# PCA-6180- B

Full-size socket 370 Intel®
Tualatin / Pentium® III / Celeron™
processor based PCI/ISA-bus
CPU card

## Acknowledgements



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# A Message to the Customer

## Advantech customer services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

## Technical support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

PCA-6180 Rev. A Series comparison table

| Model | PCA-6180E-00A1 | PCA-6180E2-00A1 | PCA-6180ES-00A1 | PCA-6180F-00A1 |
|---|---|---|---|---|
| CPU: Intel® Pentium® III / Celeron™ socket 370 | v | v | v | v |
| System chipset: Intel® 815E | v | v | v | v |
| BIOS: Award P&P BIOS | v | v | v | v |
| Max. system RAM: 512MB | v | v | v | v |
| ISA High Drive | v | v | v | v |
| 4 USB Ports | 4 | 4 | 4 | 4 |
| 2 EIDE connectors | v | v | v | v |
| 2 serial, 1 parallel ports | v | v | v | v |
| Chipset integrated VGA (AGP) | v | v | v | v |
| LAN: 10/100Base-T Ethernet | SINGLE | DUAL | SINGLE | DUAL |
| SCSI: 32-bit PCI Ultra 160 SCSI (Adaptec AIC-7892 chipset) | — | — | v | v |

PCA-6180 Rev. B Series comparison table

| Model | PCA-6180E-00B1 | PCA-6180E2-00B1 | PCA-6180ES-00B1 | PCA-6180F-00B1 |
|---|---|---|---|---|
| CPU: Intel® Tualatin / Pentium® III / Celeron™ socket 370 | v | v | v | v |
| System chipset: Intel® 815E (B) | v | v | v | v |
| BIOS: Award P&P BIOS | v | v | v | v |
| Max. system RAM: 512MB | v | v | v | v |
| ISA High Drive | v | v | v | v |
| 4 USB Ports | 4 | 4 | 4 | 4 |
| 2 EIDE connectors | v | v | v | v |
| 2 serial, 1 parallel ports | v | v | v | v |
| Chipset integrated VGA (AGP) | v | v | v | v |
| LAN: 10/100Base-T Ethernet | SINGLE | DUAL | SINGLE | DUAL |
| SCSI: 32-bit PCI Ultra 160 SCSI (Adaptec AIC-7892 chipset) | — | — | v | v |

## Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

## Initial Inspection

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 PCA-6180-B socket 370 Tualatin / Pentium® III / Celeron™ processor-based single board computer
- 1 PCA-6180B Startup Manual
- 1 CD with driver utility and manual (in PDF format)
- 2 SCSI driver disks (optional)
- 1 FDD cable
- 2 Ultra ATA 100 HDD cables, P/N: 1701400452
- 1 printer (parallel port) cable & COM port cable kit, P/N: 1700060305
- 1 ATX-to-PS/2 power cable, P/N: 1700000450
- 1 ivory cable for PS/2 keyboard and PS/2 mouse, P/N: 1700060202
- 1 single-slot bracket, P/N: 1962159010
- 1 USB cable adapter (optional), P/N: 1700100170

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

We have carefully inspected the PCA-6180-B mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the PCA-6180-B, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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CHAPTER 1

# Hardware Configuration

This chapter gives background information on the PCA-6180. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

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- Features
- Specifications
- Board Layout
- Jumpers and Connectors
- Location of Jumpers and Connectors
- Safety Precautions
- Jumper Settings
- System Memory
- Memory Installation Procedures
- Cache Memory
- CPU Installation

## 1.1 Introduction

The PCA-6180 Rev. B Series all-in-one industrial grade CPU card uses Intel®'s highly acclaimed Tualatin/Pentium® III / Celeron™ processor, together with the Intel® 815E (B)chipset. The card works with standard ISA- or PCI/ISA-bus passive backplanes.

The CPU provides 512/256/128 KB on-CPU L2 cache, eliminating the need for external SRAM chips. It has two PCI EIDE interfaces (for up to four devices) and a floppy disk drive interface (for up to two devices). Other features include two RS-232 serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port (supports SPP/EPP but PCA-6180 Rev. B does not support ECP) and four USB (Universal Serial Bus) ports. The PCI enhanced IDE controller supports Ultra ATA/100/66/33 and PIO Mode 4 operation. This provides data transfer rates of 100/66/33 MB/sec. System BIOS supports boot-up from an IDE HDD/CD-ROM, SCSI HDD/CD-ROM, LS-120, ZIP-100, FDD, and LAN.

A backup of CMOS data 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 PCA-6180 Series offers several impressive industrial features such as a chipset integrated VGA (AGP) controller, a PCI Ultra 160 SCSI controller, dual 10/100Base-T networking controllers, three DIMM slots for a total of 512 MB SDRAM memory, and an ISA High Drive. All these make it an ideal choice for applications that require both high performance and full functionality.

*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. **Fan status monitoring and alarm**: To prevent system overheating and damage, the CPU fan can be monitored for speed and failure. The fan is set for its normal RPM range and alarm thresholds.
2. **Temperature monitoring and alert**: To prevent system overheating and damage, the CPU card supports processor thermal sensing and auto-protection.
3. **Voltage monitoring and alert**: System voltage levels are monitored to ensure stable current flows to critical components. Voltage specifications will become even more critical for processors of the future. Thus monitoring will become ever more necessary to ensure proper system configuration and management.
4. **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 (see Section 3.6.6 Soft-off by PWR-BTN). Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.
5. **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.
6. **Remote wake-up**: This feature (aka "Wake-on-LAN") 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.
7. **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.
8. **Jumperless mode**: When enabled, this allows changes of proces-sor settings and Vcore voltages all through the BIOS setup.

9. **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, BIOS will check the data and automatically restore the original data for rebooting.

10. **More**:
    - Additional metal bracket for CPU 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**: PCA-6180 Rev B: Intel Tualatin processor up to 1.26 GHz, Intel Pentium III processor up to 1 GHz, and Celeron up to 800 MHz
- **Firmware hub**: Provides security enhancements on computer platforms by supporting Random Number Generator (RNG).
- **BIOS**: Award Flash BIOS.
- **System Chipset:** Intel® 815E (B) (PCA-6180 Rev. B)
- **PCI enhanced IDE hard disk drive interface**: Supports up to four IDE (AT-bus) large hard disk drives or other enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra ATA 100/66/33 (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, 1.44 MB, and 2.88 MB). BIOS enabled/disabled.

### 1.3.2 Memory

- **RAM**: Up to 512 MB in three available 168-pin DIMM sockets. Supports PC100/ PC133-compliant SDRAMs.
- **ECC** (parity DRAM): not supported.

### 1.3.3 Input/Output

- **Bus interface**: PCI/ISA bus, PICMG compliant.
- **Enhanced parallel port**: Configurable to LPT1 or disabled. Standard DB-25 female connector provided. Supports EPP/SPP.
- **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**: Two 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or a PS/2 mouse. An onboard keyboard pin header connector is also available.
- **HISA**®: ISA bus high-driving capability up to 64 mA.

### 1.3.4 VGA interface

- **Supports AGP 2X, 133 MHz.**
- **Controller**: Chipset integrated.

### 1.3.5 SCSI interface

- **PCI SCSI**: Supports 32-bit PCI interface and Ultra 160 SCSI or legacy single-ended devices; data transfer up to 160 MB/sec.
- **Chipset:** Adaptec AIC-7892.

### 1.3.6 Ethernet LAN

- **Supports dual 10/100Base-T Ethernet networking.**
- **Chipset**: One onboard Intel® GD82559 and one chipset integrated LAN controller (82562)

### 1.3.7 Industrial features

- **Watchdog timer**: Can generate a system reset or IRQ11. The watch-dog timer is programmable, from one second to 255 minutes (255 levels). See Appendix A for the programming details.

### 1.3.8 Mechanical and environmental specifications

- **Operating temperature**: 0°~60° C (32° ~ 140° F).

*Note: The temperature depends on which CPU is used. The range is 0°~50° (32°~122°F) for a Pentium© III 933 MHz.*

- **Storage temperature**: 0°~ 60° C (32° ~ 140° F).
- **Humidity**: 20 ~ 95% non-condensing.
- **Power supply voltage**: +5 V, ±12 V.
- **Power consumption** (depends on CPU and memory):

  +5V @ 6.5A, -5V @30mA, +12V @225mA, -12V @50mA ( Tualatin 1.2 GHz, 128 MB SDRAM)
- **Board size**: 338 x 122 mm (13.3" x 4.8").
- **Board weight**: 0.5 kg (1.2 lb).

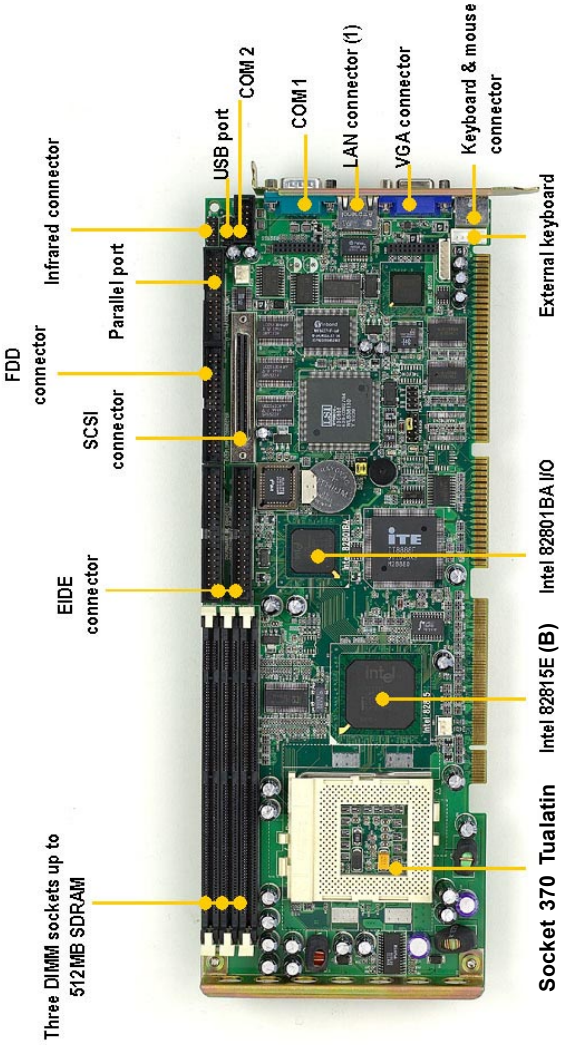



**Figure 1-2: Board layout: main features (PCA-6180 Rev. B)**

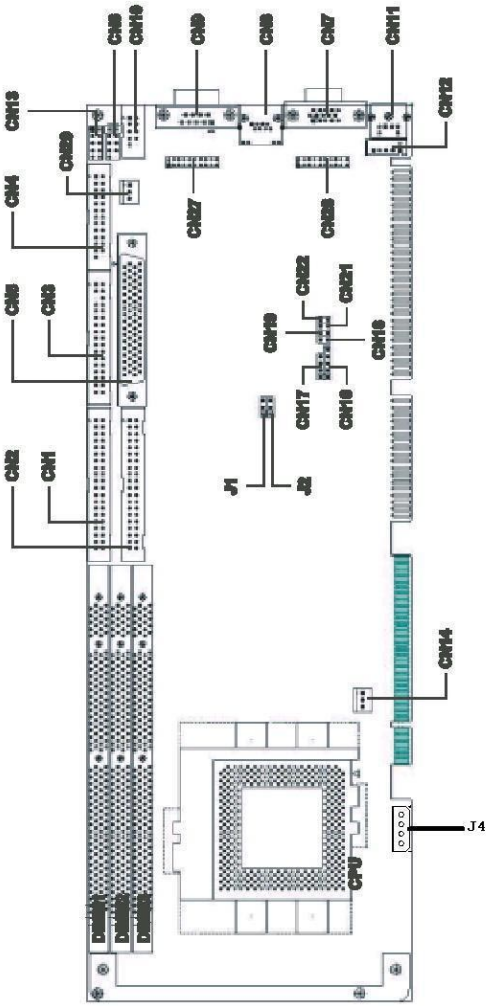



**Figure 1-3: PCA-6180-B**

## 1.5 Jumpers and Connectors

Connectors on the PCA-6180 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 the 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 |
| J4 | 4 pin power connector |

Table 1-2: Connectors

| Label | Function |
|---|---|
| CN1 | Primary IDE connector |
| CN2 | Secondary IDE connector |
| CN3 | Floppy drive connector |
| CN4 | Parallel port |
| CN5 | SCSI connector |
| CN6 | USB port |
| 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 | Keyboard lock and power LED |
| CN17 | External speaker |
| CN18 | Reset connector |
| CN19 | HDD LED connector |
| CN20 | ATX feature connector |
| CN21 | ATX soft power switch |
| CN22 | H/W monitor alarm: close - enable OBS alarm |
| | open - disable OBS alarm |
| CN23 | SM bus connector |
| CN27 | Connector to extension I/O board |
| CN28 | Connector to extension I/O board |

**Extension I/O board**

| | |
|---|---|
| CN31 | USB port 0,1 |
| CN32 | USB port 2,3 |
| CN33 | PS/2 mouse connector |
| CN34 | 10/100Base-T Ethernet connector 2 |

## 1.6 Location of Jumpers and Connectors

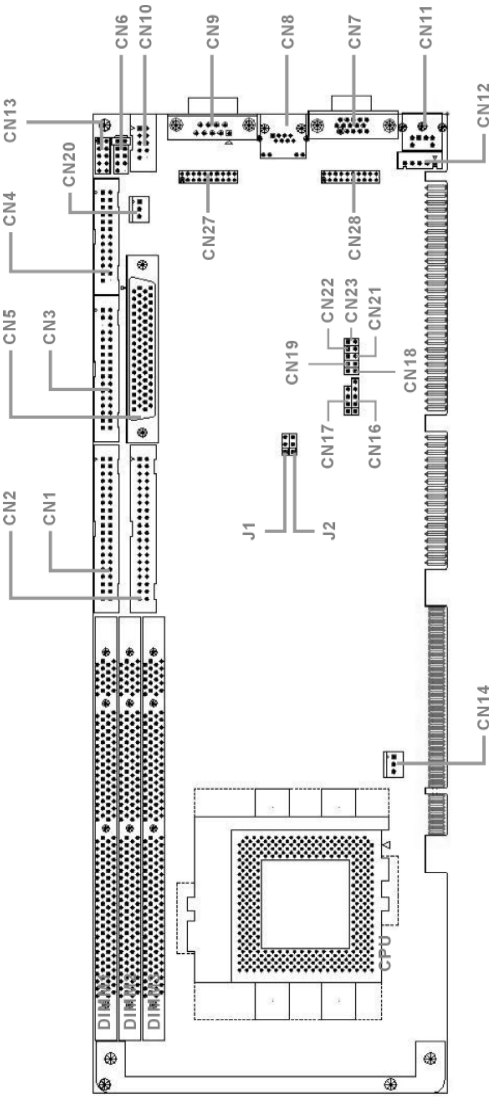



**Figure 1-3: Location of jumpers and connecters**

*Note: See Chapter 2 for the location of CN31~CN34.*

## 1.7 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!*** *Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

## 1.8 Jumper Settings

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

### 1.8.1 How to set the jumpers

You configure your card to match the needs of your application by setting the 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.

### 1.8.2 CMOS clear (J1)

The PCA-6180 CPU 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 closed. If you want to reset the CMOS data, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1-3: CMOS clear (J1)

| Function | Jumper setting | |
|---|---|---|
| * Keep CMOS data | 1-2 closed |   |
| Clear CMOS data | 2-3 closed |   |

* default setting

### 1.8.3 Watchdog timer output (J2)

The PCA-6180 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-6180 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

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

## 1.9 System Memory

The top-left edge of the PCA-6180 contains three sockets for 168-pin dual in-line memory modules (DIMMs). All three sockets use 3.3 V unbuffered synchronous DRAMs (SDRAM). DIMMs are available in capacities of 16, 32, 64, 128, or 256 MB. The sockets can be filled in any combination with DIMMs of any size, giving your PCA-6180 single board computer between 16 MB and 512 MB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1-5: DIMM module allocation table

| Socket number | 168-pin DIMM memory |
|---|---|
| 1 | (16, 32, 64, 128, or 256 MB) x 1 |
| 2 | (16, 32, 64, 128, or 256 MB) x 1 |
| 3 | (16, 32, 64, 128, or 256 MB) x 1 |

### 1.9.1 Sample calculation: DIMM memory capacity

Suppose you install a 128 MB DIMM into your PCA-6180's socket 1 and a 32 MB DIMM into sockets 2 and 3. Your total system memory is 192 MB, calculated as follows:

Table 1-6: DIMM memory capacity sample calculation

| Socket number | 168-pin | DIMM memory | Total memory |
|---|---|---|---|
| 1 | 128 MB | x 1 | 128 MB |
| 2 | 32 MB | x 1 | 32 MB |
| 3 | 32 MB | x 1 | 32 MB |
| **Total memory** | | | **192 MB** |

### 1.9.2 Supplementary information about DIMMs

Your PCA-6180 can accept SDRAM memory chips (with or without parity). Also note:

- If the PCA-6180 operates at 133 MHz, only use PC/133-compliant DIMMs. Most systems will not even boot if non-compliant modules are used. This is due to strict timing issues involved at this speed.
- Chips with 9 chips/side support ECC; chips with 8 chips/side do not support ECC. PCA-6180 does not support ECC.
- Single-sided modules are typically 16, 32, or 64 MB; double-sided modules are usually 32, 64, 128, or 256 MB.

## 1.10 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.

## 1.11 Cache Memory

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

## 1.12 CPU Installation

The PCA-6180 provides a socket 370 for an Intel® FC-PGA Pentium® III 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 370.

1. Make sure the socket 370 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.

When the CPU is installed, the lever should snap into place at the side of the socket.

*Note:* *To remove a CPU, pull the lever out to the side a little and raise it as far as it will go. Lift out the CPU.*

CHAPTER 2

# Connecting Peripherals

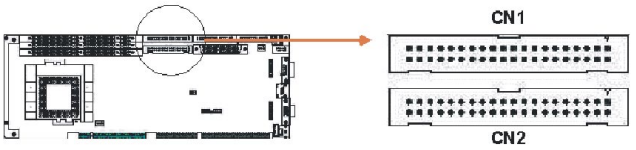
This chapter tells how to connect peripherals, switches, and indicators to the PCA-6180 board.

## 2.1 Introduction

You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed or have a packed chasis, you may need to partially remove the card to make all the connections.

