PCA-6276

Full-size dual Socket 370
Intel® Pentium ® III
processor-based PCI/ISA-bus
CPU card

Copyright notice

Acknowledgements

Part No. 2006627610

2nd Edition Printed in Taiwan June 2000

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-6276 Series comparison table

Model	PCA-6276V	PCA-6276VE
CPU: Dual Intel Celeron™/Pentium® III Socket 370	Yes	Yes
System chipset: Intel 440 BX	Yes	Yes
BIOS: Award P&P Flash BIOS	Yes	Yes
L2 cache: 128/256 KB (on CPU)	Yes	Yes
Max. system RAM: 1 GB (4 x 168-pin DIMM sockets)	Yes	Yes
ISA High Drive: Up to 64 mA	Yes	Yes
USB port	Yes	Yes
2 EIDE connectors	Yes	Yes
2 serial, 1 parallel ports	Yes	Yes
VGA: AGP/VGA (ATI 3D Rage XL)	Yes	Yes
LAN: 10/100Base-T Ethernet (Intel 82559 chipset)	-	Yes

Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year 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-6276 Socket 370 Intel® Celeron™/Pentium III processor-based single board computer
- 2 Intel® Celeron™ or Pentium III processors (optional)
- 2 cooling fans
- 1 PCA-6276 User's Manual
- CD-ROM with Utility drivers
- 1 FDD cable
- 2 EIDE HDD cables
- 1 printer (parallel port) cable and 1 serial port cable
- 1 ivory cable for PS/2 keyboard and PS/2 mouse
- 1 USB cable (optional, part no. 1700100170)
- 1 ATX-to-PS/2 power cable

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

We have carefully inspected the PCA-6276 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-6276, 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.

Contents

CHAPTER 1

Hardware Configuration

This chapter gives background information on the PCA-6276. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Introduction
- Features
- Specifications
- Board Layout
- Jumpers and Connectors
- Safety Precautions
- Jumper Settings
- System Memory
- Memory Installation Procedures
- Cache Memory
- CPU Installation
- Dual Processor Systems

1.1 Introduction

The PCA-6276 all-in-one industrial grade CPU card uses two of Intel's highly acclaimed Celeron™/Pentium III processors, together with the Intel® 440BX PCI chipset. The card works with standard ISA or PCI/ISA-bus passive backplanes.

The CPU provides 128 KB/256 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/ECP) and one USB (Universal Serial Bus) port. The PCI enhanced IDE controller supports Ultra DMA/33 and PIO Mode 4 operation. This provides data transfer rates of over 33 MB/sec. System BIOS supports boot-up from an IDE CD-ROM, SCSI CD-ROM and LS-120.

A backup of CMOS data is stored in the Flash memory, which protects data even after a battery failure. Also included is a 63-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-6276 offers several impressive industrial features such as a VGA (AGP) controller, a 10/100Base-T networking controller, four DIMM slots for a total of 1 GB RAM 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 in this chapter.

1.2 Features

- Dual Intel® Celeron™/Pentium III Socket 370 architecture
- Accepts Intel® Celeron™ processor up to 600+ MHz and Pentium III up to 900+ Mhz
- Intel® 82440BX PCI set, FSB 66/100 MHz
- Four DIMM sockets to support Intel® PC100-compliant SDRAMs up to 1 GB; supports ECC
- Award Plug and Play Flash BIOS, 2 Mb
- Onboard AGP/VGA
- Onboard Ethernet (PCA-6276VE only)
- Onboard ATX power control connector to meet ACPI requirements
- Two Enhanced IDE ports, supporting Ultra DMA/33, PIO Mode 4 (BIOS enabled/disabled)
- Two USB ports
- Two RS-232 serial ports
- One bidirectional parallel port, supports ECP/EPP/SPP
- One floppy port and one keyboard/mouse port
- PCI V2.1 compliant
- PICMG 2.0 compliant
- CMOS backup battery life of 7 years
- HISA (ISA High Drive) up to 64 mA
- Onboard security for hardware monitoring
- CPU auto detection for Celeron and Coppermine processors
- Wake on LAN, Wake on Ring and Wake on Alarm
- On board LAN Boot ROM

1.3 Specifications

1.3.1 System

- **CPU**: Dual Intel® Celeron™/Pentium III processors
- **BIOS**: Award Flash BIOS, 2 Mb
- **Green function**: Supports power management operation via BIOS. Activated by keyboard or mouse activity
- **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 DMA/33 (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 1 GB in four available 168-pin DIMM sockets. Supports PC100-compliant SDRAMs
- **ECC (parity DRAM only)**: Modules can detect multi-bit memory errors. Correction of 1-bit memory errors

1.3.3 Input/Output

- **Bus interface**: PCI/ISA bus, PICMG compliant
- **Bus speed**:
  ISA: 8 MHz
  PCI: 33 MHz
- **DMA channels**: 7
- **Interrupt levels**: 15
- **Enhanced parallel port**: Configurable to LPT1, LPT2, LPT3 or disabled. Standard DB-25 female connector provided. Supports EPP/ECP/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**: A 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on-board keyboard pin header connector is also available
- **ISA driver current**: 64 mA (High Drive)

1.3.4 VGA interface

- **Supports AGP 2X, 133 MHz**
- **Controller**: ATI 3D Rage XL
- **Display memory**: SGRAM 4 MB (8 MB upon request)

1.3.5 Ethernet LAN (PCA-6276VE only)

- **Supports 10/100Base-T Ethernet networking**
- **Chipset**: Intel® 82559

1.3.6 Industrial features

- **Watchdog timer**: Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second (63 levels). The program uses I/O port hex 443h to control the watchdog timer

1.3.7 Mechanical and environmental specifications

- **Operating temperature**: 0 ~ 60° C (32 ~ 140° F)
- **Storage temperature**: -40 ~ 60° C (-40 ~ 140° F)
- **Humidity**: 20 ~ 95% non-condensing
- **Power supply voltage**: +5 V, ±12 V
- **Power consumption**: (using Pentium III 550 MHz x2 and 256 MB DIMM x4 (M2V64520BTB)

  +5 V @ 10.7 A

  +12 V @ 86 mA

  -12 V @ 1 mA
- **Board size**: 338 x 122 mm (13.3" x 4.8")
- **Board weight**: 0.5 kg (1.2 lb)

1.4 Board Layout: Main Features

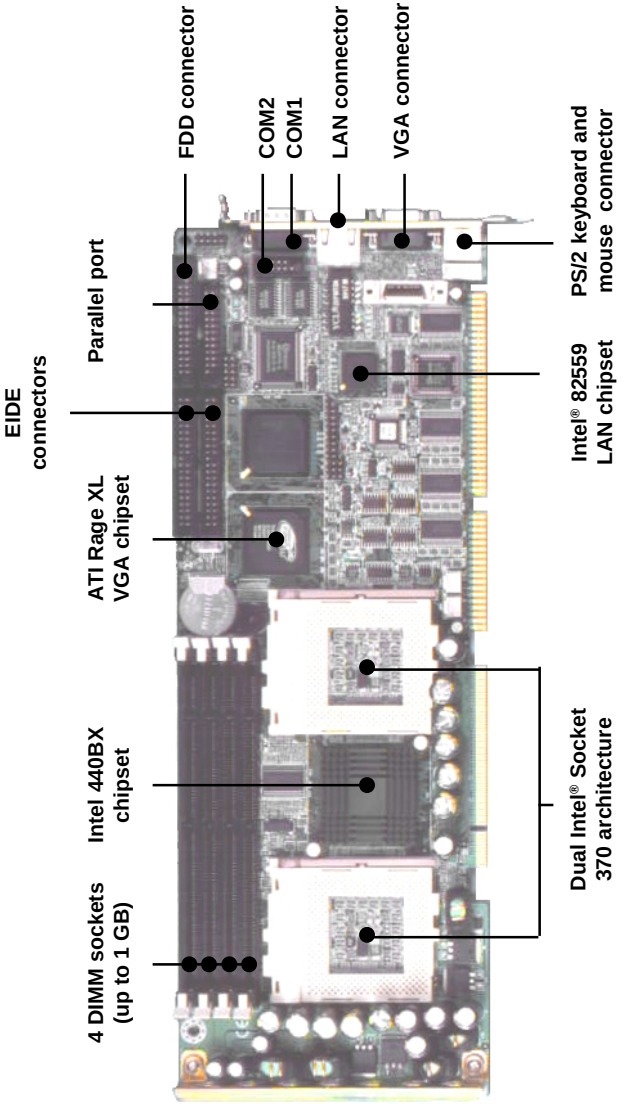


Figure 1-1: Board layout: main features

1.5 Jumpers and Connectors

Connectors on the PCA-6276 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 lists the function of each of the board's jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your card.

Table 1-1: Jumpers

Label	Function
J1	CMOS clear
J2	Watchdog timer output
J4	CPU clock (reserved)

Table 1-2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN6	USB port
CN7	VGA connector
CN8	10/100Base-T Ethernet connector
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse
CN12	External keyboard connector
CN13	Infrared (IR) connector
CN14	CPU fan connector 1
CN16	Keyboard lock and power LED
CN17	External speaker
CN18	Reset connector
CN19	IDE LED
CN20	ATX feature connector
CN21	ATX soft power switch
CN22	H/W monitor alarm
CN24	CPU fan connector 2

1.6 Board Layout: Jumper and Connector Locations

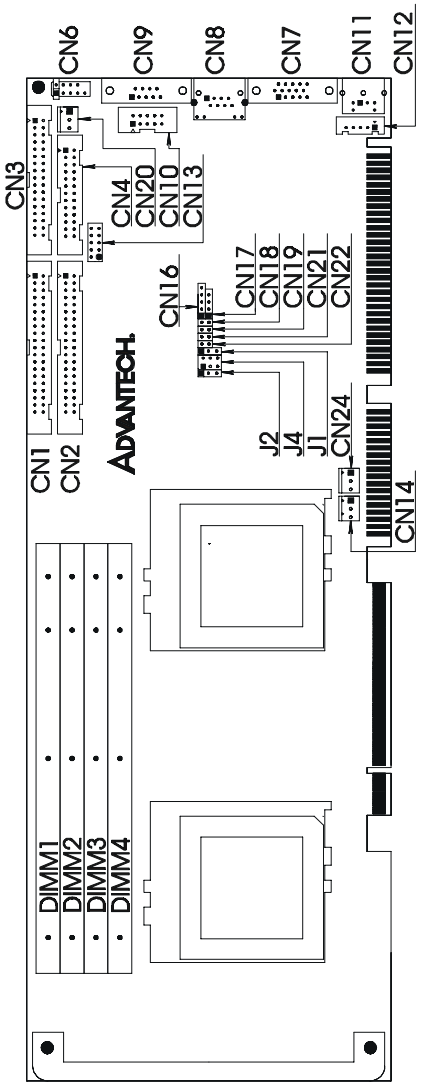


Figure 1-2: Board layout: jumper and connector locations

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 in a static-dissipative surface or 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 jumpers. It also includes the card's default settings and your options for each jumper.

1.8.1 How to set jumpers

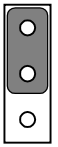
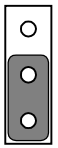
You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you 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-6276 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 1-5: CMOS clear (J1)

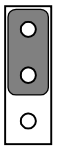
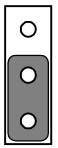
Function	Jumper setting	
* Keep CMOS data	1-2 closed	
Clear CMOS data	2-3 closed	

* default setting

1.8.3 Watchdog timer output (J2)

The PCA-6276 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-6276 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 1-6: Watchdog timer output (J2)

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

* default setting

1.9 System Memory

The top-left edge of the PCA-6276 contains four sockets for 168-pin dual inline 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-6276 single board computer between 16 MB and 1 GB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1-7: 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
4	(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-6276's socket 1 and a 32 MB DIMM into sockets 2 and 3. Your total system memory is 192 MB, calculated as follows:

Table 1-8: 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
4	-	-	0 MB
Total memory			**192 MB**

1.9.2 Supplementary information about DIMMs

Your PCA-6276 can accept SDRAM memory chips (with or without parity). Also note:

- If the PCA-6276 operates at 100 MHz, only use PC100-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.
- SDRAM chips are usually thinner and have higher pin density than EDO chips.
- Chips with 9 chips/side support ECC; chips with 8 chips/side do 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 (see *Figure 1-3, DIMM installation*). To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

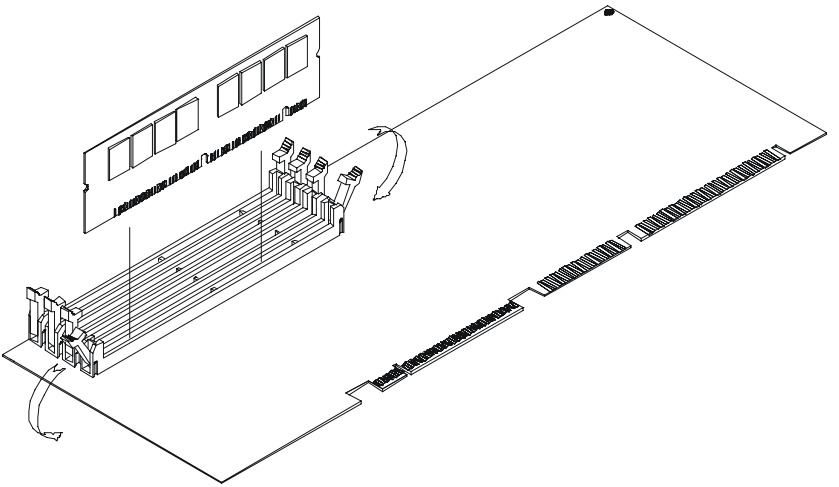


Figure 1-3: DIMM installation

1.11 Cache Memory

Since the second level (L2) cache has been embedded into the Intel® Celeron™/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 Celeron processor is 128 KB, and 256 KB for the Pentium III processor.

