IWILL DP400 Motherboard

User's Manual

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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What's In This Chapter:

Introduction
Manual Structure
Manual Features
Critical Topics
Packing List
Pre-Use Checklist

1: Introduction

This is the User's Manual is for the DP400 motherboard. Please read this chapter before you use your motherboard and identify which parts of the manual you will need to refer to, if any. 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 2 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 CPUs 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 the DP400 motherboard, please review the sections on the following topics:

- CPU backplate installation
  Please see Chapter 4.
- Xeon processor retention module installation
  Please see Chapter 4.
- Dual processor installation
  Please see Chapter 4.
- System memory installation requirements
  Please see Chapter 4.
- Rear I/O Panel Shield
  Please see Chapter 4.
- Required BIOS configuration
  Please see Chapter 5.
- Support software installation
  Please see Chapter 5.

Packing List

The DP400 motherboard package includes the following items:

- DP400 motherboard
- ATA-66/100 IDE connector cable

  Connects IDE devices to one of the onboard IDE connectors.
- Floppy Disk Drive connector cable

  Connects floppy disk drives to the onboard floppy disk connector.
- Rear I/O Panel Shield

  Covers the area around the rear panel I/O ports when the board is installed in a system housing.
- 2 CPU Back Plates

  Mount on the underside of the motherboard and provide mounting points for the heatsink retention modules and a thermal buffer.
- 2 Heatsink Retention Modules

  Secure the CPU heatsink on top of the CPU.
- 2 CRIMM spacer modules

  Install in unused system memory RIMM sockets.
- 3 Jumper Caps

  Extra caps in case original caps are lost.
- Power Installer 2 support CD-ROM disc

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

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;

  - 2 Intel Xeon processors of identical specification
  - At least two RIMM memory modules
  - 1.5V AGP video display card
  - 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:

Hardware Features
- Motherboard Layout
- Key Features & Components

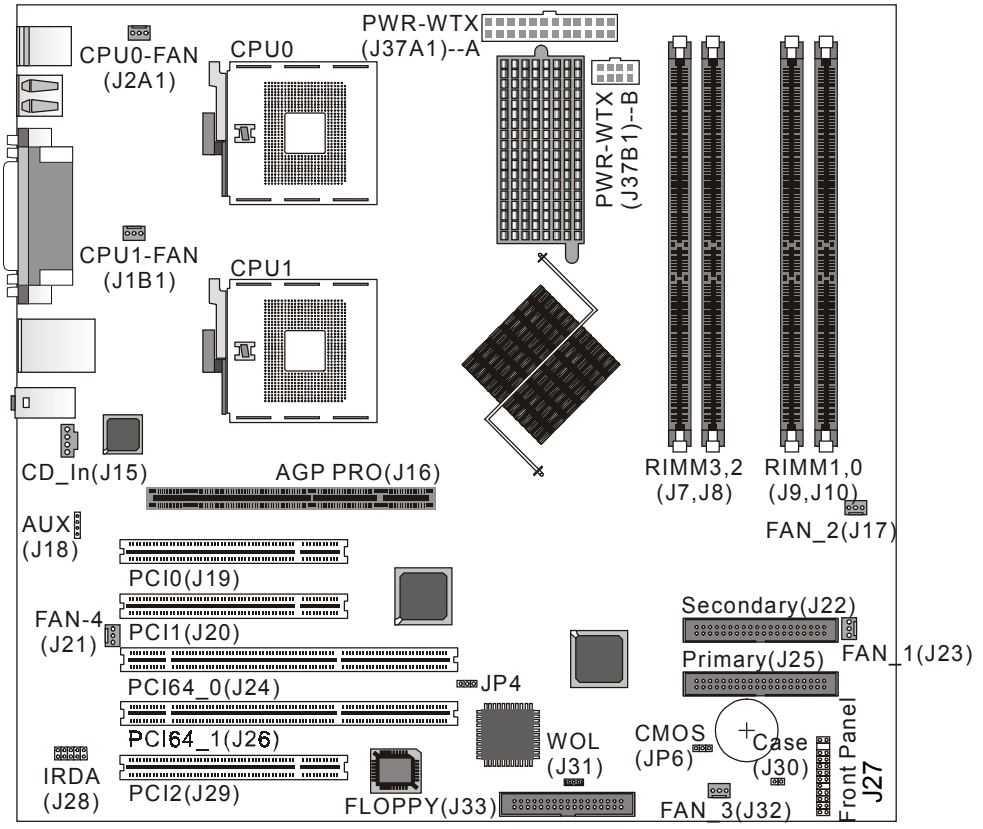
Software Features
- Driver Software
- Utility Software

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 2 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

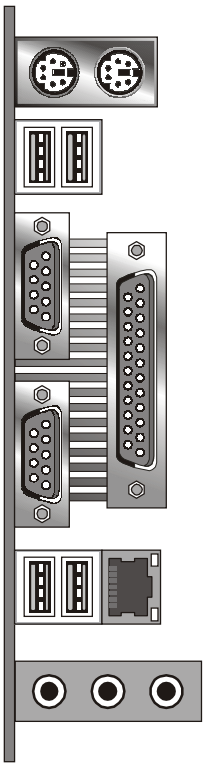
The diagram and key on these two pages shows the location of key components on the motherboard.



Motherboard Layout Key

Component	Function
CPU 0, CPU 1	Socket 603 CPU sockets
CPU0-FAN, CPU1-FAN	CPU cooling fan power connectors
PWR-WTX -A & -B	Power connectors for WTX power supply
RIMM 0, 1, 2, 3	Memory sockets for PC600 or PC800 DRDRAM modules
AGP PRO	AGP universal connector for 1.5V AGP 4X & Pro 50
PCI 0, 1, 2	32-bit PCI expansion slots
PCI64 0, 1	64-bit PCI expansion slots
PRIMARY, SECONDARY	IDE drive connectors
FLOPPY	Floppy disk drive connector
CD_In	CD-ROM drive audio-in connector
AUX	Auxiliary audio-in connector
IRDA	IR port module connector
WOL	Wake-On-LAN connector
JP4	BIOS Flash Protection jumper
CMOS (JP6)	Clear CMOS jumper
Case	Case Intrusion connector
Front Panel	Housing front panel feature connector
FAN 1, 2, 3, 4	Housing cooling fan connectors
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
Two USB ports
Parallel & Serial ports
LAN & two USB ports
Audio ports
The ports have standard color-coding as follows:
PS/2 Keyboard: Purple
PS/2 Mouse: Green
USB Ports: Black
Serial Ports: Teal
Parallel Port: Burgundy
LAN jack: None
Line-In jack: Light Blue
Line Out jack: Lime
Mic In jack: Pink



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 extended ATX form factor PCB in a design that integrates many features onto the board including several external ports.

Intel 860 Chipset

This motherboard uses the Intel 860 Chipset. It is a high-powered chipset intended for workstation applications. The components of the Intel 860 Chipset include the following devices mounted on the board:

- 82860 Memory & Graphics Controller Hub (MCH)
- 82801BA I/O Controller Hub (ICH2)
- 82802 AB Firmware Hub (FWH)
- 82806 AA 64-bit Bus Master PCI Expander (P64H)

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

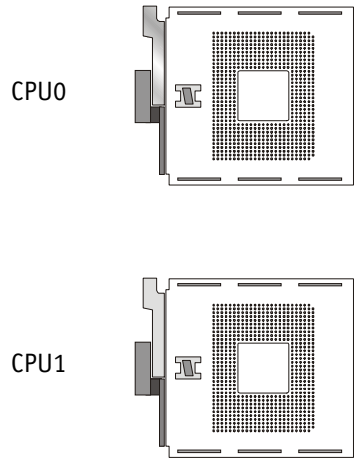
CPU Sockets

Function: The System CPUs install in these sockets. You can install either one or two CPUs, as needed.

Description: The Socket 603 CPU sockets support all Intel Xeon CPUs that use this socket. The motherboard comes with hardware to attach the heatsink and fan/wind tunnel assembly required by the Xeon 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.

Socket 603 CPU Sockets: Single CPU installs in socket CPU0 only.



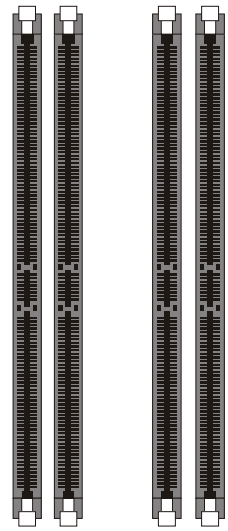
System Memory Sockets

Function: The RIMM system memory sockets are for installing DRDRAM system memory modules.

Description: There are four RIMM memory module sockets on the motherboard. These sockets are for PC600 or PC800 DRDRAM 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.

RIMM Sockets:
System memory sockets for PC600 or PC800 DRDRAM modules.
See Chapter 4 for important installation information.



RIMM 3, 2 RIMM 1, 0

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 two types of AGP card:

- AGP 4X – 266MHz data transfer, maximum 1064MB/ second data throughput
- AGP Pro50

The slot only supports 1.5V devices. Do not use a 3.3V AGP card with this motherboard. The AGP slot is extended to include support for AGP Pro50 cards using up to 50 watts of power.

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 Pro Slot:
For AGP 4X & Pro 50 1.5V cards only. Do not use 3.3V cards.

AGP slot is for both AGP 4X & AGP Pro 50 cards

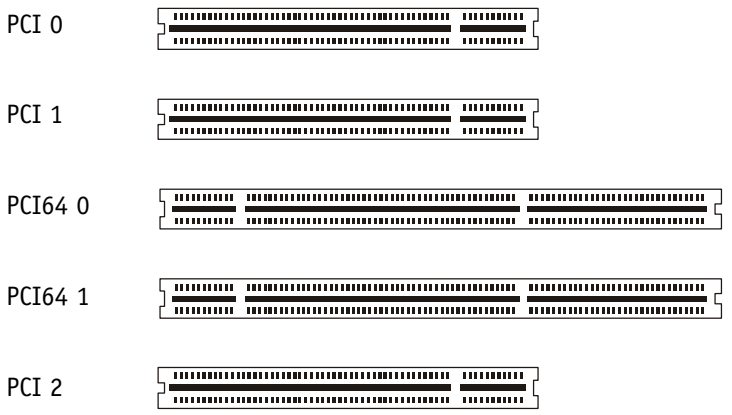
PCI Expansion Slots

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, including three 32-bit 33MHz slots and two 64-bit 66MHz slots. The slots provide two levels of fast high-bandwidth pathway between the motherboard and expansion cards.

More Information: See the section "Connecting & Installing Internal Peripherals" in Chapter 5. Technical specifications are listed in Chapter 7.

PCI Expansion Slots
All slots are Bus Master capable. The 64-bit slots require 64-bit cards.



Drive Connectors

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

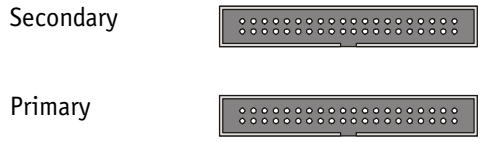
IDE Drive Connectors

Function: The two IDE connectors, marked 'Primary' and 'Secondary', 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 IDE drive connectors. Each connector supports two drives, a 'Master' and a 'Slave' which connect to the motherboard with a ribbon cable. The supplied cable 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.



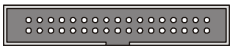
Floppy Disk Drive Connector

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:.

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



Other Connectors

There are several other connectors on the motherboard.

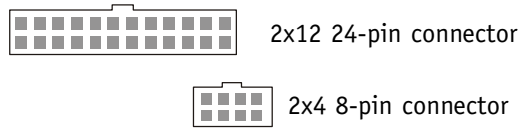
WTX Power Connectors

Function: Connectors for leads from the system power supply.

Description: There are two power connectors on the motherboard for the required WTX power supply. The power supply leads plug into the connectors. The connector design prevents incorrect orientation. These are not standard ATX connectors. The 24-pin and 8-pin connectors are for a minimum 430-watt WTX power supply that complies with the Intel Xeon processor power supply design guidelines.

More Information: Please refer to the following URL – http://www.iwill.net/dp400/IT002A430WSW.pdf – for more information on the required power supply specifications.

WTX Power Connectors:
These are for the required WTX power supply.



CPU & System Cooling Fan Connectors

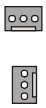
Function: Power connectors for CPU and system housing cooling fans.

Description: There are two CPU cooling fan connectors and four system housing cooling fan connectors. All connectors are 3-pin headers. The system housing fan connectors support fan tachometer monitoring. The processor heat sink fans are not speed controlled.

The system fans use the motherboard fan speed control, which consists of three states: Off, Normal speed, and High speed. In Normal speed mode, the system fans run at normal speed until the thermal sensor senses the temperature exceeds the High speed fan threshold temperature. The system fans then run at High speed when the temperature threshold is exceeded. You can set the threshold temperature in the PC Health section of the CMOS Setup Utility. You can set the threshold to 40°C to force continuous operation of the system fans in high-speed mode in the S0 and S1 sleep states.

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 all use the same 3-pin connector. The System Fan connectors are speed controlled, the CPU Fan connectors are not.



Fan power connectors (orientation varies)

WOL: Wake On LAN

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 the onboard LAN port and will also work with an additional PCI NIC that supports this feature by connecting the card to the WOL connector on the motherboard.