*Note: If your chassis has only one empty expansion slot to accommodate the CPU card, you can replace the standard dual-slot bracket with the single-slot bracket included in your PCA-6180 package, in which case you will have to access the connectors (CN31~34) on the extension I/O board from inside the chassis.*

## 2.2 Primary (CN1) and Secondary (CN2) IDE Connectors




You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6180'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.

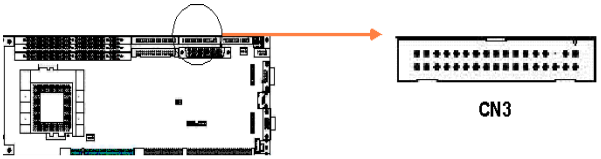
Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should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

*Note: The PCA-6180 supports the Ultra ATA/100 interface and requires special IDE cables as well as a software driver to enable this function. See Chapter 7 for more information.*

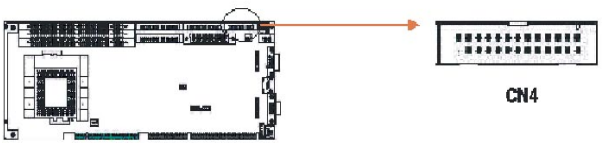
## 2.3 Floppy Drive Connector (CN3)




You can attach up to two floppy disk drives to the PCA-6180's onboard controller. You can use 3.5" (720 KB, 1.44/2.88 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.

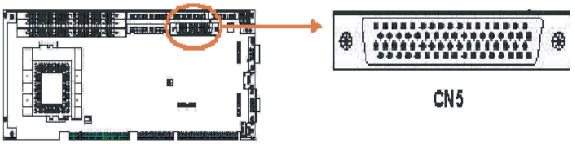
## 2.4 Parallel Port (CN4)



The parallel port is normally used to connect the CPU card to a printer. The PCA-6180 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.

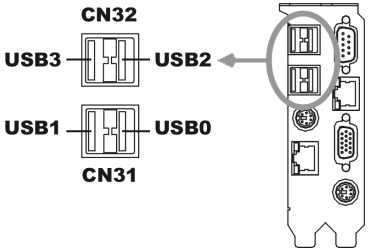
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN4 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire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

## 2.5 SCSI Connector (CN5)




The PCA-6180 has a 68-pin, dual in-line connector for Ultra 160 SCSI devices. Connection of SCSI devices requires special attention, especially when determining the last drive on the SCSI chain. Refer to Chapter 9 and your device's operating manual for detailed installation advice.

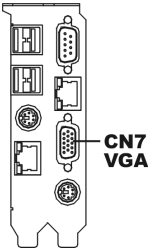
## 2.6 USB Ports (CN31 and CN32)




The PCA-6180 provides four ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 1.0 and is fuse-protected.

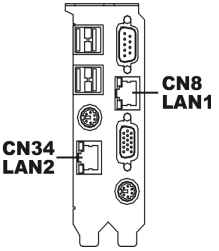
The USB interface can be disabled in the system BIOS setup.

## 2.7 VGA Connector (CN7)



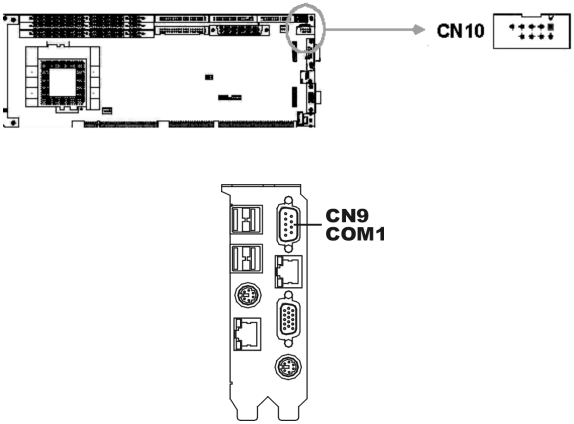

The PCA-6180 includes an AGP SVGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

## 2.8 10/100Base-T Ethernet Connectors (CN8 and CN34)




The PCA-6180 is equipped with one or two high-performance 32-bit PCI-bus Ethernet interfaces, which are fully compliant with IEEE 802.3/u 10/100 Mbps CSMA/CD standards. They are supported by all major network operating systems and are 100% Novell NE-2000 compatible. The RJ-45 jacks on the rear plate provide convenient 10/100Base-T RJ-45 operation.

## 2.9 Serial Ports (CN9: COM1; CN10: COM2)



The PCA-6180 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)

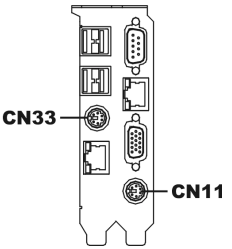
| Connector | Ports | Address | Interrupt |
|---|---|---|---|
| CN9 | COM1 | 3F8*, 3E8 | IRQ4 |
| CN10 | COM2 | 2F8*, 2E8 | IRQ3 |

* 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.

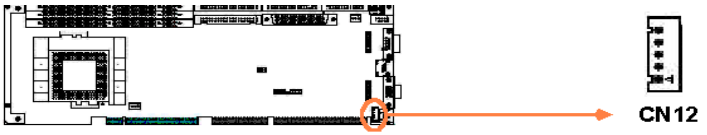
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

## 2.10 PS/2 Keyboard and Mouse Connectors (CN11 and CN33)



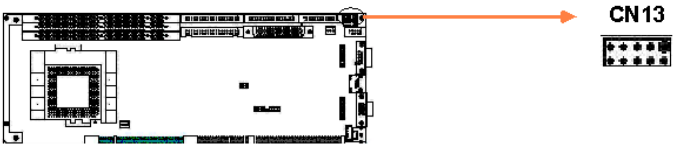

Two 6-pin mini-DIN connectors (CN11 and CN33) on the card mounting bracket provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. CN11 can also be connected to an adapter cable (P/N: 1700060202, available from Advantech) for connecting to both a PS/2 keyboard and a PS/2 mouse.

## 2.11 External Keyboard Connector (CN12)



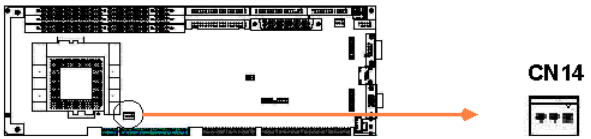

In addition to the PS/2 mouse/keyboard connector on the PCA-6180's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

## 2.12 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).

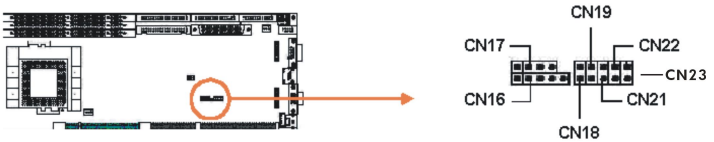
## 2.13 CPU Fan Connector (CN14)




This connector supports cooling fans of 500 mA (6 W) or less.

## 2.14 Front Panel Connectors (CN16, CN17, CN18, CN19, CN21 and CN22)

There are several external switches to monitor and control the PCA-6180.




### 2.14.1 Keyboard lock and power LED (CN16)

CN16 is a 5-pin connector for the keyboard lock and power on LED. 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 mode | LED (PS/2 power) | LED (ATX power) |
|---|---|---|
| System On | On | On |
| System Suspend | Fast flashes | Fast flashes |
| System Off | Off | Slow flashes |

### 2.14.2 External speaker (CN17)

CN17 is a 4-pin connector for an extenal speaker. If there is no external speaker, the PCA-6180 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

### 2.14.3 Reset (CN18)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button to CN18.

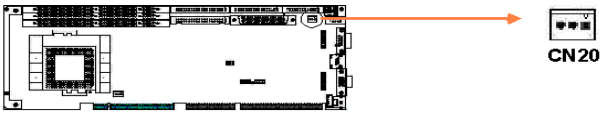
### 2.14.4 HDD LED (CN19)

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

### 2.14.5 ATX soft power switch (CN21)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to CN21. This connection enables you to turn your computer on and off.

## 2.15 ATX Power Control Connectors (CN20 and CN21)




*Note: Refer to the diagram on the previous page for the location of CN21.*

### 2.15.1 ATX feature connector (CN20) and soft power switch connector (CN21)

The PCA-6180 can support an advanced soft power switch function if an ATX power supply is used. To enable the soft power switch function:

1. Take the specially designed ATX-to-PS/2 power cable out of the PCA-6180's accessory bag.
2. Connect the 3-pin plug of the cable to CN20 (ATX feature connector).
3. 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.*

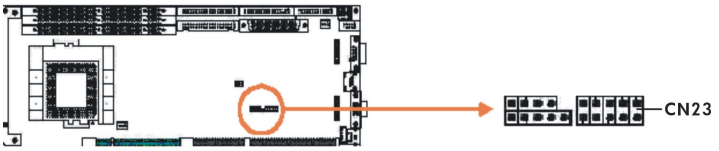
*2. ATX power supplies may power on if certain motherboard components or connections are touched by metallic objects.*

*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.*

### 2.15.2 Controlling the soft power switch

Users can also identify the current power mode through the system's power LED (see Section 2.13.1).

## 2.16 SM Bus Connector (CN23)




This connector can be used for external devices which need to be connected to the SM bus (system management bus).

CHAPTER 3

# Award BIOS Setup

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

## 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.

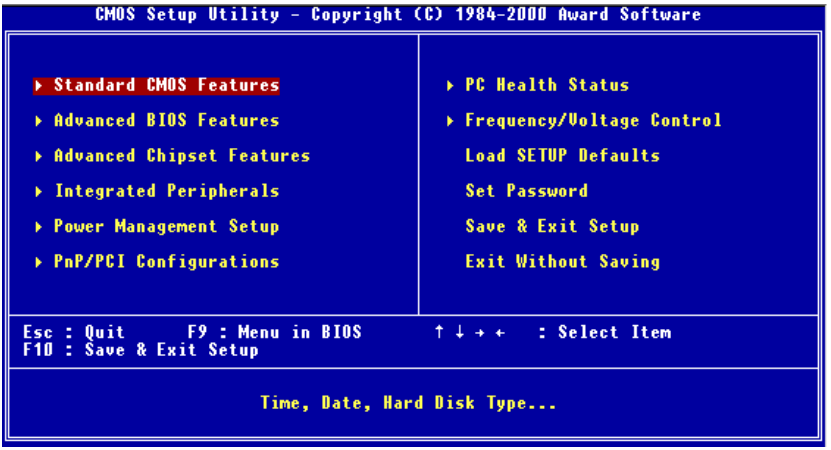



**Figure 3-1: Award BIOS Setup initial screen**

## 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.

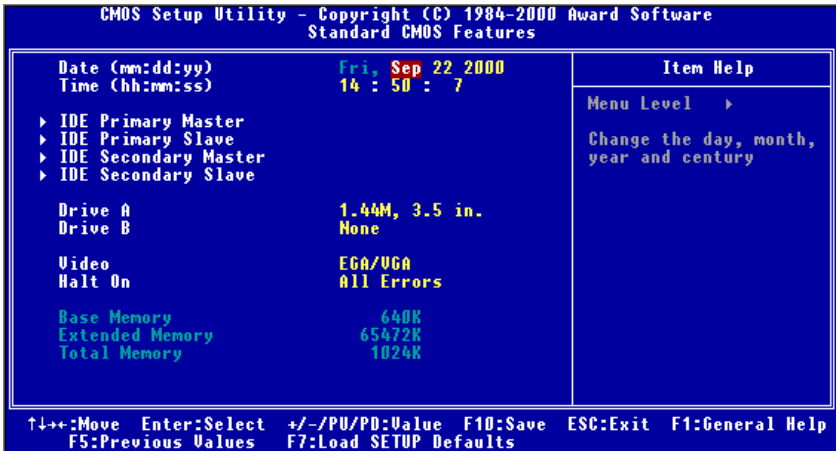



**Figure 3-2: Standard CMOS features screen**

### 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-6180 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.

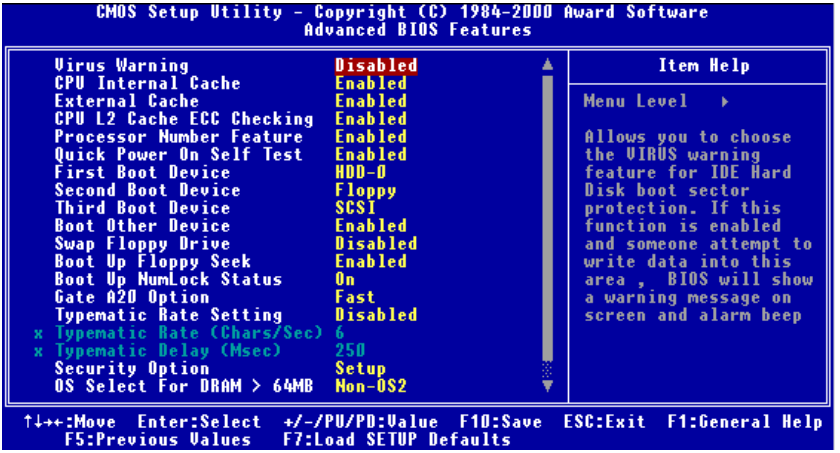



**Figure 3-3: Advanced BIOS features screen (1)**

### 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 Internal Cache / External Cache

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

### 3.4.3 CPU L2 Cache ECC Checking

Enabling allows CPU L2 cache checking. The commands are “Enabled” or “Disabled.”

### 3.4.4 Quick Power On Self Test

This option speeds up the Power On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, the computer conducts normal POST procedures. The commands are “Enabled” or “Disabled.”

### 3.4.5 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.

### 3.4.6 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.”

### 3.4.7 Boot UP Floppy Seek

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

### 3.4.8 Boot Up NumLock

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

### 3.4.9 Gate A20 Option

| | |
|---|---|
| Normal | The A20 signal is controlled by the keyboard controller. |
| Fast (Default) | The A20 signal is controlled by the chipset. |

### 3.4.10 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.

### 3.4.11 Typematic Rate (Chars/Sec)

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

### 3.4.12 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).

### 3.4.13 Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is, however, 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.*

### 3.4.14 OS Select for DRAM > 64MB

This setting allows selecting an OS with greater than 64MB of RAM. Commands are “Non-OS2” or “OS2.”

### 3.4.15 Report No FDD For Win 95

This reports if an FDD is available for Windows 95. The commands are “Yes” or “No.”

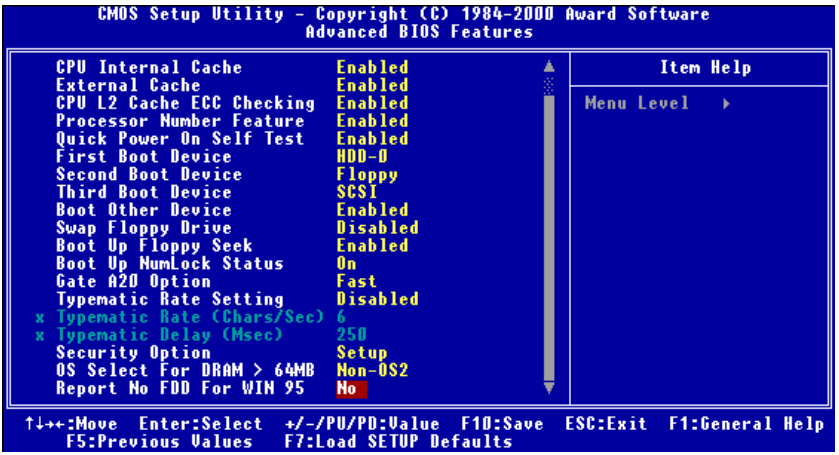



**Figure 3-4: Advanced BIOS features screen (2)**

## 3.5 Advanced Chipset Features

By choosing the “Advanced Cipset 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-6180, as shown in Figure 3-5:

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

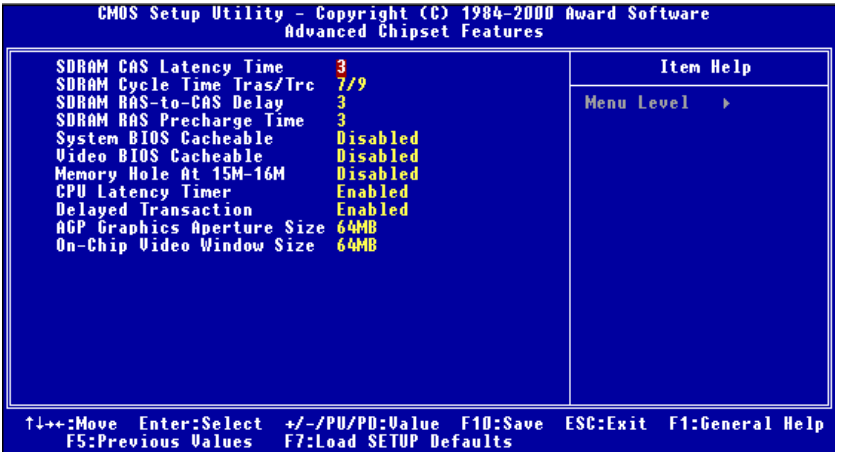



**Figure 3-5: Advanced chipset features screen**

### 3.5.1 SDRAM CAS Latency Time

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

### 3.5.2 SDRAM Cycle Time Tras/Trc

This selects the number of SCLKs for an access cycle.

### 3.5.3 SDRAM RAS-to-CAS Delay

This controls the latency between SDRAM active command and the read/write command. Leave this on the default setting.

### 3.5.4 SDRAM RAS Precharge Time

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

### 3.5.5 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 occur. The Choices: Enabled, Disabled.

### 3.5.6 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.

### 3.5.7 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 “Disabled.”

### 3.5.8 CPU Latency Timer

When enabled, the CPU cycle will only be deferred after it has been held in a “Snoop Stall” for 31 clocks and another ADS# has arrived. When disabled, the CPU cycle will be deferred immediately after the GMCH receives another ADS#. The Choices: Enabled, Disabled.

### 3.5.9 Delayed Transaction

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

### 3.5.10 AGP Graphics Aperture Size (MB)

Memory-mapped, graphics data structures can reside in a graphics aperture. Choices are: 4M, 8M, 16M, 32M, 65M, 128M, 256M.

### 3.5.11 On-Chip Video Window Size

This selects the on-chip video window size for VGA drives use. The Choices: 32MB, 64MB, Disabled.

## 3.6 Integrated Peripherals

### 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 Mode, IDE Secondary Master/Slave PIO/UDMA Mode (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.

