PCA-6184

Full-size socket 478
Intel® Pentium® 4
processor-based PCI/ISA
bus CPU card

User's Manual

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CHAPTER 1

General Information

This chapter provides background information on the PCA-6184. It shows you how to configure the card to match your application and installation into your PC.

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- Specifications
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- Jumpers and Connectors
- Safety Precautions
- Jumper Settings
- System Memory
- Memory Installation Procedures
- Cache Memory
- CPU Installation

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6184 Series all-in-one industrial grade single board computer is a high performance and full-featured computing engine. It meets most industrial application requirements.

Advantech's PCA-6184 full-sized CPU card is designed with Intel 845 chipset and supports socket 478 Pentium® 4/Celeron™ processor (FSB 400MHz) up to 2GB and above. In addition to high-speed processor, the PCA-6184 supports up to 2GHz DDR200/DDR266 SDRAM memory with 2 onboard DIMM socket. Ideal for high-performance and demanding applications, it provides maximum computing power and productivity. Moreover, the PCA-6184 is built-in with ATI Rage 128 Pro 4XL and 32MB onboard VGA SDRAM. It features superior 3D performance with AGP 4X. Single or dual Intel 82559 10/100Base-T Ethernet controller are available in the PCA-6184 series. The high reliability and excellent performance provided by Intel 82559 Ethernet controller are crucial for various network applications. Flexible I/O expansion ports allow customers to optimize their need for four USB, dual LAN port, and additional PS/2 keyboard & mouse port

A CMOS data backup is stored in the Flash memory, which protects data even after a battery failure. Also included is a 255-level watchdog timer, which resets the CPU or generates an interrupt if a program cannot be executed normally. This enables reliable operation in unattended environments. The remote management interface enables the PCA-6184 to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager..

Note: Some of the features mentioned above are not available with all models. For more information about the specifications of a particular model, see Section 1.3 Specifications.

1.2 Features

1. **Onboard hardware monitoring:** System healthy status including CPU fan, CPU temperature and system voltages levels are monitored to ensure stable operation, proper system configuration and management. A remote monitoring interface is reserved for remote management through Ethernet by using Advantech's SNMP-1000 system management module.
2. **ATX soft power switch:** Through the BIOS, the power button can be defined as the "Standby" (aka "Suspend" or "Sleep") button or as the "Soft-Off" button. Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.
3. **Power-on by modem (requires modem):** This allows a computer to be turned on remotely through an internal or external modem. Users can thus access information on their computers from anywhere in the world.
4. **Power-on by LAN:** This allows you to remotely power up your system through your network by sending a wake-up frame or signal. With this feature, you can remotely upload/ download data to/ from systems during off-peak hours.
5. **Message LED:** Chassis LEDs now act as information providers. The way a particular LED illuminates indicates the stage the computer is in. A single glimpse provides useful information to the user.
6. **CMOS RAM backup:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in industrial environments which may cause soft errors. Upon such an error occurring, BIOS will check the data, and automatically restore the original data for booting.
7. **More**:
   Additional metal bracket for board stabilization

- **Power On by Alarm:** Powers up your computer at a certain time.
- **Virus warning:** During and after system boot-up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can then run your anti-virus program to locate the problem.

1.3 Specifications

1.3.1 System

- **CPU:** Intel Pentium® 4/Celeron™ up to 2GHz and the above, FSB 400 MHz
- **BIOS:** Award Flash BIOS, 4 Mb
- **System Chipset:** Intel 845
- **PCI enhanced IDE hard disk drive interface:** Supports up to four IDE large hard disk drives or other enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra DMA (100/66/33 MB/s data transfer rate). BIOS enabled/disabled
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB and 1.44 MB). BIOS enabled/disabled

1.3.2 Memory

- **RAM:** Up to 2 GB in two available 184-pin DIMM sockets. Support PC 200/266 DDR Memory (ECC supported).
- **ECC (parity DRAM only):** Modules can detect multi-bit memory errors. Correction of 1-bit memory errors

1.3.3 Input/Output

- **Bus interface:** PCI/ISA bus, PICMG compliant.
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports SPP/EPP/ECP
- **Serial ports:** Two RS-232 ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM2 or disabled
- **Keyboard and PS/2 mouse connector:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An onboard keyboard pin header connector is also available
- **ISA driver current:** Up to 64 mA high driving current
- **USB:** Maximum up to four USB 1.1 ports. Four USB ports are available in PCA-6184E2-00A1.

1.3.4 VGA interface

- Onboard VGA(AGP 4X) controller
- **Controller:** ATI Rage Pro 128 4XL
- **Display memory:** 32 MB SDRAM

1.3.5 Ethernet LAN

- **Chipset:** Intel 82559
- **Ethernet interface:** Dual PCI 10/100 Mbps Ethernet networking
- **Connection:** Onboard RJ-45 connector x 2

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second (255 levels).

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (depends on CPU)
- **Storage temperature:** -20~70° C (-4~158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:** Typical: +5V @7.4A, +12V @320mA (Pentium 4 1.8GHz, 256MB DDR)
- **Board size:** 338 x 122 mm (13.3" x 4.8")
- **Board weight:** 0.5 kg (1.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6184 board link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your card.

Table 1.1: Jumpers

Label	**Function**
J1	CMOS Clear
J2	Watchdog timer output selection

Table 1.2: Connectors

Label	**Function**
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN6	USB pory
CN7	VGA connector
CN8	10/100Base-T Ethernet connector 1
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN13	Infrared (IR) connector
CN14	CPU FAN connector
CN16	Power LED and Keyboard Lock
CN17	External speaker
CN18	Reset connector
CN19	HDD LED connector

Table 1.2: Connectors	
CN20	ATX feature connector
CN21	ATX soft power switch
CN22	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
CN27	Extension I/O board connector
CN28	Extension I/O board connector
CN29	SM BUS Connector
CN31	USB 0,1
CN32	USB 2,3
CN33	PS/2 Keyboard and Mouse connector
CN34	10/100Base-T Ethernet connector 2
CN46	Auxiliary 4-pin power connector

1.5 Board Layout: Jumper and Connector Locations

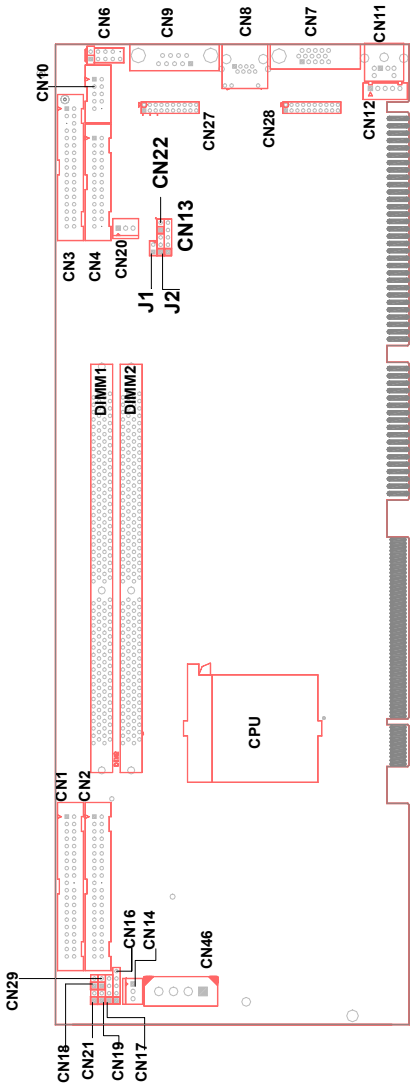


Figure 1.1: Jumper and connecter locations

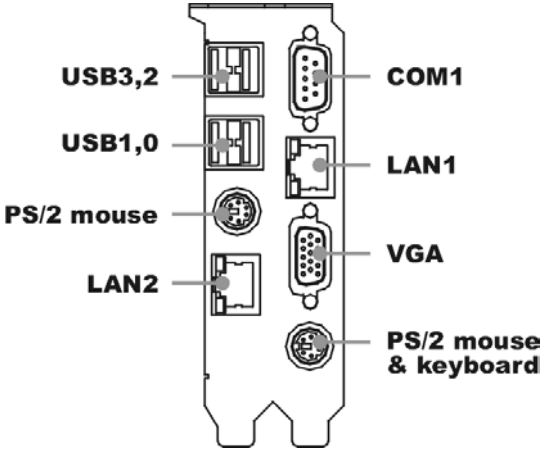


Figure 1.2: Extension I/O daughter board

1.6 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *The computer is provided with a battery-powered Real-time Clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions*

1.7 Jumper Settings

This section provides instructions on how to configure your card by setting jumpers. It also includes the card's default settings and your options for each jumper.

1.7.1 How to set jumpers

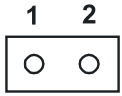
You configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3.

A pair of needle-nose pliers may be useful when setting jumpers.

1.7.2 CMOS clear (J1)

The PCA-6184CPU card contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 open. If you want to reset the CMOS data, set 1-2 pin for just a few seconds, and then move the jumper back to 1-2 open. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS (J1)

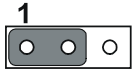
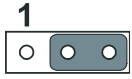
Function	Jumper Setting
* Keep CMOS data1-2 open	
Clear CMOS data 1-2 closed	

* default setting

1.7.3 Watchdog timer output (J2)

The PCA-6184 contains a watchdog timer that will reset the CPU or send a signal to IRQ11 in the event the CPU stops processing. This feature means the PCA-6184 will recover from a software failure or an EMI problem. The J2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

***Table 1.4:* Watchdog timer output (J2)**

Function	Jumper Setting	
IRQ11	1-2 closed	
* Reset	2-3 closed	

* default setting

1.8 System Memory

The PCA-6184 contains two sockets for 184-pin dual memory modules (DIMMs). All these sockets accept only 2.5 V DDR200/DDR266 SDRAM. DIMMs are available in capacities of 64,128, 256, 512 MB and 1 GB. The sockets can be filled in any combination with DIMMs of any size, giving your PCA-6184 single board computer up to 2 GB of memory.

Table 1.5: **DIMM memory capacity sample calculation**

Socket number	184-pin DIMM memory
1	64, 128, 256 or 512 MB or 1 GB
2	64, 128, 256 or 512 MB or 1 GB

1.8.1 Supplementary information about DIMMs

Your PCA-6184 can accept only DDR memory modules with or without parity. Also note:

- Chips with 9 chips/side support ECC; chips with 8 chips/side do not support ECC.

1.9 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

1.10 Cache Memory

Since the second level (L2) cache has been embedded into the Pentium® 4/Celeron™ processor, you do not have to take care of either SRAM chips or SRAM modules. The built-in second level cache in the Pentium® 4 processor yields much higher performance than the external cache memories. The cache size in the Pentium® 4 processor is 256/512 KB, depending on the type of CPU. The cache size in Celeron(TM) processor is 128KB.

