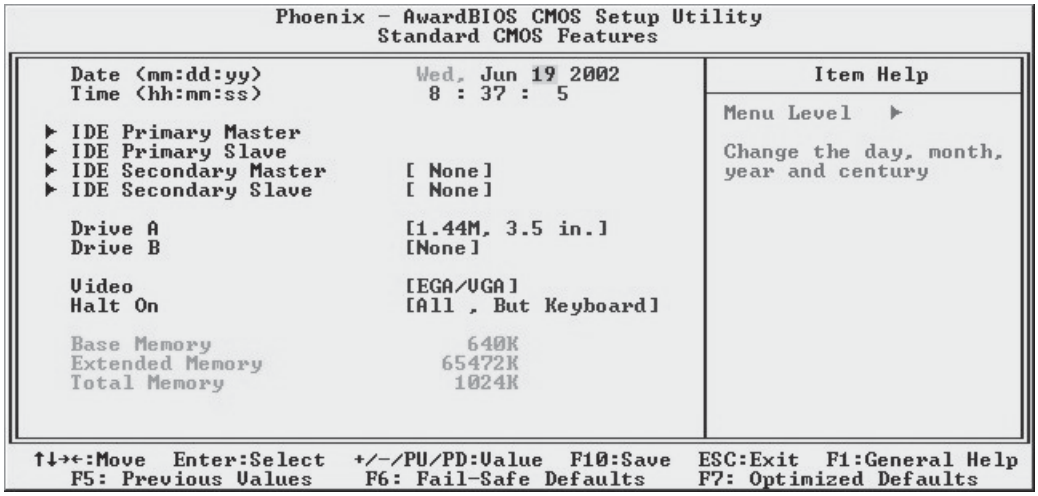
BIOS CMOS Setup Utility – Main Screen

Load the CMOS Setup Utility during the POST by pressing the Delete or Del key. The utility interface commands are explained at the bottom of each screen and "General Help" is available by pressing the F1 key. See the section on "Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.

The main screen has a basic list command instructions at the bottom of the screen and displays a function description of the highlighted item.



Sections marked by an arrow on the main screen list command instructions at the bottom of the screen.



Reconfiguring the Motherboard

You can change the default configuration (as shipped) of this motherboard as needed. However, since this motherboard has only a few hard configuration options and the CMOS Setup Utility configuration is mostly either required, recommended or automatic, there will probably be little reason to do so.

Hardware Reconfiguration

We recommend leaving the jumper settings at the default settings unless you need to perform the Clear CMOS procedure. It is much more convenient to control the BIOS Flash Protection feature using the CMOS Setup Utility.

If you install the optional FI Panel, you should remove the jumper caps on JP30 so that you can connect the FI Panel audio connector.

The JP10 default setting is correct for any DDR memory you can install on this board. The alternate settings are only used for overclocking.

Firmware Reconfiguration

You can initially specify or customize the CMOS Setup Utility settings when you first configure the system (as covered in Chapter 5) to meet your requirements. Other than doing this, there should be no need to reconfigure the CMOS Setup Utility unless the system configuration changes or the configuration record stored in CMOS memory becomes corrupted and unusable, which is not common. If you need to completely recreate the system configuration record, follow the Clear CMOS procedure described in this chapter.

In This Chapter:

4: Installing the Motherboard

This chapter covers preparing the motherboard for installation, installing the board in a system housing or "chassis" and installing or connecting other internal system components.

There are a number of important topics in this chapter and we strongly urge that you review it before attempting to install the motherboard.

Pre-installation Preparation

Before you install the motherboard you will need to do the following:

- Install a 478-pin Intel Pentium 4 CPU
- Install DDR DIMM system memory modules

Both of these require specific procedures that you must follow precisely to insure that the components are successfully installed and work properly. Please review the instructions in this section in detail and follow them carefully. The procedures are not complex.

Installing A CPU

This motherboard uses the 478-pin Intel Pentium 4 processor. To install an Intel Pentium 4 CPU on the motherboard it is very important to precisely and entirely follow the procedure for installing both the CPU and its cooling assembly. Failure to do so can result in either improper operation or damage to the CPU and possibly the motherboard.

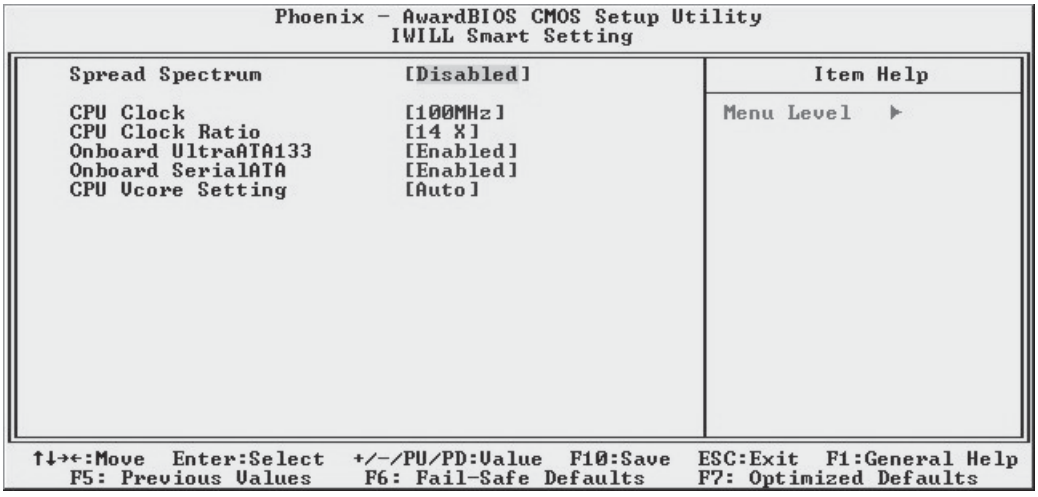
To install an Intel Pentium 4 processor on this motherboard you will need to do the following:

- Install a Pentium 4 processor in the mPGA478 socket
- Install the Heatsink/Retention Mechanism

Please follow the procedure detailed below to install the Pentium 4 processor on the board. Intel boxed Pentium 4 processors come with full installation instructions. If you have these, please also read and follow those instructions carefully.

Processor Selection

This motherboard supports all 478-pin Pentium 4 processors and the BIOS automatically detects the required settings and configures the CMOS Setup Utility accordingly.



Installing The Processor

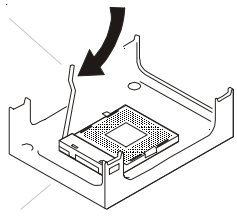
Installing a Pentium 4 processor in the mPGA478 Socket is the simplest part of the procedure. It is very important, however, to carefully handle the processor by the side edges and always fully observe precautions against electrostatic discharge. We assume here that you are installing an Intel Pentium 4 boxed processor that comes with a heatsink and Thermal Interface Material applicator. The illustrations show these. If you are installing a non-boxed processor, the procedure is the same, but the accessory items may have a different appearance.

Please follow the installation procedure as illustrated on the next two pages. The illustrations are generic and do not specifically represent this motherboard.

The processor installation procedure is as follows:

1. Raise the locking lever of the processor locking mechanism to a perpendicular position.

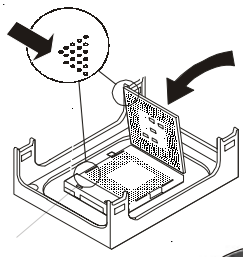
Step 1:
Raise the retaining lever



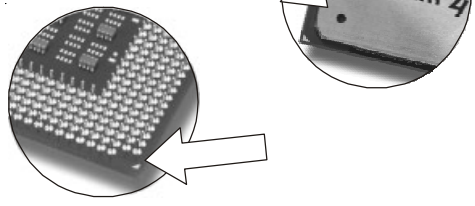
Raise the socket lever to the vertical position

2. Align the processor to the socket by matching the Pin 1 corner of the socket to the Pin 1 corner on the socket, which is located at the corner where the locking arm attaches to the socket.

Step 2:
Align the Pin 1 corners

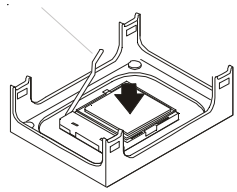


Match the Pin 1 positions on the socket and the processor



3. Carefully insert the Pentium 4 processor in the socket receptacles, taking care not to bend any pins.

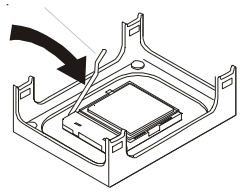
Step 3:
Insert the processor



Gently press the processor into the socket.

4. Lower the locking mechanism's retaining lever and secure it in place to secure the processor in the socket. Grasp the processor by the edges and gently pull upwards to insure it is properly inserted. The processor shouldn't move.

Step 4:
Secure the retaining lever



Press the retaining lever back down into the horizontal position and make sure it latches in place.

Installing the Heatsink

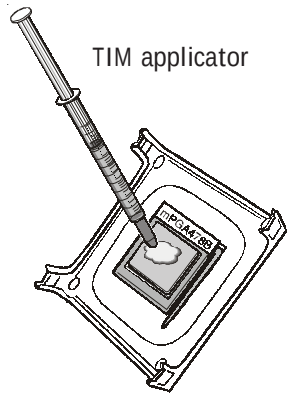
Once you have installed the CPU, you must install a Fan/Heatsink. The Fan/Heatsink clips into to the Retention Mechanism attached to the board via its integrated retaining clip assembly.

Apply Thermal Interface Material

Before you install the Fan/Heatsink you must apply the Thermal Interface Material (TIM) that is supplied in an applicator with boxed Intel Pentium 4 processors (or an exact equivalent) to the top of the installed CPU. If the Fan/Heatsink already has a patch of TIM on its underside, you don't need to apply any additional TIM to the CPU. We assume here that you have TIM in an Intel-supplied applicator. To apply TIM to the CPU do as follows:

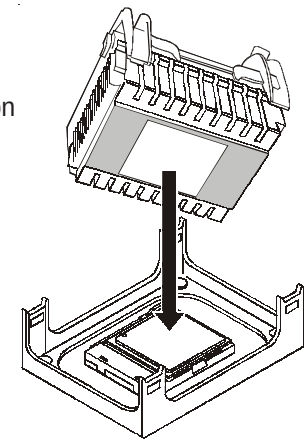
1. Apply all of the TIM in the applicator to the center of the CPU's top plate.

Step 1:
Apply TIM if needed.



2. Do not spread the TIM around. When you place the Heatsink on top of the CPU the material will disperse evenly.

Align and place on top of the CPU



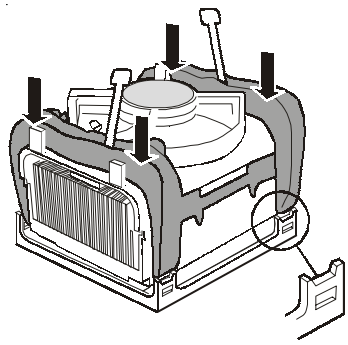
Next, install the processor Fan/Heatsink assembly as detailed below.

Install the Fan/Heatsink

To install the processor Fan/Heatsink assembly do as follows:

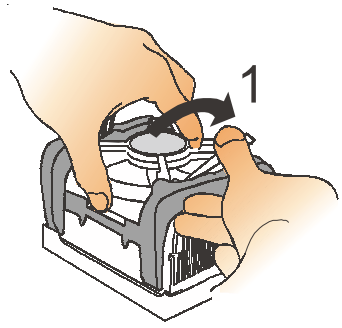
1. Place the Fan/Heatsink on top of the Pentium 4 CPU so that it's retaining clip frame snaps into the recesses in the Retaining Mechanism. The Fan/Heatsink will only fit into the mechanism frame in the correct orientation.

Step 1:
Clip Fan/Heatsink assembly into the Retention Mechanism



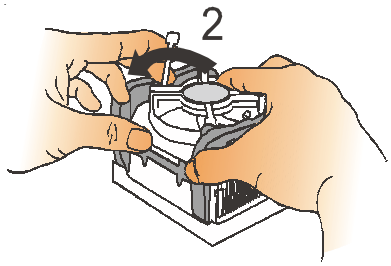
2. Hold the Fan/Heatsink steady and press one of the clip assembly's locking levers down into the locked position.

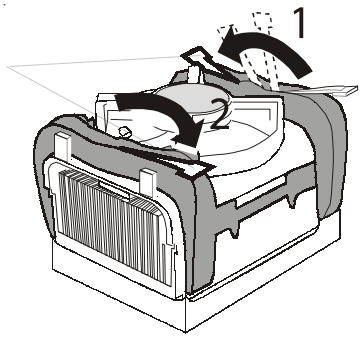
Step 2:
Hold the assembly steady and press one of the retaining clip locking arms into the locked position



3. Repeat the process for the second clip. Keep holding the Fan/Heatsink steady so that you don't damage the TIM. The locking levers should now hold the heatsink securely in the Retention Mechanism.

Step 3:
Hold the assembly steady and press the other retaining clip's locking arm into the locked position

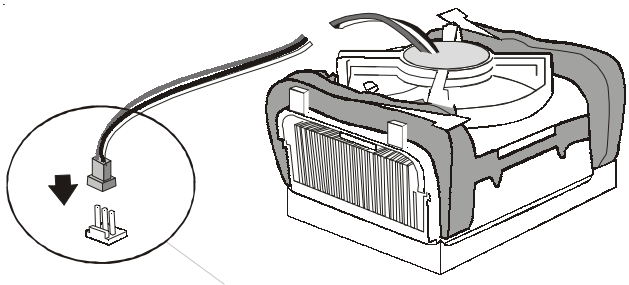




Connect Fan/Heatsink Power Lead

Plug the fan power lead onto the CPU Fan power connector near the CPU socket. The entire CPU installation is then complete.

Step 4:
Plug the Fan power lead onto the CPU fan power connector



Installing System Memory

This section details the procedure for installing system memory on the motherboard. Correct memory configuration is critical for proper system operation. Please review this section carefully and follow the configuration guidelines precisely.