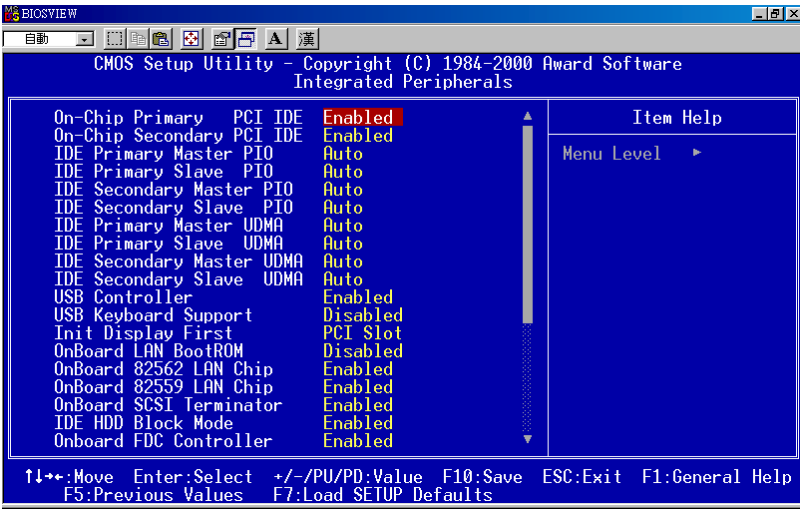



**Figure 3-6: Integrated peripherals (1)**

### 3.6.3 USB Controller

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

### 3.6.5 Init Display First

This item allows you to choose which one to activate first, PCI Slot or on-chip VGA. The choices: PCI Slot, Onboard.

### 3.6.6 IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled. This field is for systems with only SCSI drives.

### 3.6.7 Onboard FDC Controller

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

### 3.6.8 Onboard Serial Port 1 (3F8H/IRQ4)

The settings are 3F8H/IRQ4, 2F8H/IRQ3, 3E8H/IRQ4, 2E8H/ IRQ10, and Disabled for the on-board serial connector.

### 3.6.9 Onboard Serial Port 2 (2F8H/IRQ3)

The settings are 3F8H/IRQ4, 2F8H/IRQ3, 3E8H/IRQ4, 2E8H/ IRQ10, and Disabled for the on-board serial connector.

### 3.6.10 UART Mode Select

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

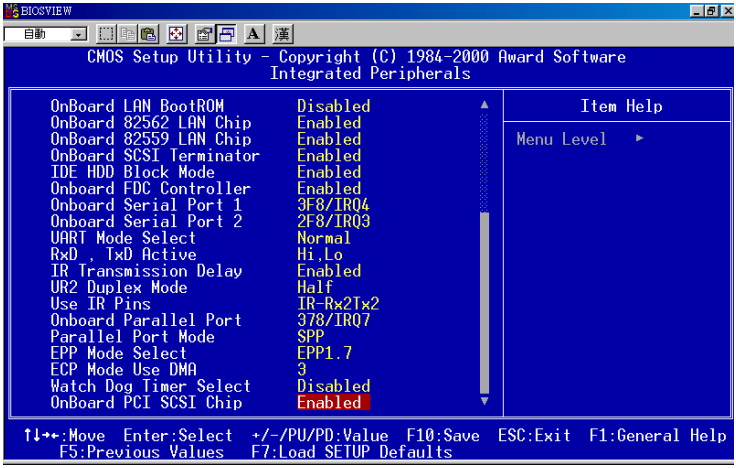



**Figure 3-7: Integrated peripherals (2)**

### 3.6.11 RxD, TxD Active

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

### 3.6.12 IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices: Enabled, Disabled.

### 3.6.13 UR2 Duplex Mode

This item allows you to select the IR half/full duplex funcion. The choices: Half, Full.

### 3.6.14 Use IR Pins

This item allows you to select IR transmission routes, one is RxD2, TxD2 (COM Port) and the other is IR-Rx2Tx2. The choices: IR-Rx2Tx2, RxD2,TxD2.

### 3.6.15 Onboard Parallel Port (378H/IRQ7)

This field sets the address of the on-board parallel port connector. You can select either 3BCH/IRQ7, 378H/IRQ7, 278H/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.

### 3.6.16 Parallel Port Mode (ECP + EPP)

This field allows you to set the operation mode of the parallel port. The setting "Normal" 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.

### 3.6.17 EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices: EPP1.7, 1.9.

### 3.6.18 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, DMA channel 3, or Disable. 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:

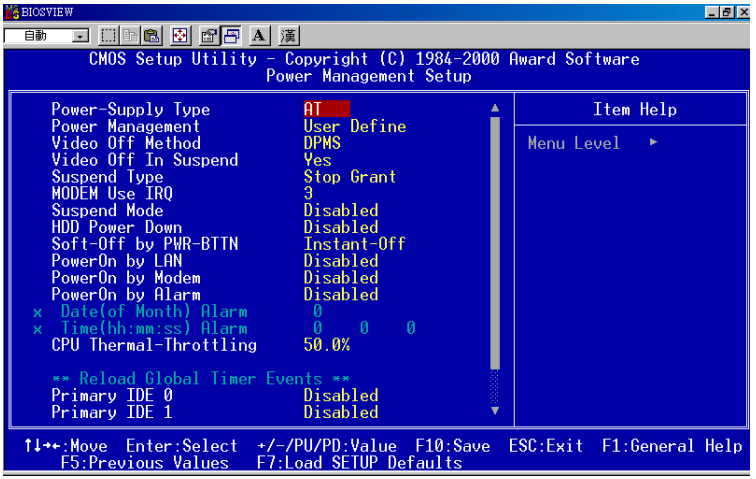



**Figure 3-8: Power management setup screen (1)**

### 3.7.1 Power Management

This option allows you to determine if the values in power management are disabled, user-defined, or predefined.

### 3.7.2 HDD Power Down

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in "suspend" mode. If the HDD is in a power saving mode, any access to it will wake it up.

*Note: The HDD will not power down if the Power Management option is disabled.*

### 3.7.3 Soft-Off by PWR-BTTN

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, 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.

### 3.7.4 PowerOn By LAN

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

### 3.7.5 PowerOn By Modem

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.

### 3.7.6 PowerOn 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: Enabled, Disabled.

### 3.7.8 CPU Thermal-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%.

### 3.7.9 PWRON AfterPWR-FAIL

This field lets you to determine the state that your computer returns after a power failure. If sets to Off, the PC will not boot after a power failure. If sets to On, the PC will restart after a power failure. If sets to Auto, the PC will go back to the previous state before a power failure occurred. For instance, if the PC is power-on when power system fails, the PC will restart when power system is working again. If the PC is power-ff when power system fails, the PC will not boot when power system is working again. The Choice: Off, On, Auto.

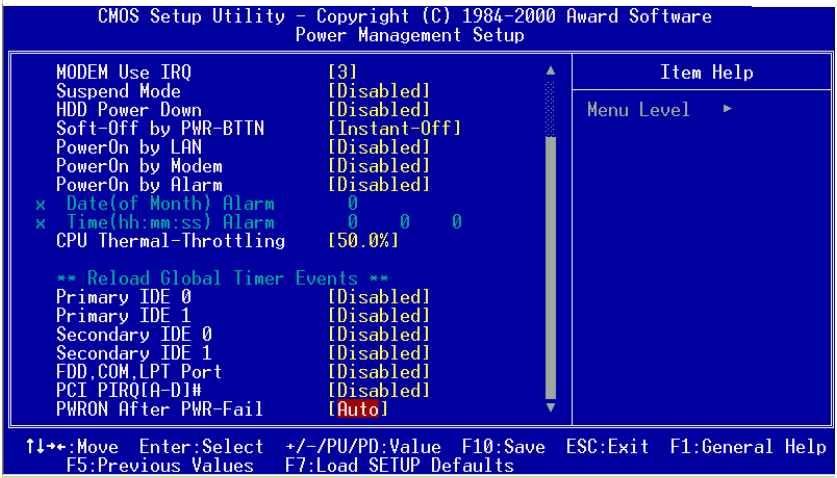



**Figure 3-9 Power Management (2)**

# 3.8 PnP/PCI Configurations

## 3.8.1 Resources controlled by:

The commands here are “Auto” or “Manual.” Choosing “manual” requires you to choose resources from each following sub-menu. “Auto” automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

## 3.8.2 PnP OS Installed

This feature allows you to install the PnP OS. The commands are “Yes” or “No.”

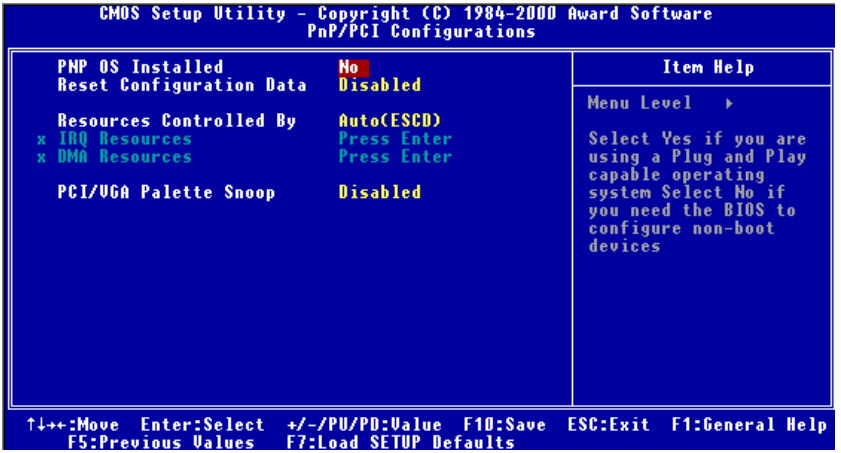



**Figure 3-10: PnP/PCI configurations screen**

### 3.8.3 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 and your OS won't boot and you need to reconfigure.*

### 3.8.4 PCI/VGA Palette Snoop

This is left at "Disabled."

## 3.9 PC Health Status

### 3.9.1 CPU Warning Temperature

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

### 3.9.2 Current System Temp.

This shows you the current system temperature.

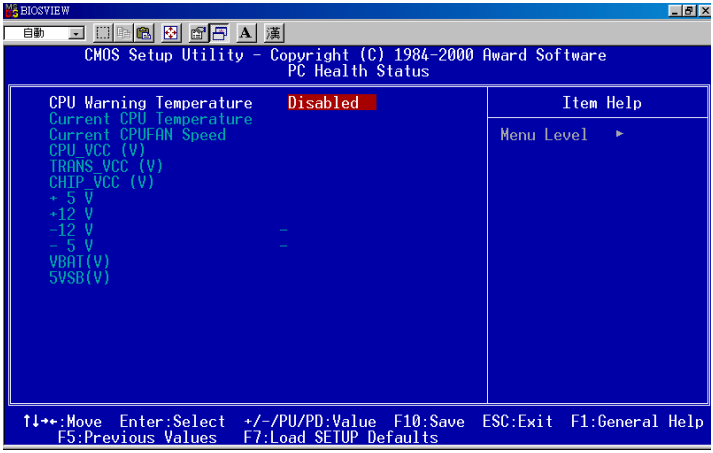



**Figure 3-11: PC health status screen**

### 3.9.3 Current CPU Temperature

This shows you the current CPU1 temperature.

### 3.9.4 Current CPUFAN Speed

This shows you the current CPUFAN operating speed.

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

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

### 3.9.6 Shutdown Temperature

This item allows you to set up the CPU shutdown Temperature. This item is effective only under Windows 98 ACPI mode. The Choices: Disabled, 60°C/140°F, 65°C/149°F, 70°C/159°F, 75°C/167°F.

## 3.10 Load Setup Defaults

"LOAD SETUP DEFAULTS" loads the values required by the system for maximum performance.

## 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:

   ```
   Enter 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:

   ```
   Confirm 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 (CSI) Utility

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

## 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-6180 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 many of the installation procedures assume that you are familiar with the 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.

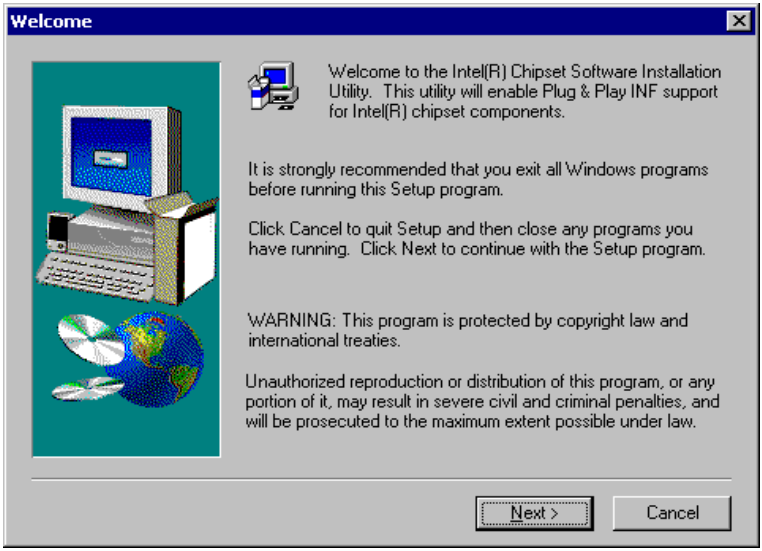
*Note: This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:*

| | |
|---|---|
| *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)* |

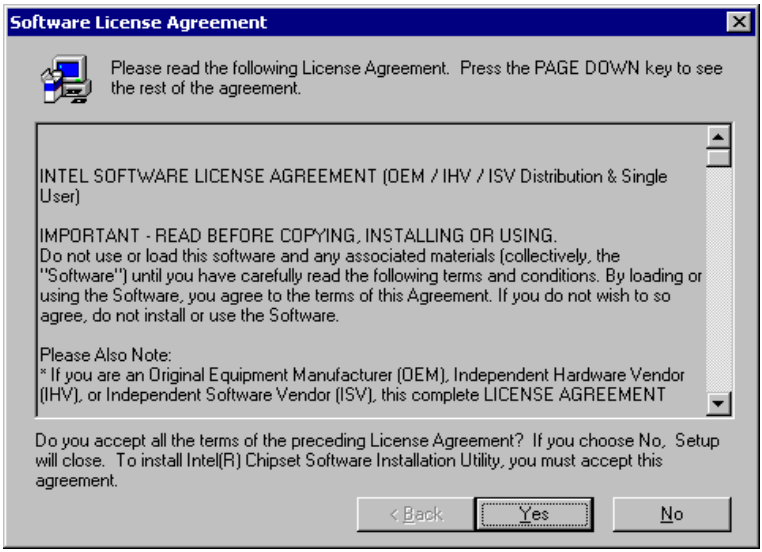
## 4.3 Installing the CSI Utility

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.

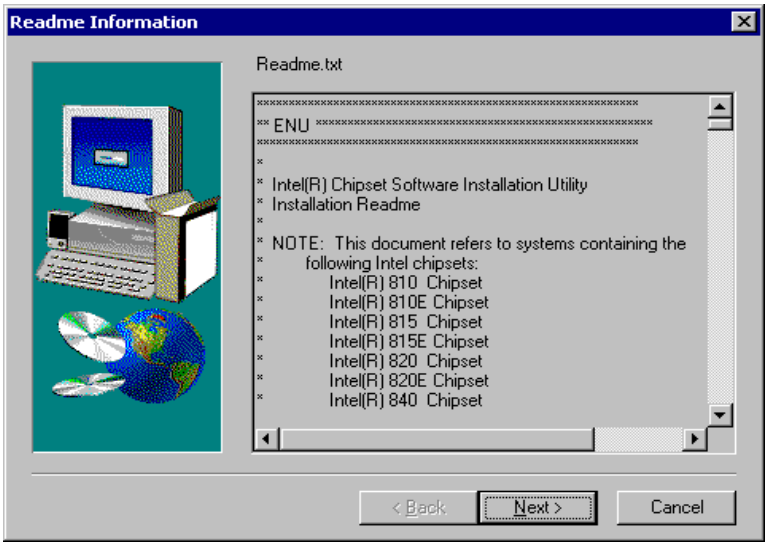
2. Click "Next" when you see the following message.



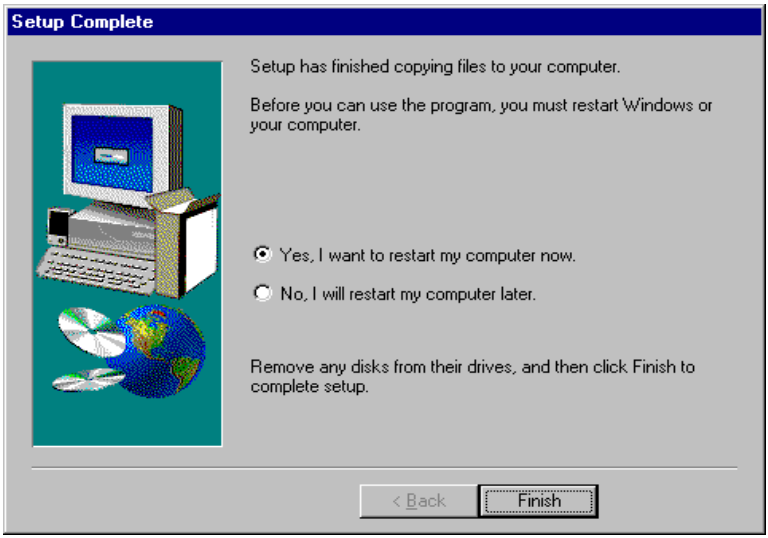

3. Click "Yes" when you see the following message.



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-6180 features an integrated AGP SVGA interface. This chapter provides instructions for installing the AGP SVGA drivers from the driver CD included in your package.

## 5.1 Introduction

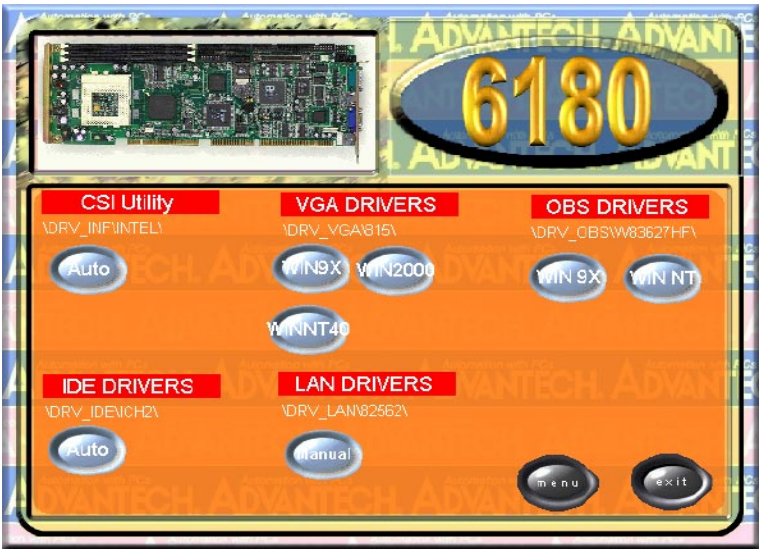
AGP (Accelerated Graphics Port) is a graphics interface that provides faster connection between the display card and memory than a PCI slot. Your PCA-6180 CPU card uses the Intel® 815 chipset that supports AGP SVGA. The features include:

- Built-in 2D/3D AGP VGA controller.
- Integrated 24-bit 230MHz RAMDAC.
- Up to 1600 x 1200 resolution in 8-bit color at 85 Hz refresh.
- H/W motion compensation assistance for s/w MPEG 2 decoding.
- Software DVD at 30 fps.

