PCA-6002-B

PCI/ISA Bus CPU card with Ultra Low Voltage Intel® Celeron® processor

Users Manual

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A Message to the Customer

Advantech customer services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical support

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

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

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

PCA-6002-B series comparison table				
Model	PCA-6002VE-00B1	PCA-6002E2-00B1	PCA-6002VE-03B1	PCA-6002E2-03B1
CPU :	ULV Celeron ® 400MHz	ULV Celeron ® 400MHz	ULV Celeron ® 650MHz	ULV Celeron ® 650MHz
System chipset : Intel 815E	V	V	V	V
L2 cache:	**256** KB	256 KB	256 KB	256 KB
USB port	2	4	2	4
VGA : Intel 815E integrated VGA	V	V	V	V
Dual 10/100Base-T Ethernet LAN (Intel 82562/ Intel 82551)	Single LAN	Dual LAN	Single LAN	Dual LAN

Product warranty

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

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

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

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

1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.

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

3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

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

- 1 PCA-6002-B Ultra Low Voltage Celeron® processor -based single board computer
- 1 PCA-6002-B Startup Manual
- 1 CD with driver utility and manual (in PDF format)
- 1 FDD cable, P/N: 1700340640
- 2 Ultra ATA 100 HDD cables, P/N: 1701400452
- 1 printer (parallel port) cable & COM port cable kit, P/N: 1701260305
- 1 ivory cable for PS/2 keyboard and PS/2 mouse, P/N: 1700060202 (Optional)
- 1 single-slot bracket, P/N: 1962159010 (optional)
- 1 USB cable adapter, P/N: 1700100170 (optional)

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

We have carefully inspected the PCA-6002-B mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the PCA-6002-B, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

CHAPTER 1

Hardware Configuration

This chapter gives background information on the PCA-6002-B. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

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

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6002-B Series all-in-one industrial grade CPU card uses Intel®'s highly acclaimed Ultra Low Voltage Celeron® 400/650 MHz processor together with the Intel® 815E chipset. The card works with standard ISA or PCI/ISA-bus passive backplanes.

The CPU provides 256 KB on-CPU L2 cache, eliminating the need for external SRAM chips. It has two PCI EIDE interfaces (for up to four devices) and a floppy disk drive interface (for up to two devices). Other features include two RS-232 serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port and four USB (Universal Serial Bus) ports. The PCI enhanced IDE controller supports Ultra ATA/100/66/33 and PIO Mode 4 operation. This provides data transfer rates of over 100/66/33 MB/sec. System BIOS supports boot-up from an IDE CD-ROM and LS-120.

A backup of CMOS data is stored in the Flash memory, which protects data even after a battery failure. Also included is a 255-level watchdog timer, which resets the CPU or generates an interrupt if a program cannot be executed normally. This enables reliable operation in unattended environments.

The PCA-6002-B Series offers several impressive industrial features such as a chipset integrated VGA (AGP) controller, dual 10/100Base-T networking controllers, two DIMM slots for a total of 512 MB SDRAM memory, and an ISA High Drive. All these make it an ideal choice for applications that require both high performance and full functionality.

The remote management interface enables the PCA-6002-B to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager.

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

1.2 Features

1. **Low-power CPU for fanless operation:** The PCA-6002-B uses Intel's ultra low voltage Celeron CPU, which consumes less power and operates without a cooling fan.
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 3.7.5 Soft-off by PWR-BTN). Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.
5. **Power-on by modem (requires modem):** This allows a computer to be turned on remotely through an internal or external modem. Users can thus access information on their computers from anywhere in the world.
6. **Power-on by LAN:** This allows you to remotely power up your system through your network by sending a wake-up frame or signal. With this feature, you can remotely upload/ download data to/ from systems during off-peak hours.
7. **Message LED:** Chassis LEDs now act as information providers. The way a particular LED illuminates indicates the stage the computer is in. A single glimpse provides useful information to the user.
8. **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.

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

1.3 Specifications

1.3.1 System

- **CPU:** PCA-6002-B supports Intel Ultra Low Voltage Celeron® 400/650MHz.
- **BIOS:** Award Flash BIOS (4Mb Flash Memory)
- **System Chipset:** Intel® 815E chipset
- **PCI enhanced IDE hard disk drive interface:** Supports up to four IDE (AT-bus) large hard disk drives or other enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra ATA 100/66/33 (100/66/33 MB/s data transfer rate). BIOS enabled/disabled
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB). BIOS enabled/disabled

1.3.2 Memory

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

1.3.3 Input/Output

- **Bus interface:** PCI/ISA bus, PICMG compliant
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/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:** Two 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

1.3.4 VGA interface

- **Controller:** Chipset integrated
- **Display memory:** shared from system memory up to 11MB SDRAM

1.3.5 Ethernet LAN

- **Supports dual 10/100Base-T Ethernet networking**
- **Chipset:** One on-board Intel® 82551QM and one chipset integrated LAN controller (82562ET)

1.3.6 Industrial features

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

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0°~60° C (32° ~ 140° F, Depending on CPU)
- **Storage temperature:** -20°~ 70° C (-4° ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:**

  Typical: +5V @3.4A, +12V@110mA (Ultra Low Voltage Celeron®650MHz, 256MB SDRAM)
- **Board size:** 338 x 122 mm (13.3" x 4.8")
- **Board weight:** 0.5 kg (1.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6002-B board link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

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

Table 1.1: Jumpers

Label	Function
J1	CMOS clear
J2	Watchdog timer output selection

Table 1.2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN6	USB port
CN7	VGA connector
CN8	10/100Base-T Ethernet connector 1
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN13	Infrared (IR) connector
CN14	CPU fan connector

Table 1.2: Connectors	
CN16	**Power LED/ KB Lock connector**
CN17	**External speaker**
CN18	**Reset connector**
CN19	**HDD LED connector**
CN20	**ATX feature connector**
CN21	**ATX soft power switch**
CN22	**H/W monitor alarm: close - enable OBS alarm**
	open - disable OBS alarm
CN27	**Connector to extension I/O board**
CN28	**Connector to extension I/O board**
CN29	**SM BUS**
	PIN1: SMB_DATA
	PIN2: SMB_CLOCK
CN31	**USB port 0,1**
CN32	**USB port 2,3**
CN33	**PS/2 keyboard and mouse connector**
CN34	**10/100Base-T Ethernet connector 2**
CN43	**AC-97 Audio extension interface**
CN44	**CompactFlash socket**

1.5 Location of Jumpers and Connectors

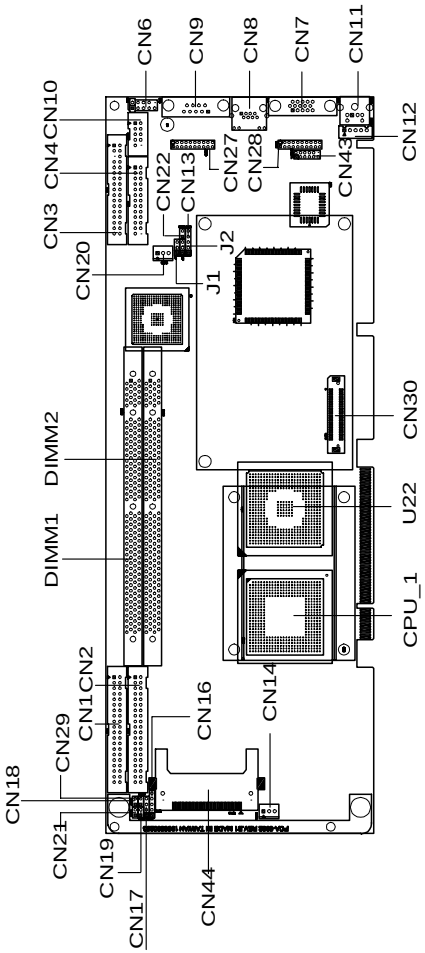


Figure 1.1: Location of jumpers and connectors

1.6 Safety Precautions

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

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

1.7 Jumper Settings

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

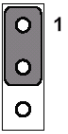
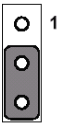
1.7.1 How to set the jumpers

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

1.7.2 CMOS clear (J1)

The PCA-6002-B CPU card contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS clear (J1)

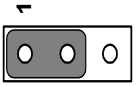
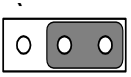
Function	Jumper setting
* Keep CMOS data 1-2 closed	
Clear CMOS data 2-3 closed	

* default setting

1.7.3 Watchdog timer output (J2)

The PCA-6002-B 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-6002-B will recover from a software failure or an EMI problem. The J2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.4: Watchdog timer output (J2)

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

* default setting

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

1.8 System Memory

The top-left edge of the PCA-6002-B contains two sockets for 168-pin dual in-line memory modules (DIMMs). All two 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-6002-B single board computer between 16 MB and 512 MB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1.5: DIMM module allocation table

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

1.8.1 Sample calculation: DIMM memory capacity

Suppose you install a 128 MB DIMM into your PCA-6002-B's socket 1 and a 32 MB DIMM into sockets 2. Your total system memory is 160 MB, calculated as follows:

Table 1.6: DIMM memory capacity sample calculation

Socket number	168-pin DIMM memory	Total memory
1	128 MB x 1	128 MB
2	32 MB x 1	32 MB
Total memory	160 MB	

1.9 Memory Installation Procedures

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

1.10 Cache Memory

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

CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches, and indicators to the PCA-6002-B board.

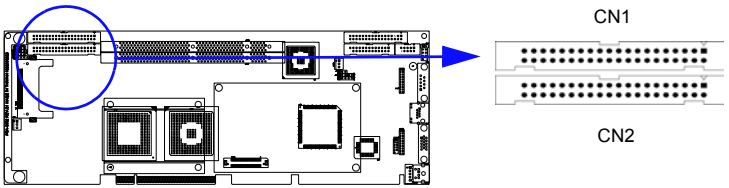
Chapter 2 Connecting Peripherals

2.1 Introduction

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

Note: If your chassis has only one empty expansion slot to accommodate the CPU card, you can replace the standard dual-slot bracket with the single-slot bracket included in your PCA-6002-B package, in which case you will have to access the connectors (CN31~34) on the extension I/O board from inside the chassis.

