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PCA-6178

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

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Part No. 2006617801

2nd Edition Printed in Taiwan Jan. 2001

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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.

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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.

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PCA-6178 Series-00B1 comparison table					
Model	**PCA-6178V-00B1**	**PCA-6178VE-00B1**	**PCA-6178VS-00B1**	**PCA-6178F-00B1**	**PCA-6178L-00B1**
CPU: Intel® Pentium® III/ Celeron™ socket 370	✓	✓	✓	✓	✓
System chipset: Intel® 440 BX	✓	✓	✓	✓	✓
BIOS: Award P&P Flash BIOS	✓	✓	✓	✓	✓
L2 cache: 128 KB (on CPU)	✓	✓	✓	✓	✓
Max. system RAM: 768 MB (3 x 168-pin DIMM sockets)	✓	✓	✓	✓	✓
ISA High Drive: Up to 64 mA	✓	✓	✓	✓	✓
USB port	✓	✓	✓	✓	✓
2 EIDE connectors	✓	✓	✓	✓	✓
Solid state disk: Supports M-Systems' DOC® 2000 Flash disk up to 144 MB	✓	✓	✓	✓	✓
2 serial, 1 parallel ports	✓	✓	✓	✓	✓
VGA: AGP/VGA (ATI 3D RAGE™ XL)	✓	✓	✓	✓	-
LAN: 10/100Base-T Ethernet (Intel® 82559 chipset)	-	✓	-	✓	-
SCSI: 32-bit PCI Ultra2 SCSI (SYMBIOS 53C895 chipset)	-	-	✓	✓	-
VGA RAM	4MB	4MB	4MB	4MB	-

PCA-6178 Series-02B1 comparison table				
Model	**PCA-6178V-02B1**	**PCA-6178VE-02B1**	**PCA-6178VS-02B1**	**PCA-6178F-02B1**
CPU: Intel® Pentium® III/ Celeron™ socket 370	✓	✓	✓	✓
System chipset: Intel® 440 BX	✓	✓	✓	✓
BIOS: Award P&P Flash BIOS	✓	✓	✓	✓
L2 cache: 128 KB (on CPU)	✓	✓	✓	✓
Max. system RAM: 768 MB (3 x 168-pin DIMM sockets)	✓	✓	✓	✓
ISA High Drive: Up to 64 mA	✓	✓	✓	✓
USB port	✓	✓	✓	✓
2 EIDE connectors	✓	✓	✓	✓
Solid state disk: Supports M-Systems' DOC® 2000 Flash disk up to 144 MB	✓	✓	✓	✓
2 serial, 1 parallel ports	✓	✓	✓	✓
VGA: AGP/VGA (ATI 3D RAGE™ XL)	✓	✓	✓	✓
LAN: 10/100Base-T Ethernet (Intel® 82559 chipset)	-	✓	-	✓
SCSI: 32-bit PCI Ultra2 SCSI (SYMBIOS 53C895 chipset)	-	-	✓	✓
VGA RAM	8MB	8MB	8MB	8MB

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.

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
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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.

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Initial Inspection

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

- 1 PCA-6178 socket 370 Pentium III® / Celeron™ processor-based single board computer
- 1 Pentium III® /Celeron™ processor (optional)
- 1 cooling fan
- 1 PCA-6178 User's Manual
- 1 CD drive utility
- 4 SCSI driven disks (optional)
- 1 FDD cable
- 2 EIDE HDD cables
- 1 printer (parallel port) cable
- 1 ATX-to-PS/2 power cable
- 1 ivory cable for PS/2 keyboard and PS/2 mouse
- 1 SCSI cable (optional, P/N 1701060000)
- 1 USB cable (optional, P/N 1700100170)

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

We have carefully inspected the PCA-6178 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-6178, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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CHAPTER 1

Hardware Configuration

This chapter gives background information on the PCA-6178. 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

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1.1 Introduction

The PCA-6178 Series all-in-one industrial grade CPU card uses Intel's highly acclaimed Pentium® III/ Celeron ™ processor, together with the Intel 440BX PCI chipset. The card works with standard ISA or PCI/ISA-bus passive backplanes.

The CPU provides 256 KB/128 KB on-CPU L2 cache, eliminating the need for external SRAM chips. It has two PCI EIDE interfaces (for up to four devices) and a floppy disk drive interface (for up to two devices). Other features include two RS-232 serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port (supports EPP/ECP) and two USB (Universal Serial Bus) ports. 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, LS-120, FDD, IDE HDD, SCSI CD-ROM, and ZIP-100.

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-6178 Series offers several impressive industrial features such as a VGA (AGP) controller, a PCI Ultra2 SCSI controller, a 10/100Base-T networking controller, three DIMM slots for a total of 768 MB RAM memory, and an ISA High Drive. In addition, the PCA-6178 Series supports a solid state disk (SSD) using M-Systems Corporation's DiskOnChip® 2000 Flash disk, for up to 144 MB of non-volatile, reliable memory that is not vulnerable to the hazards of an industrial computing environment. All these make it an ideal choice for applications that require both high performance and full functionality.

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

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1.2 Features

1. **Fan status monitoring and alarm:** To prevent system overheating and damage, the CPU fan can be monitored for speed and failure. The fan is set for its normal RPM range, and alarm thresholds.
2. **Temperature monitoring and alert**: To prevent system overheating and damage, the CPU card supports processor thermal sensing and auto-protection.
3. **Voltage monitoring and alert**: System voltage levels are monitored to ensure stable current flows to critical components. Voltage specifications will become even more critical for processors of the future. Thus monitoring will become ever more necessary to ensure proper system configuration and management.
4. **ATX soft power switch**: Through the BIOS, the power button can be defined as the "Standby" (aka "Suspend" or "Sleep") button or as the "Soft-Off" button (see Section 3.6.3 Soft-off by PWR-BTN). Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.
5. **Wake-on-ring (requires modem)**: This allows a computer to be turned on remotely through an internal or external modem. Users can thus access information on their computers from anywhere in the world!
6. **Wake-on-LAN**: This allows you to remotely power up your system through your network by sending a wake-up frame or signal. With this feature, you can remotely upload/download data to/from systems during off-peak hours.
7. **Message LED**: Chassis LEDs now act as information providers. The way a particular LED illuminates indicates the stage the computer is in. A single glimpse provides useful information to the user.

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8. **Jumper free mode**: When enabled, this allows processor settings and easy overclocking of frequency and Vcore voltages all through the BIOS setup. Easy-to-use DIP switches instead of jumpers are included in case you want to manually adjust the processor's external frequency.
9. **CMOS RAM backup**: When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in industrial environments which may cause soft errors. Upon such an error occurring, BIOS will check the data, and automatically restore the original data for booting.
10. **Power On by Alarm**: Powers up your computer at a certain time
11. **Virus warning**: During and after system boot-up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can then run your anti-virus program to locate the problem

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1.3 Specifications

1.3.1 System

- **CPU**: Intel Pentium® III /Celeron™ processor, up to 850+ MHz
- **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 768 MB in three 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

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1.3.3 Input/Output

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

- **PCI SCSI**: Supports 32-bit PCI interface and Ultra2 SCSI or legacy single-ended devices; data transfer up to 80 MB/sec.
- **Chipset:** Symbios SYM53C895

1.3.6 Ethernet LAN (PCA-6178E/6178F only)

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

1.3.7 Solid state disk

- **Supports DOC® 2000 up to 144 MB**

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1.3.7 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

1.3.8 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:**

  +5 V @ 5.02 A (for Pentium III Coppermine® 550 MHz)

  +5 V @ 5.56 A (for Pentium III Coppermine® 700 MHz)
- **Board size**: 338 x 122 mm (13.3" x 4.8")
- **Board weight**: 0.5 kg (1.2 lb)

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1.4 Board Layout: Main Features

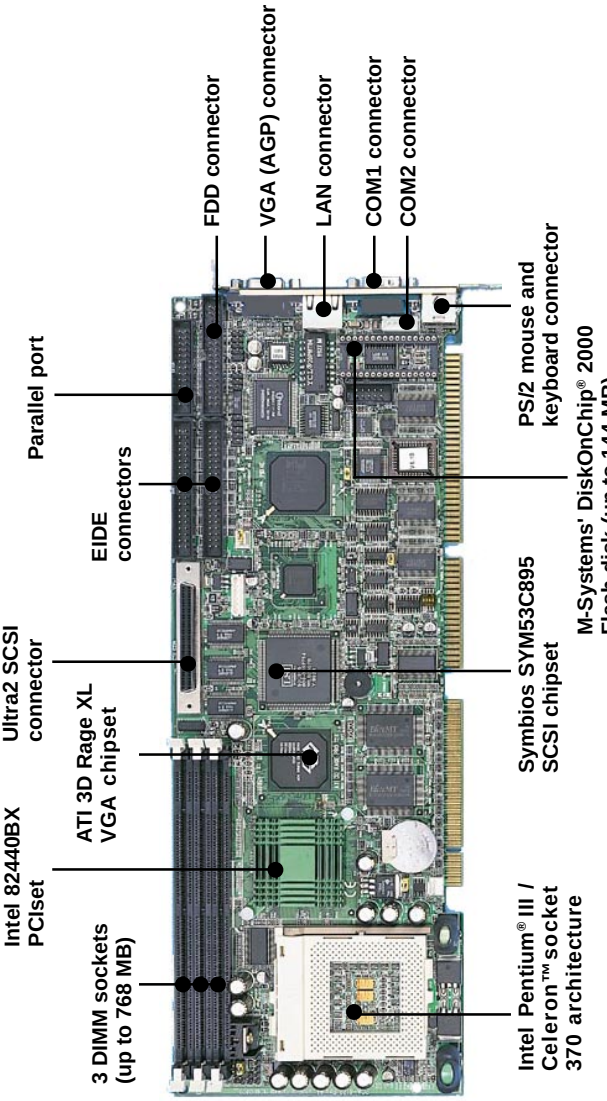


Figure 1-1: Board layout: main features

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1.5 Jumpers and Connectors

Connectors on the PCA-6178 board link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

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

Table 1-1: Jumpers

Label	Function
J1	CMOS clear
J2	Watchdog timer output
J3	DiskOnChip® 2000 address setting
SW1	CPU clock ratio setting
SW2	CPU type select

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Table 1-2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN5	SCSI connector
CN6	USB port
CN7	VGA connector
CN8	10/100Base-T Ethernet connector
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN13	Infrared (IR) connector
CN14	CPU fan connector
CN16	Keyboard lock and power LED
CN17	External speaker
CN18	Reset connector
CN19	HDD LED connector
CN20	ATX feature connector
CN21	ATX soft power switch
CN22	Reserved (Default closed)
CN26	VGA feature connector (Reserved)

