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PCA-6187

Full-sized PCI/ISA-bus socket 478 Pentium® 4/Celeron® processor-based CPU card

User's Manual

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1.0.1 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.

Table 1.1: PCA-6187 comparison table

Model	PCA-6187VE-00A1	PCA-6187VG-00A1	PCA-6187G2-00A1	PCA-6187F-00A1
VGA: Intel 865G integrated	Yes	Yes	Yes	Yes
USB 2.0 port	2	2	6	6
LAN 1: Intel 82562EZ 10/100Base-T	Yes	No	No	No
LAN 1: Intel 82547 10/100/1000Base-T	No	Yes	Yes	Yes
LAN 2: Intel 82541 10/100/1000Base-T	No	No	Yes	Yes
Dual Channel Ultra 160 SCSI: Adaptec 7899	No	No	No	Yes

1.0.2 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:

Step 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.

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

Step 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.

Step 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.

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

1.0.3 Initial Inspection

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

1 PCA-6187 Pentium® 4/Celeron® processor-based single board computer	
1 PCA-6187 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
2 Serial ATA HDD data cable	P/N: 1700071000
2 Serial ATA HDD power cable	P/N: 1703150102
1 ATX 12V power converter cable	P/N: 170304015K
1 Printer (parallel) port & COM port cable kit	P/N: 1700060305
1 Y cable for PS/2 keyboard and PS/2 mouse (only for V/VE/VG versions)	P/N: 1700060202
1 Two USB ports cable (optional)	P/N 1700100170

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

We have carefully inspected the PCA-6187 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-6187, 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.

1.0.4 Release Note

Date	Revision	Description
November 2003	1st. Edition	Initial Release

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CHAPTER 1

General Information

Chapter 1 Hardware Configuration

1.1 Introduction

The PCA-6187 Series all-in-one industrial grade single board computer is a high performance and full-featured computing engine. It follows the PICMG 1.0 specification and meets most requirements for industrial applications.

The PCA-6187 uses Intel's 865G chipset to support Intel's Socket 478 Pentium 4 and Celeron processor with 800/533/400 MHz front side bus. The dual channel DDR 400 SDRAM interface provides bottle neck free memory bandwidth up to 6.4GB/s. In addition to the two EIDE interfaces (up to four devices), it features a high performance serial ATA interface (up to 150MB/s) which eases cabling to hard drives in industrial chassis with thin and long cables. Other features include chipset built-in high performance VGA interface, dual Giga-bit Ethernet ports, dual channel Ultra 160 SCSI interface, six USB 2.0 ports (up to 480 Mbps), and other standard PC functions like two RS-232 serial ports, one enhanced parallel port and floppy disk interface.

The PCA-6187 Series offers several impressive industrial features such as: CMOS data backup, which is stored in the Flash memory, which protects data even after battery failure. Also included is a 256-level watchdog timer, which resets the CPU if a program cannot be executed normally. This enables reliable operation in unattended environments. The remote management interface enables the PCA-6187 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 Table 1.1 : Comparison table and Section 1.3: Specifications.

1.2 Features

1. **High performance:** The PCA-6187 uses Intel 865G chipset which offers high-bandwidth interfaces such as dual-channel DDR400 main memory, 800 MHz system bus, integrated graphics controller with Intel® Extreme Graphics 2 Technology, Intel® Communication Streaming Architecture featuring a Dedicated Network Bus (DNB) interface for Gigabit Ethernet (GbE) and Hi-Speed USB 2.0 connectivity to ensure the flexibility and performance you expect.
2. **Remote management:** System healthy status including CPU fan, CPU temperature and system voltages levels are monitored to ensure stable operation. A remote monitoring interface is reserved for remote management through Ethernet by using Advantech's SNMP-1000 system management module.
3. **BIOS CMOS backup and restore:** 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 harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, BIOS will check the data, and automatically restore the original data for booting.
4. **Supports Hyper-Threading :** This allows a single HT-enabled Pentium 4 processor to process two threads simultaneously. By building two logical processors into a single physical processor, the performance and utilization of the processor resource will both increase. Users can obtain a higher CPU performance while Hyper-Threading is enabled.

1.3 Specifications

1.3.1 System

- **CPU:** Intel® socket 478 Celeron® (Northwood) 2.0~2.6 GHz, Pentium® 4 (Northwood) up to 3.2 GHz, FSB 400/533/800 MHz; supports Intel Hyper-Threading technology
- **L2 Cache:** CPU built-in 128/256/512/1024 KB full-speed L2 cache
- **BIOS:** Award Flash BIOS (4Mb Flash Memory)
- **System Chipset:** Intel 865G with ICH5

- **SATA/EIDE hard disk drive interface:** Supports up to two independent Serial ATA hard drives (up to 150MB/s) and two IDE hard disk drives or four enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and ATA 33/66/100 (33/66/100MB/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 4GB in four 184-pin DIMM sockets. Supports dual channel DDR266/333/400 SDRAM

1.3.3 Input/Output

- **Bus interface:** PICMG 1.0 compliant PCI/ISA bus interface
- **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:** One 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on board keyboard pin header connector is also available
- **ISA bus:** Support ISA high drive. PCI-to-ISA bridge: ITE IT8888
- **AC-97 Audio:** PCA-6187 can provide audio function with the optional audio extension module PCA-AUDIO-00A1
- **USB port:** Supports up to six USB 2.0 and transmission rate up to 480Mbps; available on the I/O bracket (for dual layer versions) or through an optional two-USB-port cable kit (for single layer version), P/N : 1700100170

1.3.4 VGA interface

- **Controller:** Intel 865G chipset integrated
- **Display memory:** Share system memory up to 64 MB, BIOS selectable
- **Resolution:** up to 1800x1440 @ 85Hz

1.3.5 Ethernet LAN

- Supports single/dual 10/100Base-T networking or single/dual10/100/1000Base-T Ethernet networking
- **Controller:**
- Single 10/100Base-T: Intel 82562EZ
- Single 10/100/1000Base-T: Intel 82547GI (CSA)
- Dual 10/100/1000Base-T: Intel 82547GI (CSA) and Intel 82541GI (PCI)

1.3.6 Ultra 160 SCSI

- Provides dual channel Ultra 160 SCSI interface
- Chipset: Adaptec AIC7899

1.3.7 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels). You can find programming detail in Appendix A

1.3.8 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:6.53A, +12V:4.57A (Intel Pentium 4 3.0GHz with 800MHz FSB, 512MB DDR 400 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-6187 single board computer 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 single board computer.