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



You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6002-B's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

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

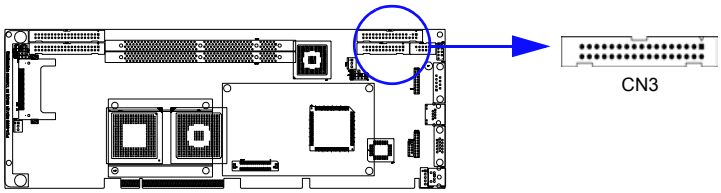
Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the

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

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

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

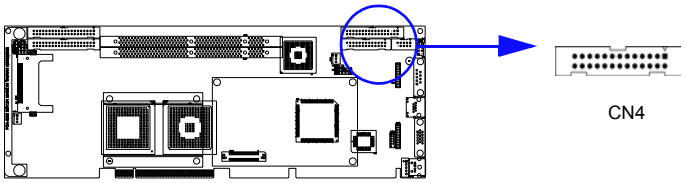
2.3 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6002-B's onboard controller. You can use 3.5" (720 KB, 1.44/2.88 MB) drives.

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

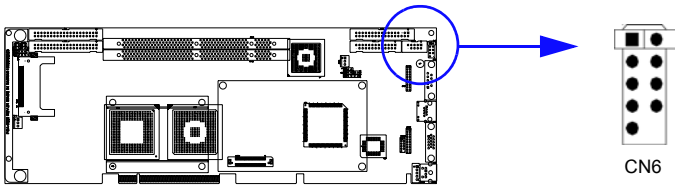
2.4 Parallel Port (CN4)



The parallel port is normally used to connect the CPU card to a printer. The PCA-6002-B includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

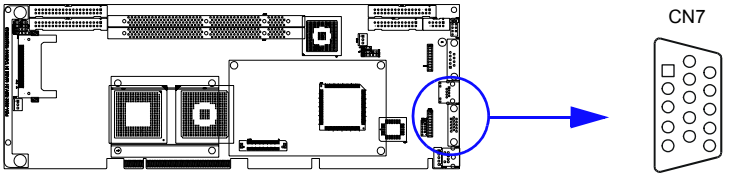
2.5 USB Ports (CN6, CN31, and CN32)



The PCA-6002-B provides four ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 1.0 and is fuse-protected.

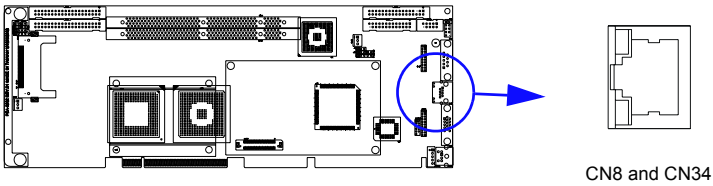
The USB interface can be disabled in the system BIOS setup.

2.6 VGA Connector (CN7)



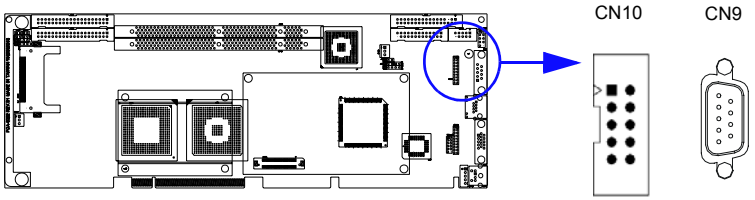
The PCA-6002-B includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.7 10/100Base-T Ethernet Connectors (CN8 and CN34)



The PCA-6002-B is equipped with one or two high-performance 32-bit PCI-bus Ethernet interfaces, which are fully compliant with IEEE 802.3/u 10/100 Mbps CSMA/CD standards. They are supported by all major network operating systems and are 100% Novell NE-2000 compatible. The RJ-45 jacks on the rear plate provide convenient 10/100 Base-T RJ-45 operation. If users use dual LANs, the second LAN port, CN34, is located at top slot of the I/O expansion ports.

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



The PCA-6002-B offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

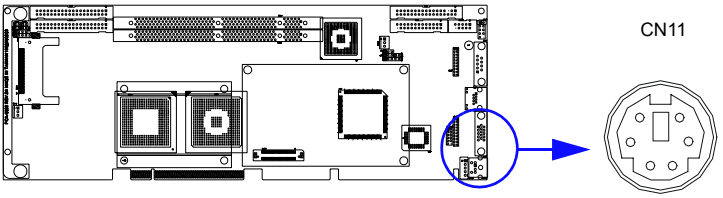
Table 2.1: Serial port connections (COM1, COM2)

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

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

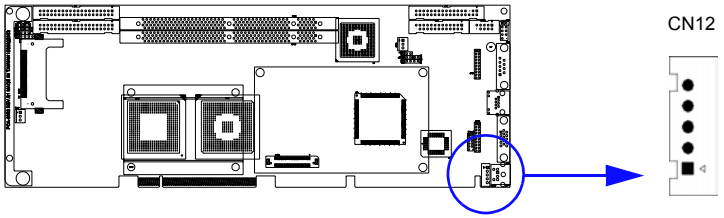
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.9 PS/2 Keyboard and Mouse Conn (CN11/33)



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

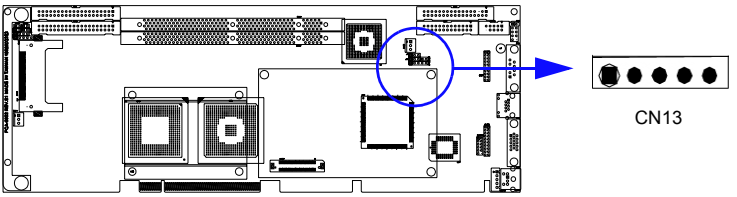
2.10 External Keyboard Connector (CN12)



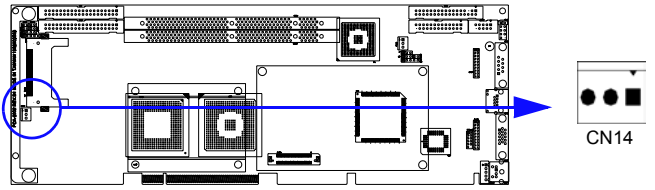
In addition to the PS/2 mouse/keyboard connector on the PCA-6002-B's ear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

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).



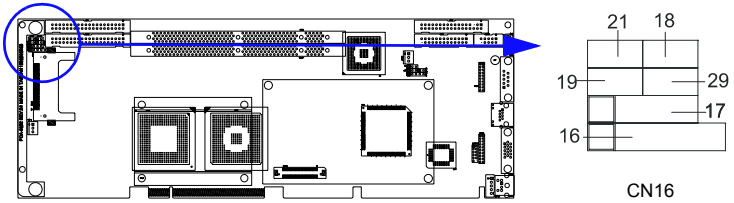
2.12 CPU Fan Connector (CN14)



If fan is used, this connector supports cooling fans of 500mA (6W) or less.

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

There are several external switches to monitor and control the PCA-6002-B.



2.13.1 Power LED (CN16)

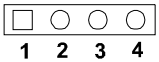
CN16 is a 5-pin connector for the keyboard lock and power on LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

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 external speaker. If there is no external speaker, the PCA-6002-B provides an onboard 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.

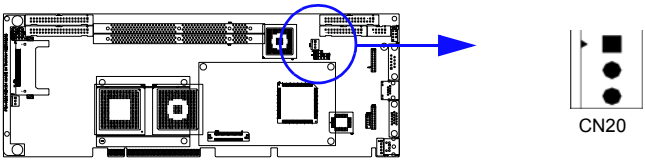
2.13.4 HDD LED (CN19)

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.

2.13.6 ATX Power Control Connectors (CN20)



Connect to the CN1 on the Advantech backplane to enable the ATX function, 5V stand-by.

2.14 SM Bus Connector (CN29)

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

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

2.15 Connecting to SNMP-1000 remote manager

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

CHAPTER 3

Award BIOS Setup

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

Chapter 3 Award BIOS Setup

3.1 Introduction

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

3.1.1 CMOS RAM Auto-backup and Restore

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

When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environment cause a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..."message appears again and again, please check to see if you need to replace the battery in your system.

3.2 Entering Setup

Turn on the computer and press <Del> to allow you to enter the BIOS setup.

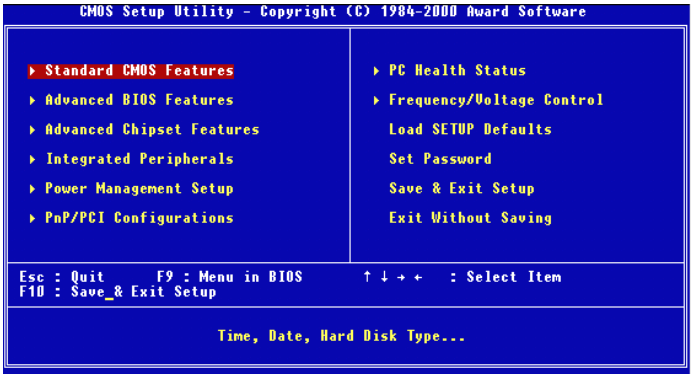


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

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

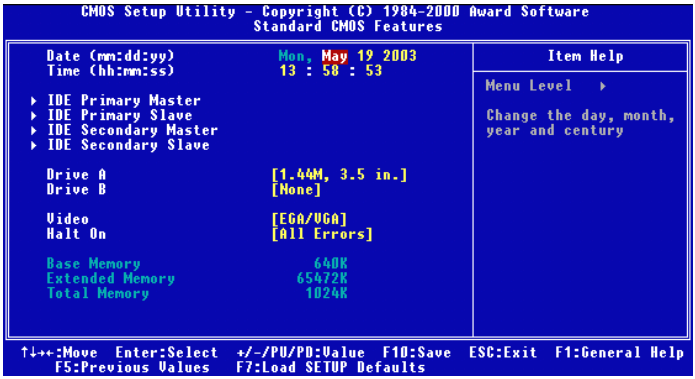


Figure 3.2: Standard CMOS features screen

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the PCA-6002-B according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen.

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

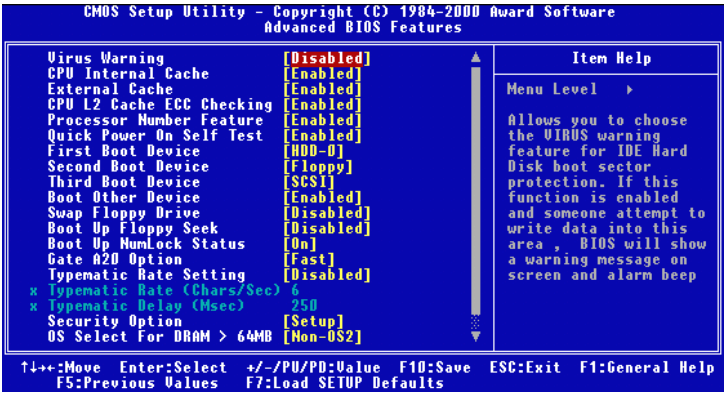


Figure 3.3: Advanced BIOS features screen

3.4.1 Virus Warning

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

3.4.2 CPU Internal Cache / External Cache

Enabling this feature speeds up CPU to access data. The commands are “Enabled” or “Disabled.”