1.12 CPU Installation

The PCA-6276 provides Socket 370 architecture for dual Intel® Celeron™/Pentium III processors. A CPU on the board must have a fan or heat sink attached, to prevent overheating.

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

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.

When you install a new CPU, be sure to adjust the board settings, such as CPU type and CPU clock. **Improper settings may damage the CPU**.

1.13 Dual Processor Systems

The dual processor function of the PCA-6276 is a special design for Socket 370 CPUs. The PCA-6276 supports Intel® SMP (Symmetric Multiple Processor) specifications. It is equipped with two PGA 370 sockets with which you can install two Socket 370 processors. Of course, if desired, only one Socket 370 processor need be installed. A single Socket 370 processor can be installed in PGA 370 socket CPU-1 (default setting).

To install two Socket 370 processors, we strongly recommend you uses the same speed CPUs. Otherwise, your system may not operate properly.

For best performance, you should use an OS (operating system) that supports multi-processors. The following OSs can support multi-processor functions: Microsoft Windows NT (3.5x, 4.x and 5.x), SCO Unix, FreeBSD 3.0 or later, and Linux. This list is not necessarily exhaustive. Check with your OS vendor for more information.

You can also use Microsoft Windows 3.1, 95 or 98. However, these do not support SMP specifications. Therefore, using two processors will yield the same result as using a single processor.

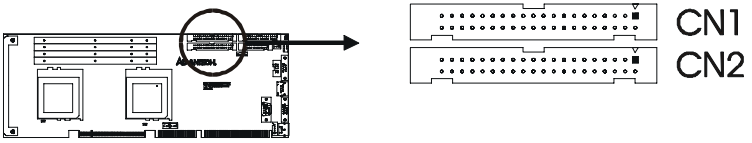
Note: Based on peripheral specifications and other considerations, the PCA-6276's SMP function is designed for testing only. The PCA-6276 cannot manage the SMP function by itself. Therefore, if you use an incorrect CPU or OS which causes the SMP function to fail, you are likely to suffer damage to your hardware and/or software. Advantech cannot take any responsibility for damage in such circumstances.

CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6276 board. 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 your chassis is very tight, you may need to partially remove the card to make all the connections.

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



You can attach up to four IDE (Integrated Device Electronics) drives to the PCA-6276's internal controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

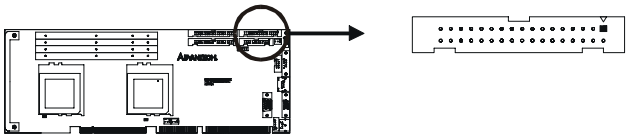
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the CPU card. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help in finding the connector.

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 one as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

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

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

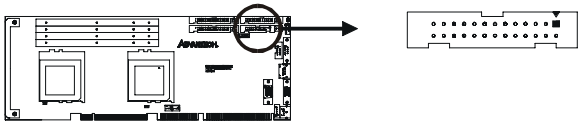
2.2 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6276's on-board controller. You can use any combination of 5.25" (360 KB / 1.2 MB) and/or 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 floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed circuit-board connector (usually used for 5.25" drives). You can use only one connector in each set. The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

2.3 Parallel Port Connector (CN4)

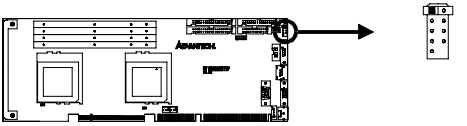


The parallel port is normally used to connect the CPU card to a printer. The PCA-6276 includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one 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.

The parallel port is designated as LPT1, and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

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

2.4 USB Connector (CN6)

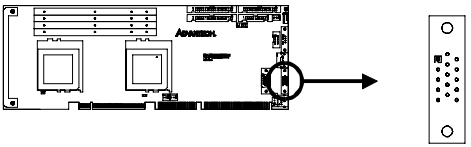


The PCA-6276 CPU card provides one USB (Universal Serial Bus) interface, which give complete Plug & Play and hot attach/detach for up to 127 external devices.The USB interface complies with USB Specification Rev. 1.0, and is fuse-protected.

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

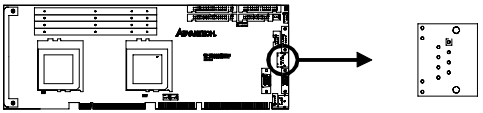
The USB interface can be disabled in the system BIOS setup.

2.5 VGA Connector (CN7)



The PCA-6276V/VE series includes a PCI 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.

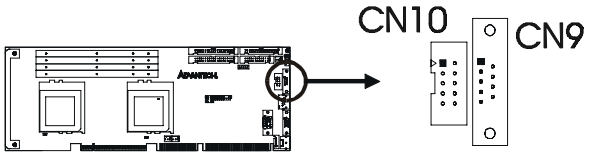
2.6 Ethernet Connector (CN8)



Note: Only the PCA-6276VE model includes a 10/100Base-T Ethernet connector.

The PCA-6276VE is equipped with a high performance 32-bit PCI-bus Ethernet interface, which is fully compliant with IEEE 802.3/u 10/100 Mbps CSMA/CD standards. It is supported by all major network operating systems, and is 100% Novell NE-2000 compatible. An onboard RJ-45 jack provides convenient 10/100Base-T RJ-45 operation.

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



The PCA-6276 offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices (such as a mouse, printers, and so on) or to a communication network.

Table 2-1: Serial port connections (COM1, COM2)

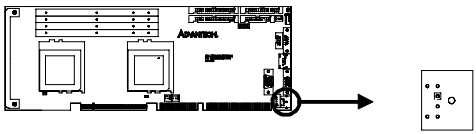
Connector	Ports	Address	Interrupt
CN9	COM1	3F8*, 3E8	IRQ4
CN10	COM2	2F8*, 2E8	IRQ3

* default settings

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

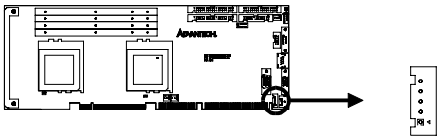
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse Connector (CN11)



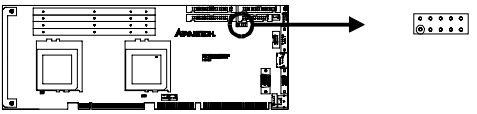
The PCA-6276 board provides a keyboard connector. A 6-pin mini-DIN connector (CN11) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a PS/2 mouse connector and a PS/2 keyboard connector.

2.9 External Keyboard Connector (CN12)



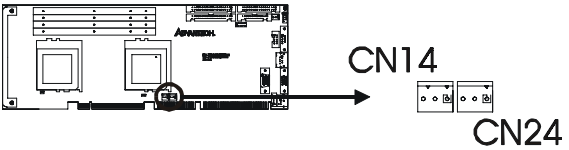
In addition to the PS/2 mouse/keyboard connector on the PCA-6276's rear plate, there is also an extra on-board external keyboard connector. This gives system integrators greater flexibility in designing their systems.

2.10 IR Connector (CN13)



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

2.11 CPU Fan Connectors (CN14, CN24)

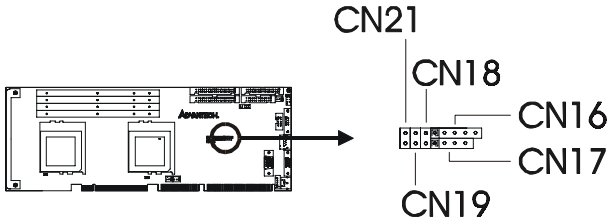


These connectors support cooling fans of 500 mA (6 W) or less.

The connectors also support hardware monitoring for CPU fan speed. For details on setting up the software for CPU fan speed monitoring, refer to Chapter 6.

2.12 Front Panel Connectors (CN16, CN17, CN18, CN19 and CN21)

There are several external switches to monitor and control the PCA-6276.



2.12.1 Keyboard lock and power on 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

2.12.2 External speaker (CN17)

CN17 is a 4-pin connector for an extenal speaker. If there is no external speaker, the PCA-6276 provides an on-board buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.12.3 Reset (CN18)

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

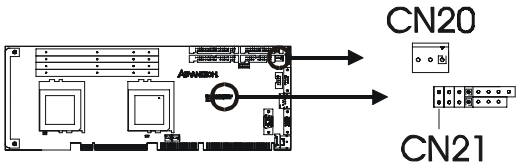
2.12.4 IDE LED (CN19)

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

2.12.5 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.

2.13 ATX Power Control Connectors (CN20 and CN21)



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

The PCA-6276 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-6276'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 are closed.

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

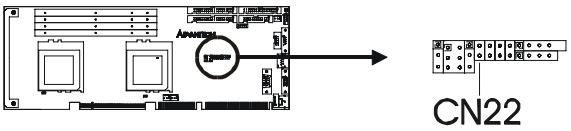
2. ATX power supplies may power on if certain motherboard components or connections are touched by metallic objects.

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

2.13.2 Controlling the soft power switch

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

2.14 Hardware Monitor Alarm (CN22)



If you enable this connector, it will send out a warning "beep" tone through the speaker when the CPU temperature, CPU fan speed or system voltage exceed safe limits. The default setting is "enable".

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 RAM so that it retains the setup information when the power is turned off.

3.2 Entering Setup

Press <Del> to enter the setup.

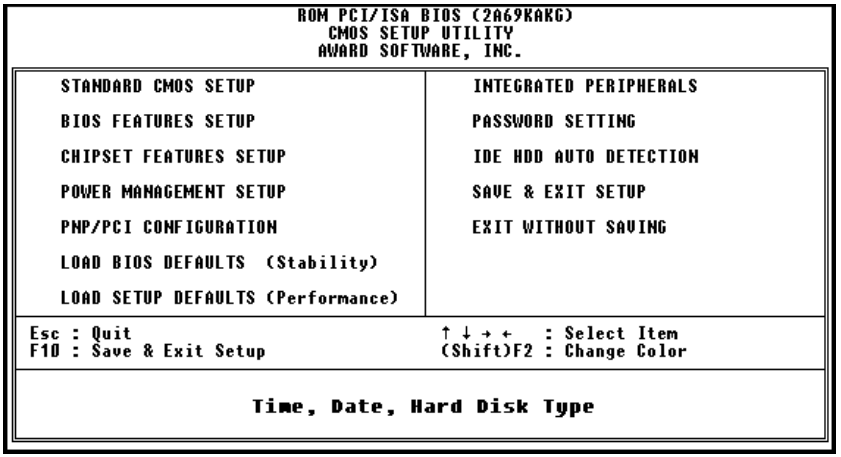


Figure 3-1: Award BIOS setup initial screen

3.3 Standard CMOS Setup

Choose the “STANDARD CMOS SETUP” option from the “INITIAL SETUP SCREEN” menu, and the screen below will be displayed. This standard setup menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

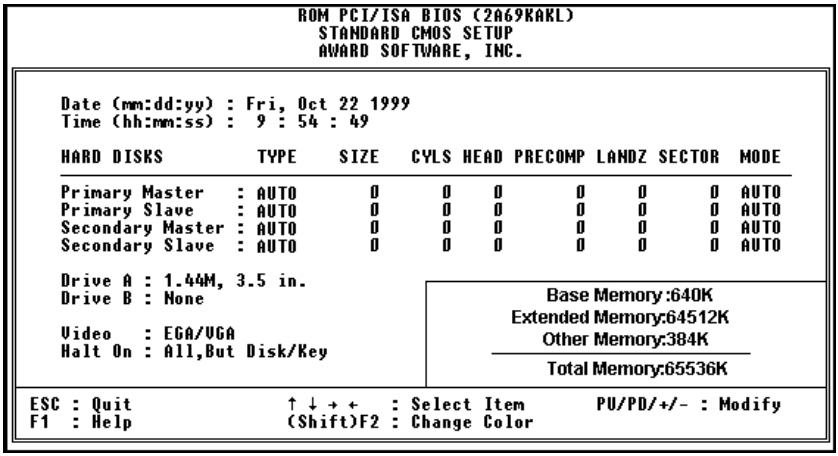


Figure 3-2: Standard CMOS setup screen

Note: BIOS versions are regularly updated from time to time without notice. Therefore, the options available in your setup screen may differ from the options shown in this manual.

3.4 BIOS Features Setup

The “BIOS FEATURES SETUP” screen appears when choosing the “BIOS FEATURES SETUP” item from the “CMOS SETUP UTILITY” menu. It allows the user to configure the PCA-6276 according to his particular requirements.

Below are some major items that are provided in the BIOS FEATURES SETUP screen.