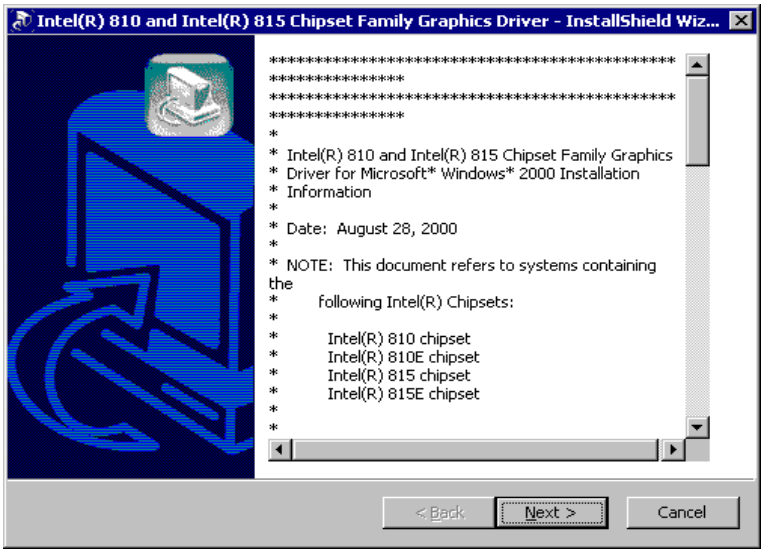
## 5.2 Installation

*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.*

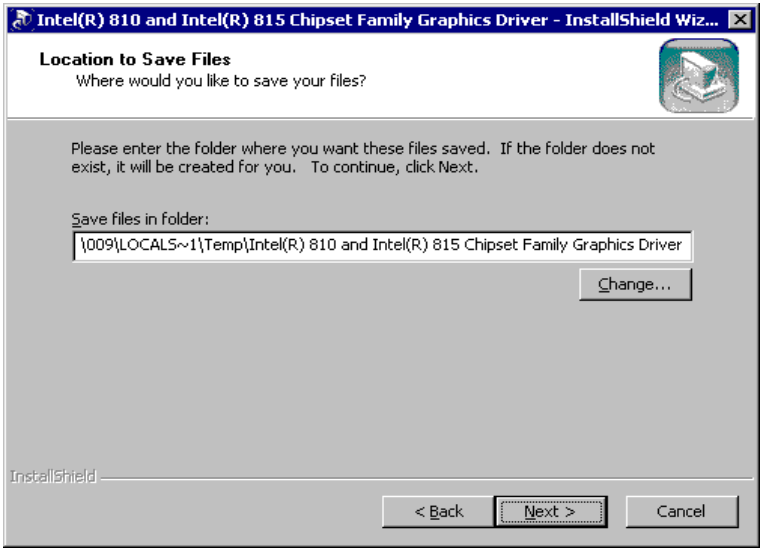
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "VGA DRIVERS" heading, click on one of the buttons (labeled "WIN9X," "WIN2000," and "WINNT40" respectively) according to the operating system you are using.



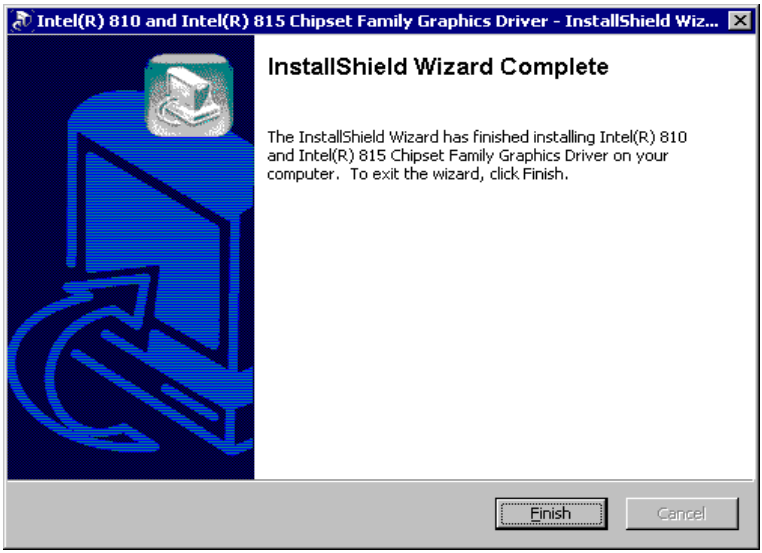

2. Click "Next" when you see the following message.



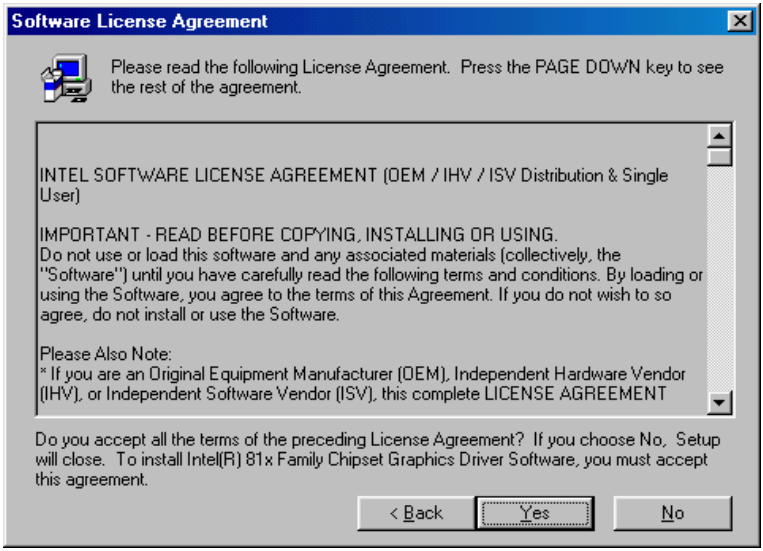
3. Click "Next" when you see the following message.



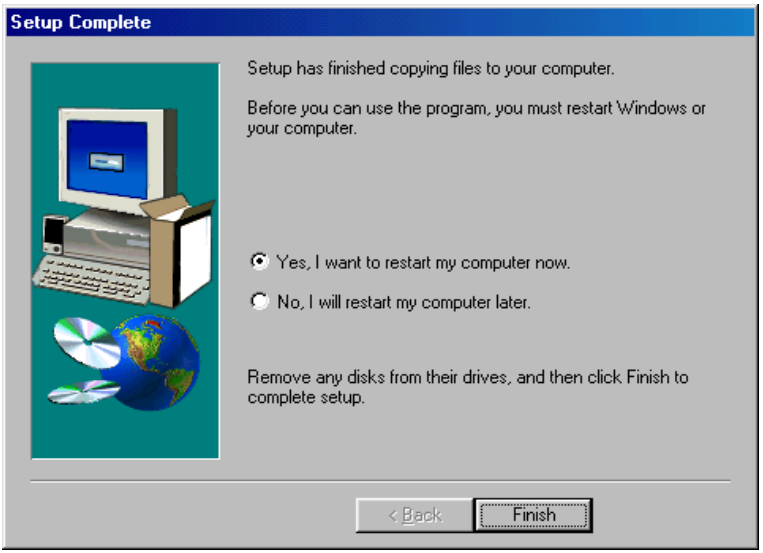

4. Click "Finish" when you see the following message.



5. Click "Yes" to accept the License Agreement.




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



CHAPTER 6

# LAN Configuration

The PCA-6180 supports dual 10/100Base-T Ethernet networking with one chipset integrated LAN controller (Intel® 82562ET) and one Intel® GD82559 (optional). This chapter gives detailed information on Ethernet configuration. It shows you how to configure the card to match your application requirements.

Sections include:

- Introduction
- Features
- Installation
- Windows 95/98/2000 Drivers Setup Procedure
- Windows NT Drivers Setup Procedure
- Windows 98SE/ME Drivers Setup Procedure
- Windows NT Wake-on-LAN Setup Procedure

## 6.1 Introduction

The PCA-6180 features the 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 and 100 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

## 6.2 Features

- Intel® 82562ET integrated LAN controller.
- Optional 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. 2.1.
- MAC & PHY (10/100 Mbps) interfaces.
- Complies to IEEE 802.3 10Base-T and 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.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.0, ACPI Rev. 1.0, and Device Class Power Management Rev. 1.0.

## 6.3 Installation

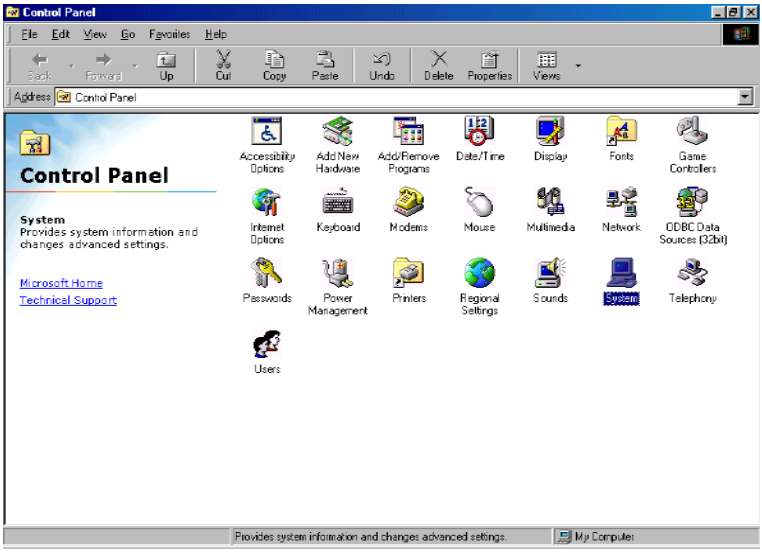
*Note: Before installing the LAN drivers, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.*

The PCA-6180's onboard Ethernet interface supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

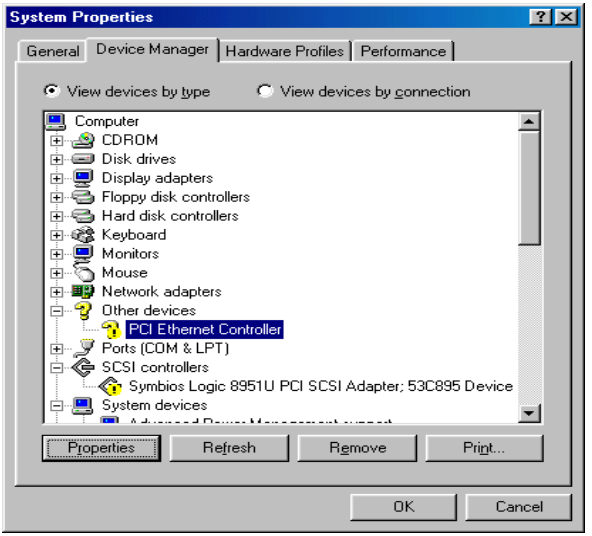
## 6.4 Windows 95/98/2000 Drivers Setup Procedure

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

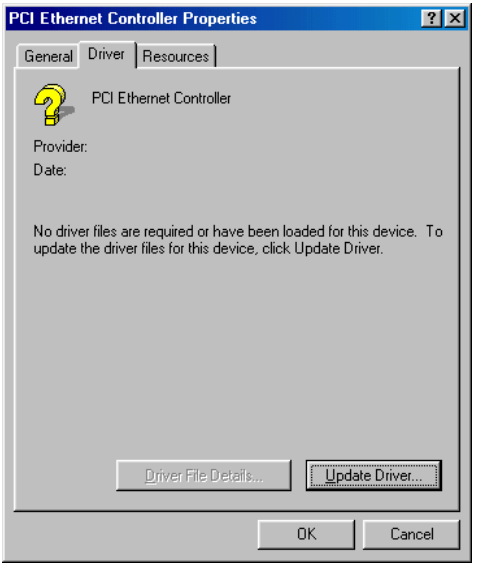
1. From the desktop of Windows 95/98/2000, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System."



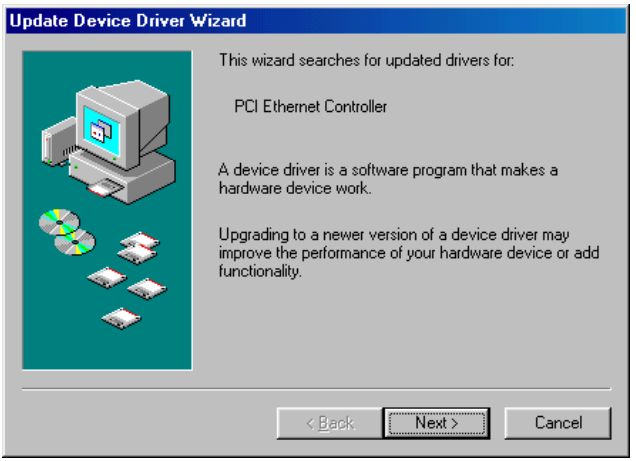
2. In the "System Properties" window, select the "Device Manager" tab. Select "View devices by type," and navigate to: Computer\Other devices. Highlight "PCI Ethernet Controller" and click on "Properties."



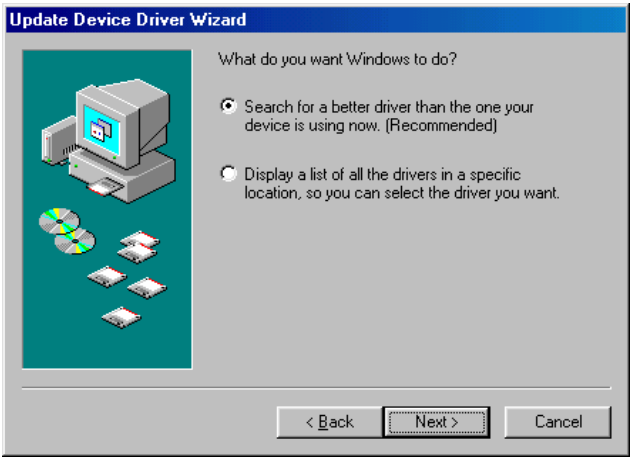
3. In the "PCI Ethernet Controller Properties" window, select the "Driver" tab. Then click on "Update Driver..."



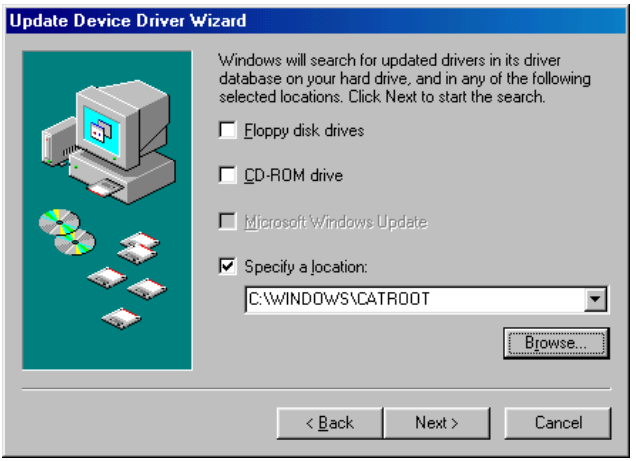

4. In the "Update Device Driver Wizard" window, click on "Next."



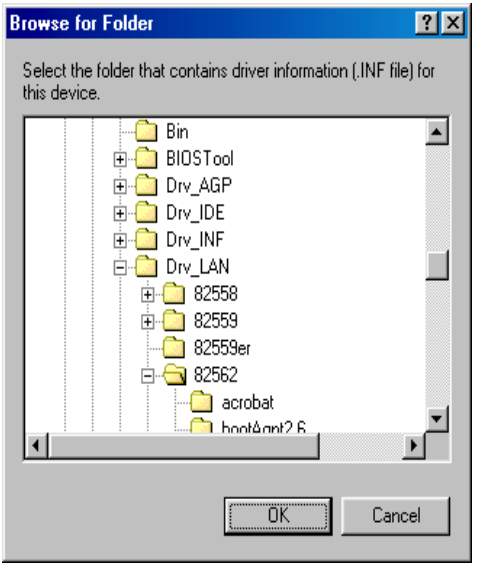
5. In the "Update Device Driver Wizard" window, select "Search for a better driver than the one your device is using now. (Recommended)." Then click on "Next."



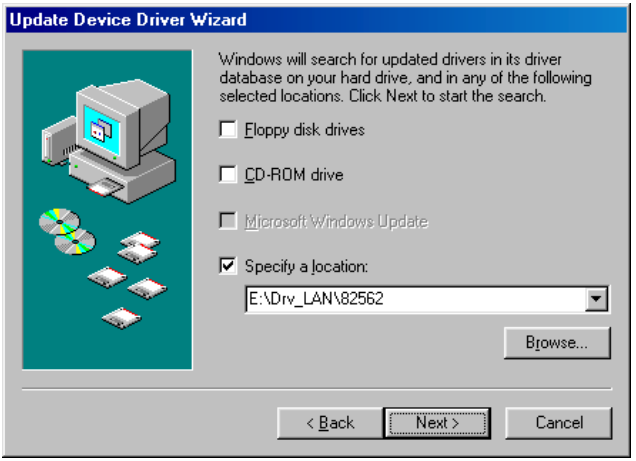

6. In the following "Update Device Driver Wizard" window, click on "Browse."



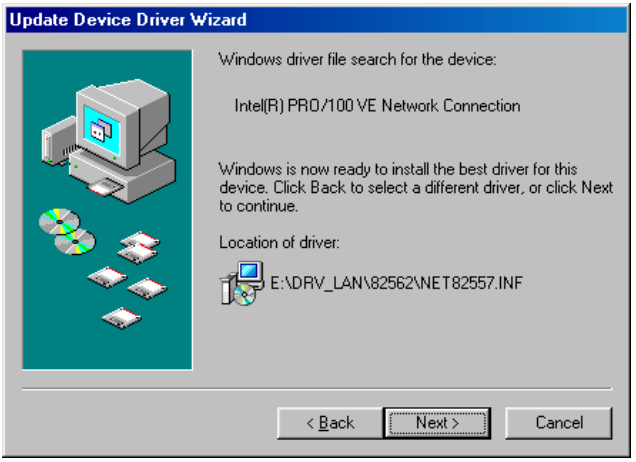
7. In the "Browse for Folder" window, navigate to the CD-ROM drive and click on the "82562" folder. Then click on "OK."