The motherboard supports Wake on LAN through the PCI bus PME# signal and the onboard Intel 82550 LAN controller. This signal will wake up the computer only when it is plugged into an AC power source and the system is in a supported sleep 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 an additional NIC. The onboard LAN port supports WOL without using this connector.

Wake On LAN connector

CD-In & AUX Audio Connectors

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 or a modem/telephony device. The connectors provide an audio input connection between a device and the integrated AC '97 audio subsystem.

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

Audio-In Connectors:
The CD-In connector is for CD-ROM or other optical drives. Use the AUX connector for an additional drive or a modem/telephony device.

CD-In audio-in connector

AUX audio-in connector

IRDA

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

Description: The IRDA connector supports both IrDA and ASKIR infrared port modules. Follow module instructions to install.

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

IRDA Connector:
The IRDA 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.

IRDA connector

Chassis Intrusion Switch Connector

Function: Connector for Chassis intrusion switch.

Description: The hardware monitor subsystem supports a chassis security feature that detects if the chassis (system housing) cover is removed. When the cover is removed, a signal is sent to the hardware monitor component. The chassis intrusion circuit is powered by the system power supply when the computer is connected to AC power or by the onboard battery when it is not.

This feature uses a mechanical switch on the chassis that connects to the chassis intrusion connector on the motherboard. When the chassis cover is removed the motherboard circuitry will detect the intrusion.

More Information: See the "System Features" section in Chapter 6.

Chassis Intrusion:
This 2-pin connector connects to the lead from a chassis-mounted chassis intrusion switch.

Chassis Intrusion Switch connector

Front Panel Connectors

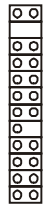
Function: Multifunction pin header connector for system housing front panel features.

Description: This connector supports the following front panel features:

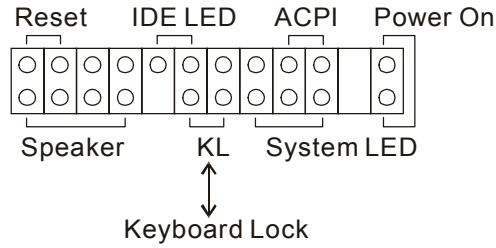
- Reset Switch
- IDE device activity LED
- System ACPI Suspend switch
- System Power LED
- Keyboard lock
- Housing-mounted speaker

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.



Front Panel feature connector



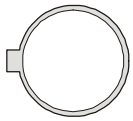
Battery Connector

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

I/O Ports

There are several external Input/Output ports on the rear edge of the motherboard. 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 Boot Options 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

USB Ports

Function: Connecting USB 1.1 devices to the system.

Description: These four ports are for USB devices. Each pair of ports is controlled by a separate USB root hub. 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 four USB ports. Each pair of ports has its own Host Controller and Root Hub.

USB ports are paired 1/2, 3/4

LAN Port

Function: Connecting a CAT 5 LAN cable to the system.

Description: This is an RJ-45 connector for standard Cat 5 LAN cabling with RJ-45 jacks. The connector is for the onboard LAN controller. You can connect or disconnect a LAN cable when the system is turned on.

More Information: See the System Features section of Chapter 6 for information LED modes.

LAN RJ-45 Jack:
Left-hand LED = Activity
Right-hand LED = Link

RJ-45 LAN jack
(on top of USB3, 4 ports)

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.

Front Panel feature connector

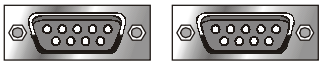
Serial (COM) Ports

Function: Connecting Serial devices.

The two serial ports have 9-pin connectors. They can operate at speeds up to 115,200bps. You can configure the port speed in the computer's Operating System. Do not connect or disconnect a serial cable 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.

Serial Ports:
The default configuration is Serial 1 = COM1 and Serial 2 = COM2. Installing an IR port requires disabling COM2.



Serials ports 1 & 2

Audio Jacks & AC '97 Audio

Function: Jacks for connecting external audio devices to the onboard AC '97 audio subsystem.

Description: There are three audio jacks:

- Line Out

  For the two stereo speakers.
- Line In

  Audio input connector for an external audio source.
- 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 AC '97 audio settings.

External Audio Jacks:
The onboard AC '97 audio supports stereo speakers, audio input and a microphone.

Line In (Light Blue)

Line Out (Lime)

Mic

Jumpers

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

JP4 Flash Protect

Function: Sets protection method to prevent accidental overwriting of installed system BIOS.

Description: A 3-pin jumper.

More Information: See Chapter 3 for configuration information.

JP4 Flash Protect:
Prevents the accidental overwriting of the system BIOS.

JP4 Flash Protect

JP6 Clear CMOS

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

Description: A 3-pin jumper.

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

JP6 Clear CMOS:
Leads from the front panel features connect to this header.

JP6 Clear CMOS

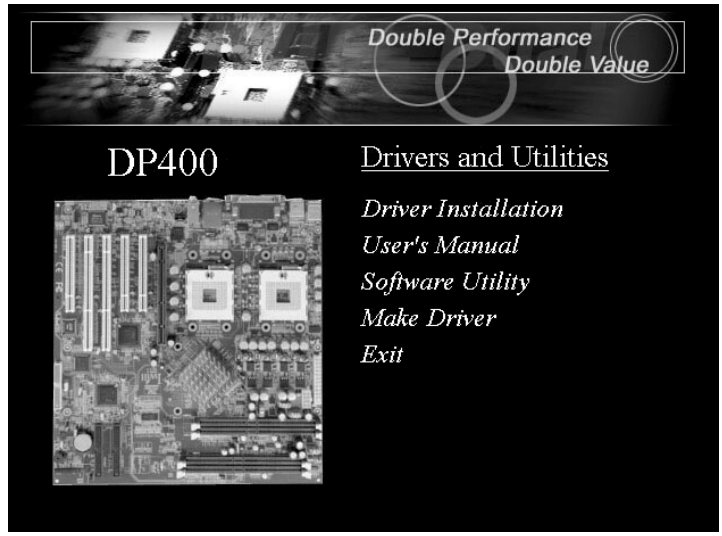
Software Features

This motherboard comes with driver software and bundled utility software on the supplied Power Installer 2 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 2 Disc

You can run the Power Installer 2 CD-ROM install interface under Microsoft Windows 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 2:
DP400
Main 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 860 chipset support software

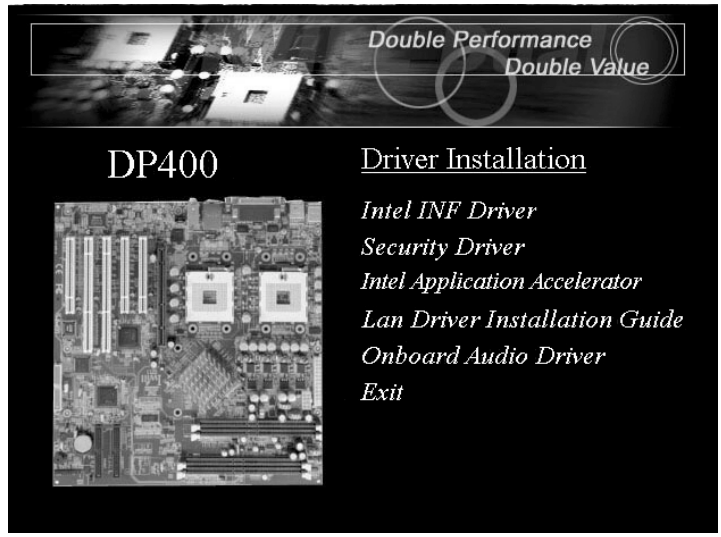
  Various drivers that support the chipset and enhance system performance.
- LAN driver software

  Driver software for the
- Audio driver software

  SoundMax audio driver that supports the onboard AC '97 audio.

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

Power Installer 2:
DP400
Driver installation screen



Utility Software

The Power Installer 2 disc also has two utility programs on it, Adobe Acrobat Reader and McAfee Anti-Virus.

- Acrobat Reader

  Acrobat Reader allows you to read documents in the Adobe PDF format, including online documents on the Power Installer 2 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.

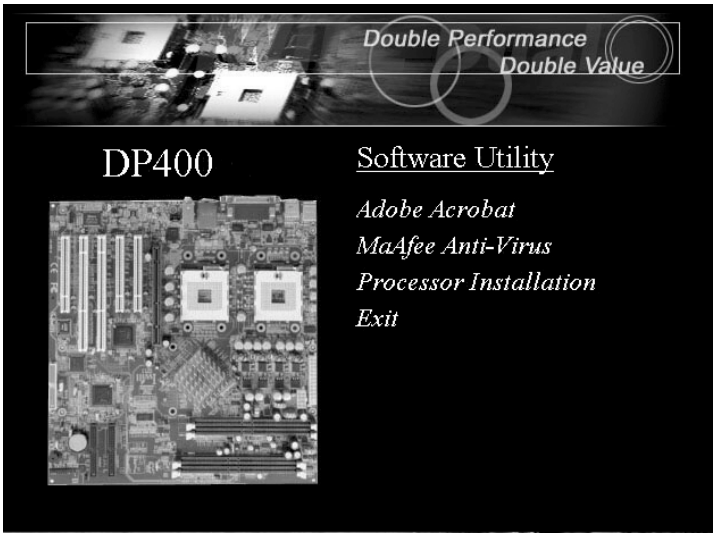
- McAfee Anti-Virus

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

- Processor Installation Video

  This is an MPEG format video from Intel that explains in detail how to install the Intel Xeon processor and its heatsink and Processor Wind Tunnel cooling components. The video is viewable with any player that can view MPEG format, including Windows Media Player. We highly recommend viewing this video on another computer first if you will install processors on the motherboard yourself. Clicking on the item in the installer window runs the video automatically under Windows NT, Windows 2000 or Windows XP.

Power Installer 2:
Utility installation screen



In This Chapter:

The Default Configuration
Hardware Configuration: Jumper Settings
Firmware Configuration: The BIOS CMOS Setup Utility
Reconfiguring the Motherboard
Hardware Reconfiguration
Firmware Reconfiguration

3: Motherboard Configuration

This chapter deatils 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 very few hardware settings. The hardware settings are configured using standard jumper switches. The motherboard has only two jumper switches, JP4, Flash BIOS Protection and JP6, Clear CMOS.

Jumper JP4: BIOS Flash Protect

The system BIOS and CMOS Setup Utility are stored in Flash memory on the motherboard, which provides permanent storage, but is rewritable, allowing for BIOS updates. Jumper JP4 controls the protection scheme that prevents accidental damage to or rewriting of the data stored in Flash memory.

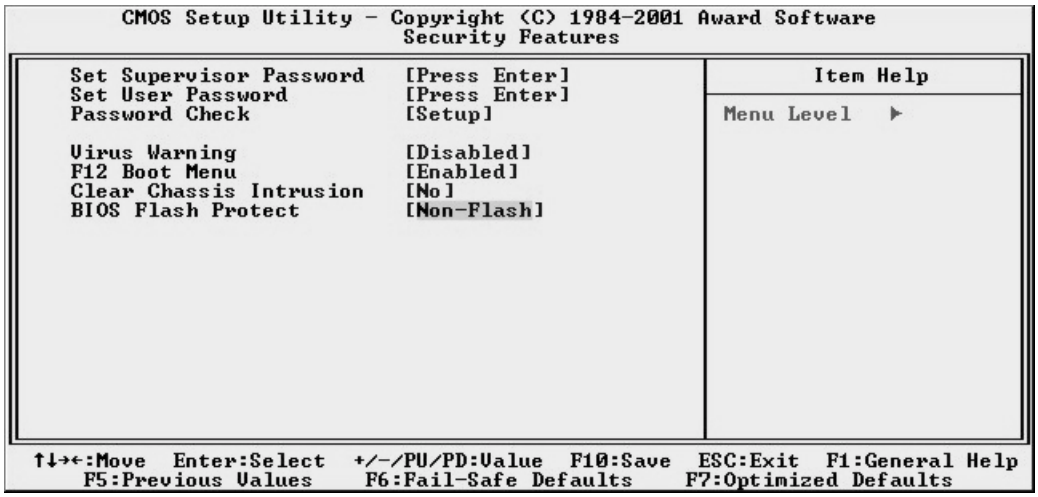
JP4 has three setting options which allow the BIOS to be protected either by a firmware setting in the Security Features section of the CMOS Setup Utility or by the jumper's hardware setting. The firmware setting option is more convenient, so it is the default setting for this jumper. The setting options are listed in the table below.

JP4: BIOS Flash Protect

Setting	Function
Short 1-2	Protection mode selected in BIOS CMOS Setup Utility [Default]
Short 2-3	Protection enabled in hardware
Open [Remove Cap]	No BIOS Flash Protection

BIOS CMOS Setup Utility – Security Features

The Security Features section of the CMOS Setup Utility has a BIOS Flash Protect item that controls BIOS flash protection. The default setting is "Non-Flash". The optional setting is "Flashable". See the section on "Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.



Jumper JP6: Clear CMOS Memory

JP6 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. JP6 provides a means to delete the configuration data stored in CMOS memory and reset the configuration to the CMOS Setup Utility's Optimized Defaults.

JP6: Clear CMOS Memory

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

Follow this procedure to clear CMOS memory. The jumper is beside the coin battery. If necessary, refer to the board diagram and key in Chapter 2 for the location of the JP6 jumper.

1. Turn off and unplug the system. Remove the system housing cover (see documentation if necessary).
2. Set JP6 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.

