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M938 Series, V3.1  
S645DX/May 2003**

## Notice:

Owing to Microsoft's certifying schedule is various to every supplier, we might have some drivers not certified yet by Microsoft. Therefore, it might happen under Windows XP that a dialogue box (shown as below) pop out warning you this software has not passed Windows Logo testing to verify its compatibility with Windows XP. Please rest assured that our RD department has already tested and verified these drivers. Just click the "Continue Anyway" button and go ahead the installation.



## Table of Contents

Chapter 1: Introduction.....	1
Key Features.....	2
Package Contents.....	5
Static Electricity Precautions.....	6
Pre-Installation Inspection.....	6
Chapter 2: Mainboard Installation.....	7
Mainboard Components.....	8
I/O Ports.....	8
Installing the Processor.....	9
Installing Memory Modules.....	10
Setting Jumper Switches.....	11
Install the Mainboard.....	12
Connecting Optional Devices.....	13
Install Other Devices.....	15
Expansion Slots.....	17
Chapter 3: BIOS Setup Utility.....	18
Introduction.....	18
Running the Setup Utility.....	19
Standard CMOS Setup Page.....	20
Advanced Setup Page.....	21
Power Management Setup Page.....	24
PCI/Plug and Play Setup Page.....	25
Load Optimal Settings.....	26
Load Best Performance Settings.....	26
Features Setup Page.....	27
CPU PnP Setup Page.....	28
Hardware Monitor Page.....	29
Change Password.....	30
Exit.....	30
Chapter 4: Software & Applications.....	31
Introduction.....	31
Installing Support Software.....	32
Bundled Software Installation.....	34
Appendix:Hyper Threading CPU.....	35



## Chapter 1

### Introduction

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This mainboard has a **Socket-478** processor socket for **Intel Pentium 4/Hyper Threading Technology** processors with front-side bus (FSB) speeds up to **533 MHz**. Hyper Threading Technology, designed to take advantage of the multitasking features in Windows XP, gives you the power to do more things at once.

This mainboard integrates the **SiS645DX/650GX/651** Northbridge along with **SiS962L** Southbridge chipsets that supports built-in **AC97 Codec**, **2 DDR** modules up to 2GB system memory, and provides **Ultra DMA 33/66/100/133** function. These chipsets' function is detailed as the Chipset description in next section. This mainboard integrates a **256-bit 3D/2D Graphics Engine**, Video Accelerator and Advanced Hardware Acceleration **MPEGI/MPEGII Video Decoder** for the Intel Pentium 4 series based PC systems. It has the external AGP slot with **AGP 4X 266MHz** capability, one **CNR** (Communications and Networking Riser) slot, and built-in **10BaseT/100BaseTX Network Interface**(optional). In addition, there is a full set of **I/O Ports** including PS/2 keyboard and mouse ports, one serial port, one VGA port, one parallel port, and maximum six USB2.0 ports – four back-panel ports and onboard USB header JUSB1 providing two extra ports by connecting the Extended USB Module to the mainboard.

This mainboard is **ATX size** and has power connectors for an **ATX** power supply and measures 305 x 190mm.

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**Note: You must initiate the HT CPU function through BIOS setup. It is strongly recommended you refer to the Appendix (page 35) for relative details.**

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## Key Features

The key features of this mainboard include:

### Socket-478 Processor

- ◆ The PGA Socket 478
- ◆ Supports **Intel Pentium 4 series** CPU with/without **Hyper-Threading** Technology
- ◆ Supports up to **533 MHz** Front-Side Bus

### Chipset

There are **SiS645DX/650GX/651 Northbridge** and **SiS962L Southbridge** in this chipset in accordance with an innovative and scalable architecture with proven reliability and performance. Here is a list of the chipset arrangement and their respective features:

Northbridge	Southbridge	Function
SiS645DX	962L	CPU FSB: 533MHz, Ultra DMA ATA133, <b>DDR333</b> , USB2.0 Supports <b>Hyper-Threading CPU, without VGA</b>
SiS650GX	SiS962L	CPU FSB: 533MHz, Ultra DMA ATA133, <b>DDR266</b> , USB2.0
SiS651	SiS962L	CPU FSB: 533MHz, Ultra DMA ATA133, <b>DDR333</b> , USB2.0 Supports <b>Hyper-Threading CPU</b>

### Memory Support

- ◆ Two 184-pin DIMM slots for DDR memory modules
- ◆ Maximum installed memory is 2GB

### Expansion Slots

- ◆ One CNR slot
- ◆ One 2x/4xAGP slot for AGP 2.0-compliant interface
- ◆ Five 32-bit PCI slots for PCI 2.2-compliant bus interface

### Onboard IDE channels

- ◆ Primary and Secondary PCI IDE channels
- ◆ Support for PIO (programmable input/output) modes

- ◆ Support for Multiword DMA modes
- ◆ Support for Bus Mastering and Ultra DMA ATA 33/66/100/**133** modes

### **Power Supply and Power Management**

- ◆ ATX power supply connector
- ◆ Meets ACPI 1.0b and APM 1.2 requirements, keyboard power on/off
- ◆ Supports RTC Alarm, Wake On Modem, AC97 Wake-Up and USB Wake-Up

### **Onboard VGA**

- ◆ Supports AGP V2.0 Compliant
- ◆ Supports **AGP 4X/2X** interface and Fast Write Transaction
- ◆ Supports high performance & high quality 3D Accelerator—A built-in 256-bit 3D engine, up to 143 MHz 3D engine clock speed
- ◆ Supports high performance 128-bit 2D Accelerator—Ultra-AGP II™ 2GB/s data read for all 2D engine functions
- ◆ Maximum Share Memory size is 64MB

### **AC97 Audio Codec**

- ◆ 6-CH hardware architecture allows multi-channel south bridge to playback 6CH audio
- ◆ Intel® AC'97 (REV. 2.2) compatible, meeting Microsoft® PC2001 requirements
- ◆ Built-in earphone buffer and internal PLL, the latter saving additional crystal
- ◆ Line-in/rear out share the same jack; Center/bass share the MIC jack
- ◆ Digital S/PDIF OUT Support
- ◆ CRL® 3D: HRTF based BS3D compatible audio engine