3.4.3 CPU L2 Cache ECC Checking

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

3.4.4 Processor Number Feature

Enabling this feature will send the processor number out through LAN.

3.4.5 Quick Power On Self Test

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

3.4.6 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. If the system fails to boot from first, second or third device, the system will seek other bootable device.

3.4.7 Swap Floppy Drive

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

3.4.8 Boot UP Floppy Seek

Selecting “Disabled” will speed up the boot and will not check the floppy. Selecting “Enabled” will search and check the floppy during boot up.

3.4.9 Boot Up NumLock Status

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

3.4.10 Gate A20 Option

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

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

3.4.11 Typematic Rate Setting

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

3.4.12 Typematic Rate (Chars/Sec)

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

3.4.13 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).

3.4.14 Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is always limited. The system will not boot, and access to Setup will be denied if the correct password is not entered at the

prompt. SetupThe 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.

3.4.15 OS Select for DRAM > 64MB

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

3.4.16 Report No FDD for WIN 95

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

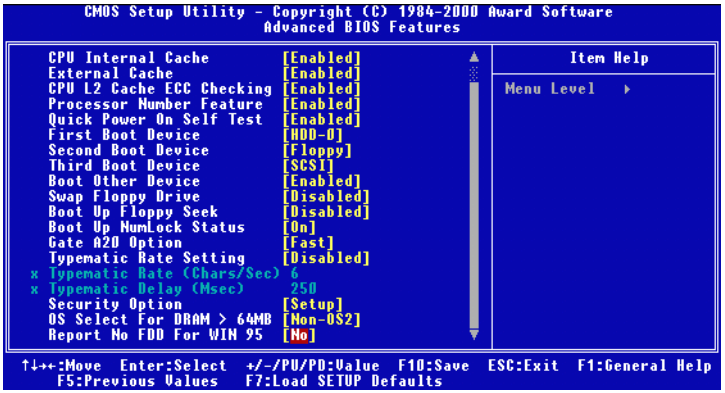


Figure 3.4: Advanced BIOS features screen

3.5 Advanced Chipset Features

By choosing the “Advanced Chipset Features” option from the “Initial Setup Screen” menu, the screen below will be displayed.

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

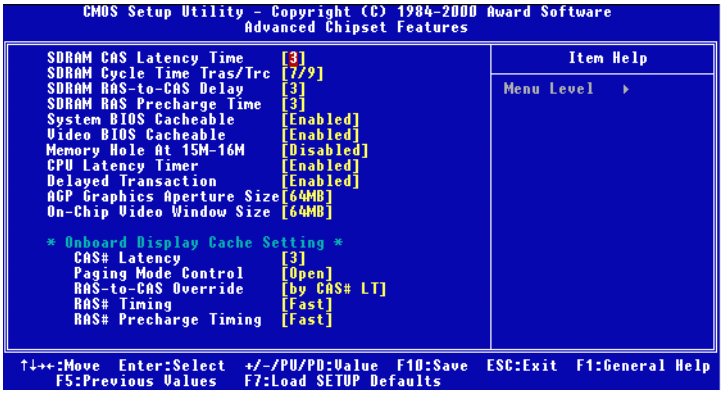


Figure 3.5: Advanced chipset features screen

3.5.1 SDRAM CAS Latency Time

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

3.5.2 SDRAM Cycle Time Tras/Trc

This selects the number of SCLKs for an access cycle.

3.5.3 SDRAM RAS-to-CAS Delay

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

3.5.4 SDRAM RAS Precharge Time

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

3.5.5 System BIOS Cacheable

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

3.5.6 Video Bios Cacheable

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

3.5.7 Memory Hole At 15M-16M

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

3.5.8 CPU Latency Timer

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

3.5.9 Delayed Transaction

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

3.5.10 AGP Graphics Aperture Size

This item can adjust the AGP Graphics Aperture Size; the choice are "32MB" and "64MB".

3.5.11 On-Chip Video Window Size

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

3.6 Integrated Peripherals

3.6.1 On-Chip Primary/Secondary PCI IDE

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

3.6.2 IDE Primary Master/Slave PIO/UDMA Mode

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

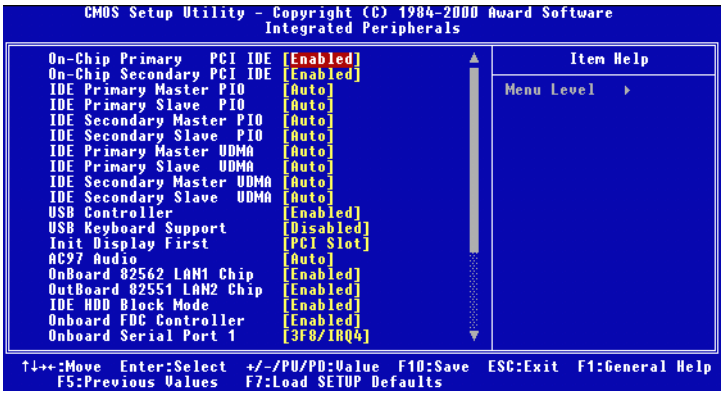


Figure 3.6: Integrated peripherals

3.6.3 USB Controller

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

3.6.4 USB Keyboard Support

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

3.6.5 Init Display First

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

3.6.6 AC97 Audio

This item allows you to enable the AC97 function. The choice are "Auto" and "Disabled".

3.6.7 OnBoard 82562 LAN1 Chip

This item allows you to enable LAN1. The choice are "Enabled" and "Disabled".

3.6.8 OutBoard 82551 LAN2 Chip

This item allows you to enable LAN2. The choice are "Enabled" and "Disabled".

3.6.9 IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled.

3.6.10 Onboard FDC Controller

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

3.6.11 Onboard Serial Port 1 (3F8/IRQ4)

The settings are 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/ IRQ10 and Disabled for the on-board serial connector.

3.6.12 Onboard Serial Port 2 (2F8/IRQ3)

The settings are 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/ IRQ10 and Disabled for the on-board serial connector.

3.6.13 UART Mode Select

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

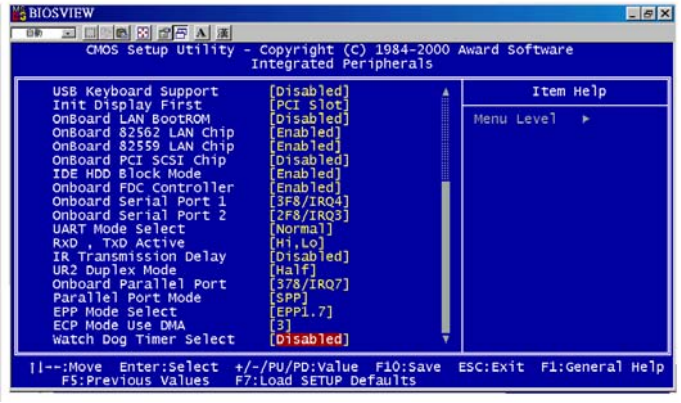


Figure 3.7: Integrated peripherals (2)

3.6.14 RxD, TxD Active

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

3.6.15 IR Transmission Delay

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

3.6.16 UR2 Duplex Mode

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

3.6.17 Use IR Pins

This item allows you to select the IR protocol depending on the IR device used. The choice are "RxD2,TxD2" and "IR-Rx2Tx2".

3.6.18 Onboard Parallel Port (378/IRQ7)

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

3.6.19 Parallel Port Mode (ECP + EPP)

This field allows you to set the operation mode of the parallel port. The setting "SPP" allows standard speed operation. “EPP” allows bidirectional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.

3.6.20 EPP Mode Select

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

3.6.21 ECP Mode Use DMA

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

3.7 Power Management Setup

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

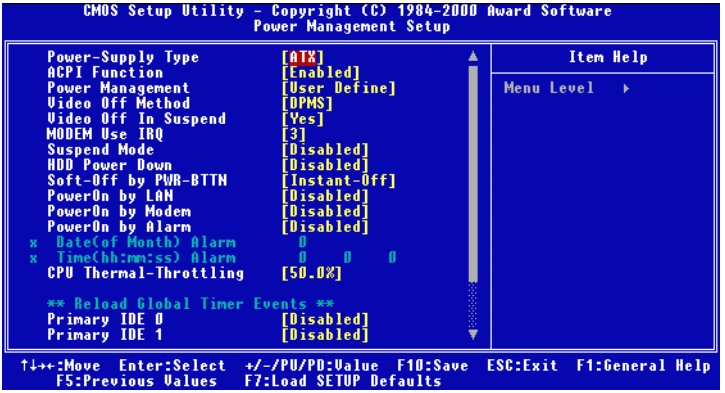


Figure 3.8: Power management setup screen (1)

3.7.1 Power-Supply Type

Choose AT or ATX power supply

3.7.2 ACPI Function

This item allows you to enable or disable ACPI function. The choice are "Enabled" and "Disabled".

3.7.3 Power Management

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

3.7.4 Video Off Method

This item allows you to setup the video off method. The choices are "Blank Screen", "V/H SYNC+Blank" and "DPMS".

3.7.5 Video Off In Suspend

When system is in suspend, video will turn off.

3.7.6 Modem Use IRQ

This item allows you to setup the IRQ which used by modem.

3.7.7 Suspend Mode

This item allows you to setup how long system will go suspending.

3.7.8 HDD Power Down

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

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

3.7.9 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.

