

PCA-6185

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

User's Manual

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A Message to the Customer

Advantech customer services

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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.

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

PCA-6185 series comparison table					
Model	PCA-6185V-00A1	PCA-6185VG-00A1	PCA-6185G2-00A1	PCA-6185F-00A1	
CPU: Support single Intel® Pentium ® 4 socket 478 processor	V	V	V	V	V
System chipset: Serverworks GC-SL	V	V	V	V	V
L2 Cache (256/512KB) depends on CPU	V	V	V	V	V
USB Port	4	4	4	4	4
VGA: ATI 3D Rage XL	V	V	V	V	V
VGA RAM: 8MB	V	V	V	V	V
Single Gigabit 10/100/1000Base-TX Ethernet LAN (Broadcom BCM5703)	X	V	X	X	X
Dual Gigabit Ethernet LAN (Broadcom BCM5704)	X	X	V	V	V
SCSI (Adaptec AIC-7902)	X	X	X	X	V

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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.
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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.
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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 socket 478 Pentium 4® processor-based single board computer
- 1 PCA-6185 startup Manual
- 1 CD driver utility and manual (in PDF format)
- 1 FDD cable, P/N: 1701340703
- 2 UDMA 100 HDD cables, P/N: 1701400452
- 1 Printer (parallel port) cable & COM port cable kit, P/N: 1700060305
- 1 Ivory cable for PS/2 keyboard and PS/2 mouse, P/N: 1700060202
- 1 USB cable, 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-6185 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-6185, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Hardware Configuration

This chapter provides background information on the PCA-6185. It will show you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

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

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6185 Series all-in-one industrial grade single CPU card uses Intel's high performance Pentium® 4 processor, together with the Server-Works' GC-SL chipset. The card features two separate 64-bit PCI-X bus, one for internal devices and one for external add-on cards. The dual PCI-X bus ensures the operation of internal devices not to be influenced by external add-on cards.

The PCA-6185 supports Pentium 4 or Celeron CPU with 533 and 400 MHz front side bus. Based on the NetBurst™ microarchitecture, the CPU is equipped with 512, 256 or 128 KB on-CPU full-speed cache memory, providing higher performance than ever before. The 3 DIMM memory sockets support up to 4 GB PC-200/266 DDR SDRAM, fulfilling the demand on computing performance of most applications. The PCA-6185 Series features powerful on-board I/O functions such as single or dual gigabit Ethernet ports and dual channel Ultra 320 SCSI interface. This makes it an ideal choice for applications that require both high performance and full functionality.

It has two EIDE interfaces (for up to four devices) and a floppy disk drive interface (for up to two devices). Other features include two RS-232 serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port (supports SPP/EPP/ECP) and four USB (Universal Serial Bus) ports. The PCI enhanced IDE controller supports ATA 33/66/100 and PIO Mode 4 operation. This provides data transfer rates of up to 100 MB/sec. System BIOS supports boot-up from an IDE CD-ROM, SCSI CD-ROM, LS-120, IDE HDD, SCSI HDD, ZIP-100, LAN, and FDD.

A backup of CMOS data is stored in the Flash memory, which protects data even after a battery failure. Also included is a 63-level watchdog timer, which resets the CPU or generates an interrupt if a program cannot be executed normally. This enables reliable operation in unattended environments.

The remote management interface enables the PCA-6185 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. **High performance PCI bus:** The PCA-6185 provides three independent PCI buses: one 32-bit, 33 MHz PCI bus and two 64-bit PCI-X buses. The 32-bit bus is used for on-board VGA controller. One of the two high performance PCI-X bus is used for onboard Gigabit Ethernet and SCSI controllers. The other PCI-X bus is available for user's add-on cards through the edge connector. This PCI-X bus is compatible with PCI bus and capable to operate at different speed: 32-bit/33 MHz, 32-bit/66MHz, 64-bit/33 MHz or 64-bit/66 MHz.
2. **Fan status monitoring and alarm:** To prevent system overheating and damage, the CPU fan can be monitored for speed and failure. The fan is set for its normal RPM range and alarm thresholds.
3. **Temperature monitoring and alarm:** To prevent system overheating and damage, the CPU card supports processor thermal sensing and auto-protection.
4. **Voltage monitoring and alarm:** 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.
5. **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 Soft-off by PWR-BTN, Section 3.7.8) Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.
6. **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.
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.

1.3 Specifications

1.3.1 System

- **CPU:** Intel Pentium® 4 /Celeron processor with 512, 256 or 128 KB L2 cache, up to 3.06 GHz and above, FSB 400/533 MHz
- **BIOS:** Award Flash BIOS, 4 MB
- **System Chipset:** ServerWorks ServerSet GC-SL
- **PCI enhanced IDE hard disk drive interface:** Supports up to four IDE large hard disk drives or other enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra DMA 33/66/100 (33/66/100 MB/s data transfer rate). BIOS enabled/disabled
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB). BIOS enabled/disabled

1.3.2 Memory

- **RAM:** Up to 4 GB DDR SDRAM in three available 184-pin DIMM sockets. Supports DDR200/DDR266 compliant SDRAM, registered only.
- **ECC (parity DRAM only):** Modules can detect multi-bit memory errors. Correction of 1-bit memory errors

1.3.3 Input/Output

- **Bus interface:** PCI bus, PICMG compliant. PCI bus supports 64-bit/66 MHz, 64-bit/33 MHz and 32-bit/33 MHz, up to 4 slots.
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports SPP/EPP/ECP
- **Serial ports:** Two RS-232 ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM2 or disabled
- **Keyboard and PS/2 mouse connector:** A 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An onboard keyboard pin header connector is also available

1.3.4 VGA interface

- On-board PCI VGA controller
- **Controller:** ATI 3D RAGE XL
- **Display memory:** 8 MB SDRAM

1.3.5 Ethernet LAN

- **Chipset:** Broadcom BCM5703 for single GbE and BCM5704 for dual GbE.
- **Ethernet interface:** 10/100/1000 Based - TX
- **Connection:** Onboard RJ-45 connector x 2

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second (63 levels). The program uses I/O port hex 444h to control the watchdog timer

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (depends on CPU)
- **Storage temperature:** -20 ~ 60° C (-40 ~ 140° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:** Typical: 2.36 A@ +5 V, 11 mA@ -5 V, 5.42A @ 12 V, 212 mA @ -12 V (typical, Pentium® 4 2.4 GHz and 1 GB SDRAM)
- **Board weight:** 0.5 kg (1.2 lb)

1.4 Jumpers and Connectors

Connectors on the PCA-6185 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
JP1	PCI bus type setting
JP2	Reserved (2-3 must short)
JP7	CPU FSB Frequency selection

Table 1.2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN5	Auxiliary ATX12 V power input
CN6	USB 0, 1 port
CN7	VGA connector
CN8	LAN1
CN9	Serial port: COM1
CN10	Serial port: COM2
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN14	CPU FAN connector
CN16	Power LED
CN17	External speaker
CN18	Reset connector
CN19	HDD LED connector
CN20	ATX feature connector
CN21	ATX soft power switch
CN22	HW Monitor Alarm (No Use)
CN26	USB 2,3 port
CN29	SM BUS Connector

Table 1.2: Connectors

CN33	Auxiliary 4-pin power input
CN34	LAN2
CN35	System Fan
CN40	PCI-X daughter board connector for SCSI & LAN
CN50	Ultra 320 SCSI 1
CN51	Ultra 320 SCSI 2