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1.6 Board Layout: Jumper and Connector Locations

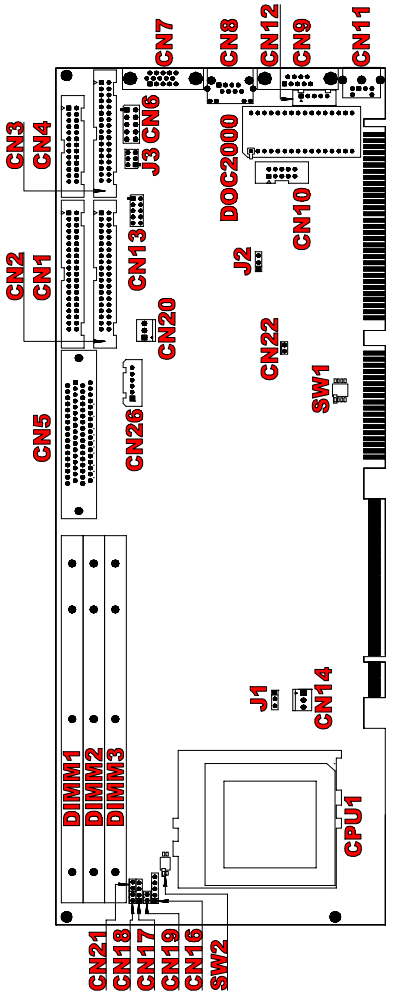


Figure 1-2: Board layout: jumper and connecter locations

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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.*



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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 CPU clock ratio setting (SW1)

You must configure your PCA-6178 CPU card to the frequency of your Intel® Celeron™/Coppermine processor by setting jumper SW1. The PCA-6178 SW1 jumper is equpped to use Intel Celeron/Coppermine processors with speed ratios of 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5 6, 6.5, 7, 7.5, 8, 8.5, 9, or 9.5 with a bus clock speed of 66/100 MHz. Configure your PCA-6178 as follows:

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Table 1-3: CPU clock ratio setting (SW1)

Ratio	SW1-1	SW1-2	SW1-3	SW1-4
2	ON	OFF	OFF	OFF
2.5	ON	OFF	ON	OFF
3	ON	ON	OFF	OFF
3.5	ON	ON	ON	OFF
4	OFF	OFF	OFF	OFF
4.5	OFF	OFF	ON	OFF
5	OFF	ON	OFF	OFF
5.5	OFF	ON	ON	OFF
6	ON	OFF	OFF	ON
6.5	ON	OFF	ON	ON
7	ON	ON	OFF	ON
7.5	ON	ON	ON	ON
8	OFF	OFF	OFF	ON
8.5	OFF	OFF	ON	ON
9	OFF	ON	ON	ON
9.5	OFF	ON	OFF	ON

1.8.3 CPU type select (SW2)

Table 1-4: CPU type select (SW2)

CPU type	SW2-1	SW2-2
Celeron™	ON	OFF
Coppermine	OFF	ON

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1.8.4 CMOS clear (J1)

The PCA-6178 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

1.8.5 Watchdog timer output (J2)

The PCA-6178 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-6178 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

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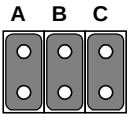
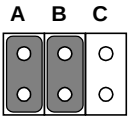
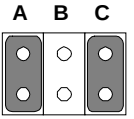
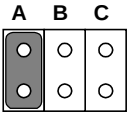
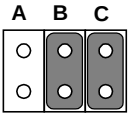
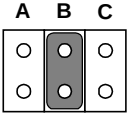
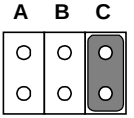
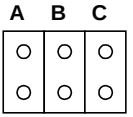
1.8.6 DiskOnChip® 2000 Flash disk address select (J3)

The PCA-6178 includes a 32-pin socket for M-Systems' DiskOnChip® 2000 Flash disk module. This revolutionary solid state disk enables critical system information to be stored within an on-board Flash disk for virtually instantaneous data access.

You must specify the memory address you want to use for your DiskOnChip 2000 Flash disk module by setting jumper (J3). Available settings are as follows:

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Table 1-7: DiskOnChip® 2000 Flash disk memory address jumper settings (J3)

Segment	A	B	C	
C800h	ON	ON	ON	
CC00h	ON	ON	OFF	
D000h	ON	OFF	ON	
D400h	ON	OFF	OFF	
D800h	OFF	ON	ON	
DC00h	OFF	ON	OFF	
E000h	OFF	OFF	ON	
Disable	OFF	OFF	OFF	

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1.9 System Memory

The top-left edge of the PCA-6178 contains three 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-6178 single board computer between 16 MB and 768 MB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1-8: DIMM module allocation table

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

1.9.1 Sample calculation: DIMM memory capacity

Suppose you install a 128 MB DIMM into your PCA-6178's socket 1 and a 32 MB DIMM into sockets 2 and 3. Your total system memory is 192 MB, calculated as follows:

Table 1-9: DIMM memory capacity sample calculation

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

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1.9.2 Supplementary information about DIMMs

Your PCA-6178 can accept SDRAM memory chips (with or without parity). Also note:

- If the PCA-6178 operates at 100 MHz, only use PC-100/ PC-133-compliant DIMMs. Most systems will not even boot if non-compliant modules are used. This is due to strict timing issues involved at this speed.
- 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 , 64, or 128 MB; double-sided modules are usually 32, 64, 128, or 256 MB.

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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). To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

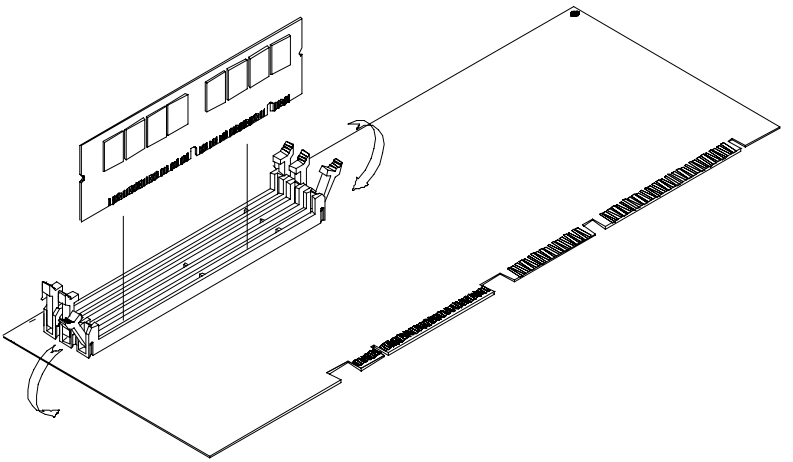


Figure 1-3: DIMM installation

1.11 Cache Memory

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

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1.12 CPU Installation

The PCA-6178 provides a socket 370 for an Intel® Pentium®III/ Celeron™processor. The CPU on the board must have a fan or heat sink attached, to prevent overheating.

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

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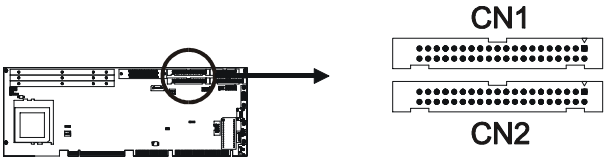
CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6178 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.

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



You can attach up to four IDE (Integrated Device Electronics) drives to the PCA-6178'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 finding the connector.

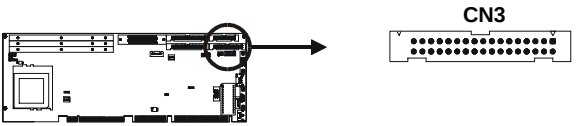
Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and one as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each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

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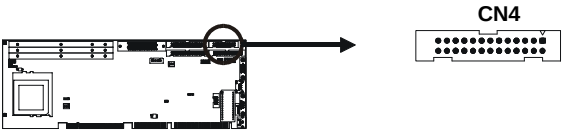
2.2 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6178's onboard 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 (CN4)



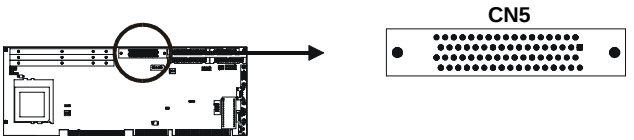
The parallel port is normally used to connect the CPU card to a printer. The PCA-6178 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

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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.

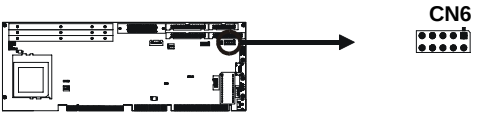
2.4 SCSI Connector (CN5)



The PCA-6178 has a 68-pin, dual in-line connector for Ultra2 SCSI devices. Connection of SCSI devices requires special attention, especially when determining the last drive on the SCSI chain. Refer to Chapter 6 and your device's operating manual for detailed installation advice.

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2.5 USB Port (CN6)

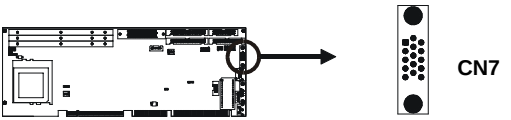


The PCA-6178 provides one USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot attach/detach for up to 127 external devices.The USB interface complies with USB Specification Rev. 1.0, and is fuse-protected.

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.

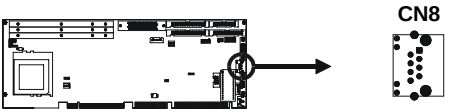
2.6 VGA Connector (CN7)



The PCA-6178 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.

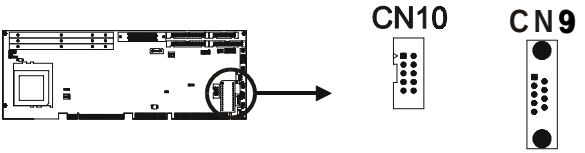
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2.7 10/100Base-T Ethernet Connector (CN8)



The PCA-6178 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.

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



The PCA-6178 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

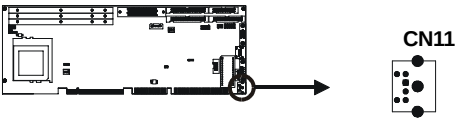
* default settings

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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.

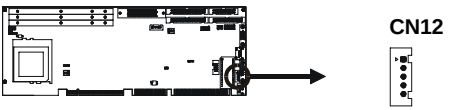
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.9 PS/2 Keyboard and Mouse Connector (CN11)



The PCA-6178 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 standard DIN connector and to a PS/2 mouse connector.