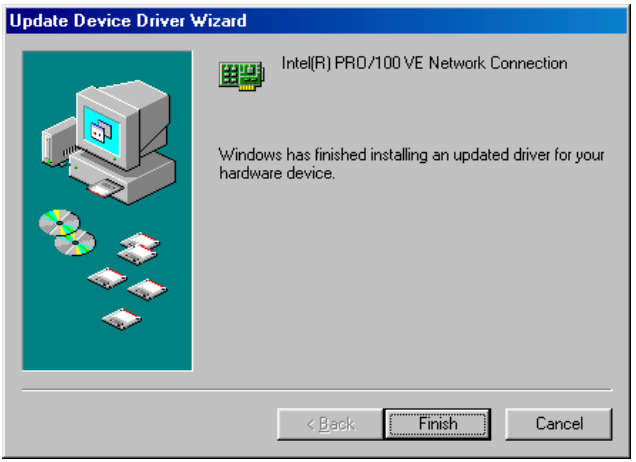

8. In the following "Update Device Driver Wizard" window, click on "Next."



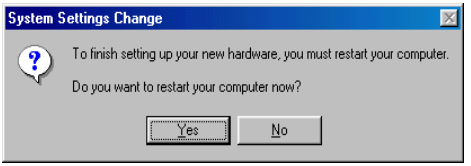
9. In the following "Update Device Driver Wizard" window, click on "Next."




10. In the following "Update Device Driver Wizard" window, click on "Finish."



11. In the "System Settings Change" window, click on "Yes" to complete the installation and restart Windows.

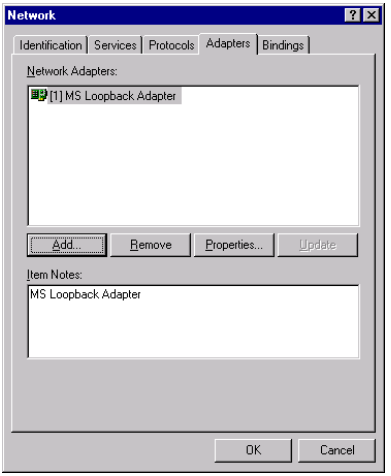


## 6.5 Windows NT Drivers Setup Procedure

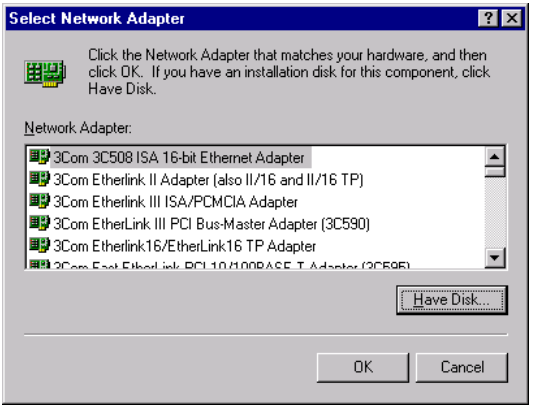
*Note: The CD-ROM drive is designated as "D" throughout this section.*

1. From the desktop of Windows NT, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System."

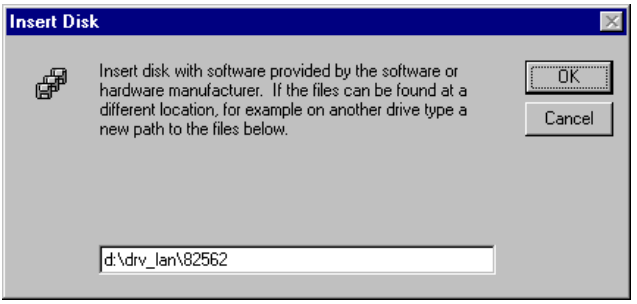

2. In the "Network" window, select the "Adapters" tab. Then click on "Add..."



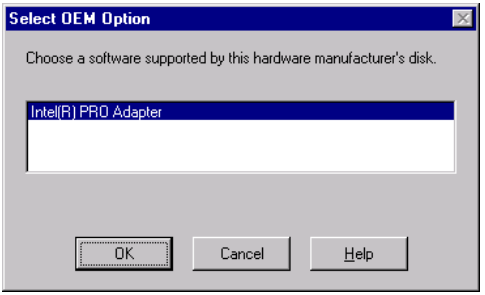
3. In the "Select Network Adapter" window, click on "Have Disk..."



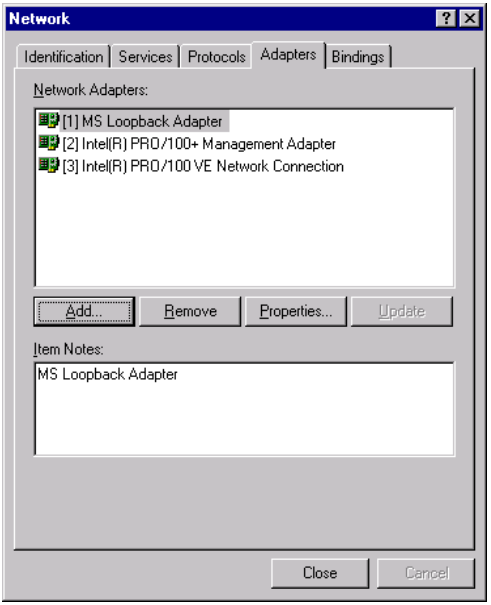

4. When the "Insert Disk" window appears, insert the driver CD into the CD-ROM drive and type in "d:\drv_lan\82562." When you have the correct file path, click on "OK."



5. In the "Select OEM Option" window, click on "OK."




6. In the "Network" window, select the "Adapters" tab. Under "Network Adapters," highlight "[2] Intel(R) PRO/100+ Management Adapter" and "[3] Intel(R) PRO/100 VE Network Connection." Then click on "Close."

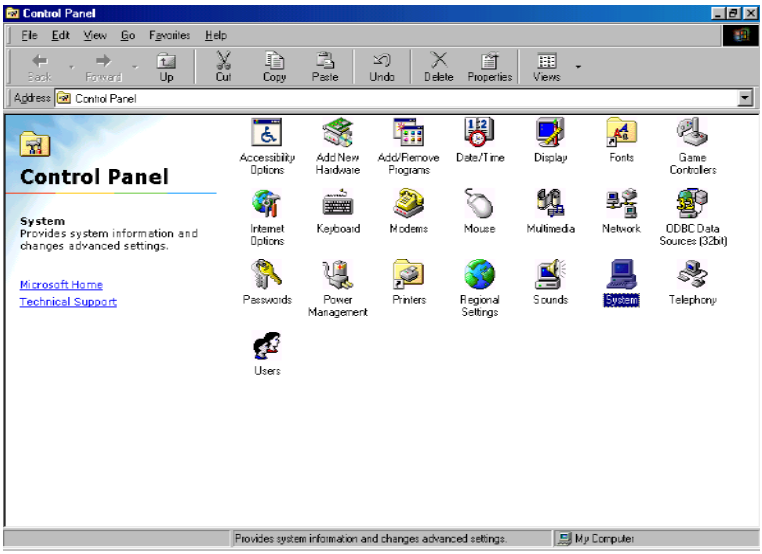


## 6.6 Windows 98SE/ME Drivers Setup Procedure

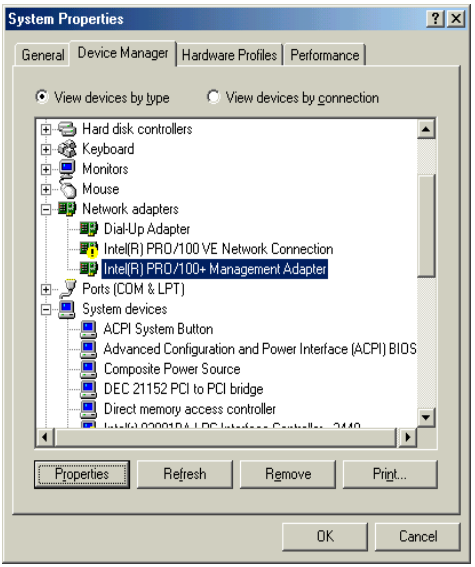
*Note: The CD-ROM drive is designated as "D" throughout this section.*

For computers using Windows 98SE or Windows ME, the operating system will automatically install the "Intel(R) Pro/100+ Management Adapter" driver the first time it detects the LAN device. If your CPU card has two Ethernet ports and you are experiencing problems with LAN connections (one of the ports does not work) after you have installed drivers for both LANs, perform the following steps to correct the problem.

1. From the desktop of Windows 98SE/ME, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System."

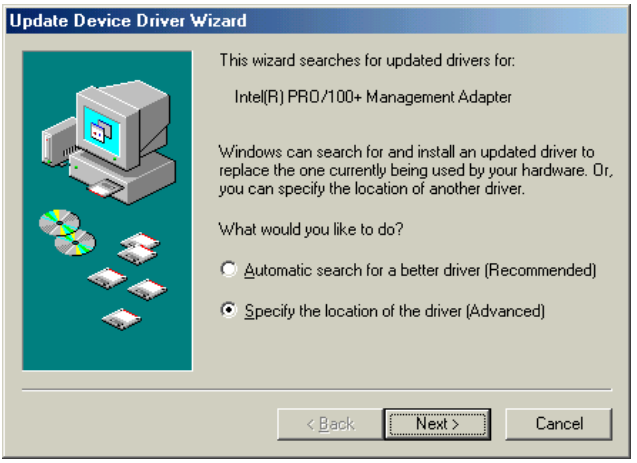


2. In the "System Properties" window, select the "Device Manager" tab. Select "View devices by type," and navigate to: Computer\Network adapters. Highlight "Intel(R) PRO/100+ Management Adapter" and click on "Properties."

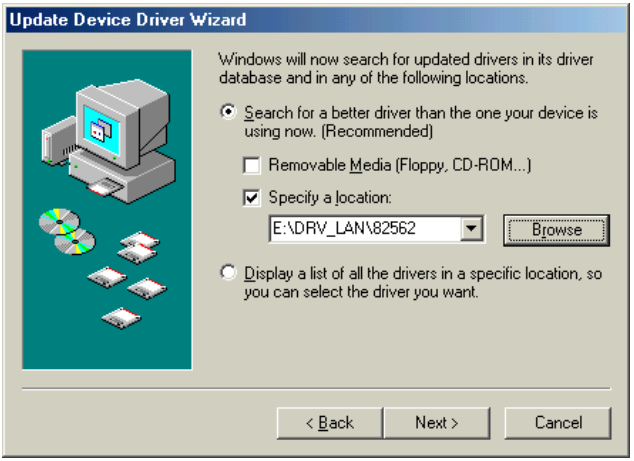


3. In the "Intel(R) PRO/100+ Management Adapter Properties" window, select the "Driver" tab. Then click on "Update Driver..."

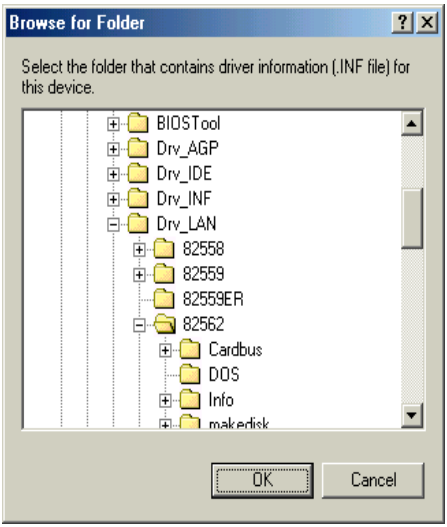

4. In the "Update Device Driver Wizard" window, click on "Specify the location of the driver (Advanced)" and then click on "Next."



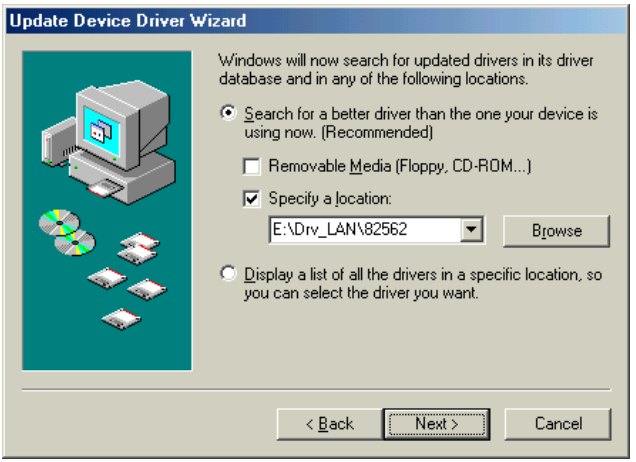
5. In the following "Update Device Driver Wizard" window, select "Search for a better driver than the one your device is using now. (Recommended)." Select "Specify a location:" and then click on "Browse."



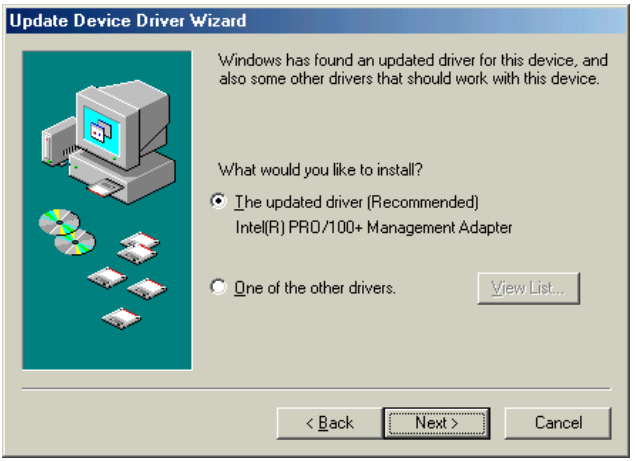

6. In the "Browse for Folder" window, navigate to the CD-ROM drive and click on the "82562" folder. Then click on "OK."



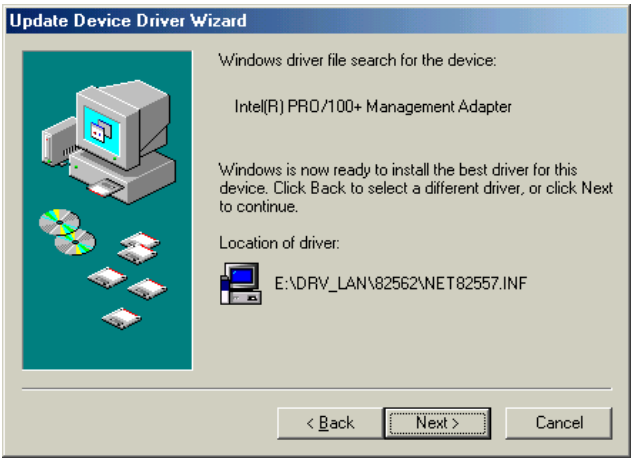
7. In the following "Update Device Driver Wizard" window, click on "Next."



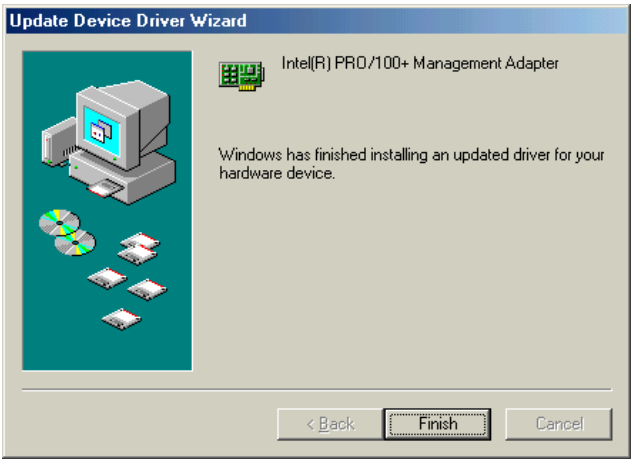

8. In the following "Update Device Driver Wizard" window, select "The updated driver (Recommended)/Intel(R) PRO/100+ Management Adapter." Then click on "Next."



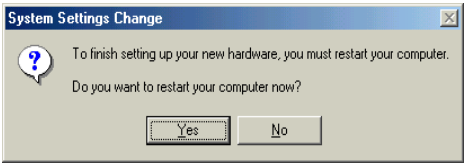
9. In the following "Update Device Driver Wizard" window, click on "Next."




10. In the following "Update Device Driver Wizard" window, click on "Next."



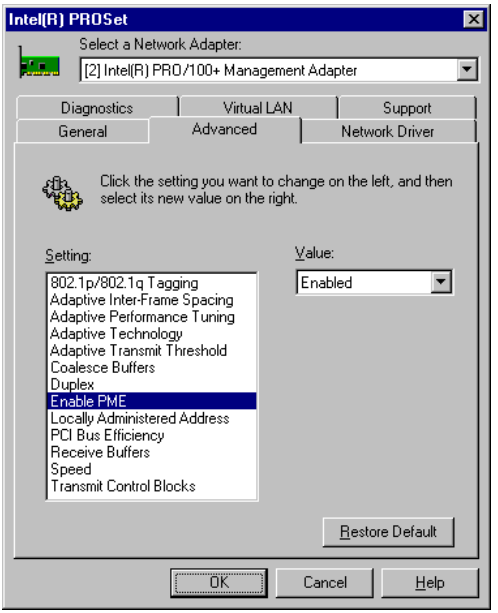
11. In the "System Settings Change" window, click on "Yes" to complete the installation and restart Windows.



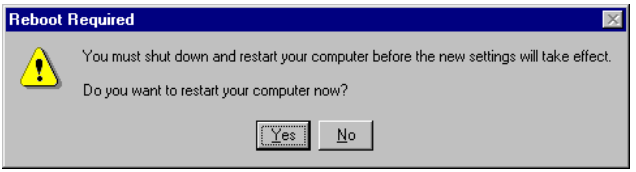
## 6.7 Windows NT Wake-on-LAN Setup Procedure

1. From the desktop of Windows NT, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System."

2. In the "Intel(R) PROSet" window, under "Select a Network Adapter," choose "[2] Intel(R) PRO100+ Management Adapter." Then select the "Advanced" tab. Under "Setting," highlight the "Enable PME" item. Under "Value," select "Enabled." Then click on "OK."