1.5 Board Layout: Jumper and Connector Locations

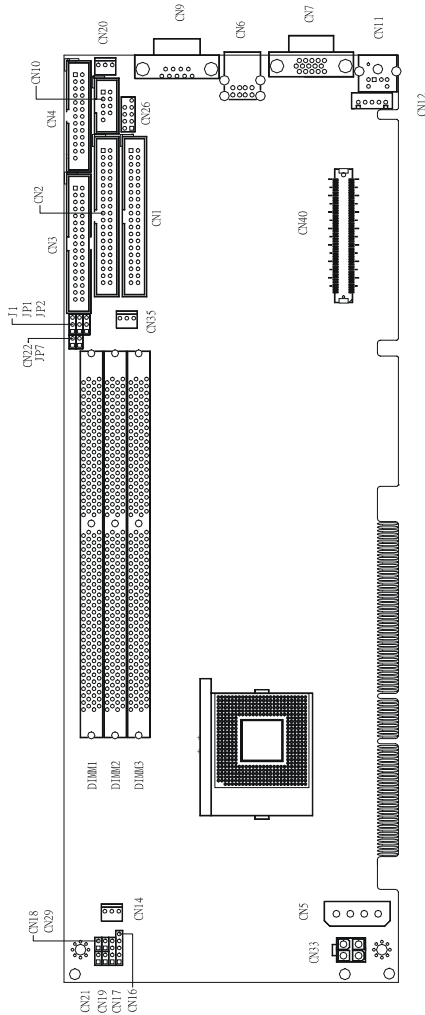


Figure 1.1: Jumper and connector locations

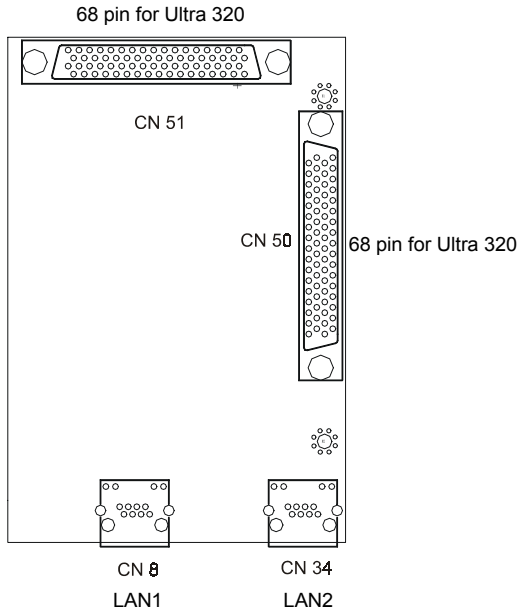


Figure 1.2: Daughter board layout

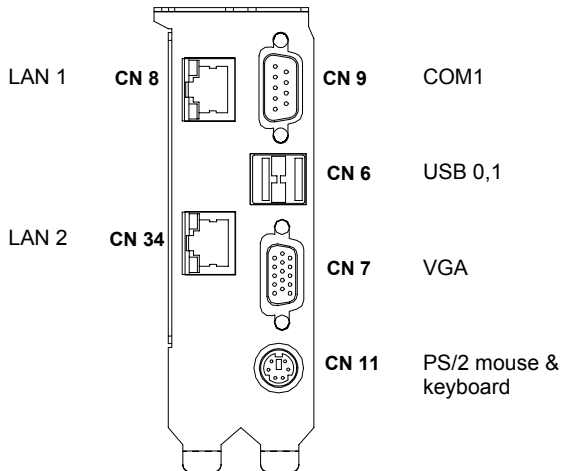


Figure 1.3: Daughter board extension I/Os

Notes:

Note 1: Shall any incompatibility occur when using add-on cards running at 66MHz PCI or 66 MHz PCI-X, please lower down the PCI bus frequency to 33MHz by setting jumpers on the backplane. You can find how to set the jumpers on the User's Note of the backplane.

Note 2: Due to the limitation of the GC-SL chipset, the PCI slot with ID select=AD31 on backplanes will not work.

Note 3: The PCA-6185 does not support "Wake-on-LAN" feature.

Note 4: The PCA-6185 supports 66MHz PCI-X operation when it is used with PCI-X compatible add-on cards and backplanes. The PCA-6106P3VX-A1 and PCA-6103P2VX-A1 support PCI-X operation.

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

1.7.1 How to set jumpers

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

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

1.7.2 CMOS clear (J1)

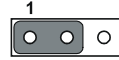
The PCA-6185 CPU card contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J1 to 2-3

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.

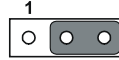
Table 1.3: CMOS clear (J1)

Function Jumper setting

* Keep CMOS data 1-2 closed



Clear CMOS data 2-3 closed



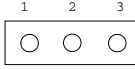


* default setting

1.7.3 PCI bus type setting selection

The PCA-6185 CPU card contains a jumper that can set PCI bus type for 33/66 PCI bus or PCI-X, that's depending on add-on cards or backplane setting.

Table 1.4: PCI bus type setting selection



Function	Jumper setting	
*PCI only, 33 or 66 MHz depending on add-on cards or backplane setting	1-2 closed	
PCI-X enabled, PCI/PCI-X mode depending on add-on cards or backplane setting. Up to 66 MHz only	2-3 closed	
PCI-X 100 MHz (Depending on backplane and add-on cards)	None	

* default setting

1.7.4 CPU FSB Frequency setting

The PCA-6185 CPU card contains a jumper that can set CPU FSB frequency on 533 MHz or 400 MHz.

Table 1.5: CPU FSB Frequency setting

Function	Jumper setting	
*533 MHz	1-2 closed	
400MHz	None	

* default setting

1.8 System Memory

The top-left edge of the PCA-6185 contains three sockets for 184-pin dual inline memory modules (DIMMs). All these sockets accept only 3.3 V registered DDR SDRAM. Registered DIMMs are available in capacities of 128, 256, 512, 1024 or 2048 MB. The sockets can be filled in any combination with DIMMs of any size, giving your PCA-6185 single board computer up to 4 GB of memory.

1.8.1 Sample calculation: DIMM memory capacity

Suppose you install a 128 MB DIMM into your PCA-6185's socket 1 and a 256 MB DIMM into sockets 2 and 3. Your total system memory is 640 MB, calculated as follows:

Table 1.6: DIMM memory capacity sample calculation

Socket number	184-pin DIMM memory	Total memory
1	128 MB x 1	128 MB
2	256 MB x 1	256 MB
3	256 MB x 1	256 MB

Total memory: 640 MB

1.8.2 Supplementary information about DIMMs

Your PCA-6185 can accept only registered DDR SDRAM memory modules. The register on the memory module secures reliable operation of high memory capacity under high speed. Also note:

- Please use only DDR compliant registered DIMMS.
 - Most systems will not even boot if non-compliant modules are used. This is due to strict timing issues involved at this speed.
- You can find two or three additional register ICs on a registered SDRAM. These ICs are relatively smaller than the SDRAM ICs.
- Registered SDRAM are usually with ECC function. Modules with 9 or 18 SDRAM chips support ECC; modules with 8 or 16 SDRAM chips do not support ECC.

1.9 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have

automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

1.10 Cache Memory

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

1.11 CPU Installation

The PCA-6185 provides socket 478 for an Intel® Pentium® 4 processor. The CPU on the board must have a fan or heat sink attached, to prevent overheating.

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



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

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

1.12 RAM Module Approval List

Module Vendor	Module Part No.	Chips	Memory Size
Apacer	77.10312.460	Samsung K4H280838C-TCB0	128M Bytes
Apacer	77.10212.460	Samsung K4H280838C-TCB0	256M Bytes
Apacer	77.10712.460	Samsung K4H560838C-TCB0	512M Bytes
Apacer	77.11243.472	Samsung K4H560438D-TCB0	1G Bytes
Apacer	77.11443.462	Samsung K4H510438M-TCB0	2G Bytes
Apacer	77.10609.112	Infineon HYB25D256800BT-7B	256M Bytes
Apacer	77.10709.110	Infineon HYB25D256800AT-7A	512M Bytes
SMART	SM3272RDDR301	NANYA NT5DS16M8AT-7K	256M Bytes
SMART	SM6472RDDR301	NANYA NT5DS32M8AT-7K	512M Bytes
ATP	AB28L72N4SMB0S	Samsung K4H560438B-TCB0	1G Bytes
Kingston	KVR266X72RC25/2G	M2S12D20TP-75	2G Bytes

1.13 Gigabit LAN Card Approval List

Card Vendor	Card Part No.	Chip Part No.
Intel	PWLA8490T	TL82543GC
3COM	3C996-T	BCM5700TKPB
Broadcom	BCM95701A10	BCM5701KHB
Broadcom	BCM95703A30U	BCM5703CKHB
Broadcom	BCM95704CA40	BCM5704CKRB

1.14 Raid Card Approval List

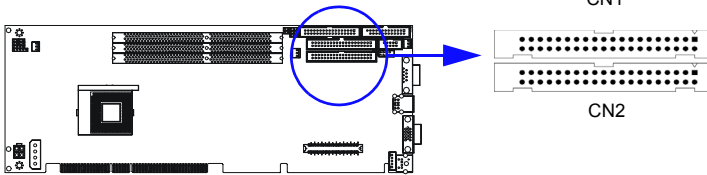
Card Vendor	Card Part No.	Speed type.
Adaptec (Dual channel / Ultra-160)	SCSI RAID 3000S	PCI64 bits / 66MHz
Mylex (Dual channel / Ultra-160)	AccleRAID 352	PCI64 bits / 66MHz
Mylex (Single channel / Ultra-160)	AccleRAID 170	PCI32 bits / 33MHz

Connecting Peripherals

This chapter tells how to connect peripherals, switches, and indicators to the PCA-6185 board.