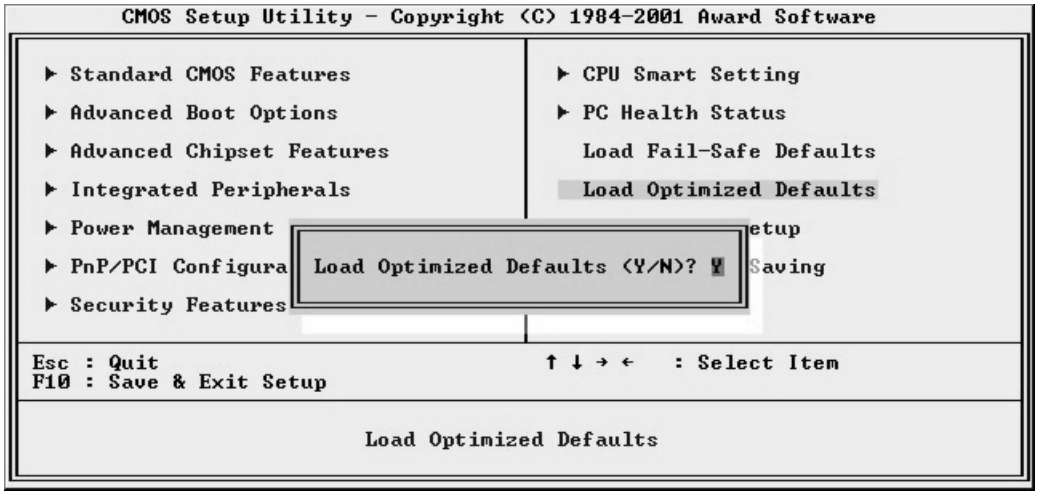
BIOS CMOS Setup Utility – Main Screen

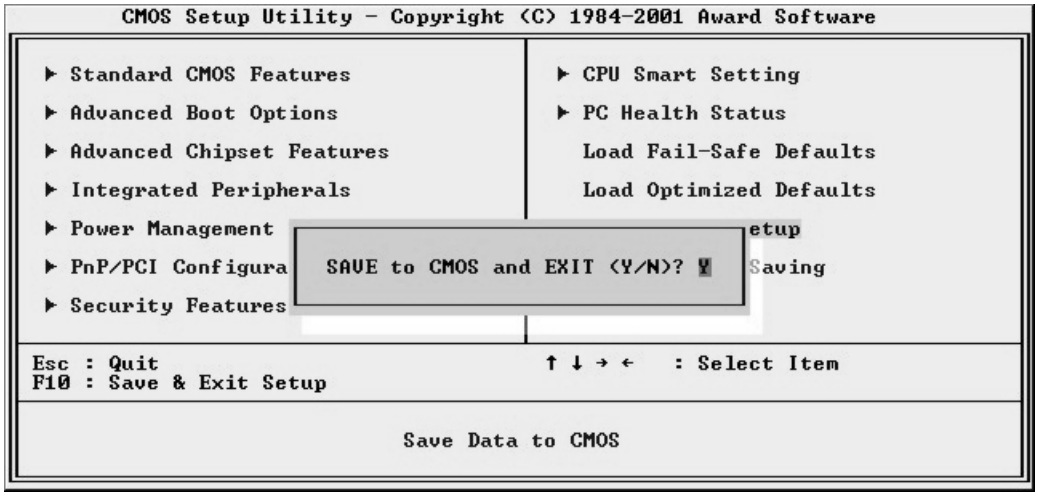
The main screen of the CMOS Setup Utility has a Load Optimized Defaults item that loads the default operation settings. After you perform the Clear CMOS procedure, loaad the defaults as follows:

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.





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.

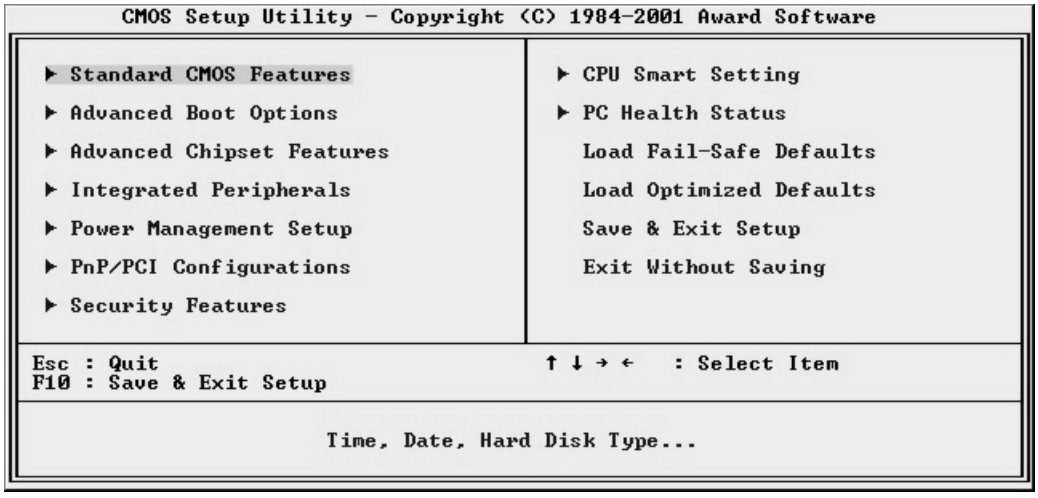
Using the CMOS Setup Utility

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.

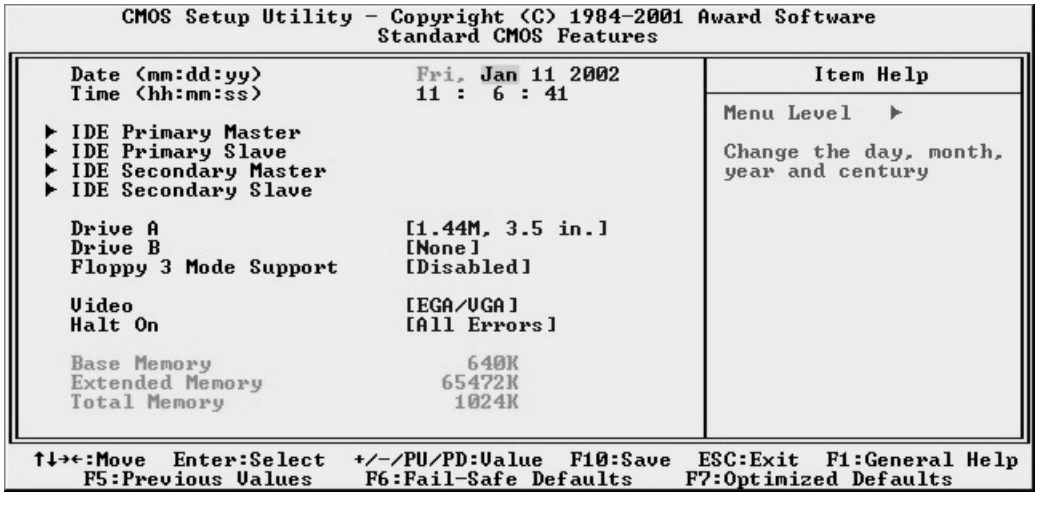
BIOS CMOS Setup Utility – Main Screen

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 very few hard configuration options and the CMOS Setup Utility is configuration is mostly either required, recommended or automatic, there will probably be little reason to do so.

Hardware Reconfiguration

We recommend leaving the two 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.

Firmware Reconfiguraton

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:

Pre-Installation Preparation
Installing CPUs
Installing System Memory
Installing the Motherboard in a System Housing
Motherboard Installation Procedure
EEB 3.0 Housing Installation
Completing System Configuration

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 one or two Intel Xeon CPUs
- Install Rambus 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 CPUs

This motherboard uses the Intel Xeon processor. Both single and dual CPU configurations are supported on this motherboard.

To install an Intel Xeon CPU on the motherboard it is very important to precisely an 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 Xeon processor on this motherboard you will need to do the following:

- Install the Xeon processor in a Socket 603
- Install the Heatsink Retention Mechanisms
- Install a Xeon-specific Heatsink
- Install the Processor Wind Tunnel assembly

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

Processor Selection

This motherboard supports all Xeon processors and the BIOS automatically detects the required settings and configures the CMOS Setup Utility accordingly. If you install two Xeon processors, they must have identical specifications.

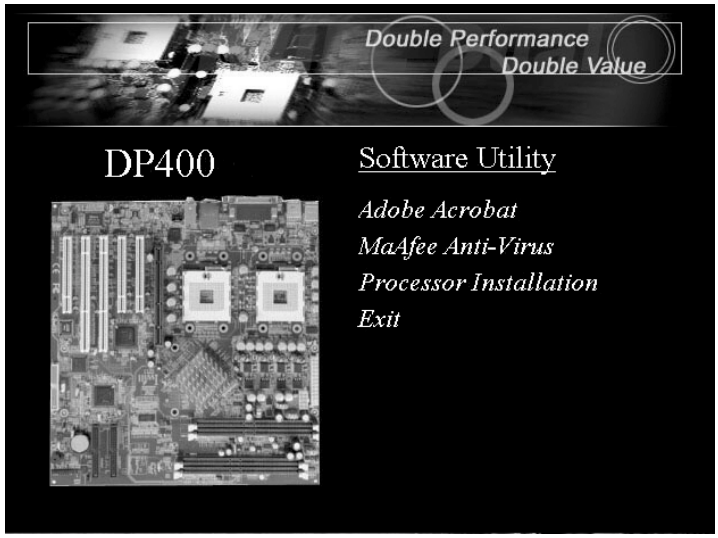
Required Tools:

- Philips-head screw driver (Crosshead)
- Flathead screw driver

Installation Video

There is a Xeon processor installation video from Intel in MPEG format on the Power Installer 2 support CD-ROM disc. You can access it from the Power Installer 2 interface in the Software Utility section. It is listed as "Processor Installation". We strongly recommend that you view this video on another computer if you have not installed a Xeon processor before. The video will play with any software that can play the MPEG format, including Windows Media Player.

Processor Installation Video:
There is an instructional video from Intel on the Power Installer 2 disc that fully details the Xeon processor installation procedure. You can access the video in the Software Utility section of the disc interface. The video will play with any software that supports the MPEG format. We suggest viewing it on another computer before installing a CPU.

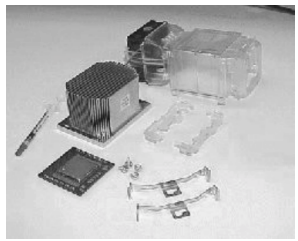


Installing The Processor

Installing a Xeon processor in the Socket 603 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.

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

Note:
If you are only installing one CPU, install it in the CPU0 socket.

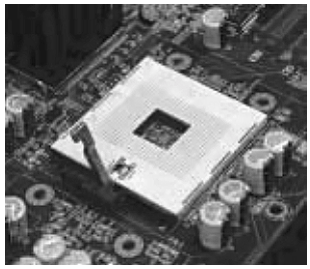


Xeon Processor package
(Clockwise from lower left):
- Xeon processor
- TIM applicator
- Heatsink
- Procesor Wind Tunnel
- Retention Mechanisms
- Heatsink clips
- Mounting screws

The processor installation procedure is as follows:

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

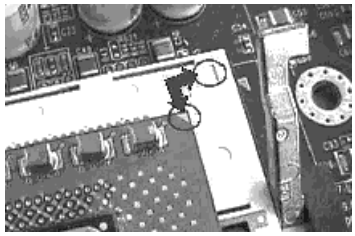
Step 1:
Raise the retaining lever



Raise the socket lever to the vertical position

2. Align the processor to the socket by matching the Pin 1 corner of the socket (marked with a triangle) to the Pin 1 corner on the Socket 603 (marked by a triangular hole in the Pin 1 corner).

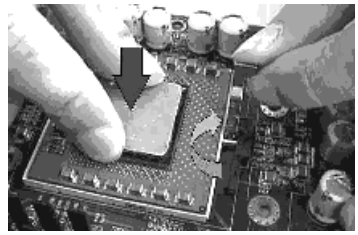
Step 2:
Align the Pin 1 corners



Match the Pin 1 positions on the socket and the processor

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

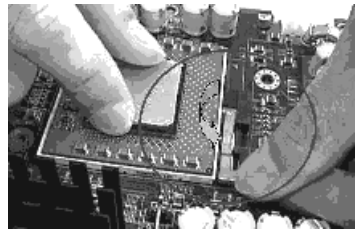
Step 3:
Insert the processor



Gently press the processor into the socket. Make sure the retaining lever is vertical.

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



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

Installing the Heatsink Retention Mechanisms

The motherboard comes with a set of two Heatsink Retention Mechanisms. You must attach these to the motherboard before installing the processor heatsink. If you are installing a boxed Intel Xeon processor, it will also come with two Retention Mechanisms, you can use either set.

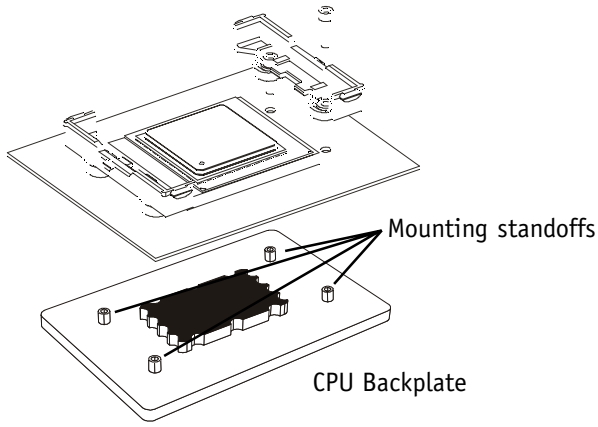
The mechanism attaches to the motherboard with the supplied screws which screw into either a supplied CPU Backplate or into the standoffs of an EEB 3.0-compliant system housing (chassis).