### **Built-in Ethernet LAN (optional)**

- ◆ **10Base-T/100Base-TX Physical Layer Solution**
- ◆ Dual Speed – 100/10 Mbps
- ◆ MII Interface to Ethernet Controller/Configuration & Status
- ◆ Auto Negotiation: 10/100, Full/Half Duplex

- ◆ Meet All Applicable IEEE802.3, 10Base-T and 100Base-TX Standards

### **Onboard I/O Ports**

The mainboard has a full set of I/O ports and connectors:

- ◆ Two PS/2 ports for mouse and keyboard
- ◆ One serial port
- ◆ One parallel port
- ◆ One VGA port
- ◆ Four back-panel USB2.0 ports and extra two USB2.0 ports (onboard USB header JUSB1)
- ◆ Audio jacks for microphone, line-in and line-out

### **Hardware Monitoring**

- ◆ Built-in hardware monitoring for CPU & System temperatures, fan speeds and mainboard voltages.

### **Onboard Flash ROM**

- ◆ Supports Plug and Play configuration of peripheral devices and expansion cards

### **USB 2.0**

- ◆ Compliant with Universal Serial Bus Specification Revision 2.0
- ◆ Compliant with Intel's Enhanced Host Controller Interface Specification Revision 0.95
- ◆ Compliant with Universal Host Controller Interface Specification Revision 1.1
- ◆ PCI multi-function device consists of two **UHCI Host Controller** cores for full-/low-speed signaling and one **EHCI Host Controller** core for high-speed signaling
- ◆ Root hub consists 4 downstream facing ports with integrated physical layer transceivers shared by **UHCI** and **EHCI** Host Controller
- ◆ Support PCI-Bus Power Management Interface Specification release 1.1
- ◆ Legacy support for all downstream facing ports

### Bundled Software

- ◆ **PC-Cillin2002** provides automatic virus protection under Windows 98/ME/NT/2000/XP
- ◆ **MediaRing Talk** provides PC to PC or PC to Phone internet phone communication
- ◆ **3Deep** delivers the precise imagery and displays accurate color in your monitor
- ◆ **PC DJ** is a dual-MP3 player that enables users to actually mix music right on their own personal computers.
- ◆ **Adobe Acrobat Reader V5.0** is the software to help users read .PDF files.

### Dimensions

- ◆ ATX form factor 305 x 190mm

### Package Contents

**Attention:** This mainboard serial has three models, M938HLU(SiS651 NB+ SiS962L SB, Hyper-Threading CPU, LAN, USB2.0), M938HLUX(SiS645DX NB+ SiS962L SB, Hyper-Threading CPU, LAN, USB2.0, without VGA), and M938LU(SiS650GX NB+ SiS962L SB, LAN, USB2.0). Please contact your local supplier for more information about your purchased model. Each model will support different specification listed as below:

Model	Specification
M938HLU	SiS651 NB+ SiS962L SB, Hyper-Threading CPU, onboard LAN PHY chip, RJ-45 LAN connector, USB2.0
M938HLUX	SiS645DX NB+ SiS962L SB, Hyper-Threading CPU, onboard LAN PHY chip, RJ-45 LAN connector, USB2.0, without VGA
M938LU	SiS650GX NB+ SiS962L SB, onboard LAN PHY chip, RJ-45 LAN connector, USB2.0

Your mainboard package contains the following items:

- The mainboard
- The User's Manual

- ❑ One diskette drive ribbon cable (optional)
- ❑ One IDE drive ribbon cable
- ❑ Software support CD

### **Optional Accessories**

You can purchase the following optional accessories for this mainboard.

- ❑ Extended USB module
- ❑ Card Reader (You can buy your own Card Reader from the third party, but please contact your local Card Reader vendor on any issues of the specification and compatibility.)

### **Static Electricity Precautions**

Components on this mainboard can be damaged by static electricity. Take the following precautions when unpacking the mainboard and installing it in a system.

1. Keep the mainboard and other components in their original static-proof packaging until you are ready to install them.
2. During installation, wear a grounded wrist strap if possible. If you don't have a wrist strap, discharge static electricity by touching the bare metal of the system chassis.
3. Handle the mainboard carefully by the edges. Avoid touching the components unless it is absolutely necessary. During installation put the mainboard on top of the static-protection packaging it came in with the component side facing up.

### **Pre-Installation Inspection**

1. Inspect the mainboard for damage to the components and connectors on the board.
2. If you suspect that the mainboard has been damaged, do not connect power to the system. Contact your mainboard vendor and report the damage.

## Chapter 2

### Mainboard Installation

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To install this mainboard in a system, please follow the instructions in this chapter:

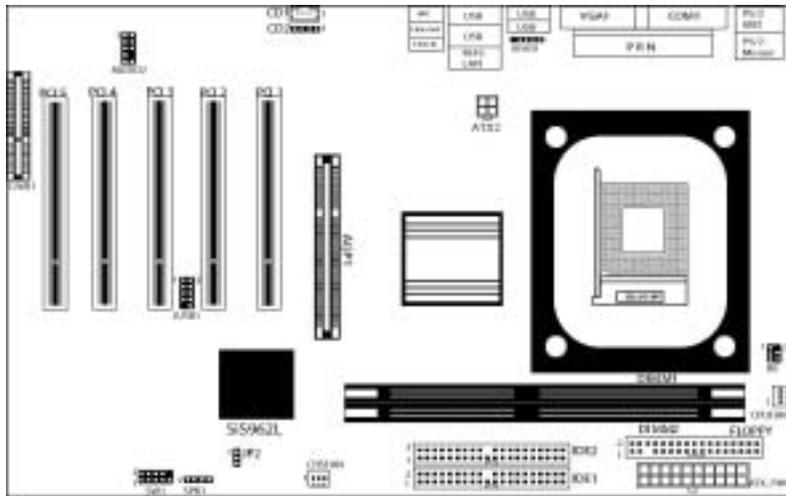
- ❑ Identify the mainboard components
- ❑ Install a CPU
- ❑ Install one or more system memory modules
- ❑ Verify that all jumpers or switches are set correctly
- ❑ Install the mainboard in a system chassis (case)
- ❑ Connect any extension brackets or cables to connecting headers on the mainboard
- ❑ Install other devices and make the appropriate connections to the mainboard connecting headers.