Chapter 2 Connecting Peripherals

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



You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6185's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

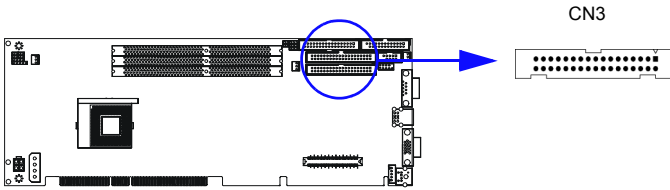
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the CPU card. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

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

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

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

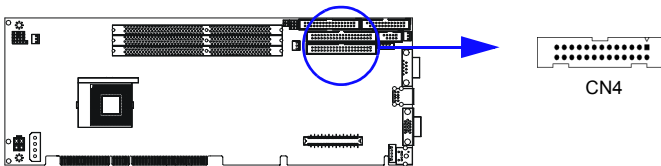
2.2 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6185's onboard connector. 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.

2.3 Parallel Port (CN4)

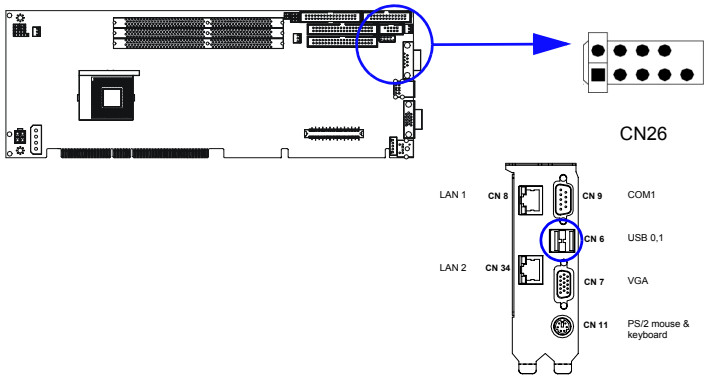


The parallel port is normally used to connect the CPU card to a printer. The PCA-6185 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the

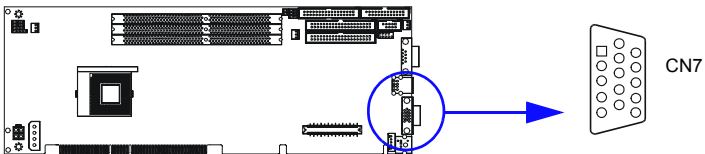
plate. Next, attach the flat-cable connector to CN4 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN4. Pin 1 is on the upper right side of CN4.

2.4 USB Ports (CN6/CN26)



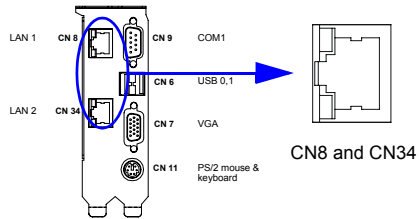
There is one onboard USB pin head is available, CN26. The adapter cable has 10-pin connector on one end and a USB connector on the bracket. Please contact with Advantech if USB cable is needed. In addition, there are two USB ports accessible from the rear I/O expansion ports. The USB interface can be disabled in the system BIOS setup.

2.5 VGA Connector (CN7)



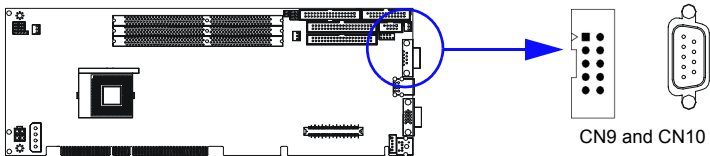
The PCA-6185 includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.6 10/100/1000Base-T Ethernet (CN8 and CN34)



The PCA-6185 is equipped with one high-performance 64-bit PCI-bus Ethernet interface, which are fully compliant with IEEE 802.3/u 10/100/1000 Mbps CSMA/CD standards. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 10/100/1000Base-T RJ-45 operation.

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



The PCA-6185 offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

Table 2.1: Serial port connections (COM1, COM2)

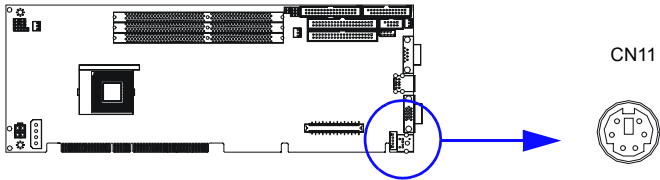
Connector	Ports	Address	Interrupt
CN9	COM1	3F8*3E8	IRQ4
CN10	COM2	2F8*2E8	IRQ3

* default settings

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

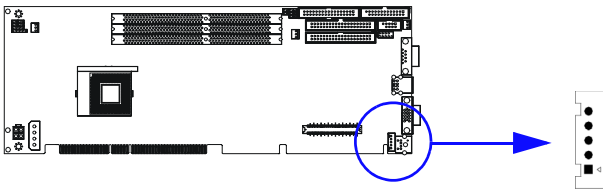
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse Connectors (CN11)



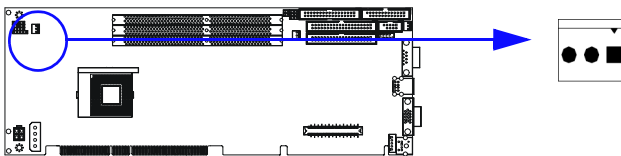
The 6-pin mini-DIN connectors (CN11) on the card mounting bracket provides connection to a PS/2 keyboard and a PS/2 mouse, by using the adapter cable (P/N: 1700060202, available from Advantech.)

2.9 External Keyboard Connector (CN12)



In addition to the PS/2 mouse/keyboard connector on the PCA-6185's ear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

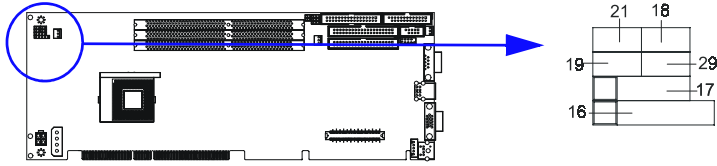
2.10 CPU Fan Connector (CN14)



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

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

There are several external switches to monitor and control the PCA-6185.



2.11.1 Power LED (CN16)

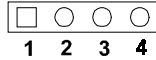
CN16 is a 5-pin connector for the power on LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.2: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	On	On

2.11.2 External speaker (CN17)

CN17 is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6185 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed



2.11.3 Reset (CN18)

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



2.11.4 HDD LED (CN19)

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



2.11.5 SM Bus Connector (CN29)

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

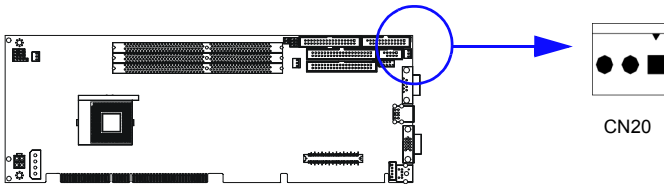
CN23 can be connected to CN3 or CN6 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin2 to pin 2 on both ends of cable.

2.11.6 Connecting to SNMP-1000 remote manager

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



2.11.7 ATX Power Control Connectors (CN20 and 21)




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

The PCA-6185 can support an advanced soft power switch function if an ATX power supply is used. To enable the soft power switch function:

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

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

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



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

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

2.11.9 Controlling the soft power switch

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

CHAPTER 3

Award BIOS Setup

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

Chapter 3 Award BIOS Setup

3.1 Introduction

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

3.2 Entering Setup

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

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

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



Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

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

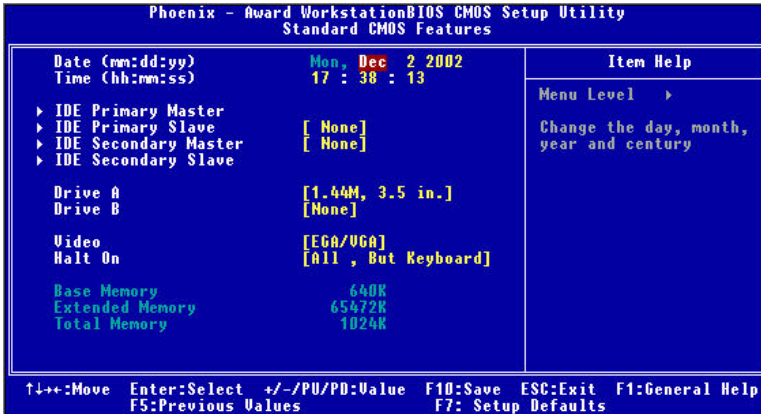


Figure 3.2: Standard CMOS features screen

3.3.1 CMOS RAM backup

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

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

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

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the PCA-6185 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen.