Memory Specifications

The motherboard has two DIMM module sockets and uses unbuffered DDR SDRAM DIMM modules for system memory. The system memory specifications are:

DIMM Sockets:
System memory sockets are for:
• PC1600: 200MHz
• PC2100: 266MHz
unbuffered DDR SDRAM modules.

- Unbuffered DDR SDRAM DIMM modules
- 200MHz PC1600 or 266MHz PC2100 DDR SDRAM
- Maximum 2GB total system memory

Memory Configuration Options

This motherboard has flexible memory configuration options. These include:

- Supports 64MB, 128MB, 256MB & 512MB modules
- Any capacity DIMM may be used in either socket as long as total memory does not exceed 2GB.
- Modules should be the same speed for best system performance.

Installing Memory Modules

Installing DIMM modules is simple. The modules insert in the sockets and are held in place by the socket retaining arms. The edge connectors on the modules are of different widths and there are key notches in each module. These ensure that you can not insert a module incorrectly.

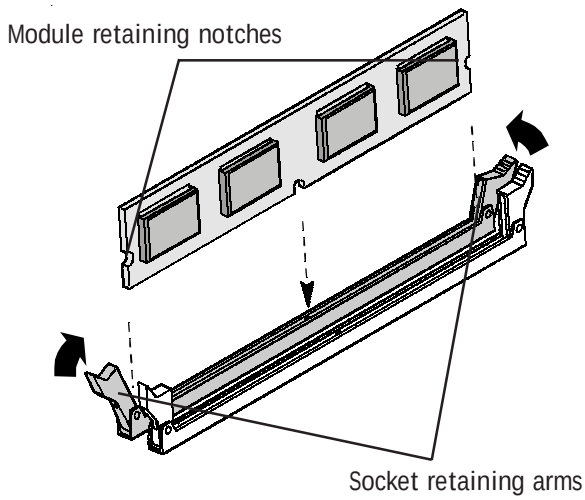
Before you install any modules, you should choose a configuration. You should then prepare the required number and type of DDR modules.

To install either type of module follow this procedure:

1. Align the module to the socket so that the edge connectors on the module match the socket sections.
2. Hold the module perpendicular to the motherboard and press the edge connector into the socket.
3. Press the module fully into the socket so that the socket retaining arms swing up and engage the retention notches at each end of the module.

Following the configuration you have chosen, repeat this procedure if necessary so that all modules are installed. Once the modules are installed, system memory installation is complete.

Module Installation:
Modules will only insert in one orientation. The width of the two edge connector sections vary slightly and prevent incorrect insertion.

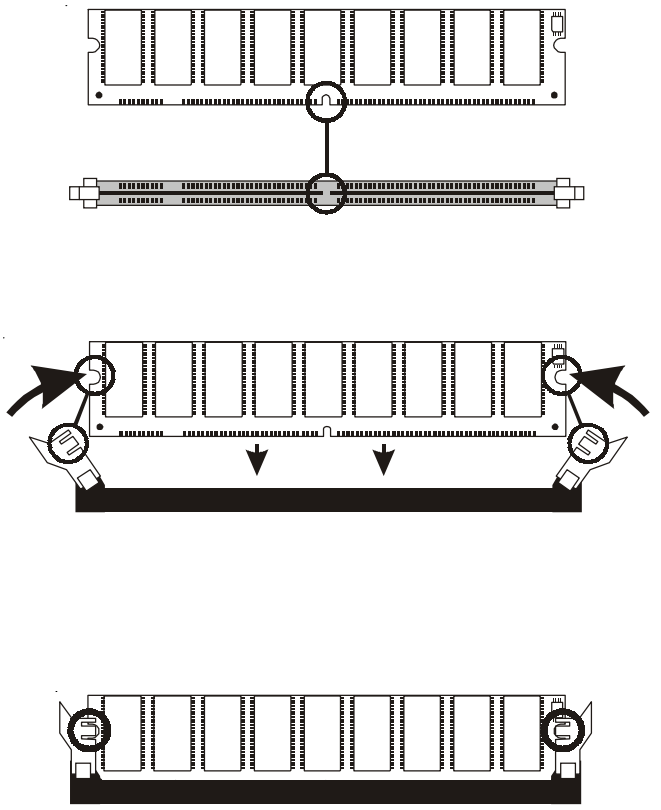


Module Installation:
All modules insert in the DIMM sockets in the same way:

1. Align the module to the socket.

2. The socket retaining arms should rotate up and engage the module's retaining notches as you press it into the socket.

3. The retaining arms must engage for the module to be properly installed.



System Memory Recognition

The BIOS will automatically recognize the installed memory and configure the CMOS Setup Utility. No other action is required to complete system memory installation.

Installing the Motherboard in a System Housing

This section explains the basic requirements for installing this motherboard in a system housing or "chassis". Since housing designs vary widely, you will need to consult the housing documentation for specific information.

This motherboard can be installed in any housing that supports the ATX form factor.

To install the motherboard in a system housing you will need to do the following:

- Install the rear I/O panel shield that comes with the motherboard
- Attach the board to the housing
- Connect leads from the housing's front panel

You can then connect other internal system components as described later in this chapter.

Motherboard Installation Procedure

This section assumes you are installing the board in a suitable housing. We also assume you have prepared the board for installation as previously described in this manual. If the housing you are using normally stands vertically, place the open housing on it's side before you start installing the board.

Please follow this procedure to install this motherboard:

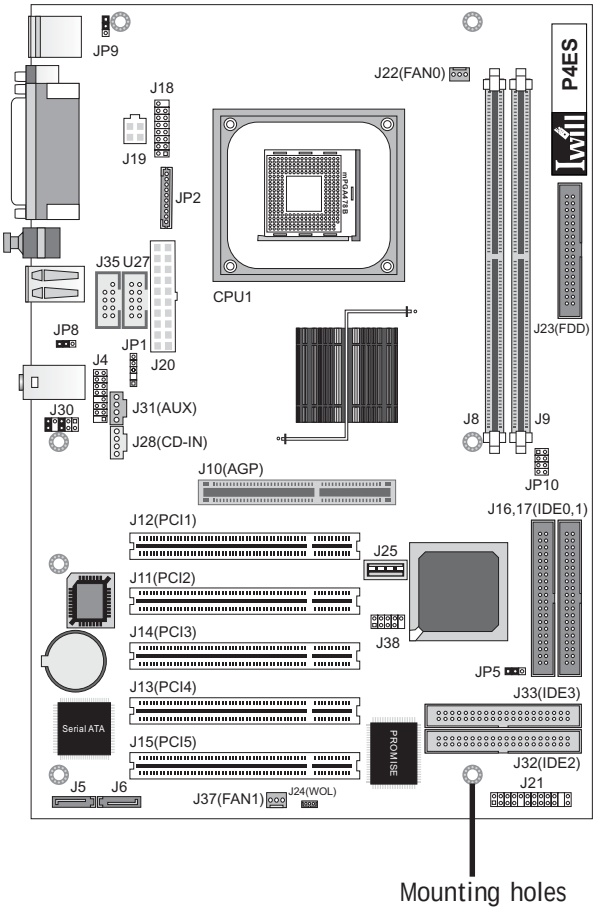
Required Tool:
- Philips-head screw driver (Crosshead)

1. Review any instructions that came with the system housing and prepare the necessary mounting hardware that came with it.
2. Identify the mounting holes on the board and confirm that the housing has standoffs that match them.
3. Install the rear I/O panel shield that came with the motherboard in the housing's I/O panel opening. This should match the ports on the board.

4. Insert the board in the housing and align the mounting holes to the standoffs on the housing's motherboard mounting plate. Make sure all of the rear I/O ports are properly aligned with the openings in the I/O panel shield.

Mounting Holes

There are 7 mounting holes on the motherboard that should correspond to mounting standoffs on the system housing's motherboard mounting plate.



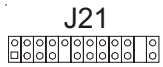
5. Attach the board to the housing by inserting mounting screws in all the holes and tightening them snugly.

Connecting Front Panel Components

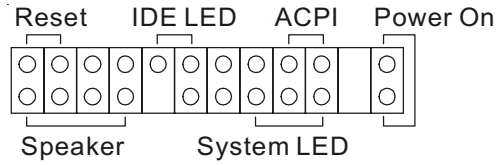
After the motherboard is installed in the system housing, you should connect whatever front panel components the housing has to the Front Panel feature connector on the motherboard.

The figure below indicates the pin assignments of the connector for your reference.

Front Panel Connector:
Leads from the front panel features connect to this header.



Front Panel feature connector pin assignments

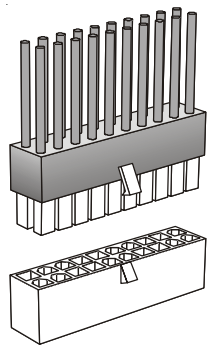


Completing System Configuration

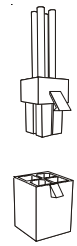
Once the motherboard is installed in the system housing, you can proceed to connect or install whatever internal devices you will use to complete the system. These will at least include an AGP display card and disk drives and connecting the housing power supply leads.

After that, having replaced the system housing cover, you can connect external peripherals to complete the process of preparing the system for use. These will include at least a video display and a keyboard and probably a pointing device. Please see the next chapter for information on completing these final hardware installation steps and installing Operating System and support software.

ATX Power Connectors:
The main power connector from the system power supply plugs into the 20-pin J20 connector on the board.
The ATX12V power lead plugs into the J19 4-pin connector.



J20 ATX connector



J19 ATX12V connector

In This Chapter:

5: System Configuration

This chapter explains what you need to do to assemble a complete system after you have installed the motherboard in a system housing. This will include installing or connecting internal devices, connecting external system components. Once the system is assembled, you'll need to check and possibly configure the motherboard's CMOS Setup Utility, install an Operating System and install the support software supplied on the Power Installer support CD-ROM disc.

Installing or Connecting Internal Peripherals

To complete the assembly of a working system you will need to at least install an AGP video display card and connect whatever disk drives you will use in the system.

This section covers what you need to know on the motherboard side to do this. You will also need to consult the documentation that comes with your internal system peripherals for additional installation instructions and information. This section covers the minimum components you will need to connect to the motherboard to create a functioning system. You may plan to add other devices as well.

Installing an AGP Card

The AGP connector on the board supports AGP 4X 1.5-volt display cards. Follow the instructions that come with the display card for installing the card hardware in the AGP slot.

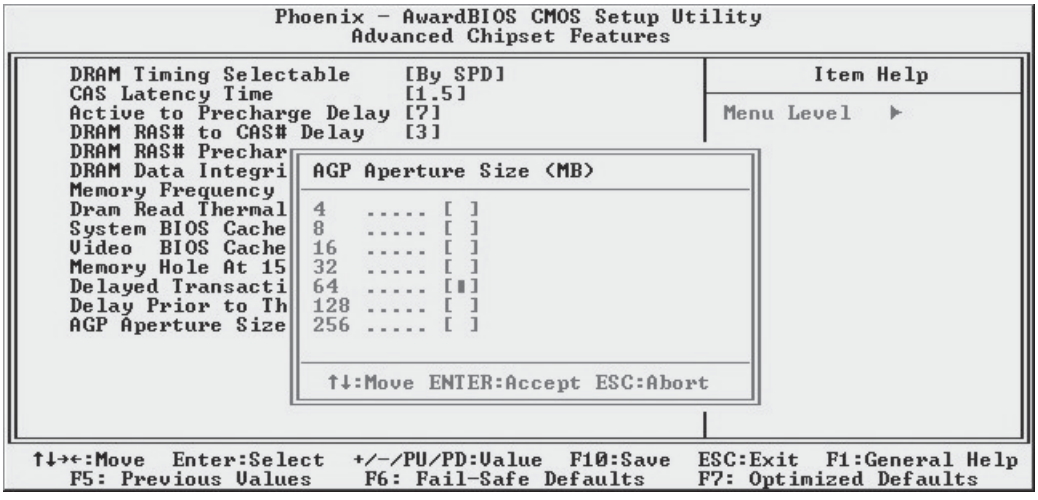
AGP Configuration

You can configure the amount of system memory the AGP card will use as auxiliary memory by adjusting the AGP Aperture Size setting in the Advanced Chipset Features section of the CMOS Setup Utility. The default aperture setting is 64MB the maximum is 256MB.

Display Drivers

You should install the display card's display driver software according to the instructions that come with the card after you have completed system assembly and have installed an OS and the support software for this motherboard.

AGP Aperture Setting
You can set the AGP aperture size in the Advanced Chipset Features section of the CMOS Setup Utility



Connecting Internal Devices

To assemble a complete system capable of completing the installation of this motherboard you will need to install and connect the following internal devices:

- Hard Disk Drive
- CD-ROM or other optical drive
- Floppy disk drive

The floppy disk drive is not strictly necessary, but is a standard system component and is needed if you will create driver floppy disks from the Power Installer 2.

We assume here, in the absence of an alternative drive controller that any hard disk or optical drives will be IDE devices connected to the motherboard's IDE channels.

Connecting IDE Devices

This motherboard supports two IDE channels, Primary and Secondary. It has two IDE device connectors onboard which support IDE devices running in any data transfer mode up to ATA-100. Each IDE connector supports two drives, a Master and a Slave. The drives connect to the motherboard with an IDE ribbon cable. IDE cables have three connectors on them, one that plugs into a drive connector on the board and the other two that connect to IDE devices. The connector at the end of the cable is for the Master drive. The connector in the middle of the cable is for the Slave drive.

There are three types of IDE ribbon cable, supporting transfer modes up through ATA-33, ATA-66 or ATA-100. You must use a cable that supports the transfer mode of the fastest device connected to it. For example, if both an ATA-66 mode and an ATA-100 mode device are connected to the same cable, the cable must support ATA-100 mode to achieve maximum performance.

To install an IDE drive, connect the drive to one of the drive connectors on a suitable ribbon cable. Plug the board end of the cable into one of the IDE connectors on the motherboard.