**Note:**

1. Before installing this mainboard, make sure jumper JP2 is under Normal setting. See this chapter for information about locating JP2 and the setting options.
2. Never connect power to the system during installation; otherwise, it may damage the mainboard.

## Mainboard Components

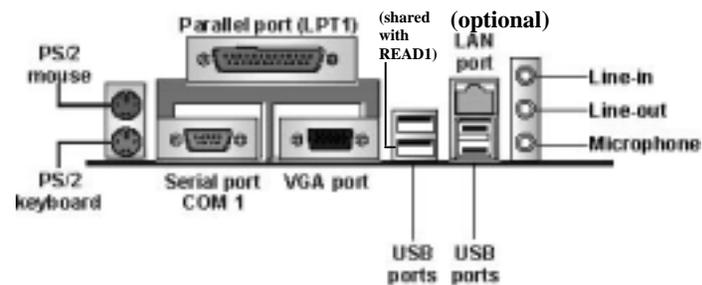
Use the diagram below to identify the major components on the mainboard.



**Note:** Any jumpers on your mainboard not appearing in the illustration above are for testing only.

## I/O Ports

The illustration below shows a side view of the built-in I/O ports on the mainboard.



<b>PS/2 Mouse</b>	Use the upper PS/2 port to connect a PS/2 pointing device.
<b>PS/2 Keyboard</b>	Use the lower PS/2 port to connect a PS/2 keyboard.
<b>LPT1</b>	Use LPT1 to connect printers or other parallel communications devices.
<b>COM1</b>	Use the COM port to connect serial devices such as mice or fax/modems. COM1 is identified by the system as COM1.
<b>VGA</b>	Use the VGA port to connect VGA devices.
<b>LAN Port (optional)</b>	Connect an RJ-45 jack to the LAN port to connect your computer to the Network.
<b>USB Ports</b>	Use the USB ports to connect USB devices. <i>Note: The lower USB port located beside the VGA port is shared with the READ1 connector.</i>
<b>Audio Ports</b>	Use the three audio ports to connect audio devices. The first jack is for stereo Line-In signal. The second jack is for stereo Line-Out signal. The third jack is for Microphone.

## Installing the Processor

This mainboard has a Socket 478 processor socket. When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.

### CPU Installation Procedure

Follow these instructions to install the CPU:

1. Unhook the CPU socket's locking lever by pulling it away from socket and raising it to the upright position.
2. Match the pin 1 corner of CPU socket to the one of processor, and insert the processor into the socket. Do not use force.
3. Push the locking lever down and hook it under the latch on the edge of socket.

4. Apply thermal grease to the top of the CPU.
5. Lower the CPU fan/heatsink unit onto the CPU and CPU socket, and then use the retention module clamps to snap the fan/heatsink into place.
6. Plug the CPU fan power cable into the CPU cooling fan power supply (CPUFAN) on the mainboard.

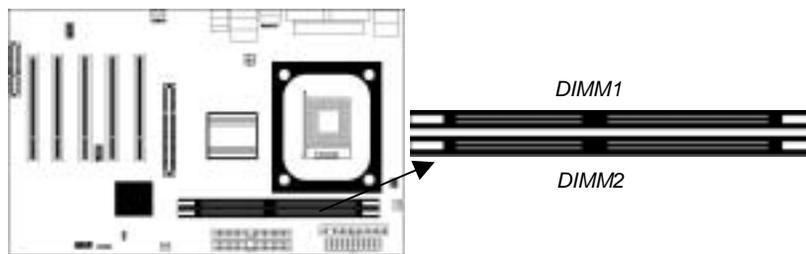
## Installing Memory Modules

This mainboard accommodates two 184-pin 2.5V unbuffered Double Data Rate SDRAM (DDR SDRAM) Dual Inline Memory Module (DIMM) sockets, and supports up to 2.0 GB of 266/333 MHz DDR SDRAM.

DDR SDRAM is a type of SDRAM that supports data transfers on both edges of each clock cycle (the rising and falling edges), effectively doubling the memory chip's data throughput. DDR DIMMs can synchronously work with 100 MHz or 133 MHz memory bus.

DDR SDRAM provides 1.6 GB/s or 2.1 GB/s data transfer rate depending on whether the bus is 100 MHz or 133 MHz.

DDR SDRAM uses additional power and ground lines and requires 184-pin 2.5V unbuffered DIMM module.



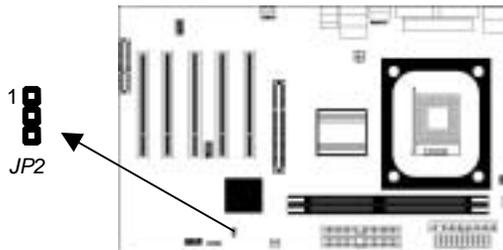
### Installation Procedure

These modules can be installed with up to 2 GB system memory. Refer to the following steps to install the memory module.

1. Push the latches on each side of the DIMM socket down.
2. Align the memory module with the socket. The DIMM sockets are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
3. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM socket.
4. Install the DIMM module into the socket and press it firmly down until it is seated correctly. The socket latches are levered upwards and latch on to the edges of the DIMM.
5. Install any remaining DIMM modules.

## Setting Jumper Switches

Jumpers are sets of pins that can be connected together with jumper caps. The jumper caps change the way the mainboard operates by changing the electronic circuits on the mainboard. If a jumper cap connects two pins, we say the pins are **SHORT**. If a jumper cap is removed from two pins, the pins are **OPEN**.