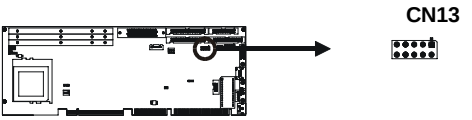
2.10 External Keyboard Connector (CN12)



In addition to the PS/2 mouse/keyboard connector on the PCA-6178's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

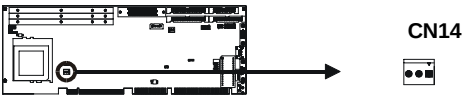
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2.11 Infrared (IR) Connector (CN13)



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

2.12 CPU Fan Connector (CN14)

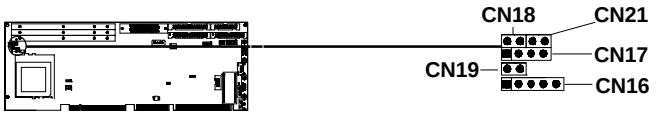


This connector supports cooling fans of 500 mA (6 W) or less.

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

There are several external switches to monitor and control the PCA-6178.



2.13.1 Keyboard lock and power LED (CN16)

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

Table 2-2: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	On	On
System Suspend	Fast flashes	Fast flashes
System Off	Off	Slow flashes

2.13.2 External speaker (CN17)

CN17 is a 4-pin connector for an extenal speaker. If there is no external speaker, the PCA-6178 provides an on-board buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.13.3 Reset (CN18)

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

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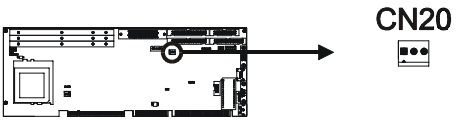
2.13.4 HDD LED (CN19)

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

2.13.5 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.

2.14 ATX Power Control Connectors (CN20 and CN21)



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

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

The PCA-6178 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-6178'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.

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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.*

2.14.2 Controlling the soft power switch

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

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CHAPTER 3

Award BIOS Setup

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

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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

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

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

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

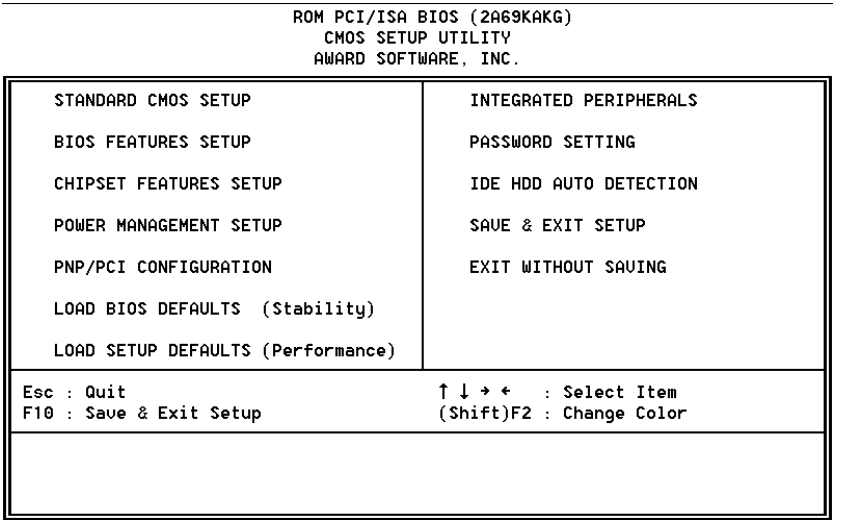


Figure 3-1: Award BIOS Setup initial screen

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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.

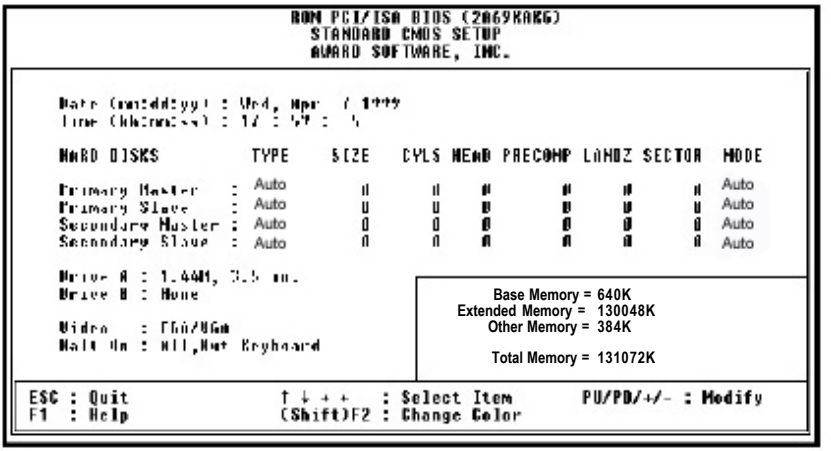


Figure 3-2: Standard CMOS Setup screen

3.3.1 CMOS RAM backup

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

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

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

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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-6178 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.

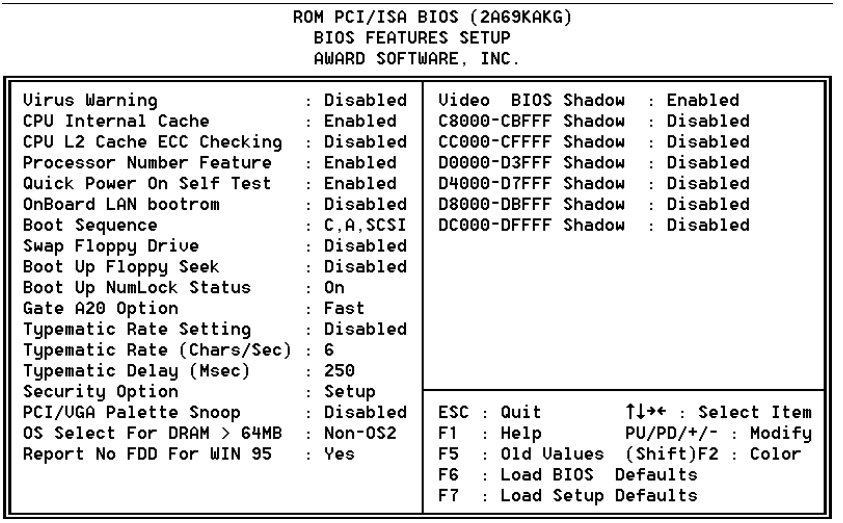


Figure 3-3: BIOS features setup screen

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.

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3.4.2 Quick Power On Self Test

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

3.4.3 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 folllowing 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

LS120, C

Zip 100, C

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3.4.4 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.

3.4.5 Boot Up NumLock Status

The default is "On".

On Keypad boots up to number keys.

Off Keypad boots up to arrow keys.

3.4.6 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.

3.4.7 Typematic Rate Setting

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

3.4.8 Typematic Rate (Chars/Sec)

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

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3.4.9 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).

3.4.10 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.

3.4.11 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*.

3.4.12 OS Select for DRAM > 64MB

This setting is under the OS/2 system.

3.4.13 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.

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3.4.14 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-6178.

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:

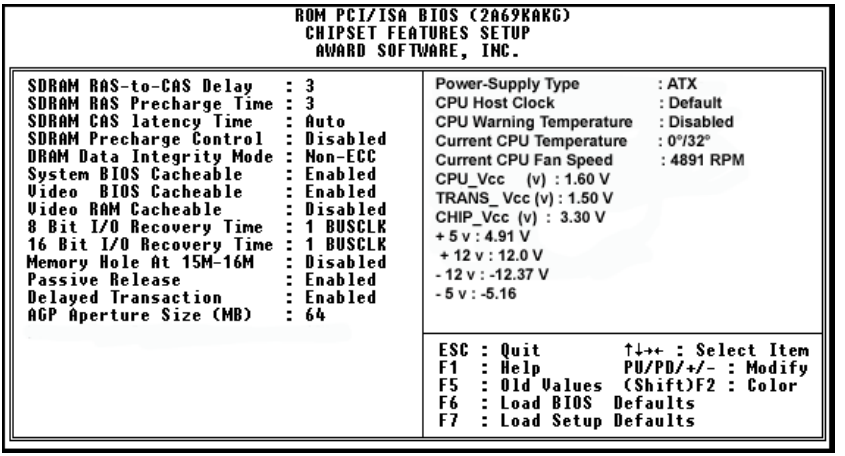


Figure 3-4: Chipset features setup screen

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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.”

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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:

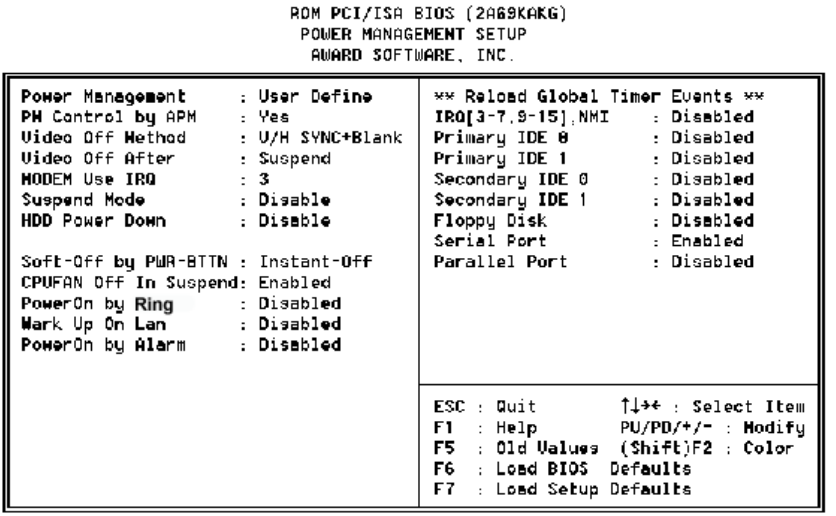


Figure 3-5: Power management setup screen

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.