IDE Drive Positioning

Normally the system's primary hard disk drive should be in the Primary Master position. If you will use only the supplied ribbon cable, connect a CD-ROM drive to the Primary Slave position.

If you obtain an additional IDE ribbon cable, you can install a second hard disk drive in the Primary Slave position and install the CD-ROM as the Secondary Master. This is a good idea if the CD-ROM drive uses a slower data transfer mode than the hard disk drive.

Cable Select:
Not all drives work properly with Cable Select mode. If you try to use this mode and the drive does not operate properly, set the drive to either master or Slave mode, as appropriate for its position on the cable.

Follow any instructions that come with the drives to configure and install them. IDE devices generally can be set to one of three operation modes:

- Master
- Slave
- Cable Select

Many drives come set to the Master setting. If you will use the drive in a Slave position, you must reconfigure it as either Slave or use the Cable Select setting to allow the drives position on the cable to define the mode.

Connecting a Floppy Disk Drive

This motherboard has one Floppy Drive connector for connecting one or two floppy disk drives. Most computer systems use one 3.5-inch 1.44MB floppy disk drive. The drive connector is for a standard floppy drive ribbon cable.

To install a floppy disk drive, connect the drive to the end of the cable, which is the Drive A: position. Plug the other end of the cable into the floppy disk drive connector on the motherboard.

Connecting a Smartcard or MS/SD Reader

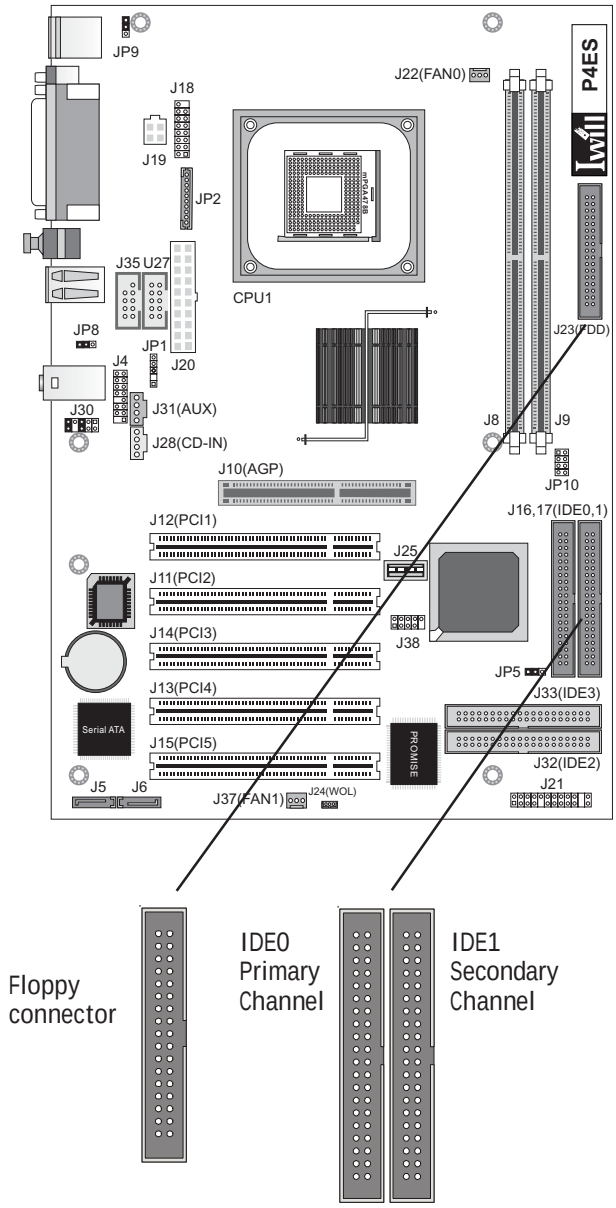
This motherboard has connectors for a Smartcard reader (J27) and a Memory Stick™ or Secure Digital™ memory card reader (JP2). You can either connect individual modules to them or you can connect the appropriate cables from the optional FI Panel.

To connect any of these devices, follow the instructions that come with them. You will need to connect a module cable to the appropriate connector and enable the feature in the "Integrated Peripherals" section of the CMOS Setup Utility. The default port settings listed should work.

Onboard IDE Connectors
Each channel connector supports one IDE channel with two drives, a Master and a Slave. The Master drive connects to the connector on the end of the ribbon cable. The Slave drive connects to the connector in the middle of the ribbon cable.

Note:
The ribbon cable used must support the transfer mode of the fastest device connected to it to avoid degraded performance.
The P4E & P4ES models also have two ATA-133 channels that require ATA-133 cables.

Floppy Drive Connector
The floppy drive connector supports two floppy disk drives. The first drive, Drive A:, connects to the connector on the end of the floppy drive connector cable. A second drive, Drive B:, would connect to the middle connector on the cable although systems now commonly only have one floppy disk drive.



Multiple Drive Configurations

The P4E and P4ES motherboards include additional disk drive subsystems you may want to make use of. The P4E adds a Promise Technologies AT-133 IDE controller and interface and the P4ES includes it and a Serial-ATA controller and two connectors.

These additional controllers allow you to add additional disk drives to the system over and above the four drives supported by the standard onboard IDE controller. On the P4E you can connect an additional four ATA-133 IDE, or slower, IDE devices, as needed. The P4ES provides the addition of two Serial-ATA connectors, to which you can connect at least two more devices.

This means that the P4E supports eight IDE devices and the P4ES supports at least ten devices including the Serial-ATA interface. If you are going to configure your system with a large number of devices, make sure that the wattage of the system power supply is sufficient to support all the devices you want to install.

ATA-133 & Serial-ATA Drivers

Both the ATA-133 and Serial-ATA features require drivers to operate. The Power Installer support CD-ROM disc includes Windows drivers for these features. Make sure you install the appropriate driver if you will use either of them. See the relevant Installation Guide on the Power Installer for more information.

ATA-133 Cabling

The P4E and P4ES motherboards come with one ATA-133 cable. This type of cable is required for use with the ATA-133 connectors. The ATA-133 is similar to the supplied ATA-100 IDE ribbon cable. Both support two devices. If you will connect more than two ATA-133 devices to the board, make sure you purchase an additional ribbon cable that is specifically for ATA-133.

Serial-ATA Cabling

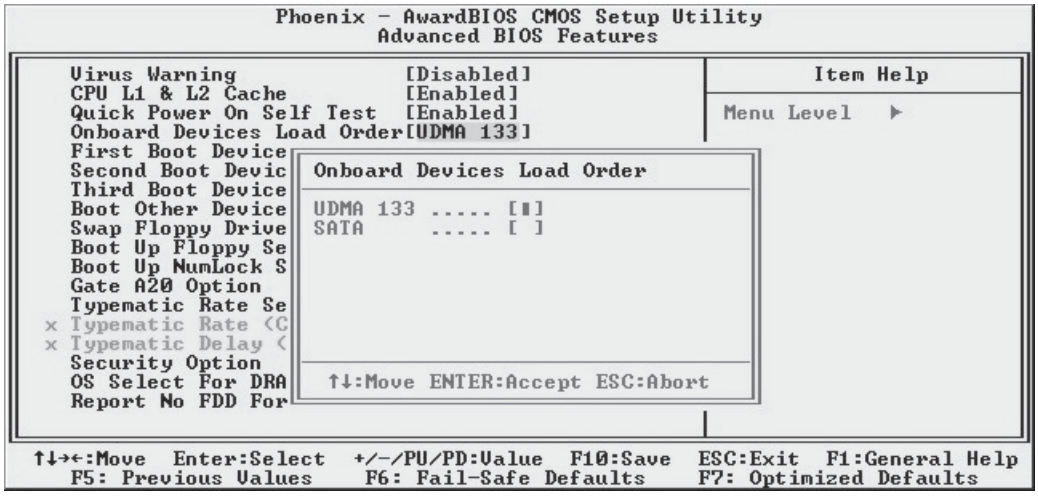
The P4ES motherboard comes with one Serial-ATA cable. You use it to connect a Serial-ATA device to either Serial-ATA connector. If you want to use the other Serial-ATA connector, you will need to purchase an additional cable. The cable just plugs onto the onboard connector. The connector is designed so that it isn't possible to plug the cable on the wrong way.

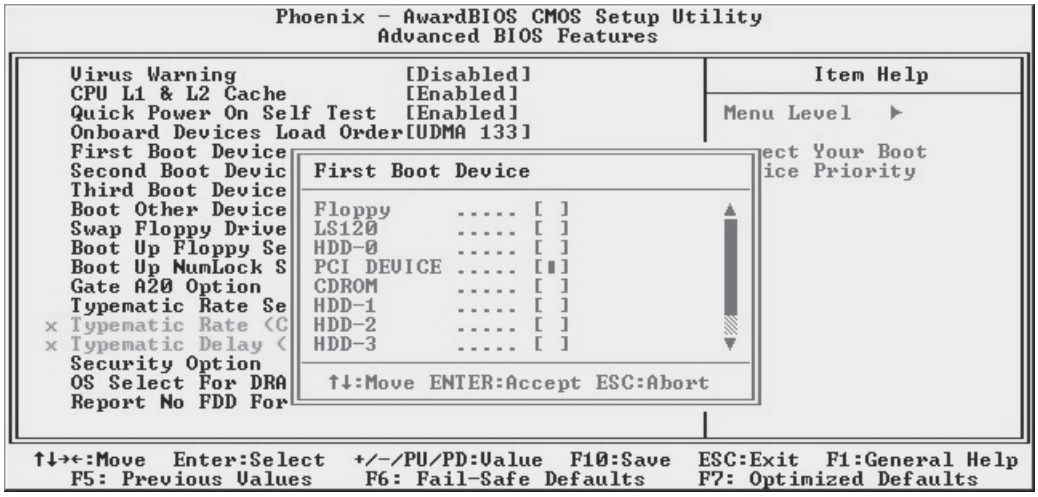
Alternate Controllers
Any alternate drive controllers must be set to Enabled in the IWILL Smart Setting section of the CMOS Setup Utility in order to use the boot order feature described here.

Alternate Drive Controller Boot Device Settings

You can set an ATA-133 or Serial ATA disk drive as the system's boot device. The Onboard Devices Load Order item in the CMOS Setup Utility's Advanced BIOS Features section sets which "PCI Device" the system should attempt to boot from. You can then set a PCI Device as any of the boot devices.

This feature sets only one alternate drive controller as the selected PCI Device for seeking a bootable device. If you have the P4E, the Onboard Devices Load Order line is fixed on the UDMA 133 (ATA-133) setting. There is no alternate setting. On the P4ES, the selections are UDMA 133 and SATA (Serial ATA).





Connecting External System Peripherals

To complete the assembly of functioning system you will need at minimum to connect the following external system components to the system housing:

- Video Display Monitor
- Keyboard
- Mouse or other Pointing Device

Connecting a Display Monitor

You can connect any display monitor supported by the AGP display card you installed in the system. This may include either a CRT or LCD monitor, depending on the card's specifications.

Connect the display monitor cable to the appropriate display connector on the AGP card according to the instructions that come with the card and monitor.

Connecting a Keyboard & Mouse

You can use either PS/2 or USB input devices with this motherboard.

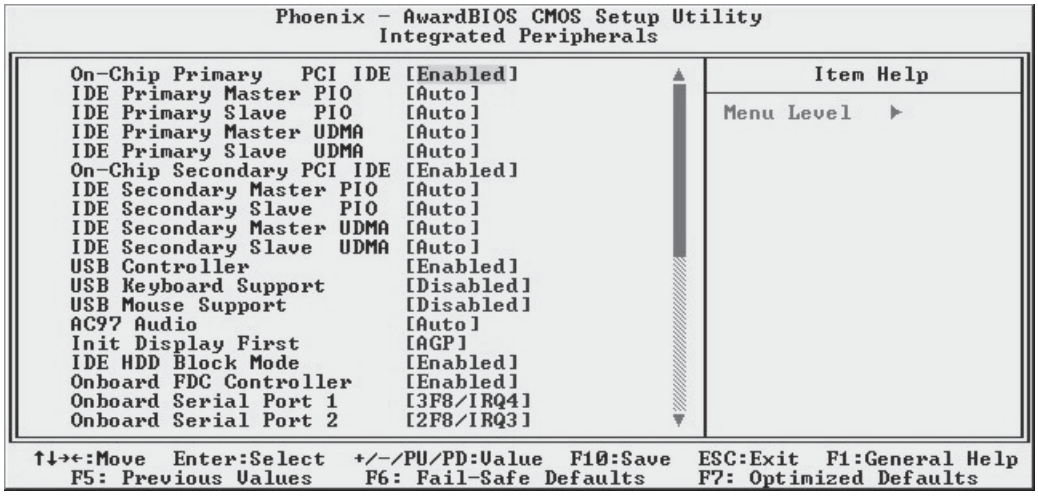
Connecting PS/2 Devices

Connect a PS/2 keyboard and mouse to the Keyboard and Mouse PS/2 ports on the rear I/O port panel. Don't connect or disconnect a device while the system is turned on. Doing so can damage the board.

Connecting USB Devices

You can use a USB keyboard and mouse with this motherboard. They plug into two of the USB ports. You must enable this function in the BIOS CMOS Setup Utility as noted on the next page. The Operating System you use must support USB to use any USB devices. You can plug and unplug USB devices when the system is turned on.

CMOS Setup Utility – Integrated Peripherals



Enable “USB Keyboard Support” if you will use a USB keyboard.
Enable “USB Mouse Support” if you will use a USB pointing device.

Configuring the CMOS Setup Utility

The motherboard Award BIOS includes the CMOS Setup Utility that creates a system configuration record that is stored in CMOS memory on the board and is required by the system to operate properly.

Most of the configuration settings are either predefined by the BIOS Optimized Default settings which are stored with the BIOS or are automatically detected and configured without requiring User action. There are a few settings that you may need to change depending on your system configuration.