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 4, 5
CN7	VGA connector
CN8	Ethernet connector 1
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

Table 1.2: Connectors	
CN19	HDD LED connector
CN20	ATX feature connector
CN21	ATX soft power switch (PS_ON)
CN22	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
CN27	Extension I/O board connector
CN28	Extension I/O board connector
CN29	SM BUS Connector PIN1: SMB_DATA PIN2: SMB_CLOCK
CN30	Extension PCI connector (for SCSI daughter board)
CN31	USB port 0,1
CN32	USB port 2,3
CN33	PS/2 mouse connector
CN34	Ethernet connector 2
CN43	AC97 Link connector
SA0	Serial ATA0
SA1	Serial ATA1
ATX1	ATX 12v Auxillary power connector

Notice: The 4-pin ATX 12V power connector "ATX1" must be connected to the power supply to provide adequate power to the CPU card. Otherwise system might be unstable.

Table 1.3: SCSI Daughter Board Connectors	
CN50	68-pin Ultra 160 SCSI connector
CN51	68-pin Ultra 160 SCSI connector
CN52	50-pin Ultra Wide SCSI Connector

1.5 Board Layout: Jumper and Connector Locations

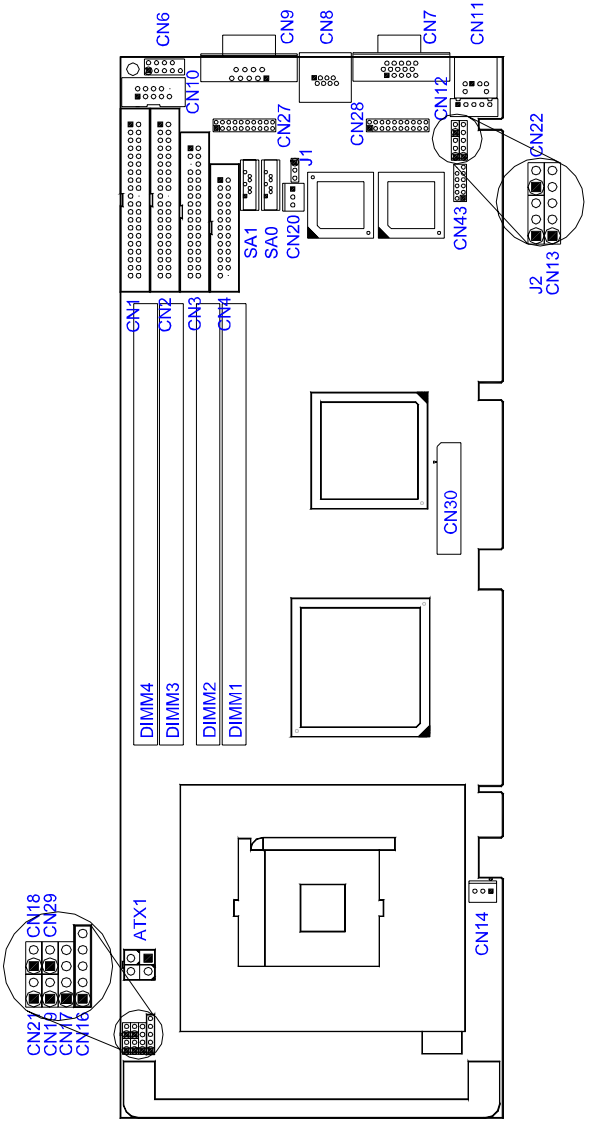


Figure 1.1: Jumper and Connector locations

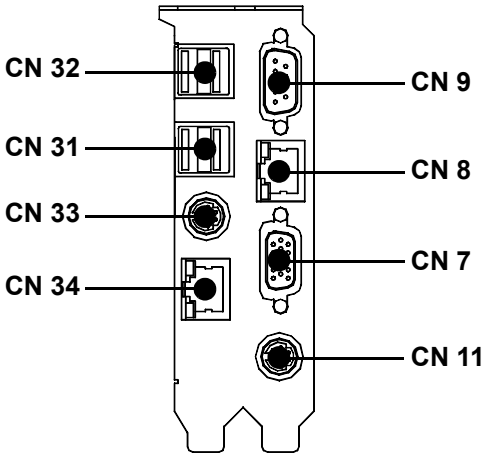


Figure 1.2: I/O Connectors

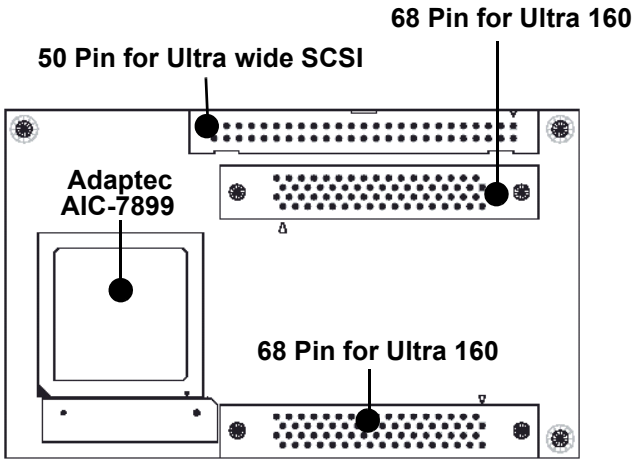


Figure 1.3: SCSI daughter board

1.6 PCA-6187 Block Diagram

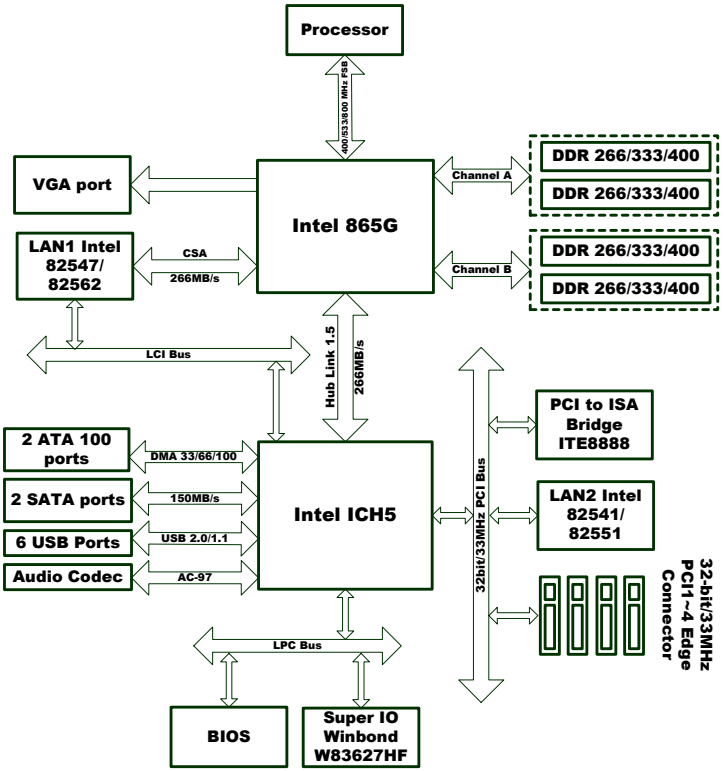


Figure 1.4:

1.7 Safety Precautions

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

Caution! *Always ground yourself to remove any static charge before touching the single board computer. 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.*

Caution! *The computer is provided with a battery-powered Real-time Clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Notice: Before install your PCA-6187 into a chassis, make sure that all components on both sides of the CPU card do not touch any metal parts, especially the chassis wall and add-on card at the adjacent slot.