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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

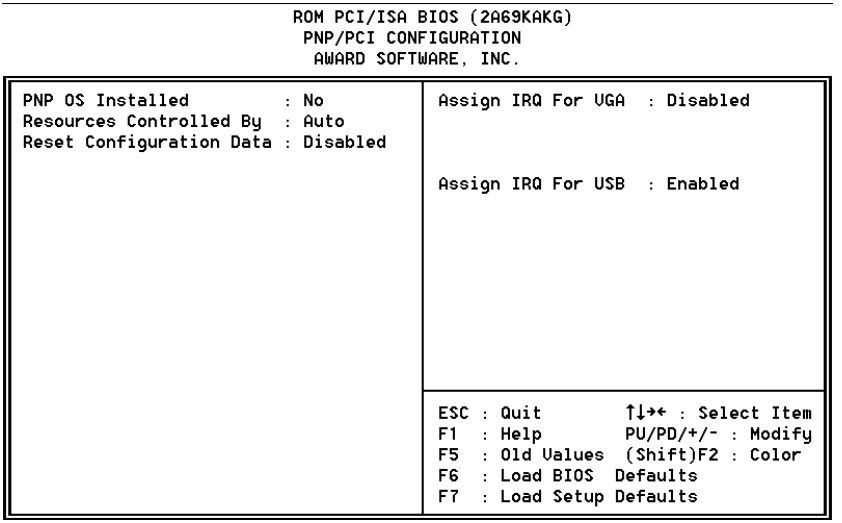


Figure 3-6: PCI configuration screen

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

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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”.

3.7.3 Used MEM base addr : N/A

This field allows you to set the base address and block size of a legacy ISA card that uses any memory segment within the C800H and DFFFH address range. If you have such a card, select a used base address from the six available options. The “Used MEM base addr” field will then appear for selecting the block size. If you have more than one legacy ISA card in your system that needs to use this address range, you can increase the block size to either 8 K, 16 K, 36 K or 64 K.

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.

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3.10 Integrated Peripherals

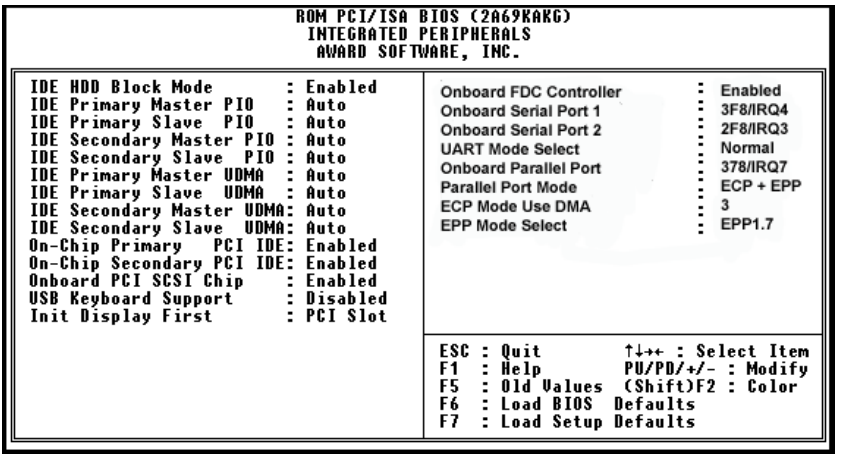


Figure 3-7: Integrated peripherals

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.

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3.10.4 Onboard FDC Controller

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

3.10.5 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 CPU card 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.

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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.

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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.

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CHAPTER 4

PCI SVGA Setup

The PCA-6178 features an onboard PCI AGP/VGA interface. This chapter provides instructions for installing and operating the software drivers on the display driver CD included in your package.

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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-6178 board are located on the software installation CD. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers.

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

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

4.2 Features

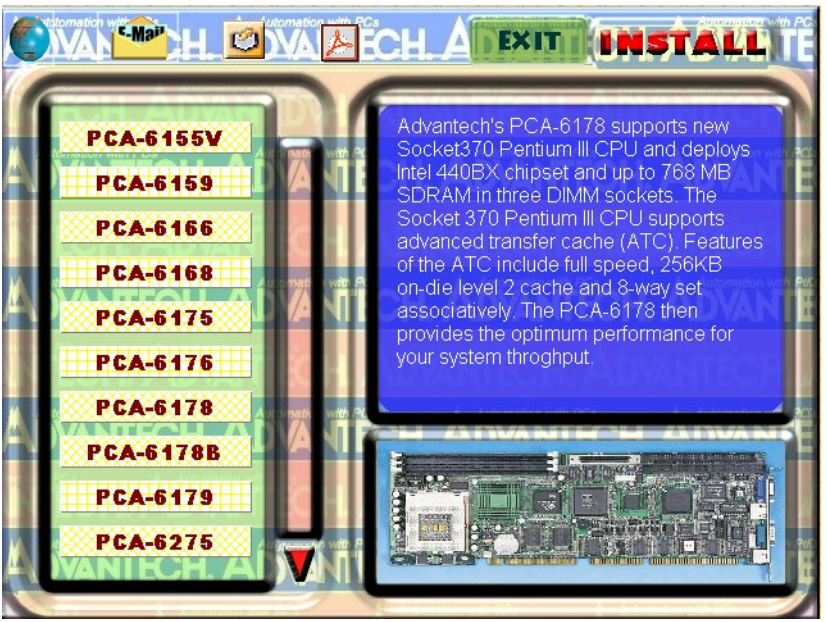
- Built-in ATI RAGE™ XL 3D multimedia accelerator
- Supports AGP 2X (133 MHz) mode with sideband addressing and AGP texturing
- PC 98 compliant
- Superior 3D performance achieved through a floating print setup engine rated at 1.2 million triangles/sec
- Integrated 230 MHz DAC allows 85 Hz refresh at 1600 x 1200 resolution
- Complete local language support
- Power management for full VESA DPMS and EPA Energy Star

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- User-friendly installation for Windows 95 and Windows NT
- AGP 1.0 interface
- 4 MB/ 8 MB, 64-bit, 100 MHz SGRAM frame buffer interface with 800 MB/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

Follow the Icons for your PCA Series model number



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Click on the right driver for the installation



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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.

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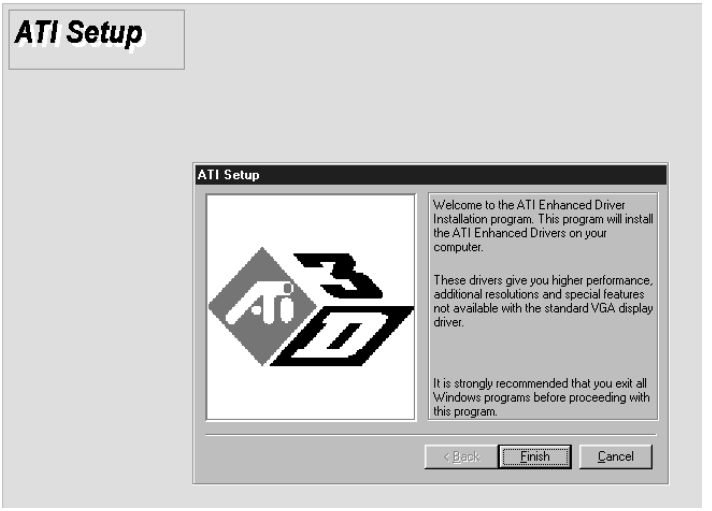
4.5 Windows 95/98 Drivers Setup Procedure

1. Insert the CD and click on PCA-6178B. Click Win 9x

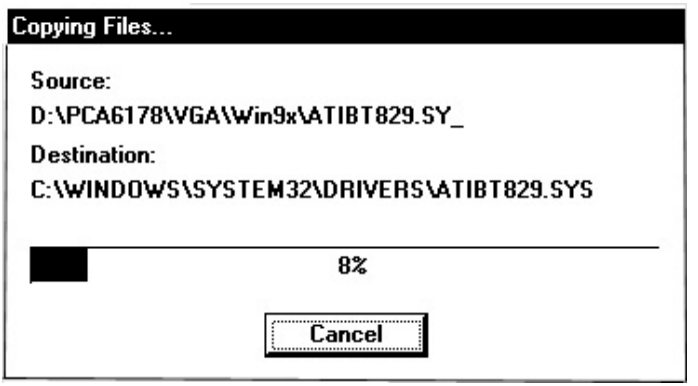


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2. Click "Finish"



3. Start the installation

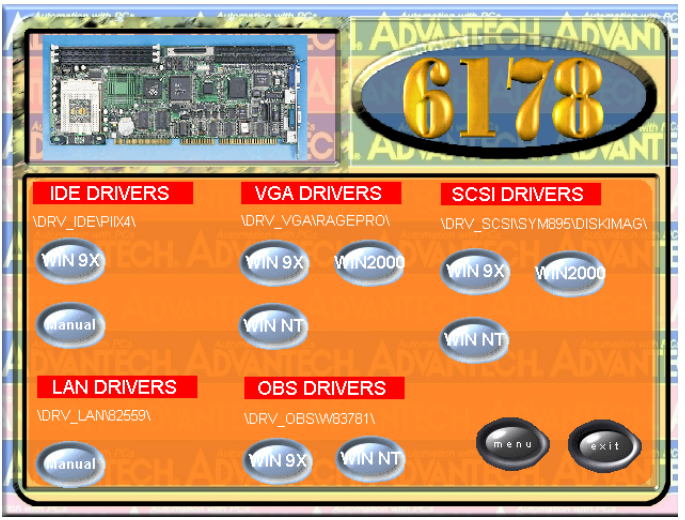


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4.6 Windows NT Drivers Setup Procedure

Note: Before you install the VGA driver, make sure that you are using service pack 3 (or above).

1. Click on " WIN NT".

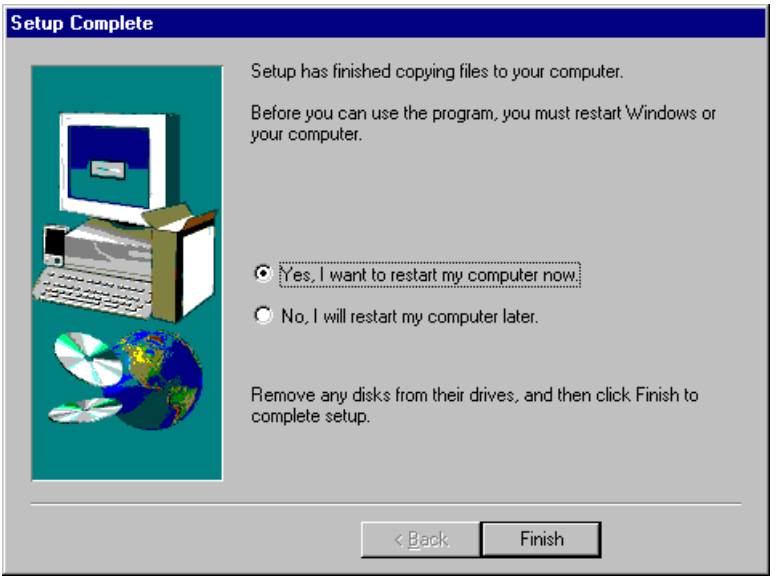


2. Click "Next".



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3. Click "Finish" to restart your computer and enable the changes to take effect.