We've assumed here that you are installing the motherboard in a non EEB 3.0 chassis and therefore will use a supplied CPU Backplate. If this is not the case, please first install system memory as described later in this chapter. Then install the Heatsink Retention Mechanisms, Heatsink and Processor Wind Tunnel after the board is installed.

To install the supplied heatsink retention mechanisms, do as follows:

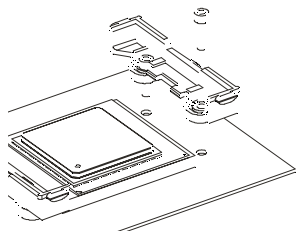
1. Align the four standoffs on a CPU Backplate (mounting nuts attached to the plate) to Retention Mechanism mounting holes around one of the CPU sockets on the motherboard.

Step 1:
Align the CPU backplate



2. Align a Retention Mechanism to two of the mounting holes in the board so that the mechanism is facing in towards the CPU socket.

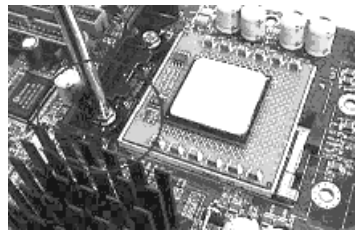
Step 2:
Position the Retention Mechanism



Position the mechanism facing in towards the CPU socket.

3. Insert one of the supplied screws in each hole in the mechanism so that it inserts in a matching standoff on the CPU Backplate. Tighten the screws until they are snug. Don't overtighten the screws.

Step 3:
Attach the mechanism & CPU Backplate with screws



Insert & tighten the mounting screws so that they screw into the CPU backplate

4. Repeat the same procedure to attach the second Retention Mechanism on the opposite side of the CPU socket. The mechanisms should hold the CPU Backplate securely against the underside of the motherboard.

If you are installing two CPUs, repeat this procedure on the CPU1 socket.

Installing the Heatsink

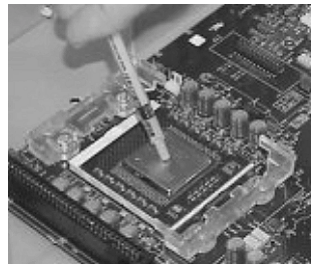
Once you have attached a set of Retention Mechanisms, you must install a Heatsink. The Heatsink attaches to the Retention Mechanisms with the two supplied Heatsink retaining clips.

Apply Thermal Interface Material

Before you install the heatsink you must apply the Thermal Interface Material (TIM) that is supplied in an applicator with boxed intel Xeon processors (or an exact equivalent) to the heat spreader on the installed 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 square heat spreader plate in the middle of the CPU.
2. Do not spread the TIM around. When you place the Heatsink on top of the CPU the material will disperse evenly.

Apply TIM
Apply all of the Thermal Interface Material to the center of the processor heat spreader plate



Don't spread the TIM out with the applicator tip. The Heatsink will disperse it.

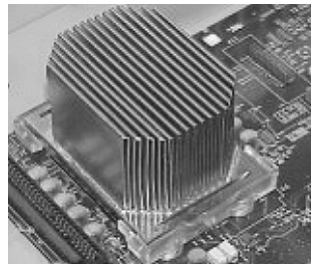
Next, install the processor Heatsink as detailed below.

Install the Heatsink

To install a processor Heatsink do as follows:

1. Place the Heatsink on top of the Xeon CPU so that it fits into the recesses in the Retaining Mechanisms. The Heatsink base is rectangular and will only fit into the mechanism frame in the correct orientation.

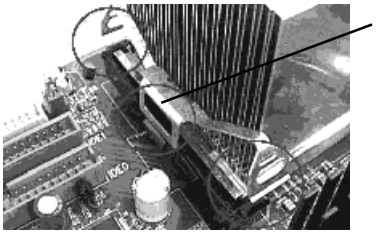
Position the Heatsink
place the Heatsink on top of the CPU so that it fits into the Retention Mechanisms.



Don't spread the TIM out with the applicator tip. Wiggle the Heatsink a little after you position it to disperse the Thermal Inteface Material.

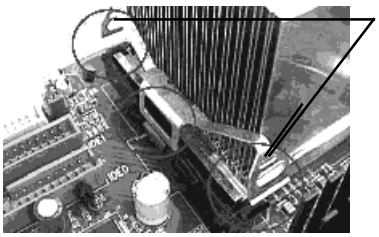
2. Place a heatsink retaining clip on one of the Retention Mechanisms so that the large outer center tab is on the outside and fits over the extension on the Retention Mechanism. The inner center tab should clip over the edge of the Heatsink.

Position Heatsink Clips
Position a clip on each Retention Mechanism.



3. Hold the clip down against the mechanism and press down on one end of the retaining clip so that the tab on the end clips securely over the extension on that end of the mechanism.
4. Press the other end of the retaining clip down so that it clips securely over the extension at the other end of the mechanism. The spring tension of the clip should now hold that side of the heatsink securely against the Retention Mechanism.

Attach Heatsink Clips
Press the clip ends onto Retention Mechanism.



5. Repeat the procedure above on the Retention Mechanism on the other side of the Heatsink.

After you install the two retaining clips, the Heatsink should be securely attached.

Installing the Processor Wind Tunnel

After you install the Xeon processor and heatsink assembly, you must install the Processor Wind Tunnel (PWT) assembly. The PWT has three parts:

- Shroud
- Fan Assembly (fan with mounting frame)
- PWT End Cap

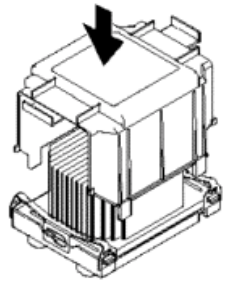
You install these components separately and in order as follows.

Install Shroud

First install the PWT shroud:

1. Clip the shroud onto the retaining mechanisms at the corners. It should fit onto the mechanism corners and the flexible tabs should snap into place.

Step 1:
Attach the PWT shroud



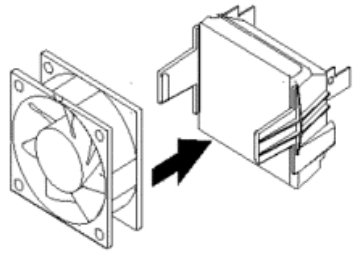
Press the shroud down onto the Retention Mechanisms untl it snaps into place

Attach Fan Assembly

Next attach the cooling fan:

1. Clip the fan mounting frame onto the cooling fan. Orient the fan so that it will blow air into the PWT Shroud.

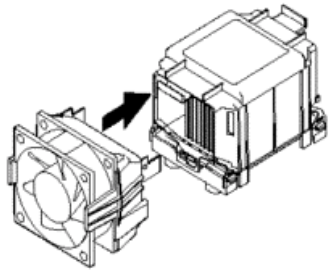
Step 1:
Clip the fan mount onto the fan



Orient the fan so that it blows toward the Heatsink

2. Insert the fan mounting frame tabs into the holes on the forward side of the PWT Shroud. The plastic tabs should snap securely into place.

Step 2:
Insert the PWT fan mount into the PWT shroud

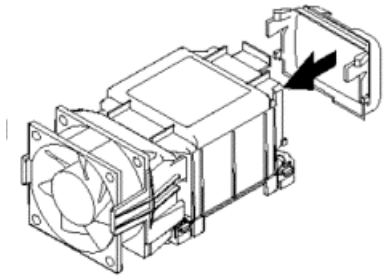


Press the fan mount into the shroud so that it snaps into place securely

Attach End Cap

1. Insert the End Cap tabs into the holes on the rear side of the PWT Shroud. The plastic tabs should snap securely into place.

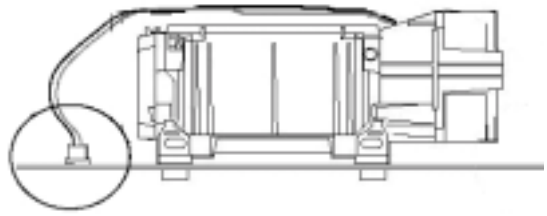
Step 3:
Insert the PWT end cap into the PWT shroud



Press the end cap into the shroud so that it snaps into place securely

Connect Power Lead

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



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 four RIMM module sockets. The sockets operate in pairs. This motherboard uses Rambus DRDRAM RIMM modules for system memory. The system memory specification are:

- Rambus DRDRAM RIMM modules
- PC600 or PC800
- Maximum 2GB total system memory

Memory Configuration Options

This motherboard has specific memory configuration requirements. These include:

- All sockets must have either RIMM or CRIMM modules installed in them.
- Module configurations are limited as specified.
- Any capacity RIMM may be used in any socket as long as total memory does not exceed 2GB.
- Modules should all be the same speed (PC600 or PC800) for best system performance.

Module Types

There are two modules types:

- RIMM
- CRIMM

The RIMM (Rambus Inline Memory Module) is a Rambus DRDRAM memory module. The CRIMM (Continuity Rambus Inline Memory Module) is not a memory module. CRIMMs must be installed in all sockets that do not have RIMMs installed in them. No sockets can remain empty in this memory design.

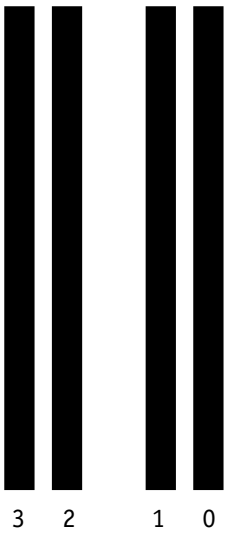
Module Configurations

The figures on the next page illustrate the allowed module configurations. Do not install modules in any other configuration. Please note the configurations indicate module positioning, not capacity. You can install any mixture of module capacities that does not exceed 2GB.

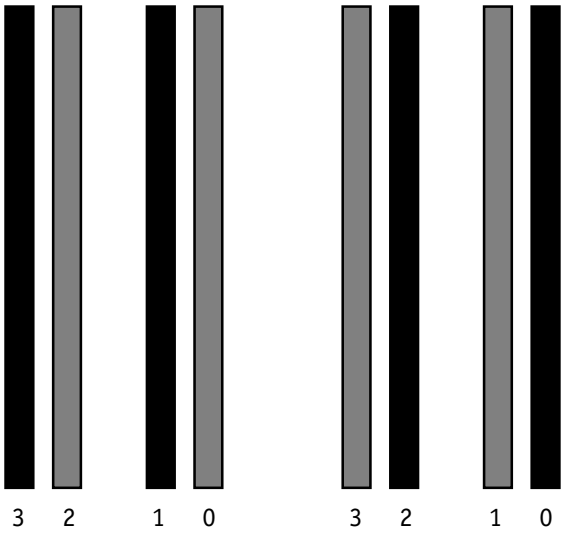
Memory Configuration Layouts:
The configuration layout shown here are the only ones allowed. Do not use any other layout of RIMM and CRIMM modules. All sockets **MUST** have some kind of module installed.

RIMM module

CRIMM module



Each bank of two sockets muct have at least one RIMM installed



Installing Memory Modules

Installing RIMM or CRIMM 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 the center of each module. These ensure that you can not insert a module incorrectly.

Before you install any modules, you should review the configuration requirements and choose a configuration. You should then prepare the required number of RIMM and CRIMM 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 pattern you have chosen, repeat this procedure until all modules are installed. Recheck the configuration pattern guide and confirm that you have installed module in the correct configuration.

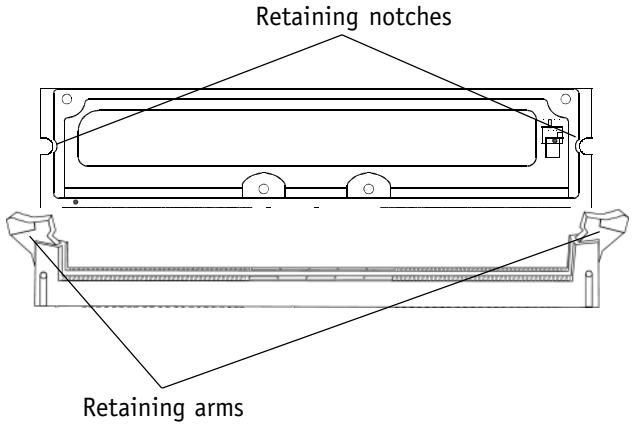
Once all modules are installed, system memory installation is complete.

System Memory Recognition

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

Module Installation:
All modules insert in the RIMM sockets in the same way. The socket retaining arms should engage the retaining notches on the module securely.

Make sure the module is correctly oriented before inserting it in the socket



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 an EEB 3.0-compliant housing that is specific to the board's CPU layout. Other housings must support the extended ATX form factor, which is larger than other ATX form factors.

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

- Install a rear I/O panel shield
- 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 non-EEB 3.0 housing and will use the supplied CPU backplates to mount the heatsink retention mechanisms. If you are installing the board in an EEB 3.0 chassis, please see the EEB 3.0 section later in this chapter.