1.11 CPU Installation

The PCA-6184 provides socket 478 for an Pentium® 4 or Celeron ™ processor. The CPU on the board must have a fan or heat sink attached, to prevent overheating.

Warning: Without a fan or heat sink, the CPU will overheat and cause damage to both the CPU and the motherboard.

To install a CPU, first turn off your system and remove its cover. Locate the processor socket 478.

1. Make sure the socket 478 lever is in the upright position. To raise the lever, pull it out to the side a little and raise it as far as it will go.
2. Place the CPU in the empty socket. Follow the instructions that came with the CPU. If you have no instructions, complete the following procedure. Carefully align the CPU so it is parallel to the socket and the notches on the corners of the CPU correspond with the notches on the inside of the socket. Gently slide the CPU in. It should insert easily. If it does not insert easily, pull the lever up a little bit more.
3. Press the lever down. The plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and will not damage the CPU.

1.11.1 Power Supply

To ensure the sufficiency of power supply for Pentium® 4 CPU card, a auxiliary 4 pin power connector is avaliable in PCA-6184. It is strongly suggested to use auxiliary 4 pin power connector for adequate power supply.

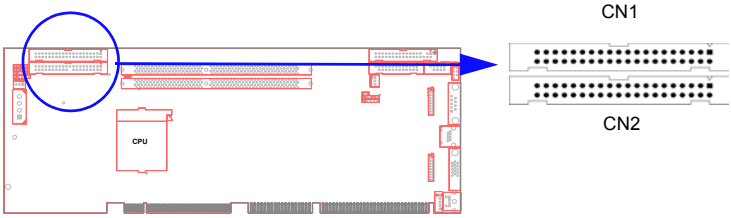
CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches, and indicators to the PCA-6184 board.

Chapter 2 Connecting Peripherals

2.1 Primary (CN1) and Secondary (CN2) IDE Connectors



You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6184's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

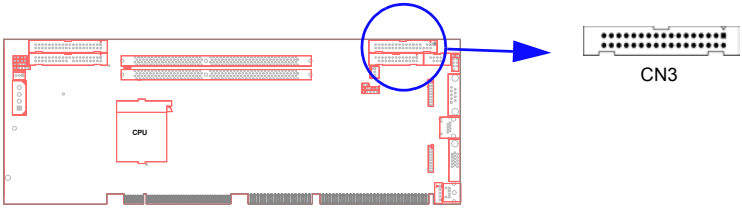
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the CPU card. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second hard drive to the remaining connector (CN2 or CN1), in the same way as described above.

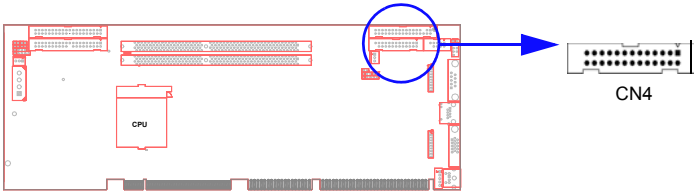
2.2 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6184's onboard connector. You can use 3.5" (720 KB, 1.44 MB) drives.

The card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of 34-pin flat-cable connector (usually used for 3.5" drives). The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

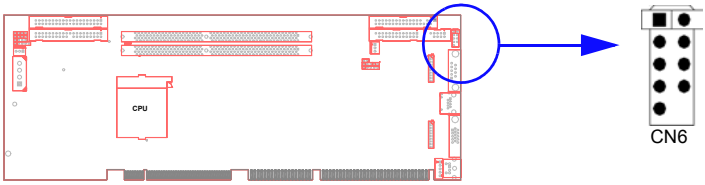
2.3 Parallel Port (CN4)



The parallel port is normally used to connect the CPU card to a printer. The PCA-6184 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN4 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN4. Pin 1 is on the upper right side of CN4.

2.4 USB Ports (CN6)

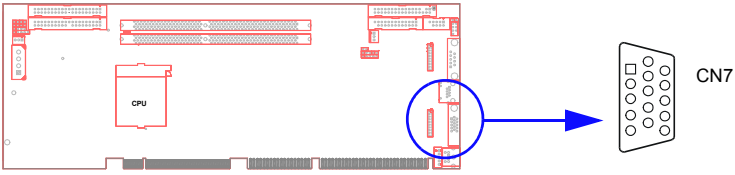


The PCA-6184 provides four USB (Universal Serial Bus) interfaces, which give complete Plug & Play and hot attach/detach for up to 127 external devices.The USB interface complies with USB Specification Rev. 1.1 and is fuse-protected.

The USB interface is accessed through a 10-pin flat-cable connector, CN6. The adapter cable has a 10-pin connector on one end and two USB connectors on the bracket.

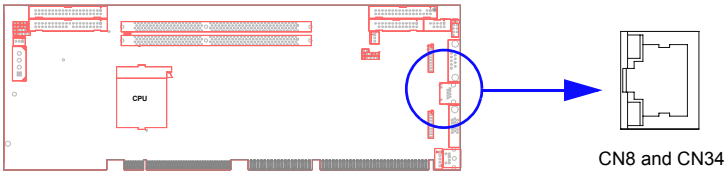
The USB interface can be disabled in the system BIOS setup.

2.5 VGA Connector (CN7)



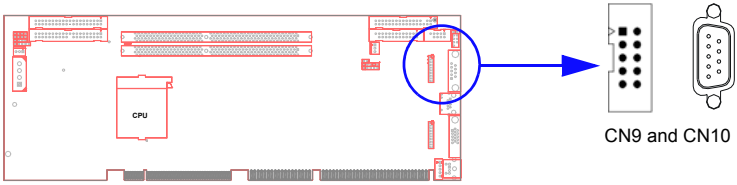
The PCA-6184 includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.6 10/100Base-T Ethernet Connectors (CN8 and CN34)



The PCA-6184 is equipped with one or two high-performance 32-bit PCI-bus Ethernet interfaces, which are fully compliant with IEEE 802.3u 10/100 Mbps CSMA/CD standards. They are supported by all major network operating systems and are 100%. Two RJ-45 jacks on the rear plate provide dual 10/100Base-T RJ-45 operation. If users use dual LANs, the second LAN port, CN34, is located at top slot of the I/O expension ports.

2.7 Serial Ports (CN9: COM1; CN10: COM2)



The PCA-6184 offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

Table 2.1: Serial port connections (COM1, COM2))

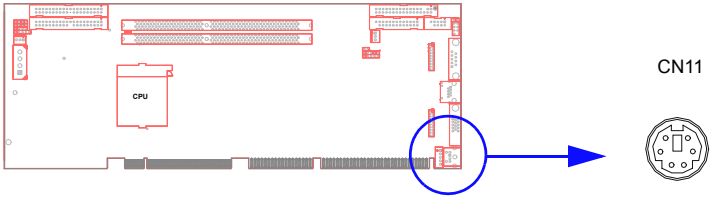
Connector	Ports	Address	Interrupt
CN9	COM1	3F8*3E8	IRQ4
CN10	COM2	2F8*2E8	IRQ3

* Default Settings

The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

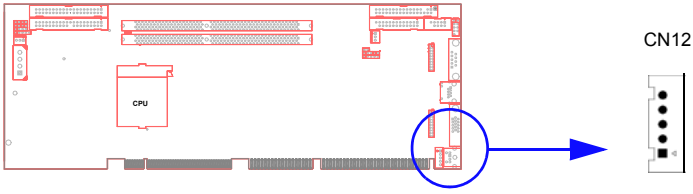
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse Connectors (CN11 and 33)



The PCA-6184 board provides a PS/2 keyboard and mouse connector. Two 6-pin mini-DIN connector (CN11 and 33) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a PS/2 keyboard connector and to a PS/2 mouse connector.

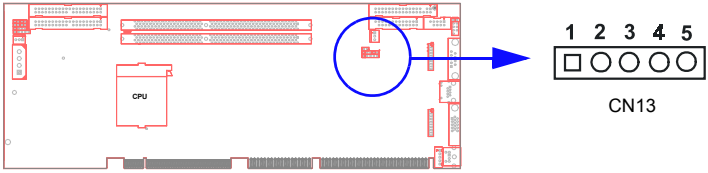
2.9 External Keyboard Connector (CN12)



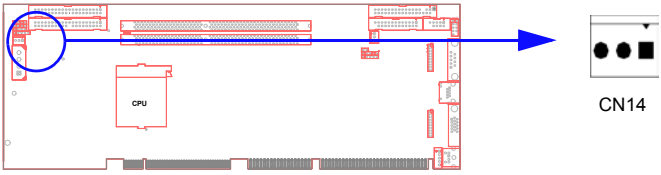
In addition to the PS/2 mouse/keyboard connector on the PCA-6184's ear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

2.10 Infrared (IR) Connector (CN13)

This connector supports the optional wireless infrared transmitting and receiving module. This module mounts on the system case. You must configure the setting through the BIOS setup (see Chapter 3).



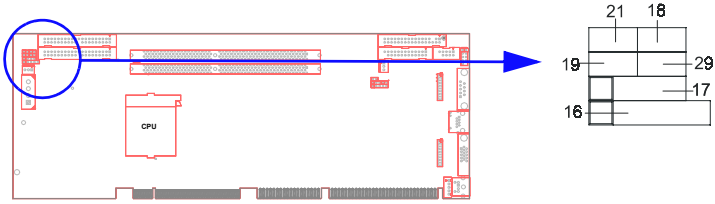
2.11 CPU Fan Connector (CN14)



This connector supports cooling fans of with current up to 2A.

2.12 Front Panel Connectors (CN16, 17, 18, 19, 21&22)

There are several external switches to monitor and control the PCA-6184.



2.12.1 Power LED and Keyboard Lock(CN16)

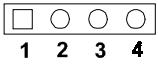
CN16 is a 5-pin connector for the power on LED and Keyboard Lock. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.2: PS/2 or ATX Power Supply LED Status

Power Model	LED (PS/2 power)	LED (ATX Power)
System On	On	On
System Suspend	Fast Flashes	Fast Flashes
System Off	Off	Slow Flashes

2.12.2 External speaker (CN17)

CN17 is a 4-pin connector for an extenal speaker. If there is no external speaker, the PCA-6184 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed



2.12.3 Reset (CN18)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button.

2.12.4 HDD LED (CN19)

You can connect an LED to connector CN19 to indicate when the HDD is active.

2.12.5 SM Bus Connector (CN29)

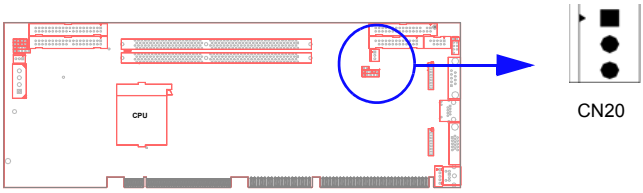
This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

CN29 can be connected to CN3 or CN6 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin2 to pin 2 on both ends of cable.