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CHAPTER 5

LAN Configuration

The PCA-6178 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:

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5.1 Introduction

The PCA-6178 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

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5.3 Driver Installation

The PCA-6178'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.

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5.4 Windows 95/98/98SE 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*

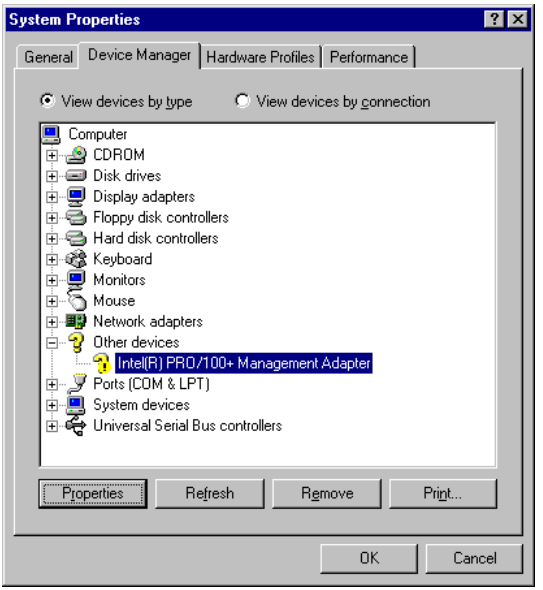
Note 2: *The CD-ROM drive is designated as "D" throughout this section.*

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



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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".

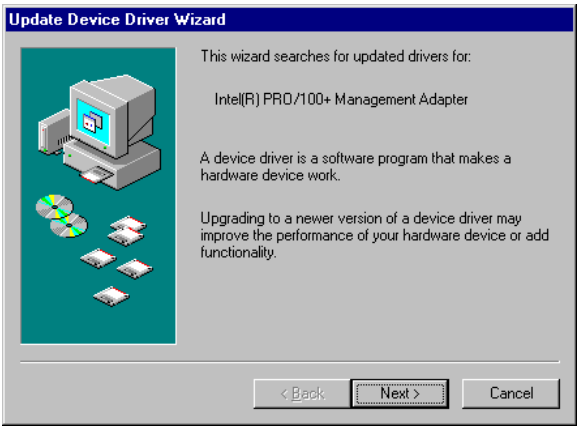


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3. In the "Intel[R] PRO/100+ Management Adapter Properties" window, select the "Driver" tab. Then click on "Update Driver...".



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



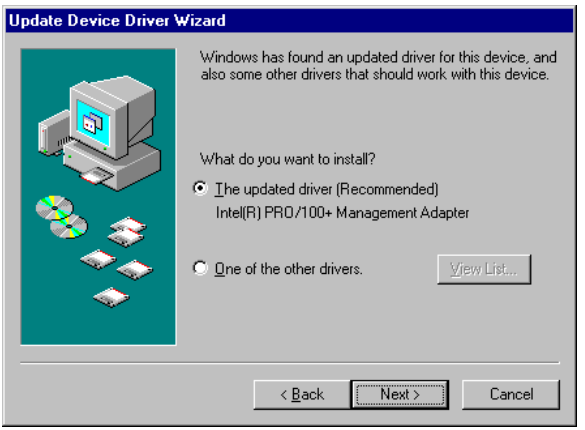
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5. In the following "Update Device Driver Wizard" window, select "Specify a location:". Type in: "D:\PCA6178\LAN". Then click on "Next".



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



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



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8. In the "Copying Files..." window, the correct file path should be: D:\PCA6178\LAN. When you have the correct location, click on "OK".

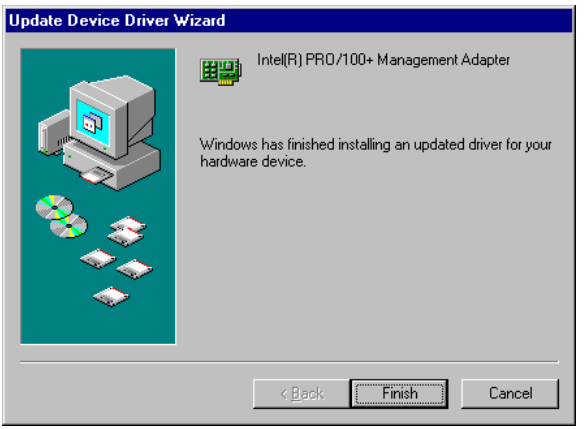


9. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. Then click on "OK".



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



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

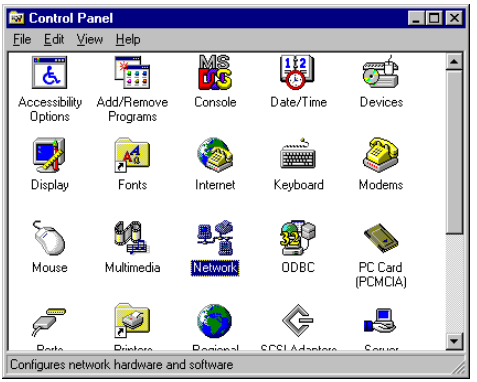


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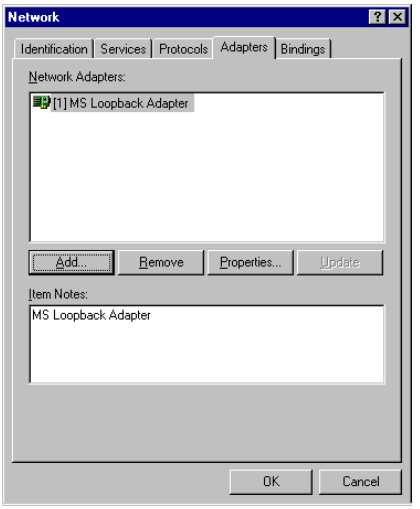
5.5 Windows NT Drivers Setup Procedure

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

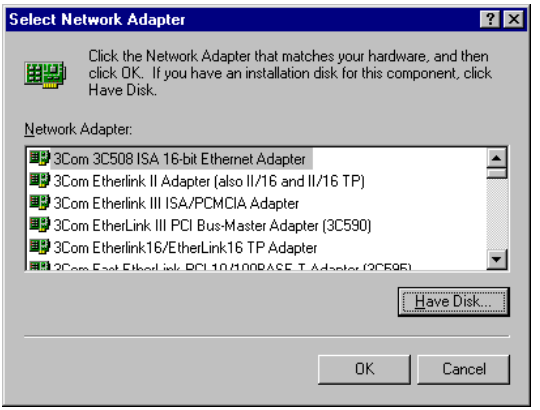


2. In the "Network" window, select the "Adapters" tab. Then click on "Add...".

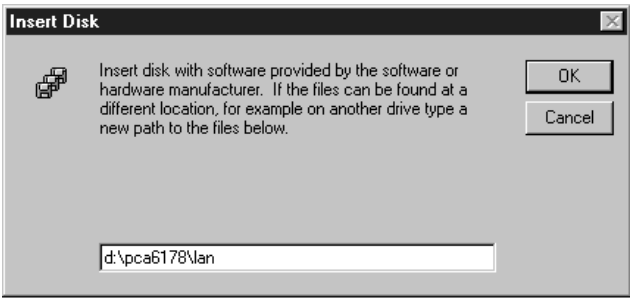


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3. In the "Select Network Adapter" window, click on "Have Disk...".

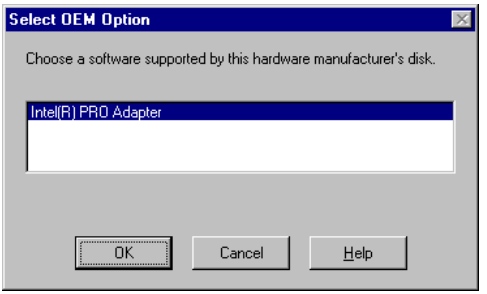


4. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. The correct file path is; D:\PCA6178\LAN. When you have the correct file path, click on "OK".

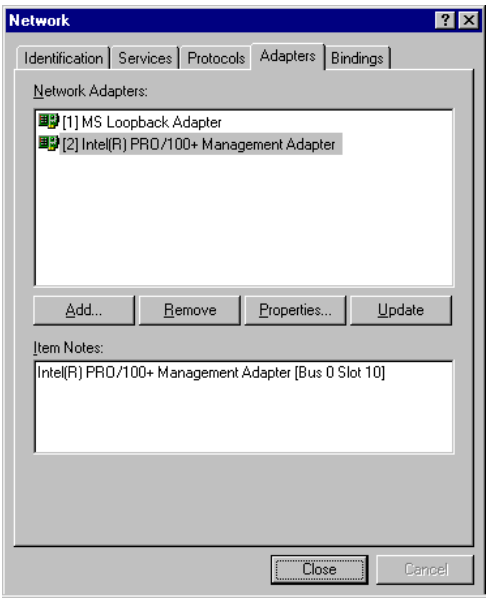


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5. In the "Select OEM Option" window, click on "OK".

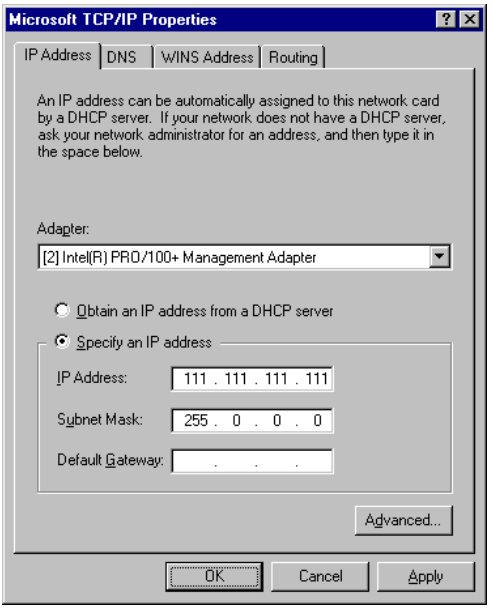


6. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "[2] Intel[R] PRO/100+ Management Adapter". Then click on "Close".

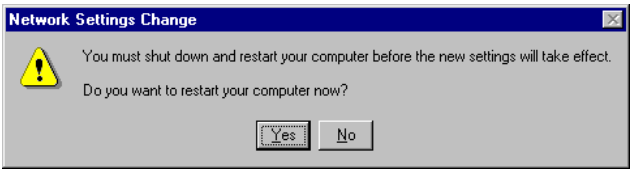


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7. In the "Microsoft TCP/IP Properties" window, select the "IP Address" tab. Then select "Specify an IP address". Type in the IP Address and Subnet Mask details. Then click on "OK".