### **Jumper JP2: Clear CMOS Memory**

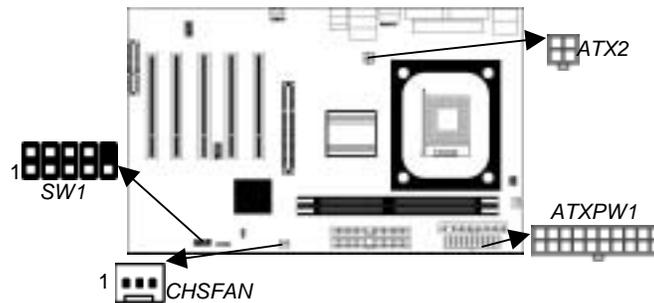
This jumper can clear the contents of the CMOS memory. You may need to clear the CMOS memory if the settings in the Setup Utility are incorrect and prevent your mainboard from operating. To clear the CMOS memory, disconnect all the power cables from the mainboard and then move the jumper cap into the **CLEAR** setting for a few seconds.

Function	Jumper Setting
Clear CMOS	Short Pins 1-2
Normal Mode	Short Pins 2-3

## Install the Mainboard

Install the mainboard in a system chassis (case). The board is a Micro ATX size mainboard. You can install this mainboard in an ATX case. Ensure your case has an I/O cover plate that matches the ports on this mainboard.

Install the mainboard in a case. Follow the instructions provided by the case manufacturer using the hardware and internal mounting points on the chassis.



Connect the power connector from the power supply to the **ATXPW1** connector on the mainboard. **ATX2** is the CPU Vcore power connector.

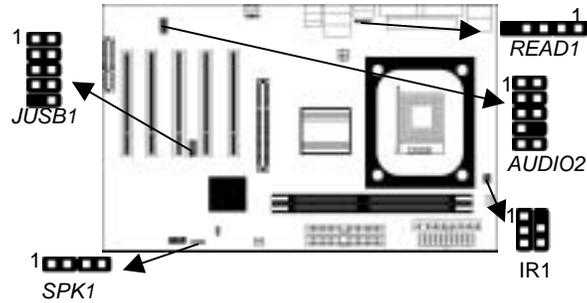
If there is a cooling fan installed in the system chassis, connect the cable from the cooling fan to the **CHSFAN** fan power connector on the mainboard.

Connect the case switches and indicator LEDs to the **SW1** header.

Pin	Signal	Pin	Signal
1	HDD_LED_P	2	FP ACPI LED
3	HDD_LED_N	4	FP ACPI LED
5	RST_SW_N	6	PW_BT_P
7	RST_SW_P	8	PW_BT_N
9	RSVD_DNU	10	KEY

## Connecting Optional Devices

Refer to the following for information on connecting the mainboard's optional devices:



### SPK1: Speaker Connector

Connect the cable from the PC speaker to the **SPK1** header on the mainboard.

Pin	Signal	Pin	Signal
1	SPKR	2	NC
3	GND	4	+5V

### AUDIO2: Front Panel Audio Header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal	Pin	Signal
1	AUD_MIC	2	AUD_GND
3	AUD_MIC	4	AUD_VCC
5	AUD_FPOUT	6	AUD_RET_R
7	NC	8	KEY
9	AUD_FPOUT	10	AUD_RET_L

### JUSB1: Front panel USB Connector

The mainboard has USB ports installed on the rear edge I/O port array. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector USB3 to connect the front-mounted ports to the mainboard.

Pin	Signal	Pin	Signal
1	VCC	2	VCC
3	DATA1-	4	DATA2-
5	DATA1+	6	DATA2+
7	GND	8	GND
9	KEY	10	NC

1. Locate the JUSB1 header on the mainboard.
2. Plug the bracket cable onto the JUSB1 header.
3. Remove a slot cover from one of the expansion slots on the system chassis. Install an extension bracket in the opening. Secure the extension bracket to the chassis with a screw.

### READ1: USB Card Reader Connector (optional)

This connector is for connecting internal USB card reader. You can use a card reader to read or transfer files and digital images to your computer.

Pin	Signal	Pin	Signal
1	VCC	2	USB-
3	USB+	4	GND
5	KEY		

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❗ The JUSBC is shared with one of the USB ports of the I/O back panel. The USB port is located beside the serial port connectors. See “I/O Ports” for more information.

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❗ Please check the pin assignment of the cable and the USB header on the mainboard. Make sure the pin assignment will match before plugging in. Any incorrect usage may cause unexpected damage to the system. The vendor won't be responsible for any incidental or consequential damage arising from the usage or misuse of the purchased product.

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### IR1: Infrared Port

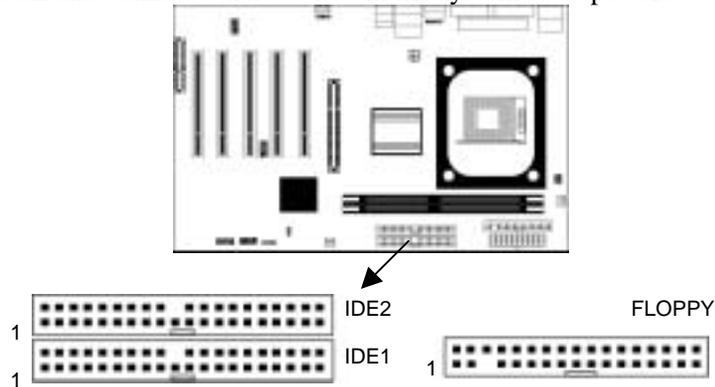
The infrared port allows the wireless exchange of information between your computer and similarly equipped devices such as printers, laptops, Personal Digital Assistants (PDAs), and other computers.

Pin	Signal	Pin	Signal
1	NC	2	KEY
3	+5V	4	GND
5	IRTX	6	IRRX

1. Locate the infrared port **IR1** header on the mainboard.
2. If you are adding an infrared port, connect the ribbon cable from the port to the IR1 header and then secure the port to an appropriate place in your system chassis.

## Install Other Devices

Install and connect other devices in the system as steps below.



### Floppy Disk Drive

The mainboard ships with a floppy disk drive cable that can support one or two drives. Drives can be 3.5" or 5.25" wide, with capacities of 360K, 720K, 1.2MB, 1.44MB, or 2.88MB.

Install your drives and connect power from the system power supply. Use the cable provided to connect the drives to the floppy disk drive connector **FLOPPY**.