1.8 Jumper Settings

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

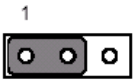
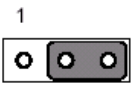
1.8.1 How to set jumpers

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

1.8.2 CMOS clear (J1)

The PCA-6187 single board computer contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 open. If you want to reset the CMOS data, set J1 to 1-2 closed for just a few seconds, and then move the jumper back to 1-2 open. This procedure will reset the CMOS to its default setting.

Table 1.4: CMOS (J1)

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

* default setting

1.8.3 Watchdog timer output (J2)

The PCA-6187 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-6187 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 1.5: Watchdog timer output (J2)

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

* default setting

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

1.9 System Memory

The PCA-6187 has four sockets for 184-pin dual inline memory modules (DIMMs) in two separated memory channels. It can operate with single channel or dual channel modules. We recommend to use dual channel mode to provide optimized performance.

All these sockets use 2.5 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 128, 256, 512 and 1024 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 128 MB and 4 GB.

Note: System resources such as PCI and AGP require physical memory address locations that reduce available memory addresses above 3GB. This may result in less than 4GB of memory being available to the operating system and applications.

1.9.1 CPU FSB and memory speed

The PCA-6187 can accept DDR SDRAM memory chips without parity. Also note: The PCA-6187 accepts PC2100 (DDR266), PC2700 (DDR 333) and PC3200 (DDR 400) DDR SDRAM, depending on the CPU front side bus frequency (FSB). Please refer below table for the relationship between the CPU FSB and memory speed.

Table 1.6: CPU FSB and memory speed

Memory Speed	Processor	FSB frequency	Memory speed Outcome
DDR400	Pentium 4	800 MHz	400 MHz
DDR333	Pentium 4	800 MHz	320 MHz
	Pentium 4	533MHz	333 MHz
	Pentium 4 or Celeron	400 MHz	266 MHz
DDR266	Pentium 4	533 or 400 MHz	266 MHz
	Celeron	400 MHz	266 MHz

The PCA-6187 does not support ECC (error checking and correction). Memory modules with 9 SDRAM chips/side support ECC; modules with 8 chips/side do not support ECC.

1.9.2 Dual channel configuration

The four DIMM sockets are arranged in two channels: DIMM1 & DIMM2 in channel A; DIMM3 & DIMM4 in channel B. To enable dual channel operation, please install a matched pair of DIMMs in DIMM1 & DIMM3 (green sockets). If additional memory is to be used, another matched pair of DIMMs have to be installed in DIMM2 & DIMM4 (purple sockets).

"Matched pair of DIMMs" means: same in speed (DDR266, DDR333, DDR400), same in size (128MB, 256MB, 512MB or 1GB), same in chip density (128 Mb, 256Mb or 512Mb and same in CSA latency. Any other memory configuration will result in single channel memory operation.

1.10 Memory Installation Procedures

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

1.11 Processor Installation

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 over-heat and cause damage to both the CPU and the single board computer. 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. When the CPU is installed, the lever should snap into place at the side of the socket.

Note : The CPUs made with 0.18 micro-meter process technology ("Willamette") cannot be supported by PCA-6187.

CHAPTER 2

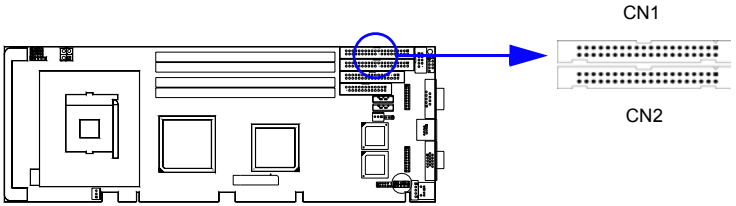
Connecting Peripherals

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.

2.2 1st & 2nd (CN1, CN2) IDE Connectors



You can attach up to four IDE (Integrated Drive Electronics) drives to the PCA-6187's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

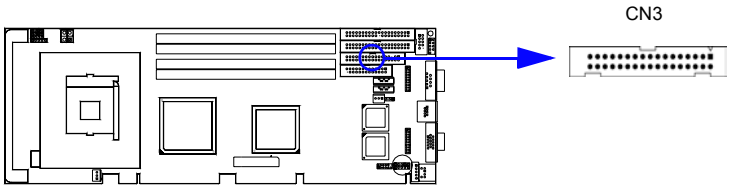
Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the single board computer. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

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.

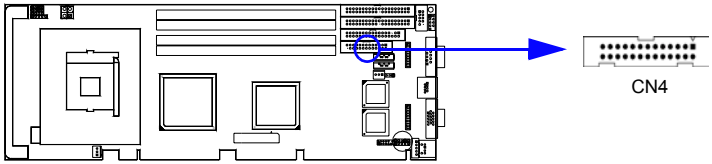
2.3 Floppy Drive Connector (CN3)



You can attach up to two floppy disk drives to the PCA-6187's on board controller. You can use 3.5" (720 KB, 1.44 MB) drives.

The single board computer 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)



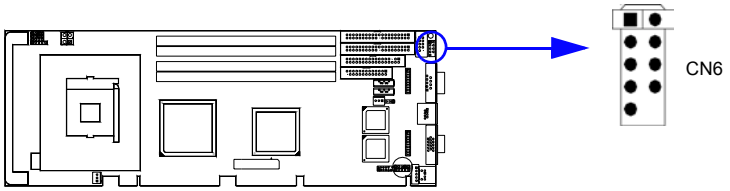
The parallel port is normally used to connect the single board computer to a printer. The PCA-6187 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

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

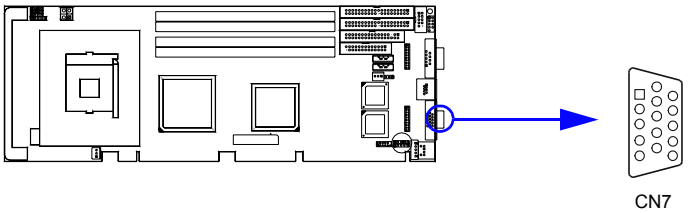
1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN4. Pin 1 is on the upper right side of CN4.