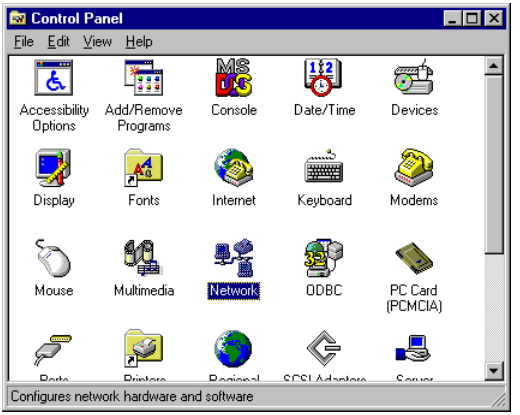


8. In the "Network Settings Change" window, click on "Yes".

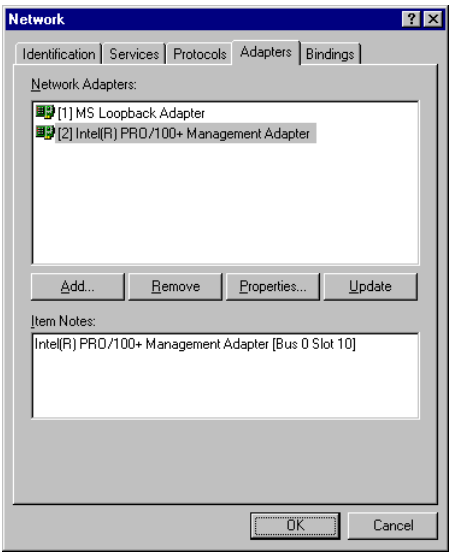


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9. You are now ready to enable the LAN device driver. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Network".



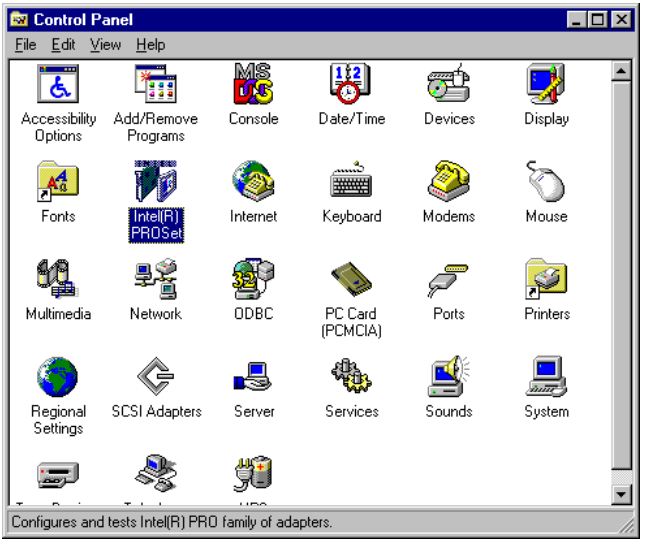
10. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "[2] Intel[R] PRO/100+ Management Adapter". Then click on "OK".



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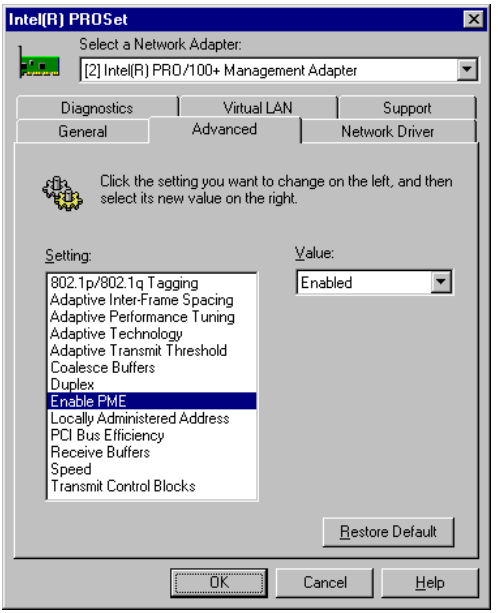
5.6 Windows NT Wake-on-LAN Setup Procedure

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

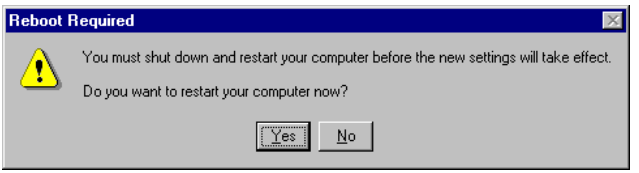


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2. In the "Intel[R] PROSet" window, under "Select a Network Adapter", choose "[2] Intel[R] PRO100+ Management Adapter". The select the "Advanced" tab. Under "Setting", highlight the "Enable PME" item. Under "Value", select "Enabled". Then click on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



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



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CHAPTER 6

SCSI Setup and Configurations

The PCA-6178 features an onboard SCSI interface. This chapter provides basic SCSI concepts and instructions for installing the software drivers with the SCSI driver disks/CD included in your package.

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6.1 Introduction

The PCA-6178 is equipped with a Symbios SYM53C895 single-chip PCI-to-SCSI host adapter which provides a powerful Ultra2 multitasking interface between your computer's PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.). Up to a total of 15 SCSI devices can be connected to the SCSI connector through the Symbios SYM53C895.

The SYMBIOS 53C895 is a 16-bit, LVD/SE (Low Voltage Differential/Single-Ended) SCSI solution for your computer. It can support both legacy Fast SCSI and Ultra SCSI devices, as well as the newest LVD Ultra2 SCSI devices.

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

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

6.2 Before You Begin

SDMS software requires an IBM PC/AT or compatible computer with an 80486 or higher microprocessor. An understanding of basic operating system commands is assumed. In addition, users should have a general knowledge of the SCSI standard.

Before using the SDMS software, you should configure the Symbios SCSI controller into your system, taking into account the configuration of other host adapters and system resources (see Section 6.3).

Symbios recommends that you back up all data before making any changes or installing any software, including the Symbios SCSI controllers and software. Failure to adhere to this accepted computer practice may lead to loss of data.

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6.3 Basic Rules for SCSI Host Adapter and Device Installation

You must terminate both ends of the SCSI bus. Refer to the hardware manuals for the devices and the host adapter to properly terminate the bus.

Unless your system is SCSI Configured AutoMatically (SCAM) capable, you must configure each SCSI device with a different SCSI ID number. Refer to the hardware manuals for the devices to locate where the jumpers of dip switches are for setting SCSI ID numbers. Usually, the host adapter is ID 7. The devices are then set at IDs 0 through 6 (plus 8 through 15 for Wide SCSI). The bootable hard drive must have the lowest numerical SCSI ID, unless you are able to use the BIOS Boot Specification (BBS).

The red or blue line on a standard SCSI cable (or the black line on one end of a multi-colored SCSI cable) designates pin one on the cable connector and must connect to pin one on the device or host adapter connector. Refer to Appendix B to find Pin 1 of the connector.

6.4 Configuring the SCSI Adapter

Access the SCSI BIOS by holding down both the CTRL and C keys when you see the BIOS banner message listing the driver name and the attached devices. For example:

```
Symbios Inc. SDMS (TM) V 4.0 PCI SCSI BIOS

PCI Rev. 2.0, 2.1

Copyright 1995, 1998 Symbios Inc.

PCI-4.12.00

Press Ctrl-C to start Symbios Configuration
Utility...
```

The SCSI Select screen will come up. Instructions on how to move the cursor and select options are listed on the bottom of the program windows. You can select either Configure/View Host Adapter Settings or SCSI CD Utilities.

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6.5 SCSI Terminators

To ensure reliable communication, the SCSI bus must be properly terminated. Termination is controlled by a set of electrical resistors, called terminators. Terminators must be placed (or enabled) at the two extreme ends of the SCSI bus. All devices that lie between the ends must have their terminators removed (or disabled).

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

- Termination on internal SCSI peripherals is usually controlled by manually setting a jumper or switch on the peripheral, or by physically removing or installing one or more resistor modules on the peripheral.
- Termination on external SCSI peripherals is usually controlled by installing or removing a SCSI terminator. On some external peripherals, termination is controlled by setting a switch on the rear of the drive.
- By default, termination on the CPU card itself is automatic (the preferred method).
- Internal Ultra2 peripherals are set at the factory with termination disabled, which cannot be changed. Proper termination for internal Ultra2 peripherals is provided by the built-in terminator at the end of the Ultra2 internal SCSI cable.
- Most non-Ultra2 SCSI peripherals come from the factory with termination enabled.

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6.6 SDMS Drivers

The SDMS device drivers translate an operating system I/O request into a SCSI request. Each Symbios SCSI device driver is operating system specific and is designed to work on standard Symbios chip implementations.

We provide PCI SDMS device drivers for the following operating systems:

- MS-DOS/Windows
- Windows 95/98
- Windows NT - 3.51 and above
- OS/2 4.x Warp
- SCO UNIX - Open Server 5.0.2 and above
- Novell NetWare - 3.12, 4.11 (NWPA)

Note: When you start the Windows NT installation with either a CD-ROM boot or from the floppy disks, a black screen will initially appear with the following text at the top:

```
Setup is inspecting your computer's hardware
configuration...
```

While this is on the screen (before entering the initial blue screen), press the F6 key. Windows NT setup will allow a SCSI driver to be added before the second disk is requested. Add the appropriate driver from a prepared floppy disk. Follow the rest of the instructions to finish the installation.

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CHAPTER 7

Onboard Security Setup

This chapter explains OBS concepts and provides instructions for installing the relevant software drivers. This is done using the OBS driver CD included in your PCA-6178 package.

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7.1 Introduction

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

The PCA-6178 can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature.