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

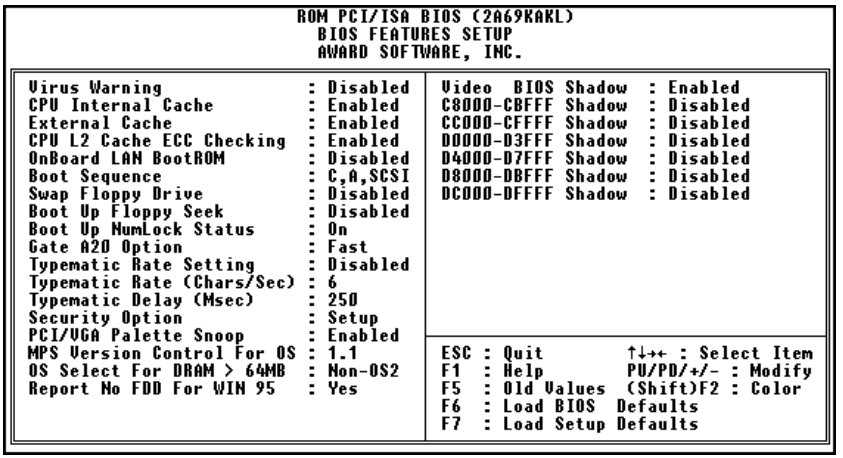


Figure 3-3: BIOS features setup screen

3.4.1 Virus Warning

While the system is booting up, and after 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 run the anti-virus program to locate the problem.

If Virus Warning is disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

3.4.2 Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The BIOS provides the following boot sequences:

A,C, SCSI

C,A, SCSI (Default)

C, CDROM, A

CDROM, C, A

D, A, SCSI

E, A, SCSI

F, A, SCSI

SCSI, A, C

SCSI, C, A

C only

LS/ZIP, C

3.4.3 Boot Up Floppy Seek

During Power-On Self Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. A 360 KB type drive is 40 tracks; while 720 KB, 1.2 MB, and 1.44 MB type drives are all 80 tracks.

Enabled BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives. This is because they are all 80 tracks.

Disabled BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

3.4.4 Boot Up NumLock Status

The default is “On”.

On	Keypad boots up to number keys.
Off	Keypad boots up to arrow keys.

3.4.5 Gate A20 Option

Normal	The A20 signal is controlled by the keyboard controller or chipset hardware.
Fast (Default)	The A20 signal is controlled by Port 92 or the chipset specific method.

3.4.6 Typematic Rate Setting

The typematic rate determines the characters per second accepted by the computer. Typematic Rate Setting enables or disables the typematic rate.

3.4.7 Typematic Rate (Chars/Sec)

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

3.4.8 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).

3.4.9 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.

3.4.10 PCI/VGA Palette Snoop

Some display cards that are nonstandard VGA, such as graphics accelerators or MPEG Video Cards, may not show colors properly. The setting *Enabled* should correct this problem. Otherwise, leave this on the setup default setting of *Disabled*.

3.4.11 OS Select for DRAM > 64MB

This setting is under the OS/2 system.

3.4.12 Video BIOS Shadow

This determines whether video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video BIOS Shadow increases the video speed.

3.4.13 C8000-CBFFF Shadow / DC000-DFFFF Shadow

These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled Optional shadow is enabled.

Disabled Optional shadow is disabled.

3.5 Chipset Features Setup

By choosing the “CHIPSET FEATURES SETUP” 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-6276.

If you enable the OBS function, you can view the temperature, fan speed and voltage of your PC system. The data will be displayed in similar fashion to the display shown in Fig. 3-4:

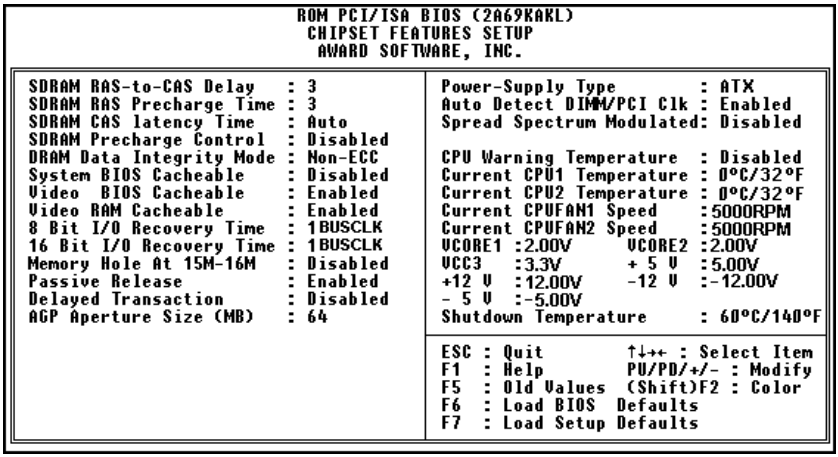


Figure 3-4: Chipset features setup screen

3.5.1 SDRAM RAS to CAS Delay

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

3.5.2 SDRAM RAS Precharge Time

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

3.5.3 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.

3.5.4 DRAM Data Integrity Mode

“Non-ECC” has byte-wise write capability but no provision for protecting data integrity in the memory module array. “EC-Only” data errors are detected but not corrected. “ECC” with hardware scrubbing allows detection of single-bit and multiple-bit errors and recovery of single-bit errors. The default setting is “Non-ECC.”

3.5.5 16 Bit I/O Recovery Time / 8 Bit I/O Recovery Time

Timing for 16-bit and 8-bit ISA cards respectively. Leave these on their respective default settings.

3.5.6 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.”

3.5.7 AGP Aperture Size (MB)

Memory-mapped, graphics data structures can reside in a graphics aperture. The default setting is 64.

3.6 Power Management Setup

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

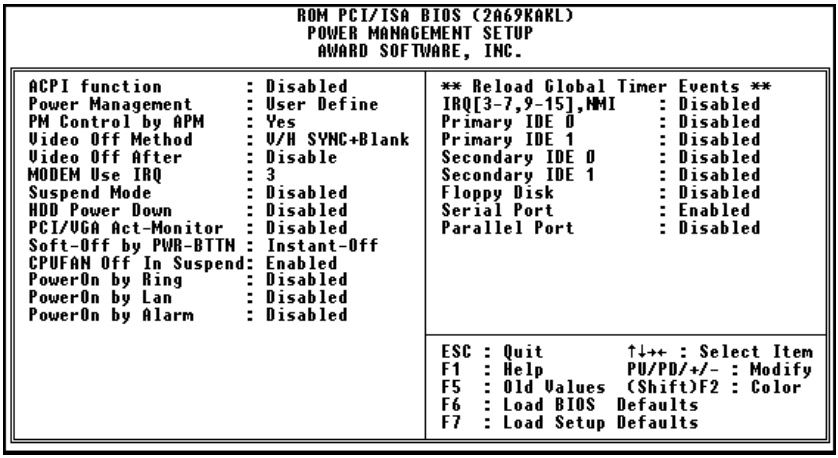


Figure 3-5: Power management setup screen

3.6.1 Power Management

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

3.6.2 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.

3.6.3 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 PCI Configuration Setup

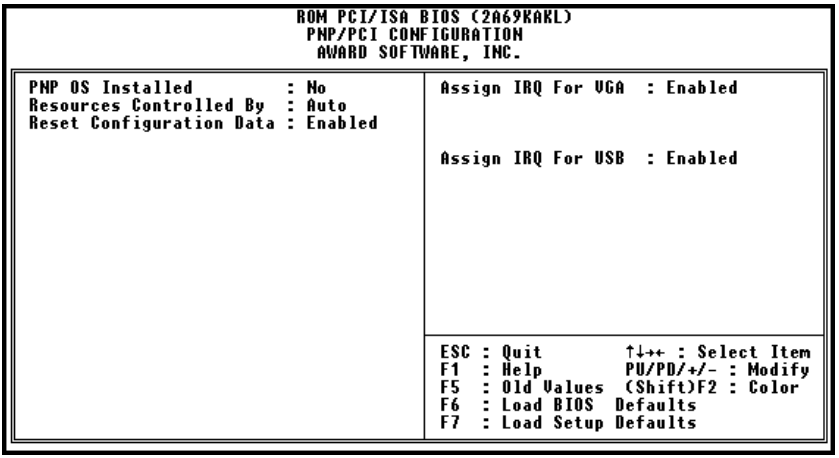


Figure 3-6: PCI configuration screen

3.7.1 IRQ-xx assigned to : PCI/ISA PnP

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) card. Two options are available: PCI/ISA PnP or Legacy ISA. The first option, the default setting, indicates that the displayed IRQ is not used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ, you must set the field for that IRQ to “Legacy ISA”. Say for example that you install a legacy ISA card that requires IRQ10. You must then set “IRQ-10 assigned to :” as “Legacy ISA”.

3.7.2 DMA-x assigned to : PCI/ISA PnP

These fields indicate whether or not the displayed DMA channel for each field is being used by a legacy (non-PnP) card. Two options are available: PCI/ISA PnP or Legacy ISA. The first option, the default setting, indicates that the displayed DMA channel is not used to determine if an ISA card is using that channel. If you install a legacy ISA card that requires a unique DMA channel, you must set the field for that channel to “Legacy ISA”.

3.8 Load BIOS Defaults

“LOAD BIOS DEFAULTS” indicates the most appropriate values for the system parameters to achieve maximum stability. These default values are loaded automatically if the stored record created by the setup program becomes corrupted (and therefore unusable).

3.9 Load Setup Defaults

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

3.10 Integrated Peripherals

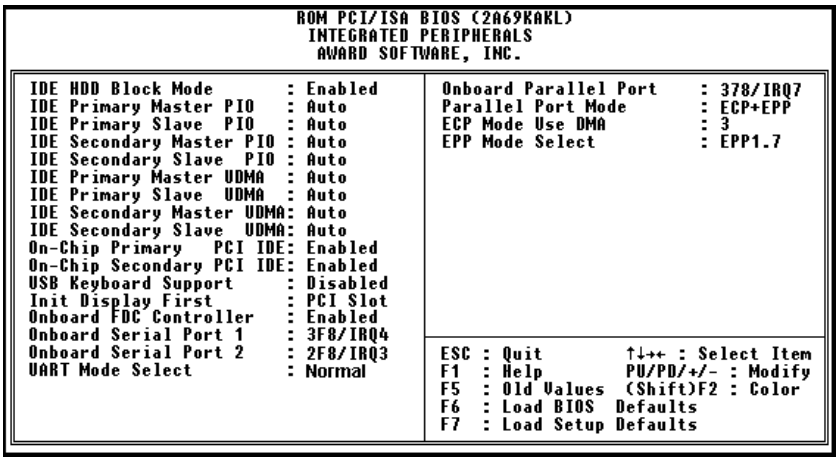


Figure 3-7: Integrated peripherals screen

3.10.1 IDE HDD Block Mode

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

3.10.2 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.

3.10.3 On-Chip PCI IDE Primary/Secondary

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.

3.10.4 Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the on-board 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.

3.10.5 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.

3.10.6 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.

3.10.7 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 PCA-6168 can support up to three parallel ports, as long as there are no conflicts for each port.

3.10.8 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.

3.10.9 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.

3.11 Password Setting

To change the password:

1. Choose the "PASSWORD SETTING" option from the Setup main 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 to secure your option in "BIOS FEATURES SETUP".

3.12 IDE HDD Auto Detection

"IDE HDD AUTO DETECTION" automatically self-detects for the correct hard disk type.

3.13 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.

3.14 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

SVGA Setup

The PCA-6276 features an onboard AGP/VGA interface. This chapter provides instructions for installing and operating the software drivers on the display driver utility CDs included in your PCA-6276 package.

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 enhanced display drivers for the PCA-6276 board are located on the software utility CDs. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers.

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

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

4.2 Features

- Built-in ATI Rage XL 128-bit 3D multimedia accelerator
- Supports AGP 2x (133 MHz) mode with sideband addressing and AGP texturing
- PC 98 compliant
- Superior 3D performance achieved through a floating print setup engine rated at 1.2 million triangles/sec
- Integrated 230 MHz DAC allows 85 Hz refresh at 1600 x 1200 resolution
- Complete local language support
- Power management for full VESA DPMS and EPA Energy Star compliance
- User-friendly installation for Windows 95, Windows 98, Windows NT and Windows 2000
- AGP 1.0 interface
- 4 MB, 64-bit, 125 MHz SGRAM frame buffer interface with 1 GB/sec bus bandwidth
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

4.3 Installation

Utility CDs:

ATI RAGE XL - AGP/VGA for Win95/98/98SE/Win2000 - V1.00

ATI RAGE XL - AGP/VGA for WinNT - V1.00

4.4 Driver Installation

4.4.1 Necessary prerequisites

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM personal computer. Before you attempt to install any driver or utility, you should know how to copy files from a floppy disk to a directory on the hard disk. You should also understand the MS-DOS directory structure, and know how to format a floppy disk. If you are uncertain about any of these concepts, please refer to the DOS or Windows user reference guides for more information before you proceed with the installation.