2.5 USB Ports (CN6)



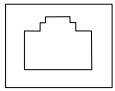
The PCA-6187 provides up to six ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps and is fuse-protected. The USB interface can be disabled in the system BIOS setup.

2.6 VGA Connector CN7



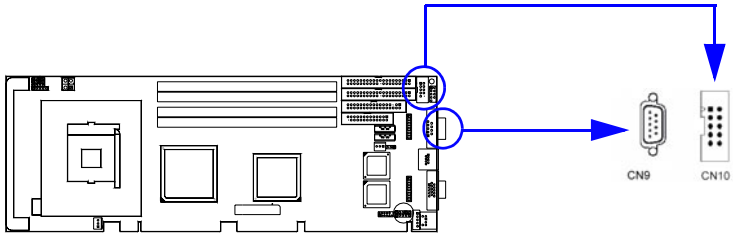
The PCA-6187 includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.7 Ethernet Connector (CN8 and CN34)



The PCA-6187 is equipped with single/dual high-performance 32-bit PCI-bus Ethernet interface, which is fully compliant with IEEE 802.3/u 10/100Mbps CSMA/CD and IEEE 802.3ab 1000Base-T standards. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible. An onboard RJ-45 jack provides convenient 10/100Base-T or 10/100/1000Base-T RJ-45 operation.

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

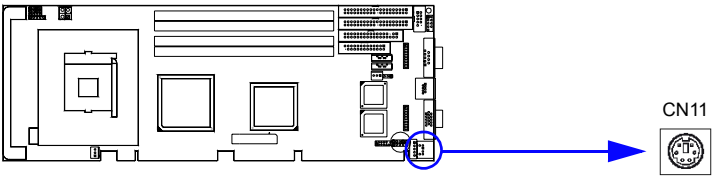


The PCA-6187 offers two serial ports, CN9 as COM1 and CN10 as COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

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.

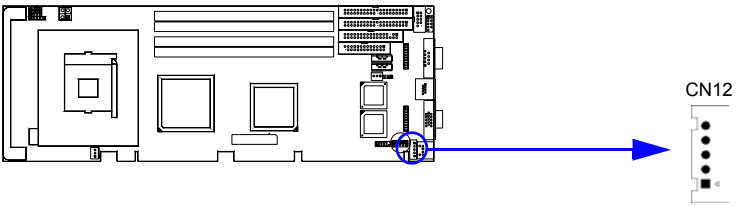
Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.9 PS/2 Keyboard/Mouse Connector (CN11/CN33)



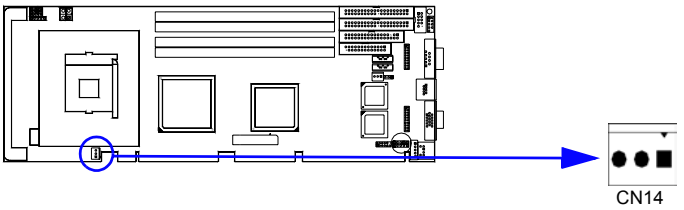
Two 6-pin mini-DIN connectors (CN11 and CN33) on the card mounting bracket provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. CN11 can also be connected to an adapter cable (P/N: 1700060202, available from Advantech) for connecting to both a PS/2 keyboard and a PS/2 mouse.

2.10 External Keyboard Connector (CN12)



In addition to the PS/2 mouse/keyboard connector on the PCA-6187's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

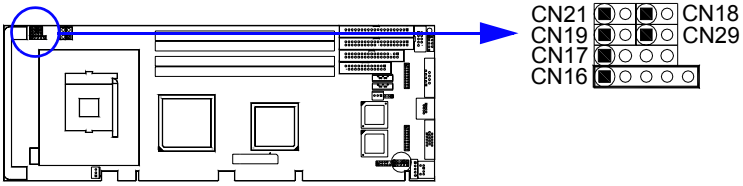
2.11 CPU Fan Connector (CN14)



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

2.12 Front Panel Connectors (CN16, 17, 18, 19, 21&29)

There are several external switches to monitor and control the PCA-6187



2.12.1 Power LED (CN16)

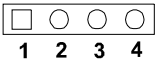
CN16 is a 5-pin connector for the power on LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.1: PS/2 or ATX power supply LED status

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

2.12.2 External speaker (CN17)

CN17 is a 4-pin connector for an external speaker. If there is no external speaker, the PCA-6187 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed



2.12.3 Reset (CN18)

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



2.12.4 HDD LED (CN19)

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



2.12.5 ATX soft power switch (CN21)

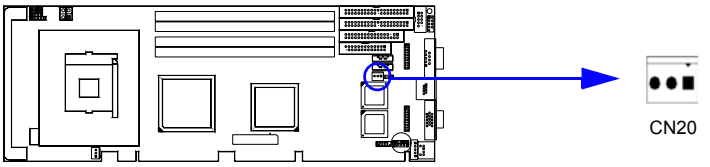
If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to CN21. This connection enables you to turn your computer on and off.

2.12.6 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.

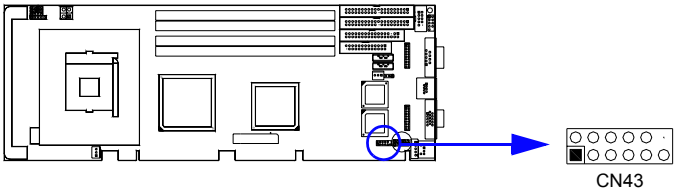
CN29 can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin2 to pin 2 on both ends of cable.

2.13 ATX feature connector (CN20)



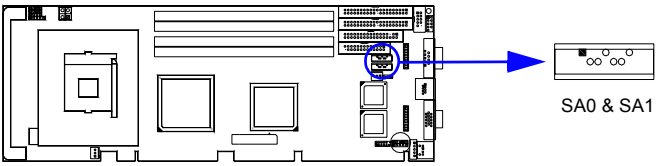
Connect to the CN1 on the Advantech backplane to enable the ATX function, 5V stand-by.

2.14 AC-97 Audio interface (CN43)



The PCA-6187 provides AC-97 audio through PCA-AUDIO-00A1 module from Advantech.