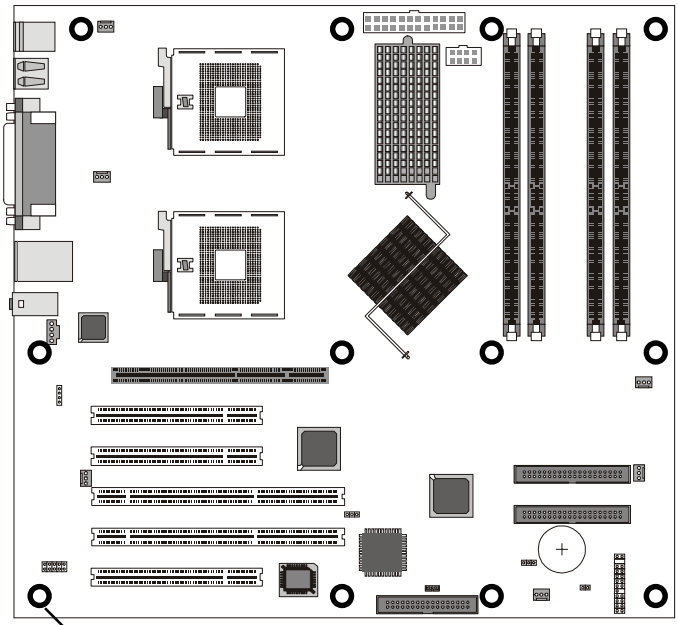
We also assume you have prepared the board for installation as previously described in this manual. If the housing you are using normally stands vertically, place the open housing on it's side before you start.

Please follow this procedure to install this motherboard:

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 in the housing's I/O panel opening.
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.
5. Attach the board to the housing by inserting mounting screws in all the holes and tightening them snugly.

Mounting Holes

All modules insert in the There are 12 mounting holes on the motherboard that should correspond to mounting standoffs on the system housing's motherboard mounting plate.

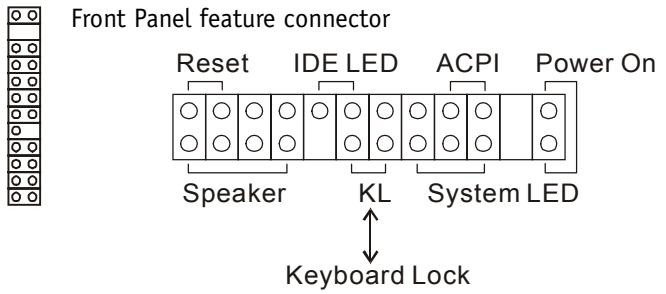


Connecting Front Panel Components

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.

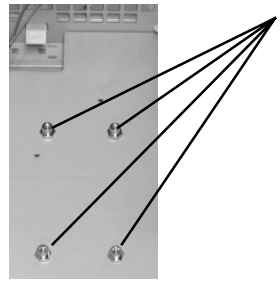


EEB 3.0 Housing Installation

If you install the motherboard in an EEB 3.0 system housing, you should not attach the CPU Backplates. Instead, attach the board to the housing's motherboard mounting plate first. When you do this, the Retention Mechanism mounting holes should line up with the Retention Mechanism mounting standoffs on the housing's motherboard mounting plate. You can then position and install the Retention Mechanisms by screwing them into the mounting standoffs.

Once you have installed the Retention Mechanisms, you can proceed to install the Heatsink and Processor Wind Tunnel assembly as described earlier in this chapter. This procedure is illustrated in the Xeon processor installation video mentioned at the beginning of the chapter. Although the board in the video is not the DP400, the procedure is the same. Please note that the PWT assembly should be oriented so that the fan blows towards the rear of the system housing.

EEB 3.0 Housing
An EEB 3.0 system housing will have four Retention Mechanism mounting standoffs for each CPU socket. The Retention Mechanisms mounting screws screw into the standoffs instead of a CPU Backplate.



There are four Retention Mechanism mounting standoffs for each CPU socket on an EEB 3.0 housing's motherboard mounting plate.

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.

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.

In This Chapter:

Installing or Connecting Internal Peripherals
Installing an AGP Card
Connecting Internal Devices
Connecting External System Peripherals
Configuring the CMOS Setup Utility
Installing an OS & Support Software

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 2 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 universal connector on the board supports AGP 4X and AGP Pro 50 1.5-volt display cards. Follow the instructions that come with the display card for installing the card hardware in the AGP slot.

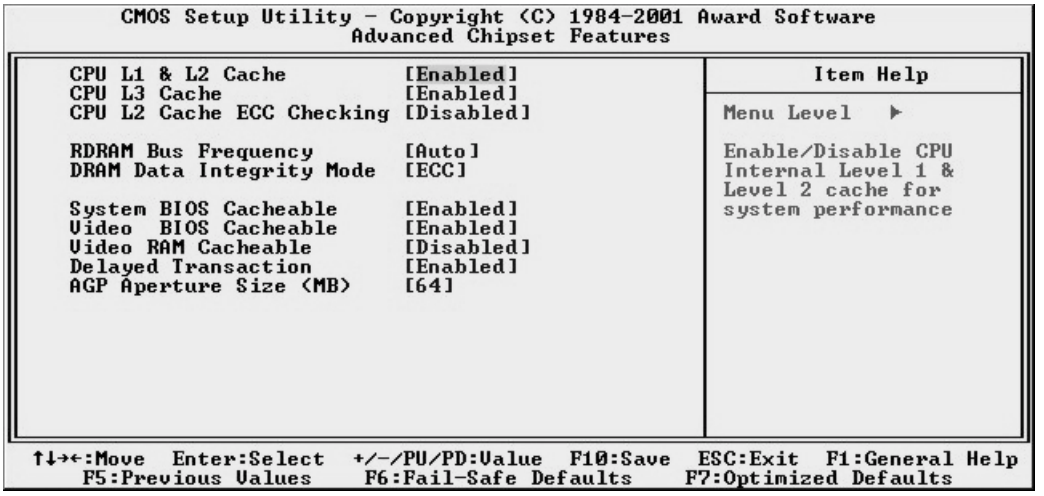
AGP Configuration

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.

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.

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

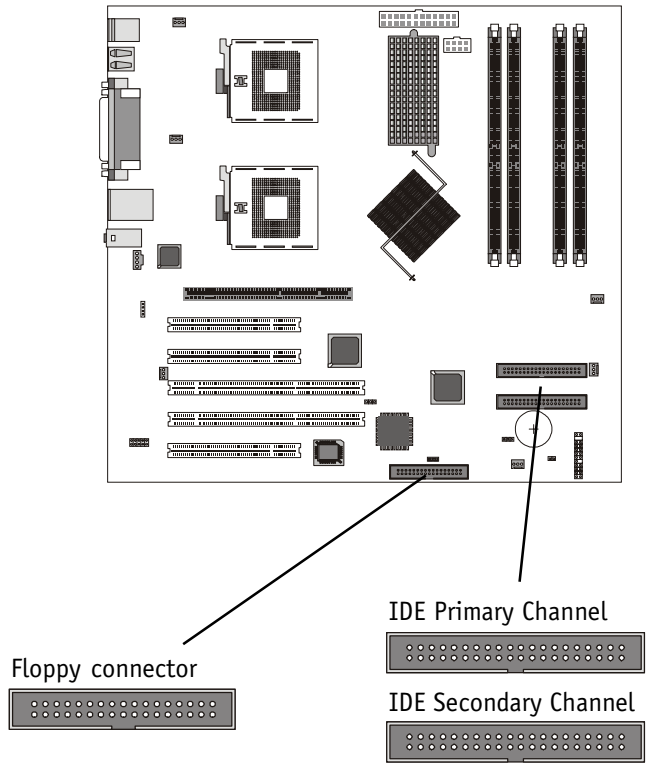
This motherboard has one Floppy Drive connector for connecting one or two floppy disk drives. Most computer systems use one 3.5-inch 1.44MB floppy disk drive. The drive connector is for a standard floppy drive ribbon cable.

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.

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.

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.



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.

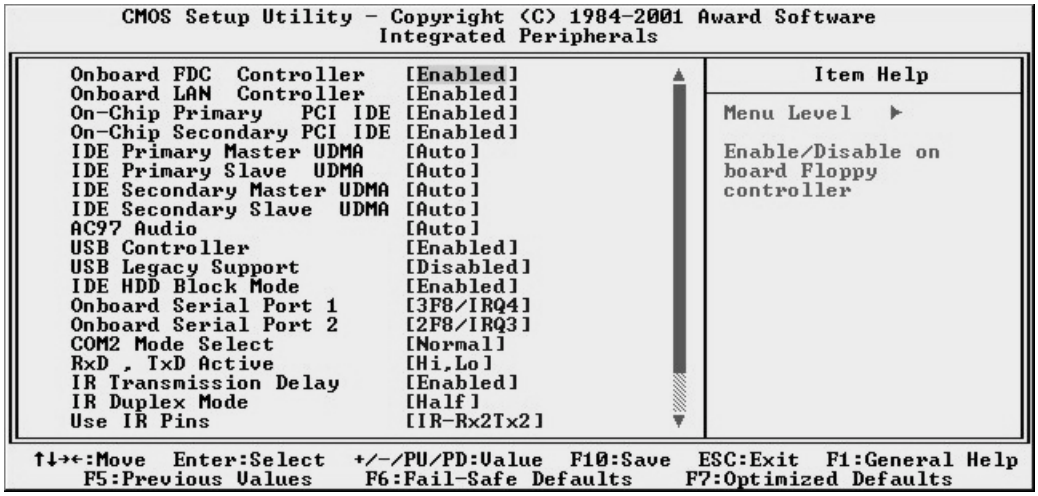
Connecting PS/2 Devices

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. The Operating System you use must support USB to use any USB devices. If your OS can operate in DOS mode, you should enable USB Legacy Support in the Integrated Peripherals section of the CMOS Setup Utility. You can plug and unplug USB devices when the system is turned on.

CMOS Setup Utility – Integrated Peripherals



Enable “USB Legacy Support” if you will use a USB keyboard with an OS that can operate in DOS mode.

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.

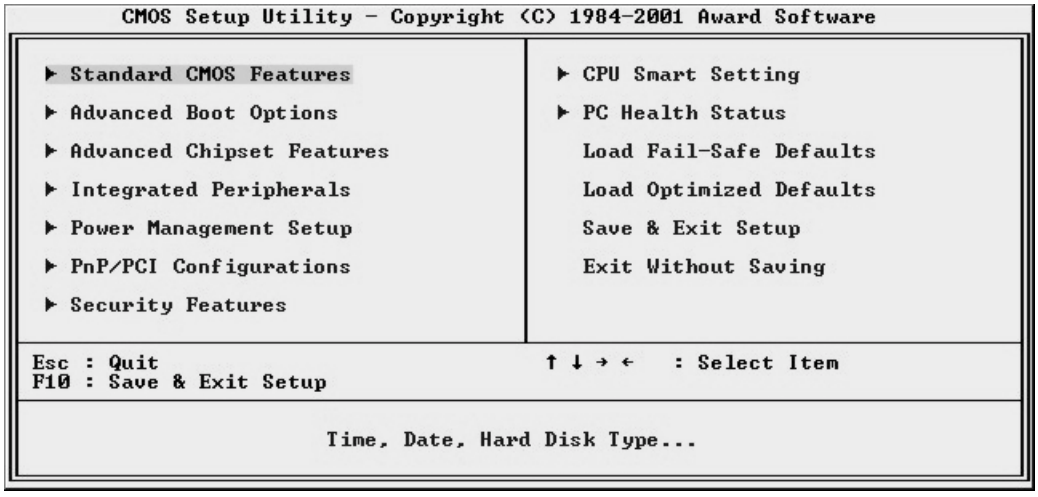
The CMOS Setup Utility User Interface

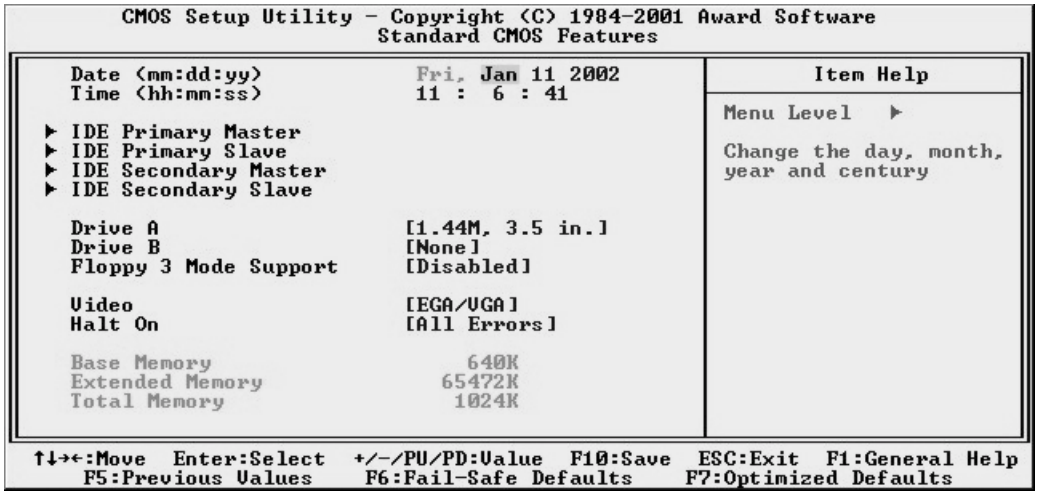
The CMOS Setup Utility user interface is simple and largely self evident. The utility can only be operated from the keyboard and all commands are keyboard commands. The utility does not support mouse use. The commands are straightforward and those available for the program section you are in are listed 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 Boot Options
- Advanced Chipset features
- Integrated Peripherals
- Power Management Setup
- PnP/PCI Configurations
- Security Features
- CPU Smart Setting
- PC Health Status