### IDE Devices

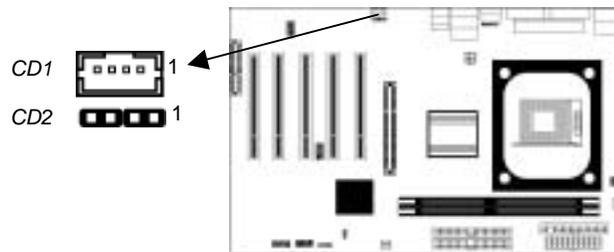
IDE devices include hard disk drives, high-density diskette drives, and CD-ROM or DVD-ROM drives, among others.

The mainboard ships with an IDE cable that can support one or two IDE devices. If you connect two devices to a single cable, you must configure one of the drives as Master and one of the drives as Slave. The documentation of the IDE device will tell you how to

configure the device as a Master or Slave device. The Master device connects to the end of the cable. Install the device(s) and connect power from the system power supply. Use the cable provided to connect the device(s) to the Primary IDE channel connector **IDE1** on the mainboard. If you want to install more IDE devices, you can purchase a second IDE cable and connect one or two devices to the Secondary IDE channel connector **IDE2** on the mainboard. If you have two devices on the cable, one must be Master and one must be Slave.

### Internal Sound Connections

If you have installed a CD-ROM drive or DVD-ROM drive, you can connect the drive audio cable to the onboard sound system.



When you first start up your system, the BIOS should automatically detect your CD-ROM/DVD drive. If it doesn't, enter the Setup Utility and configure the CD-ROM/DVD drive that you have installed. On the mainboard, locate the two 4-pin connectors **CD1** and **CD2**.

**CD1**

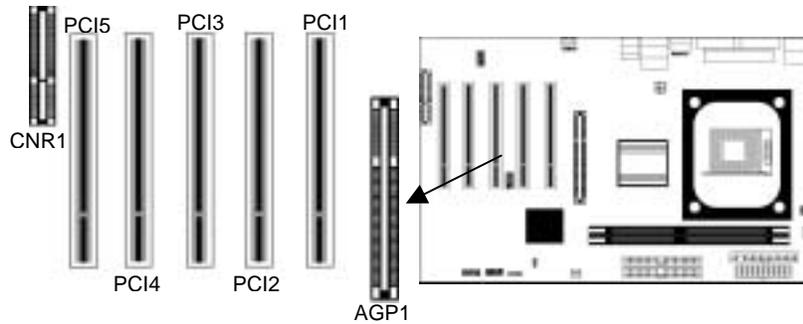
Pin	Signal
1	GND
2	CD IN R
3	GND
4	CD IN L

**CD2**

Pin	Signal
1	CD IN L
2	GND
3	GND
4	CD IN R

## Expansion Slots

This mainboard has one AGP, one CNR and five 32-bit PCI slots.



Follow the steps below to install one AGP/CNR/PCI expansion card.

1. Locate the AGP, CNR or PCI slots on the mainboard.
2. Remove the blanking plate of the slot from the system chassis.
3. Install the edge connector of the expansion card into the slot.  
Ensure the edge connector is correctly seated in the slot.
4. Secure the metal bracket of the card to the system chassis with a screw.

## Chapter 3

# BIOS Setup Utility

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### Introduction

The BIOS Setup Utility records settings and information about your computer such as the date and time, the kind of hardware installed, and various configuration settings. Your computer uses this information to initialize all the components when booting up and functions as the basis for coordination between system components.

If the Setup Utility configuration is incorrect, it may cause the system to malfunction. It can even stop your computer from booting properly. If this happens, you can use the clear CMOS jumper to clear the CMOS memory used to store the configuration information.

You can run the setup utility and manually make changes to the configuration. You might need to do this to configure some of the hardware that you install on or connect to the mainboard, such as the CPU, system memory, disk drives, etc.

## Running the Setup Utility

Each time your computer starts, before the operating system loads, a message appears on the screen that prompts you to “*Hit <DEL> if you want to run SETUP*”. When you see this message, press the **Delete** key and the Main menu page of the Setup Utility appears on your monitor.

AMIBIOS SIMPLE SETUP UTILITY – VERSION 1.21.12  
(C) 2000 American Megatrends, Inc. All Rights Reserved

<b>Standard CMOS Setup</b>	Features Setup
Advanced Setup	CPU PnP Setup
Power Management Setup	Hardware Monitor
PCI / Plug and Play Setup	Change Password
Load Optimal Settings	Exit
Load Best Performance Settings	
Esc : Quit    ↑ ↓ ← →: Select Item (Shift)F2 : Change Color    F5 : Old Values F6 : Optimal values                      F7 : Best performance values    F10 : Save&Exit	
Standards CMOS setup for changing time, date, hard disk type, etc.	

You can use the cursor arrow keys to highlight any of the options on the main menu page. Press **Enter** to select the highlighted option. To leave the setup utility, press the **Escape** key. To cycle through the Setup Utility’s optional color schemes hold down the **Shift** key and press **F2**.

Some of the options on the main menu page lead to tables of items with installed values. In these pages, use the cursor arrow keys to highlight the items, and then use the **PgUp** and **PgDn** keys to cycle through the alternate values for each of the items. Other options on the main menu page lead to dialog boxes requiring you to answer Yes or No by hitting the **Y** or **N** keys.

If you have already made changes to the setup utility, press **F10** to save those changes and exit the utility. Press **F5** to reset the changes to the original values. Press **F6** to install the setup utility with a set of default values. Press **F7** to install the setup utility with a set of high-performance values.

## Standard CMOS Setup Page

Use this page to set basic information such as the date, the time, the IDE devices, and the diskette drives. If you press the F3 key, the system will automatically detect and configure the hard disks on the IDE channels.