3.7.10 PowerOn By LAN

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

3.7.11 PowerOn By Modem

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

3.7.12 PowerOn By Alarm

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

3.7.13 CPU Thermal-Throttling

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

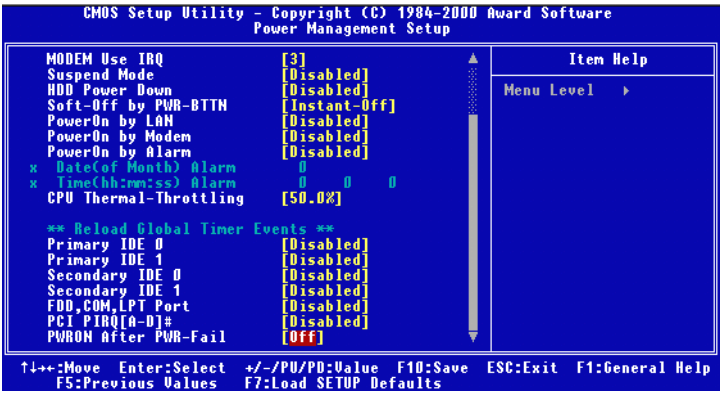


Figure 3.9: Power management setup screen (2)

3.8 PnP/PCI Configurations

3.8.1 PnP OS Installed

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

3.8.2 Reset Configuration Data

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

3.8.3 Resources controlled by:

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

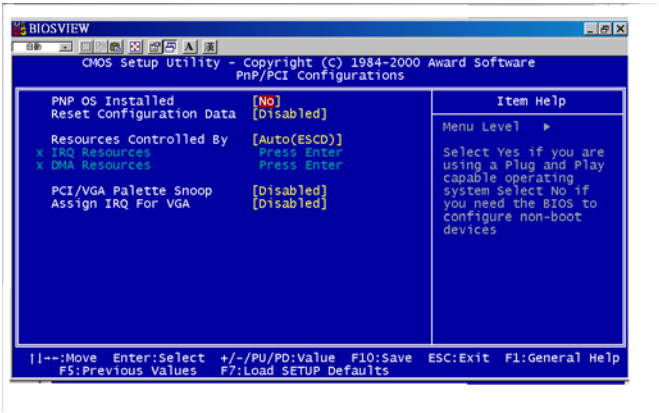


Figure 3.10: PnP/PCI configurations screen

3.8.4 PCI/VGA Palette Snoop

This is left at “Disabled.”

3.8.5 Assign IRQ for VGA

This item allows you to assign IRQ for VGA; the default is "Disabled".

3.9 PC Health Status

3.9.1 CPU Warning Temperature

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

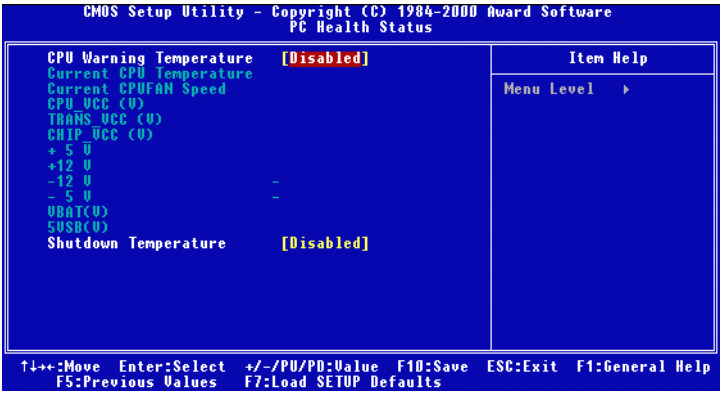


Figure 3.11: PC health status screen

3.9.2 Current CPU Temperature

This shows you the current CPU temperature.

3.9.3 Current CPUFAN Speed

This shows you the current CPUFAN operating speed. 3.9.5 +5V/+12V/-12V/-5V This shows you the voltage of +5V/+12V/-12V/-5V.

3.10 Password Setting

To change the password:

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

Please Enter Your Password

Press <Enter>.

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

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

3.11 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.

3.12 Exit Without Saving

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

CHAPTER 4

VGA Setup

This chapter provides information on the VGA setup.

Sections include:

- Introduction
- Installation of VGA Drivers
  - for Windows 2000
  - for Windows XP

Chapter 4 Chipset Software Installation Utility

4.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the PCA-6002-B board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system.

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

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

4.2 Introduction

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

- Core PCI and ISA PnP services.
- AGP support.
- IDE Ultra ATA 100/66/33 interface support.
- USB support.
- Identification of Intel ® chipset components in the Device Manager.

- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

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

Windows 98SE

Windows 2000

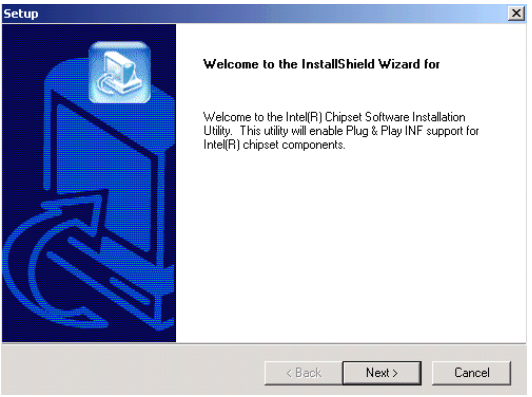
Windows ME

Windows XP

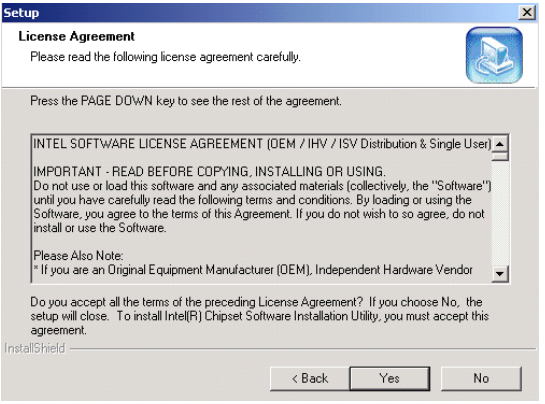
4.3 Windows 2000 Drivers Setup Procedure

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

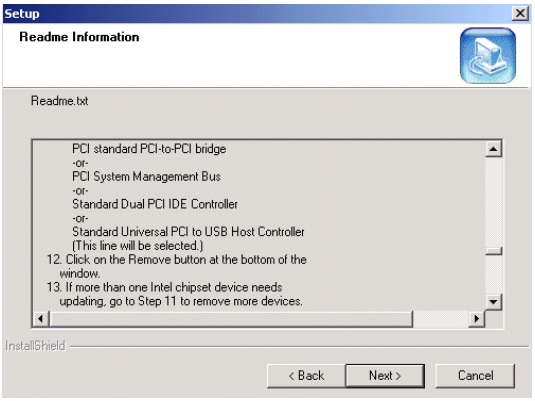
2. Click "Next" when you see the following message.



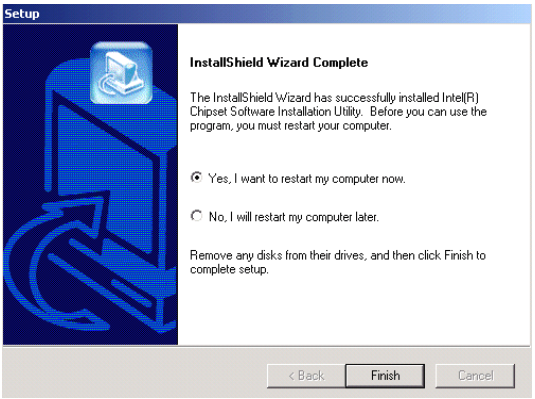
3. Click "Yes" when you see the following message.



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



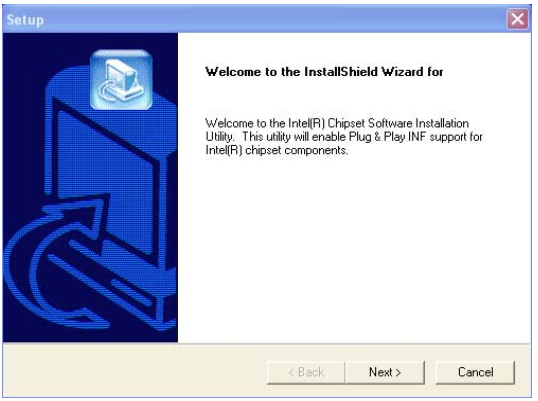
5. When the following message appears, click "Finish" to complete the installation and restart Windows.



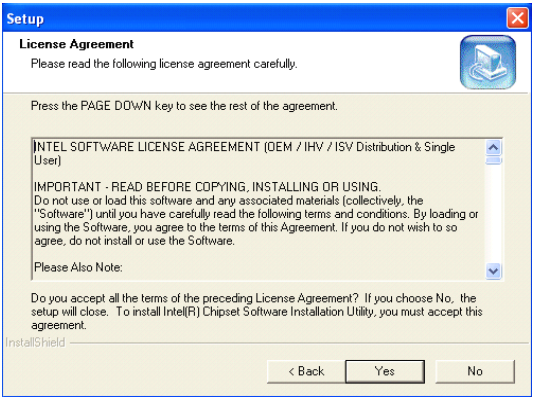
4.4 Windows XP Drivers Setup Procedure

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

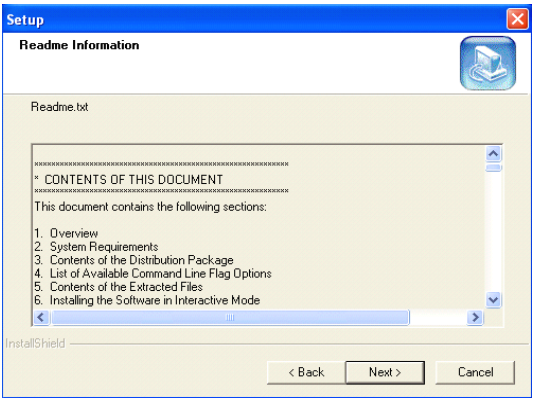
2. Click "Next" when you see the following message.



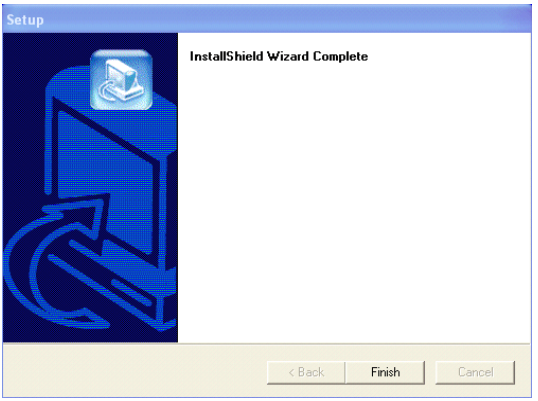
3. Click "Yes" when you see the following message.



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



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



CHAPTER 5

AGP SVGA Setup

The PCA-6002-B features an integrated AGP SVGA interface. This chapterprovides instructions for installing the AGP SVGA drivers from the driver CD included in your package.