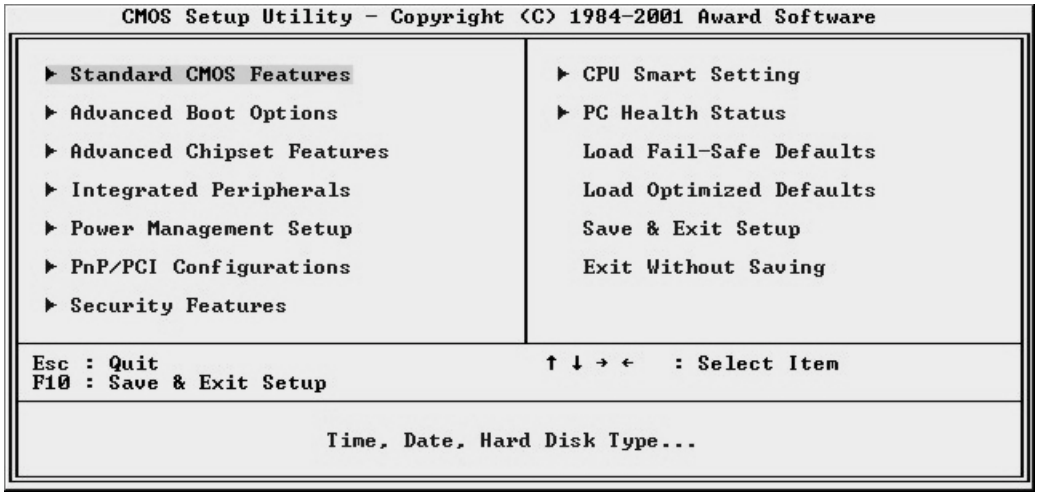
The main screen also has these command options:

- Load Fail-Safe Defaults
- Load Optimized Defaults
- 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.

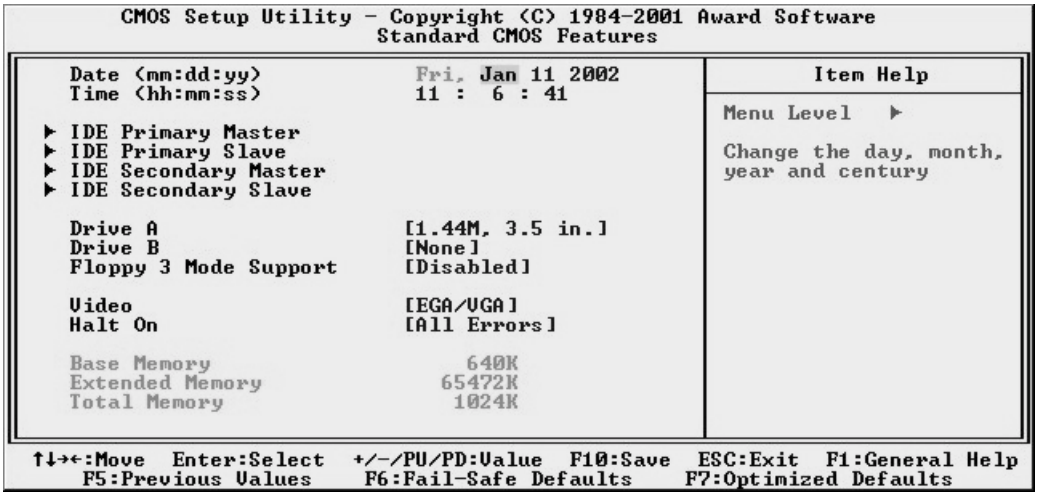
Default & Autodetected Settings

The IDE device settings are autodetected. You shouldn't need to change this. 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.

CMOS Setup Utility – Standard CMOS Features



Advanced Boot Options

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.

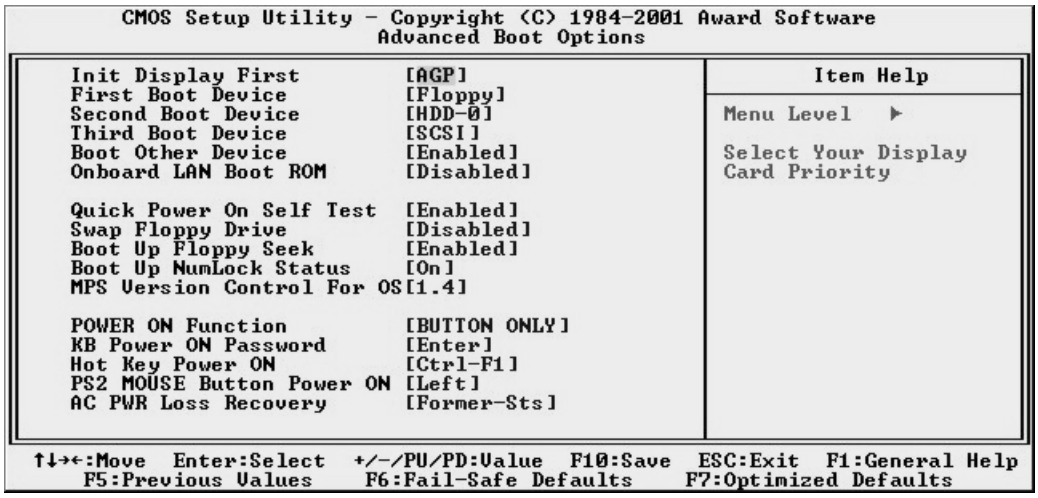
Default & Autodetected Settings

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. You can enter a Keyboard power on password. Don't change the setting for the first line.

CMOS Setup Utility – Advanced Boot Options



Advanced Chipset Features

Main Section Functions

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

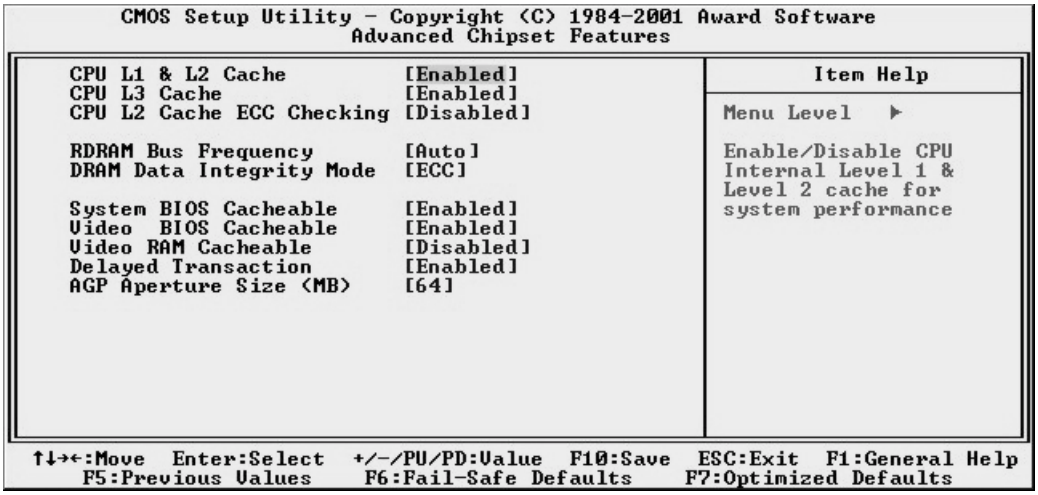
Default & Autodetected Settings

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

Setting Options & Constraints

Don't change anything in this section except the AGP Aperture, which you can adjust if needed. The default setting will work.

CMOS Setup Utility – Advanced Chipset Features



Integrated Peripherals

Main Section Functions

Configures the peripheral features integrated onto the motherboard.

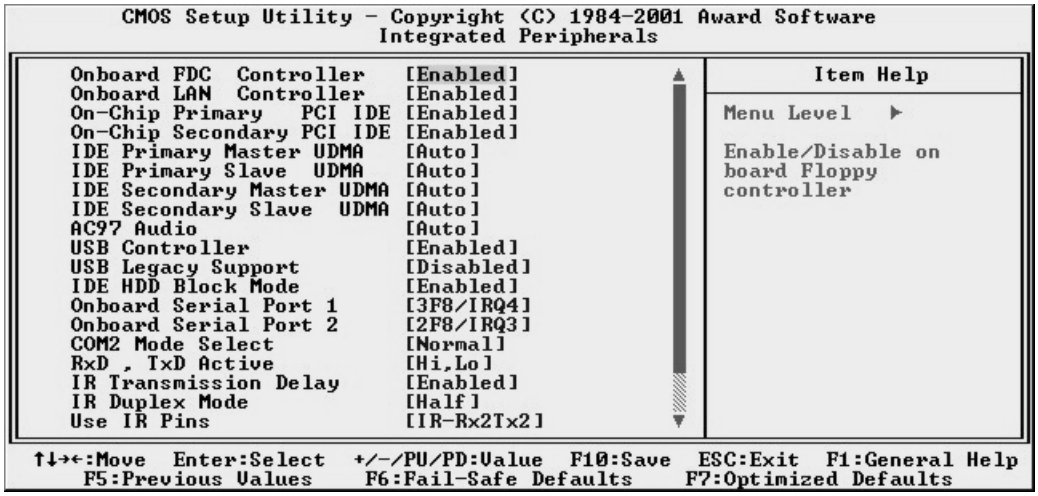
Default & Autodetected Settings

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 install an IR port module, you have to set the "COM2 Mode Select" line to the appropriate IR setting.

CMOS Setup Utility – Integrated Peripherals



Power Management Setup

Main Section Functions

Configures power management settings. These are overridden by ACPI power management.

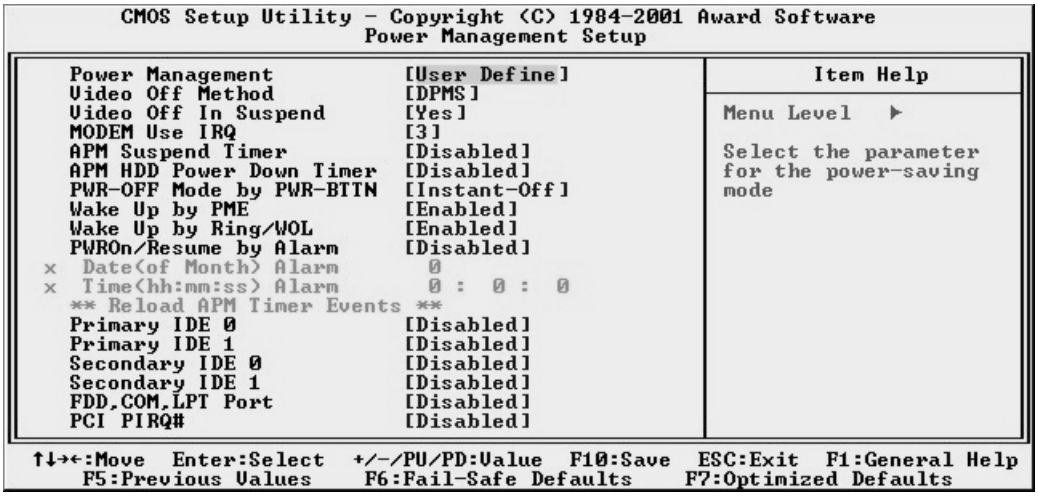
Default & Autodetected Settings

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. You can also set a date and time for the system to turn on or wake up.

CMOS Setup Utility – Power Management Setup



PnP/PCI Configurations

Section Function

Configures Plug and Play and other PCI bus settings.

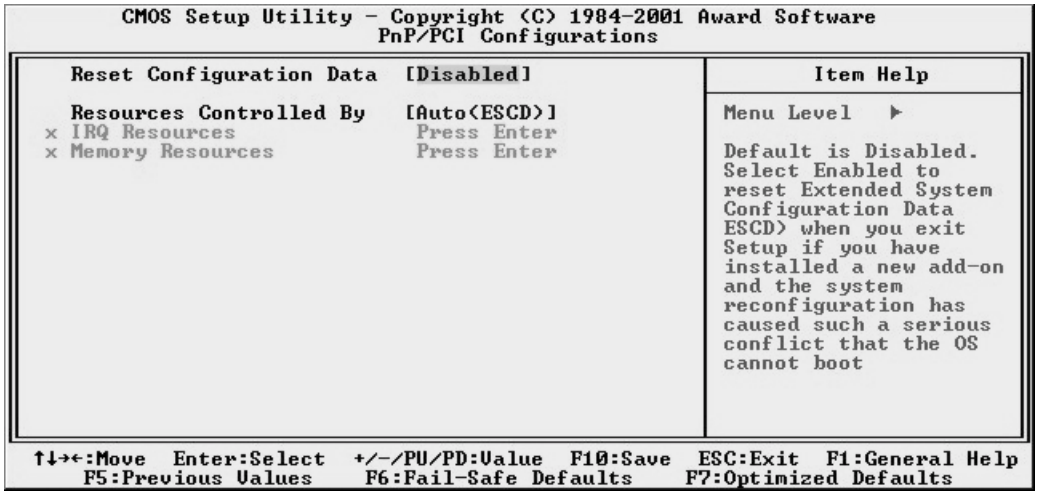
Default & Autodetected Settings

The default is for the BIOS to control these functions.