This section gives a brief profiles of the several sections of the CMOS Setup Utility and indicates settings you might need to change and those which you should not.

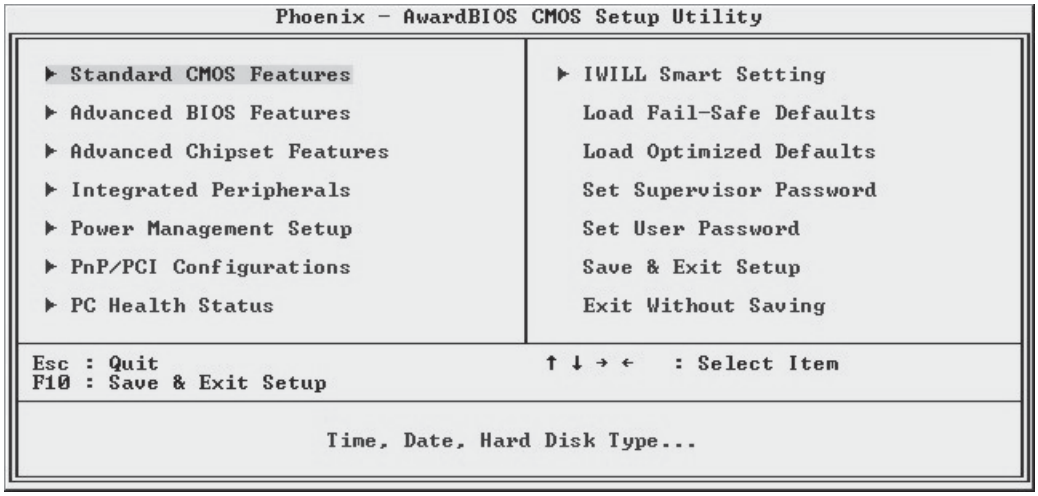
The CMOS Setup Utility User Interface

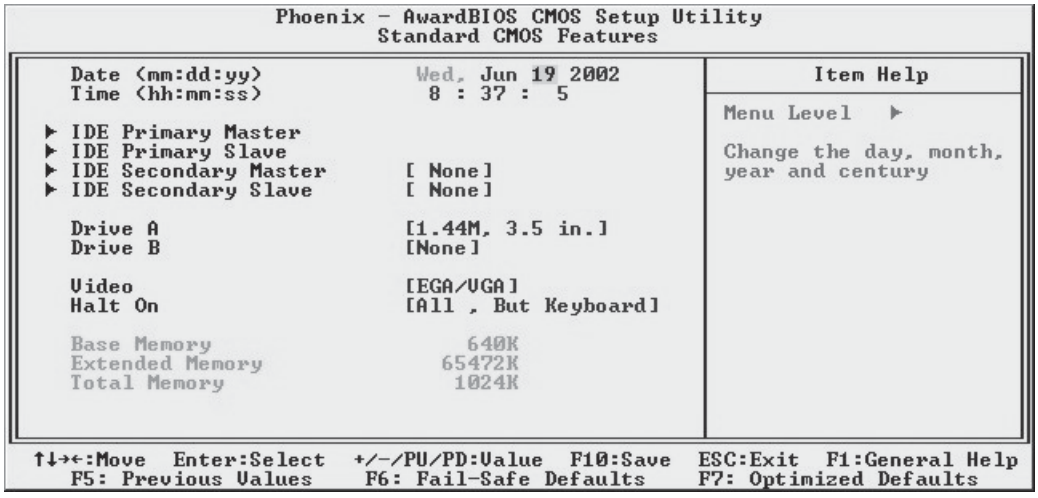
The CMOS Setup Utility user interface is simple and largely self evident. The utility can only be operated from the keyboard and all commands are keyboard commands. The utility does not support mouse use. The commands are straightforward and those available for the program section you are in are listed at the bottom of the screen. The main screen has few commands, other sections have more. General Help, which lists the commands and their functions is available at any time by pressing the F1 key.

Running the CMOS Setup Utility

The CMOS Setup Utility does not require an operating system to run. You run the utility by typing the Del or Delete key when the computer is starting to boot up. The utility's main screen will then appear.

CMOS Setup Utility – Interface commands





CMOS Setup Utility Program Sections

The CMOS Setup Utility is divided into several subsections and some top level commands including the following sections:

- Standard CMOS Features
- Advanced BIOS Features
- Advanced Chipset features
- Integrated Peripherals
- Power Management Setup
- PnP/PCI Configurations
- PC Health Status
- IWILL Smart Setting

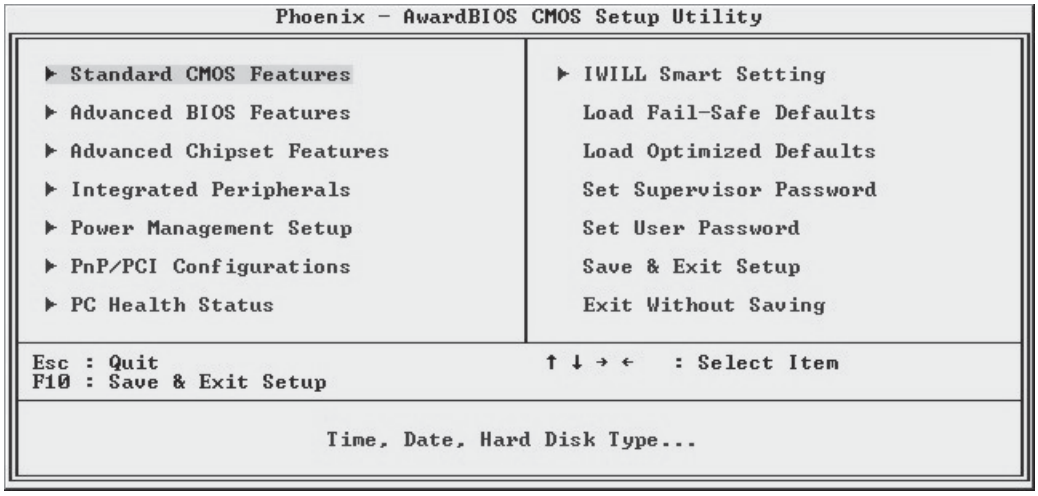
The main screen also has these command options:

- Load Fail-Safe Defaults
- Load Optimized Defaults
- Set Supervisor Password
- Set User Password
- Save & Exit Setup
- Exit Without Saving

Please see the following sections for a brief profile of what each section does, information on settings you might want to change and things to leave alone.

To open one of the program sections, highlight the item you want and press the Enter key. To change a setting, highlight an item and use the "Value" keys indicated to change the setting. Alternatively, press the Enter key and all options for that item will display and you can choose from those listed.

CMOS Setup Utility – Main Screen



Standard CMOS Features

Main Section Functions

This section has the real time clock settings, the IDE and floppy device settings.

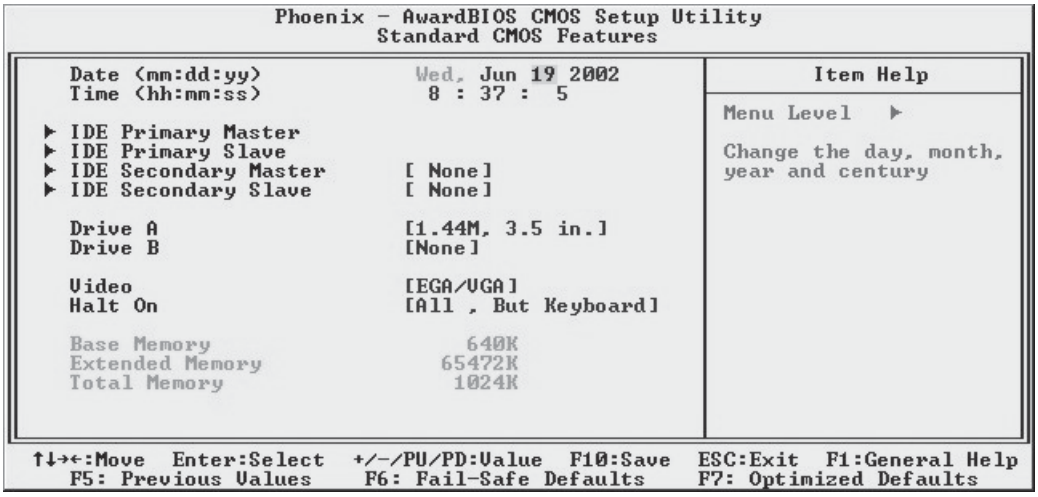
Default & Autodetected Settings

The IDE device settings are autodetected. You shouldn't need to change them. The floppy and other settings are standard defaults.

Setting Options & Constraints

You can reset the time and date settings if they are not correct for your location. You can manually set the IDE device settings if you need to.

CMOS Setup Utility – Standard CMOS Features



In operation, the screen will display the detected IDE devices

Advanced BIOS Features

Main Section Functions

This section mainly configures boot options including boot devices and their boot order and some power functions. There are also some miscellaneous boot configuration settings.

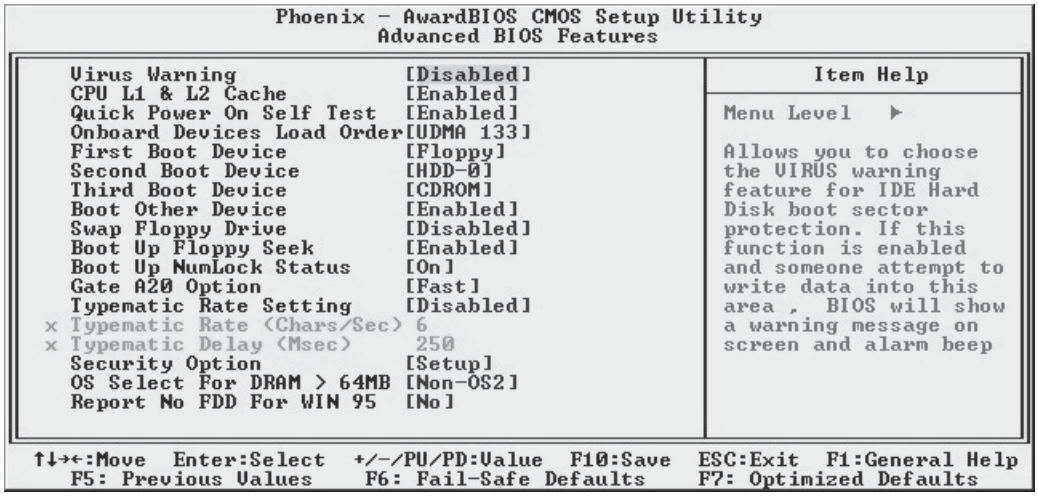
Default & Autodetected Settings

The screen illustration shows the default settings. These do not need to be changed. You can customize the settings to suit your purposes if necessary and you know what you're doing.

Setting Options & Constraints

You can change the boot device assignments and order, the boot options and the power on settings as you like. If you are using OS/2 set the OS Select For DRAM > 64MB line to the OS2 setting.

CMOS Setup Utility – Advanced BIOS Features



Advanced Chipset Features

Main Section Functions

Configures the chipset, BIOS caching and the AGP Aperture size.

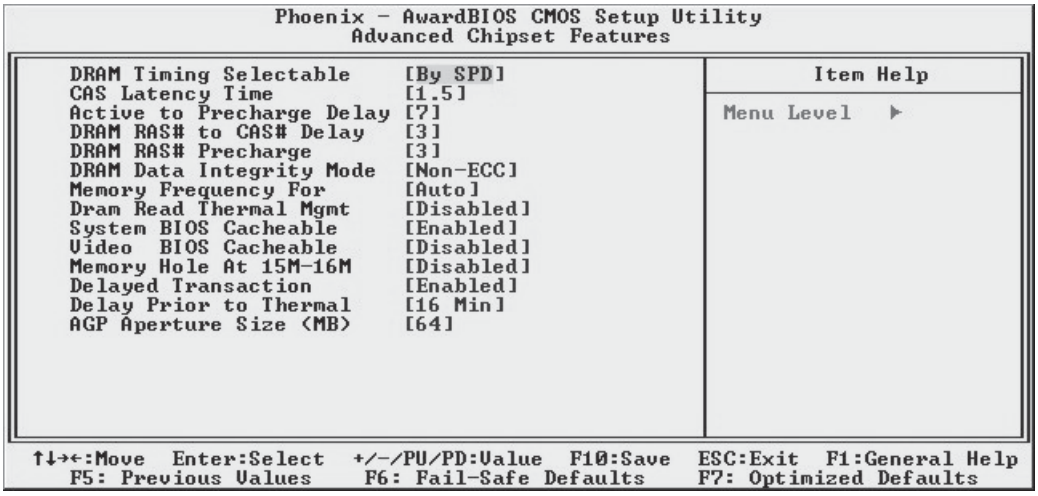
Default & Autodetected Settings

Everything on this screen is an optimized default or is autodetected.

Setting Options & Constraints

We don't suggest changing anything in this section above the Memory Hole AT 15M-16M line. You can change the thermal warning timeout and the AGP Aperture if needed. The default AGP setting will work.

CMOS Setup Utility – Advanced Chipset Features



Integrated Peripherals

Main Section Functions

Configures the peripheral features integrated onto the motherboard.

Default & Autodetected Settings

Everything on this screen is an optimized default. The IDE transfer mode settings are autodetected. The system will work with these defaults. The port settings are standard PC settings.