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

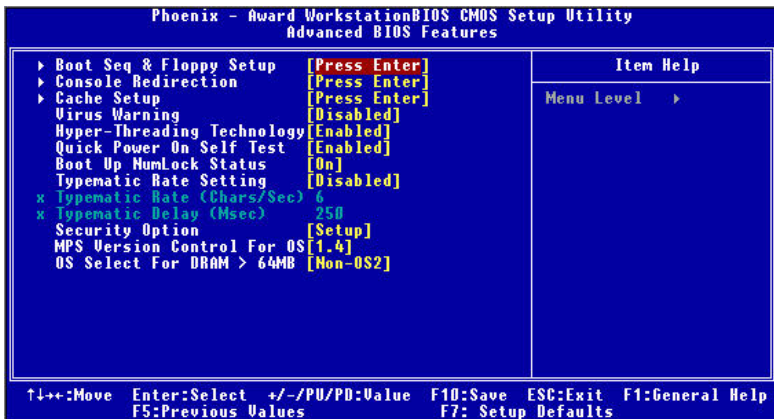


Figure 3.3: Advanced BIOS features screen

3.4.1 Virus Warning

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

3.4.2 CPU Internal Cache / External Cache

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

3.4.3 CPU L2 Cache ECC Checking

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

3.4.4 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected.

Choices are: Floppy, LS/ZIP, HDD, SCSI, CDROM, LAN, Disabled.

3.4.5 Swap Floppy Drive

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

3.4.6 Boot UP Floppy Seek

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

3.4.7 Boot Up NumLock Status

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

3.4.8 Gate A20 Option

NormalThe A20 signal is controlled by the keyboard controller.

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

3.4.9 Typematic Rate Setting

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

3.4.10 Typematic Rate (Chars/Sec)

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

3.4.11 Typematic Delay (msec)

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

3.4.12 Security Option

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

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

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

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

3.4.13 OS Select for DRAM > 64MB

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

3.4.14 Video BIOS Shadow

Enable copies video BIOS to shadow RAM for performance improving. Choices are Enable, Disable.

3.4.15 EPA Logo Show

Energy Star Log from Environmental Protection Agency. Choices are: Enable, Disable.

3.5 Advanced Chipset Features

By choosing the “Advanced Chipset Features” option from the “Initial Setup Screen” menu, the screen below will be displayed. This sample screen contains the manufacturer’s default values for the PCA-6185, as shown in Figure 3-4:

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

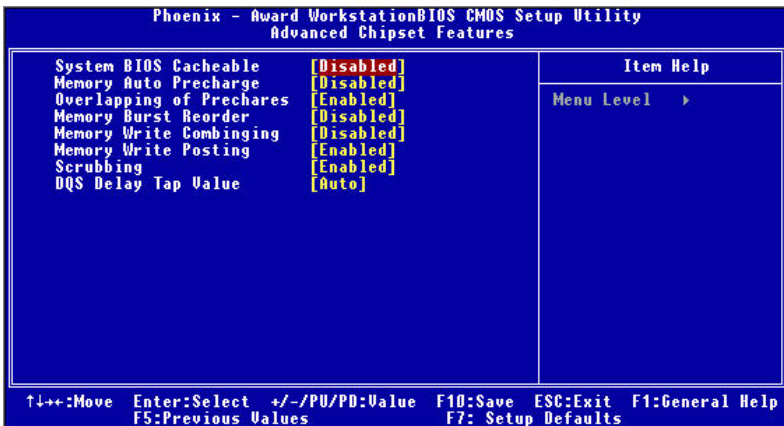


Figure 3.4: Advanced chipset features screen

3.5.1 System BIOS Cacheable

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

3.5.2 Video BIOS Cacheable

Select Enabled allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

3.5.3 ISA IO Cycle Delay

This item allows you to select between three methods of memory error checking, Auto, Enabled and Disabled

3.6 Integrated Peripherals

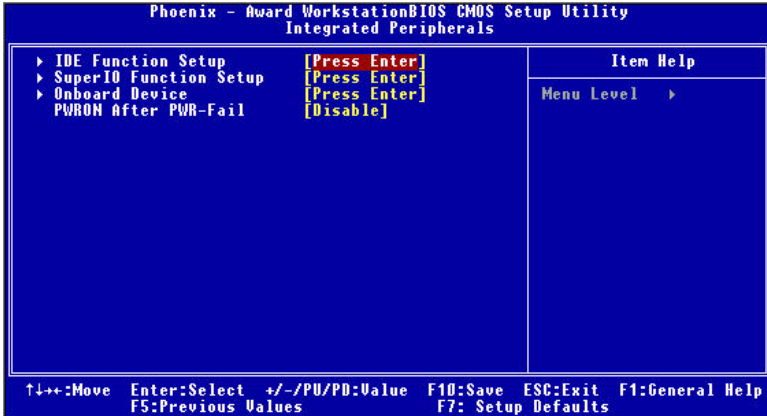


Figure 3.5: Integrated peripherals

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 Prim/Secondary Master/Slave PIO/UDMA Mode

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

3.6.3 USB Controller

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

3.6.4 USB Keyboard Support

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

3.6.5 Onboard FDC Controller

When 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.

3.6.6 Onboard Serial Port 1 (3F8H/IRQ4)

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

3.6.7 Onboard Serial Port 2 (2F8H/IRQ3)

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

3.6.8 Onboard Parallel Port (378H/IRQ7)

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

3.6.9 Parallel Port Mode (ECP + EPP)

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

3.6.10 ECP Mode Use DMA

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

3.7 Power Management Setup

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

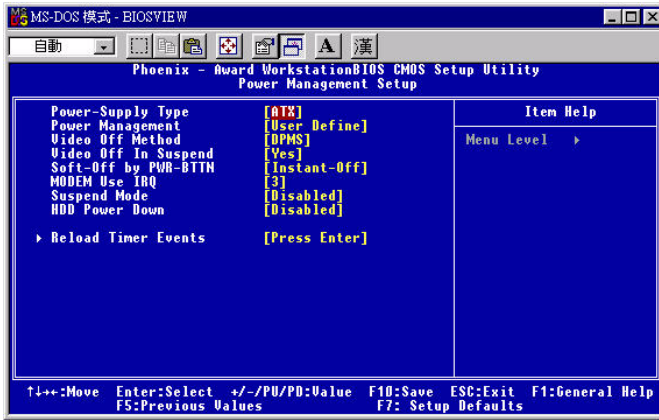


Figure 3.6: Power management setup screen

3.7.1 Power-supply Type

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

3.7.2 ACPI function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The choice: Enabled, Disabled.

3.7.3 Power Management

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

1. HDD Power Down
2. Suspend Mode

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

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

3.7.4 Video Off In Suspend

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

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

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

3.7.5 MODEM Use IRQ

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

3.7.6 Soft-Off by PWRBTN

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

3.7.7 PWRON After PWR-Fail

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

3.8 PnP/PCI Configurations

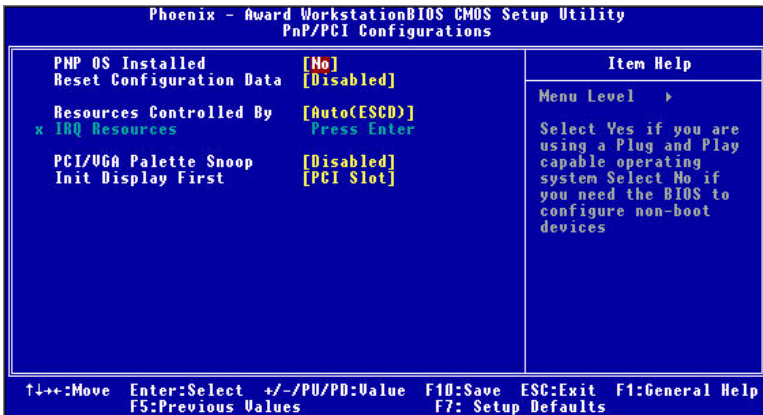


Figure 3.7: PnP/PCI configurations screen

3.8.1 PnP OS Installed

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

3.8.2 Reset Configuration Data

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

3.8.3 Resources controlled by:

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

3.9 PC Health Status

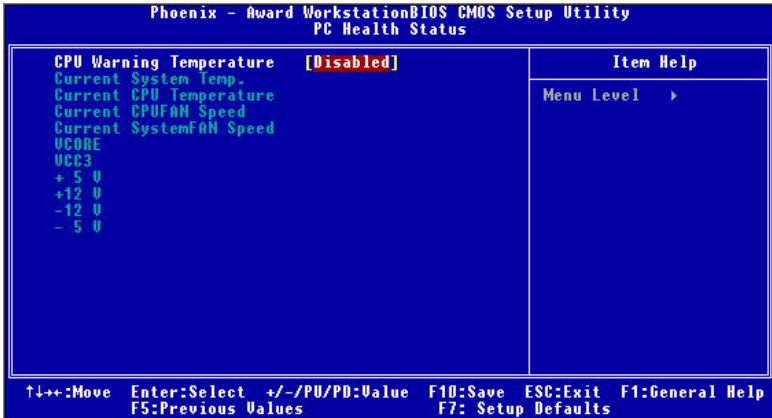


Figure 3.8: PC health status screen

3.9.1 Current System Temperature

This shows you the current system temperature

3.9.2 Current CPU Temperature

This shows you the current CPU speed.