2.12.6 Connecting to SNMP-1000 remote manager

Use the 6-pin to 8-pin cable to connect the CPU card to SNMP-1000. This cable comes with the SNMP-1000.

2.13 ATX Power Control Connectors (CN20 and 21)



2.13.1 ATX feature (CN20) and soft power switch (CN21)

The PCA-6184 can support an advanced soft power switch function if an ATX power supply is used. To enable the soft power switch function:

1. Connect the 3-pin plug of the cable to CN20 (ATX feature connector).
2. Connect the power on/off button to CN21. (A momentary type of button should be used.)

Note: *If you will not be using an ATX power connector, make sure that pins 2-3 of CN20 are closed.*

Warnings: *1. Make sure that you unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your CPU card and expansion cards.*

2. ATX power supplies may power on if certain motherboard components or connections are touched by metallic objects.

Important: *Make sure that the ATX power supply can take at least a 720 mA load on the 5 V standby lead (5VSB). If not, you may have difficulty powering on your system and/or supporting the "Wake-on-LAN" function.*

2.13.2 Controlling the soft power switch

Users can also identify the current power mode through the system's power LED (see Section 2.12.1).

CHAPTER 3

Award BIOS Setup

This chapter describes how to set the card's BIOS configuration data.

Chapter 3 Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off.

3.2 Entering Setup

Turn on the computer and check for the "patch code". If there is a number assigned to the patch code, it means that the BIOS supports your CPU.

If there is no number assigned to the patch code, please contact Advantech's applications engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid.

After ensuring that you have a number assigned to the patch code, press <Del> to allow you to enter the setup.

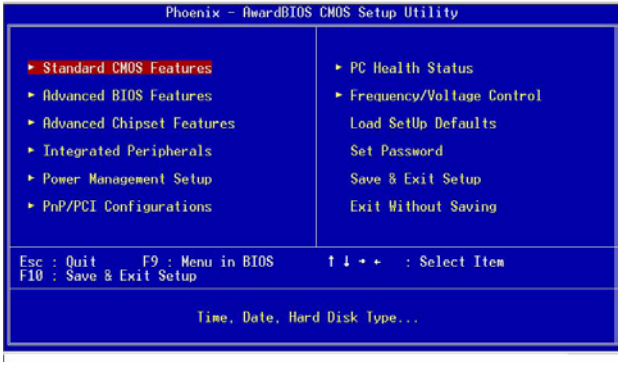


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

Choose the “Standard CMOS Features” option from the “Initial Setup Screen” menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

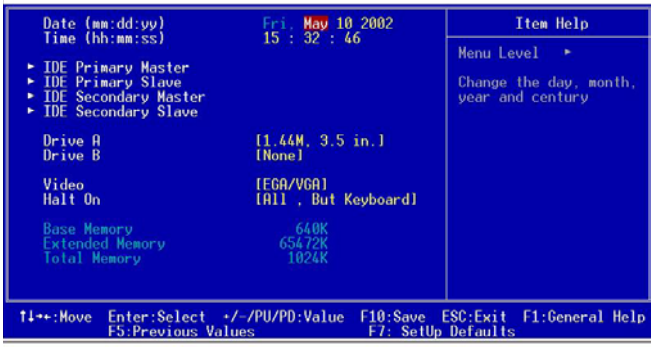


Figure 3.2: Standard CMOS features screen

3.3.1 CMOS RAM backup

The CMOS RAM is powered by an onboard button cell battery.

When BIOS CMOS Setup has been completed, CMOS RAM data is automatically backed up to Flash ROM. If conditions in a harsh industrial enviroment cause a soft error, BIOS will recheck the data and automatically restore the original data for booting.

Note: If you intend to update CMOS RAM data, you have to click on “DEL” within two seconds of the “CMOS checksum error....” display screen message appearing. Then enter the “Setup” screen to modify the data. If the “CMOS checksum error....” message appears again and again, please check to see if you need to replace the battery in your system.

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the PCA-6184 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen.

A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

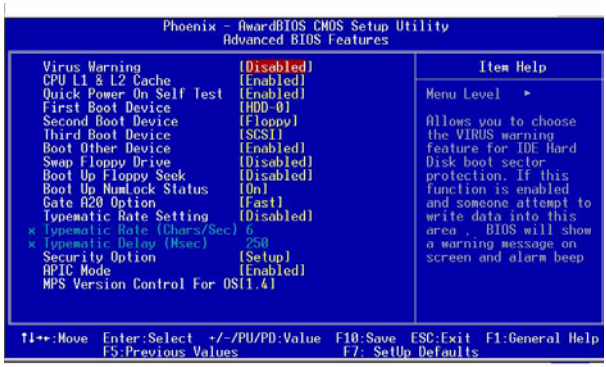


Figure 3.3: Advanced BIOS features screen

3.4.1 Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here. The commands are “Enabled” or “Disabled.”

3.4.2 CPU L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”

3.4.3 Quick Power on Self Test

Allows the system to skip certain tests while booting. It will reduce the time needed to boot the system.

3.4.4 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: Floppy, LS/ZIP, HDD, SCSI, CDROM, LAN, Disabled.

3.4.5 Swap Floppy Drive

Logical name assignments of floppy drives can be swapped if there is more than one floppy drive. The commands are “Enabled” or “Disabled.”

3.4.6 Boot UP Floppy Seek

Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.

3.4.7 Boot Up NumLock Status

This feature selects the “power on” state for NumLock. The commands are “Enabled” or “Disabled.”

3.4.8 Gate A20 Option

Normal: The A20 signal is controlled by the keyboard controller.

Fast (Default): The A20 signal is controlled by the chipset.

3.4.9 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are “Enabled” or “Disabled.” Enabling allows the typematic rate and delay to be selected.

3.4.10 Typematic Rate (Chars/Sec)

BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

3.4.11 Typematic Delay (msec)

Typematic delay is the time interval between the appearance of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

3.4.12 Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is always limited.

System: The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.

Setup: The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select "PASSWORD SETTING" in the main menu. At this point, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

3.5 Advanced Chipset Features

By choosing the "Advanced Chipset Features" option from the "Initial Setup Screen" menu, the screen below will be displayed. This sample screen contains the manufacturer's default values for the PCA-6184, as shown in Figure 3-4:

Note: DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support

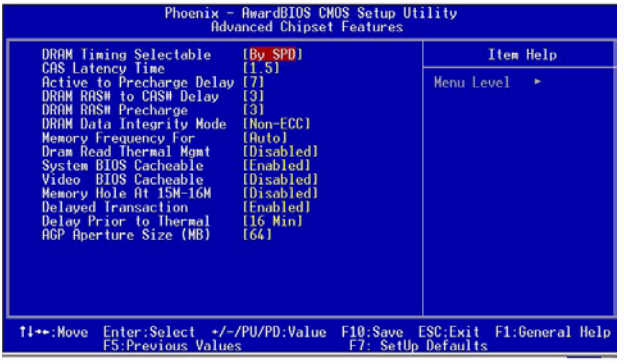


Figure 3.4: Advanced chipset features screen

3.5.1 DRAM Timing Selectable

This item allows you to control the DRAM speed. The Choice: Host-Clock, CLK-33M.

3.5.2 CAS Letency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available. Leave this on the default setting.

3.5.3 Active to Precharge Delay

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The Choice: EDO 50ns, EDO 60ns,Slow, Medium, Fast, Turbo.

3.5.4 DRAM RAS#-to-CAS Delay

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB. The Choice: 15M-16M, Disabled.

3.5.5 DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to SDRAM. Leave this on the default setting.

3.5.6 DRAM DATA Integrity Mode

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The Choice: 4M, 8M, 16M, 32M, 65M, 128M, 256M.

3.5.7 Memory Frequency For Onboard UBS

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

3.5.8 DRAM Read Thermal Mgmt

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. The choice: Enabled, Disabled.

3.5.9 System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The choice: Enabled, Disabled.

3.5.10 Video BIOS Cacheable

Selecting Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The Choices: Enabled, Disabled.

3.5.11 Memory Hole At 15M-16M

Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is ìDisabled.

3.5.12 Delay Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1. The Choice: Enabled, Disabled.

3.5.13 Delay Prior to Thermal

The chipset has an ambedded 32-bit posted write buffer to support delay transaction cycles. Select Enabled to support compliance with PCI specification version 2.1. The choice: Enabled, Disabled

3.5.14 AGP Apecture Size (MB)

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

3.6 Integrated Peripherals

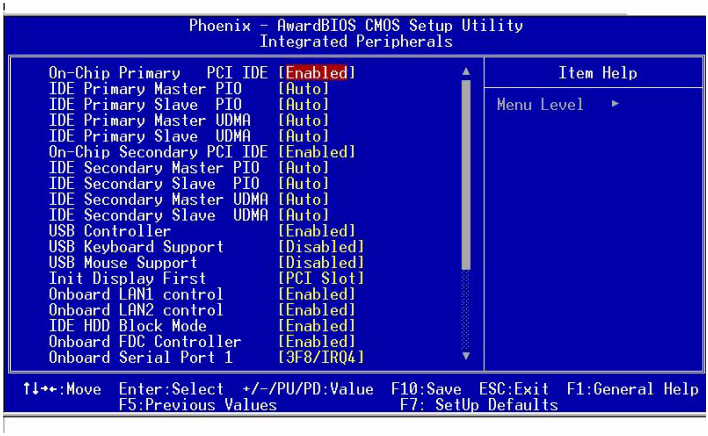


Figure 3.5: Integrated peripherals (1)

3.6.1 On-Chip Primary/Secondary PCI IDE

If you enable IDE HDD Block Mode, the enhanced IDE driver will be enabled. Leave IDE HDD Block Mode on the default setting.

3.6.2 IDE Primary Master/Slave PIO/UDMA, and IDE Secondary Master/Slave PIO/UDMA Modes (Auto)

Each channel (Primary and Secondary) has both a master and a slave, making four IDE devices possible. Because each IDE device may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting “Auto” will allow autodetection to ensure optimal performance.

3.6.3 USB Controller

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

3.6.4 USB Keyboard Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. The choice: Enabled, Disabled.

3.6.5 Onboard FDC Controller

When enable, this field allows you to connect your floppy disk drives to an onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller and card to connect the floppy disk drives, set this field to Disabled.

3.6.6 Onboard Serial Port 1 (3F8H/IRQ4)

The settings are Auto 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, and Disabled for the on-board serial connector.

3.6.7 Onboard Serial Port 2 (2F8H/IRQ3)

The settings are Auto 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, and Disabled for the on-board serial connector.

3.6.8 UART Mode Select

This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal

3.6.9 RxD, TxD Active

This item allows you to determine the active of RxD, TxD. The Choices: ìHi, Hi,î ìLo, Lo,î ìLo, Hi,î ìHi, Lo..