The positive system voltage sets which can be monitored include:

- CPU core voltage: 1.3 V ~ 3.3 V, according to Intel specifications
- Transmission voltage from CPU to chipset: typically 1.5 V
- Chipset voltage: typically 3.3 V
- Main voltage: +5 V, +12 V

The negative system voltage sets which can be monitored include:

- Main voltage: -5 V, -12 V

7.2 Driver Installation

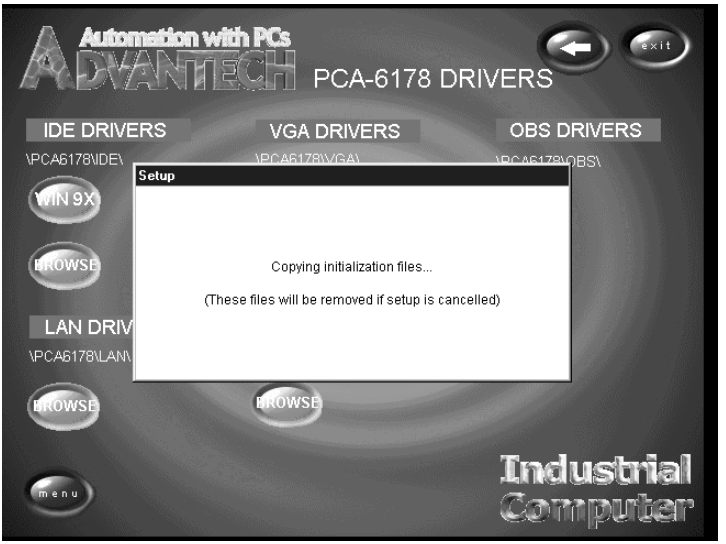
7.2.1 Before you begin

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.

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7.2.2 Windows 95 drivers setup procedure

1. Insert drivers CD, click on OBS icon



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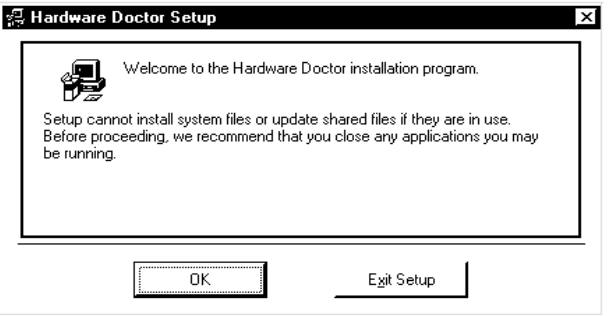
2. If your operating system is Win95, you will see the following screen images after running the driver. You must then reboot your system, start the procedure from Step 1 again, and then proceed directly to Step 3.



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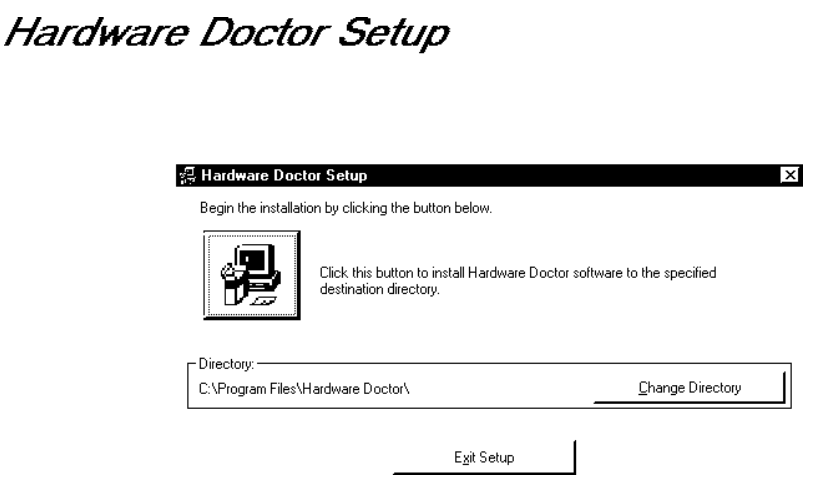
Follow the screen instructions to install the software.



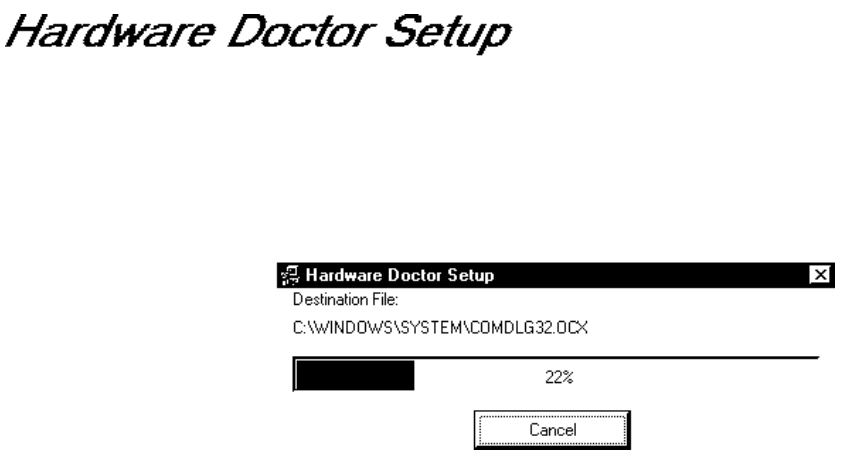


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3. Choose the Directory you want to install the files to.

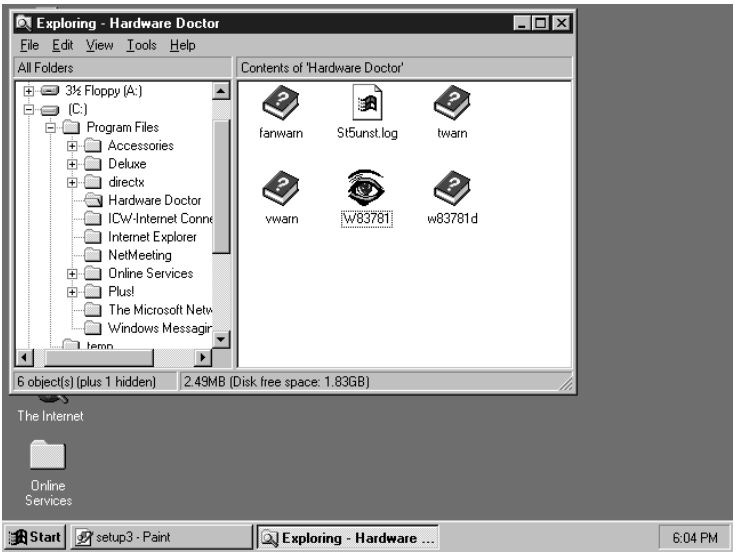


4. Let the installation continue, and complete the setup.



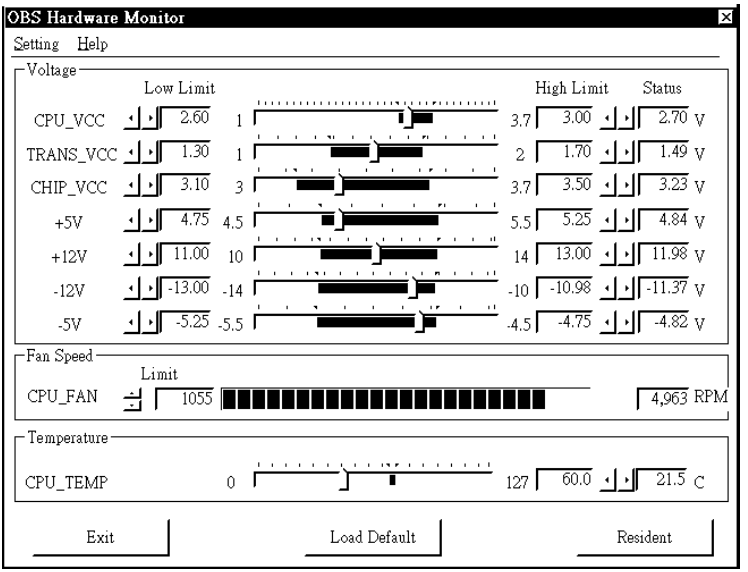
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5. Using your file manager, click on "Hardware Doctor" in drive C:, and then click on W83781".



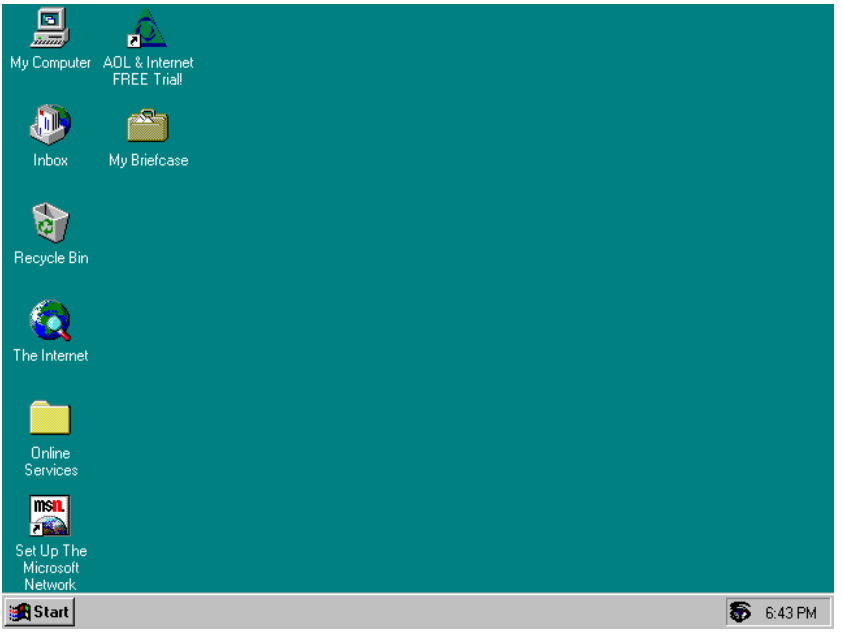
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6. It is recommended that you load the default values for all the OBS settings. However, if desired, you can establish new conditions for voltage, fan speed and temperature.