4.4.2 Before you begin

Before you begin installing software drivers, you should make a backup copy of the display driver CD and store the original in a safe place. The display driver CD contains drivers for several versions of certain applications. You must install the correct version in order for the driver to work properly, so make sure you know which version of the application you have.

4.4.3 Changing display drivers in Windows

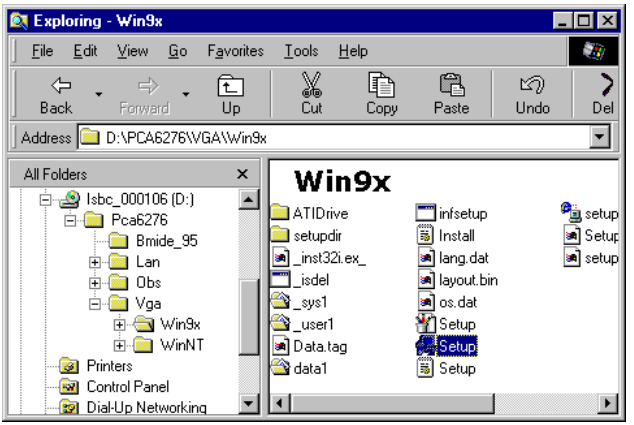
To change display drivers in Windows, select the ***Windows Setup*** icon from the Main window. You will be shown the current setup configuration. Select ***Change System Settings*** from the Option menu. Click on the arrow at the end of the Display line. You will be shown a list of display drivers. Click on the driver you want. Then click on the ***OK*** button. Follow the directions to complete the setup.

4.4.4 Changing color schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. To change the color scheme, select the ***Control Panel*** from the Main window. Select the ***Color*** icon. You will be shown the current color scheme. Choose a new color scheme, and click the ***OK*** button.

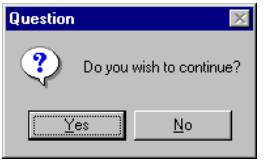
4.5 Windows 95/98/98 SE Drivers Setup Procedure

1. Insert the utility CD into drive D:. Navigate to Pca6276\Vga\Win9x\Setup. Double-click on "Setup".



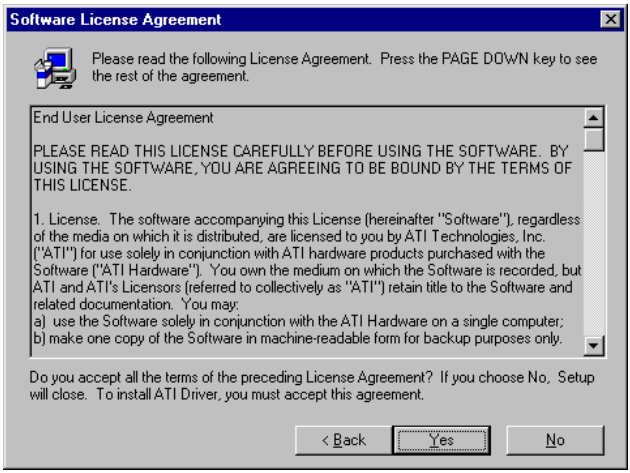
2. In the "Severe" window, click on "OK".

3. In the "Question" window, click on "Yes".

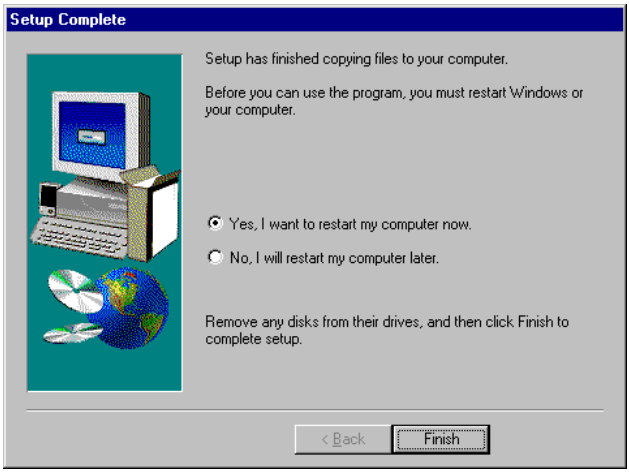


4. In the "Welcome" window, click on "Next".

5. In the "Software License Agreement" window, carefully read the "End User License Agreement". If you accept all the terms of this Agreement, click on "Yes".

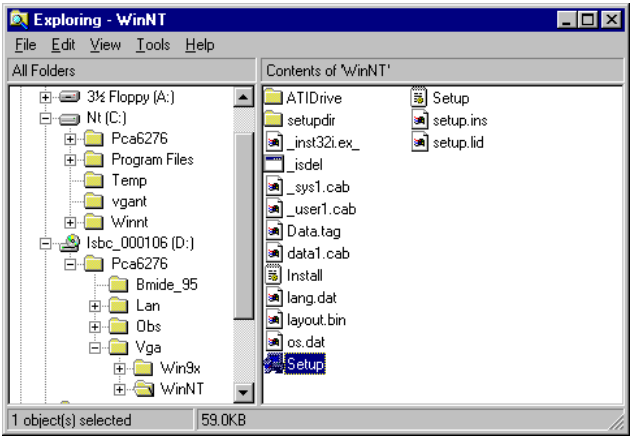


6. In the "Setup Complete" window, select "Yes, I want to ...". Then click on "Finish".

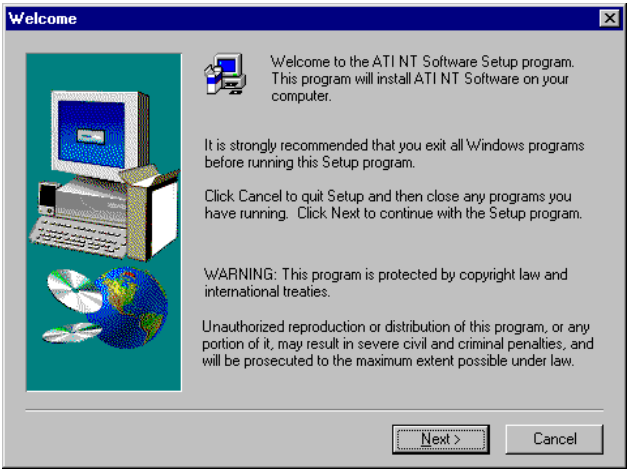


4.6 Windows NT Drivers Setup Procedure

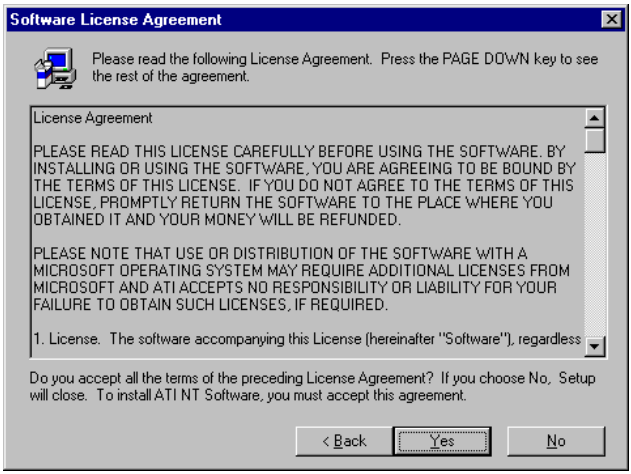
1. Insert the utility CD into drive D:. Navigate to Pca6276\Vga\WinNT\Setup. Double-click on "Setup".



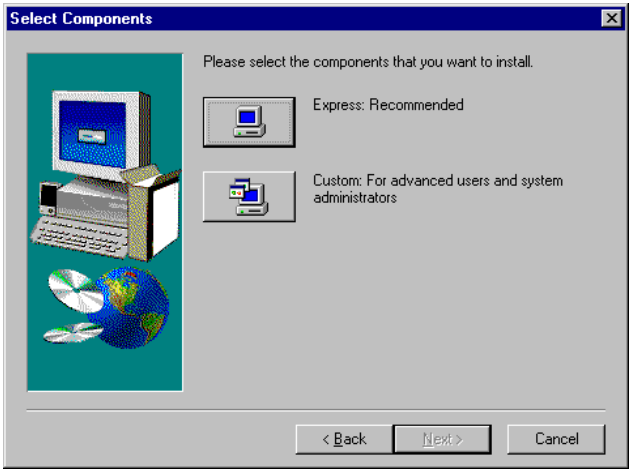
2. In the "Welcome" window, click on "Next".



3. When the "Software License Agreement" window, carefully read the "End User License Agreement". If you accept all the terms of this Agreement, click on "Yes".



4. In the "Select Components" window, click on "Express: Recommended".



5. In the "Setup Complete" window, select "Yes, I want to ...". Then click on "Finish".

CHAPTER 5

LAN Configuration

The PCA-6276VE features an onboard LAN interface. 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
- Driver Installation
- Windows 95 Drivers Setup Procedure
- Windows 98/98SE Drivers Setup Procedure
- Windows NT Drivers Setup Procedure
- Windows NT Wake On LAN Setup Procedure

5.1 Introduction

The PCA-6276VE features an optional 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.

5.2 Features

- 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

5.3 Driver Installation

The PCA-6276VE's onboard Ethernet interface supports all major network operating systems.

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

The drivers and installation instructions are located in the following directories of the utility CD:

- Dos: Drivers for DOS platforms
- Info: Installation instructions
- Nwserver: Drivers for Novell NetWare
- Wfw: Drivers for Windows 3.11 for Workgroups

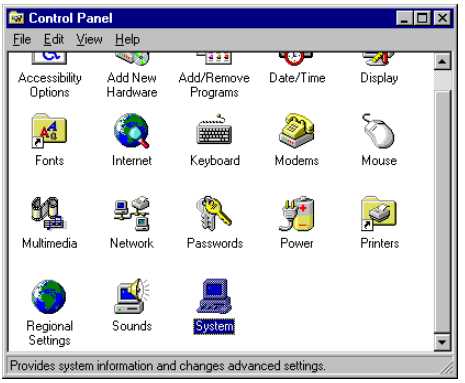
Please refer to the text files in the Info directory for detailed information about installing the drivers.

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

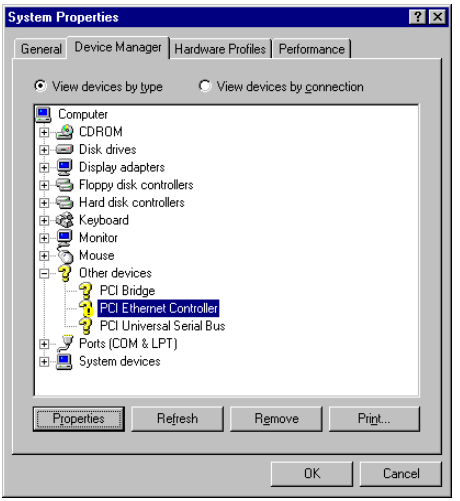
5.4 Windows 95 Drivers Setup Procedure

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

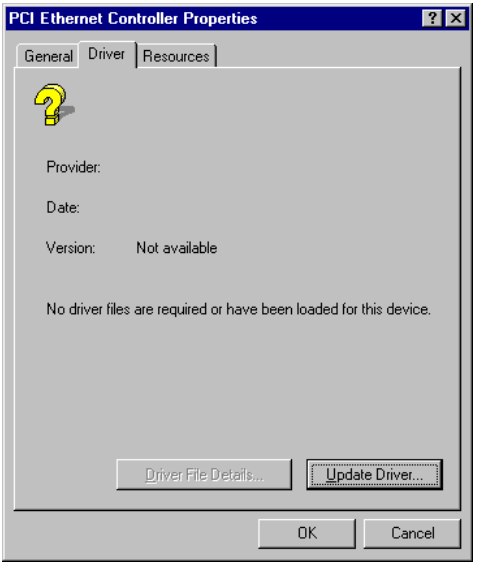
1. In the "Windows 95" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "System".



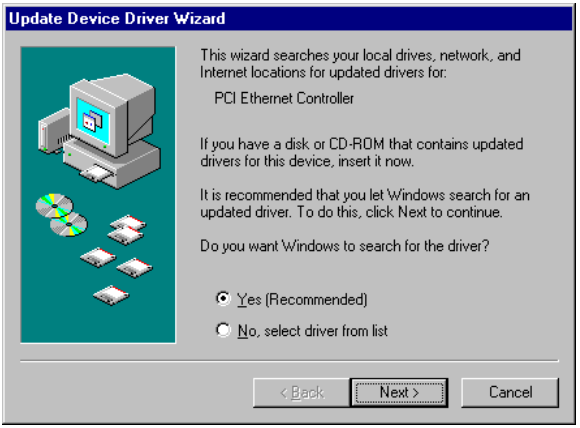
2. In the "System Properties" window, select the "Device Manager" tab. Select "View devices by type", and navigate to: Computer\Other devices\PCI Ethernet Controller. Highlight "PCI Ethernet Controller" and click on "Properties".