3.9.3 Current CPU Fan Speed

This shows you the current CPU fan speed.

3.9.4 VCORE

This shows CPU core voltage.

3.9.5 VTT

CPU terminator voltage

3.9.6 VCC3/+5V/+12V/-12V/-5V

This shows you the voltage of +3.3V/ + 5V/ +12V

3.10 Load Setup Defaults

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

3.11 Password Setting

To change the password:

1. Choose the “Set Password” option from the “Initial Setup Screen” menu and press <Enter>.


The screen will display the following message:



Please Enter Your Password

Press <Enter>.

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



Please Confirm Your Password

Enter the current password and press <Enter>.

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

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

3.12 Save & Exit Setup

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

3.13 Exit Without Saving

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

PCI SVGA Setup

The PCA-6185 features an onboard PCI VGA interface. This chapter provides instructions for installing and operating the software drivers on the display driver CD included in your package.

Chapter 4 PCI SVGA Setup

4.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The enhanced display drivers for the PCA-6185 board are located on the software installation CD. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers.

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

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

4.2 Features

- Built-in ATI 3D RAGE XL multimedia accelerator
- Superior 3D performance achieved through a floating point setup engine rated at 1.2 million triangles/sec
- Integrated 230 MHz DAC allows 85 Hz refresh at 1600 x 1200 resolution
- Complete local language support
- Power management for full VESA DPMS and EPA Energy Star compliance
- User-friendly installation for Windows 2000 and Windows NT
- 8 MB SDRAM frame buffer interface with 800 MB/sec bus bandwidth

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

4.3 VGA Installation

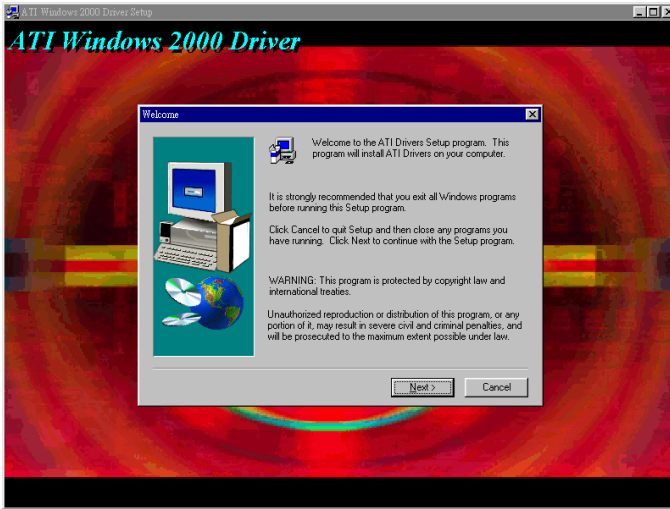
First, insert CD drive. Then follow the Icons for your PCA Series model number.

Click on the right driver for the auto-installation. Below take Windows 2000 as an example.

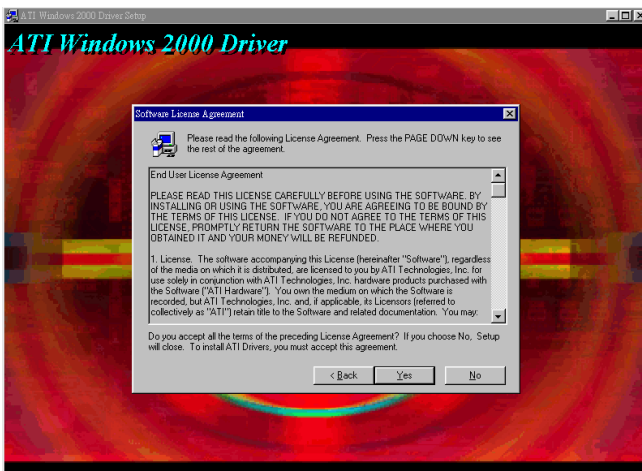


Click on "WIN2000", the VGA driver will start installation automatically.

You will see the welcome window and ask you to exit all Windows programs. Click on "Next" to continue.



In the license window, click on "Yes" to continue.



Click on "Yes".

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

LAN Configuration

The PCA-6185 features single or dual 10/100/1000Base-T Ethernet LAN interface. This chapter gives detailed information on Ethernet configuration. It shows you how to configure the card to match your application requirements.

Chapter 5 LAN Configuration

5.1 Introduction

The PCA-6185 features single or dual 64-bit gigabit Ethernet networking interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling with RJ-45 connectors for both 10 Mbps, 100 Mbps, and 1000 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

5.2 Features

- Broadcom® 5703 or 5704 Ethernet LAN controller (fully integrated 10Base-T/100/1000Base-TX)
- Supports Wake-on-LAN remote control function
- PCI Bus Master complies with PCI Rev. 2.2
- MAC & PHY (10/100/1000 Mbps) interfaces
- Complies to IEEE 802.3 10Base-T, IEEE 802.3u 100Base-T interfaces, and IEEE 802.3 1000Base-T interfaces
- Single or dual RJ-45 connector gives auto-detection of 10 Mbps, 100 or 1000 Mbps network data transfer rates and connected cable types
- 64-bit Bus Master technology complies with PCI Rev. 2.2

5.3 Driver Installation

The PCA-6185's Ethernet interface supports all major network operating systems.

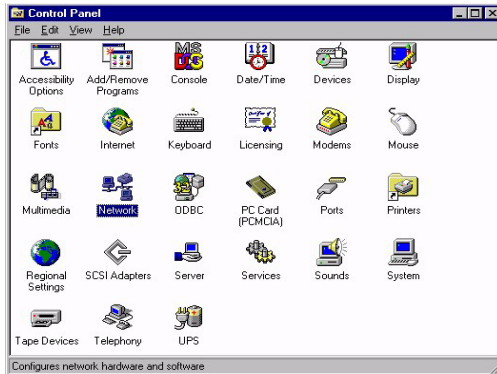
The BIOS automatically detects the LAN while booting, and assigns an IRQ level and I/O address. No jumpers or switches are required for user configuration.

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

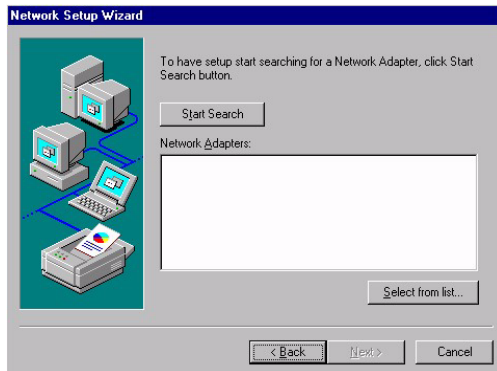
5.4 Windows NT Drivers (Broadcom 5703/4) Procedure

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

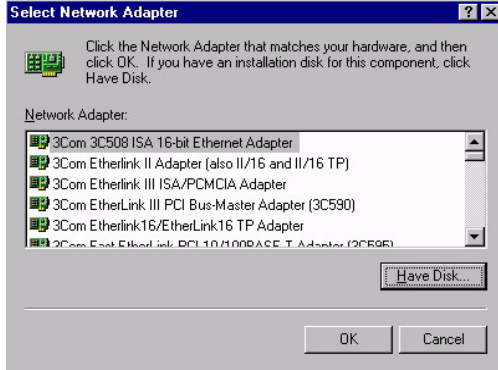
1. In the "Windows NT" screen, click on "Start" and select "Settings". Then click on the "Control Panel" icon to select "Net-work".



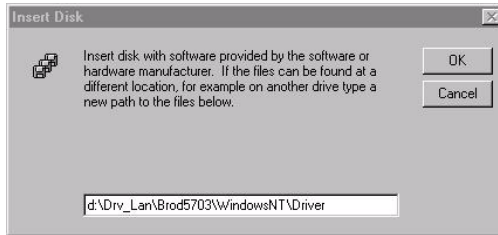
2. In the "Network" window, select the "Adapters" tab. Then click on "Add...".



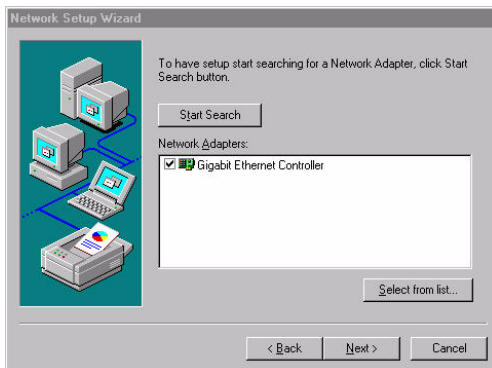
3. In the "Select Network Adapter" window, click on "Have Disk...".