3. In the "Reboot Required" window, click on "Yes."



CHAPTER 7

# Ultra ATA 100 Storage Driver Setup

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

## 7.1 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.

## 7.2 Features

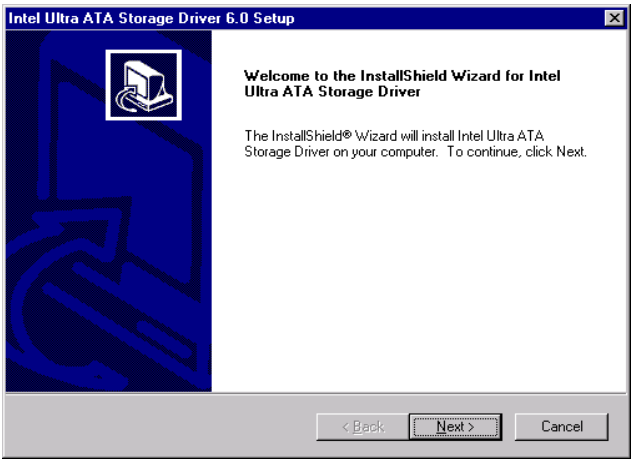
- The driver enables fast Ultra ATA transfers by default.
- Users no longer have to manually enable DMA transfers for each ATA and/or ATAPI peripheral devices.
- Each ATA channel has independent device timings/transfers which allows PIO-only and DMA-capable devices to share the same ATA controller cable, 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.

## 7.3 Installation

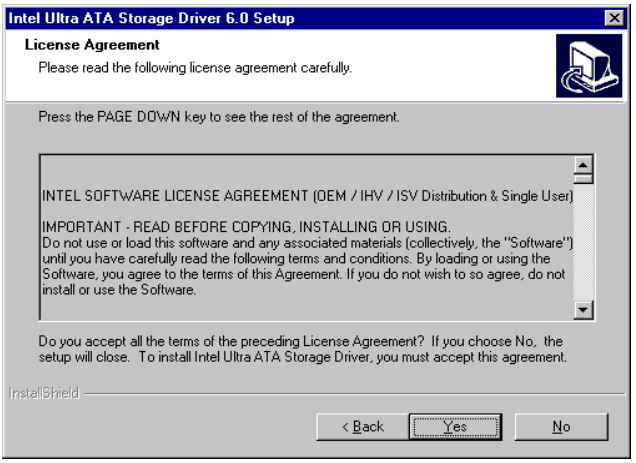
*Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.*

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 "Auto" button.

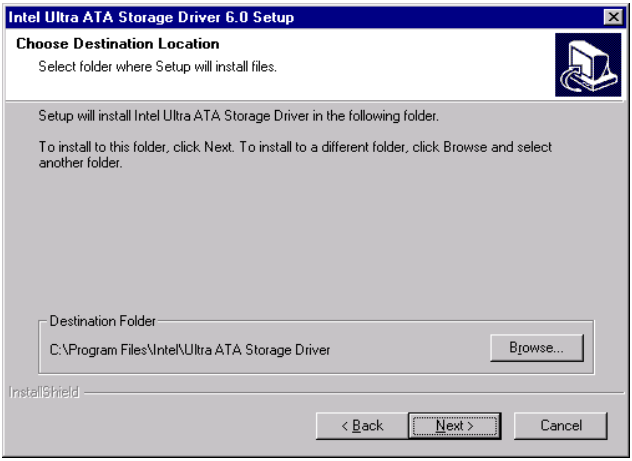
2. Click on "Next" when you see the following message.



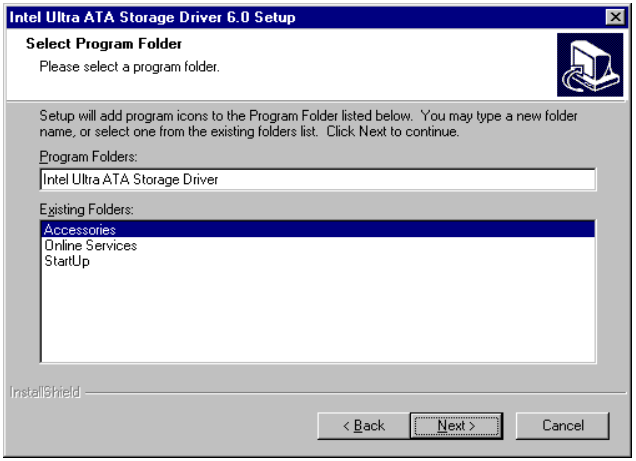

3. When you see the following message, click on "Yes" to accept the License Agreement.



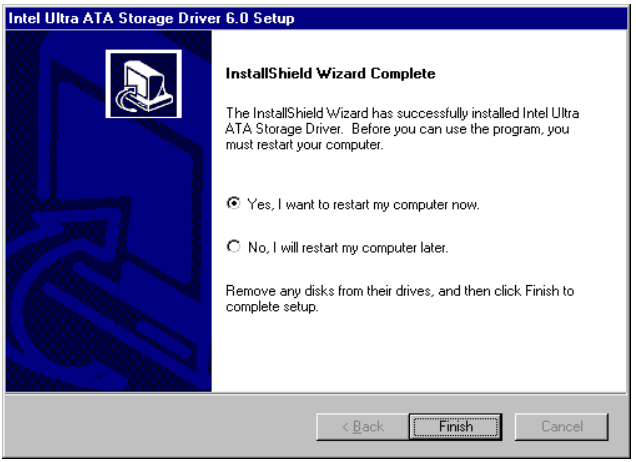
4. Click on "Next" when you see the following message.




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



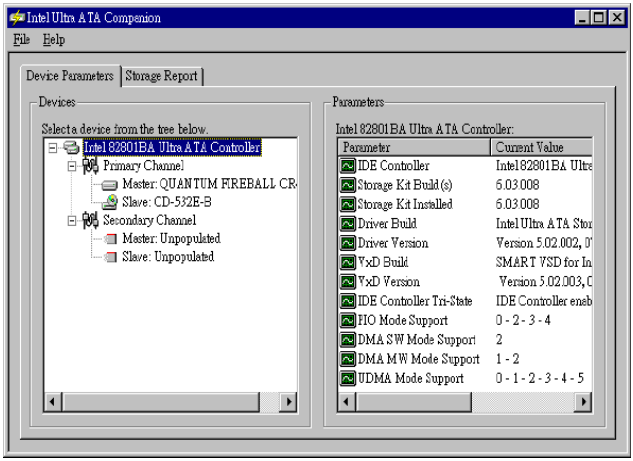
6. When the following message appears, click "Finish" to complete the installation and restart Windows.



## 7.4 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.



CHAPTER 8

# 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-6180 package.

## 8.1 Introduction

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

The PCA-6180 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 1.5 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.

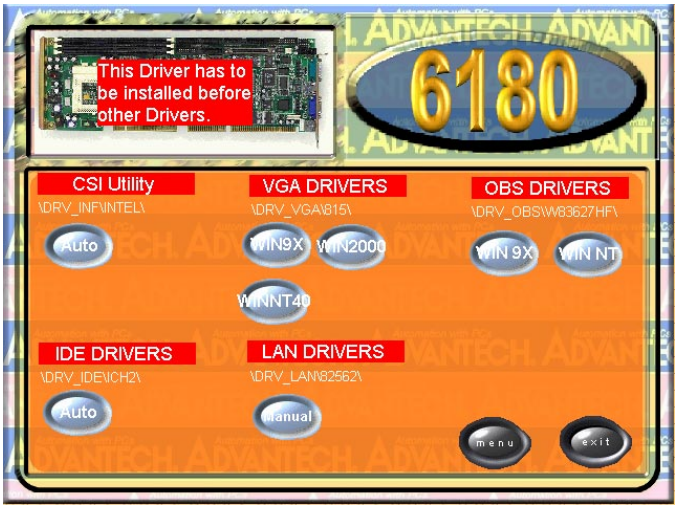
## 8.2 Installation

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

The installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

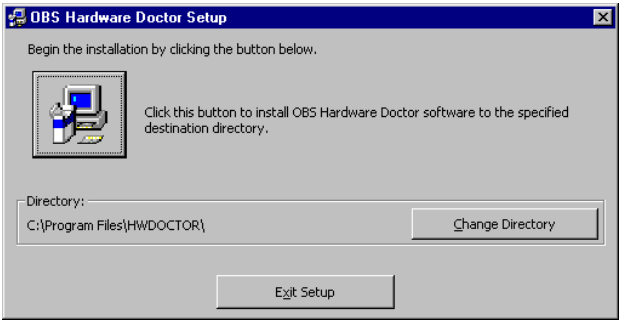
## 8.3 Windows 9X Drivers Setup Procedure

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.

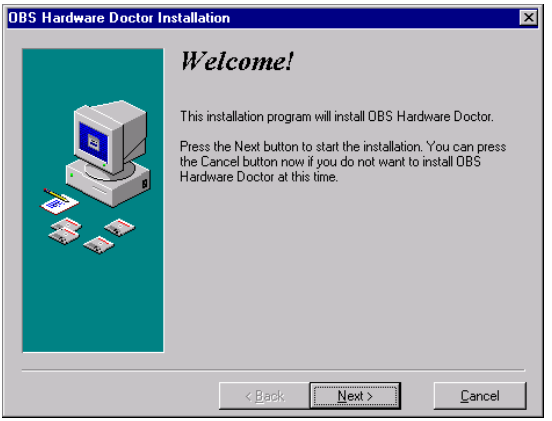


4. When you see the following message, click on "OK" to complete the installation.

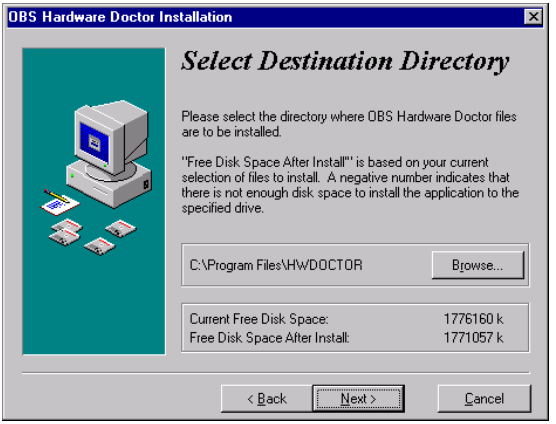

## 8.4 Windows NT Drivers Setup Procedure

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.

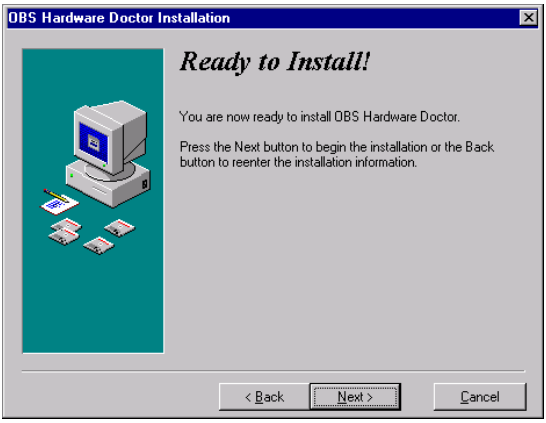
2. Click "Next" when you see the following message.



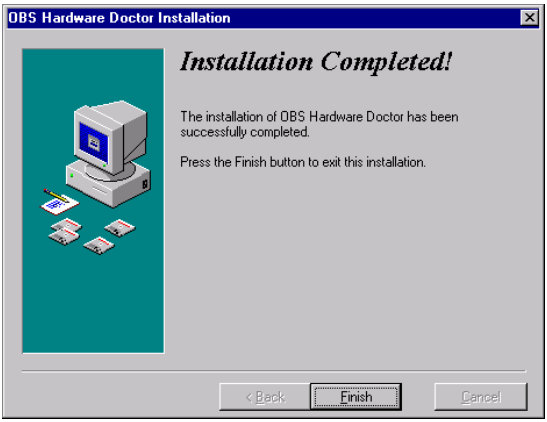

3. Click "Next" when you see the following message.



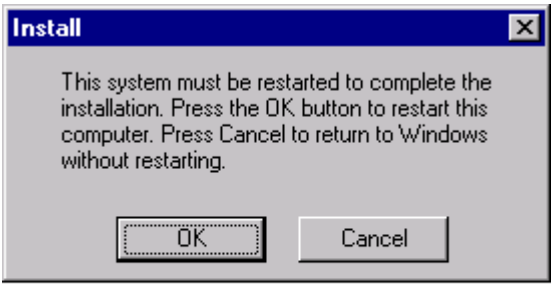
4. Click "Next" when you see the following message.




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



6. Click "OK" to restart Windows.



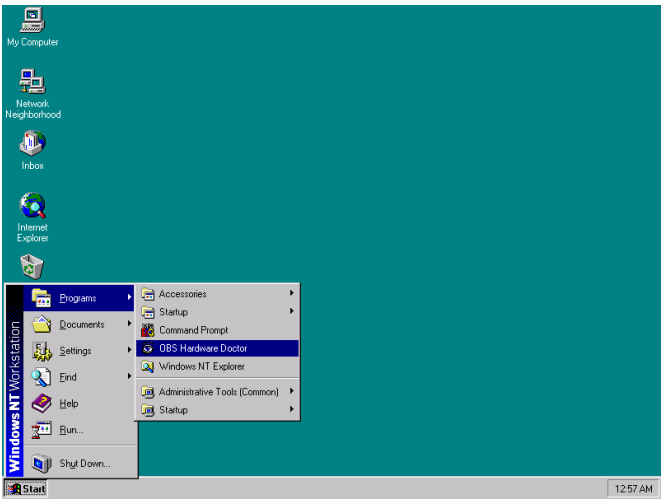
## 8.5 Using the OBS Hardware Doctor Utility

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.

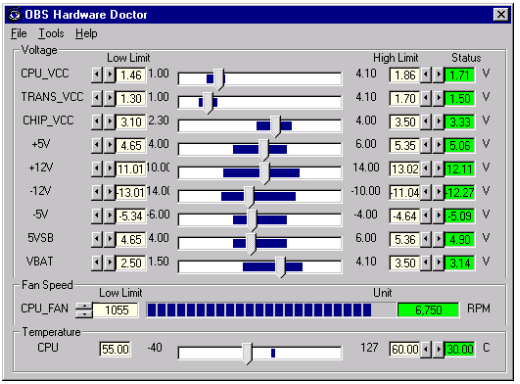
OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security system.

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.



CHAPTER 9

# SCSI Setup and Configurations

The PCA-6180 features an onboard SCSI interface. This chapter provides basic SCSI concepts.

## 9.1 Introduction

The PCA-6180 is equipped with an Adaptec AIC-7892 single-chip PCI-to-SCSI host adapter which provides a powerful Ultra160 multitasking interface between your computer's PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.). Ultra160 is a new generation of SCSI technology that expands SCSI performance from 80 MBytes/sec to 160 MBytes/sec. Up to a total of 15 SCSI devices can be connected to the SCSI connector through the AIC-7892.

The AIC-7892 combines this Ultra160 SCSI technol-ogy with Adaptec's SpeedFlex™ technology. SpeedFlex allows the Adaptec SCSI Card 29160 to be backwards compatible with previous generations of SCSI products, while allowing newer Ultra160 SCSI devices to operate at the higher 160 MBytes/sec rate.

If you need to configure the SCSI, the onboard SCSI Select configuration utility allows you to change host adapter settings without opening the computer or handling the board. The SCSI Select utility also contains a utility to low-level format and verifies the disk media on your hard disk drives.

*Note: If any peripheral is attached to the Ultra2 SCSI segment and is running at SE mode, one or more Ultra/Ultra Wide peripherals will be attached to the Ultra2 SCSI segment and will cause the Ultra2 SCSI segment to run at speeds up to 40 MBytes/sec instead of 80 MBytes/sec.*

## 9.2 Understanding SCSI

SCSI (pronounced "scuzzy") stands for Small Computer Systems Interface. SCSI is an industry standard computer interface for connecting SCSI devices to a common SCSI bus.

A SCSI bus is an electrical pathway that consists of a SCSI interface (such as the AIC-7892) installed in a computer and one or more SCSI devices. SCSI cables are used to connect the devices to the SCSI interface. For the SCSI bus to function properly, a unique SCSI ID

must be assigned to the SCSI interface and each SCSI device connected to it, and the SCSI bus must be properly terminated.

## 9.3 SCSI IDs

Each device attached to the AIC-7892, as well as the AIC-7892 itself, must be assigned a unique SCSI ID number from 0 to 15. A SCSI ID uniquely identifies each SCSI device on the SCSI bus and determines priority when two or more devices are trying to use the SCSI bus at the same time.

Refer to the device's documentation to set the SCSI ID. Here are some general guidelines for SCSI IDs:

- For internal SCSI devices, the SCSI ID usually is set by configuring a jumper on the device.
- For external SCSI devices, the SCSI ID usually is set with a switch on the back of the device.
- SCSI ID numbers don't have to be sequential, as long as the AIC-7892 and each device has a different number.
- For example, you can have an internal SCSI device with ID 0, and an external SCSI device with ID 6.
- SCSI ID 7 has the highest priority on the SCSI bus. The priority of the remaining IDs, in descending order, is 6 to 0, then 15 to 8.
- The on-board SCSI interface is preset to SCSI ID 7 and should not be changed. This gives it the highest priority on the SCSI bus.
- Most internal SCSI hard disk drives come from the factory pre-set to SCSI ID 0.
- If you have 8-bit (or Narrow) SCSI devices, they must use SCSI IDs 0, 1, 2, 3, 4, 5, or 6. SCSI ID 0 is recommended for the first SCSI hard disk drive.
- If you are booting your computer from a SCSI hard disk drive connected to the AIC-7892, the Boot SCSI ID setting in the

SCSI*Select* utility must correspond to the SCSI ID of the device from which you are booting. By default, the Boot SCSI ID is set to 0. We recommend that you do not change this setting.

- In Windows® 95/98, you can use the Device Manager to determine which SCSI ID is assigned to each installed SCSI device.

## 9.4 Terminating the SCSI Bus

To ensure reliable communication on the SCSI bus, the ends of the SCSI bus must be properly terminated. This is accomplished when the device at the end of each cable, or the end of the cable itself, has a terminator installed (or enabled). Terminators must be removed, or termination must be disabled, on devices between the ends of each cable.

Since the method for terminating a SCSI device can vary widely, refer to the device's documentation for instructions on how to enable or disable termination. Here are some general guidelines for termination:

- Internal Ultra160 and Ultra2 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination for internal Ultra160 and Ultra2 SCSI devices is provided by a 68-pin Internal LVD (low voltage differential) SCSI cable, which has a built-in terminator at its end.
- Termination on non-Ultra160 and Ultra2 internal SCSI devices usually is controlled by manually setting a jumper or a switch on the device, or by physically removing or installing one or more resistor modules on the device.
- Termination on most external SCSI devices is controlled by installing or removing a SCSI terminator. However, termination on some external SCSI devices is enabled or disabled by setting a switch on the back of the SCSI device.
- The last external Ultra160 or Ultra2 SCSI device *must* be terminated with an LVD/SE (low voltage differential/single ended) terminator plug to ensure that the device will operate at its maxi-

mum speed. If you use a different kind of terminator plug, the data I/O rate will decrease.