2.15 Serial ATA interface (SA0 and SA1)



In addition to the two EIDE interfaces (up to four devices), the PCA-6187 features high performance serial ATA interface (up to 150MB/s) which eases cabling to hard drives with thin and long cables.

2.16 Connecting to SNMP-1000 remote manager

Use the 6-pin to 8-pin cable to connect the single board computer to SNMP-1000. This cable comes with the SNMP-1000.



2.17 Auxiliary 4-pin power connector (ATX1)

To ensure the sufficiency of power supply for Pentium® 4 single board computer, one auxiliary 4 pin power connector is available on PCA-6187. This connector must be connected to the power supply, otherwise system might be unstable.

CHAPTER 3

Award BIOS Setup

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.

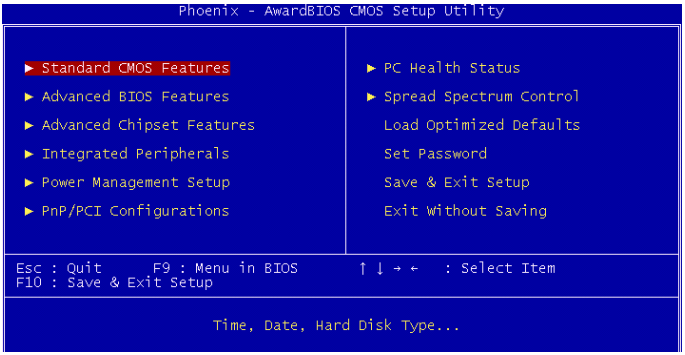


Figure 3.1: Award BIOS Setup initial screen

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.

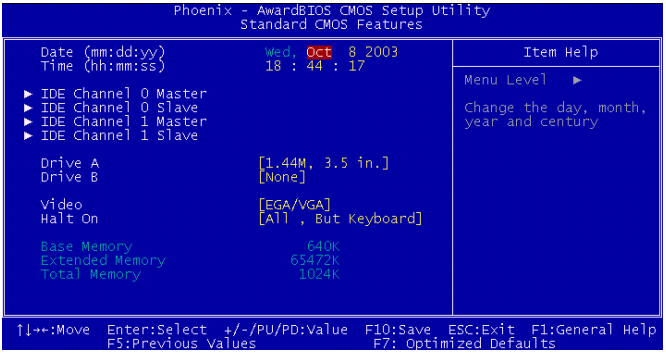


Figure 3.2: Standard CMOS features screen

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-6187 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

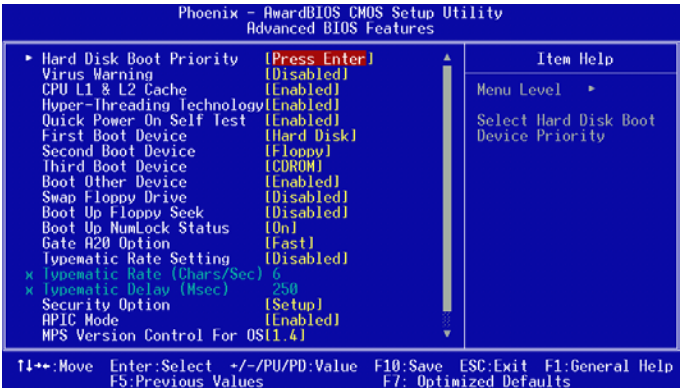


Figure 3.3: Advanced BIOS features screen

3.4.1 Hard Disk Boot Priority

Select hard disk boot device priority.

3.4.2 Virus Warning

Enable virus warning, the commands are "Enabled" or "Disabled".

3.4.3 CPU L1 & L2 Cache

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

3.4.4 Hyper-Threading Technology

While using CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper Threading Technology in OS which supports Hyper-Threading Technology or select "Disabled" for other OS which do not support HT technology.

3.4.5 Quick Power On Self Test

Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.

3.4.6 First/Second/Third Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: "Floppy", "LS120", "HDD-0", "SCSI", "CDROM", "HDD-1", "HDD-2", "HDD-3", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN", "Disabled".

3.4.7 Boot Other Device

Choose other device to boot, the choice is "Enabled" or "Disabled".

3.4.8 Swap Floppy Drive

If the system has two floppy drives, choose "Enabled" to assign physical drive B to logical drive A and vice-versa. The commands are “Enabled” or “Disabled.”

3.4.9 Boot UP Floppy Seek

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

3.4.10 Boot Up NumLock Status

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

3.4.11 Gate A20 Option

"Normal": A pin in the keyboard controller controls GateA20.

"Fast" (Default): Lets chipset control GateA20.

3.4.12 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.

3.4.13 Typematic Rate (Chars/Sec)

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

3.4.14 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).

3.4.15 Security Option

Select whether the password is required every time the system boots or only when you enter setup.

"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.

3.4.16 APIC Mode

This setting allows to enable the APIC mode, the choice is "Disabled" or "Enabled."

3.4.17 MPS Version Control For OS

This reports if an FDD is available for Windows 95. The selections are "1.1" or "1.4."

3.4.18 OS Select For DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system. Commands are "Non-OS2" or "OS2."

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-6187, 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.

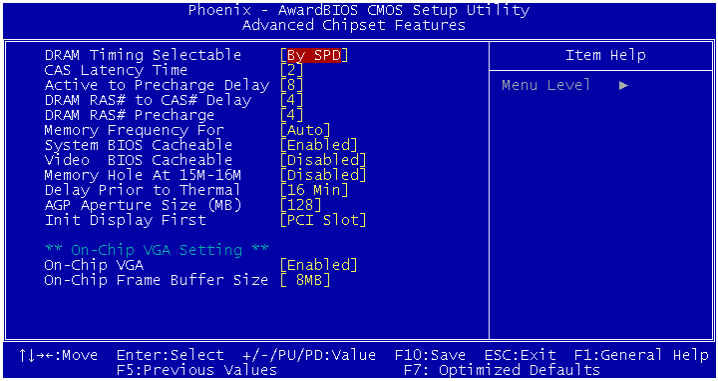


Figure 3.4: Advanced chipset features screen

3.5.1 DRAM Timing Selectable

This item allows you to control the DRAM speed. The selections are "Manual" or "By SPD".

3.5.2 CAS Latency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available. Leave this on the default setting. The options are "2", "2.5" or "3".

3.5.3 Active to Precharge Delay

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The Choice: "8", "7", "6" and "5".

3.5.4 DRAM RAS# to CAS# Delay

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB. The Choice: "4", "3" and "2".

3.5.5 DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to DRAM. Leave this on the default setting. The choice : "4", "3" and "2".

3.5.6 Memory Frequency

To adjust the frequency of memory. The choice : "DDR266", "DDR333", "DDR400" and "Auto".