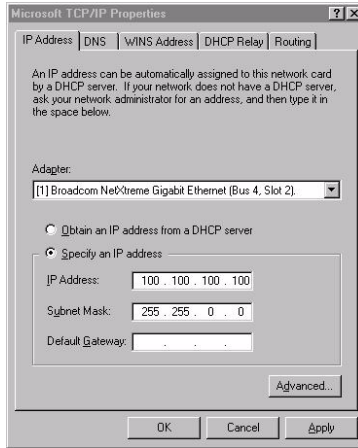
4. When the "Insert Disk" window appears, insert the utility CD into the CD-ROM drive. The correct file path is D:\Drv_Lan\BROD5703(4)\WindowsNT\Driver. When you have the correct file path, click on "OK".



5. In the "Network" window, select the "Adapters" tab. Under "Network Adapters:", highlight "Gigabit Ethernet Controller". Then click on "Close".



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



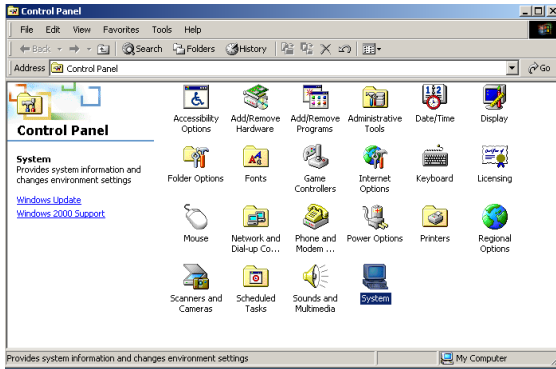
- In the "Network Settings Change" window, click on "Yes" to restart the computer.



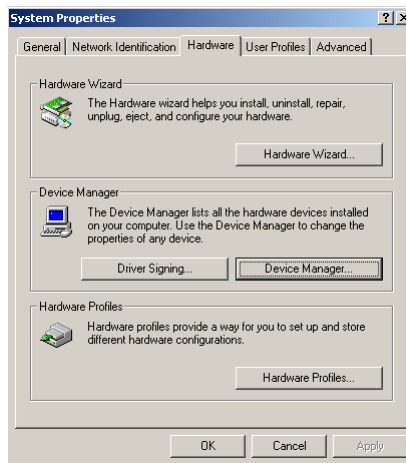
5.5 Windows 2000 Drivers (Broadcom 5703/4) Procedure

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

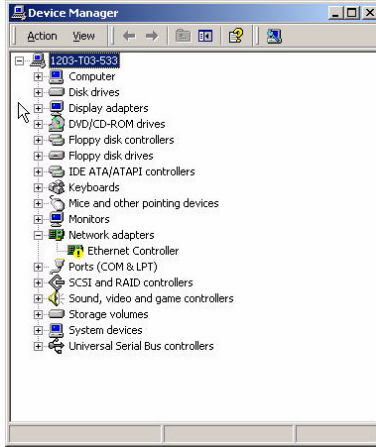
1. In the "Windows 2000" screen, click on " Start" and select " settings". Then click on the " Control Panel" icon to select "system".



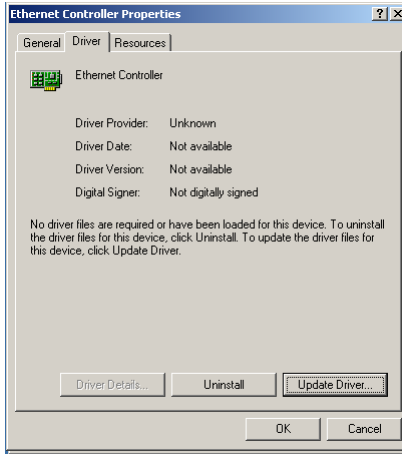
2. In the " System Properties" window, select the " Device Manager".



3. In "Device Manager" screen, follow the screen instructions, to click on "Properties".



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



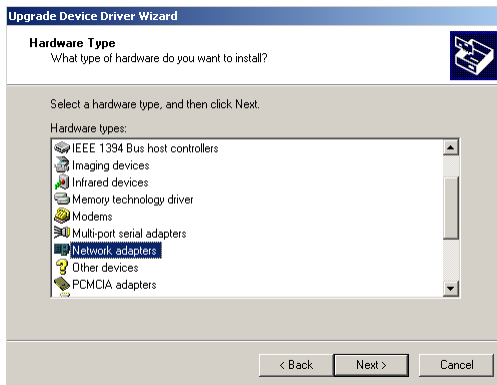
5. Click on "Next".



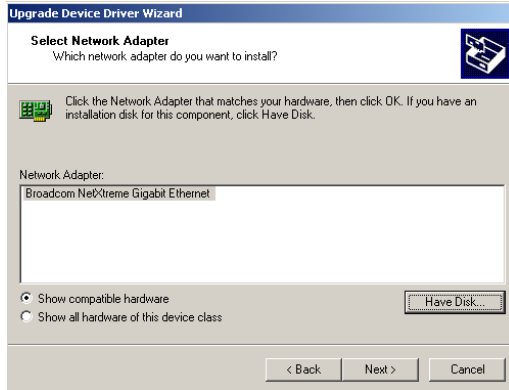
6. Following the highlighted item, and click on "Next".



7. Select "Network adapter" and then click Next



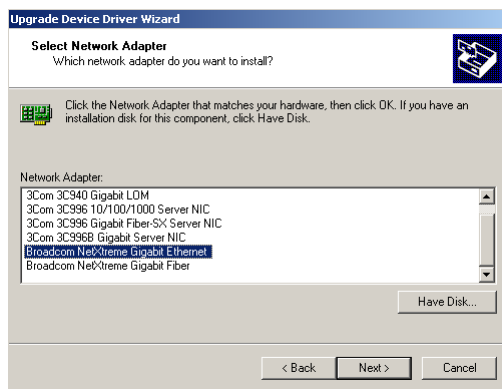
8. Click on "Have Disk".



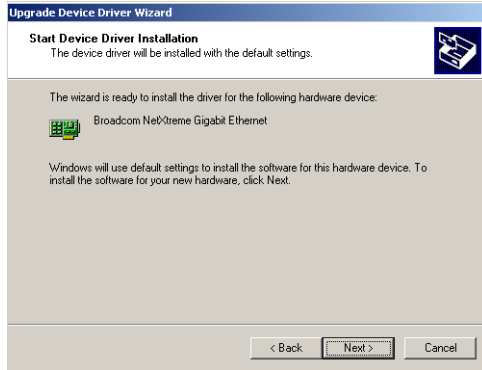
9. Key in "D:\Drv_)Lan\BROD5703(4)\Windows2000\Driver", then click on "OK".



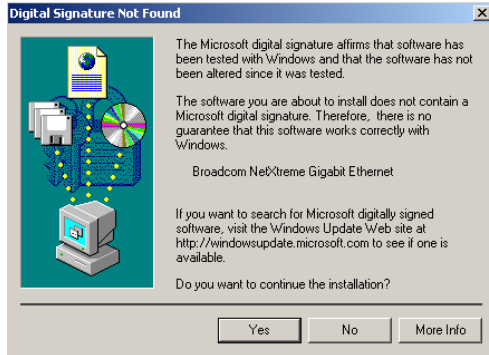
10. To highlight the following item, and click "Next".



11. Click "Next".



12. Press Yes to continue the installation



13. Click "Finish" to complete the installation



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-6185 package.

Chapter 6 Onboard Security Setup

6.1 Introduction

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

The PCA-6185 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.
- Termination voltage from CPU to chipset: typically 1.5 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.

The negative system voltage sets which can be monitored include:

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

6.2 Installation

The following sections, refer to the one that provides driver setup procedure for the operating system you are using.

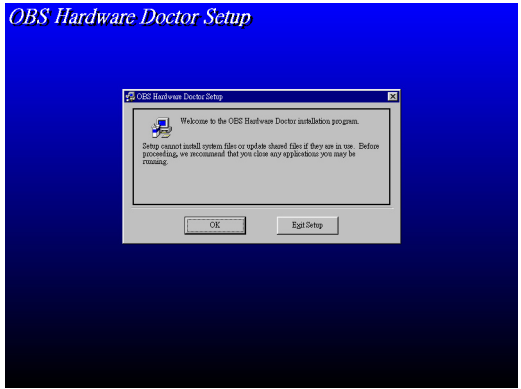
6.3 Windows 9x/2000 Drivers Setup Procedure

Windows 9x/2000 Drivers Setup Procedure

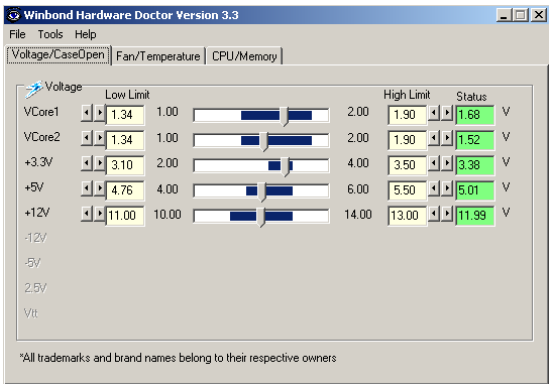
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "WIN 9X" button under the "OBS DRIVERS" heading.