Chapter 5 AGP SVGA Setup

5.1 Introduction

AGP (Accelerated Graphics Port) is a graphics interface that provides faster connection between the display card and memory than a PCI slot. Your PCA-6002-B CPU card uses the Intel ® 815 chipset that supports AGP SVGA. The features include:

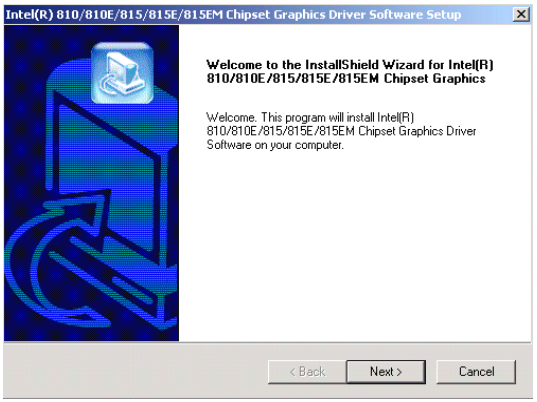
- Built-in 2D/3D AGP VGA controller.
- Integrated 24-bit 230MHz RAMDAC.
- Up to 1600 x 1200 resolution in 8-bit color at 85 Hz refresh.
- H/W motion compensation assistance for s/w MPEG 2 decoding.
- Software DVD at 30 fps.

5.2 Features

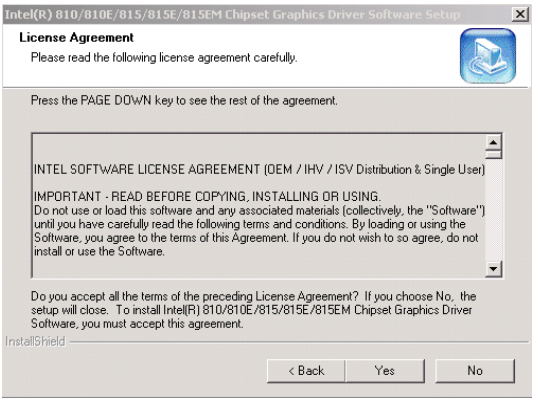
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "VGA DRIVERS" heading, click on one of the buttons (labeled "WIN9X," "WIN2000," and "WINXP" respectively) according to the operating system you are using. Take WIN200 as an example.

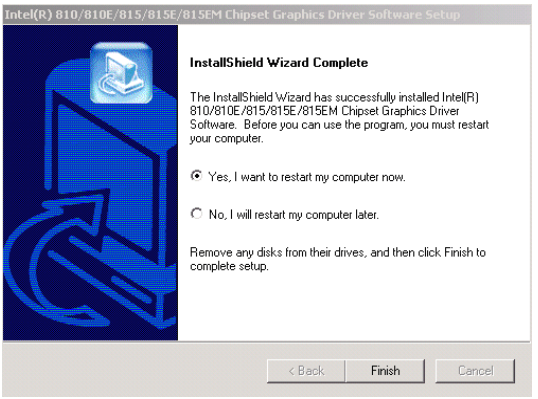
2. Click "Next" when you see the following message.



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



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



CHAPTER 6

LAN Configuration

The PCA-6002-B supports dual 10/100Base-T Ethernet networking with one chipset integrated LAN controller (Intel® 82562ET) and one Intel® 82551QM (optional). This chapter gives detailed information on Ethernet configuration. It shows you how to configure the card to match your application requirements.

Sections include:

- Introduction
- Features
- Installation
- Windows 2000 Drivers Setup Procedure
- Windows XP Drivers Setup Procedure
- Windows Wake-on-LAN Setup

Chapter 6 LAN Configuration

6.1 Introduction

The PCA-6002-B features the 32-bit 10/100 Mbps Ethernet network interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling with RJ-45 connectors for both 10 Mbps and 100 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

6.2 Features

- Intel ® 82562ET integrated LAN controller.
- Optional Intel ® 82551QM Ethernet LAN controller (fully integrated 10Base-T/100Base-TX).
- Supports Wake-on-LAN remote control function.
- PCI Bus Master complies with PCI Rev. 2.1.
- MAC & PHY (10/100 Mbps) interfaces.
- Complies to IEEE 802.3 10Base-T and IEEE 802.3u 100Base-T interfaces.
- Fully supports 10Base-T and 100Base-TX operation.
- Single RJ-45 connector gives auto-detection of 10 Mbps or 100 Mbps network data transfer rates and connected cable types.
- 32-bit Bus Master technology complies with PCI Rev. 2.1.
- Plug and Play.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.0, ACPI Rev. 1.0, and Device Class Power Management Rev. 1.0.

6.3 Installation

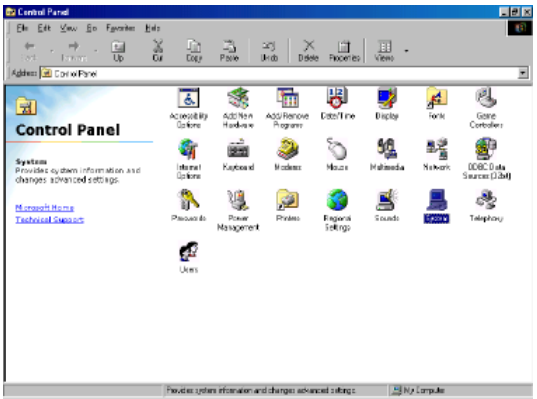
Note: Before installing the LAN drivers, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

The PCA-6002-B's onboard Ethernet interface supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

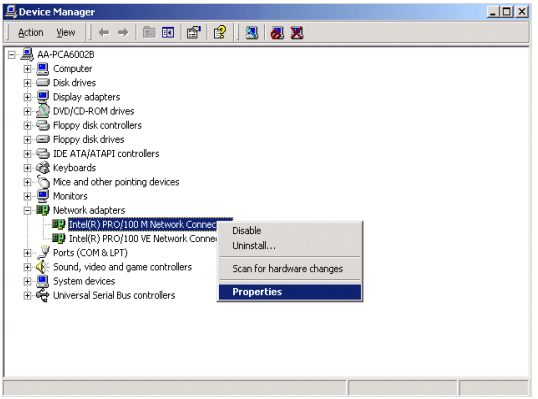
6.4 Windows 2000 Drivers Setup Procedure

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

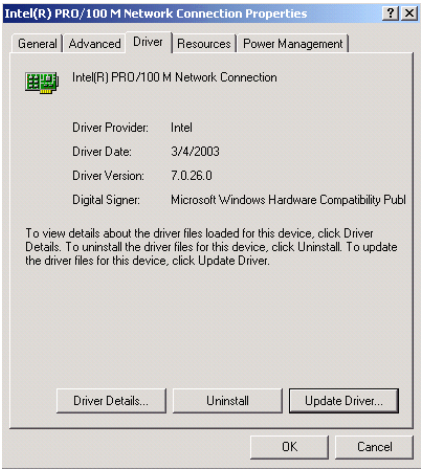
1. From the desktop of Windows 2000, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System."



2. In the "System Properties" window, select the "Device Manager" tab. Select "View devices by type," and navigate to: AA-PCA6002B\Network adapters devices. Highlight "Intel® PRO/100M Network Connection" and click on "Properties."



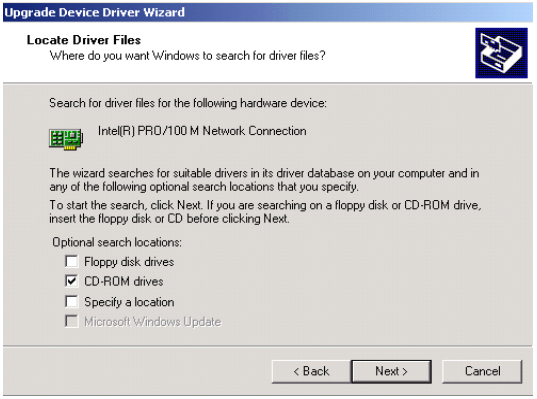
3. In the "Intel® PRO/100M Network Connection Properties" window, select the "Driver" tab. Then click on "Update Driver..."



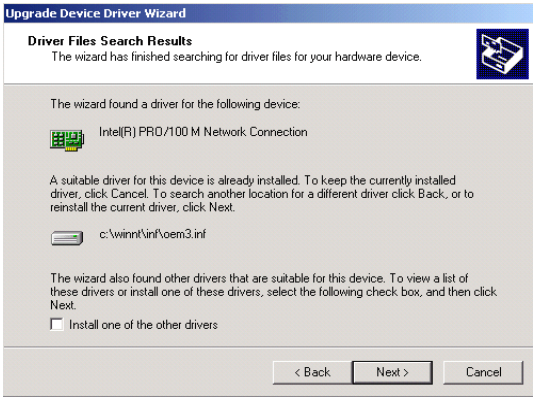
4. In the "Update Device Driver Wizard" window, click on "Next."

5. In the "Update Device Driver Wizard" window, select "Search for a suitable driver for my device (recommended)." Then click on "Next."

6. In the following "Update Device Driver Wizard" window, click on "CD-ROM drives."



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

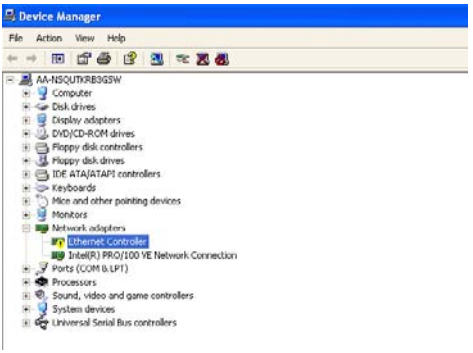


8. In the following "Update Device Driver Wizard" window, click on "Finish" to complete the installation.”

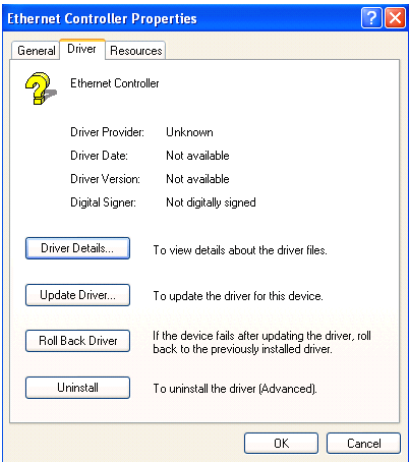
6.5 Windows XP Drivers Setup Procedure

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

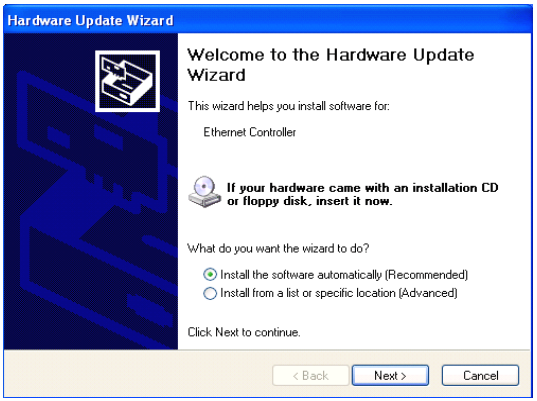
1. From the desktop of Windows XP, click on "Start" and select "Settings." Then click on the "Control Panel" icon to select "System." In the "System Properties" window, select the "Device Manager" tab. Navigate to"Network adapters" and click "Ethernet Controller."