AMIBIOS SETUP – STANDARD CMOS SETUP										
(C) 2000 American Megatrends, Inc. All Rights Reserved										
Date (mm/dd/yy) : Thu Mar 20, 2003										
Time (hh/mm/ss) : 15:32:20										
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit Mode
	Pri Master : Auto									On
	Pri Slave : Auto									On
	Sec Master : Auto									On
	Sec Slave : Auto									On
Floppy Drive A : 1.44 MB 3 1/2										
Floppy Drive B : Not Installed										
Month : Jan – Dec					ESC : Exit					
Day : 01 – 31					↑↓ : Select Item					
Year : 1901 – 2099					PU/PD/+/- : Modify					
					(Shift)F2 : Color					
					F3 : Detect All HDD					

Date & Time	Use these items to set the system date and time
Pri Master Pri Slave Sec Master Sec Slave	Use these items to configure devices connected to the Primary and Secondary IDE channels. To configure an IDE hard disk drive, choose <i>Auto</i> . If the <i>Auto</i> setting fails to find a hard disk drive, set it to <i>User</i> , and then fill in the hard disk characteristics (Size, Cyls, etc.) manually. If you have a CD-ROM drive, select the setting <i>CDROM</i> . If you have an ATAPI device with removable media (e.g. a ZIP drive or an LS-120) select <i>Floptical</i> .
Floppy Drive A Floppy Drive B	Use these items to set the size and capacity of the floppy diskette drive(s) installed in the system.

## Advanced Setup Page

This page sets up more advanced information in the system. Be more careful with this page. Making changes can affect the operation of your computer.

AMIBIOS SETUP – ADVANCED SETUP			
(C) 2000 American Megatrends, Inc. All Rights Reserved			
Quick Boot	Enabled	Auto Detect DIMM/PCI Clk	Enabled
Card Reader Boot Function	Disabled	Spread Spectrum	Disabled
1 <sup>st</sup> Boot Device	IDE-0	DOS Flat Mode	Disabled
2 <sup>nd</sup> Boot Device	Floppy		
3 <sup>rd</sup> Boot Device	CDROM		
Try Other Boot Devices	Yes		
S.M.A.R.T. for Hard Disks	Disabled		
BootUp Num-Lock	On		
Floppy Drive Swap	Disabled		
Floppy Drive Seek	Disabled		
Password Check	Setup	ESC : Quit	↑↓←→ : Select Item
Boot To OS/2 > 64MB	No	F1 : Help	PU/PD/+/- : Modify
L2 Cache	Enabled	F5 : Old Values (Shift)	F2 : Color
System BIOS Cacheable	Disabled	F6 : Load BIOS Defaults	
Share Memory Size	32 MB	F7 : Load Setup Defaults	
Graphic Win Size	4MB		
DRAM CAS# Latency	3T		
Timing Setting Mode	Normal		
MA 1T/2T Select	MA 2T		
Advanced Read Prefetch	Enabled		
Hyper Threading Function	Disabled		

Quick Boot	If you enable this item, the system starts up more quickly by elimination of some of the power on test routines.
Card Reader Boot Function	If this item is enabled, you can use this device to boot up the system.
1 <sup>st</sup> Boot Device 2 <sup>nd</sup> Boot Device 3 <sup>rd</sup> Boot Device	Use these items to determine the device order the computer uses to look for an operating system to load at start-up time.
Try Other Boot Device	If you enable this item, the system will also search for other boot devices if it fails to find an operating system from the first two locations.

S.M.A.R.T. for Hard Disks	Enable this item if any IDE hard disks support the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature.
BootUp Num-Lock	This item determines if the Num Lock key is active or inactive at system start-up time.
Floppy Drive Swap	If you have two diskette drives installed and you enable this item, drive A becomes drive B and drive B becomes drive A.
Floppy Drive Seek	If you enable this item, your system will check all floppy disk drives at start up. Disable this item unless you are using an old 360KB drive.
Password Check	If you have entered a password for the system, use this item to determine, if the password is required to enter the Setup Utility ( <i>Setup</i> ) or required both at start-up and to enter the Setup Utility ( <i>Always</i> ).
Boot to OS/2 > 64MB	Enable this item if you are booting the OS/2 operating system and you have more than 64MB of system memory installed.
L2 Cache	Leave these items enabled since all the processors that can be installed on this board have internal L2 cache memory.
System BIOS Cacheable	If you enable this item, a segment of the system BIOS will be copied to main memory for faster execution.
Share Memory Size	This item lets you allocate a portion of the main memory for the onboard VGA display application with five options of 4/8/16/32/64 MB.

<b>Graphic Win Size</b>	This item defines the size of aperture if you use a graphic adapter.
<b>DRAM CAS# Latency</b>	This item determines the operation of DRAM memory CAS (column address strobe). It is recommended that you leave this item at the default value. The 3T setting requires faster memory that specifically supports this mode.
<b>Timing Setting Mode</b>	This item determines the timing setting mode of the memory. We recommend you leave this item at the default value.
<b>MA 1T/2T Select</b>	This item adjusts timing 1T/2T latency. We recommend you to leave this item at the default value.
<b>Advanced Read Prefetch</b>	This item enables prefetching for reading data. We recommend you to leave this item at the default value.
<b>Hyper Threading Function</b>	If your P4 CPU is not HT CPU, this item will be hidden.  If your P4 CPU is HT CPU, BIOS will show this item. You can set "Disabled" or "Enabled" to control HT CPU support in O.S. Set "Enabled" to test HT CPU function.
<b>Auto Detect DIMM/PCI Clk</b>	When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.
<b>Spread Spectrum</b>	If you enable spread spectrum, it can significantly reduce the EMI(Electro-Magnetic Interference) generated by the system.
<b>DOS Flat Mode</b>	This item enables BIOS entering the DOS protected mode without other software supporting under the DOS operating system. We recommend you to leave this item at the default value.

## Power Management Setup Page

This page sets some of the parameters for system power management operation.