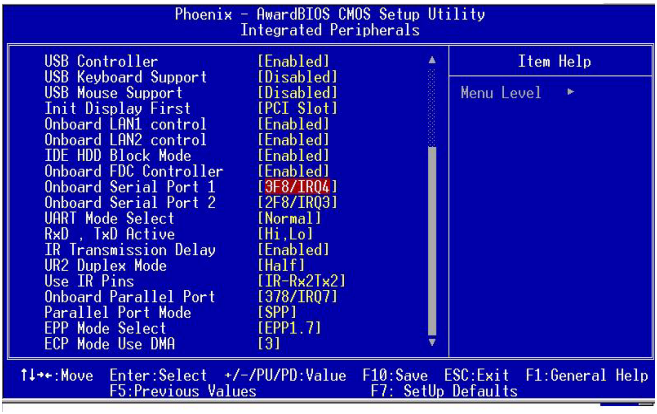


Figure 3.6: Integrated peripherals (2)

3.6.10 Onboard Parallel Port (378/IRQ7)

This field sets the address of the on-board parallel port connector. You can select either 3BC/IRQ7, 378/IRQ7, 278/IRQ5 or Disabled. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The CPU card can support up to three parallel ports, as long as there are no conflicts for each port.

3.6.11 Parallel Port Mode (ECP + EPP)

This field allows you to set the operation mode of the parallel port. The setting "SPP" allows normal speed operation, but in one direction only. "EPP" allows bidirectional parallel port operation at maximum speed. "ECP" allows the parallel port to operate in bidirectional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode.

3.6.12 ECP Mode Use DMA

This selection is available only if you select "ECP" or "ECP + EPP" in the Parallel Port Mode field. In ECP Mode Use DMA, you can select-DMA channel 1 or DMA channel 3. Leave this field on the default setting.

3.7 Power Management Setup

The power management setup controls the CPU card's "green" features to save power. The following screen shows the manufacturer's defaults:

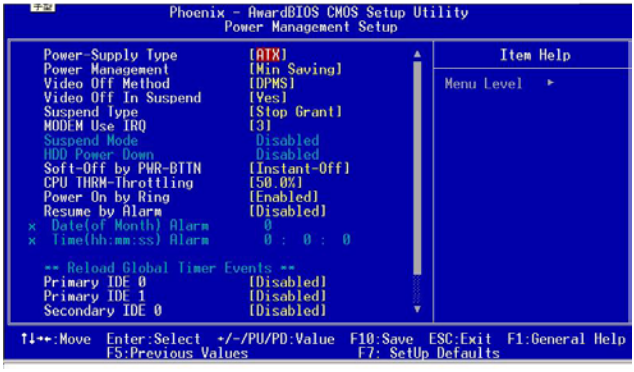


Figure 3.7: Power management setup

3.7.1 Power-supply Type

This item allows you to select power supply type-- AT or ATX

3.7.2 Power Management

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

1. HDD Power Down
2. Suspend Mode

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

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

3.7.3 Video Off In Suspend

When you select “Yes”: Video will trun off when computer suspends.

When you select “No”: Video will be on when computer suspends.

V/H SYNC+BLANK	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer
DPMS	Select this option if your monitor supports the display power management signaling (DPMS) standard of the Video Electronics Standards to select Video Power Management values.

3.7.4 MODEM Use IRQ

This determines the IRQ in which the MODEM can use.The choices: 3, 4, 5, 7, 9, 10, 11, NA.

3.7.5 Soft-Off by PWRBTN

If you choose “Instant-Off”, then pushing the ATX soft power switch button once will switch the system to “system off” power mode. You can choose “Delay 4 sec.” If you do so, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button

momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

3.7.6 CPU THRM-Throttling

This field allows you to select the CPU THRM-Throttling rate. The choices: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

3.7.7 Power on by LAN

This item allows you to wake up the system via LAN from the remote-host. The choices: Enabled, Disabled.

3.7.8 Power on by Ring

When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state. The choices: Enabled, Disabled.

3.7.9 Power on by Alarm

When Enabled, your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode. The choices: Enable, Disable.

3.8 PnP/PCI Configurations

Figure 3.8: PnP/PCI configurations screen

3.8.1 PnP OS Installed

This features allows you to install the PnP OS. The commands are “yes” or “no.”

3.8.2 Reset Configuration Data

Note: This is left "Disabled." Select "Enabled" to reset Extended System Configuration Data (ECSD) if you have installed a new add-on card and your OS won't boot and you need to reconfigure.

3.8.3 Resources controlled by:

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

3.9 PC Health Status

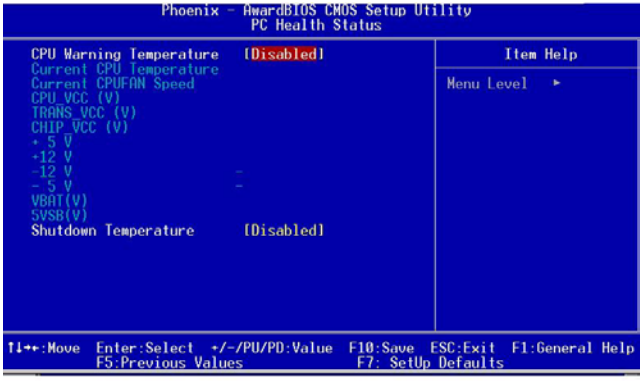


Figure 3.9: PC health status screen

3.9.1 CPU Warning Temperature

This item will prevent the CPU from overheating. The choices: 30~120.

3.9.2 Current System Temperature

This shows you the current system temperature

3.9.3 Current CPU Temperature

This shows you the current CPU speed.

3.9.4 VCORE

This shows CPU core voltage.

3.9.5 +5V/+12V/-5V/-12V

This shows you the voltage of +5V/+12V/-5V/-12V

3.10 Load Setup Defaults

"LOAD SETUP DEFAULTS" loads the default BIOS settings required by the system for reliable operation.

3.11 Password Setting

To change the password:

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>.
   The screen will display the following message:

   Please Enter Your Password

   Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

   Please Confirm Your Password

   Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.

3.12 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

CHAPTER 4

Chipset Software Installation Utility

This utility software installs to the Windows INF files that outline to the operating system how the componentswill be configured. This utility has to be installed before other drivers.

Chapter 4 Chipset Software Installation Utility

4.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the PCA-6184 board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system.

Note: The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs to the target system the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI and ISA PnP services.
- AGP support.
- IDE Ultra ATA 100/66/33 interface support.
- USB support.
- Identification of Intel ® chipset components in the Device Manager.
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

Note: This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:

Windows 95 4.00.950 (Original release)

Windows 95 4.00.950a (OSR1)

Windows 95 4.00.950b (OSR2 without USB Supplement)

Windows 95 4.00.950b (OSR2.1 with USB Supplement)

Windows 95 4.00.950c (OSR2.5 with or without USB Supplement)

Windows 98 4.10.1998 (Original release)

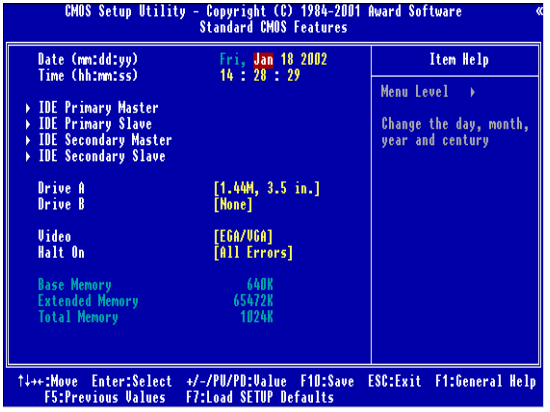
Windows 98 Second Edition 4.10.2222 (Original release)

Windows 2000 5.00.2195 (Original release)

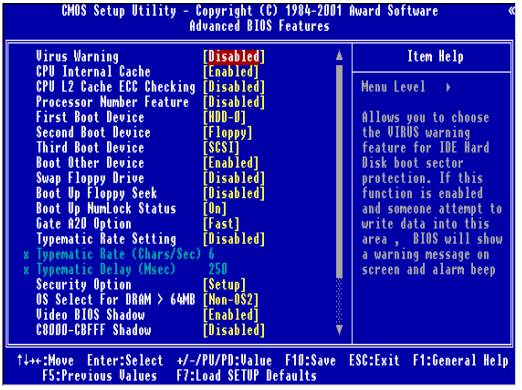
4.3 Installing the CSI Utility

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Move the mouse cursor over the "Auto" button under the "CSI UTILITY" heading, a message pops up telling you to install the CSI utility before other device drivers, as shown in the following figure. Click on this button.

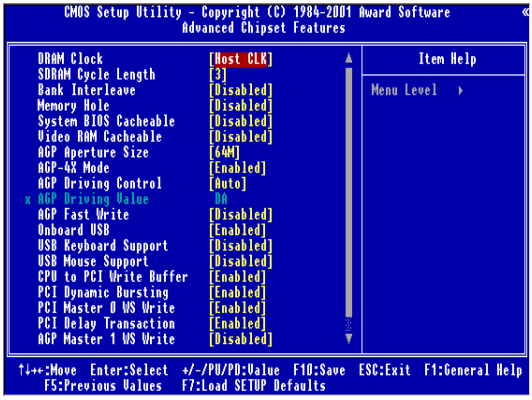
2. Click "Next" when you see the following message



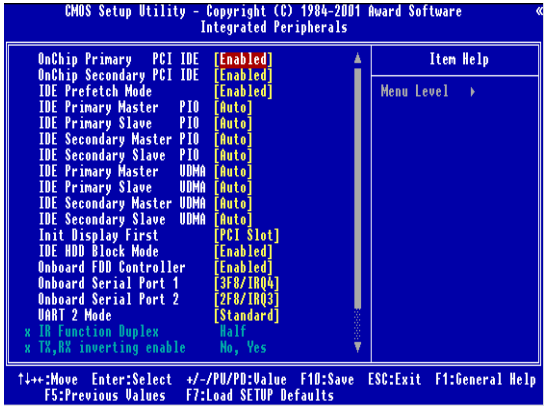
3. Click "Yes" when you see the following message



4. Click "Next" when you see the following message



5. When the following message appears, click "Finish" to complete the installation and restart Windows



CHAPTER 5

AGP SVGA Setup

The PCA-6184 features an onboard VGA interface. This chapter provides instructions for installing and operating the software drivers on the display driver CD included in your package.

Chapter 5 AGP SVGA Setup

5.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The enhanced display drivers for the PCA-6184 board are located on the software installation CD. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers..