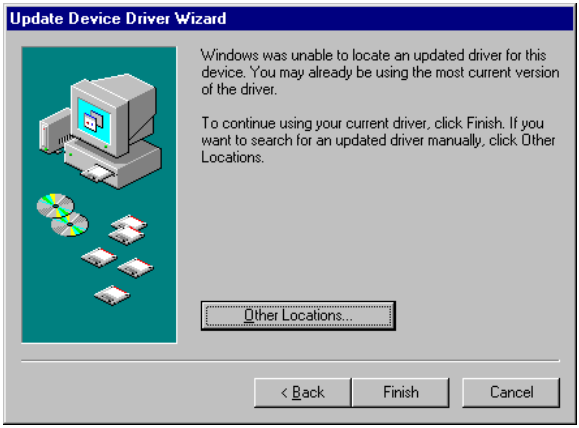
3. In the "PCI Ethernet Controller Properties" window, select the "Driver" tab. Then click on "Update Driver...".



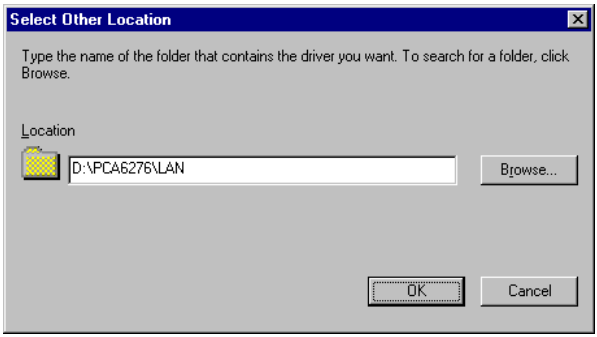
4. In the "Update Device Driver Wizard" window, select "Yes [Recommended]". Then click on "Next".



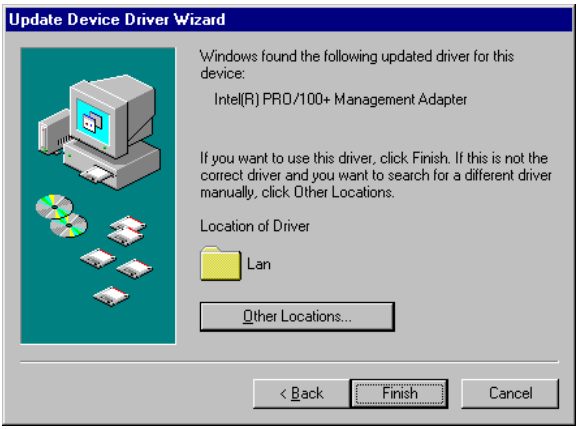
5. In the following "Update Device Driver Wizard" window, click on "Other locations...".



6. In the "Select Other Location" window, the location of the driver should be: D:\PCA6276\LAN. When you have the correct location, click on "OK".

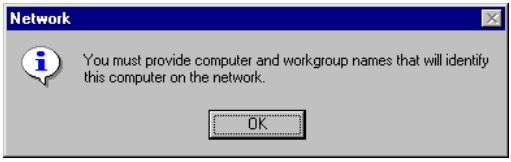


7. In the "Update Device Driver Wizard", click on "Finish".

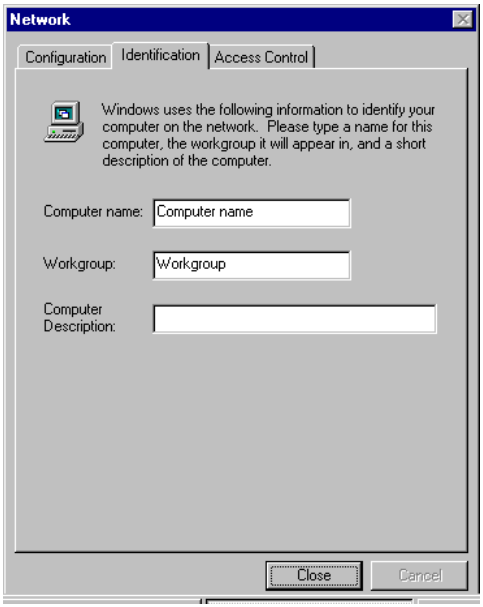


8. In the "Copying Files..." window, the correct file path should be: D:\PCA6276\LAN. When you have the correct location, click on "OK".

9. In the "Network" window, click on "OK".



10. In the following "Network" window, select the "Identification" tab. Type in your Computer name and your Workgroup. Then click on "Close".



11. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. Then click on "OK".

12. In the "System Settings Change" window, click on "Yes".

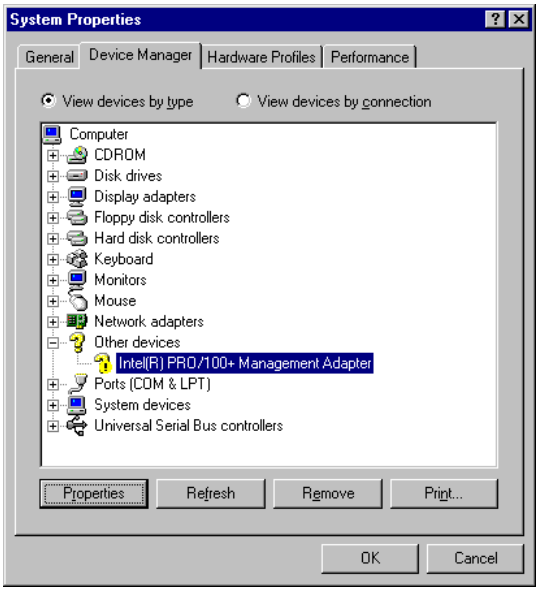
5.5 Windows 98/98SE Drivers Setup Procedure

Note 1: *If you are using Windows 98SE, your system will find the LAN device "Intel[R] Pro/100+ Management Adapter". You must first remove this device from your system, and then restart your computer. Then you will be ready to install the correct driver by following the procedure below*

Note 2: *The CD-ROM drive is designated as "E" throughout this section.*

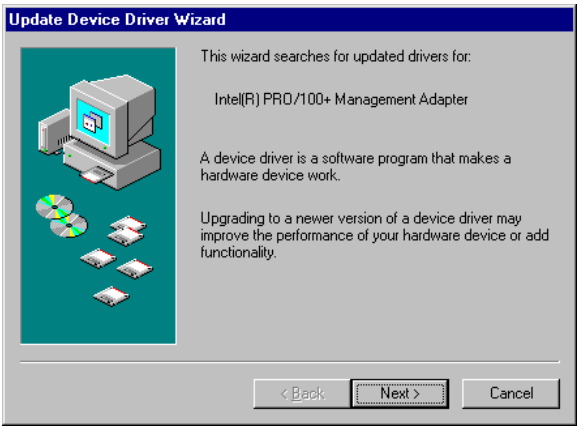
1. In the "Windows 98" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "System".

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

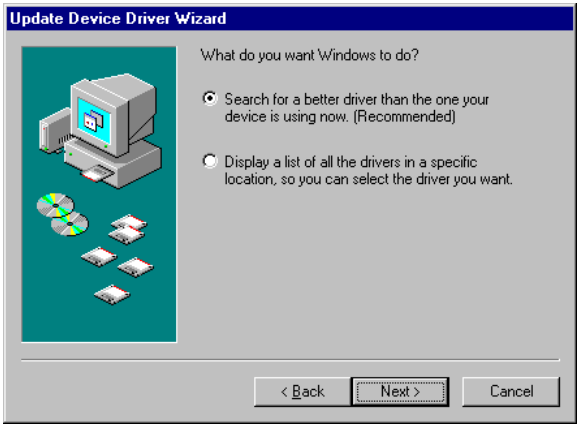


3. In the "Intel[R] PRO/100+ Management Adapter Properties" window, select the "Driver" tab. Then click on "Update Driver...".

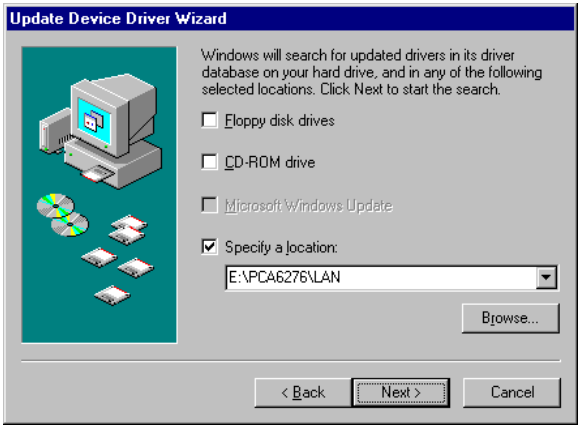
4. In the "Update Device Driver Wizard" window, click on "Next".



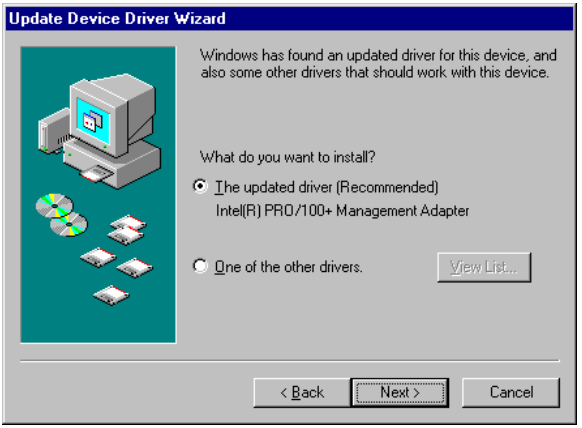
5. In the following "Update Device Driver Wizard" window, select "Search for a better driver...". Then click on "Next".



6. In the following "Update Device Driver Wizard" window, select "Specify a location:". Type in: "E:\PCA6276\LAN". Then click on "Next".

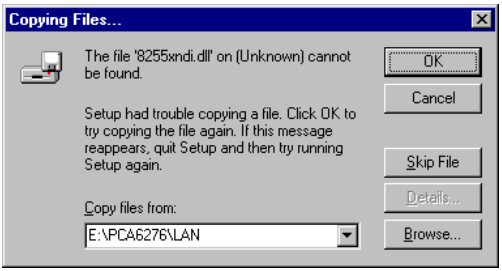


7. In the following "Update Device Driver Wizard" window, select "The updated driver ...". Then click on "Next".



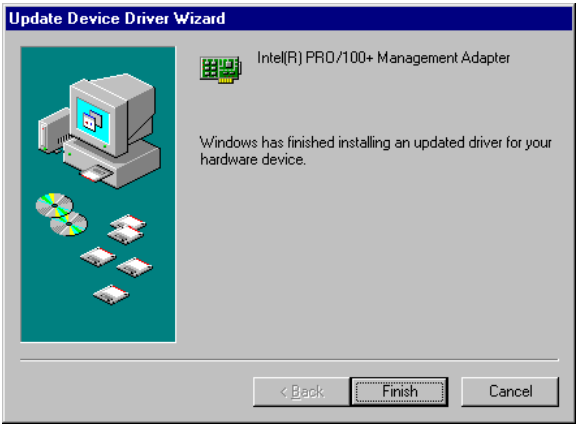
8. In the following "Update Device Driver Wizard" window, click on "Next".

9. In the "Copying Files..." window, the correct file path should be: E:\PCA6276\LAN. When you have the correct location, click on "OK".



10. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. Then click on "OK".

11. When the "Update Device Driver Wizard" window, click on "Finish".

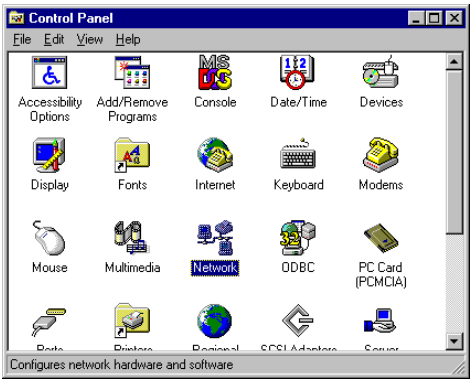


12. In the "System Settings Change" window, click on "Yes".

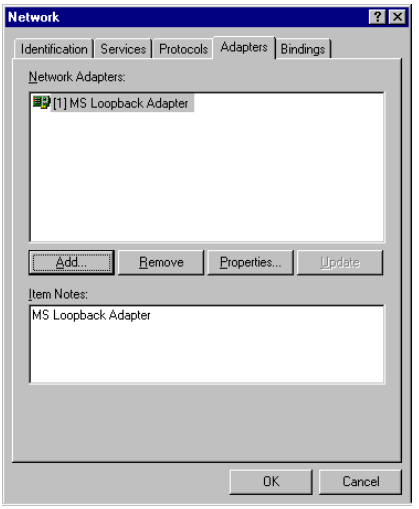
5.6 Windows NT Drivers Setup Procedure

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

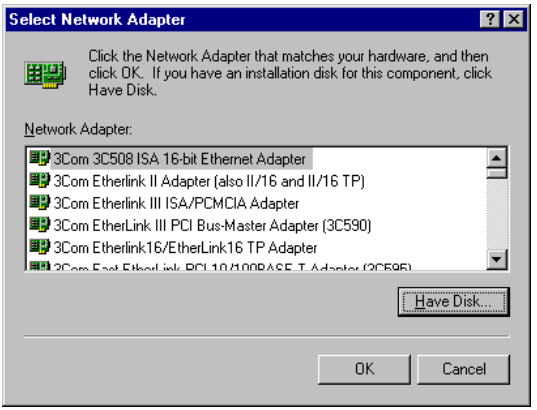
1. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Network".