Setting Options & Constraints

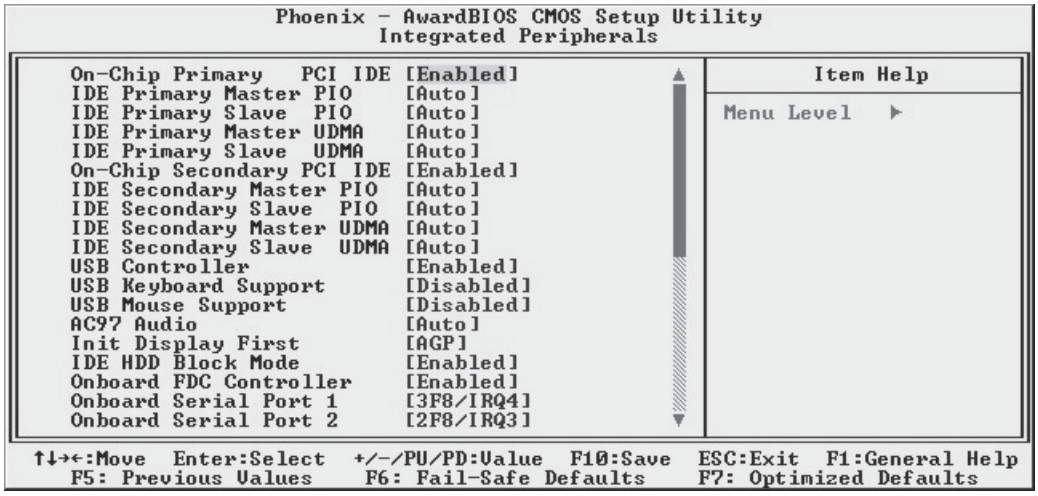
You can disable onboard devices and change port settings. If you're going to use a USB keyboard or mouse, you have to enable support for them from this screen.

You can disable the onboard audio feature if you need to.

The IDE HDD Block Mode feature should work with newer IDE hard disk drives.

You may want to set Onboard Serial Port 2 to Disabled if you aren't going to use the onboard COM2 port.

CMOS Setup Utility – Integrated Peripherals

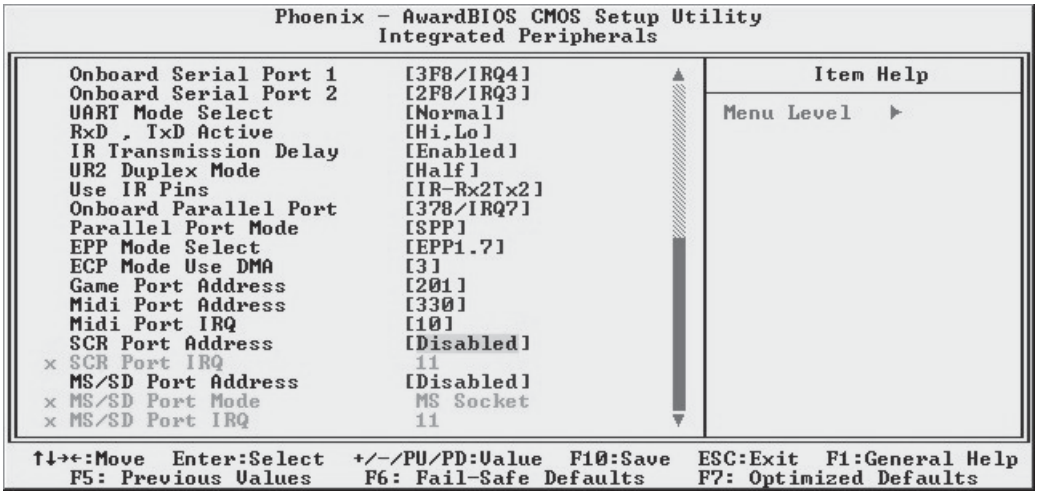


If you install an IR port module, you have to set the UART Mode Select line to the appropriate IR setting. Check the module instructions for this information. The following four lines will display the defaults for the IR mode you select and should work.

You can alter the parallel port settings as needed. You can disable the Game and MIDI settings if you aren't going to use the Game port header.

The last several items when at the bottom of the list are SCR Port Address and MS/SD Port Address. These enable and configure a Smartcard reader and Memory Stick™ or Secure Digital™ memory card reader respectively. The default port addresses should work. You must set these to Enabled if you install the optional FI Panel.

CMOS Setup Utility – Integrated Peripherals (lower section)



Power Management Setup

Main Section Functions

Configures power management settings. Most of these are overridden by ACPI power management in Windows.

Default & Autodetected Settings

Everything on this screen is an optimized default.

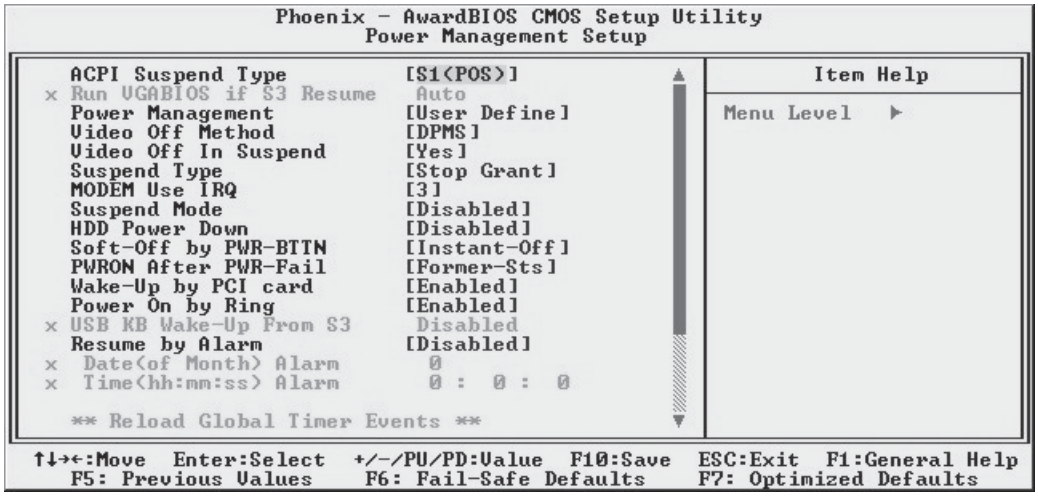
Setting Options & Constraints

You can select the Minimum or Maximum configurations rather than the User Defined defaults. You can customize all settings in User Defined mode. If your OS supports power management, configure it there.

The Soft-Off by PWR-BTTN line controls the function of the system housing power button. The default sets it to turn the system on and off when you press the button. The alternate setting, delay 4 Sec., requires you to press the power button for more than four seconds before the system will turn off.

You can also set a date and time for the system to turn on or wake up using the Resume by Alarm settings.

CMOS Setup Utility – Power Management Setup



PnP/PCI Configurations

Section Function

Configures Plug and Play and other PCI bus settings.

Default & Autodetected Settings

The default is for the BIOS to control these functions.

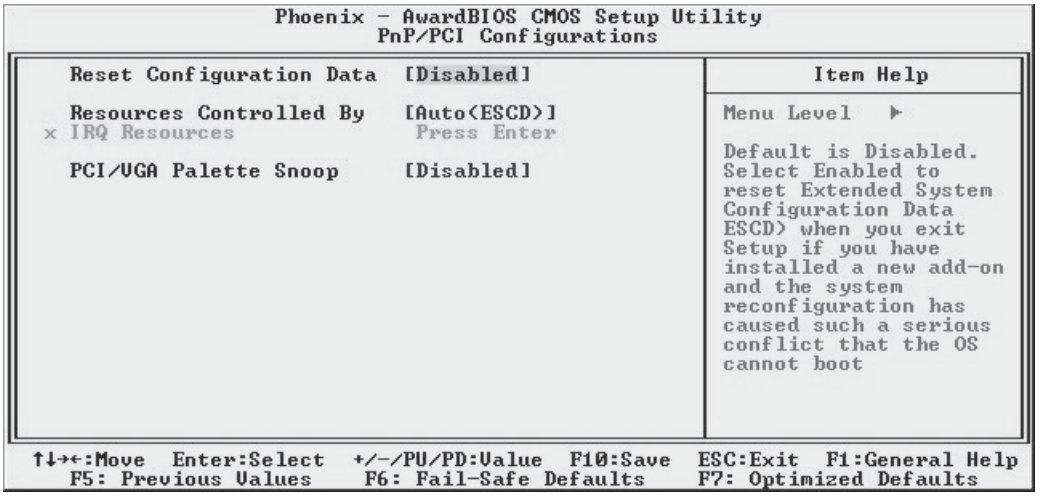
Setting Options & Constraints

If you have a problem after you install an expansion card, set "Reset Configuration Data" to Enabled to rewrite the ESCD.

Don't change the resource settings, they're set to be handled automatically by the BIOS. While you can set them manually, there shouldn't be any need to do so.

The PCI/VGA Palette Snoop item is for PCI display cards that have a problem displaying a screen image properly at startup. You should not normally need to use this feature since the AGP slot is the primary display.

CMOS Setup Utility – PnP/PCI Configurations



PC Health Status

Section Function

Displays detected system information CPU cooling fan speed and various voltage levels.

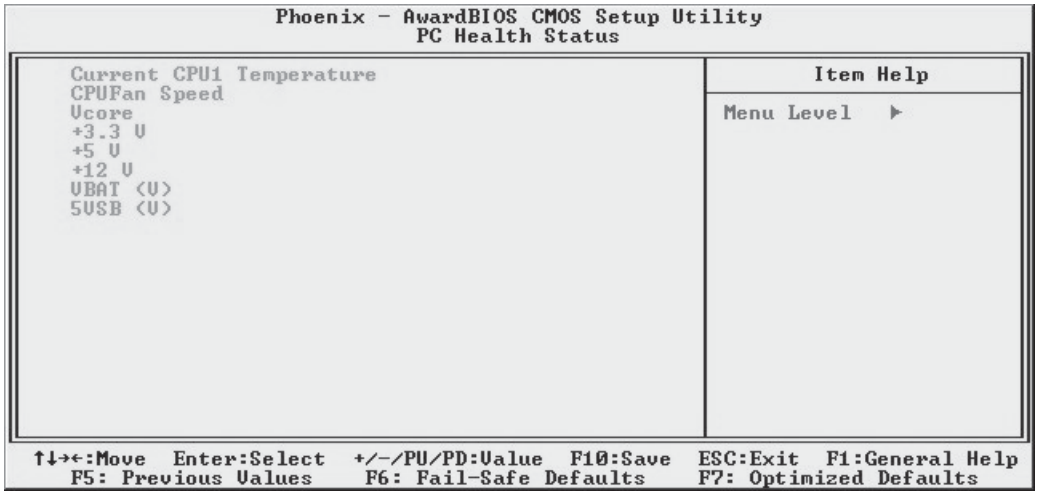
Default & Autodetected Settings

The list of system information is autodetected and displayed.

Setting Options & Constraints

None.

CMOS Setup Utility – PC Health Status



IWILL Smart Setting

Section Function

Configures CPU settings and enables the Promise ATA-133 controller on the P4E and P4ES.

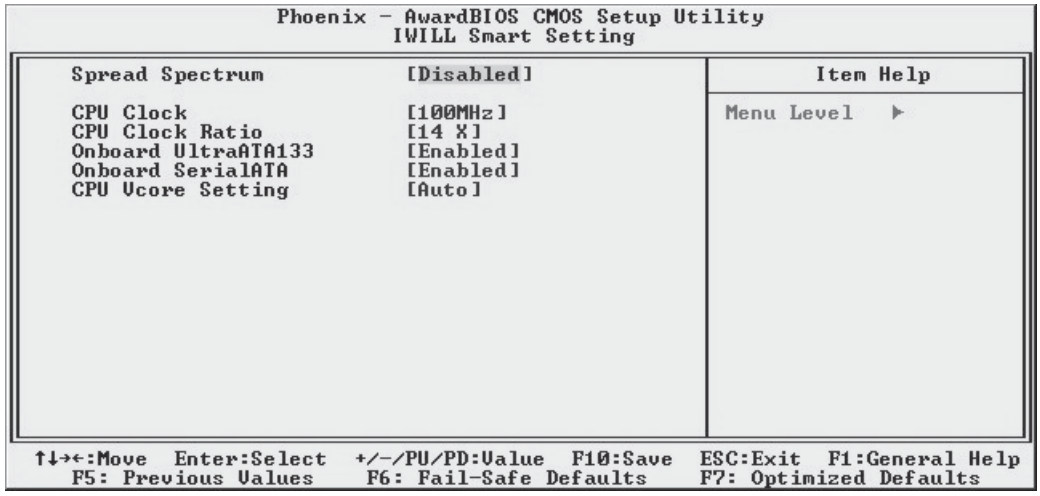
Default & Autodetected Settings

The default settings autodetect the CPU and PCI Clock settings. The "Spread Spectrum" setting reduces interference generated by the board circuitry when Enabled.

Setting Options & Constraints

Don't change the auto-detected settings unless you really know what you are doing. You can configure the CPU settings manually. Configuring CPU settings at variance with Intel's specifications can damage the CPU and void the CPU warranty. You can disable any additional storage controllers (ATA-133 or Serial ATA) if you are not using them.

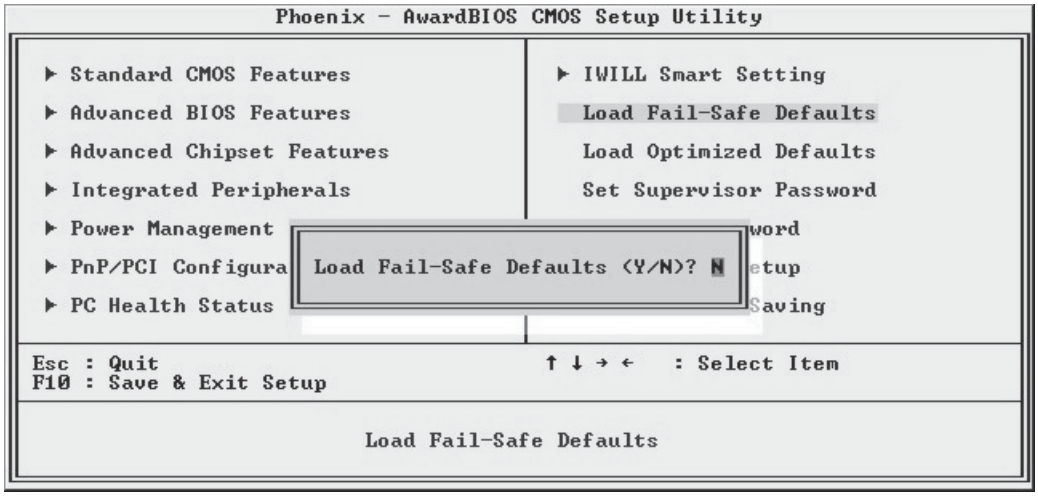
CMOS Setup Utility – IWILL Smart Setting



Note: The screen above is for the P4ES. The P4E screen will not have the 'Onboard SerialATA' line and the P4L will not have either it or the 'Onboard UltraATA133' line.