Setting Options & Constraints

Don't change the resource settings, they're set to be handled automatically by the BIOS. If you have a problem after you install an expansion card, set "Reset Configuration Data" to Enabled to rewrite the ESCD.

CMOS Setup Utility – PnP/PCI Configurations



Security Features

Section Function

Sets passwords and other security features. Enables the OS dual boot menu.

Default & Autodetected Settings

All the selection items on this screen are optimized defaults. Passwords must be entered by the User. See the "Using System Features" section in Chapter 6 for instructions on how to set and use passwords.

Setting Options & Constraints

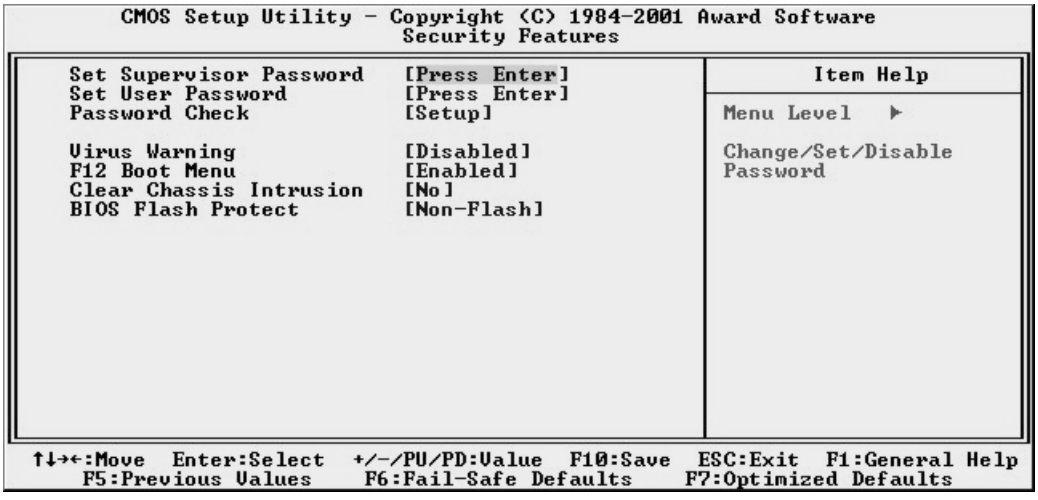
"Virus Warning" checks the boot sector of the first hard disk and warns when it is rewritten. You can enable this feature.

"F12 Boot Menu" displays an OS selection menu at boot up. If there is only one OS, it does not appear.

"Clear Chassis Intrusion" controls whether or not to clear an intrusion message the next time the computer boots up. A system housing intrusion message appears on screen at boot-up when an intrusion has occurred.

"BIOS Flash Protect" controls Flash ROM protection from the BIOS. Don't change the setting to Flashable unless you need to update the system BIOS.

CMOS Setup Utility – Security Features



CPU Smart Setting

Section Function

Automatically configures CPU settings.

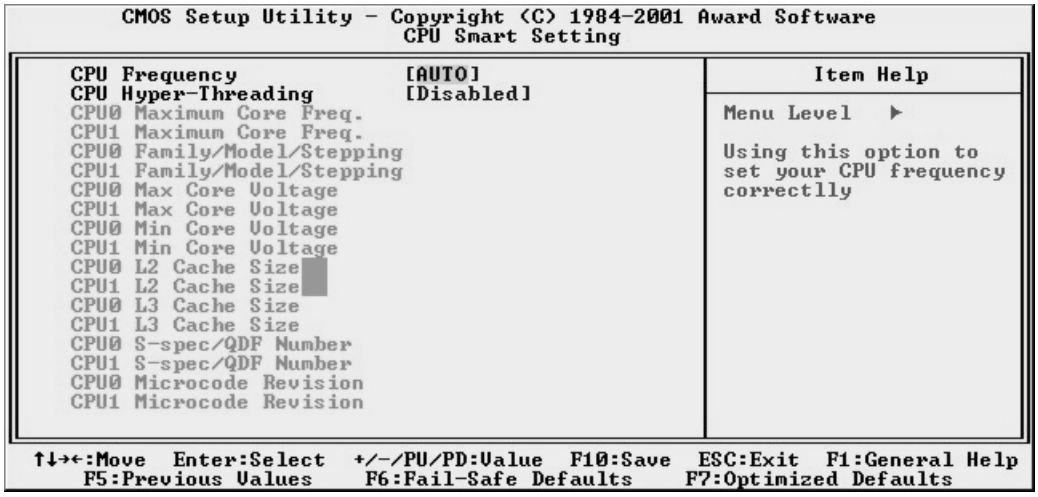
Default & Autodetected Settings

The default setting is to autodetect CPU settings. Don't change the second line.

Setting Options & Constraints

Don't change the Auto setting. It is possible to set the CPU internal frequency yourself, but we do not recommend this. The rest of the screen display detected CPU specifications.

CMOS Setup Utility – CPU Smart Setting



PC Health Status

Section Function

Configures cooling fan settings and displays detected system information.

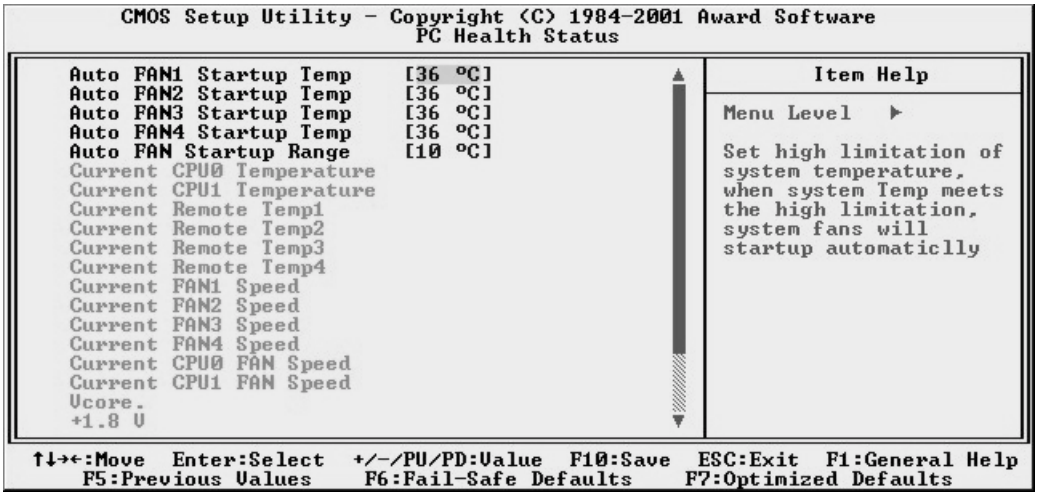
Default & Autodetected Settings

The Fan startup temperature settings are optimized defaults. The list of system information is autodetected and displayed.

Setting Options & Constraints

You can change the Fan startup temperature settings and range though we don't recommend this unless you know what you're doing.

CMOS Setup Utility – PC Health Status



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. You only need to do this if the configuration record has been corrupted or mistakenly configured and 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 then press Enter again.

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.

Installing an OS & Support Software

This section covers installing Operating System software and the support software on the Power Installer 2 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 2 disc.

Installing an Operating System

This motherboard is intended to use the following Operating Systems:

- Microsoft Windows NT 4.0
- Microsoft Windows 2000
- Microsoft Windows XP Professional
- Red Hat Linux (or compatible distribution)

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

Multi-boot Option

If you install more than one OS, you can use the BIOS level multi-boot feature which is enabled by default. With two OS installations, for example Windows and Linux, when the system boots, a boot selection menu will appear and let you select which OS to boot.

Installing the Support Software

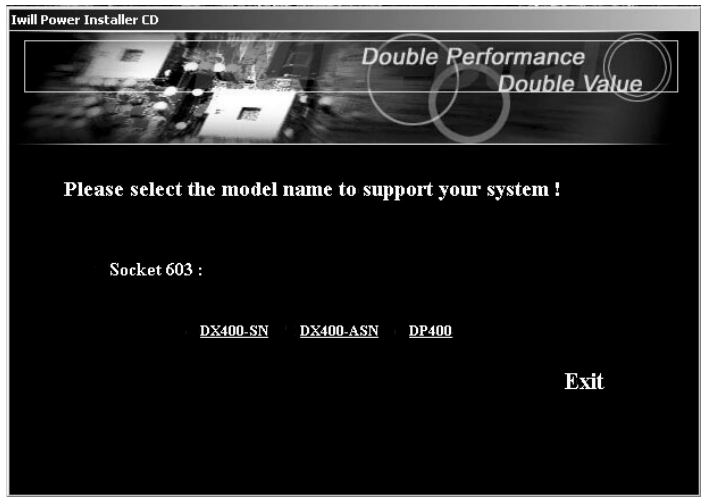
The Power Installer CD-ROM disc comes with required hardware drivers for Microsoft Windows and some additional utility software, as noted in Chapter 2. If you have installed a supported Microsoft OS, you must install the required drivers. If you have install Linux, you will need to create driver disks.

Installing Windows Drivers

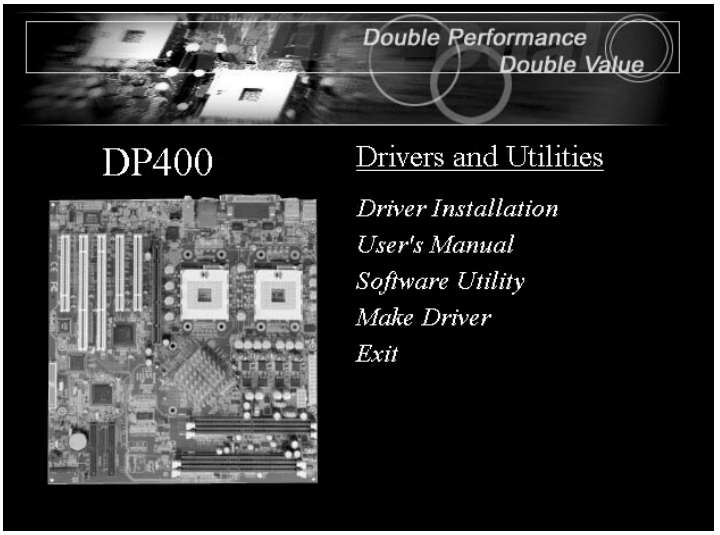
This section assumes you have installed one of the supported Microsoft Operating Systems on the system hard disk drive.

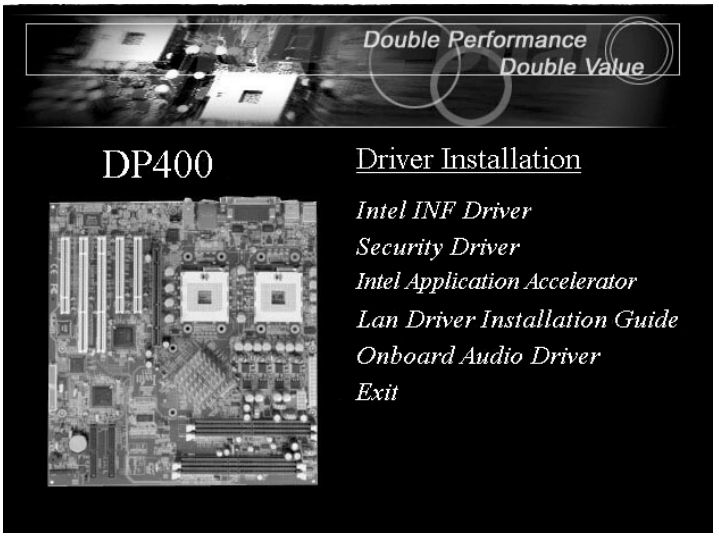
To install Windows drivers, insert the Power Installer 2 CD-ROM disc in the system's CD-ROM (or other optical drive) and wait for the Power Installer 2 interface to automatically load. If it doesn't start, run the Power Installer interface directly from the disc by running Setup.

The Power Installer main screen will appear. Click on this motherboard's model number to open the section for this board.



The “Driver and Utilities” screen will appear. Click on “Driver Installation” and the Driver Installation screen will appear.





Install the first three items for the Intel Chipset in sequence by clicking on them and following the install program instructions.

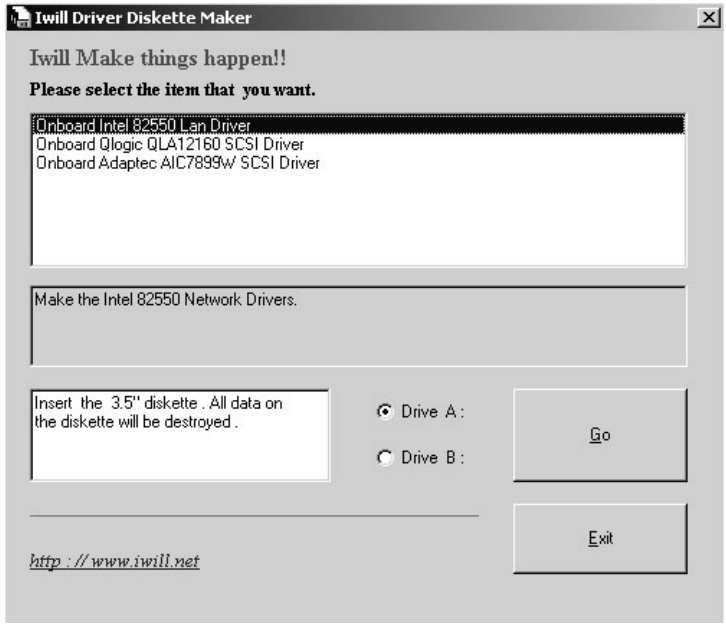
Next install the "Onboard Audio Driver" in the same way.