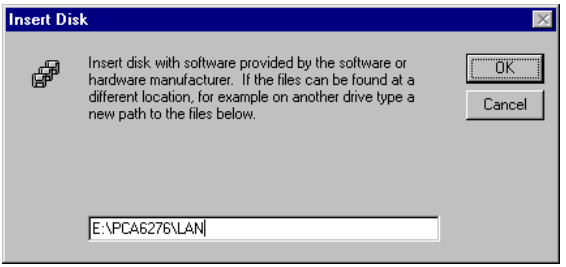
2. In the "Network" window, select the "Adapters" tab. Then click on "Add...".



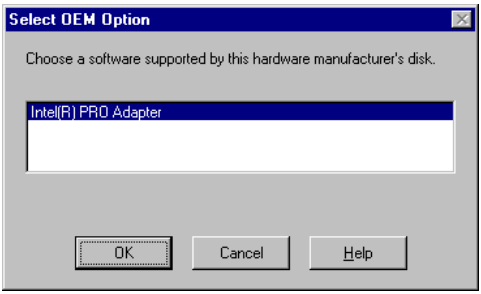
3. In the "Select Network Adapter" window, click on "Have Disk...".



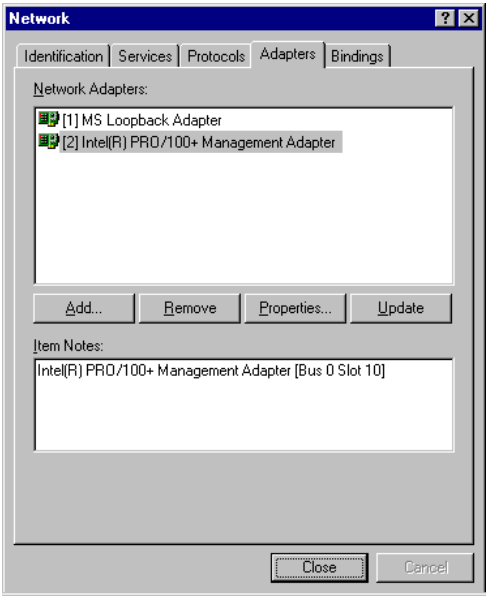
4. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. The correct file path is; E:\PCA6276\LAN. When you have the correct file path, click on "OK".



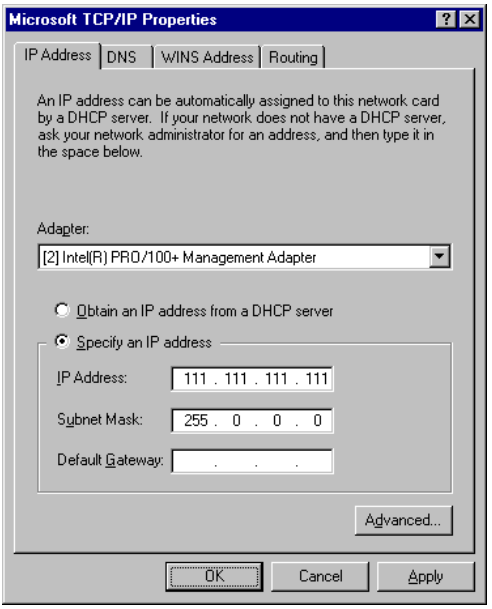
5. In the "Select OEM Option" window, click on "OK".



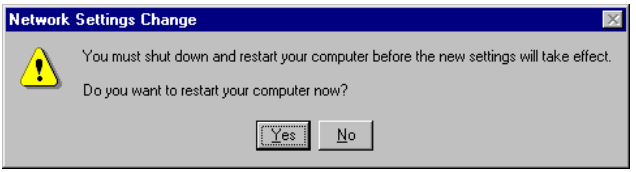
6. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "[2] Intel[R] PRO/100+ Management Adapter". Then click on "Close".



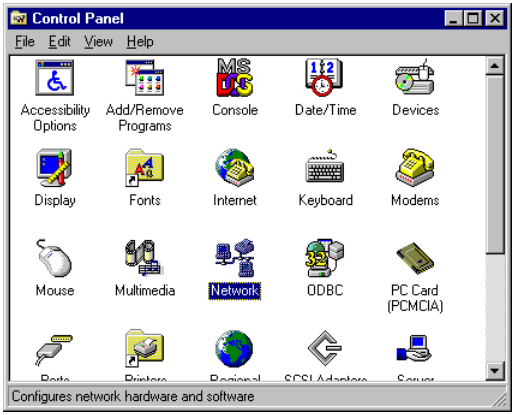
7. In the "Microsoft TCP/IP Properties" window, select the "IP Address" tab. Then select "Specify an IP address". Type in the IP Address and Subnet Mask details. Then click on "OK".



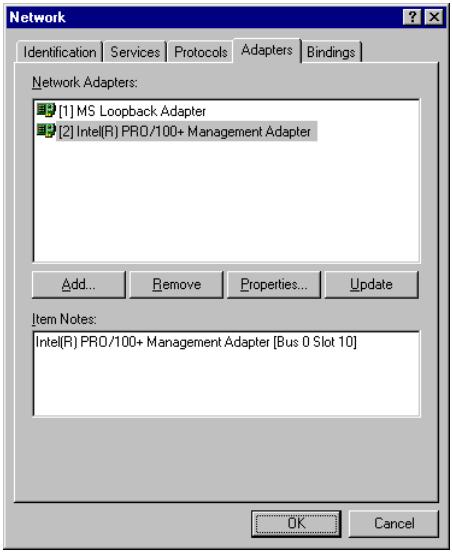
8. In the "Network Settings Change" window, click on "Yes".



9. You are now ready to enable the LAN device driver. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Network".

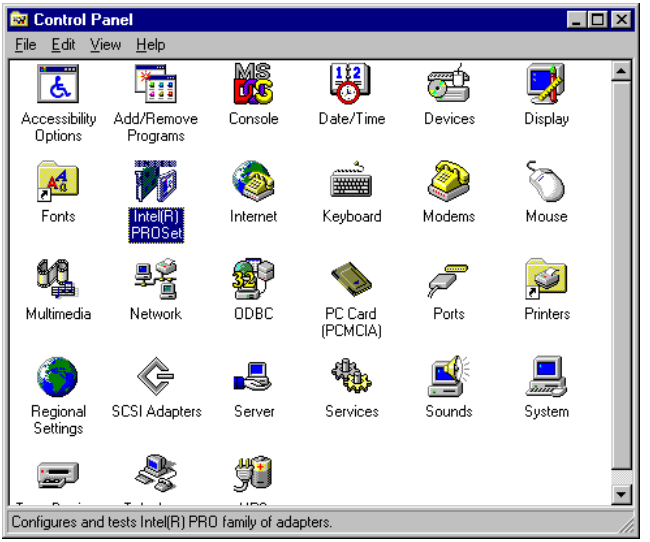


10. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "[2] Intel[R] PRO/100+ Management Adapter". Then click on "OK".

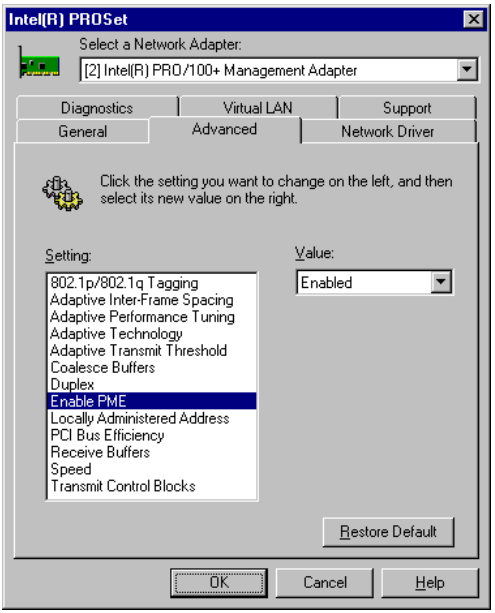


5.7 Windows NT Wake On LAN Setup Procedure

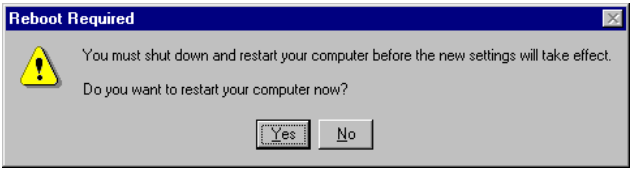
1. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Intel[R] PROset".



2. In the "Intel[R] PROSet" window, under "Select a Network Adapter", choose "[2] Intel[R] PRO100+ Management Adapter". The 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 6

Onboard Security Setup

This chapter explains OBS concepts and provides instructions for installing the relevant software drivers. This is done using the OBS driver utility CDs included in your PCA-6276 package.

6.1 Introduction

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

The PCA-6276 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:

- CPU1 core voltage: 1.3 ~ 3.3 V, according to Intel® specifications
- CPU2 core voltage: 1.3 ~ 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

6.2 Driver Installation

6.2.1 Necessary prerequisites

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM personal computer. Before installing any driver or utility, you should know how to copy files from a floppy disk to a directory on the hard disk, understand the MS-DOS directory structure, and know how to format a floppy disk. If you are uncertain about any of these concepts, please refer to DOS or Windows user reference guides for more information before you proceed with the installation.

6.2.2 Before you begin

Before you begin installing software drivers, you should make a backup copy of the display driver disk and store the original in a safe place. The display driver disk contains drivers for several versions of certain applications. You must install the correct version in order for the driver to work properly, so make sure you know which version of the application you have.

Utility CDs:

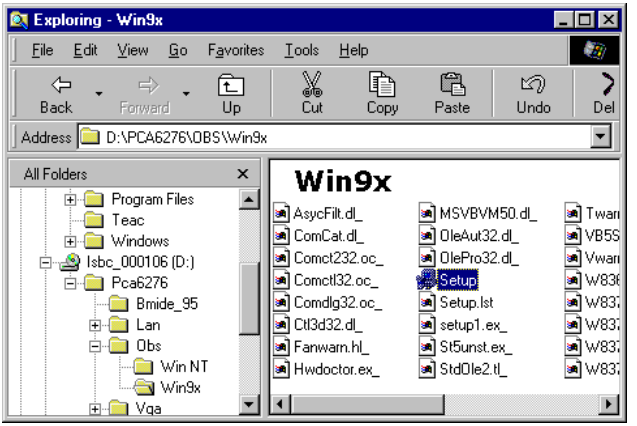
OBS Monitor Win95/98/98SE/Win2000 V2.60

OBS Monitor WinNT V2.60

6.3 Windows 95/98/98SE Drivers Setup Procedure

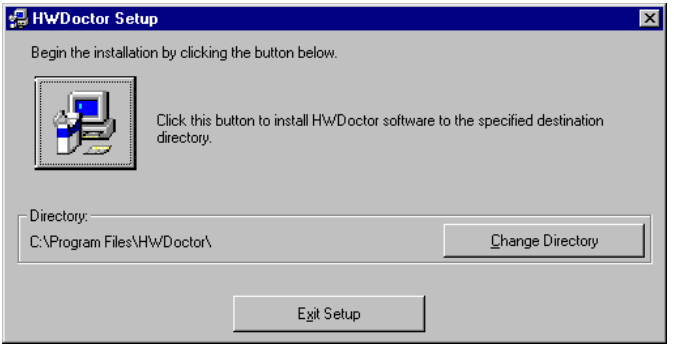
1. Insert the utility CD into drive D:. Navigate to: Pca6276\Obs\Win9x\Setup. Double-click on "Setup".

Note: *If you are using Windows 95, you will have to restart Windows twice. This is necessary to update some outmoded files which are on your system.*



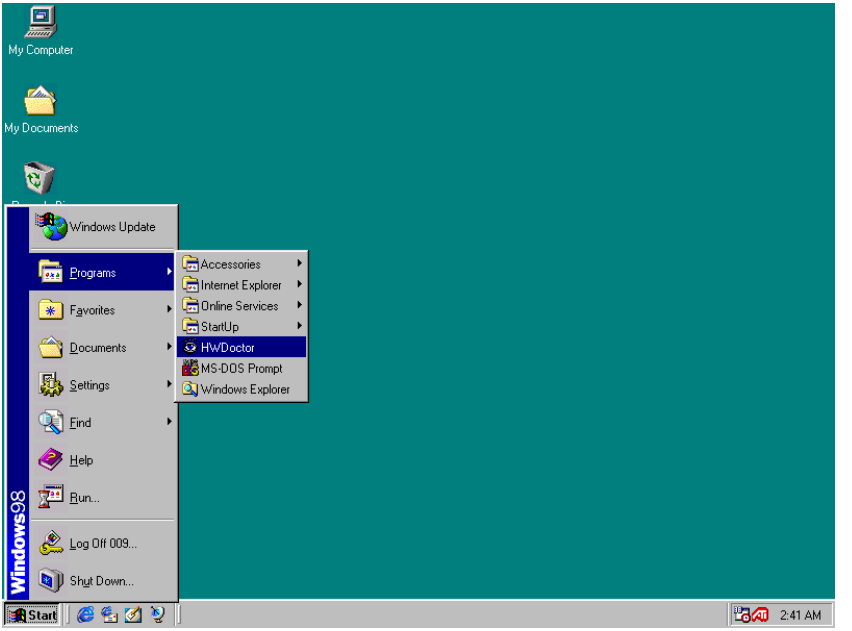
2. In the "HWDoctor Setup" screen, click on "OK".