2. Click on OK to install OBS driver



3. After the setup is completed. You can view OBS setting by running this utility.
4. It is recommended that you load the default values for all OBS settings. However, if desired, you can establish new conditions for voltage, fan speed, and temperature



SCSI Setup

The PCA-6185 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 7 SCSI Setup

7.1 Introduction

The PCA-6185 is equipped with an Adaptec AIC-7902 single-chip PCI-to-SCSI host adapter which provides a dual channel Ultra 320 multitasking interface between your computer's PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.). Ultra 320 is a new generation of SCSI technology that expands SCSI performance from 80 MBytes/sec to 320 MBytes/sec. Up to a total of 15 SCSI devices can be connected to each of the SCSI connectors.

The AIC-7902 combines this Ultra 320 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 320 SCSI devices to operate at the higher 320 MBytes/sec rate.

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

Note: If any peripheral is running at SE mode, the Ultra 320 SCSI segment will run at speeds up to 40 MBytes/sec only instead of 320 MBytes/sec.

7.2 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.

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

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

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

7.4 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 320 and Ultra 2 SCSI devices come from the factory with termination disabled and cannot be changed. Proper termination for internal Ultra 320 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 320 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 swetich on the back of the SCSI device.
- The last external Ultra 320 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.

7.5 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 sys-*

tems. 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 Enabled Disabled	Automatic
SE Connectors	Automatic Low On/High On Low Off/High Off Low Off/High On	Automatic
Boot Device Options:		
Boot SCSI ID	0-15	0
Boot LUN Number1	0-7	0

SCSISelect Options	Available Settings	Default Setting
SCSI Device Configuration:		
Sync Transfer Rate (MBytes/sec)	320, 160, 80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0	320
	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) Yes, No	N/C (No Change)
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

Host Adapter BIOS	Enabled	Enabled
	Disabled : Not Scan	
	Disabled: Scan Bus	
Domain Validation2	Enabled, Disabled	Enabled
Support Removable Disks Under	Disabled	Disabled
BIOS as Fixed Disks2	Boot Only, All Disks	
BIOS Support for Bootable CD_ROM2	Enabled, Disabled	Enabled
BIOS Support for Int 13 Extensions2	Enabled, Disabled	Enabled
1	Setting is valid only if Multiple LUN Support is enabled.	
2	Settings are valid only if host adapter BIOS is enabled.	

7.6 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.)
2. 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.

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

Boot Device Options

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

SCSI Device Configuration

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

Note: To configure settings for a SCSI device, you must know its SCSI ID

- **Sync Transfer Rate-(Default: 320)** Determines the maximum synchronous data transfer rate that the SCSI card supports. Use the maximum value of 320 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 or 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 larger 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

- 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.

7.8 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 IDs and the devices assigned to each ID.
2. Use the arrow keys to move the cursor to a specific ID and device, then press Enter.
3. A small menu appears, displaying the options Format Disk and Verify Disk Media.

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

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

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

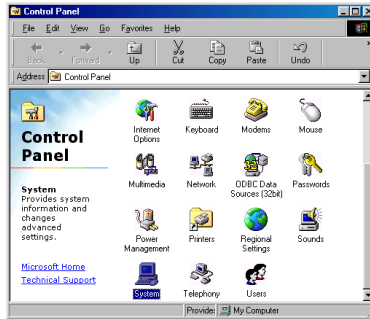
7.9 Installation under Windows NT/Windows 2000

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

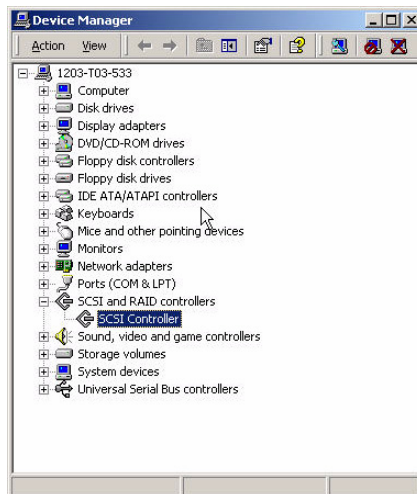
1. Insert Windows NT/Windows 2000 CD Disk.
2. Press F6 immediately when it displays: “Set up is inspecting your computer’s hardware configuration.”
3. Then it enter SCSI installation. Please insert SCSI driver floppy disk.

7.10 Windows 2000 Driver setup procedure

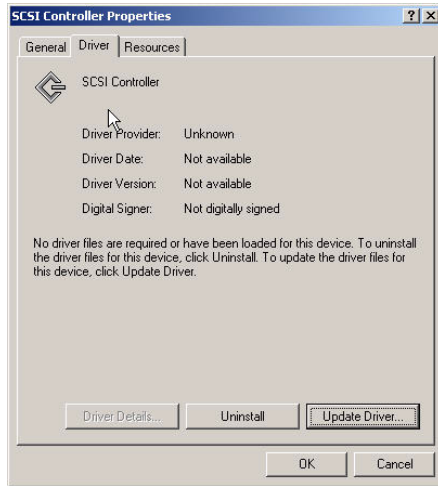
1. In the window 2000 screen, click on “start” and select “setting.” Then click on the “Control Panel” icon to select “System”



2. In the “System properties”, choose “PCI SCSI Bus Controller.” Then click on “Properties”



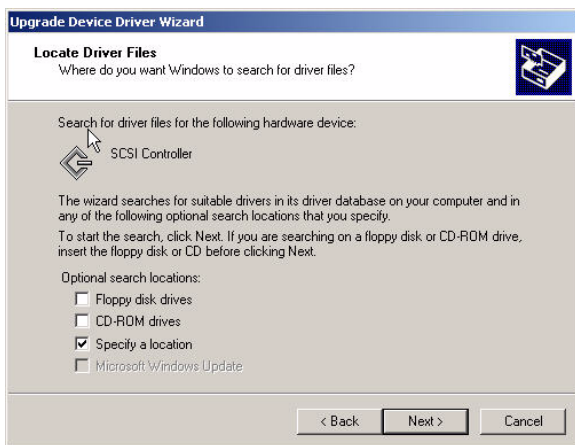
3. Click on “Update Driver”



4. Click on “Next”



5. Recommend to search for a better driver



6. If the SCSI driver is supplied in floppy disk, click on “Floppy disk drives.” Then, click on “Next.” If the SCSI driver is supplied in CD-ROM disk, click on “Specify a location:” then enter "D:\Drv_SCSI\Adaptec7902\Windows\Win2000"



7. The installation is completed. Click on “Finish.”



8. Click on “Yes” to restart the system.

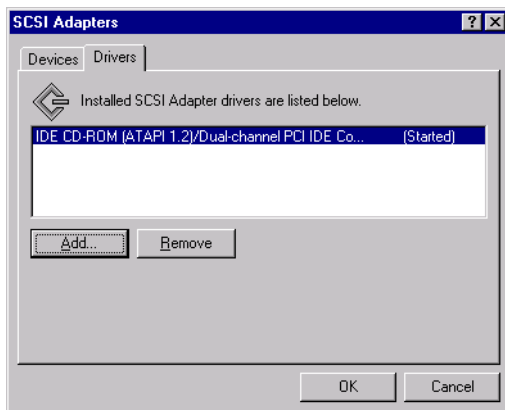


7.11 Windows NT Driver Setup Procedure

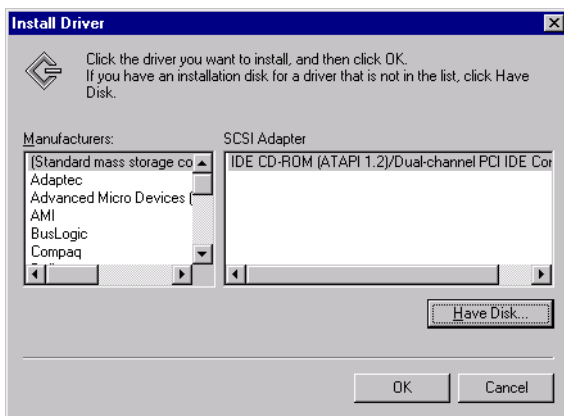
1. In the Windows NT screen, click on “Start” and select “Setting.” Then click on the “Control Panel” icon to select “SCSI Adapter.”