- By default, termination on the AIC-7892 itself is set to *Automatic* (the preferred method). We recommend that you do not change this default setting.

## 9.4 Configuring the SCSI Interface with SCSI*Select*

SCSI*Select,* included with the AIC-7892, enables you to change SCSI settings without opening the computer. SCSI*Select* also enables you to low-level format or verify the disk media of your SCSI hard disk drives. The following table lists the available and default settings for each SCSI*Select* option.

*Note: The default settings are appropriate for most systems. Run SCSI*Select *if you need to change or view curre nt set-tings, or if you would like to run the SCSI disk utilities. See the descriptions of each option starting on page 113.*

| SCSI*Select* Options | Available Settings | Default Setting |
|---|---|---|
| **SCSI Bus Interface Definitions:** | | |
| Host Adapter SCSI ID | 0-15 | 7 |
| SCSI Parity Checking | Enabled, Disabled | Enabled |
| Host Adapter SCSI Termination | | |
| LVD/SE Connectors | Automatic,<br>Enabled,<br>Disabled | Automatic |
| SE Connectors | Automatic<br>Low On/High On<br>Low Off/High Off<br>Low Off/High On | Automatic |
| **Boot Device Options:** | | |
| Boot SCSI ID | 0-15 | 0 |
| Boot LUN Number [1] | 0-7 | 0 |

| SCSI*Select* Options | Available Settings | Default Setting |
|---|---|---|
| **SCSI Device Configuration:** | | |
| Sync Transfer Rate (MBytes/sec) | 160, 80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0, ASYN | 160 |
| Initiate Wide Negotiation | Yes, No | Yes (Enabled) |
| Enable Disconnection | Yes, No | Yes (Enabled) |
| Send S tart Unit Command | Yes, No | Yes (Enabled) |
| Enable Write Back Cache [2] | N/C (No Change)<br>Yes, No | N/C (No Change) |
| BIOS Multiple LUN Support [2] | Yes, No | No (Disabled) |
| Include in BIOS Scan [2] | Yes, No | Yes (Enabled) |
| **Advanced Configuration Options:** | | |
| Reset SCSI Bus at IC Initialization | Enabled, Disabled | Enabled |
| Display <Ctrl> <A> Messages during BIOS Initialization | Enabled, Disabled | Enabled |
| Extended BIOS Translation for DOS Drives > 1 GByte | Enabled, Disabled | Enabled |
| Verbose/Silent Mode | Verbose, Silent | Verbose |
| Host Adapter BIOS | Enabled<br>Disabled: Not Scan<br>Disabled: Scan Bus | Enabled |
| Domain Validation [2] | Enabled, Disabled | Enabled |
| Support Removable Disks Under BIOS as Fixed Disks [2] | Disabled,<br>Boot Only,<br>All Disks | Disabled |
| BIOS Support for Bootable CD-ROM [2] | Enabled, Disabled | Enabled |
| BIOS Support for Int 13 Extensions [2] | Enabled, Disabled | Enabled |

[1] Setting is valid only if Multiple LUN Support is enabled.

[2] Settings are valid only if host adapter BIOS is enabled.

## 9.5 Starting SCSI*Select*

Follow these steps to start SCSI*Selec*t:

1. Turn on or restart your system.
   During the startup process, pay careful attention to the mes-sages that appear on your screen.

2. When the following message appears on your screen, press the **Ctrl-A** keys simultaneously (this message appears for only a few seconds):

Press <Ctrl><A> for SCSISelect (TM) Utility!

3. From the menu that appears, use the arrow keys to move the cursor to the option you want to select, then press **Ente**r.

*Note: If you have difficulty viewing the display, press **F5** to toggle between color and monochrome modes. (This feature may not work on some monitors.)*

### Exiting SCSI*Select*

Follow these steps to exit SCSI*Selec*t:

1. Press **Esc** until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit).
2. At the prompt, select **Yes** to exit, then press any key to reboot the computer. Any changes you made in SCSI*Select* take effect after the computer boots.

## 9.6 Using SCSI*Select* Settings

To select an option, use the arrow keys to move the cursor to the option, then press **Ente**r.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing **Es**c.

To restore the original SCSI*Select* default values, press **F6** from the main SCSI*Select* screen.

### SCSI Bus Interface Definitions

- **Host Adapter SCSI ID**—(Default: *7*) Sets the SCSI ID for the SCSI card. The Adaptec SCSI Card 29160 is set at 7, which gives it the highest priority on the SCSI bus. We recommend that you do not change this setting.
- **SCSI Parity Checking**—(Default: *Enabled*) When set to **Enabled**, verifies the accuracy of data transfer on the SCSI bus. Leave

this setting enabled unless any SCSI device connected to the Adaptec SCSI Card 29160 does not support SCSI parity.

- **Host Adapter SCSI Termination**—(Default: *Automatic*) Determines the termination setting for the SCSI card. The default setting for both the LVD/SE (low voltage differential/single ended) connectors and SE connectors is *Automatic*, which allows the SCSI card to adjust the termination as needed depending on the configuration of the connected SCSI devices. We recommend that you do not change these settings.

## Boot Device Options

- **Boot SCSI ID**—(Default: *0*) Specifies the SCSI ID of your boot device. We recommend that you do not change the default setting.
- **Boot LUN Number**—(Default: *0*) Specifies which LUN (Logical Unit Number) to boot from on your boot device. This setting is not valid unless Multiple LUN Support is **Enabled** (see *Advanced Configuration Options* on page 115).

## SCSI Device Configuration

SCSI Device Configuration options can be set individually for each connected SCSI device.

*Note: To configure settings for a SCSI device, you must know its SCSI ID (see* Using SCSI Disk Utilities *on page 23).*

- **Sync Transfer Rate**—(Default: *160*) Determines the maximum synchronous data transfer rate that the SCSI card supports. Use the maximum value of 160 MBytes/sec.
- **Initiate Wide Negotiation**—(Default: *Yes*) When set to **Yes**, the SCSI card attempts 16-bit data transfer (wide negotiation). When set to **No**, the SCSI card uses 8-bit data transfer unless the SCSI device requests wide negotiation.

*Note: Set Initiate Wide Negotiation to **No** if you are using an 8-bit SCSI device that hangs or exhibits other performance problems with 16-bit data transfer rate enabled.*

- **Enable Disconnection**—(Default: *Yes*) When set to **Yes**, allows the SCSI device to disconnect from the SCSI bus. Leave the setting at **Yes** if two or more SCSI devices are connected to the SCSI card. If only one SCSI device is connected, changing the setting to **No** results in slightly better performance.
- **Send Start Unit Command**—(Default: *Yes*) When set to **Yes**, the Start Unit Command is sent to the SCSI device at bootup.

The following three options have no effect if the SCSI Card BIOS is disabled. (The SCSI Card BIOS is normally enabled by default.)

- **Enable Write Back Cache**—(Default: *N/C*) Can be used to enable or disable the write-back cache on SCSI disk drives con-nected to the host adapter. Leave this option at its default setting of N/C (no change), which usually allows for optimum drive performance.
- **BIOS Multiple LUN Support**—(Default: *No*) Leave this set-ting at **No** if the device does not have multiple Logical Unit Numbers (LUNs). When set to **Yes** , the SCSI card BIOS provides boot support for a SCSI device with multiple LUNs (for example, a CD "juke box" device in which multiple CDs can be accessed simultaneously).
- **Include in BIOS Scan**—(Default: *Yes*) When set to **Yes**, the SCSI card BIOS includes the device as part of its BIOS scan at bootup.

## Advanced Configuration Options

*Note:* Do not *change the Advanced Configuration Options unless absolutely necessary.*

- **Reset SCSI Bus at IC Initialization**—(Default: *Enabled*) When set to **Enable**d, the SCSI card generates a SCSI bus reset during its power-on initialization and after a hard reset.

- **Display <Ctrl> <A> Messages during BIOS Initialization**—(Default: *Enabled*) When set to **Enable**d, the SCSI card BIOS displays the Press <Ctrl> <A> for SCSISelect (TM) Utility! message on your screen during system bootup. If this setting is disabled, you can still invoke the SCSI*Select* Utility by pressing **<Ctrl> <A>** after the SCSI card BIOS banner appears.

- **Extended BIOS Translation for DOS Drives > 1 GByte**—(Default: *Enabled*) When set to **Enabled**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1 GByte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems, such as NetWare or UNIX.

*Caution: Changing the translation scheme destroys all data on the drive. Be sure to back up your disk drives before changing the translation scheme.*

Use the MS-DOS Fdisk command to partition a disk larger than 1 GByte controlled by the SCSI card BIOS, when using DOS, Windows 3.1.x, or Windows 95/98.

- **Verbose/Silent Mode**—(Default: *Verbose)* When set to **Verbose**, the SCSI card BIOS displays the host adapter model on the screen during system buildup. When set to **Silent**, the message is not displayed during bootup.

- **Host Adapter BIOS (Configuration Utility Reserves BIOS Space)**—(Default: *Enabled*) Enables or disables the SCSI card BIOS.

  - Leave at **Enabled** to allow the SCSI card BIOS to scan and initialize all SCSI devices.

  - Set to **Disabled: Not scan** if the devices on the SCSI bus (for example, CD-ROM drives) are controlled by software driv-ers and do not need the BIOS, and you do not want the BIOS to scan the SCSI bus.

- Set to **Disabled: Scan Bus** if you do not need the BIOS, but you want it to scan the SCSI devices on the bus and you need to spin up the devices.

The following four options have no effect when the SCSI Card BIOS is disabled. (The SCSI Card BIOS is normally enabled by default.)

- **Domain Validation**—(Default: *Enabled*) Determines the optimal transfer rate for each device on the SCSI bus and sets transfer rates accordingly. Displays the resulting data transfer rate.
- **Support Removable Disks Under BIOS as Fixed Disks**—(Default: *Disabled*) Determines which removable-media drives are supported by the SCSI card BIOS. Choices are as follows:
  - **Disabled**— No removable-media drives are treated as hard disk drives. Software drivers are required because the drives are not controlled by the BIOS.
  - **Boot Only**—Only the removable-media drive designated as the boot device is treated as a hard disk drive.
  - **All Disks**—All removable-media drives supported by the BIOS are treated as hard disk drives.

*Caution:* You may lose data *if you remove a removable-media cartridge from a SCSI drive controlled by the SCSI card BIOS while the drive is on. If you want to be able to remove the media while the drive is on, install the removable-media software driver and set Support Removable Disks Under BIOS as Fixed Disks to* ***Disabled****.*

- **BIOS Support for Bootable CD-ROMs**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS allows the computer to boot from a CD-ROM drive.
- **BIOS Support for Int 13 Extensions**—(Default: *Enabled*) When set to **Enabled**, the SCSI card BIOS supports Int 13h extensions as required by Plug-and-Play. The setting can be either enabled or disabled if your system is not Plug-and-Play.

## 9.7 Using SCSI Disk Utilities

To access the SCSI disk utilities, follow these steps:

1. Select the **SCSI Disk Utilities** option from the menu that appears after starting SCSI*Selec*t. SCSI*Select* scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the devices assigned to each ID.
2. Use the arrow keys to move the cursor to a specific ID and device, then press **Enter**.
3. A small menu appears, displaying the options Format Disk and Verify Disk Media.

   - **Format Disk**—Allows you to perform a low-level format on a hard disk drive. *Most SCSI disk devices are preformatted at the factory and do not need to be formatted aga*in.

*Caution: A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You* cannot *abort a low-level format once it is started.*

   - **Verify Disk Media**—Allows you to scan the media of a hard disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select *yes*, those blocks are no longer used. Pressing **Esc** at any time aborts the utility.

APPENDIX A

# Programming the Watchdog Timer

The PCA-6180 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.

# A.1 Programming the Watchdog Timer

The PCA-6180'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.

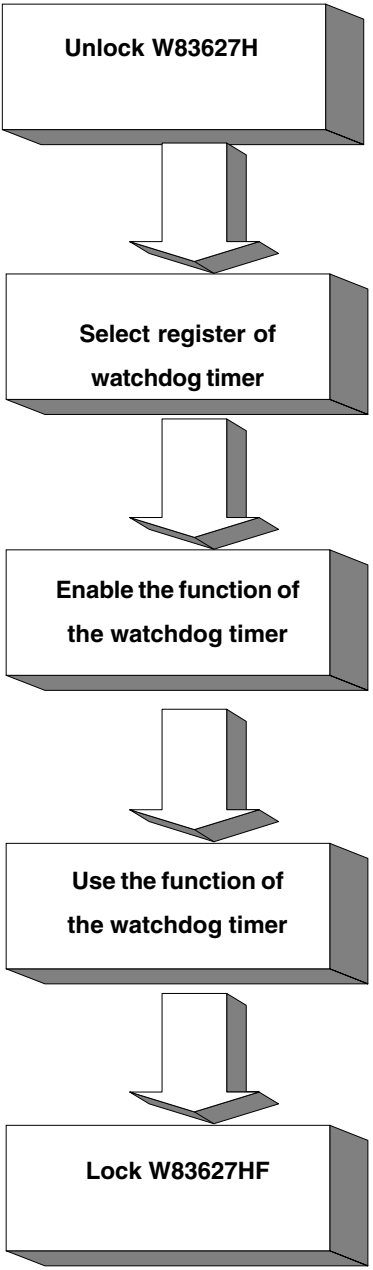
*Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.*

## A1.3 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

| 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 watchdog timer. Disabled is set as default. |
| F5 (hex) | write | Set seconds or minutes as units for the timer.<br>Write 0 to bit 3: set second as counting unit. [default]<br>Write 1 to bit 3: set minute as counting unit |
| F6 (hex) | write | 0: stop timer [default]<br>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 register can reset the timer to count with the new value. |
| F7 (hex) | read/write | Bit 7: Write 1 to enable mouse to reset the timer, 0 to disable [default]<br>Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default]<br>Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0]<br>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. |

**Table A-1: Watchdog timer registers**

## 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

# Pin Assignments

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

- IDE Hard Drive Connector
- Floppy Drive Connector
- Parallel Port Connector
- SCSI 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 and Keylock Connector
- External Speaker Connector
- Reset Connector
- HDD LED Connector
- ATX Feature Connector
- ATX Soft Power Switch
- H/W Monitor Alarm
- SM Bus Connector
- Extension I/O Board Connector
- PS/2 Mouse Connector
- System I/O Ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

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

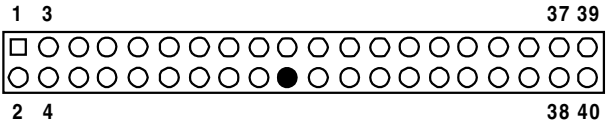



Table B-1: IDE hard drive connector (CN1, CN2)

| 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 | N/C |
| 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)

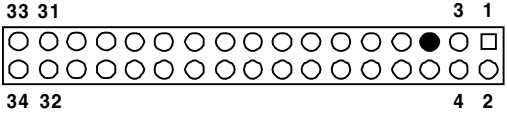



Table B-2: Floppy drive connector (CN3)

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | GND | 2 | FDHDIN* |
| 3 | GND | 4 | N/C |
| 5 | N/C | 6 | FDEDIN* |
| 7 | GND | 8 | INDEX* |
| 9 | GND | 10 | MOTOR 0* |
| 11 | GND | 12 | DRIVE SELECT 1* |
| 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)

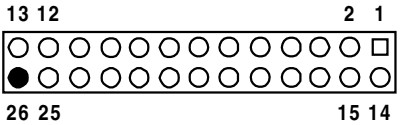



Table B-3: Parallel port connector (CN4)

| 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 SCSI Connector (CN5)

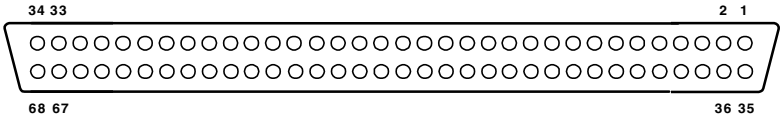



Table B-4: SCSI connector (CN5)

| Pin | Function | Pin | Function |
|---|---|---|---|
| 1 | SD+12 | 35 | SD-12 |
| 2 | SD+13 | 36 | SD-13 |
| 3 | SD+14 | 37 | SD-14 |
| 4 | SD+15 | 38 | SD-15 |
| 5 | SDP+1 | 39 | SDP-1 |
| 6 | SD+0 | 40 | SD-0 |
| 7 | SD+1 | 41 | SD-1 |
| 8 | SD+2 | 42 | SD-2 |
| 9 | SD+3 | 43 | SD-3 |
| 10 | SD+4 | 44 | SD-4 |
| 11 | SD+5 | 45 | SD-5 |
| 12 | SD+6 | 46 | SD-6 |
| 13 | SD+7 | 47 | SD-7 |
| 14 | SDP+0 | 48 | SDP-0 |
| 15 | GND | 49 | GND |
| 16 | DIFS | 50 | SENIN |
| 17 | TPWEX | 51 | TPWEX |
| 18 | TPWEX | 52 | TPWEX |
| 19 | NC | 53 | NC |
| 20 | GND | 54 | GND |
| 21 | SATN+ | 55 | SATN- |
| 22 | GND | 56 | GND |
| 23 | SBSY+ | 57 | SBSY- |
| 24 | SACK+ | 58 | SACK- |
| 25 | SRST+ | 59 | SRST- |
| 26 | SMSG+ | 60 | SMSG- |
| 27 | SSEL+ | 61 | SSEL- |
| 28 | SCD+ | 62 | SCD- |
| 29 | SREQ+ | 63 | SREQ- |
| 30 | SIO+ | 64 | SIO- |
| 31 | SD+8 | 65 | SD-8 |
| 32 | SD+9 | 66 | SD-9 |
| 33 | SD+10 | 67 | SD-10 |
| 34 | SD+11 | 68 | SD-11 |

## B.5 USB Connector (CN6)

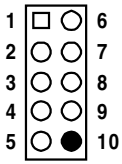



Table B-5: USB1/USB2 connector (CN6)

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

## B.6 VGA Connector (CN7)

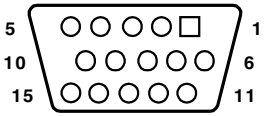



Table B-6: VGA connector (CN7)

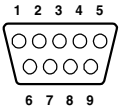
| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | RED | 9 | $V_{CC}$ |
| 2 | GREEN | 10 | GND |
| 3 | BLUE | 11 | N/C |
| 4 | N/C | 12 | SDT |
| 5 | GND | 13 | H-SYNC |
| 6 | GND | 14 | V-SYNC |
| 7 | GND | 15 | SCK |
| 8 | GND | | |

## B.7 Ethernet 10/100Base-T RJ-45 Connector (CN8, CN34)

Table B-7: 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.8 COM1/COM2 RS-232 Serial Port (CN9, CN10)



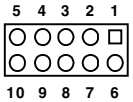




Table B-8: COM1/COM2 RS-232 serial port (CN9, CN10)

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

## B.9 Keyboard and Mouse Connnector (CN11)

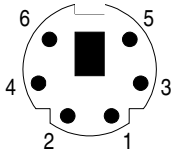



Table B-9: Keyboard and mouse connector (CN11)

| Pin | Signal |
|---|---|
| 1 | KB DATA |
| 2 | MS DATA |
| 3 | GND |
| 4 | $V_{cc}$ |
| 5 | KB CLOCK |
| 6 | MS CLOCK |

## B.10 External Keyboard Connector (CN12)

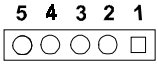



Table B-10: External keyboard connector (CN12)

| Pin | Signal |
|---|---|
| 1 | CLK |
| 2 | DATA |
| 3 | NC |
| 4 | GND |
| 5 | $V_{cc}$ |

## B.11 IR Connector (CN13)

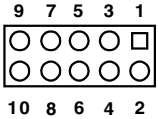



Table B-11: IR connector (CN13)

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +5 V | 2 | N/C |
| 3 | FIRRX | 4 | CIRRX |
| 5 | IR_RX | 6 | +5VSB |
| 7 | GND | 8 | N/C |
| 9 | IR_TX | 10 | N/C |

## B.12 CPU Fan Power Connector (CN14)

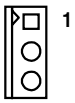



Table B-12: CPU fan power connector (CN14)

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | +12 V |
| 3 | Detect |

## B.13 Power LED and Keylock Connector (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.

You can use a switch (or a lock) to disable the keyboard so that the PC will not respond to any input. This is useful if you do not want anyone to change or stop a program which is running. Simply connect the switch from Pin 4 to Pin 5 of CN16.