Note: The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

5.2 Features

- Built-in ATI RAGE 128 PRO 4XL multimedia accelerator
- Supports AGP 4X mode with sideband addressing and AGP texturing
- Superior 3D performance achieved through a floating point setup engine rated at 1.5 million triangles/sec
- Integrated 250 MHz DAC allows 85 Hz refresh at 1600 x 1200 resolution
- Complete local language support
- Power management for full VESA DPMS and EPA Energy Star compliance
- AGP 1.0 interface
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

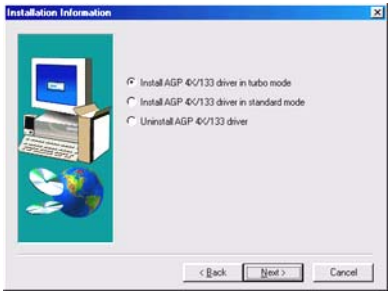
5.3 VGA Installation

First, insert CD drive. Then follow the Icons for your PCA Series model number.

Click on VGA Drivers "Install" for Auto-installation..

1. In the Setup, click on "next."

2. In the Installation Information, choose turbo mode or standard. Then click on "Next."



3. The installaion is complete click on "Yes" to restart the system.

CHAPTER 6

LAN Configuration

The PCA-6184 features onboard dual 10/100Base-T Ethernet LAN. This chapter gives detailed information on Ethernet configuration. It shows you how to configure the card to match your application requirements

Chapter 6 LAN Configuration

6.1 Introduction

The PCA-6184 features single or dual 32-bit 10/100 Mbps Ethernet network interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling with RJ-45 connectors for both 10 Mbps, 100 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

6.2 Features

- Dual Intel® 82559 Ethernet LAN controller (fully integrated 10Base-T/ 100Base-TX)
- Supports Wake-on-LAN remote control function
- PCI Bus Master complies with PCI Rev. 2.2
- MAC & PHY (10/100 Mbps) interfaces
- Complies to IEEE 802.3 10Base-T, IEEE 802.3u 100Base-T interfaces.
- Fully supports 10Base-T and 100Base-TX operation
- Single RJ-45 connector gives auto-detection of 10 Mbps or 100 Mbps network data transfer rates and connected cable types
- 32-bit Bus Master technology complies with PCI Rev. 2.1 Plug and Play

6.3 Driver Installation

The PCA-6184's onboard Ethernet interface supports all major network operating systems.

The BIOS automatically detects the LAN while booting, and assigns an IRQ level and I/O address. No jumpers or switches are required for user configuration.

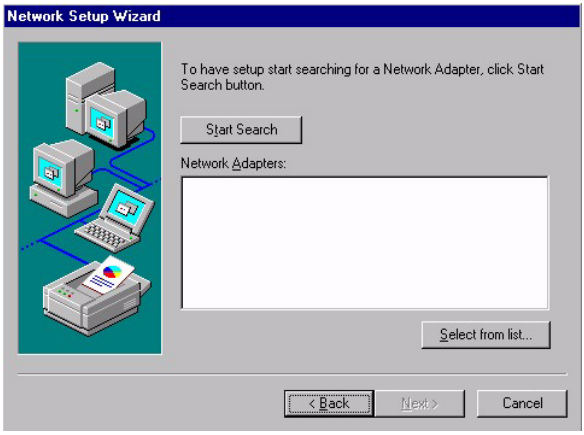
Note: Operating system vendors may post driver updates on their websites. Please visit the websites of OS vendors to download updated drivers.

6.4 Windows NT Drivers (Intel 82559) Setup Procedure

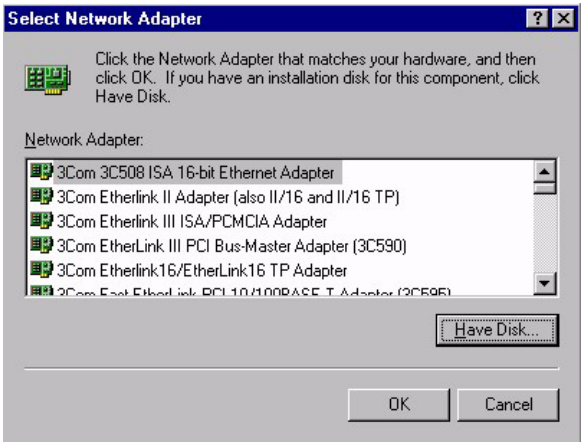
Note : The CD-ROM drive is designated as "D" throughout

1. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Network".

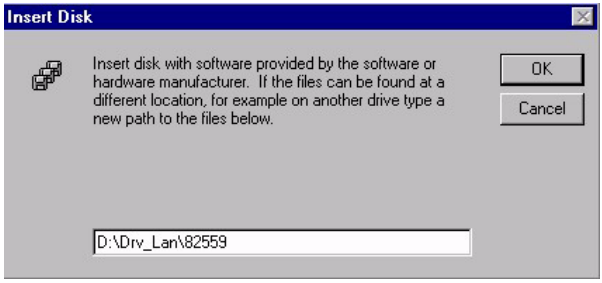
2. In the "Network" window, select the "Start Search" tab. Then click on "Next".



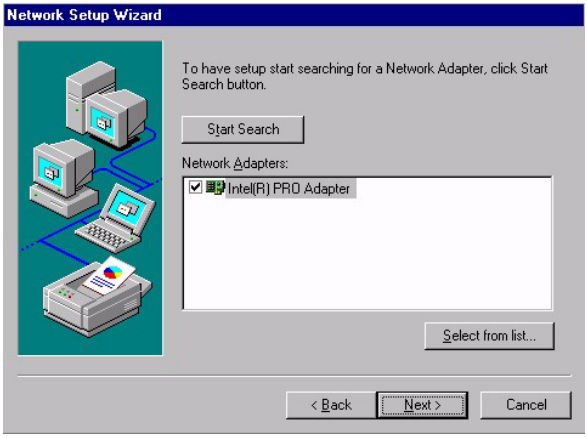
3. In the "Select Network Adapter" window, click on "Have Disk...".



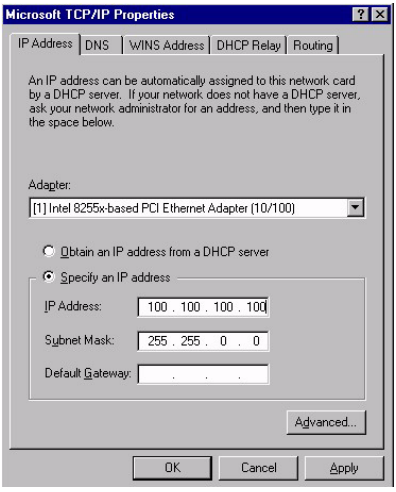
4. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. The correct file path is D:\Drv_Lan\82559. When you have the correct file path, click on "OK".



5. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "Intel® Pro Adapter". Then click on "Close".



6. In the "Microsoft TCP/IP Properties" window, select the "IP Address" tab. Then select "Specify an IP address". Type in the IP Address and Subnet Mask details. Then click on "OK".

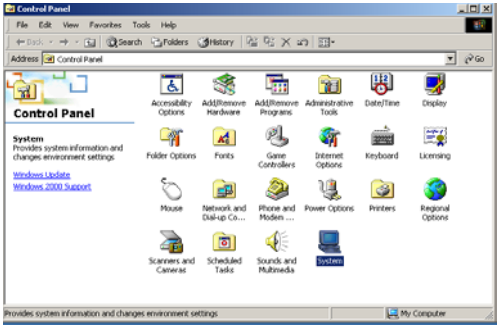


7. In the "Network Settings Change" window, click on "Yes" to restart the computer.

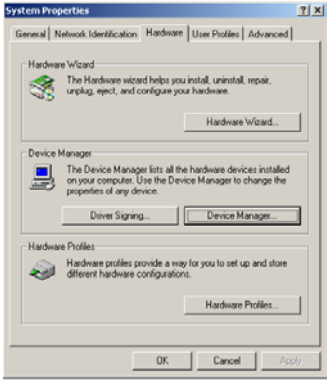
6.5 Windows 2000 Drivers (Intel 82559) Setup Procedure

Note: The CD-ROM drive is designed as "D" throughout this section.

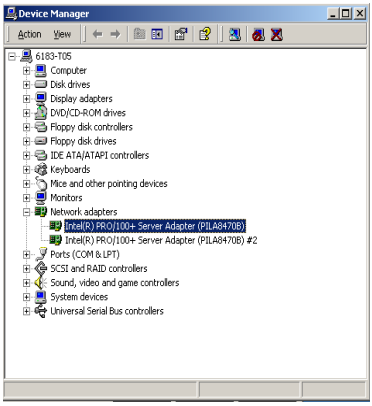
1. In the "Windows 2000" screen, click on " Start" and select " settings". Then click on the " Control Panel" icon to select "system".



2. In the " System Properties" window, select the " Device Manager".

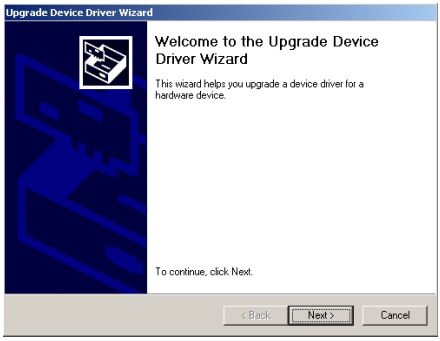


3. In " Device Manager" screen, click on "Intel® PRO/100+ Server Adapter (PILA84708) #2. Then click on mice's right button. You can see "Property". Click on "Property"..



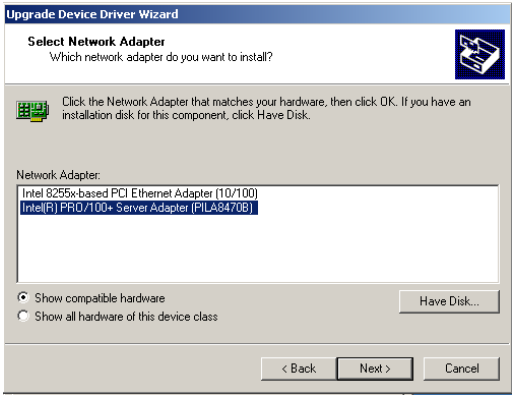
4. In the following screen, to click on "Update Driver".

5. Click on "Next".

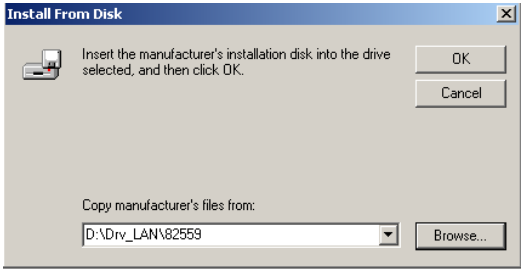


6. Following the highlighted item, and click on "Next".

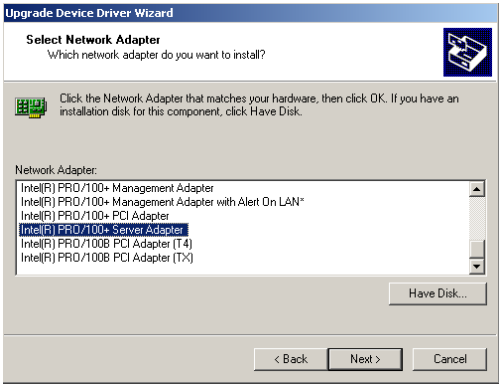
7. Click on "Have Disk".