AMIBIOS SETUP – POWER MANAGEMENT SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	Yes	ESC : Quit      ↑↓←→ : Select Item F1 : Help        PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
Power Management	Enabled	
Suspend Time out	Disabled	
Hard Disk Time out	Disabled	
Resume On RTC Alarm	Disabled	
RTC Alarm Date	15	
RTC Alarm Hour	12	
RTC Alarm Minute	30	
RTC Alarm Second	30	
LAN/Ring Power On	Disabled	
Keyboard Power On	Disabled	

<b>ACPI Aware O/S</b>	Enable this item if you are using an O/S that supports ACPI function such as Windows 98/ME /2000.
<b>Power Management</b>	Use this item to select a power management scheme. Both APM and ACPI are supported.
<b>Suspend Time Out</b>	This sets the timeout for Suspend mode in minutes. If the time selected passes without any system activity, the computer will enter power-saving Suspend mode.
<b>Hard Disk Time Out</b>	This sets the timeout to power down the hard disk drive, if the time selected passes without any hard disk activity.
<b>Resume On RTC Alarm Date / Hour / Minute / Second</b>	The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

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<b>LAN/Ring Power On</b>	The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the Modem. You must use an ATX power supply in order to use this feature.
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<b>KeyBoard Power On</b>	If you enable this item, you can turn the system on and off by pressing hot keys on the keyboard. You must enable the Keyboard Power On jumper and use an ATX power supply in order to use this feature.
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### PCI / Plug and Play Setup Page

This page sets some of the parameters for devices installed on the PCI bus and devices that use the system plug and play capability.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	Yes	ESC : Quit      ↑↓←→ : Select Item F1 : Help        PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
Primary Graphics Adapter	PCI	
Allocate IRQ to PCI VGA	Yes	
PCI IDE BusMaster	Disabled	

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<b>Plug and Play Aware O/S</b>	Enable this item if you are using an O/S that supports Plug and Play such as Windows 95/98/ME.
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<b>Primary Graphics Adapter</b>	This item indicates if the primary graphics adapter uses the PCI or the AGP bus. The default PCI setting still lets the onboard display work and allows the use of a second display card installed in a PCI slot.
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Allocate IRQ to PCI VGA	If this item is enabled, an IRQ will be assigned to the PCI VGA graphics system. You set this value to No to free up an IRQ.
PCI IDE BusMaster	This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

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### Load Optimal Settings

If you select this item and press **Enter** a dialog box appears. If you press **Y**, and then **Enter**, the Setup Utility loads a set of fail-safe default values. These default values are not very demanding and they should allow your system to function with most kinds of hardware and memory chips.

*Note: It is highly recommended that users enter this option to load optimal values for accessing the best performance.*

### Load Best Performance Settings

If you select this item and press **Enter** a dialog box appears. If you press **Y**, and then **Enter**, the Setup Utility loads a set of best-performance default values. These default values are quite demanding and your system might not function properly if you are using slower memory chips or other low-performance components.

## Features Setup Page

This page sets some of the parameters for peripheral devices connected to the system.

AMBIOS SETUP – FEATURES SETUP		
(C) 2000 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Enabled	
OnBoard Serial Port	3F8h/COM1	
OnBoard IR Port	Disabled	
OnBoard Parallel Port	378h	
Parallel Port Mode	ECP	
Parallel Port IRQ	7	
Parallel Port DMA	3	
OnBoard PCI IDE	Both	ESC : Quit      ↑↓←→ : Select Item
Audio Device	Enabled	F1 : Help      PU/PD/+/- : Modify
Modem Device	Enabled	F5 : Old Values (Shift)F2 : Color
Ethernet Device	Enabled	F6 : Load BIOS Defaults
Onboard USB Function	Enabled	F7 : Load Setup Defaults
USB Function for DOS	Disabled	
ThumbDrive for DOS	Disabled	

<b>OnBoard FDC</b>	Use this item to enable or disable the onboard floppy disk drive interface.
<b>OnBoard Serial Port</b>	Use these items to enable or disable the onboard COM1 serial port, and to assign a port address.
<b>OnBoard IR Port</b>	Use this item to enable or disable the onboard infrared port, and to assign a port address.
<b>Onboard Parallel Port</b>	Use this item to enable or disable the onboard LPT1 parallel port, and to assign a port address. The Auto setting will detect and available address.
<b>Parallel Port Mode</b>	Use this item to set the parallel port mode. You can select SPP (Standard Parallel Port), ECP (Extended Capabilities Port), EPP (Enhanced Parallel Port), or ECP + EPP.
<b>Parallel Port IRQ</b>	Use this item to assign either IRQ 5 or 7 to the parallel port.

Parallel Port DMA	Use this item to assign a DMA channel to the parallel port. The options are 0, 1 and 3.
Onboard PCI IDE	Use this item to enable or disable either or both of the onboard Primary and Secondary IDE channels.
Audio Device	This item enables or disables the onboard AC'97 audio chip.
Modem Device	This item enables or disables the onboard AC'97 modem chip.
Ethernet Device	This item enables or disables the onboard Ethernet LAN.
Onboard USB Function	Enable this item if you plan to use the USB ports on this mainboard.
USB Function for DOS	Enable this item if you plan to use the USB ports on this mainboard in a DOS environment.
ThumbDrive for DOS	Enable this item to make a small portion of memory storage device for the USB ports.

## CPU PnP Setup Page

This page lets you manually configure the mainboard for the CPU. The system will automatically detect the kind of CPU that you have installed and make the appropriate adjustments to the items on this page.

AMIBIOS SETUP - CPU PnP SETUP	
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CPU Type	Intel P4
CPU/DRAM Speed	100/100 MHz
CPU Core Voltage	1.632V
CPU Ratio	H/W TRAP
CPU Frequency	100 MHz
DRAM Frequency	100 MHz
ESC : Quit      ↑↓←→ : Select Item F1 : Help      PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load Optimal values F7 : Load Best performance values	

CPU Type/Core Voltage/Ratio/Frequency	These items show the type, core voltage, ratio and frequency of CPU installed in your system.
CPU/DRAM Speed/Frequency	These items decide CPU/DRAM speed/frequency installed in your system.

## Hardware Monitor Page

This page sets some of the parameters for the hardware monitoring function of this mainboard.

AMBIOS SETUP – HARDWARE MONITOR (C) 2000 American Megatrends, Inc. All Rights Reserved		
*** System Hardware ***		
Vcore	1.616V	
Vcc 1.8V	1.792V	
Vcc 3.3V	3.392V	
Vcc	4.945V	
+12V	12.032V	
Vcc2.5V	2.532V	
SB5V	4.962V	
VBAT	3.472V	
SYSTEM Fan Speed	0 RPM	ESC : Quit      ↑↓←→ : Select Item
CPU Fan Speed	1308 RPM	F1 : Help      PU/PD/+/- : Modify
SYSTEM Temperature	33°C/91°F	F5 : Old Values (Shift)F2 : Color
CPU Temperature	41°C/105°F	F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

System/ CPU Temperature	These items display Power, CPU and System temperature measurement.
FANS & Voltage Measurements	These items indicate cooling fan speeds in RPM and the various system voltage measurements.