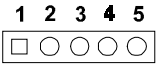



Table B-13: Power LED and keylock connector (CN16)

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

## B.14 External Speaker Connector (CN17)

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

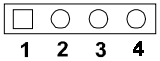



Table B-14: External speaker (CN17)

| Pin | Function |
|---|---|
| 1 | +5 $V_{CC}$ |
| 2 | GND |
| 3 | Internal buzzer |
| 4 | Speaker out |

## B.15 Reset Connector (CN18)


Table B-15: Reset connector (CN18)

| Pin | Signal |
|---|---|
| 1 | RESET |
| 2 | GND |

## B.16 HDD LED Connector (CN19)


Table B-16: HDD LED connector (CN19)

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

## B.17 ATX Feature Connector (CN20)

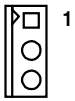



Table B-17: ATX feature connector (CN20)

| Pin | Signal |
|---|---|
| 1 | PS-ON |
| 2 | $V_{CC}$ |
| 3 | $V_{CC}$SB |

## B.18 ATX Soft Power Switch (CN21)


Table B-18: ATX soft power switch (CN21)

| Pin | Signal |
|---|---|
| 1 | 5VSB |
| 2 | PWR-BTN |

## B.19 H/W Monitor Alarm (CN22)

Table B-19: H/W monitor alarm (CN22)

| Pin | Signal |
|---|---|
| 1 | $V_{CC}$ (LED+) |
| 2 | LED0 (LED-) |

## B.20 SM Bus Connector (CN23)


Table B-20: ATX soft power switch (CN21)

| Pin | Signal |
|---|---|
| 1 | SMB_CLK |
| 2 | SMB_DATA |

## B.21 Extension I/O Board Connector (CN27)

Table B-21: Extension I/O board connector (CN27)

| 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 (LAN 2) |

## B.22 Extension I/O Board Connector (CN28)

Table B-22: Extension I/O board connector (CN28)

| 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.23 PS/2 Mouse Connector (CN33)

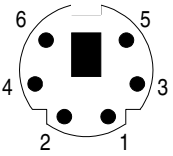



Table B-23: PS/2 mouse connector (CN33)

| Pin | Signal |
|---|---|
| 1 | MS DATA |
| 2 | N/C |
| 3 | GND |
| 4 | $V_{CC}$ |
| 5 | MS CLOCK |
| 6 | N/C |

## B.24 System I/O Ports

Table B-24: System I/O ports

| Addr. range (Hex) | Device |
|---|---|
| 000-01F | DMA controller |
| 020-021 | Interrupt controller 1, master |
| 022-023 | Chipset address |
| 040-05F | 8254 timer |
| 060-06F | 8042 (keyboard controller) |
| 070-07F | Real-time clock, non-maskable interrupt (NMI) mask |
| 080-09F | DMA page register |
| 0A0-0BF | Interrupt controller 2 |
| 0C0-0DF | DMA controller |
| 0F0 | Clear math co-processor |
| 0F1 | Reset math co-processor |
| 0F8-0FF | Math co-processor |
| 1F0-1F8 | Fixed disk |
| 200-207 | Game I/O |
| 278-27F | Parallel printer port 2 (LPT3) |
| 290-297 | On-board hardware monitor |
| 2F8-2FF | Serial port 2 |
| 300-31F | Prototype card |
| 360-36F | Reserved |
| 378-37F | Parallel printer port 1 (LPT2) |
| 380-38F | SDLC, bisynchronous 2 |
| 3A0-3AF | Bisynchronous 1 |
| 3B0-3BF | Monochrome display and printer adapter (LPT1) |
| 3C0-3CF | Reserved |
| 3D0-3DF | Color/graphics monitor adapter |
| 3F0-3F7 | Diskette controller |
| 3F8-3FF | Serial port 1 |
| 2E-2F | Watchdog timer |

## B.25 DMA Channel Assignments

Table B-25: DMA channel assignments

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

## B.26 Interrupt Assignments

Table B-26: Interrupt assignments

| Priority | Interrupt# | Interrupt source |
|---|---|---|
| 1 | NMI | Parity error detected |
| 2 | IRQ0 | Interval timer |
| 3 | IRQ1 | Keyboard |
| - | IRQ2 | Interrupt from controller 2 (cascade) |
| 4 | IRQ8 | Real-time clock |
| 5 | IRQ9 | Cascaded to INT 0A (IRQ 2) |
| 6 | IRQ10 | Available |
| 7 | IRQ11 | Available |
| 8 | IRQ12 | PS/2 mouse |
| 9 | IRQ13 | INT from co-processor |
| 10 | IRQ14 | Fixed disk controller |
| 11 | IRQ15 | Available |
| 12 | IRQ3 | Serial communication port 2 |
| 13 | IRQ4 | Serial communication port 1 |
| 14 | IRQ5 | Parallel port 2 |
| 15 | IRQ6 | Diskette controller (FDC) |
| 16 | IRQ7 | Parallel port 1 (print port) |

## B.27 1st MB Memory Map

Table B-27: 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 - 9FFFFh | Base memory |

## B.28 PCI Bus Map

Table B-28: PCI bus map

| Function | Signals: Device ID | INT# pin | GNT# pin |
|---|---|---|---|
| Onboard LAN1 | AD24 | INT E | |
| Onboard LAN2 | AD21 | INT H | GNT A |
| Onboard SCSI | AD20 | INT A | GNT E |
| Bridge | AD22 | | GNT F |
| PCI slot 1 | AD31 | INT B, C, D, A | GNT A |
| PCI slot 2 | AD30 | INT C, D, A, B | GNT B |
| PCI slot 3 | AD29 | INT D, A, B, C | GNT C |
| PCI slot 4 | AD28 | INT A, B, C, D | GNT D |

*Note: In the PCA-6180E2/F, LAN devices use "GNT A" signals via PCI slot 1. Therefore, PCI slot 1 cannot be used for plug-in bus master add-on cards such as SCSI cards or LAN cards.*

APPENDIX C

# Security Driver Installation Guide

This appendix contains information on the security driver quick installation guide. It includes:

- Security Driver Installation Instructions
- Additional Information and Assistance

## C.1 Security Driver

The Intel(R) Security Driver installs to the target system the Windows* driver files for the Intel(R) 82802 Firmware Hub component. It provides access to the Hardware Random Number Generator located in the Firmware Hub device. Your system must have one of these operating systems:

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

Windows 98 4.10.1998 (Original release)

Windows 98 4.10.2222 (Original release)

Second Edition

Windows NT 4.0 4.00.1381 (Original release)

Windows 2000 5.00.2195 (Original release)

To find out what OS is on your system, do this:

a. Click on Start.

b. Select Settings.

c. Select Control Panel.

d. Double-click on the System icon.

e. Click on the General system properties tab.

f. Verify which OS has been installed by reading the System information.

*Note:Your system memory must have at least 32MB available.There must be sufficient hard disk space in the <TEMP> directory (typicallyC:\WINDOWS\TEMP) of the system on which this software is installed.Please check with your vendor to determine which OS and Intel chipset are used in your system.*

## C.2 Software Installation

This software can be installed in three modes: Interactive, Silent, or via the Simple Installation method. The Interactive Mode requires user input during installation; the Silent Mode does not. The Simple Installation method copies over the key driver files and README.TXT for a simple or "Have Disk" installation.

Additionally, this software offers a set of command line flag options that enable extended installation functionality. The command line flags are not case-sensitive. See Section 3C for detailed descriptions of these flags.

### C.2.1 Interactive Mode Installation

1. Check the System Requirements. The operating system must be fully installed and running on the system befor running this

   sofware.

2. Close any running applications. Otherwise, you may experience difficulties.

3. Run the InstallShield* installation program:

   Compressed .ZIP distribution: SETUP.EXE

4. You will be prompted to agree to the license agreement. If you do not agree, the Installer will exit before extracting any files.

5. Follow the on-screen instructions and use the default

   settings to complete the setup, once the operating

   system has rebooted.

6. This completes the installation of the Intel(R) Security Driver.

### C.2.2 Silent Mode Installation

1. Check the System Requirements. The operating system must be fully installed and running on the system before running this software.
2. Close any running applications. Otherwise, you may experience difficulties.
3. Run the InstallShield installation program:
   Compressed .ZIP distribution : SETUP.EXE -s
4. The utility will perform the necessary updates and record the installation status in the following system registry key:
   HKEY_LOCAL_MACHINE\Software\Intel\Intel Security Driver
5. NOTE: The system MUST be rebooted for all device updates to take effect.
6. To determine whether the install was successful, verify the 'install' value in the registry key specified in Step 4.
   The following table describes the various parameter values:

| Value | Type | Data | Description |
|---|---|---|---|
| "install" | String | "success" | The installation was successful. |
| | | "fail" | The installation was not successful. No files were copied to the system. |
| "reboot" | String | "REBOOT" | A reboot is required to complete the installation. |
| | | "No" | No reboot is required to complete the installation. |

"version" String <varies> Current version number of the Intel(R) Security Driver

### C.2.2 AVAILABLE COMMAND LINE FLAG OPTIONS

The Intel(R) Security Driver supports command line flags for various installation options.
All command line flags and parameters must be separated by a space, except for the language code after the '-L' flag.

Below is a list of the available command line flags that may be used with the program call. Note that the '-L' and the '-S' flags MUST be specified at the end of the command line flag list.

| Flag | Description |
|---|---|
| -L<LangCode> | Forces the InstallShield user interface to display the specified language during setup. Note that there should be NO spaces between '-L' and the 4-digit language code (see below). This flag and the '-S' flag must be placed at the end of the command line flag list. This parameter works in Interactive mode only. |

-S Runs the Installer in silent mode. No user interface is displayed. This flag and the '-L' flag must be placed at the end of the command line flag list.

Below are the language codes used with the '-L' flag:

| Language | <LangCode> |
|---|---|
| Chinese (PRC) | 0804 |
| Chinese (Taiwan) | 0404 |
| Danish | 0006 |
| Dutch | 0013 |
| English (US) | 0409 |
| English (UK - International) | 0809 |
| Finnish | 000B |
| French (Standard) | 040C |
| French (Canadian) | 0C0C |
| German | 0007 |
| Italian | 0010 |
| Japanese | 0011 |
| Korean | 0012 |
| Norwegian | 0014 |
| Polish | 0015 |
| Portuguese (Brazilian) | 0416 |
| Portuguese (Standard) | 0816 |
| Russian | 0019 |

| | |
|---|---|
| Spanish | 000A |
| Swedish | 001D |
| Thai | 001E |

## C.3 VERIFYING INSTALLATION OF THE SOFTWARE

Run Device Manager to verify the correct installation and usage of the Intel(R) Security Driver.

For Windows 95, Windows 98, and Windows 98 Second Edition:

1. Click on Start.
2. Select Settings.
3. Select Control Panel.
4. Double-click on System icon.
5. Click on Device Manager tab.
6. Click on View Devices by Type button.
7. Click on System Devices.
8. Click on "Intel(R) 82802 Firmware Hub Device"
9. Select the Properties button.
10. The Device Status dialog should indicate:
    "The device is working properly."
11. Select the Driver tab.
12. Click on the Driver File Details button.
13. A list of installed drivers will be displayed. The "isecdrv.sys" should be listed.

*NOTE: if either the Driver File Details button, or the "isecdrv.sys" listing is not present, the driver is not currently installed on the system.*

For Windows NT 4.0:

1. Click on Start.
2. Click on Settings.
3. Select Control Panel.
4. Double-click on Devices icon.
5. Scroll through the listed devices to locate the "Isecdrv" device.

   "Isecdrv" device should be listed as follows:

   Isecdrv Started Automatic

For Windows 2000:

1. Click on Start.
2. Select Settings.
3. Select Control Panel.
4. Double-click on System icon.
5. Click on Hardware tab.
6. Click on Device Manager button.
7. Click on System Devices.
8. Click on "Intel(R) 82802 Firmware Hub Device"
9. Select the Properties button.
10. The device should be listed as working with no issues.
11. Select the Driver tab.
12. The "File Version" entry will display the version number of the software currently installed on this system.

    The "Manufacturer" entry will display the manufacturer

of the software currently installed on this system.

* 5. CONTENTS OF THE DISTRIBUTION PACKAGE

The Intel(R) Security Driver package contains the following items:

File(s)

---

ISECDRV_AUTOL.ZIP

ISECDRV_ENU.ZIP

README.TXT

After installation on any system one or more of the following files are copied to the <InstallPath>\Document directory:

README.TXT

LICENSE.TXT*

INSTRUCT.TXT

VERSION.TXT

** NOTE: This file is only copied to the system if driver setup is invoked with the "-s" flag.*

After installation on a Windows 95 system, the following files are copied

1. to the <Windows>\SYSTEM directory:

   ISECDRV.VXD

2. to the <Windows>\INF directory:

   ISD_95.INF

After installation on a Windows NT 4.0 system,

the following files are copied

to the <Windows>\SYSTEM32\DRIVERS directory:

ISECDRV.SYS

After installation on a Windows 98, Windows 98 SE,

or Windows 2000 system, the following INF files are copied

1. to the <Windows>\SYSTEM32\DRIVERS directory:

   ISECDRV.SYS

2. to the <Windows>\INF directory:

   ISD_WDM.INF

3. to the <Windows>\CATROOT directory on

   ISD_WDM.CAT

## C.4 IDENTIFYING THE SOFTWARE VERSION NUMBER

The software version of the Intel(R) Security Driver can be

obtained by the following procedure:

For Windows 98 and Windows 98 Second Edition:

1. Click on Start.
2. Select Settings.
3. Select Control Panel.
4. Double-click on System icon.
5. Click on Device Manager tab.
6. Click on View Devices by Type button.
7. Click on System Devices.
8. Click on "Intel(R) 82802 Firmware Hub Device"

9. Select the Properties button.
10. The Device Status dialog should indicate:

    "The device is working properly."
11. Select the Driver tab.
12. Click on the Driver File Details button.
13. A list of installed drivers will be displayed. The "isecdrv.sys" should be listed. Select the "isecdrv.sys" entry.
14. The "File Version" entry will display the version number of the software currently installed on this system. The "Manufacturer" entry will display the manufacturer of the software currently installed on this system.

*NOTE: if either the Driver File Details button, or the "isecdrv.sys" listing is not present, the driver is not currently installed on the system.*

For Windows NT 4.0:

1. Click on Start.
2. Click on Programs.
3. Select Windows Explorer
4. Select the following file:

   <Windows>\SYSTEM32\DRIVERS\ISECDRV.SYS
5. On the main menu, select File.
6. Select Properties.
7. The file information should be listed.

For Windows 2000:

1. Click on Start.
2. Select Settings.
3. Select Control Panel.
4. Double-click on System icon.
5. Click on Hardware tab.
6. Click on Device Manager button.
7. Click on System Devices.
8. Click on "Intel(R) 82802 Firmware Hub Device"
9. Select the Properties button.
10. The device should be listed as working with no issues.
11. Select the Driver tab.
12. The "File Version" entry will display the version number of the software currently installed on this system.
    The "Manufacturer" entry will display the manufacturer of the software currently installed on this system.

For Windows 95:

1. Click on Start.
2. Click on Programs.
3. Select Windows Explorer
4. Select the following file:
   <Windows>\SYSTEM32\DRIVERS\ISECDRV.VXD
5. On the main menu, select File.
6. Select Properties.

7. The file information should be listed.

## C.4 UNINSTALLING THE SOFTWARE

*NOTE: This procedure assumes that the above installation process was successful. This uninstall procedure is specific only to the version of the driver and installation file included in this package.*

To uninstall the Intel Security Driver and associated documentation (following an installation), do the following:

1. Click on Start.
2. Select Settings.
3. Select Control Panel.
4. Double-click on the Add/Remove Programs icon.
5. Click the "Intel Security Driver" item in the list window, then click the Add/Remove... button.

## C.5 TROUBLESHOOTING

It is assumed that the system requirements in Section 2 above have been satisfied.

Issue: System locks up during Device Manager Remove or during restart.

Solution: System lockup can occur during Restart as a result of several possible system issues. In

the event of system lockup, restart the machine and view Device Manager. If devices are listed properly and the system experiences no further problems, then the .INF file restore process was successful. If devices are not configured correctly, try re-running the procedures outlined in Section 3.

If this does not fix problems or further problems are experienced, reinstall the operating system.

Issue: After performing the silent install, the HKLM\Software\Intel\Isecdrv key was not created or the data of the value "success" is not "success".

Solution: This is caused by one of the following scenarios:

- The current system does not contain a supported operating system, or
- The current system does not contain a supported chipset.

Verify the System Requirements in Section 2.