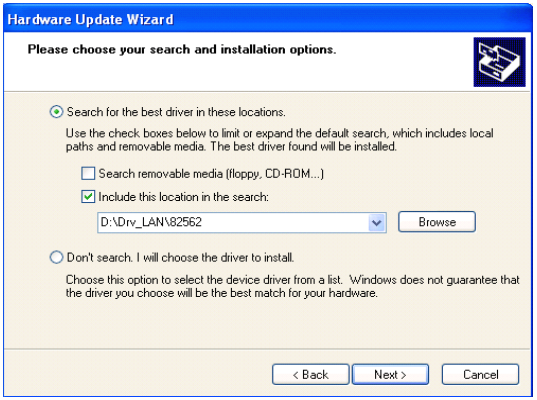
2. In the "Ethernet Controller Properties" window, select the "Driver" tab. Then click on "Driver Details..."



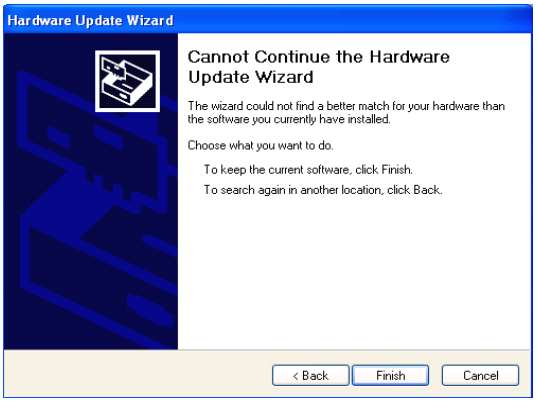
In the "Hardware Update Wizard" window, select "Install the software automatically (Recommended)" Then click on "Next."



3. In the "Hardware Update Wizard" window, select "Search for the best driver in these locations" and "Include this location in the search." Click "Search" to find the location of driver. Then click on "Next."



4. In the following "Hardware Update Wizard" window, click on "Finish" to complete the installation.



CHAPTER 7

Ultra ATA Storage Driver Setup

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

Chapter 7 Ultra ATA Storage Driver Setup

7.1 Introduction

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

7.2 Features

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

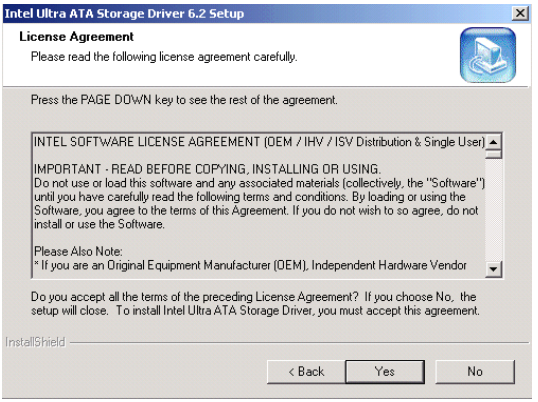
7.3 Windows 2000 Drivers Setup Procedure

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

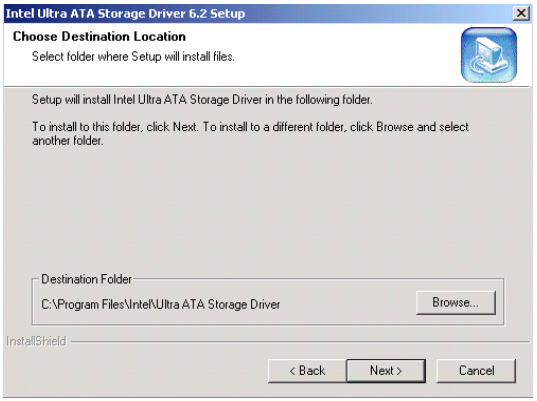
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "IDE DRIVERS" heading, click on the "Auto" button.

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

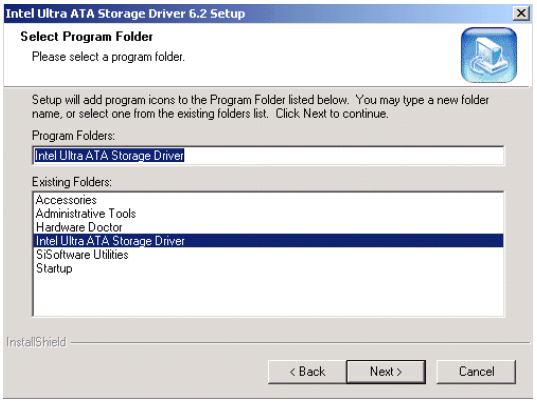
3. When you see the following message, click on "Yes" to accept the License Agreement.



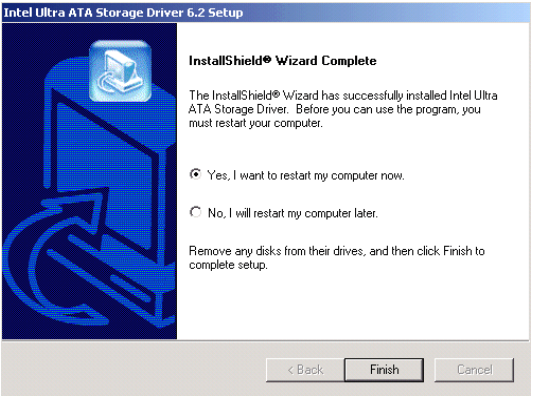
4. Click on "Next" when you see the following message.



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

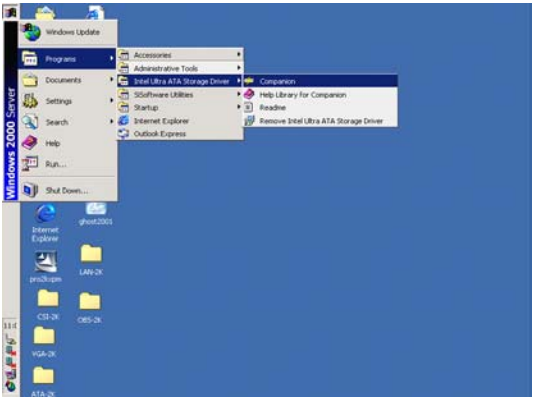


6. When the following message appears, click "Finish" to complete the installation and restart Windows.

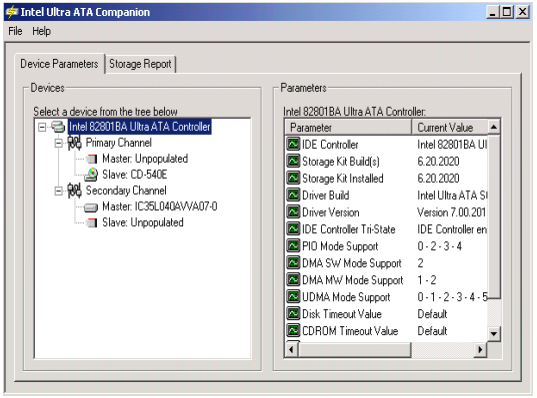


7.4 Displaying Driver Information

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



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



CHAPTER 8

Onboard Security Setup

This chapter explains OBS concepts and provides instructions for installing the relevant software drivers. This is done using the driver CD included in your PCA-6002-B package.

Chapter 8 Onboard Security Setup

8.1 Introduction

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

The PCA-6002-B can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets which can be monitored include:

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

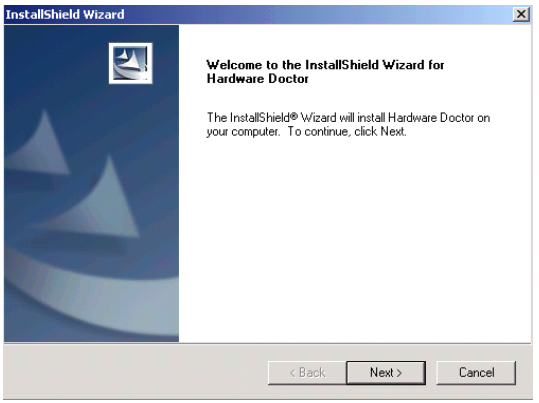
The negative system voltage sets which can be monitored include:

- Main voltage: -5 V, -12 V.

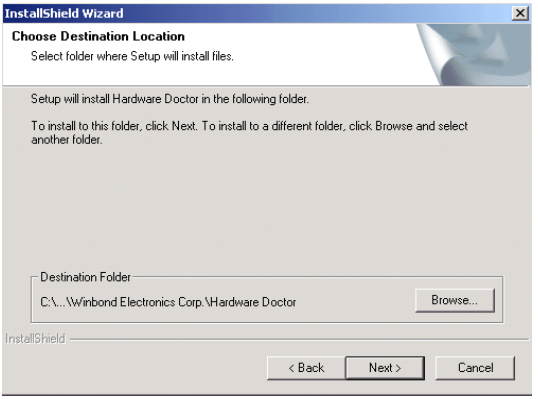
8.2 Windows 2000 Drivers Setup Procedure

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "WIN2000" button under the "OBS DRIVERS" heading.

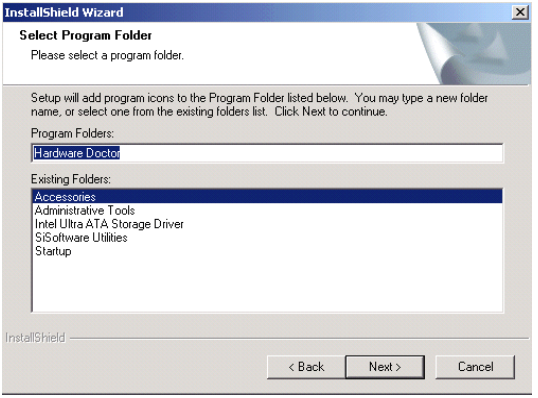
2. Click "Next" when you see the following message.