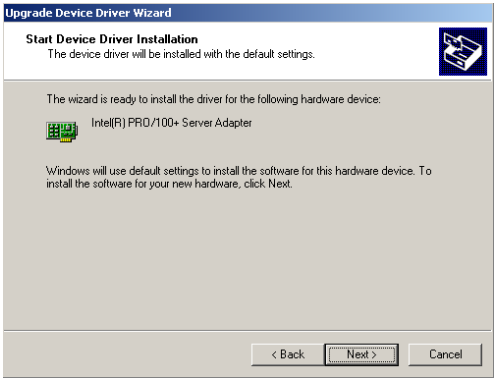
8. Key in "D:\Drv_Lan\D_82559", then click on "OK".



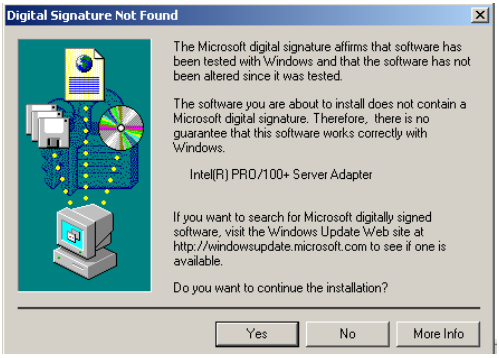
9. To highlight the following item, and click "Next".



10. Click "Next".



11. Click on "Yes"



12. Click "Finish" to complete the installation.

CHAPTER 7

Onboard Security Setup

This chapter explains OBS concepts and provides instructions for installing the relevant software drivers. This is done using the driver CD included in your PCA-6184

Chapter 7 Onboard Security Setup

7.1 Introduction

Onboard security (OBS) functions monitor key hardware. They help you maintain your system's stability and durability.

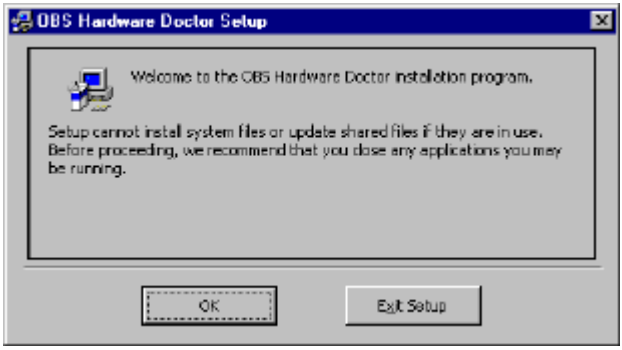
The PCA-6184 can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets which can be monitored include:

- CPU core voltage: 1.3 V ~ 3.3 V, according to Intel specifications.
- Transmission voltage from CPU to chipset: typically 1.8 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.
- The negative system voltage sets which can be monitored include: Main voltage: -5 V, -12 V.

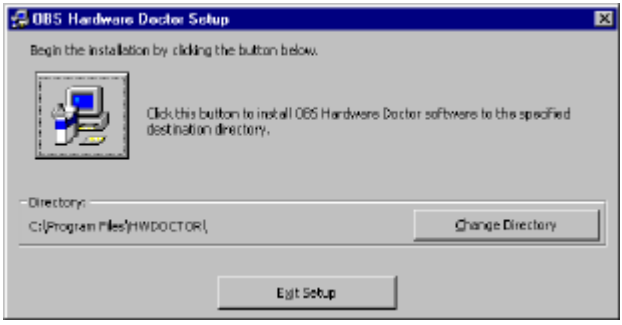
7.2 Windows 9X Drivers Setup Procedure

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "WIN 9X" button under the "OBS DRIVERS" heading.

2. When you will see the following message, make sure you have closed all other programs, then click on "OK."



3. Click on the square graphics button when you see the following message.

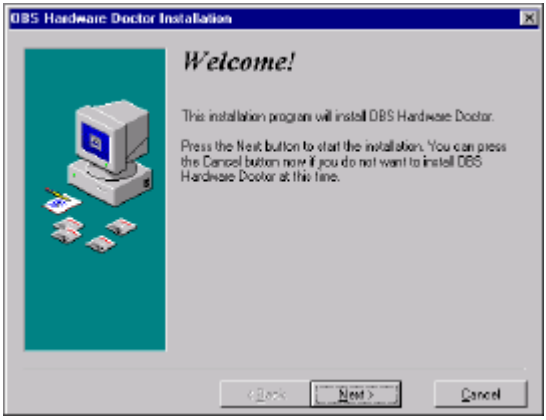


4. When you see the following message, click on "OK" to complete the installation.

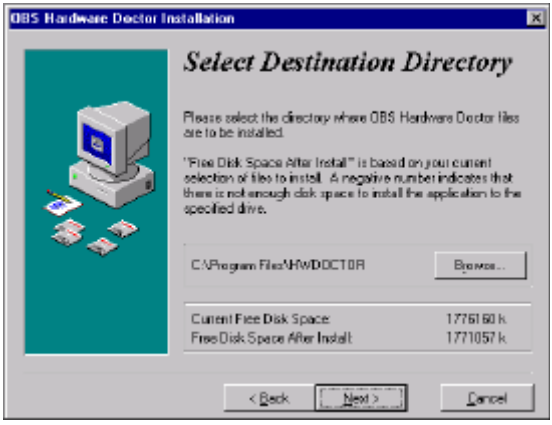
7.3 Windows NT Drivers Setup Procedure

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "WIN NT" button under the "OBS DRIVERS" heading.

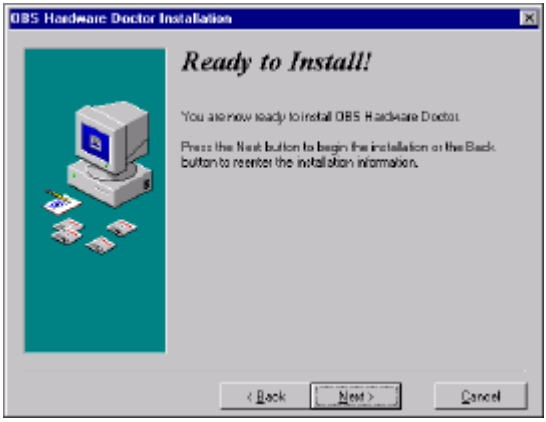
2. Click "Next" when you see the following message.



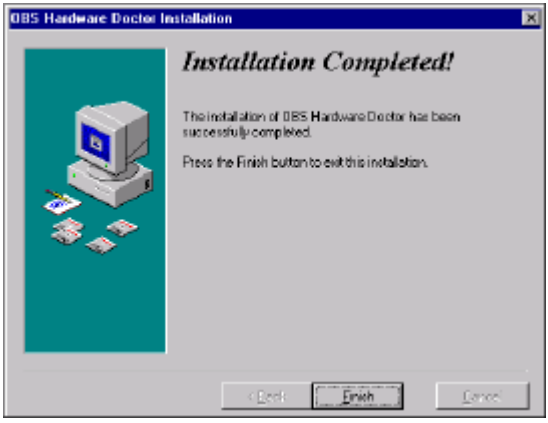
3. Click "Next" when you see the following message.



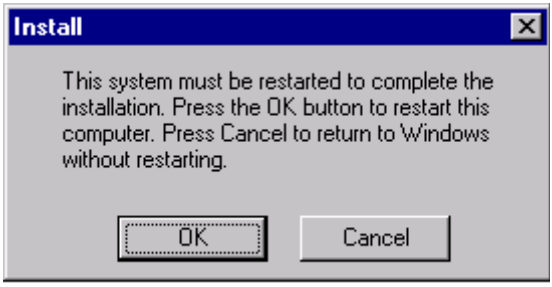
4. Click "Next" when you see the following message.



5. Click "Finish" when you see the following message.



6. Click "OK" to restart Windows.



7.4 Using the OBS Hardware Doctor Utility

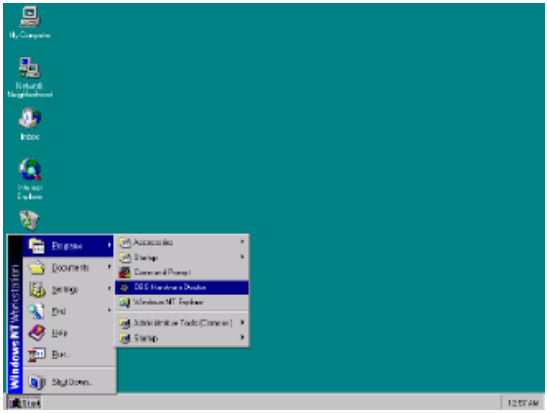
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security

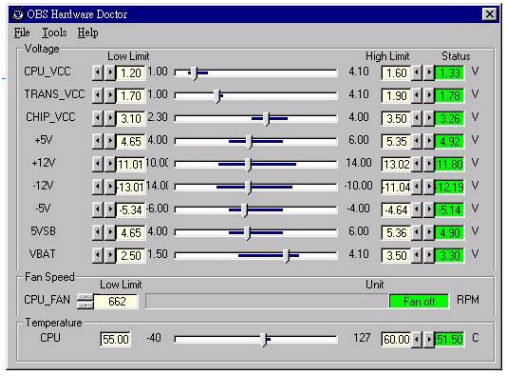
system.

You can view or change values for various OBS settings by running this utility:

1. From the desktop of Windows, click on "Start" and select "Programs" and then "OBS Hardware Doctor."



2. It is recommended that you load the default values for all the OBS settings. However, if desired, you can establish new conditions for voltage, fan speed, and temperature. Please adjust TRANS_VCC high limit to 1.9V. .



CHAPTER 8

Ultra ATA Storage Driver Setup

This driver must be installed to use the Intel® Ultra ATA controller to improve storage subsystem performance and overall systemperformance.

Chapter 8 Ultra ATA Storage Driver Setup

8.1 Introduction

This driver takes advantage of the latest Intel ® Ultra ATA controller features to improve both storage subsystem performance and overall system performance. A useful diagnostic tool, Intel Ultra ATA Companion® , shows technical information of the ATA subsystem.