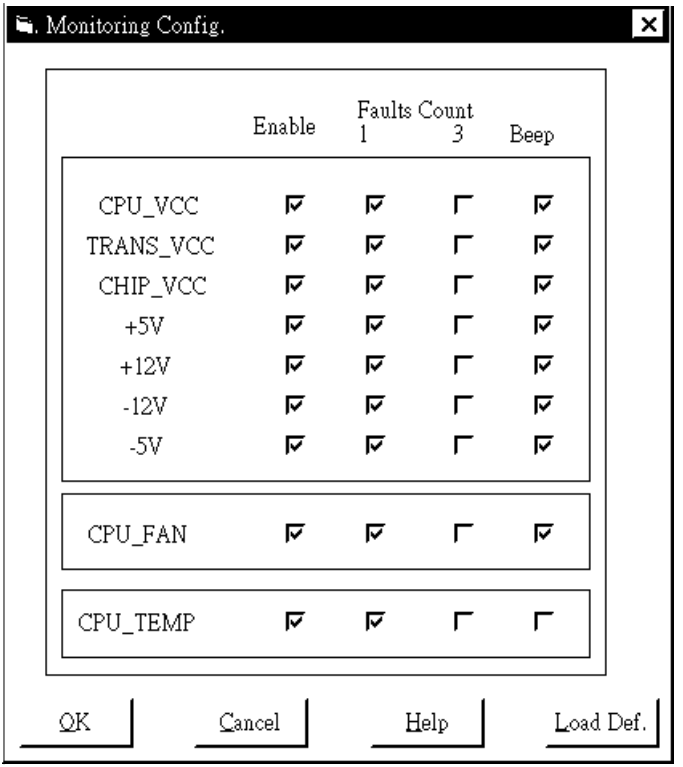
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7. "Winbond Hardware Doctor" will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered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



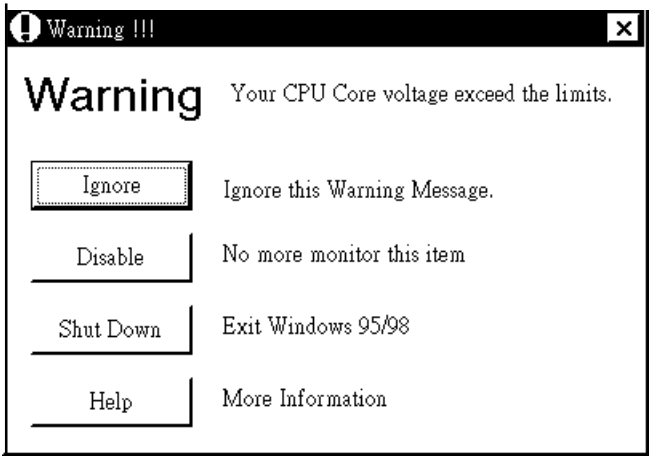
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8. Click on "Setting", then "Monitoring Config." While enabling each OBS function, you can choose "Faults 1". This will result in a warning message being delivered as soon as any monitored reading exceeds safe limits for the first time. Alternatively, 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.



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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.



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7.3 Windows NT driver setup procedure

Insert driver CD to start the NT driver setup

1. Click "Next".



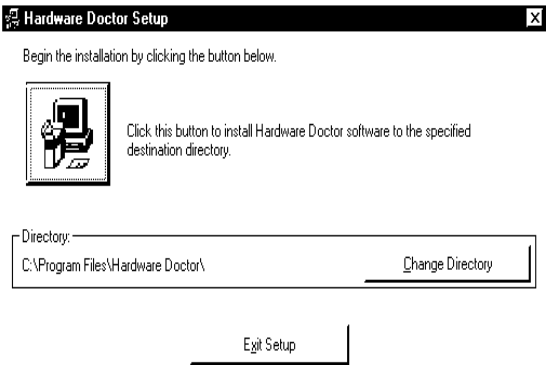
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2. Click "Next".



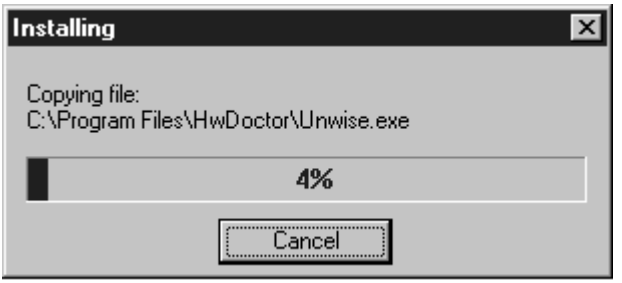
3. Click "Next".

Hardware Doctor Setup



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4. Start the installation.

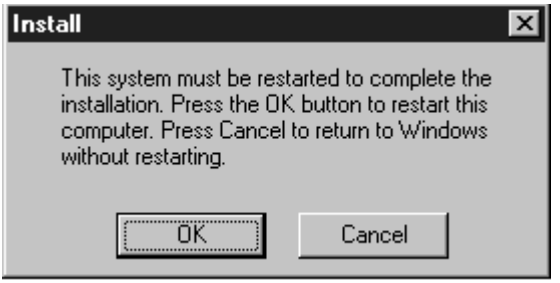


5. Finish the set up.



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6. Click "OK" to restart the computer.



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APPENDIX A

Programming the Watchdog Timer

The PCA-6178 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.

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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.

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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
```


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APPENDIX B

Pin Assignments

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

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

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

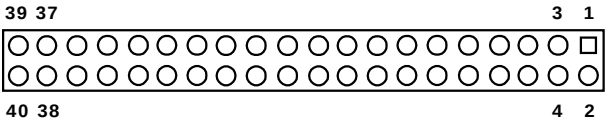


Table B-1: IDE hard drive connector (CN1, CN2)

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

* low active

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B.2 Floppy Drive Connector (CN3)

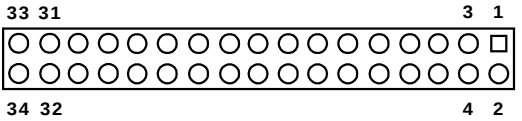


Table B-2: Floppy drive connector (CN3)

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

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B.3 Parallel Port Connector (CN4)

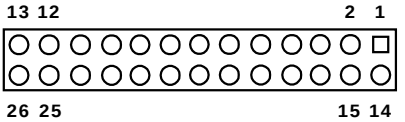


Table B-3: Parallel port connector (CN4)

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

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B.4 SCSI Connector (CN5)

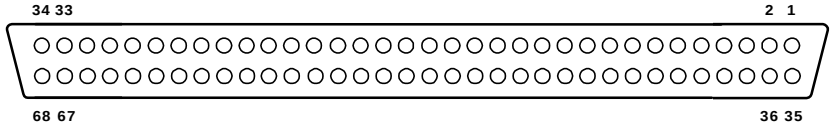


Table B-4: SCSI connector (CN5)

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

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B.5 USB Connector (CN6)

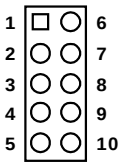


Table B-5: USB1/USB2 connector (CN6)

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

B.6 VGA Connector (CN7)

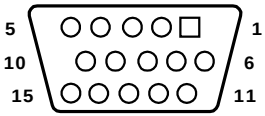


Table B-6: VGA connector (CN7)

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

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

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

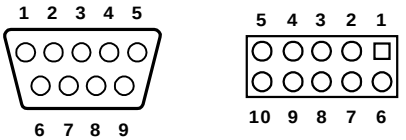


Table B-8: COM1/COM2 RS-232 serial port (CN9, CN10)

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

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B.9 Keyboard and Mouse Connnector (CN11)

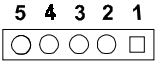


Table B-9: Keyboard and mouse connector (CN11)

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

B.10 External Keyboard Connector (CN12)

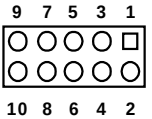


Table B-10: External keyboard connector (CN12)

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

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B.11 IR Connector (CN13)

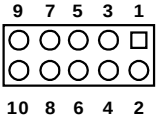


Table B-11: IR connector (CN13)

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

B.12 CPU Fan Power Connector (CN14)

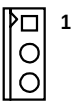


Table B-12: CPU fan power connector (CN14)

Pin	Signal
1	GND
2	+12 V
3	Detect

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B.13 Power LED and Keylock Connector (CN16)

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

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

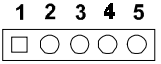
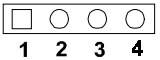


Table B-13: Power LED and keylock connector (CN16)

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

B.14 External Speaker Connector (CN17)



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

Table B-14: External speaker (CN17)

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

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B.15 Reset Connector (CN18)

Table B-15: Reset connector (CN18)

Pin	Signal
1	GND
2	RESETIN

B.16 HDD LED Connector (CN19)

Table B-16: HDD LED connector (CN19)

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

B.17 ATX Feature Connector (CN20)

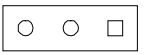


Table B-17: ATX feature connector (CN20)

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

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B.18 System I/O Ports

Table B-18: 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

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B.19 DMA Channel Assignments

Table B-19: 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.20 Interrupt Assignments

Table B-20: 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)

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B.21 1st MB Memory Map

Table B-21: 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.22 PCI Bus Map

Table B-22: PCI bus map

Function	Signals: Device ID	INT# pin	GNT# pin
Onboard LAN	AD21	INT D	GNT E
Onboard SCSI	AD20	INT A	GNT A
PCI slot 1	AD31	INT B, C, D, A	GNT A
PCI slot 2	AD30	INT C, D, A, B	GNT B
PCI slot 3	AD29	INT D, A, B, C	GNT C
PCI slot 4	AD28	INT A, B, C, D	GNT D

Note: In the PCA-6178VS/F, SCSI devices use "GNTA" signals via PCI slot 1. Therefore, PCI slot1 cannot be used for plug-in bus master add-on cards such as SCSI cards or LAN cards.

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APPENDIX C

DiskOnChip® 2000 Installation Guide

This appendix contains information on the DiskOnChip® 2000 quick installation guide. It includes:

- DiskOnChip® 2000 Installation Instructions
- Additional Information and Assistance

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C.1 DiskOnChip® 2000 Quick Installation Guide

C.1.1 DiskOnChip® 2000 installation instructions

1. Make sure the target platform is powered OFF.
2. Plug the DiskOnChip® 2000 device into its socket. Verify the direction is correct (pin 1 of the DiskOnChip 2000 is aligned with pin 1 of the socket).
3. Power up the system.
4. During power up you may observe the messages displayed by the DiskOnChip 2000 when its drivers are automatically loaded into the system's memory.
5. At this stage, the DiskOnChip 2000 can be accessed as any disk in the system.
6. If the DiskOnChip 2000 is the only disk in the system, it will appear as the first disk (drive C: in DOS).
7. If there are more disks besides the DiskOnChip 2000, the DiskOnChip 2000 will appear by default as the last drive, unless it was programmed as the first drive. (Please refer to the DiskOnChip 2000 utilities user manual.)
8. If you want the DiskOnChip 2000 to be bootable:
   a. Copy the operating system files to the DiskOnChip by using the standard DOS command (for example, SYS d:).
   b. The DiskOnChip should be the only disk in the systems or would be configured as the first disk in the system (c:) using the DUPDATE utility.

```
DUPDATE C /S: DOC104.EXB /FIRST   (set as c:)
DUPDATE D /S: DOC104.EXB          (set as d:)
```


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C.1.2 Addtional information and assistance

1. Visit M-Systems' website at **http://www.m-sys.com** where you can find the Utilities Manual, data sheet and Application Notes. In addition, you can find the latest DiskOnChip 2000 software utilities.
2. Contact your dealer for technical support if you need additional assistance, and have the following information ready:
   - Product name and serial number.
   - Description of your computer hardware (manufacturer, model, attached devices, etc.)
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem.
   - The exact wording of any error messages.

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