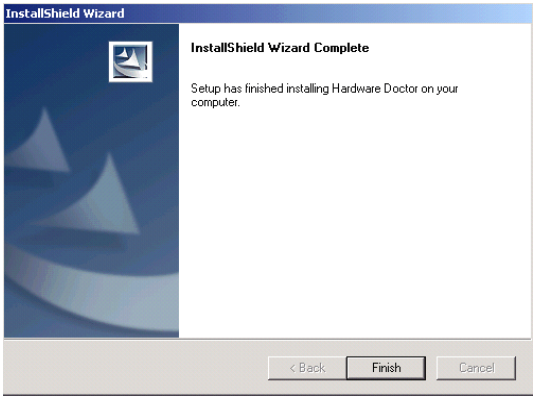
3. Click "Next" when you see the following message.



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



5. Click "Finish" to complete the installation.



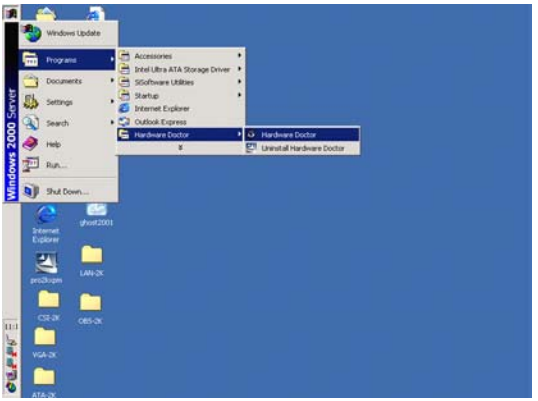
8.3 Using the OBS Hardware Doctor Utility

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

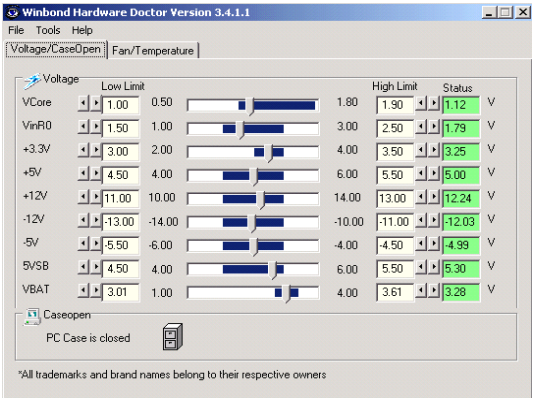
OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security system.

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

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



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



CHAPTER 9

SCSI Setup and Configuration

The PCA-6002-B 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

Chapter 9 SCSI Setup and Configuration

9.1 Introduction

The PCA-6002-B is equipped with an Adaptec AIC-7899 single-chip PCI- to-SCSI host adapter which provides a dual channel Ultra 160 multi-tasking interface between your computer.s PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.). Ultra 160 is a new generation of SCSI technology that expands SCSI performance from 80 MBytes/sec to 160 MBytes/ sec. Up to a total of 15 SCSI devices can be connected to each of the SCSI connectors.

The AIC-7899 combines this Ultra 160 SCSI technology with Adaptec.s SpeedFlex. technology. SpeedFlex allows the Adaptec SCSI card to be backwards compatible with previous generations of SCSI products, while allowing newer Ultra 160 SCSI devices to operate at the higher 160 MBytes/sec rate.

There are 3 SCSI connectors on the CPU card: CN50 and CN51 for Ultra 160 devices, and CN52 for 50-pin SCSI devices. You can use Ultra 160 and Ultra wide devices simultaneously without compromising the performance.

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 running at SE mode, the Ultra 160 SCSI segment will run at speeds up to 40 MBytes/sec only instead of 160 MBytes/sec.

9.2 Understanding SCSI

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

A SCSI bus is an electrical pathway that consists of a SCSI interface installed in a computer and one or more SCSI devices. SCSI cables are used to connect the devices to the SCSI interface. For the SCSI bus to function properly, a unique SCSI ID must be assigned to the SCSI interface and each SCSI device connected to it, and the SCSI bus must be properly terminated.

9.3 SCSI IDs

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

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

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

- If you are booting your computer from a SCSI hard disk drive connected to the SCSI bus, the Boot SCSI ID setting in the SCSISelect utility must correspond to the SCSI ID of the device from which you are booting. By default, the Boot SCSI ID is set to 0. We recommend that you do not change this setting.

9.4 Terminating the SCSI Bus

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

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

- Internal Ultra 160 and Ultra 2 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination for internal Ultra 160 and Ultra2 SCSI devices is provided by a 68-pin Internal LVD (low voltage differential) SCSI cable, which has a built-in terminator at its end.
- Termination on non-Ultra 160 and Ultra2 internal SCSI devices usually is controlled by manually setting a jumper or a switch on the device, or by physically removing or installing one or more resistor modules on the device.
- Termination on most external SCSI devices is controlled by installing or removing a SCSI terminator. However, termination on some external SCSI devices is enable or disabled by setting a switch on the back of the SCSI device.

The last external Ultra160 or Ultra2 SCSI device must be terminated with an LVD/SE (low voltage differential/single ended) terminator plug to ensure that the device will operate at its maximum speed. If you use a different kind of terminator plug, the data I/O rate will decrease.

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

9.5 Configuring the SCSI interface with SCSISelect

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

Note: The default settings are appropriate for most systems. Run SCSISelect if you need to change or view current settings, or if you would like to run the SCSI disk utilities.

SCSISelect Options	Available Settings	Default Setting
SCSI Bus Interface		
Definitions:		
Host Adapter SCSI ID	0-15	7
SCSI Parity Checking	Enable, Disabled	Enabled
Host Adapter SCSI Termination		
LVD/SE Connectors	Automatic	Automatic
	Enabled	
	Disabled	
SE Connectors	Automatic	Automatic
	Low On/High On	
	Low Off/High Off	
	Low Off/High On	
Boot Device Options:		
Boot SCSI ID	0-15	0
Boot LUN Number1	0-7	0

SCSI Device Configuration:		
Sync Transfer Rate (MBytes/sec)		
	160, 80.0, 53.4, 40.0,	160
	32.0, 26.8, 20.0,	
	16.0, 13.4, 10.0	
	ASYN	
Initiate Wide Negotiation	Yes, No	Yes (enabled)
Enable Disconnection	Yes, No	Yes (enabled)
Send Start Unit Command	Yes, No	Yes (enabled)
Enable Write Back Cache2	N/C (No Change)	N/C (No Change)
	Yes, No	
BIOS Multiple LUN Support2	Yes, No	No (disabled)
Include in BIOS Scan2	Yes, No	Yes (enabled)
Advanced Configuration Options:		
Reset SCSI Bus at IC Initialization	Enabled, Disabled	Enabled
Display <Ctrl><A> Messages during BIOS Initialization	Enabled, Disabled	Enabled
Extended BIOS Translation for DOS Drives > 1 GByte	Enabled, Disabled	Enabled
Verbose/Silent Mode	Verbose, Silent	Verbose
HostAdapterBIOS	Enabled	Enabled
	Disabled : Not Scan	
	Disabled: Scan Bus	
Domain Validation2	Enabled, Disabled	Enabled
Support Removable Disks Under BIOS as Fixed Disks2	Disabled	Disabled
	Boot Only,	
	All Disks	

BIOS Support for Bootable CD_ROM2	Enabled, Disabled	Enabled
BIOS Support for Int 13	Enabled, Disabled	Enabled
Extensions2		
1 Setting is valid only if Multiple LUN Support is enabled.		
2 Settings are valid only if host adapter BIOS is enabled.		

9.6 Starting SCSISelect

Follow these steps to start SCSISelect:

1. Turn on or restart your system. During the startup process, pay careful attention to the messages that appear on your screen.
2. When the following message appears on your screen, press the Ctrl-A keys simultaneously (this message appears for only a few seconds): Press <Ctrl><A> for SCSISelect (TM) Utility!
3. From the menu that appears, use the arrow keys to move the cursor to the option you want to select, then press ENTER.

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

Exiting SCSISelect

Follow these steps to exit SCSISelect:

1. Press ESC until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit.)

At the prompt, select YES to exit, then press any key to reboot the computer. Any changes you made in SCSISelect take effect after the computer boots.

Using SCSISelect Settings

To select an option, use the arrow keys to move the cursor to the option, then press ENTER. In some cases, selecting an option displays another many. You can return to the previous menu at any time by pressing ESC. To restore the original SCSISelect default values, press F6 from the main SCSISelect screen

SCSI Bus Interface Definitions

- **Host Adapter SCSI ID**-(Default: 7) Sets the SCSI ID for the SCSI controller. The Adaptec SCSI controller AIC-7899 is set at 7, which gives t the highest priority on the SCSI bus. We recommend that you do not change this setting.
- **SCSI Parity Checking**-(Default: Enabled) When set to Enabled, verifies the accuracy of data transfer on the SCSI bus. Leave this setting enabled unless any SCSI device does not support SCSI parity.
- **Host Adapter SCSI Termination**-(Default: Automatic) Determines the termination setting for the SCSI card. The default setting for both the LVD/SE (low voltage differential/single ended) connectors and SE connectors is Automatic, which allows the SCSI card to adjust the termination as needed depending on the configuration of the connected SCSI devices. We recommend that you do not change these settings.

Boot Device Options

- **Boot SCSI ID**-(Default: 0) Specifies the SCSI ID of your boot device. We recommend that you don't t change the default setting.
- **Boot LUN Number-**(Default: 0) Specifies which LUN (Logical Unit Number) to boot from on your boot device. This setting is not valid unless Multiple LUN Support is **Enabled**

SCSI Device Configuration

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

Note: To configure settings for a SCSI device, you must know it.s SCSI ID

- **Sync Transfer Rate**-(Default: 160) Determines the maximum synchronous data transfer rate that the SCSI card supports. Use the maximum value of 160 MBytes/sec.

- **Initiate Wide Negotiation**-(Default: Yes) When set to Yes, the SCSI card attempts 16-bit data transfer (wide negotiation.) When set to No, the SCSI card uses 8-bit data transfer unless the SCSI device requests wide negotiation.

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

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

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

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

Advanced Configuration Options

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

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

- **Display <Ctrl> <A> Messages during BIOS Initialization**-(Default: Enabled) When set to Enabled, the SCSI card BIOS displays the Press <Ctrl> <A> for SCSISelect (TM) Utility! message on your screen during system bootup. If this setting disabled, you can still invoke the SCSISelect Utility by pressing <Ctrl> <A> after the SCSI card BIOS banner appears.
- **Extended BIOS Translation for DOS Drives > 1 GByte**-(Default: Enabled) When set to **Enabled**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1 GByte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems, such as NetWare of UNIX.