3.5.7 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".

3.5.8 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".

3.5.9 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.”

3.5.10 Delay Prior to Thermal

Select the period if user wants to lower the CPU speed when CPU temperature is too high. The choice: "4 Min", "8 Min", "16 Min" and "32 Min".

3.5.11 AGP Aperture Size (MB)

Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The Choice : "4", "8", "16", "32", "64", "128", and "256".

3.5.12 Init Display First

Choose the first display interface to initiate while booting. The choice is "PCI Slot" or "Onboard".

3.5.13 On-Chip VGA

User can disable onboard VGA controller by selecting "Disabled"

3.5.14 On-Chip Frame Buffer Size

User can select frame buffer size. Option is :"1MB", "8MB" and "16MB".

3.6 Integrated Peripherals

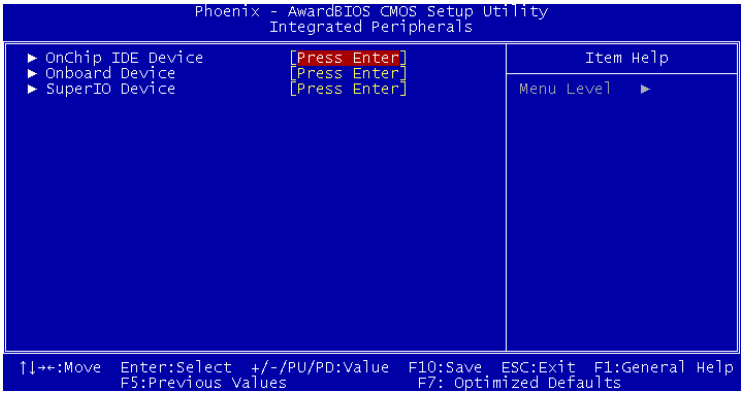


Figure 3.5: Integrated peripherals

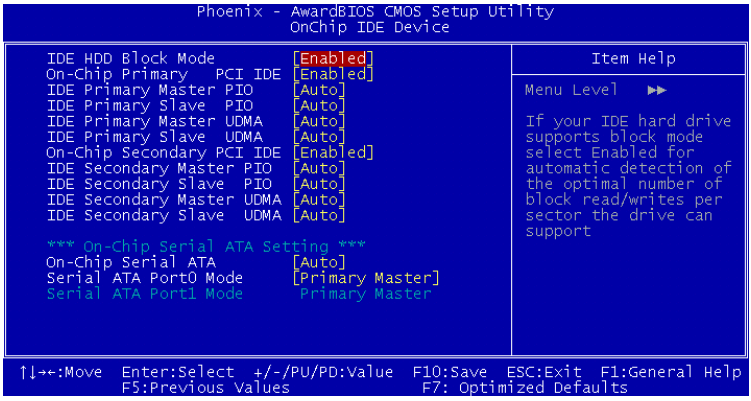


Figure 3.6: On-Chip IDE Device

3.6.1 IDE HDD Block Mode

If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. This field is for systems with only SCSI drives.

3.6.2 On-Chip IDE Device

IDE Primary (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.

3.6.3 On-Chip Serial ATA

Choose the status of serial ATA, the default setting is "Auto" which let system to arrange all parallel and serial ATA resource automatically. The "Disabled" will disable SATA controller. The "Combined Mode" will combine PATA and SATA, and max of 2 IDE drives in each channel. The "Enhanced Mode" will enable both SATA and PATA, and max of 6 IDE drives are supported. The "SATA Only" means SATA is operating in legacy mode.

3.6.4 Serial ATA Port0/Port1 Mode

Select the mode for SATA port0 and SATA port1. The choices are "Primary Master", "Primary Slave", "Secondary Master", "Secondary Slave", "SATA0 Master" and "SATA1 Master".

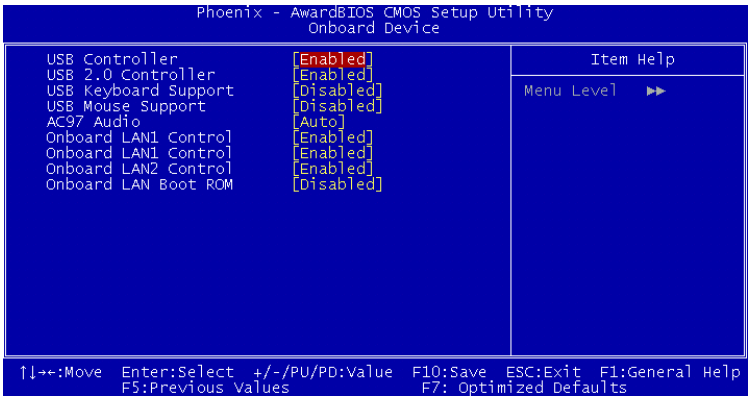


Figure 3.7: Onboard Device

3.6.5 USB Controller

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

3.6.6 USB 2.0 Controller

This entry is for disable/enable USB2.0 controller only. The BIOS itself may/may not have high speed USB support. If the BIOS has high speed USB support built in, the support will be automatically turn on when high speed device were attached. The Choice : "Enabled" and "Disabled".

3.6.7 USB Keyboard/Mouse Support

Select Enabled if user plan to use an USB keyboard. The choice: "Enabled", "Disabled".

3.6.8 AC97 Audio

Select Disable if you do not want to use AC-97 audio. Option is "Auto", "Disabled".

3.6.9 Onboard LAN1 Control

Options are "Enabled" and "Disabled" Select Disable if user does not want to use onboard LAN controller1

3.6.10 Onboard LAN2 Control

Options are "Enabled" and "Disabled" Select Disable if user does not want to use onboard LAN controller2

3.6.11 Onboard LAN Boot ROM

Decide whether to invoke the boot ROM of the onboard LAN chip. The Choice : "Disabled", "LAN1", "LAN2".

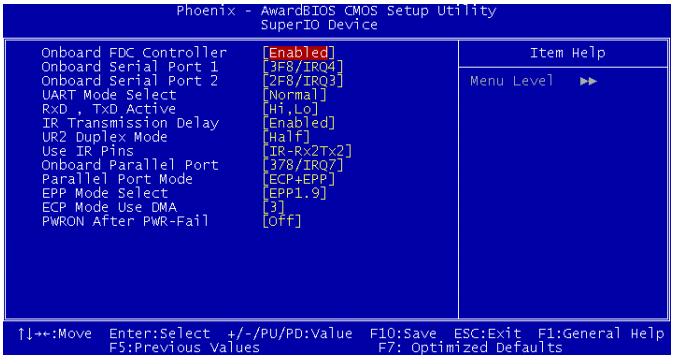


Figure 3.8: SuperIO Device

3.6.12 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.