3. In the following "HWDoctor Setup" screen, click on the button indicated.

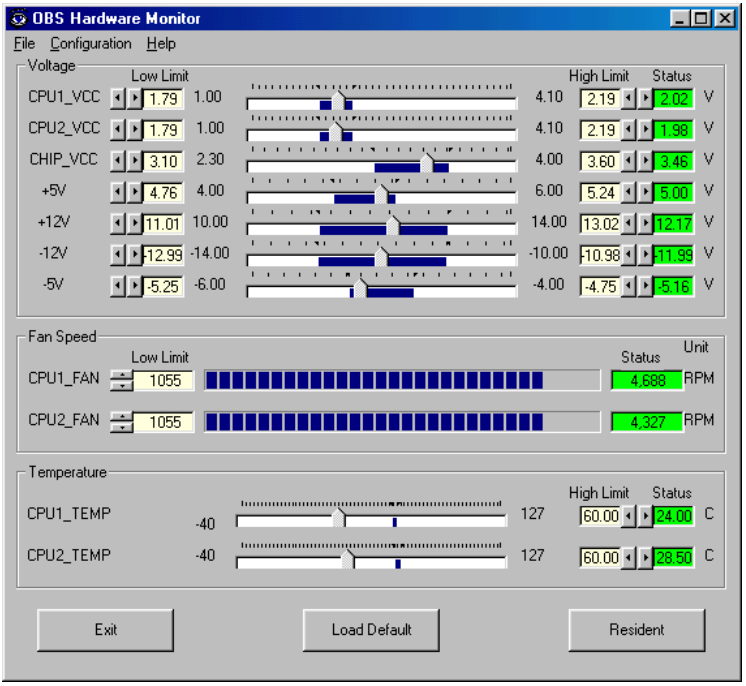


4. In the following "HWDoctor Setup" screen, click on "OK".

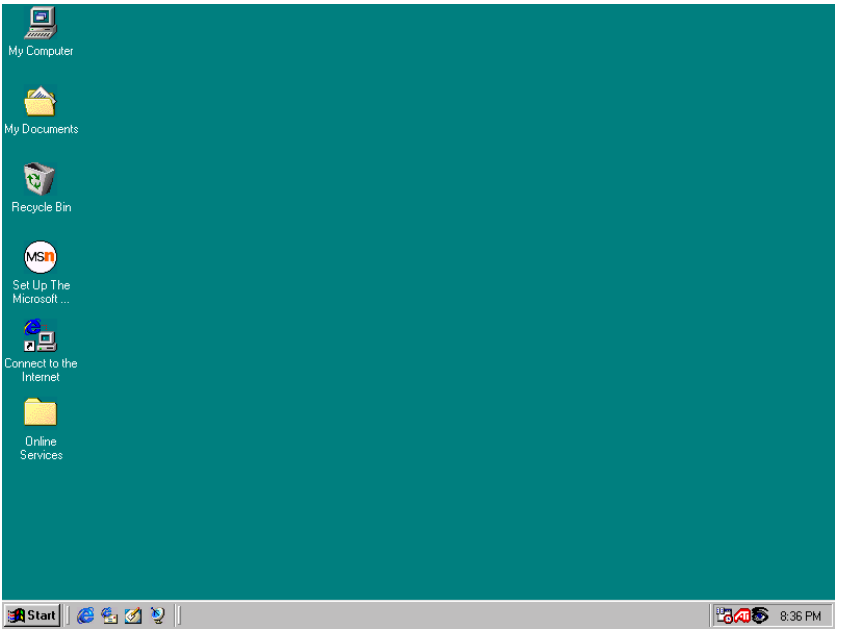
5. Using the "Start" button, select "Programs". Then click on "HWDoctor".



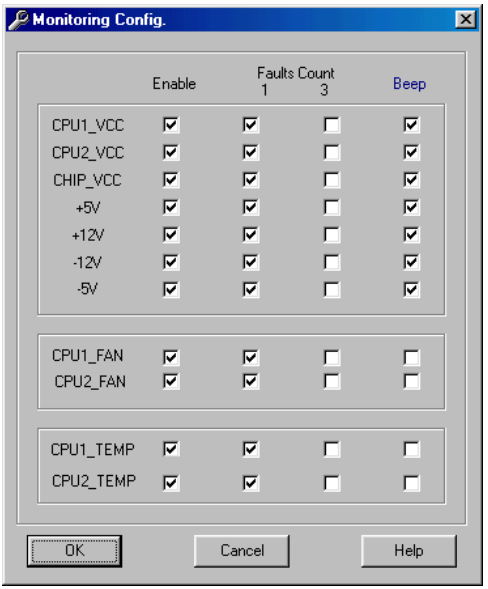
6. It is recommended that you load all the default values for all the OBS settings. If desired, however, you can set new conditions for voltage, fan speed and temperature.



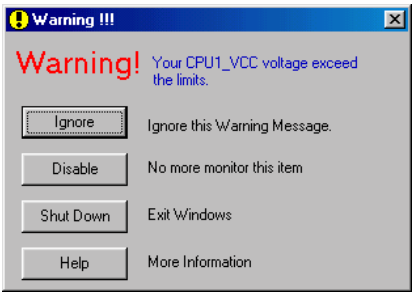
7. "OBS Hardware Monitor" will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security system.



8. In the "OBS Hardware Monitor" window, click on "Configuration" in the top menu bar (see step 6 on page 67). Then click on "Monitoring Config." While enabling each OBS function, you can choose "Faults 1". This will result in a warning message being delivered as soon as any monitored reading exceeds safe limits for the first time. Alternatively, you can set up "Count 3". This will result in a warning message being delivered only after any monitored reading exceeds safe limits for a third time. It is recommended that you load the default settings for all the OBS functions.

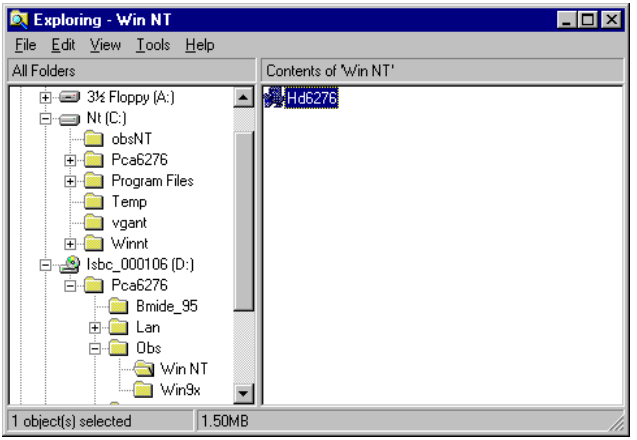


9. After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

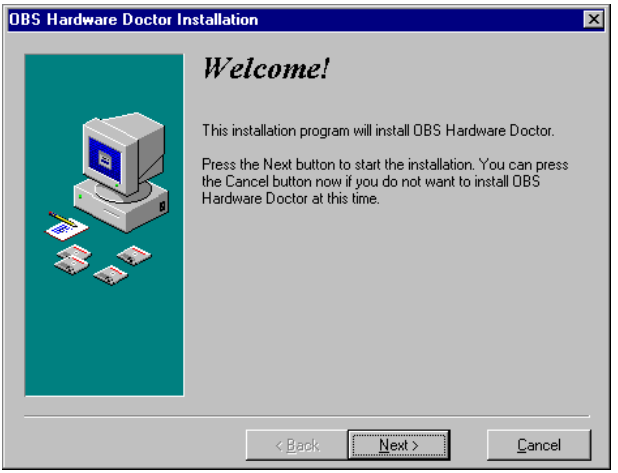


6.4 Windows NT Drivers Setup Procedure

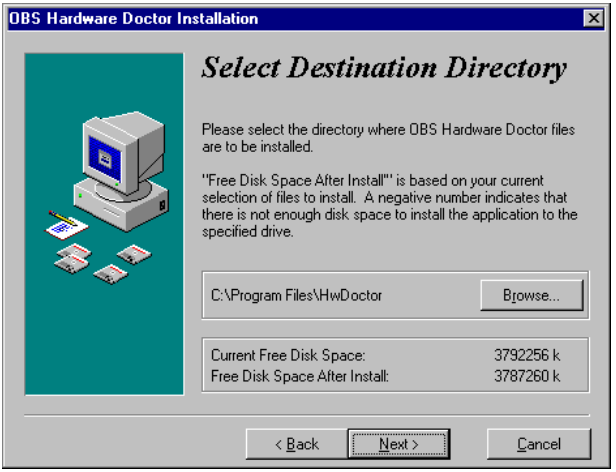
1. Insert the utility CD into drive D:. Navigate to: Pca6276\Obs\Win NT\Hd6276. Double-click on "Hd6276".



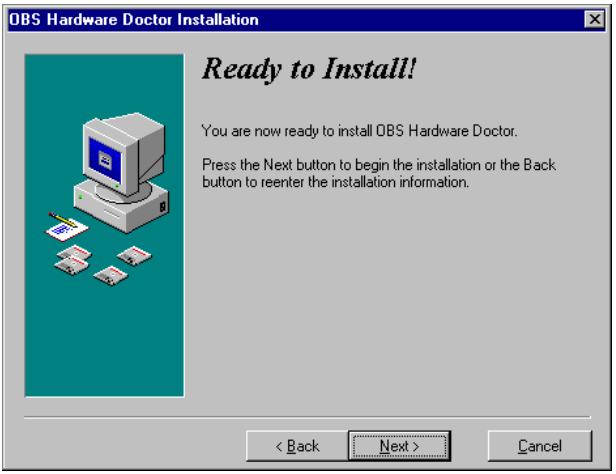
2. In the "OBS Hardware Doctor Installation" window, click on "Next".



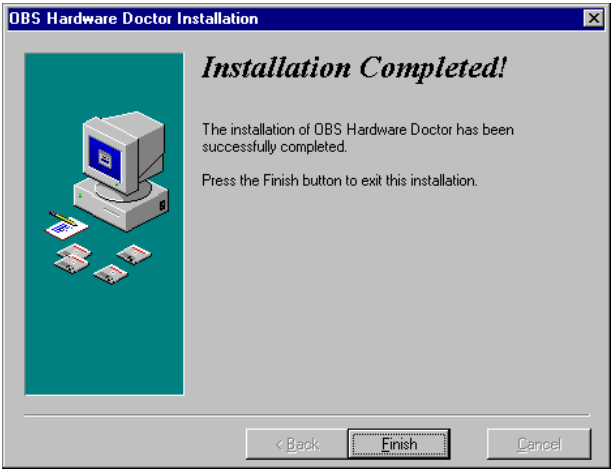
3. In the following "OBS Hardware Doctor Installation" window, click on "Next".



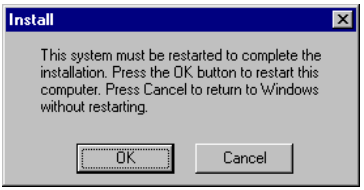
4. In the following "OBS Hardware Doctor Installation" window, click on "Next".



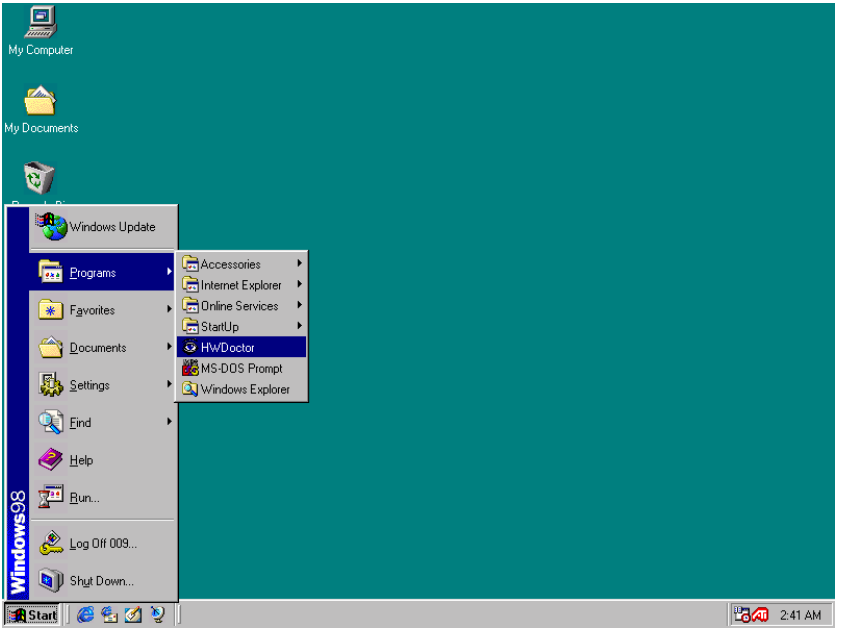
5. In the following "OBS Hardware Doctor Installation" window, click on "Finish".