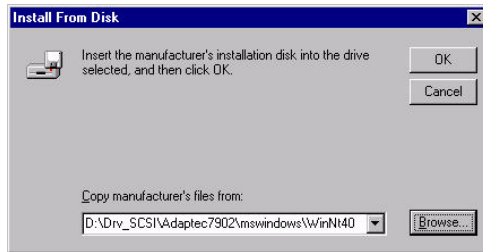
2. In the SCSI Adapter, choose “Drivers.” Click on “Add” to install SCSI driver.



3. Click on “Have Disk.”

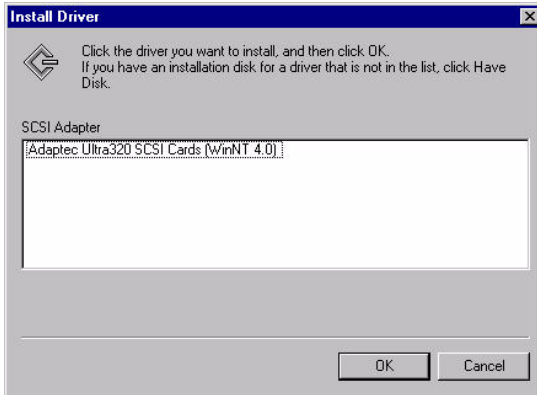
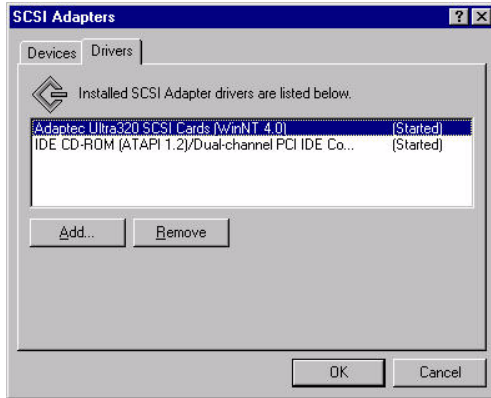


4. Click on “Browse” to select the drivers. If the SCSI driver is supplied in floppy disk, choose the directory A:\.



5. Click the SCSI driver, and then click “OK.”

6. The installation of SCSI Driver is completed. Click on “OK.”



Programming the Watchdog Timer

The PPC-123 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

To program the watchdog timer, you must write a program which writes I/O port address 444 (hex). The output data is a time interval value. The value range is from 01 (hex) to 3E (hex), and the related time interval is from 1 sec. to 62 sec.

Data Time Interval

01 1 sec.

02 2 sec.

03 3 sec.

04 4 sec.

• •

• •

• •

3E 62 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 444 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 43 (hex).

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

```
10  REM Watchdog timer example program
20  OUT &H444, data REM Start and restart the watchdog
30  GOSUB 1000 REM Your application task #1,
40  OUT &H444, data REM Reset the timer
50  GOSUB 2000 REM Your application task #2,
60  OUT &H444, data REM Reset the timer
70  X=INP (&H43) REM, Disable the watchdog timer
80  END

1000 REM Subroutine #1, your application task
.      .
.      .
.      .

1070 RETURN

2000 REM Subroutine #2, your application task
.      .
.      .
.      .

2090 RETURN
```


Appendix

B

Pin Assignments

Appendix B Pin Assignments

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

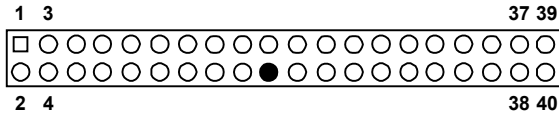


Table B.1: IDE hard drive connector (CN1, CN2)

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
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)

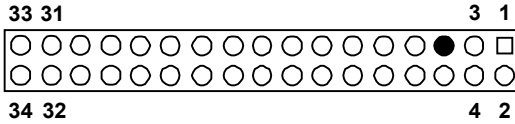


Table B.2: Floppy drive connector (CN3)

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)

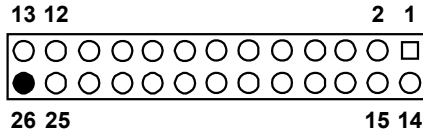


Table B.3: Parallel port connector (CN4)

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)

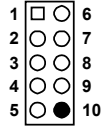


Table B.4: USB1/USB2 connector (CN6)

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)

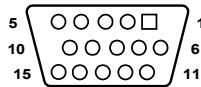


Table B.5: VGA connector (CN7)

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
8	GND		

B.6 Keyboard and Mouse Connector (CN11)

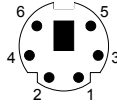


Table B.6: Keyboard and mouse connector (CN11)

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

B.7 External Keyboard Connector (CN12)



Table B.7: External keyboard connector (CN12)

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

B.8 IR Connector (CN13)

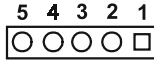


Table B.8: IR connector (CN13)

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

B.9 CPU Fan Power Connector (CN14)

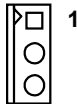


Table B.9: CPU fan power connector (CN14)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.10 Power LED (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.

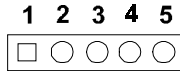


Table B.10: Power LED (CN16)

Pin	Function
1	LED power (+5 V)
2	NC
3	GND
4	N/A
5	GND

B.11 External Speaker Connector (CN17)

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

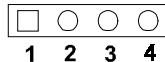


Table B.11: External speaker (CN17)

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

B.12 Reset Connector (CN18)



Table B.12: Reset connector (CN18)

Pin	Signal
1	RESET
2	GND

B.13 HDD LED Connector (CN19)



Table B.13: HDD LED connector (CN19)

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

B.14 ATX Feature Connector (CN20)



Table B.14: ATX feature connector (CN20)

Pin	Signal
1	PS-ON
2	VCC
3	VCCSB

B.15 ATX Soft Power Switch (CN21)



Table B.15: ATX soft power switch (CN21)

Pin	Signal
1	3VSB
2	PWR-BTN

B.16 Extension I/O Board Connector (CN27)

Table B.16: 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

B.17 Extension I/O Board Connector (CN28)

Table B.17: 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.18 SM Bus Connector (CN29)



Table B.18: SM Bus connector (CN29)

Pin	Signal
1	SMB_CLK
2	SMB_DATA

B.19 System I/O Ports

Table B.19: System I/O ports

Addr. Range (HEX)	Device
000 00F	Direct memory access controller
000 03A	PCI Bus
010 01F	Motherboard resources
020 021	Programmable interrupt controller
022 03F	Motherboard resources
040 043	System timer
044 05F	Motherboard resources
060 060	Standard 101/102 key or Microsoft Natural PS/2
061 061	System speaker
062 063	Motherboard resources
064 064	Standard 101/102 key or Microsoft Natural PS/2
065 06F	Motherboard resources
070 073	System CMOS/real time clock
074 07F	Motherboard resources
080 090	Direct memory access controller
091 093	Motherboard resources
094 09F	Direct memory access controller
0A0 0A1	Programmable interrupt controller
0A2 0BF	Motherboard resources
0C0 0DF	Direct memory access controller

0E0	0EF	Motherboard resources
0F0	0FF	Numeric data processor
170	177	Secondary IDE channel
1F0	1F7	Primary IDE channel
279	279	ISAPNP read data port
294	297	Motherboard resources
2F4	2F7	ISAPNP read data port
2F8	2FF	Communication port (COM2)
376	376	Secondary IDE channel
378	37F	Printer port (LTP1)
444		Watchdog Timer

B.20 DMA Channel Assignments

Table B.20: 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.21 Interrupt Assignments

Table B.21: Interrupt assignments

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

21 (PCI)	LAN 1 (Broadcom 5703 for PCA-6185VG, Broadcom 5704 for PCA-6185G2/F)
22 (PCI)	LAN 2, Broadcom 5704
23 (PCI)	Adaptec AIC-7902 Ultra320 SCSI
24 (PCI)	Adaptec AIC-7902 Ultra320 SCSI

B.22 1st MB Memory Map

Table B.22: 1st MB memory map

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

B.23 PCI Bus Map

Table B.23: PCI bus map

Function	AD_Select	PCI IRQ	GNT
Onboard LAN2	AD20 (CIOBX2)	SIRQ5 (CIOBX2)	SGNT0 (CIOBX2)
Onboard LAN1	AD20 (CIOBX2)	SIRQ6 (CIOBX2)	SGNT0 (CIOBX2)
Onboard VGA	AD19 (CSB5)	SIRQ4 (CSB5)	SGNT0 (CSB5)
SCSI	AD21 (CIOBX2)	SIRQ7, 8	SGNT1 (CIOBX2)
PCI slot 1	AD31	Not Supported	
PCI slot 2	AD30	PIRQ 2, 3, 0, 1	PGNT 2 (CIOBX2)
PCI slot 3	AD29	PIRQ3, 0, 1, 2	PGNT1 (CIOBX2)
PCI slot 4	AD28	PIQR 0, 1, 2, 3	PGNT0 (CIOBX2)