3.6.13 Onboard Serial Port 1

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

3.6.14 Onboard Serial Port 2

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

3.6.15 UART Mode Select

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

3.6.16 RxD, TxD Active

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

3.6.17 IR Transmission Delay

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

3.6.18 UR2 Duplex Mode

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

3.6.19 Use IR Pins

The Choice : "RxD2, TxD2", "IR-Rx2Tx2".

3.6.20 Onboard Parallel Port

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

3.6.21 Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting “Normal” allows normal speed operation, but in one direction only. “EPP” allows bidirectional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in 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.

3.6.22 EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices: "EPP1.9", "EPP1.7".

3.6.23 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.

3.6.24 PWRON After PWR-Fail

To setup the status of system after power fail. The "Off" will keep system power off after power fail, the "On" will boot up the system after fail, and the "Former-Sts" will return to the status before power fail.

3.7 Power Management Setup

The power management setup controls the single board computer's “green” features to save power. The following screen shows the manufacturer’s defaults.

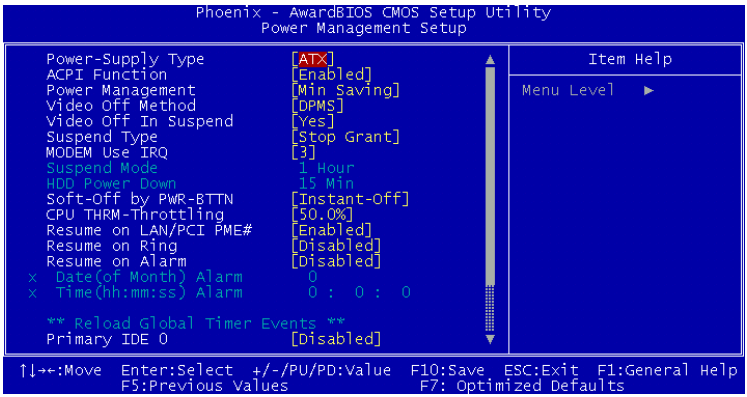


Figure 3.9: Power management setup screen (1)

3.7.1 Power-Supply Type
Choose the power-supply type, the choices are "AT" and "ATX".

3.7.2 ACPI function
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 three selections for Power Management, and they have fixed mode settings.

Min Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	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 Method
To select the method to off the video. The Choice : "Blank Screen", "V/H SYNC+ Blank", "DPMS".

3.7.5 Video Off In Suspend
When system is in suspend, video will turn off. The choices are "No" and "Yes".

3.7.6 Suspend Type
The Choice : "Stop Grant", "PwrOn Suspend".

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

3.7.8 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.

3.7.9 CPU THRM-Throttling

This field allows you to select the CPU THRM-Throttling rate. The choices: "75.0%", "50.0%", and "25.0%".

3.7.10 Resume on LAN/PCI PME#

To enabled or disable the function to resume the system by PCI card or LAN. The Choice : "Enabled", "Disabled".

3.7.11 Resume on Ring

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

3.7.12 Resume on Alarm

The Choice : "Enabled", "Disabled".

3.7.13 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active. The choice: "Enabled", "Disabled".

3.7.14 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: "Enabled", "Disabled".

3.7.15 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs. The choice: "Enabled", "Disabled".

3.8 PnP/PCI Configurations

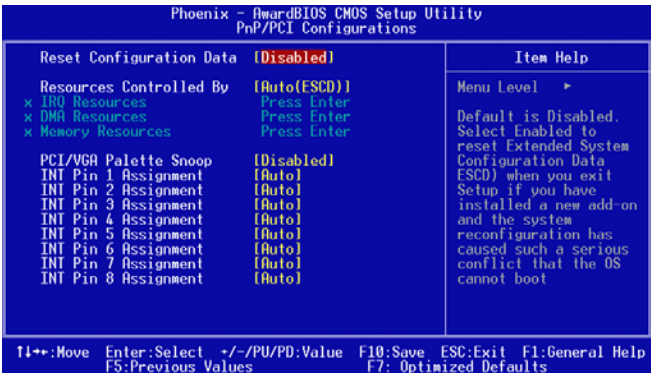


Figure 3.10: PnP/PCI configurations screen

3.8.1 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused such a conflict that OS cannot boot.

3.8.2 Resources Controlled By

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

3.8.3 PCI/VGA Palette Snoop

This is left at “Disabled.”

3.9 PC Health Status

3.9.1 CPU Warning Temperature

This item will prevent the CPU from overheating. The choices are: "Disabled", "50C/122F", "53C/127F", "56C/133F", "60C/140F", "63C/145F", "66C/151F", "70C/158F".

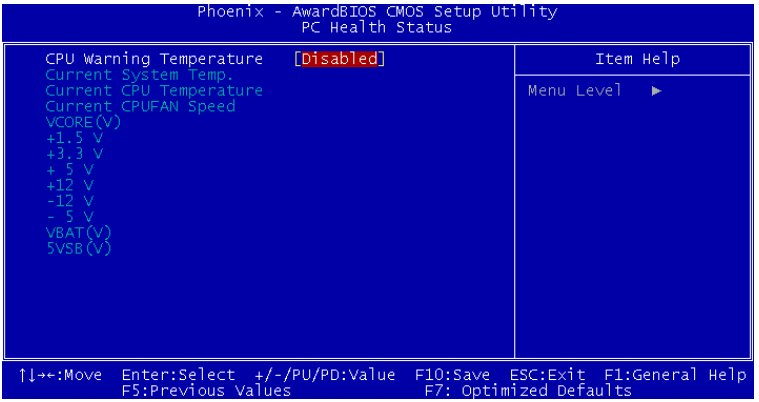


Figure 3.11: PC health status screen

3.9.2 Current System Temp

This shows you the current temperature of system.

3.9.3 Current CPU Temperature

This shows you the current CPU temperature.

3.9.4 Current CPUFAN Speed

This shows you the current CPUFAN operating speed.

3.9.5 VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

This shows you the voltage of VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), and 5VSB(V).