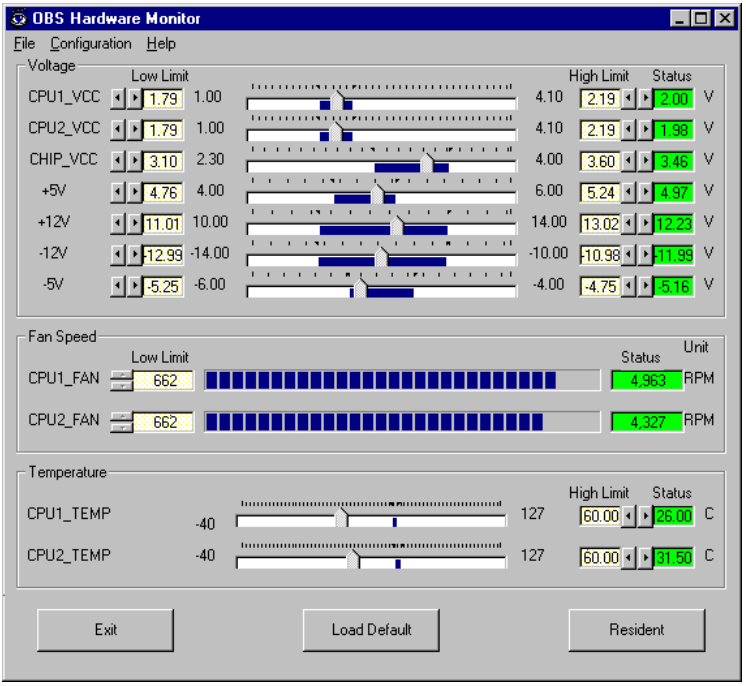
6. In the "Install" window, click on "OK".



7. Using the "Start" button, select "Programs". Then click on "HWDoctor".

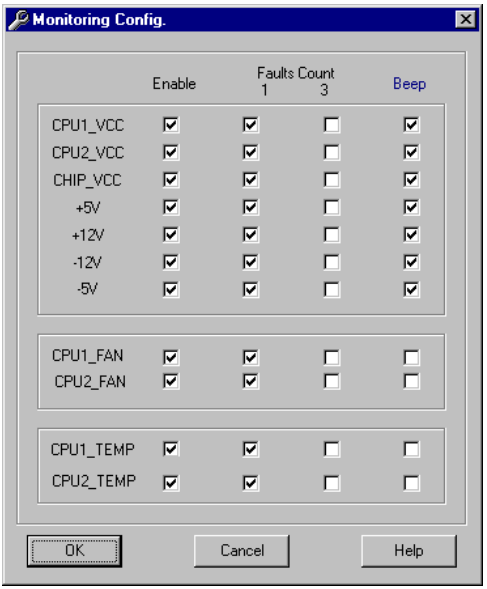


8. It is recommended that you load all the default values for all the OBS settings. If desired, however, you can set new conditions for voltage, fan speed and temperature.

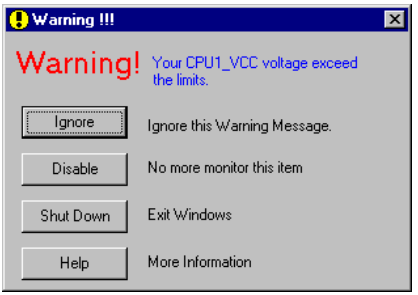


9. "OBS Hardware Monitor" will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security system.

10. In the "OBS Hardware Monitor" window, click on "Configuration" in the top menu bar (see step 6 on page 67). Then click on "Monitoring Config." While enabling each OBS function, you can choose "Faults 1". This will result in a warning message being delivered as soon as any monitored reading exceeds safe limits for the first time. Alternatively, you can set up "Count 3". This will result in a warning message being delivered only after any monitored reading exceeds safe limits for a third time. It is recommended that you load the default settings for all the OBS functions.



11. 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.



APPENDIX A

Programming the Watchdog Timer

The PCA-6276 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

To program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a time interval value. The value range is from 01 (hex) to 3F (hex), and the related time interval is 1 sec. to 63 sec.

Data	Time Interval
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
•	•
•	•
•	•
3F	63 sec.

After data entry, your program must refresh the watchdog timer by rewriting I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 443 (hex).

The following example shows how you might program the watchdog timer in BASIC:

```
10        REM  Watchdog timer example program
20        OUT &H443, data REM  Start and restart the watchdog
30        GOSUB 1000 REM  Your application task #1,
40        OUT &H443, data REM  Reset the timer
50        GOSUB 2000 REM  Your application task #2,
60        OUT &H443, data REM  Reset the timer
70        X=INP (&H443) REM  Disable the watchdog timer
80        END

1000      REM  Subroutine #1, your application task
•         •
•         •
•         •
1070      RETURN
2000      REM  Subroutine #2, your application task
•         •
•         •
•         •
2090      RETURN
```

APPENDIX B

Pin Assignments

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

- Primary (CN1) and Secondary (CN2) IDE Connectors
- Floppy Drive Connector
- Parallel Port Connector
- USB Connector
- VGA Connector
- Ethernet 10/100Base-T RJ-45 Connector
- COM1/COM2 RS-232 Serial Port
- PS/2 Keyboard and Mouse Connector
- External Keyboard Connector
- IR Connector
- CPU Fan Power Connectors
- Power LED and Keylock Connector
- External Speaker Connector
- Reset Connector
- HDD LED Connector
- ATX Feature Connector
- System I/O Ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map
- PCI Bus Map

B.1 Primary (CN1) and Secondary (CN2) IDE Connectors

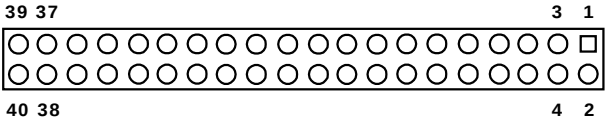


Table B-1: IDE hard drive connectors (CN1, CN2)

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)

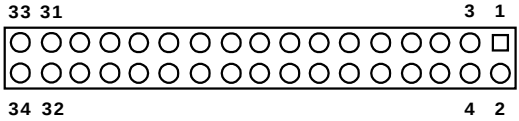


Table B-2: Floppy drive connector (CN3)

Pin	Signal	Pin	Signal
1	GND	2	FDHDIN*
3	GND	4	N/C
5	GND	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)

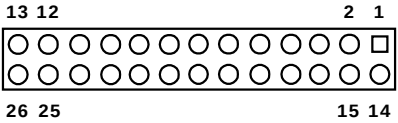


Table B-3: Parallel port connector (CN4)

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 USB Connector (CN6)

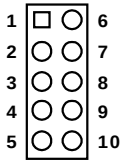


Table B-4: USB1/USB2 connector (CN6)

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	Key

B.5 VGA Connector (CN7)

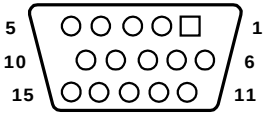


Table B-5: VGA connector (CN7)

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.6 Ethernet 10/100Base-T RJ-45 Connector (CN8)

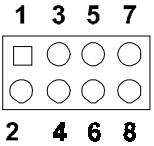
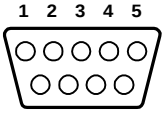


Table B-6: Ethernet 10/100Base-T RJ-45 connector (CN8)

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

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



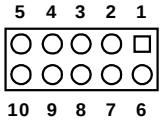


Table B-7: COM1/COM2 RS-232 serial port (CN9, CN10)

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

B.8 PS/2 Keyboard and Mouse Connector (CN11)

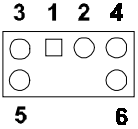


Table B-8: Keyboard and mouse connector (CN11)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	V_{CC}
5	KB CLOCK
6	MS CLOCK

B.9 External Keyboard Connector (CN12)

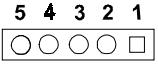


Table B-9: External keyboard connector (CN12)

Pin	Signal
1	CLK
2	DATA
3	NC
4	GND
5	V_{CC}

B.10 IR Connector (CN13)

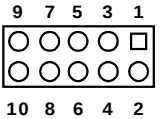


Table B-10: IR connector (CN13)

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.11 CPU Fan Power Connectors (CN14, CN24)

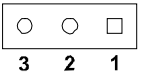


Table B-11: CPU fan power connectors (CN14, CN24)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.12 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.

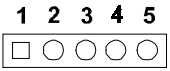


Table B-12: Power LED and keylock connector (CN16)

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

B.13 External Speaker Connector (CN17)

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

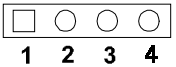


Table B-13: External speaker (CN17)

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

B.14 Reset Connector (CN18)

Table B-14: Reset connector (CN18)

Pin	Signal
1	GND
2	RESETIN

B.15 HDD LED Connector (CN19)

Table B-15: HDD LED connector (CN19)

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

B.16 ATX Feature Connector (CN20)

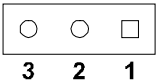


Table B-16: ATX feature connector (CN20)

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

B.17 System I/O Ports

Table B-17: 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
443	Watchdog timer

B.18 DMA Channel Assignments

Table B-18: 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.19 Interrupt Assignments

Table B-19: 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.20 1st MB Memory Map

Table B-20: 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.21 PCI Bus Map

Table B-21: PCI bus map

Function	Signals: Device ID	INT# pin	GNT# pin
Onboard LAN	AD21	INT D	GNT E
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

APPENDIX B

Pin Assignments

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

- Primary (CN1) and Secondary (CN2) IDE Connectors
- Floppy Drive Connector
- Parallel Port Connector
- USB Connector
- VGA Connector
- Ethernet 10/100Base-T RJ-45 Connector
- COM1/COM2 RS-232 Serial Port
- PS/2 Keyboard and Mouse Connector
- External Keyboard Connector
- IR Connector
- CPU Fan Power Connectors
- Power LED and Keylock Connector
- External Speaker Connector
- Reset Connector
- HDD LED Connector
- ATX Feature Connector
- System I/O Ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map
- PCI Bus Map

B.1 Primary (CN1) and Secondary (CN2) IDE Connectors

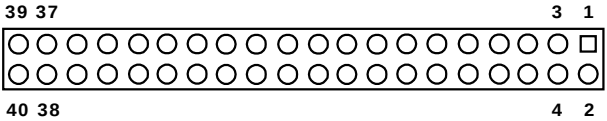


Table B-1: IDE hard drive connectors (CN1, CN2)

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)

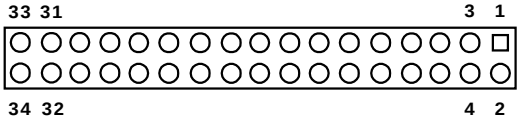


Table B-2: Floppy drive connector (CN3)

Pin	Signal	Pin	Signal
1	GND	2	FDHDIN*
3	GND	4	N/C
5	GND	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)

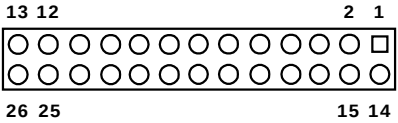


Table B-3: Parallel port connector (CN4)

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 USB Connector (CN6)

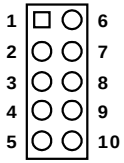


Table B-4: USB1/USB2 connector (CN6)

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	Key

B.5 VGA Connector (CN7)

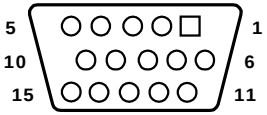


Table B-5: VGA connector (CN7)

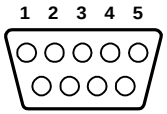
Pin	Signal	Pin	Signal
1	RED	9	V_{CC}
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

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

Table B-6: Ethernet 10/100Base-T RJ-45 connector (CN8)

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

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



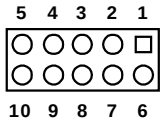


Table B-7: COM1/COM2 RS-232 serial port (CN9, CN10)

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

B.8 PS/2 Keyboard and Mouse Connector (CN11)

Table B-8: 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.9 External Keyboard Connector (CN12)

Table B-9: External keyboard connector (CN12)

Pin	Signal
1	CLK
2	DATA
3	NC
4	GND
5	V_{CC}

B.10 IR Connector (CN13)

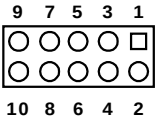


Table B-10: IR connector (CN13)

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.11 CPU Fan Power Connectors (CN14, CN24)

Table B-11: CPU fan power connectors (CN14, CN24)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.12 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-12: Power LED and keylock connector (CN16)

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

B.13 External Speaker Connector (CN17)

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

Table B-13: External speaker (CN17)

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

B.14 Reset Connector (CN18)

Table B-14: Reset connector (CN18)

Pin	Signal
1	GND
2	RESETIN

B.15 HDD LED Connector (CN19)

Table B-15: HDD LED connector (CN19)

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

B.16 ATX Feature Connector (CN20)

Table B-16: ATX feature connector (CN20)

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

B.17 System I/O Ports

Table B-17: 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
443	Watchdog timer

B.18 DMA Channel Assignments

Table B-18: 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.19 Interrupt Assignments

Table B-19: 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.20 1st MB Memory Map

Table B-20: 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.21 PCI Bus Map

Table B-21: PCI bus map

Function	Signals: Device ID	INT# pin	GNT# pin
Onboard LAN	AD21	INT D	GNT E
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