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

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

- **Verbose/Silent Mode**-(Default: Verbose) When set to Verbose, the SCSI card BIOS displays the host adapter model on the screen during system buildup. When set to **Silent**, the message is not displayed during bootup.
- **Host Adapter BIOS (Configuration Utility Reserves BIOS Space)**-(Default: Enabled) Enables or disables the SCSI card BIOS.
- Leave at **Enabled** to allow the SCSI card BIOS to scan and initialize all SCSI devices.
- Set to **Disabled: Not scan** if the devices on the SCSI bus (for example, CD-ROM drives) are controlled by software drivers and do not need the BIOS, and you do not want the BIOS to scan the SCSI bus.
- Set to **Disabled**: **Scan Bus** if you do not need the BIOS, but you want it to scan the SCSI devices on the bus and you need to spin up the devices.

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

- **Domain Validation.**(Default: Enabled) Determines the optimal transfer rate for each device on the SCSI bus and sets transfer rates accordingly. Displays the resulting data transfer rate.

- **Support Removable Disks Under BIOS as Fixed Disks.** (Default: Disabled) Determines which removable-media drives are supported by the SCSI card BIOS. Choices are as follows:
- **Disabled.** No removable-media drives are treated as hard disk drives. Software drivers are required because the drives are not controlled by the BIOS.
- **Boot Only.**Only the removable-media drive designated as the boot device is treated as a hard disk drive.
- **All Disks.**All removable-media drives supported by the BIOS are treated as hard disk drives.

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

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

9.7 Using SCSI Disk Utilities

To access the SCSI disk utilities, follow these steps:

1. Select the SCSI Disk Utilities option from the menu that appears after starting SCSISelect. SCSISelect scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI

9.8 Installation under Windows 2000

If you are only using SCSI hard drives without any IDE HDD drive installed. Please follow these steps:

1. Insert Windows 2000 CD Disk.
2. Press F6 immediately when it displays: “Set up is inspecting your computer’s hardware configuration.”
3. Then it enter SCSI installation. Please insert SCSI driver floppy disk.

CHAPTER A

Programming the Watchdog Timer

The PCA-6002-B is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A Programming the watchdog timer

A.1 Programming the Watchdog Timer

The PCA-6002-B's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

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

- Can be enabled and disabled by user's program.
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes.
- Generates an interrupt or resets signal if the software fails to reset the timer after time-out.

A.1.2 Reset/ Interrupt selection

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

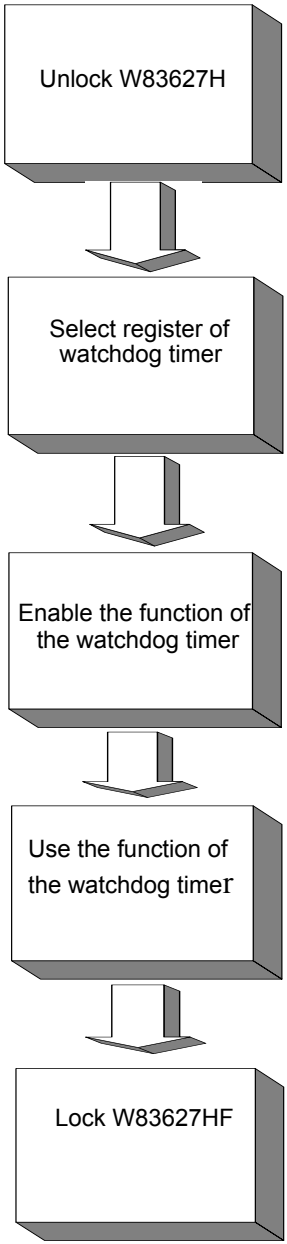
Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

A.1.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E(hex) and 2F(hex).

2E (hex) is the address port. 2F(hex) is the data port.

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


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

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

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

Table A.1: Watchdog timer registers

A.1.4 Example Program

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

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

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

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

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

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

3. Enable watchdog timer to be reset by mouse

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

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

4. Enable watchdog timer to be reset by keyboard

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

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

5. Generate a time-out signal without timer counting

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

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

CHAPTER 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
- USB Connector
- VGA Connector
- Ethernet 10/100Base-T RJ-45 connector
- COM1/COM2 RS-232 Serial Port
- Keyboard and Mouse Connector
- External Keyboard Connector
- IR Connector
- CPU Fan Power Connector
- Power LED Connector
- External Speaker Connector
- Reset Connector
- HDD LED Connector
- ATX Feature Connector
- ATX Soft Power Switch
- H/W Monitor Alarm
- SM Bus Connector
- Extension I/O Board Connector
- PS/2 Mouse Connector
- System I/O Ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

Appendix B Pin Assignments

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

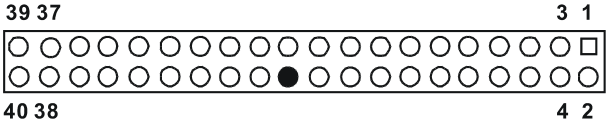


Table B.1: IDE hard drive connector (CN1, CN2)

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	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

Table B.1: IDE hard drive connector (CN1, CN2)			
31	**IRQ14**	**32**	**N/C**
33	**ADDR 1**	**34**	**N/C**
35	**ADDR 0**	**36**	**ADDR 2**
37	**HARD DISK SELECT 0***	**38**	**HARD DISK SELECT 1***
39	**IDE ACTIVE***	**40**	**GND**
*** low active**			

B.2 Floppy Drive Connector (CN3)

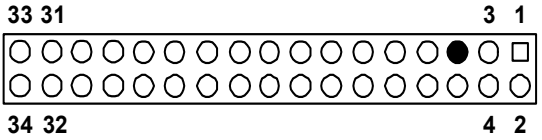


Table B.2: Floppy drive connector (CN3)

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

* low active

B.3 Parallel Port Connector (CN4)

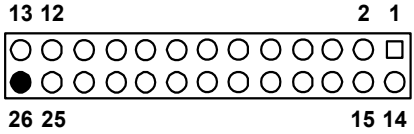


Table B.3: Parallel port connector (CN4)

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

* low active

B.4 USB Connector (CN6)

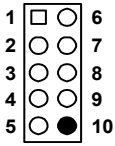


Table B.4: USB1/USB2 connector (CN6)

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

B.5 VGA Connector (CN7)

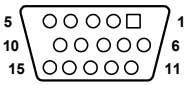


Table B.5: VGA connector (CN7)

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

B.6 Ethernet 10/100Base-T RJ-45 Conn(CN8/34)

Table B.6: 10/100Base-T RJ-45 conn(CN8/34)

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

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

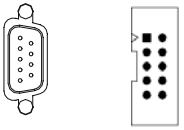


Table B.7: COM1/2 RS-232 serial port (CN9/10)

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

B.8 Keyboard & Mouse connector (CN11)

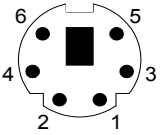


Table B.8: Keyboard & Mouse connector (CN11)	
Pin	**Signal**
1	**KB DATA**
2	**MS DATA**
3	**GND**
4	**VCC**
5	**KB CLOCK**
6	**MS CLOCK**

B.9 External Keyboard Connector (CN12)

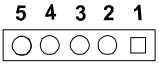


Table B.9: External keyboard connector (CN12)	
Pin	**Signal**
1	**CLK**
2	**DATA**
3	**NC**
4	**GND**
5	**VCC**

B.10 IR Connector (CN13).

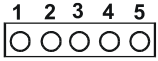


Table B.10: IR connector (CN13)

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

B.11 CPU Fan Power Connector (CN14)

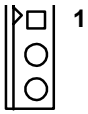


Table B.11: CPU fan power connector (CN14)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.12 Power LED 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.

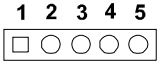


Table B.12: Power LED & keylock conn (CN16)	
Pin	**Function**
1	**LED power (+5 V)**
2	**NC**
3	**GND**
4	**N/A**
5	**N/A**

B.13 External Speaker Connector (CN17)

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

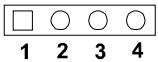


Table B.13: External speaker (CN17)	
Pin	**Function**
1	**+5 VCC**
2	**GND**
3	**Internal buzzer**
4	**Speaker out**

B.14 Reset Connector (CN18)

Table B.14: Reset connector (CN18)

Pin	Signal
1	RESET
2	GND

B.15 HDD LED Connector (CN19)

Table B.15: HDD LED connector (CN19)

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

B.16 ATX Feature Connector (CN20)

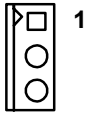


Table B.16: ATX feature connector (CN20)

Pin	Signal
1	PS-ON
2	VCC
3	VCCSB

B.17 ATX Soft Power Switch (CN21))

Table B.17: ATX soft power switch (CN21)

Pin	Signal
1	5VSB
2	PWR-BTN

B.18 H/W Monitor Alarm (CN22)

Table B.18: H/W monitor alarm (CN22)

Pin	Signal
1	Enable OBS alarm
2	Disable OBS alarm

B.19 SM Bus Connector (CN29)

Table B.19: SM Bus Connector (CN29)

Pin	Signal
1	SMB_DATA
2	SMB_CLK

B.20 Extension I/O Board Connector (CN27)

Table B.20: Extension I/O board connector (CN27)

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

B.21 Extension I/O Board Connector (CN28)

Table B.21: Extension I/O board connector (CN28)

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

B.22 PS/2 Mouse Connector (CN33)

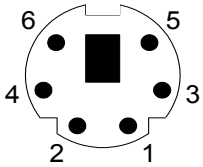


Table B.22: PS/2 mouse connector (CN33)

Pin	Signal
1	MS DATA
2	N/C
3	GND
4	VCC
5	MS CLOCK
6	N/C

B.23 System I/O Ports

Table B.23: 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

Table B.23: System I/O ports	
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**

B.24 DMA Channel Assignments

Table B.24: 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.25 Interrupt Assignments

Table B.25: 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

Table B.25: Interrupt assignments		
11	**IRQ15**	**Available**
12	**IRQ3**	**Serial communication port 2**
13	**IRQ4**	**Serial communication port 1**
14	**IRQ5**	**Parallel port 2**
15	**IRQ6**	**Diskette controller (FDC)**
16	**IRQ7**	**Parallel port 1 (print port)**

B.26 1st MB Memory Map

Table B.26: 1st MB memory map	
Addr. range (Hex)	**Device**
F0000h - FFFFFh	**System ROM**
CC000h - EFFFFh	**Unused**
C0000h - CBFFFh	**VGA BIOS**
B8000h - BFFFFh	**CGA/EGA/VGA text**
B0000h - B7FFFh	**Unused**
A0000h - AFFFFh	**EGA/VGA graphics**
00000h - 9FFFFh	**Base memory**

B.27 PCI Bus Map

Table B.27: PCI bus map

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