8.2 Features

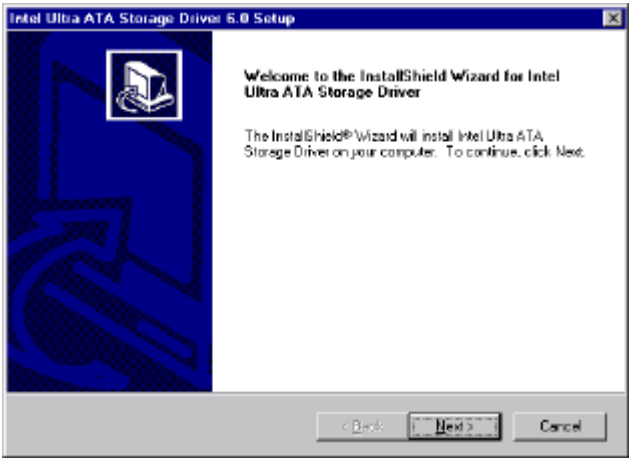
- The driver enables fast Ultra ATA transfers by default.
- Users no longer have to manually enable DMA transfers for each ATA and/or ATAPI peripheral devices.
- Each ATA channel has independent device timings/transfers which allows PIO-only and DMA-capable devices to share the same ATA controller cable, where one is the master and the other the slave, without restricting transfer mode to PIO-only for both devices.
- Technical details of the ATA subsystem can be viewed via use of the application.
- Drivers are optimized.

8.3 Installation

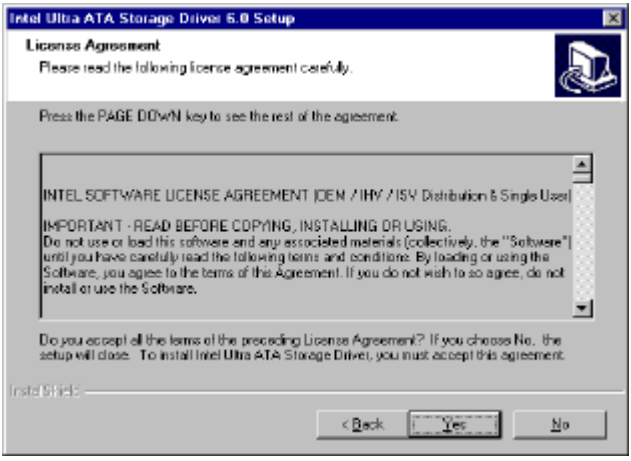
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "IDE DRIVERS" heading, click on the "Install" button.

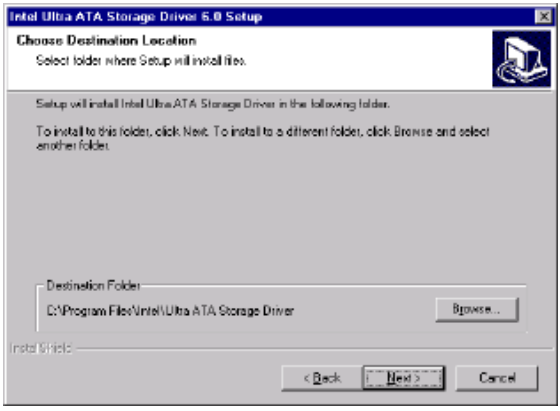
2. Click on "Next" when you see the following message



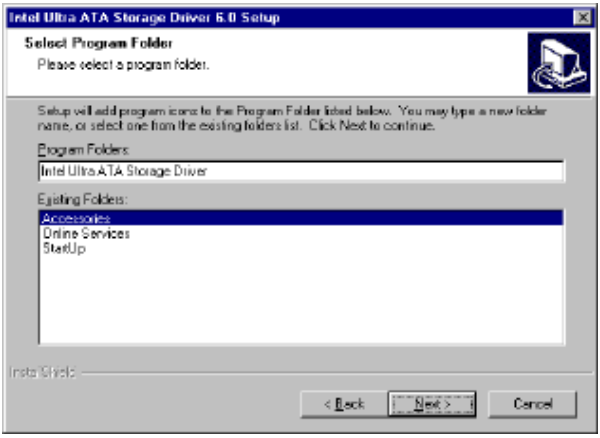
3. When you see the following message, click on "Yes" to accept the License Agreement.



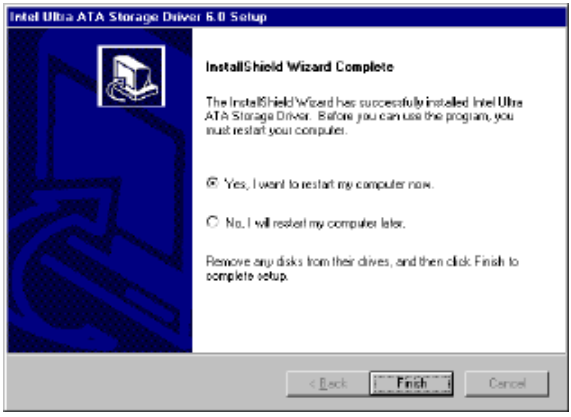
4. Click on "Next" when you see the following message.



5. Click on "Next" when you see the following message.

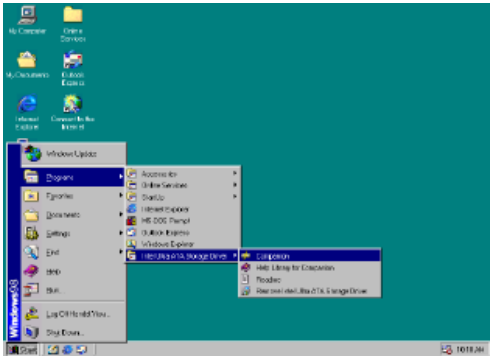


6. When the following message appears, click "Finish" to complete the installation and restart Windows.

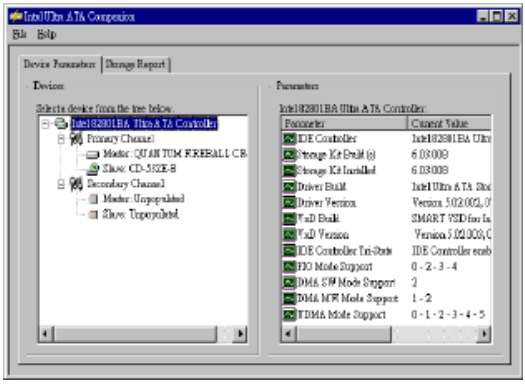


8.4 Displaying Driver Information

1. From the desktop of Windows, click on "Start" and select "Programs." Then select "Intel Ultra ATA Storage Driver" and then "Companion."



2. Click on the "Device Parameters" or the "Storage Report" tab to view related information.



Appendix A

Programming the Watchdog Timer

The PCA-6184 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A Programming the watchdog timer

A.1 Programming the Watchdog Timer

The PCA-6184's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

The watchdog timer is built-in the super I/O controller W83627HF. It provides the following functions for user programming:

- Can be enabled and disabled by user's program.
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes.

  Generates an interrupt or resets signal if the software fails to reset the timer after time-out.

A.1.2 Reset/ Interrupt selection

The J2 jumper is used to select reset or interrupt (IRQ 11) in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

A.1.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E(hex) and 2F(hex). 2E (hex) is the address port. 2F(hex) is the data port. You must first assign the address of register by writing address value into address port 2E(hex), then write/read data to/from the assigned register through data port 2F (hex).

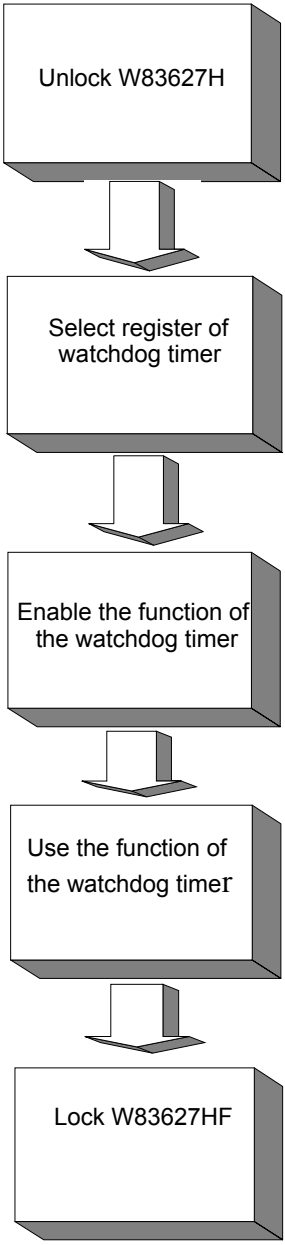

Unlock W83627H
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627HF

Table A.1: Watchdog Timer Registers		
Address of register (2E)	**Attribute**	
Read/Write	Value (2F) and description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock theW83627HF
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watch-dog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer.
Write 0 to bit 3: set second as counting unit. [default]		
Write 1 to bit 3: set minute as counting unit		
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this regis-ter can reset the timer to count with the new value.

F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to dis-able.[default] Bit 5: Write 1 to generate a timeout signal immedi-ately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is ""time out"" ."
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer.2

A.1.4 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;-----------------------------------------------------------
Mov dx,2eh                    ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-----------------------------------------------------------
Mov al,07h                    ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov   al,08h
Out   dx,al
;-----------------------------------------------------------
Dec dx                ; Enable the function of watchdog timer
Mov   al,30h
Out   dx,al
Inc   dx
Mov   al,01h
Out   dx,al
;-----------------------------------------------------------
```

```
Dec dx                  ; Set second as counting unit
Mov  al,0f5h
Out    dx,al
Inc     dx
In       al,dx
And al,not 08h
Out    dx,al
;-----------------------------------------------------------
Dec dx               ; Set timeout interval as 10 seconds and start counting
Mov  al,0f6h
Out    dx,al
Inc     dx
Mov  al,10
Out    dx,al
;-----------------------------------------------------------
Dec dx               ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;-----------------------------------------------------------
Mov dx,2eh           ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;-----------------------------------------------------------
Mov al,07h           ; Select registers of watchdog timer
Out    dx,al
Inc     dx
Mov  al,08h
Out    dx,al
;-----------------------------------------------------------
```

```
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out    dx,al
Inc     dx
Mov  al,01h
Out    dx,al
;-----------------------------------------------------------
Dec dx              ; Set minute as counting unit
Mov  al,0f5h
Out    dx,al
Inc     dx
In      al,dx
Or  al,08h
Out    dx,al
;-----------------------------------------------------------
Dec dx              ; Set timeout interval as 5 minutes and start counting
Mov  al,0f6h
Out    dx,al
Inc     dx
Mov  al,5
Out    dx,al
;-----------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;-----------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
```

```
;-------------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov  al,08h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc   dx
Mov  al,01h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; Enable watchdog timer to be reset by mouse
Mov  al,0f7h
Out   dx,al
Inc   dx
In    al,dx
Or  al,80h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
4.    Enable watchdog timer to be reset by keyboard
;-------------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
```