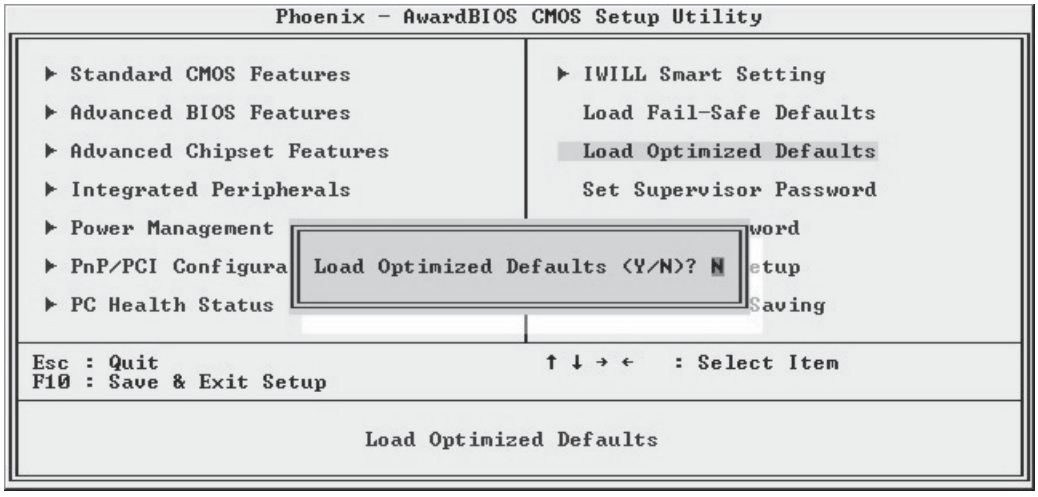
Load Fail-Safe Defaults

This loads a set of minimum configuration defaults. It is used to allow the system to start and then troubleshoot hardware problems. You shouldn't need to use this, it's mainly for technicians.



Load Optimized Defaults

This loads the Optimized Defaults. Do this if the configuration record has been corrupted or mistakenly configured or after the Clear CMOS procedure has been performed. See Chapter 3 for more information on this procedure. To load the defaults, select this item, press the Enter key, type a Y and press Enter again.



Set Supervisor/User Password

These two items set passwords for system access.

Setting a Password

You can install a Supervisor or User Password. The password prevents access to the CMOS Setup Utility (Supervisor) or the entire system (User).

To install a password, follow these steps:

1. Highlight either Set Password item in the main menu and press Enter.
2. The password dialog box will appear.
3. If you are entering a new password, carefully type in the password. You cannot use more than eight characters or numbers. Passwords are case-sensitive. Press Enter after you have typed in the password. If you are deleting a password that is already installed just press Enter when the password dialog box appears.
4. The system will ask you to confirm the new password by asking you to type it in a second time. Carefully type the password again and press Enter, or just press Enter if you are deleting a password that is already installed.
5. If you have used the correct format, the password will be recorded.

If you decide not to set a password after bringing up the password entry window, press the Enter key, not Esc to exit the password entry window.

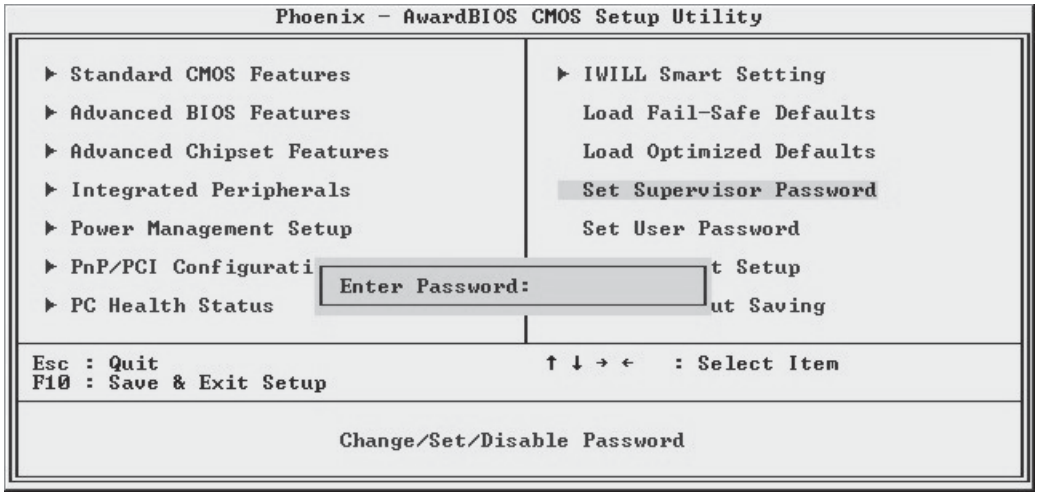
Save & Exit Setup

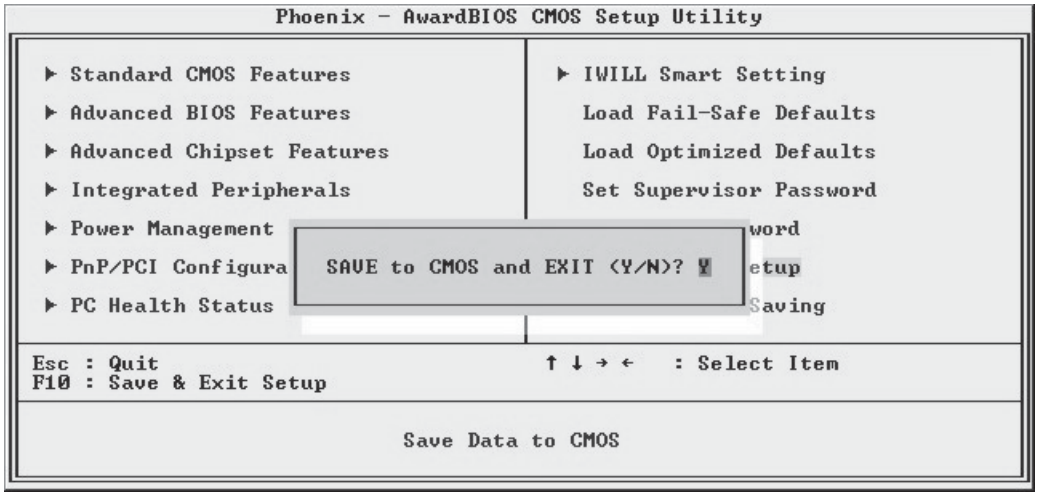
This saves the current utility configuration as a new configuration record, exits the utility and restarts the system using the saved configuration record.

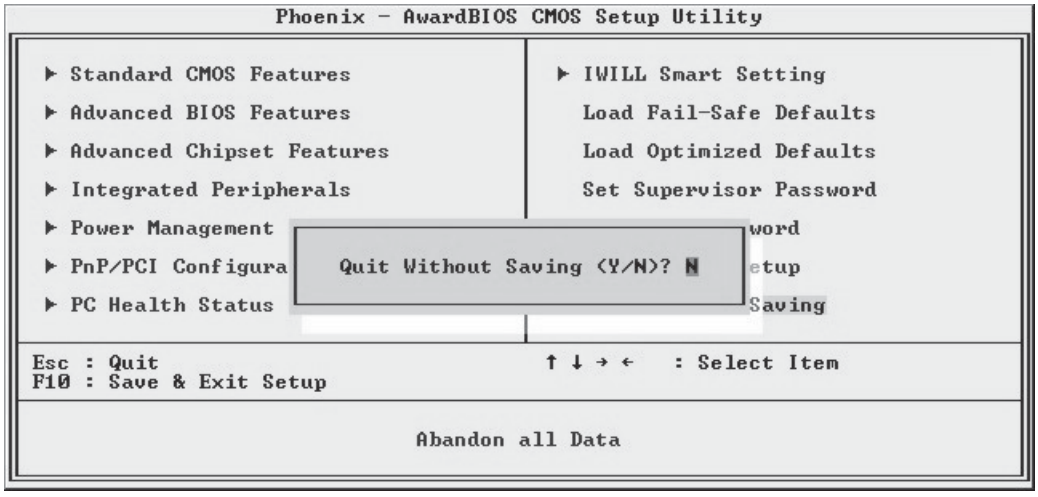
Exit Without Saving

Exits the utility and restarts the system without changing the saved configuration record.

In general, it should not be necessary to use the CMOS Setup Utility once you have fully configured it. In the event you do need to change or re-establish the settings, always make sure to save the settings when you exit the utility or the new settings will not be stored.


Phoenix - AwardBIOS CMOS Setup Utility
▶ Standard CMOS Features
▶ Advanced BIOS Features
▶ Advanced Chipset Features
▶ Integrated Peripherals
▶ Power Management Setup
▶ PnP/PCI Configurati
▶ PC Health Status
▶ IWILL Smart Setting
Load Fail-Safe Defaults
Load Optimized Defaults
Set Supervisor Password
Set User Password
t Setup
ut Saving
Enter Password:
Esc : Quit
F10 : Save & Exit Setup
↑ ↓ → ← : Select Item
Change/Set/Disable Password


Phoenix - AwardBIOS CMOS Setup Utility
▶ Standard CMOS Features
▶ Advanced BIOS Features
▶ Advanced Chipset Features
▶ Integrated Peripherals
▶ Power Management
▶ PnP/PCI Configura
▶ PC Health Status
▶ IWILL Smart Setting
Load Fail-Safe Defaults
Load Optimized Defaults
Set Supervisor Password
word
etup
Saving
SAVE to CMOS and EXIT (Y/N)? Y
Esc : Quit
F10 : Save & Exit Setup
↑ ↓ → ← : Select Item
Save Data to CMOS


Phoenix - AwardBIOS CMOS Setup Utility
▶ Standard CMOS Features
▶ Advanced BIOS Features
▶ Advanced Chipset Features
▶ Integrated Peripherals
▶ Power Management
▶ PnP/PCI Configura
▶ PC Health Status
▶ IWILL Smart Setting
Load Fail-Safe Defaults
Load Optimized Defaults
Set Supervisor Password
word
etup
Saving
Quit Without Saving (Y/N)? N
Esc : Quit
F10 : Save & Exit Setup
↑ ↓ → ← : Select Item
Abandon all Data

Installing an OS & Support Software

This section covers installing Operating System software and the support software on the Power Installer support CD-ROM disc. Once you have configured the CMOS Setup Utility, you should install an OS. If you install a supported Microsoft OS, you should also install the driver software on the Power Installer disc.

Installing an Operating System

This motherboard is primarily intended for use with the following Operating Systems:

- Microsoft Windows 9X
- Microsoft Windows NT
- Microsoft Windows 2000
- Microsoft Windows XP
- Linux
- Novell Netware
- Unix

Prepare the hard disk drive and install an OS according to the instructions that come with the OS you will use.

Installing the Support Software

The Power Installer CD-ROM disc comes with required hardware drivers for Microsoft Windows and some additional utility software, as noted in Chapter 2. If you have installed a supported Microsoft OS, you must install the required drivers. If you have installed Linux, you can create Linux support disks.

Installing Windows Drivers

This section assumes you have installed one of the supported Microsoft Operating Systems on the system hard disk drive.

To install Windows drivers, insert the Power Installer support CD-ROM disc in the system's CD-ROM (or other optical drive) and wait for the Power Installer interface to automatically load. If it doesn't start, run the Power Installer interface directly from the disc by running Setup.

The Power Installer main screen will appear. Click on a motherboard model number to open the section for it.

Power Installer: Main Screen

Click on the model name for this board in the Socket 478 section.

Note:

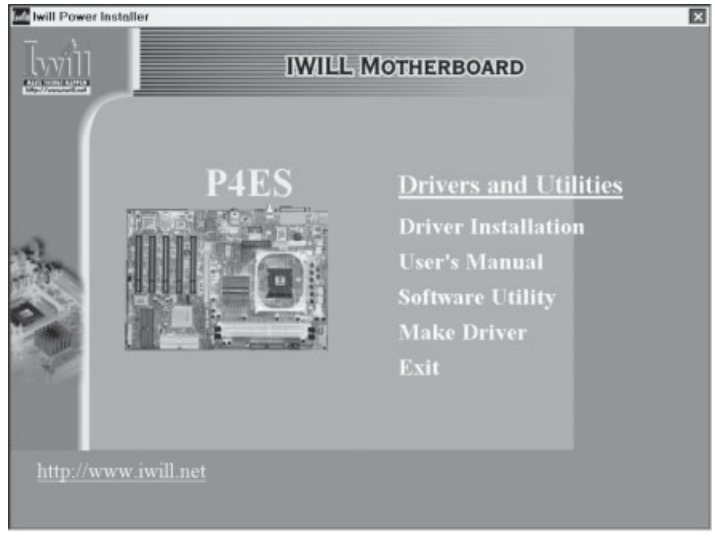
The screen illustrations in this section are for the P4ES. The P4E section has the same items.