Finally, review the "Lan Driver Installation Guide" for the OS you have installed and install the appropriate LAN driver for that OS.

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

Making Driver Discs

You can make driver floppy disks by running the "Make Driver" utility from the Drivers and Utilities screen. Follow the screen interface, which is self-evident to make driver disks.



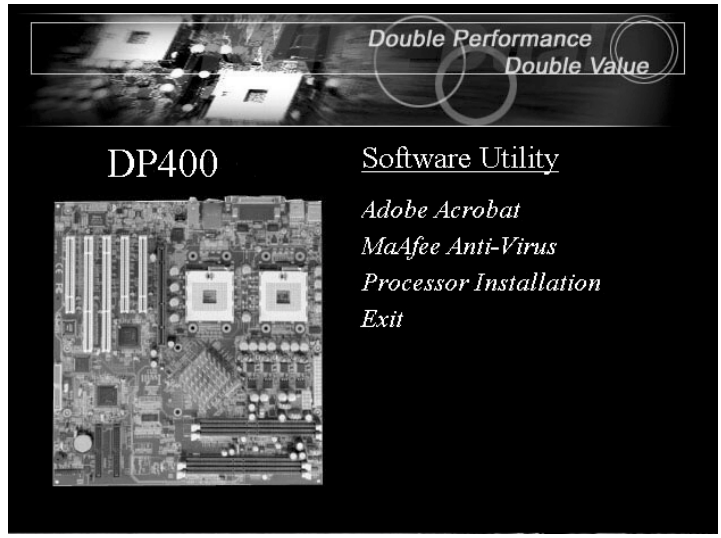
Making & Installing Linux Drivers

You can boot the system from the Power Installer 2 disc. The system will boot from the Linux kernel on the disc and you can use the driver disk creator that loads to create Linux driver disks. You can then install these drivers according to the instructions for driver installation from your Linux distribution.

Installing the Utility Software

To install the utility software bundled on the Power Installer 2 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 also view the Xeon Processor Installation video from here. It will run automatically in the default MPEG payer software, which is likely to be Windows Media Player.



In This Chapter:

Using System Features
- Front Panel Controls & Indicators
- Additional System Features
- Installing & Configuring An IR Port

Performance Optimization
Troubleshooting

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 "PWR-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.
- 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

There are two additional system features, LAN LED indicators and Wake On LAN.

LAN Indicator LEDs

The RJ-45 LAN jack on the rear I/O panel has two indicator LEDs mounted above it.

- Activity LED (on left)
  Flashes when the LAN connection is active.
- Link LED (on right)
  Lights to indicate the LAN is connected.

Wake-on LAN (WOL)

Function: The system "wakes up", i.e. resumes from a Suspend state, in response to a signal arriving over a LAN that it is connected to.

Use: The onboard LAN interface supports the WOL feature. In addition, the onboard WOL connector supports connection to an additional PCI Network Interface Card. The WOL cable from the card connects to the WOL connector on the board.

The feature is enabled by default in the Power Management section of the CMOS Setup Utility and functions automatically.

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.

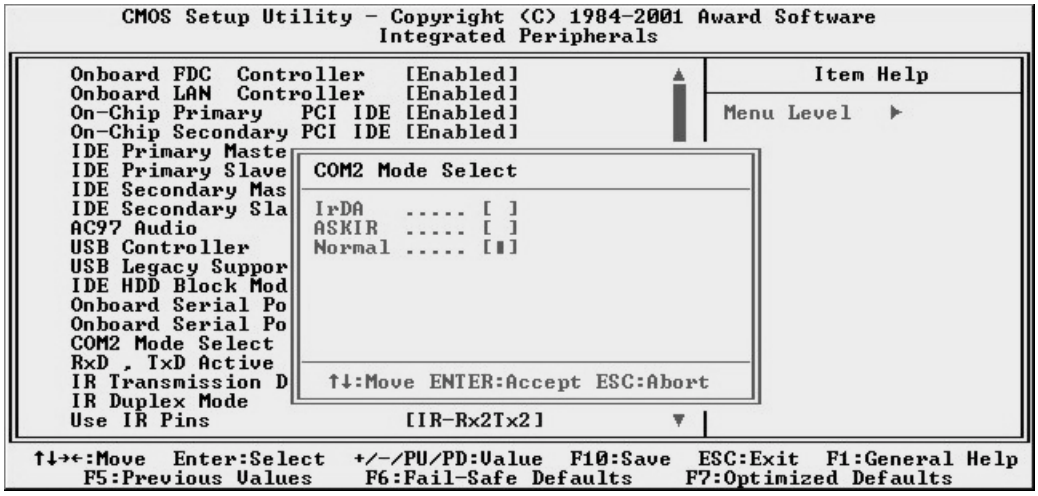
Installing an IR port module requires an expansion slot opening unless the system housing has a built-in IR port with a cable to connect to the motherboard.

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 IR pin header connector on the motherboard. It is beside the PCI2 expansion slot.
4. Remove the expansion slot cover in the system housing that corresponds to the PCI2 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 "COM2 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

COM2 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 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

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 adding a SCSI controller card and SCSI disk drive. A SCSI disk controller with high-speed SCSI hard disk drives will provide a substantial performance enhancement.

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 Xeon 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.

Remember that if you install dual processors, they must have the same specification. If you upgrade one, you must upgrade both.

The CMOS Setup Utility's CPU Smart Setting feature will automatically detect and configure whatever processors are installed. The Intel Xeon processor should not be set to operating parameters outside those specified.

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 RIMMs 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.
- Make sure the processor and its 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

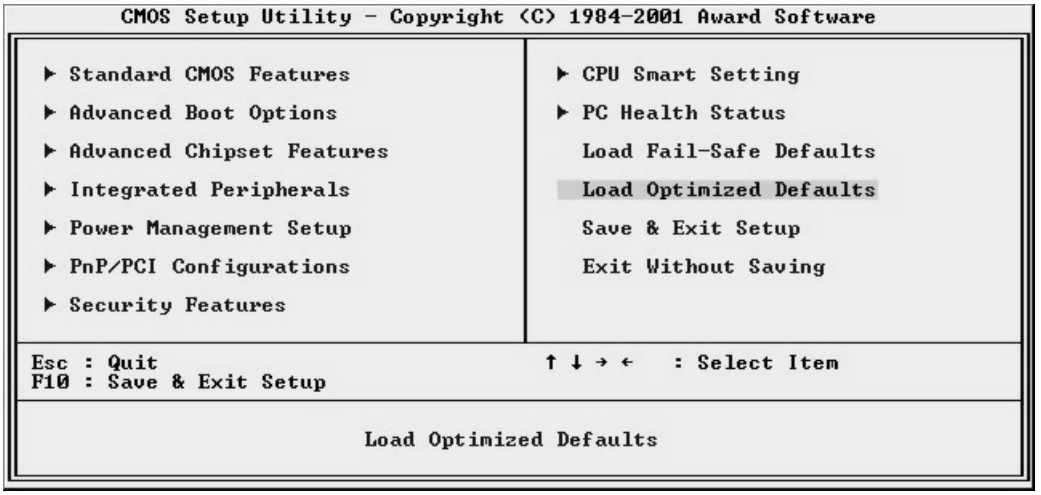
The BIOS Setup Utility does not require an operating system to run. You run the utility by typing the Del or Delete key while the system is starting up to brings up the utility's main screen.

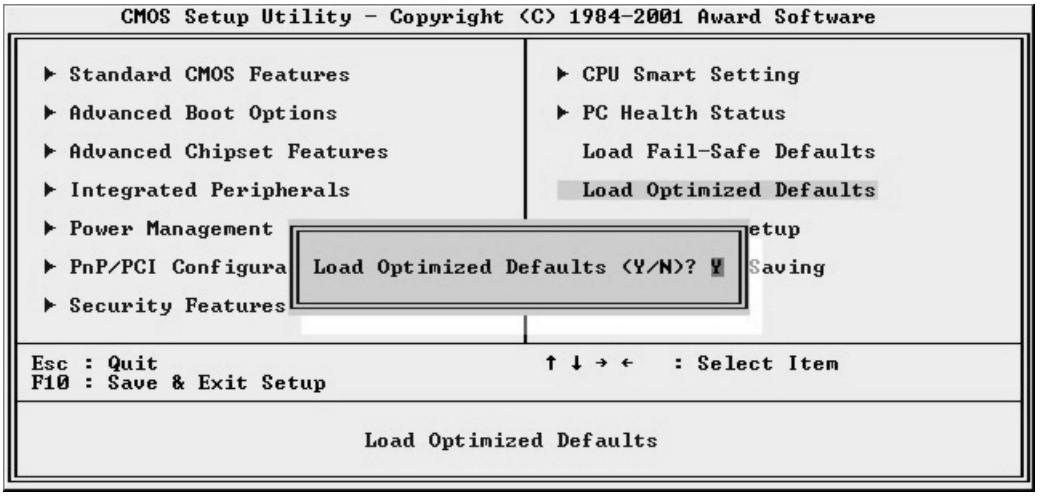
There are two sets of defaults listed, Optimized and Fail-Safe. The Fail-Safe Defaults are a minimum configuration set for use by technicians when troubleshooting system problems. The Optimized Defaults are what the system normally operates on. If a corrupted system configuration record caused the problem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

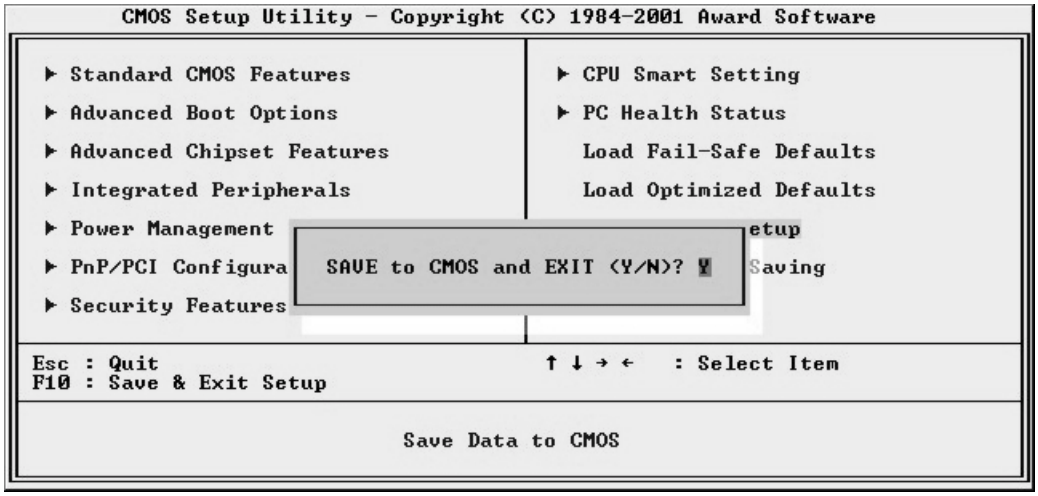
1. Select the “Load Optimized Defaults” item.

2. Press the Enter Key. A confirmation message will appear 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.

Item	Description
CPU	
	Supports Intel DP Foster (socket 603) & Next Generation processors (Prestonia)
	Supports all CPUs speed
Chipset	
	Intel 860 chipset
	MCH (1012 OLGA) – Memory & Graphics controller
	ICH2 (360 EBGA) – I/O controller
	FWH (32 PLCC) – BIOS & Management controller
	P64H (241 mBGA) – 64-bit Bus Master PCI Expander
Memory	
	One board RIMM x 4
	Supports PC600 and PC800 DRDRAM modules
	Supports maximum memory size up to 2GB
I/O Control	
	Winbond W83627HF SIO low pin count (LPC)interface I/O controller
Graphics	
	AGP universal connector support AGP4X/AGP Pro 50
Audio	
	Analog Device Audio Codec '97
LAN	
	Intel 82550EY Lan Controller
	RJ45 Lan connector
Peripheral Interfaces	
	Supports one floppy connector
	Supports two ATA/100 IDE connectors
	Supports two external COM connector
	Supports one external Parallel connector
	Supports four external USB 1.1 connectors
	Supports one external PS/2 keyboard connector
	Supports one external PS/2 mouse connector
	Supports one Front-Panel connector
PCI	
	Supports three 32-bit/33MHz Bus Master PCI slot
	Supports two 64-bit/66MHz Bus Master PCI slots

H/W Monitoring
- Supports Voltage sense to detect out of range values
- Supports 4 Fan Speed Monitoring and Control
- Supports 5 Temperature Monitoring
- (Three for system and two for processor temperature)
- Supports Chassis Intrusion detecting

Management
- Resume by LAN/Ext. Modem/PS2 keyboard/PS2 mouse
- Supports ACPI
- Supports APM
- Supports PnP
- Supports BIOS Flash Control to provide H/W & S/W BIOS protection
- Supports AC-Loss Recovery

Software
- OS focus on Windows NT 4.0/2000/XP & Redhat Linux
- Corelogic Patch utility for Windows 2000
- H/W Monitoring utility for Windows NT 4.0/Windows 2000

Power Supply
- Requires new WTX 430W connector, provided by NMB power supply

Form Factor
- 6-layer PCB design
- Extended ATX form-factor 305mm x 330mm
- Supports EEB 3.0 specification