```
;-----------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov  al,08h
Out   dx,al
;-----------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc   dx
Mov  al,01h
Out   dx,al
;-----------------------------------------------------------
Dec dx              ; Enable watchdog timer to be strobed reset by keyboard
Mov  al,0f7h
Out   dx,al
Inc   dx
In    al,dx
Or  al,40h
Out   dx,al
;-----------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

5. Generate a time-out signal without timer counting

```
;-----------------------------------------------------------
Mov dx,2eh          ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
```

```
;-------------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov  al,08h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc   dx
Mov  al,01h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; Generate a time-out signal
Mov  al,0f7h
Out   dx,al                     ;Write 1 to bit 5 of F7 register
Inc   dx
In    al,dx
Or  al,20h
Out   dx,al
;-------------------------------------------------------------
Dec dx              ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

Appendix B

I/O Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- IDE Hard Drive Connector
- Floppy Drive Connector
- Parallel Port Connector
- USB Connector
- VGA Connector
- Ethernet 10/100Base-T RJ-45 Connector
- COM1/COM2 RS-232 Serial Port
- Keyboard and Mouse Connector
- External Keyboard Connector
- IR Connector
- CPU Fan Power Connector
- Power LED Connector
- External Speaker Connector
- Reset Connector
- HDD LED Connector
- ATX Feature Connector
- ATX Soft Power Switch
- H/W Monitor Alarm
- Extension I/O Board Connector
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

Appendix B Pin Assignments

B.1 IDE Hard Drive Connector(CN1, CN2)

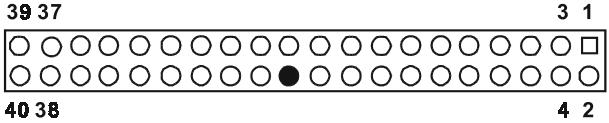


Table B.1: IDE hard drive connector (CN1, CN2)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	GND
21	DISK DMA Request	22	GND
23	IO Write	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	GND
29	HDACKO*	30	GND
31	IRQ14	32	N/C
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE	40	GND

* low active

B.2 Floppy Drive Connector (CN3)

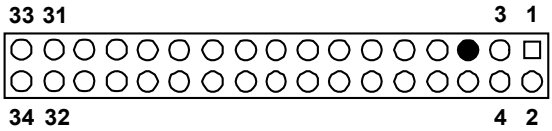


Table B.2: Floppy Drive Connector (CN3)

Pin	Signal	Pin	Signal
1	GND	2	FDHDIN
3	GND	4	N/C
5	DATA 6	6	FDEDIN
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE

* low active

B.3 Parallel Port Connector (CN4)

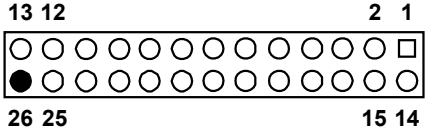


Table B.3: Parallel Port Connector (CN4)

Pin	Signal	Pin	Signal
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C

* low active

B.4 USB Connector (CN6)

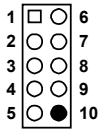


Table B.4: USB Connector (CN6)

Pin	USB1 Signal	Pin	USB2 Signal
1	+5 V	6	+5 V
2	UNV-	7	UV-
3	UV+	8	UV+
4	GND	9	GND
5	Chassis GND	10	N/C

B.5 VGA Connector (CN7)

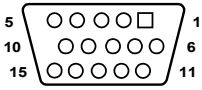


Table B.5: VGA Connector (CN7)

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.6 Ethernet Base-T Connector (CN8, CN34)

Table B.6: Ethernet 10/100Base-T RJ-45 Connector (CN8, CN34)

Pin	Signal	Pin	Signal
1	XMT+	5	N/C
2	XMT-	6	RCV-
3	RCV+	7	N/C
4	N/C	8	N/C

B.7 COM1/COM2 Serial Port (CN9, CN10)

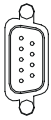


Table B.7: COM1/COM2 RS-232 serial port (CN9, CN10)

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.8 Keyboard and Mouse Connnector (CN11)

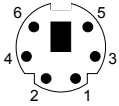


Table B.8: Keyboard and Mouse Connector (CN 11)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.9 External Keyboard Connector (CN12)

Table B.9: External Keyboard Connector (CN 12)

Pin	Signal
1	CLK
2	DATA
3	NC
4	GND
5	VCC

B.10 IR Connector (CN13)

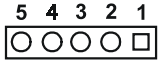


Table B.10: IR Connector (CN 13)

Pin	Signal
1	+5 V
2	N/C
3	IR_RX
4	GND
5	IR_TX

B.11 CPU Fan Power Connector (CN14)

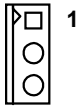


Table B.11: CPU Fan Power Connector (CN 14)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.12 Power LED and Keyboard Lock (CN16)

You can use an LED to indicate when the CPU card is on. Pin 1 of CN16 supplies the LED's power, and Pin 3 is the ground.

Pin 4 is for keyboard lock.

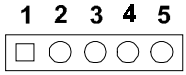


Table B.12: Power LED and Keyboard Lock (CN 16)

Pin	Function
1	LED power (+5 V)
2	NC
3	GND
4	Keyboard Lock
5	GND

B.13 External Speaker Connector (CN17)

The CPU card has its own buzzer. You can also connect it to the external speaker on your computer chassis.

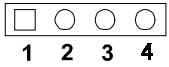


Table B.13: External Speaker Connector (CN 17)

Pin	Function
1	+5 VCC
2	GND
3	Internal buzzer
4	Speaker out

B.14 Reset Connector (CN18)

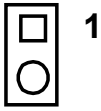


Table B.14: Reset Connector (CN 18)

Pin	Signal
1	Reset
2	GND

B.15 HDD LED Connector (CN19)

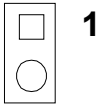


Table B.15: HDD LED Connector (CN 19)

Pin	Signal
1	Vcc(LED+)
2	LED0 (LED-)

B.16 ATX Feature Connector (CN20)

Table B.16: ATX Feature Connector (CN 20)

Pin	Signal
1	PS-ON
2	VCC
3	VCC5VSB

B.17 ATX Soft Power Switch (CN21)

Table B.17: ATX Soft Power Switch (CN 21)

Pin	Signal
1	3VSB
2	PWR-BTN

B.18 Extension I/O Board Connector (CN27)

Table B.18: Extension I/O Board Connector (CN 27)

Pin	Signal	Pin	Signal
1	D+ (USB3)	11	D- (USB1)
2	D+ (USB2)	12	D- (USB0)
3	D- (USB3)	13	Vcc (USB1)
4	D- (USB2)	14	Vcc (USB0)
5	Vcc (USB3)	15	GND (USB1)
6	Vcc (USB2)	16	GND (USB0)
7	GND (USB3)	17	5VSB
8	GND (USB2)	18	ACT LED (LAN2)
9	D+ (USB1)	19	LINK (LAN 2)
10	D+ (USB0)	20	SPEED-100Mbps

B.19 Extension I/O Board Connector (CN28)

Table B.19: Extension I/O Board Connector (CN 28)

Pin	Signal	Pin	Signal
1	TXC+ (DVI)	11	TX0+ (DVI)
2	TXC- (DVI)	12	TX0- (DVI)
3	FP_SDAT (DVI)	13	TXD+ (LAN2)
4	FP_SCLK (DVI)	14	GND
5	H_DEC (DVI)	15	RXIN+ (LAN2)
6	FP_VCC (DVI)	16	TXD- (LAN2)
7	TX2+ (DVI)	17	MS DATA (PS/2 MS)
8	TX2- (DVI)	18	RXIN- (LAN2)
9	TX1+ (DVI)	19	MS CLOCK (PS/2 MS)
10	TX1- (DVI)	20	MS_VCC (PS/2 MS)

B.20 SM Bus Connector (CN29)

Table B.20: SM Bus Connector (CN 29)

Pin	Signal
1	SMB_DATA
2	SMB_CLK

B.21 System I/O Ports

Table B.21: System I/O Ports

Address Range	HEX	Device
000	00F	Direct memory access controller
000	03A	PCI Bus
010	01F	Motherboard resources
020	021	Programmable interrupt controller
022	03F	Motherboard resources
040	043	System timer
044	05F	Motherboard resources
060	060	Standard 101/102 key or Microsoft Natural PS/2
061	061	System speaker
062	063	Motherboard resources
064	064	Standard 101/102 key or Microsoft Natural PS/2
065	06F	Motherboard resources
070	073	System CMOS/real time clock
074	07F	Motherboard resources
080	090	Direct memory access controller
091	093	Motherboard resources
094	09F	Direct memory access controller
0A0	0A1	Programmable interrupt controller

Table B.21: System I/O Ports

Address Range	HEX	Device
0A2	0BF	Motherboard resources
0C0	0DF	Direct memory access controller
0E0	0EF	Motherboard resources
0F0	0FF	Numeric data processor
170	177	Secondary IDE channel
1F0	1F7	Primary IDE channel
279	279	ISAPNP read data port
294	297	Motherboard resources
2F4	2F7	ISAPNP read data port
2F8	2FF	Communication port (COM2)
376	376	Secondary IDE channel
378	37F	Printer port (LTP1)

B.22 DMA Channel Assignments

Table B.22: DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller
5	Available
6	Available
7	Available

B.23 Interrupt Assignments

Table B.23: Interrupt Assignments

Interrupt #	Interrupt assignments
0 (ISA)	System timer
1 (ISA)	Standard 101/102 key or Microsoft Natural PS/2
3 (ISA)	Communications port (COM2)
4 (ISA)	Communications port (COM1)
6 (ISA)	Standard floppy disk controller
8 (ISA)	System CMOS/real time clock
9 (ISA)	Microsoft ACPI-compliant system
12 (ISA)	PS/2 compatible mouse
13 (ISA)	Numeric data processor
14 (ISA)	Primary IDE channel
11 (PCI)	Standard OpenHCD USB host controller
21 (PCI)	Intel® PRO/100+ Server adapter (PILA8470B) #2
22 (PCI)	Intel® PRO/100+ Server adapter (PILA8470B)

B.24 1st MB Memory Map

Table B.24: 1st MB memory map

Addr. range (HEX)	Device
F0000h - FFFFFh	System ROM
C8000h - EFFFFh	Unused
C0000h - C7FFFh	VGA BIOS
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh6	Base memory

B.25 PCI Bus Map

Table B.25: PCI bus map

Function	Device_ID	INT# Pin	GNT# Pin
Onboard LAN2	AD21	INTG	GNTE
Onboard LAN1	AD20	INTH	GNTA
ISA Bridge	AD22		GNTF
PCI slot 1	AD31	INT B, C, D, A	GNTA
PCI slot 2	AD30	INT C, D, A, B	GNTB
PCI slot 3	AD29	INT D, A, B, C	GNTC
PCI slot 4	AD28	INT A, B, C, D	GNTD