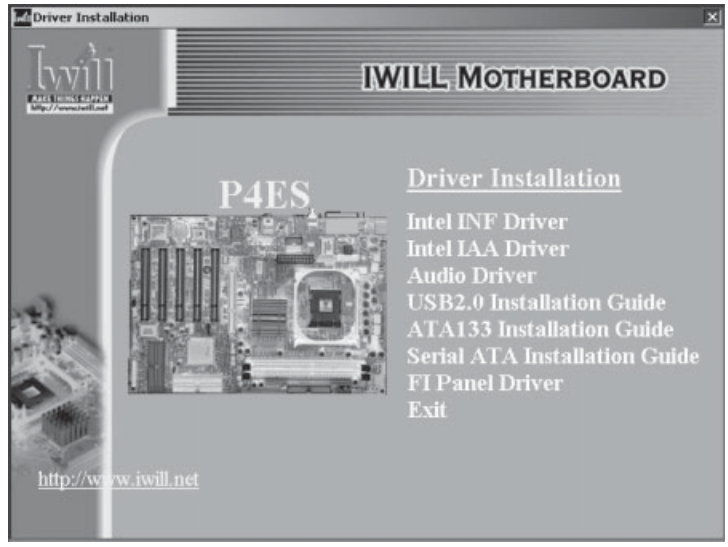
Power Installer: P4ES Main Screen

You can automatically install the required Intel chipset support by choosing "Auto Installation" or you can do all installations manually by choosing Manual Installation. Either way, you must install the Intel chipset support before you install anything else.

The "Driver and Utilities" screen will appear when you click on Manual Installation. Click on "Driver Installation" and the Driver Installation screen will appear.

Power Installer: Drivers and Utilities
Click on Driver Installation to access the driver install programs.





Install the first two items for the Intel Chipset, Intel INF Driver and Intel IAA Driver, in sequence by clicking on them and following the install program instructions.

Install the audio driver for Windows by clicking on the Audio Driver item to run it and install the driver. This item also installs audio software for use with the onboard Realtek audio subsystem.

Review the Installation Guides by clicking on its name. Install the appropriate USB 2.0, ATA-133 and Serial-ATA drivers as needed for the OS you are using.

The Adobe Acrobat reader install program will run when you try to view an Installation Guide if you have not already installed it. Install the program and then repeat the procedure to read the guide information.

If you will use Windows 2000 or Windows XP, install the supplied USB 2.0 driver. Other versions of Windows and other operating systems are not supported. Under them, the USB ports will function as USB 1.1 ports.

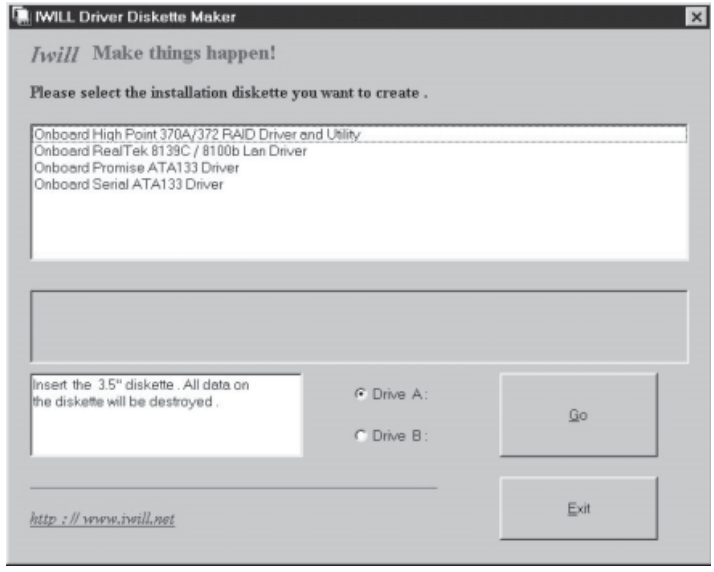
USB 2.0 Support:
The supplied USB 2.0 driver is for use with Windows 2000 and Windows XP. The driver does not support other versions of Windows.

If you have installed either a Smart Card Reader or a Memory Stick/Secure Digital card reader, or have installed the optional Fi Panel, install the FI Panel driver. Click on the item and follow the installation program's instructions to install the driver.

The Make Driver Utility

The "Make Driver" utility makes driver floppy disks. You can use this utility to make a Windows driver disk for the onboard Realtek LAN chip.

Make Driver Utility:
You can use this utility to make driver disks for the onboard Realtek audio subsystem, ATA-133 IDE and Serial-ATA drivers. Select a listed item and follow the onscreen instructions.



Making a Linux Support Disk

You can boot the system from the Power Installer disc. The system will boot from a Linux kernel on the disc and you can use the disk creator that loads to create a Linux support disk. You can then use it to install any necessary modules according to your Linux distribution's instructions for module installation.

Installing the Utility Software

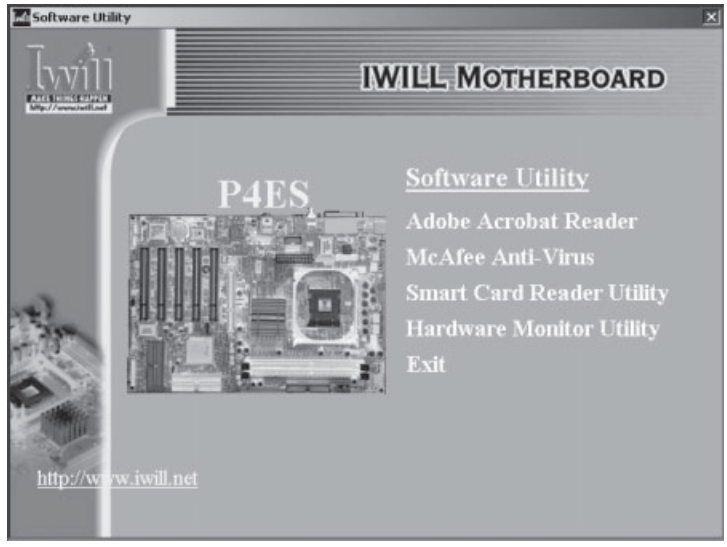
To install the utility software bundled on the Power Installer disc, click on "Software Utility" in the Drivers and Utilities screen to open the Software Utility window.

To install the Adobe Acrobat reader or McAfee Anti-Virus software packages, click on the item you want to install and follow the install program's instructions.

You can install the Smart Card Reader Utility if you have installed a Smart Card reader or the FI Panel.

The Hardware Monitor Utility gives you access to information detected by the Winbond hardware monitor.

Power Installer: Software Utility
Click on the item you want to install and follow the install program instructions.



In This Chapter:

6: Using the Motherboard

This chapter covers several topics related to using this motherboard once it is installed in a working system. These include external system features that connect to the motherboard, things you can do to optimize the performance of a system based on this board and some troubleshooting tips you can review in the event any problems arise.

Using System Features

This section explains the system controls and indicators that connect to the motherboard. It also explains how the other system level features on the board work.

Front Panel System Controls & Indicators

The front panel of the system housing will have some or all of the front panel features that connect to the motherboard. These enable the User to determine some information on the systems operational status and provide some system controls.

System Controls

The front panel connector on the motherboard supports several system controls that mount on the front panel of the system housing.

Power Button

Function: Turns the system On and Off.

Use: This button is configured by the CMOS Setup Utility by the "Soft-Off Mode by PWR-BTTN" line in the Power Management section. Depending on the setting, the power button will function in one of two modes, instant on/off or instant on/4-second delay off. In the delay mode, when you push the power button for less than 4 seconds when the system is turned, the system goes into the Suspend power conservation mode. In this mode, you have to push the button for more than 4 seconds to turn the system power off.

Reset Switch

Function: Restarts the system to cold boot.

Use: Press the button to restart the system. This forces a restart under all conditions. Don't use the Reset button if you can shut the system down from within the Operating System.

Note On Reset & Rebooting:

You should always restart or shut down the system by using the OS command for this. This procedure allows the OS to shut down properly, minimizing the possibility of hard disk drive problems or data loss. If the system crashes or "hangs", you may have to restart the system at the hardware level. There are two hardware reboot options, a keyboard command and the Reset button.

You can effect a "warm" reboot with a key command if the OS supports it. For example, all versions of Microsoft Windows support restarting the computer with the Ctrl-Alt-Del (Delete) command. You can try this command first if it is supported. Otherwise, you will need to use the Reset button.

Suspend Button

Function: Toggles system in and out of Suspend mode.

Use: Press the button to cause the system to enter or resume from Suspend mode.

Note: The front panel feature connector supports a system Suspend button (the ACPI connector) but not all system housings have this button. The same function can be performed at the Operating System level if the OS supports the feature.

Indicator LEDs

The motherboard front panel features connector supports three system status indicator LEDs:

- Power Status LED Indicator
  Lights when the system is turned on.
- System Hard Disk Drive Activity LED Indicator
  Flashes during hard disk drive access.
- Power Conservation Mode LED Indicator
  Lights to indicate the system is in a Suspend state power conservation mode.

Most system housings will have all of these LEDs mounted in the housing's front panel.

Additional System Features

This motherboard supports an optional "FI Panel" device. The Smart Panel connectors on the motherboard connect to cables from the Smart Panel, a device that mounts in a 5¼-inch bay in the system housing and includes the following features:

USB 2.0:
USB 2.0 support is provided for Windows 2000 and Windows XP. Under other operating systems the USB ports will function as USB 1.1 ports.

- Compact Flash reader
- Memory Stick reader
- Secure Digital Card reader
- Line Out audio jack
- Microphone jack
- Two Hi-Speed USB 2.0 ports

If you purchase an optional Smart Panel, follow the instructions that come with it to install the device.

Wake-on LAN (WOL)

Function: The system wakes up in response to a signal arriving over a LAN that it is connected to.

Use: The onboard WOL connector supports connection to a PCI Network Interface Card. The WOL cable from the card connects to the WOL connector on the board.

The feature is not enabled by default in the Power Management section of the CMOS Setup Utility. If you want to use it, set the "Wake-Up by PCI card" line to Enabled.

Installing & Configuring An IR Port

There is a pin header connector for an Infrared communications port module on the motherboard. An IR port enable wireless communication between the system and another device with IR capability. Common examples of such devices are a PDA or notebook computer. Installing an IR port module requires disabling the COM2 serial port on the rear I/O panel and reconfiguring it for IR use in the CMOS Setup Utility.

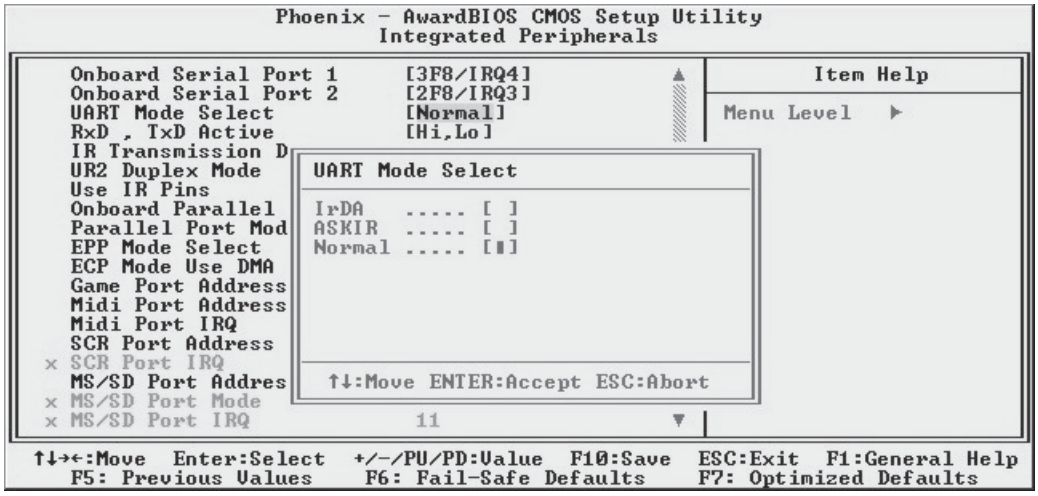
Installing an IR port module requires an expansion slot opening unless the system housing has a built-in IR port with a cable to connect to the motherboard.

Follow the instructions that come that come with the port module you want to install. The basic installation procedure is as follows if the module installs in an expansion slot opening:

1. Turn off and unplug the system if necessary.
2. Remove the system housing cover.
3. Locate the JP1 IR pin header connector on the motherboard.
4. Remove the expansion slot cover in the system housing that corresponds to an open PCI slot. There may be a slot cover retaining screw to remove and put aside for later use.
5. Insert the port module in the open expansion slot cover and align the module's mounting bracket with the screw hole for the retaining screw If there is one). Insert the screw and tighten it to secure the port module in place.
6. Plug the module's connector cable on to the IR connector on the motherboard.
7. Replace the system housing cover.
8. Plug in and turn on the computer.
9. Run the CMOS Setup Utility and pen the Integrated Peripherals section. Set the "UART Mode Select" to the required mode, IrDA or ASKIR, and configure the port settings below it if necessary. Save the settings and reboot.

CMOS Setup Utility – Integrated Peripherals

UART Mode Select – IR mode selection



The supported Microsoft Operating Systems should automatically detect and configure the port module after you restart the system. Consult the OS documentation or online Help for more information if necessary. You may also need to install support software that came with the IR port module in order to use it. Consult the installation instructions that came with the module for additional instructions.

Performance Optimization

This section covers things you can do to increase the performance of a system based on this motherboard. The topics covered include system memory, disk subsystems and processor upgrades or adjustments.

System Memory

Adding system memory will increase system performance and capability under any of the supported Operating System. This motherboard supports a total of 2GB of unbuffered DDR DRAM system memory. If you have not installed the maximum, you can consider increasing the amount of installed system memory. Additional system memory speeds up system operation and in some cases produces additional stability in the Operating System.

Disk Subsystems

The main IDE controller on this motherboard supports IDE drives using data transfer modes up through ATA-100. If you use IDE drives as the primary disk subsystem, selecting drives that support ATA-100 and have a high rotation speed (at least 7,200rpm) will maximize performance.

If you need even better performance from a disk subsystem, you can consider using the ATA-133 controller on the P4E or P4ES, or, the Serial-ATA controller on the P4ES. Both of these, and particularly the Serial-ATA controller, will provide a substantial performance enhancement over the standard onboard IDE controller.