## Change Password

If you highlight this item and press **Enter**, a dialog box appears which lets you enter a Supervisor password. You can enter no more than six letters or numbers. Press **Enter** after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press **Enter** after you have retyped it correctly. The password is then required to access the Setup Utility or for that and at start-up, depending on the setting of the Password Check item in Advanced Setup.

### **Change or Remove the Password**

Highlight this item, press **Enter** and type in the current password. At the next dialog box, type in the new password, or just press **Enter** to disable password protection.

## Exit

Highlight this item and press **Enter** to save the changes that you have made in the Setup Utility configuration and exit the program. When the Save and Exit dialog box appears, press **Y** to save and exit, or press **N** to exit without saving.

## Chapter 4

# Software & Applications

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### Introduction

This chapter describes the contents of the support CD-ROM that comes with the mainboard package.

The support CD-ROM contains all useful software, necessary drivers and utility programs to properly run our products. More program information is available in a README file, located in the same directory as the software.

To run the support CD, simply insert the CD into your CD-ROM drive. An Auto Setup screen automatically pops out, and then you can go on the auto-installing or manual installation depending on your operating system.

If your operating system is Windows 98/ME/2000/XP, it will automatically install all the drivers and utilities for your mainboard; if Windows NT or manual installation, please follow the instructions described as the Installing under Windows NT or Manual Installation section.

## Installing Support Software

1. Insert the support CD-ROM disc in the CD-ROM drive.
2. When you insert the CD-ROM disc in the system CD-ROM drive, the CD automatically displays an Auto Setup screen.
3. The screen displays three buttons of **Setup**, **Browse CD** and **Exit** on the right side, and three others **Setup**, **Application** and **ReadMe** at the bottom. Please see the following illustration.



The **Setup** button runs the software auto-installing program as explained in next section.

The **Browse CD** button is a standard Windows command that you can check the contents of the disc with the Windows 98 file browsing interface.

The **Exit** button closes the Auto Setup window. To run the program again, reinsert the CD-ROM disc in the drive; or click the CD-ROM driver from the Windows Explorer, and click the Setup icon.

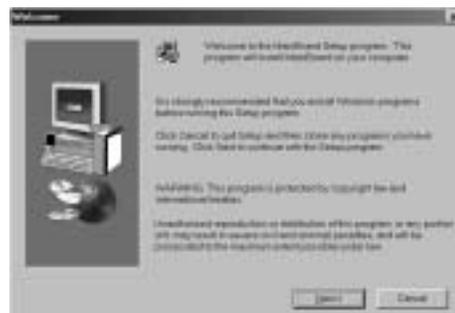
The **Application** button brings up a software menu. It shows the bundled software that this mainboard supports.

The **ReadMe** brings you to the Install Path where you can find out path names of software driver.

### Auto-Installing under Windows 98/ME/2000/XP

If you are under Windows 98/ME/2000/XP, please click the **Setup** button to run the software auto-installing program while the Auto Setup screen pops out after inserting the support CD-ROM:

1. The installation program loads and displays the following screen. Click the **Next** button.



2. Select the items that you want to setup by clicking on it (the default options are recommended). Click the **Next** button to proceed.



3. The support software will automatically install.

Once any of the installation procedures start, software is automatically installed in sequence. You need to follow the onscreen instructions, confirm commands and allow the computer to restart as few times as needed to complete installing whatever software you selected. When the process is finished, all the support software will be installed and start working.

### **Installing under Windows NT or Manual Installation**

If you are under Windows NT, the auto-installing program doesn't work out; or you have to do the manual installation, please follow this procedure while the Auto Setup screen pops out after inserting the support CD-ROM:

1. Click the **ReadMe** to bring up a screen, and then click the Install Path at the bottom of the screen.
2. Find out your mainboard model name and click on it to obtain its correct driver directory.
3. Install each software in accordance with the corresponding driver path.

### **Bundled Software Installation**

All bundled software available on the CD-ROM is for users' convenience. You can install bundled software as follows:

1. Click the **Application** button while the Auto Setup screen pops out after inserting the support CD-ROM.
2. A software menu appears. Click the software you want to install.
3. Follow onscreen instructions to install the software program step by step until finished.

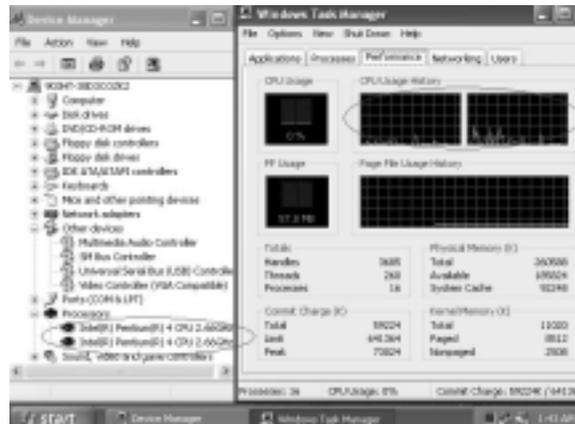
## Appendix: Hyper Threading CPU

You must update BIOS to initiate BIOS Hyper Threading Function and use HT CPU function under WinXP Operating System; if not, please disable this option.

- ◆ When BIOS detects the HT CPU, it shows the “Hyper Threading Function (default Disabled)” option, which you must set Enabled if you want to test HT CPU function. If there is no HT CPU, this option is hidden and default Disabled.



- ◆ You must re-install WINXP to activate the HT CPU function.



While you are in Windows Task Manager, please push down ctrl+Alt Del keys. A dual CPU appears in the CPU Usage History&Device Manager under WinXP.

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**Note:** Hyper Threading Function only works under WINXP Operating System; therefore, disable it under other Operating System.

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