Processor Upgrades & Adjustments

Processor speed has a significant effect on overall system performance. To increase system performance, you can consider using or upgrading to a faster processor.

The Intel Pentium 4 processor used by this motherboard comes in a variety of clock speeds. To maximize performance, select a processor with the fastest clock speed the system budget or specification allows.

The CMOS Setup Utility's Frequency/Voltage Setting section will automatically detect and configure whatever processors are installed. Manual configuration is also available, but setting the Intel Pentium 4 processor to operating parameters outside those specified can damage the CPU and void the warranty.

Onboard 5.1 Audio

The onboard audio subsystem provides support for connecting a 5.1 speaker system to the computer.

Speaker Types

A 5.1 speaker system has the following speakers:

- Front Left & Right Channel
- Rear Left & Right Channel
- Center Channel
- Bass Subwoofer

The "5" stands for the five speakers and the "1" for the Subwoofer. These speakers make up the full set for a Home Theater speaker system.

Speaker Connections

The P4E Series motherboards have several means of connecting a 5.1 speaker system to the board. The rear I/O panel provides the following connections:

- Line Out: For the Front Left & Right Channel speakers. A miniplug connector from a cable for both speakers plugs into this jack. This can also be used for Stereo speakers.
- Rear: For the Rear Left & Right Channel speakers. A miniplug cable for both speakers plugs into this jack.
- Center/Subwoofer: For the Center Channel speaker and the Subwoofer. A miniplug cable for both speakers plugs into this jack.

The 5.1 speaker systems designed for computers usually have an amplifier built into the Subwoofer housing and come with cables to connect these audio jacks to the Subwoofer. Additional cables then connect the five speakers to the subwoofer's amplifier.

- SP/DIF: this is a connector for a special optical digital audio cable.

The SP/DIF cable carries the entire audio signal out to a sound system that includes an amplifier with a connection for this type of cable and a built-in decoder to differentiate the audio signal and divide it into it's various components and send them to the correct speaker in the 5.1 system.

The P4E motherboards also have an onboard connector for IWILL's optional audio port brackets, which can also

provide RCA audio connectors for a 5.1 system.

Troubleshooting

This section details some things you can do to evaluate problems that could possibly occur in the course of using this motherboard. The topics covered include possible hardware problems and problems with the CMOS Setup Utility's system configuration record.

Hardware Problems

A hardware problem may occur either after you install additional hardware or because some existing hardware has failed or has a disconnected or loose connection. This section has some pointers on things you can check before seeking assistance.

General Hardware Troubleshooting

If the motherboard does not operate properly when you first try to use it in the system, it is likely that it is either configured incorrectly, there are problems with external connections. It os also possible the board or some other system component is defective. Always check the most obvious possibilities first.

First check the external components:

- Make sure the system, the monitor and any other external peripherals are plugged in and turned on. Confirm that the system and the power LEDs on any external peripherals are on.
- Check that the monitor, keyboard and mouse are properly connected.

Next check the CMOS Setup Utility:

- Run the CMOS Setup Utility and load the Optimized

Defaults. Reset any other custom settings. Remember to "Save & Exit Setup" to restart the computer.

If there is still a problem, check the internal components. Turn off and unplug the system before you remove the system housing cover.

- Press all installed DIMMs into the module sockets to make sure they're fully inserted.
- Make sure you used the correct cables to connect the internal peripherals and that the peripherals are properly connected to the motherboard. Check the Master/Slave positions on all IDE cables. If you installed a device that uses ATA-100 mode, make sure it is connected to the motherboard with an ATA-100 cable to ensure maximum performance.
- Check that all expansion cards are correctly installed and fully inserted in the expansion slots. Pay particular attention to the AGP display card if one is installed.
- Make sure the processor and its fan/heatsink cooling assembly are properly installed.
- Check all the hardware settings on the motherboard and make sure they are correct.

When you're done, reassemble the system and try again. If the problem persists after you have checked all of the above, there may be a hardware conflict or bug. See the next section for additional information.

Hardware Configuration Problems

It is possible for system hardware components to conflict with each other. While all the components and subsystems on the motherboard are designed and tested to work together, expansion cards and peripheral devices can be a problem.

Assuming you have gone through the general troubleshooting procedures and the system still will not start, if you have just added new hardware to your system, there may be a hardware conflict or bug or a problem with a device driver. Try removing the new hardware and see if the system will start. If it does, consult with the device manufacturer for information on solving the problem. In

some cases, a firmware or driver upgrade may resolve the problem.

Plug and Play Problems

This motherboard supports the automatic recognition and configuration of expansion cards that support the Plug and Play (PnP) specification. Most currently available expansion cards support PnP. PnP simplifies card installation by allowing the system to handle system resource allocation. If you install an expansion card that is not PnP compliant, you may still need to configure the card manually. Consult the card's documentation for instructions or other information.

Replacing the System Configuration Record

As noted previously, the CMOS Setup Utility creates a system configuration record and stores it in CMOS memory on the motherboard. This record must be correct and uncorrupted for the system to operate properly.

It is possible for the system configuration record can become corrupted or lost. If this occurs, the system will not operate properly or at all. This is not a serious problem. You can restore a working configuration using the CMOS Setup Utility to create a new configuration record by loading the Optimized Defaults and reentering any other settings you had made.

Loading Optimized Defaults

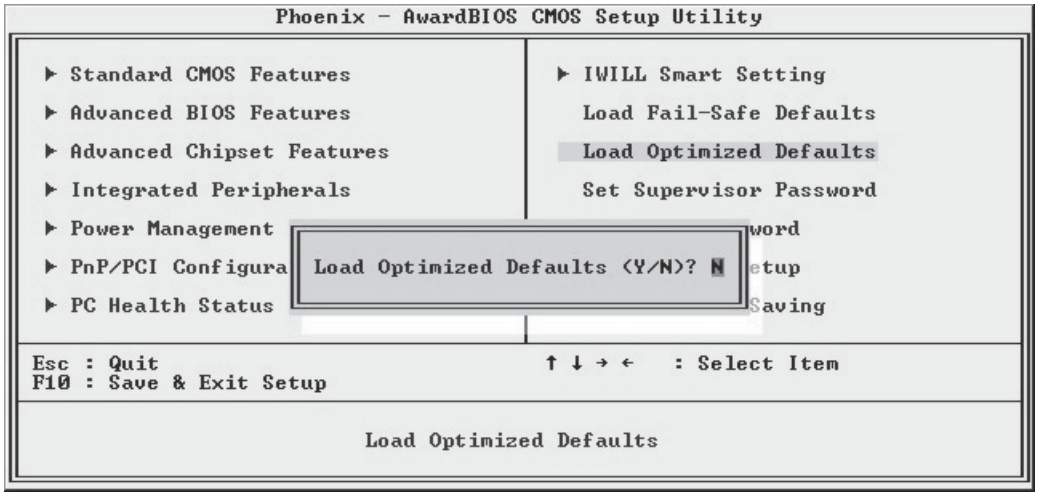
The CMOS Setup Utility does not require an operating system to run. You run the utility by typing the Del or Delete key while the system is starting up to brings up the utility's main screen.

There are two sets of defaults listed, Optimized and Fail-Safe. The Fail-Safe Defaults are a minimum configuration set for use by technicians when troubleshooting system problems. The Optimized Defaults are what the system normally operates on. If a corrupted system configuration record caused the problem you experienced, once

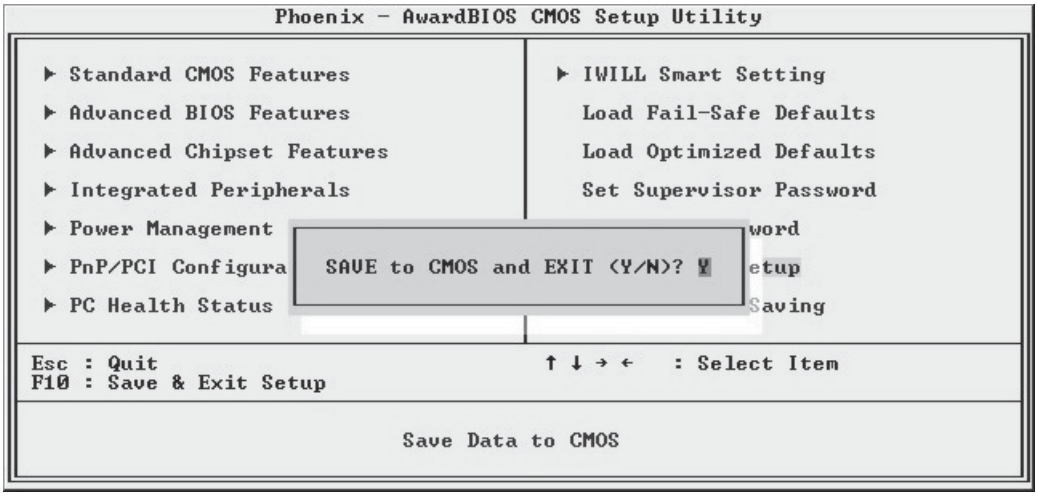
you load the Optimized Defaults and reboot, the system should function normally. The instructions on the next page illustrate this procedure.

You can easily restore a working system configuration record from the main screen of the CMOS Setup Utility. To do so, do as follows:

1. Select the “Load Optimized Defaults” item.
2. Press the Enter Key. A confirmation message will ap-



pear on the screen. Type a “Y” to accept loading the Optimized Default settings. Now make any other settings you need to.



3. Select “Save & Exit Setup” and press the Enter key. A confirmation message will appear. Press the Enter key again to confirm.

The CMOS Setup Utility will close and the system will reboot. The system should then start properly and run normally.

In This Chapter:
Technical Specifications

7: Technical Specifications

This chapter lists some technical information about this motherboard series.

Technical Specifications

Processor
Single Intel Pentium 4 processor for mPGA478 socket
System Bus: 100MHz or 133MHz (400MHz or 533Mhz FSB)
Supports Willamette & Northwood processors
Autodetect CPU type, external clock and multiplier.
CPU external clock 1MHz/step adjustment in BIOS.
CPU Power
Follows VRM 9.0 spec
VRD design
Memory
PC1600/PC2100 DDR SDRAM
Unbuffered DDR SDRAM
ECC DDR SDRAM
2 DIMMs up to 2GB
Chipset
North Bridge : Intel 845E
South Bridge : ICH4
Super I/O
Winbond Super I/O W83637HF
Graphics
AGP 4X
PCI Slots
Five 32-bit PCI/33MHz slots
PCI 2.1/2.2 Compliant
Serial-ATA (P4ES Only)
Controller: Silicon Image
Two onboard SATA ports
ATA-133 (P4E & P4ES Only)
Controller: Promise PDC20275 ATA-133
Two channel IDE connectors

Memory Stick/Secure Digital/Smart Card Readers
For either individual units or optional FI Panel
Memory Stick Reader connector
Secure Digital Reader connector
Smart Card Reader connector
USB 2.0
3 USB 2.0 external ports on rear I/O panel
2 USB 2.0 port pin header for external connector or optional FI Panel
1 USB 2.0 onboard connector for internal USB 2.0 device.
Audio
AC '97 Codec
5.1 Channel speaker system support
Line In/Line Out/Mic jacks on rear I/O panel
Supports Mic/Line Out for front panel or optional FI Panel
Rear Out and Center/Subwoofer Out jacks on rear I/O panel
4-pin CD-ROM audio-in connector
4-pin AUX audio-in connector
General I/O
2 IDE connector (Bus Master with Enhanced) to support ATA-33/ATA-66/ATA-100 IDE drives and ATAPI compliant devices
1 Floppy Controller for up to two drives
1 UART connector
1 25-pin ECP/EPP Parallel Port
1 PS/2 Keyboard port
1 PS/2 Mouse port
1 internal WOL connector
BIOS
Award BIOS
4Mb Flash ROM
Dual BIOS code: one of copy is read only.
Watchdog
Flash write protection for BIOS
Write Protection for memory SPD EEPROMs
Supports ACPI S1, S3
Auto configuration of IDE hard disk type
Multiple boot options
Power Supply
ATX
ATX12V

System Management
Winbond hardware monitor
Analog Device fan controller for Monitoring/Alerting
3-pin CPU Fan header
3-pin Chassis Fan header
CPU temperature sensor
Voltage monitoring (Vcore, +1.5V, +2.5V, +3.3V, +5V, +12V, Battery, 5VSTB)
Form Factor
ATX
4 Layer PCB
Other
Supports AC power failure
ACPI 1.1
PC2001
PCI 2.2
APM 1.2
SMBIOS 2.3
BIOS boot Spec. 1.01
WfM 2.0
DMI 2.0
Approvals
FCC class B
CE mark 89/336/ECC(EMV) and acc. To EU

Connector Pinouts

CPU & System Fan Headers:

Pin	Assignment
1	**Ground**
2	**+12V**
3	**Sense**

WOL:

Pin	Assignment
1	**5V SB**
2	**Ground**
3	**Wake up**

Front USB Headers:

Pin	Assignment	Pin	Assignment
1	+5V(fused)	**2**	+5V(fused)
3	USB Data (-)	**4**	USB Data (-)
5	USB Data (+)	**6**	USB Data (+)
7	Ground	**8**	Ground
9	KEY	**10**	NA

CD-ROM Audio-In Header:

Pin	Assignment
1	**Left Channel Input**
2	**Ground**
3	**Ground**
4	**Right Channel Input**

Front Audio Header:

Pin	Assignment	Pin	Assignment
1	**Mic In**	2	**Ground**
3	**Mic Power**	4	**Audio Power**
5	**RT Line Out**	6	**RT Line Out**
7	**Reserved**	8	**Key**
9	**LFT Line Out**	10	**LFT Line Out**

Auxiliary Audio Header:

Pin No.	Assignment
1	**Left channel AUX_IN**
2	**Ground**
3	**Ground**
4	**Right channel AUX_IN**

IR Header:

Pin No.	Assignment
1	**Voltage 5V**
2	**Key**
3	**IR_RX**
4	**GND**
5	**IR_TX**