3.10 Spread Spectrum Control

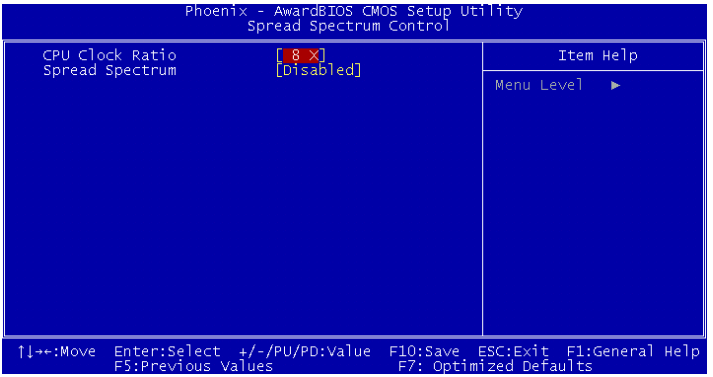


Figure 3.12: Spread Spectrum Control screen

3.10.1 CPU Clock Ratio

Key in a DEC number to setup the CPU Clodk Ratio. (Min=8; Max=50). This item only shows up under some special situations.

3.10.2 Spread Spectrum

To enable/disable the spread spectrum. The Choice : "Disabled", "- 0.40%", "- 0.50%", "- 0.60%" and "- 1.00%".

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:



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.

3.12 Save & Exit Setup

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

3.13 Exit Without Saving

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

CHAPTER 4

Chipset Software Installation Utility

Chapter 4 Chipset Software Install 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-6187 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. The Intel® Chipset Software Installation Utility is not required on any systems running Windows NT 4.0. Updates are provided via Service Packs from Microsoft*.

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 and Serial ATA interface support.
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)

- 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

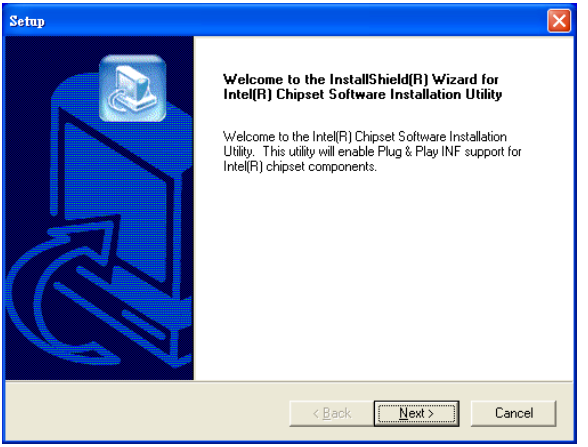
Windows XP

4.3 Windows XP Driver Setup

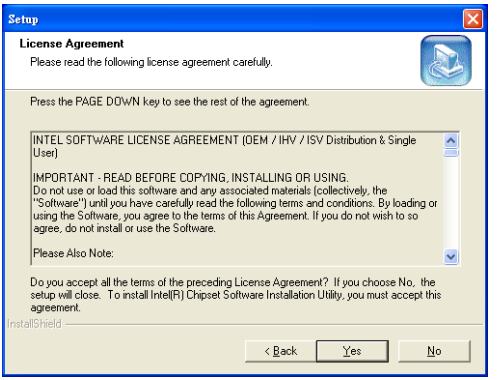
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Move the mouse cursor over the "Auto" button under the "CSI UTILITY" heading, a message pops up telling you to install the CSI utility before other device drivers, as shown in the following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



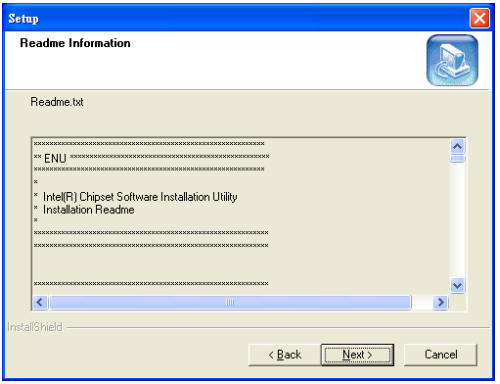
2. Click "Next" when you see the following message.



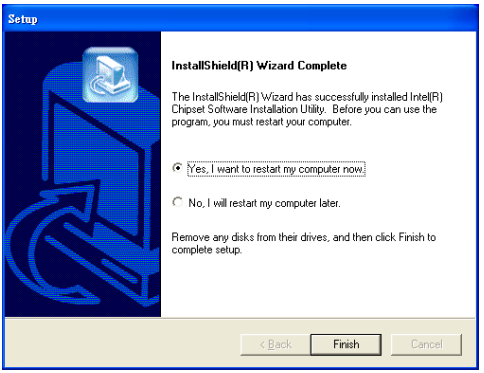
3. Click "Yes" when you see the following message.



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



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



CHAPTER 5

VGA Setup

Chapter 5 VGA Setup

5.1 Introduction

The PCA-6187 has VGA onboard, you need to install the VGA driver to enable the function.

The Intel® 865G Graphics Memory Controller Hub (the 865G GMCH) provides an integrated graphics accelerator delivering cost competitive 3D, 2D, and video capabilities. The GMCH contains an extensive set of instructions for 3D operations, BLT and Stretch BLT operations, motion compensation, overlay, and display control. The 865G GMCH's video engines support video conferencing and other video applications. The GMCH does not support a dedicated local graphics memory interface; it may only be used in a UMA configuration. The features include:

• Built-in 2D/3D VGA controller.

• Use Intel® Extreme Graphics Architecture

• Integrated 350MHz RAMDAC that can directly drive a progressive scan analog monitor up to a resolution of 2048x1536 at 75Hz

• Maximum 3D resolution supported : 1600 x 1200 x 32 @ 85Hz.

• H/W motion compensation assistance for s/w MPEG 2 decoding.

• Software DVD at 30 fps Full Screen.

5.2 Dynamic Video Memory Technology

The following is quoted from "Intel® 865G Chipset Dynamic Video Memory Technology", document number : 253144-001 :

The method of memory allocation where the Operating System, Application and Graphics Memory come from a unified System Memory pool known as Unified Memory Architecture (UMA).

Dynamic Video Memory Technology (DVMT) is an enhancement of the UMA concept, wherein the optimum amount of memory is allocated for balanced graphics and system performance, through Direct AGP (known as Non-Local Video Memory, or NLVM), and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available memory – regardless of frame buffer or main memory sizing – for maximum 2D/3D graphics performance.

DVMT dynamically responds to system requirements, and application demands, by allocating the proper amount of display, texturing and buffer memory after the operating system has booted. For example, a 3D application when launched may require more vertex buffer memory to enhance the complexity of objects, or more texture memory to enhance the richness of the 3D environment. The operating system views the integrated graphics driver as an application, which uses Direct AGP to request allocation of additional memory for 3D applications, and returns the memory to the operating system (OS) when no longer required.

The Intel Extreme Graphics Driver determines the size of the pre-allocated memory needed and will make additional Non-Local Video Memory requests to achieve the amount needed for the display and application requirement. The video memory size in the Intel® 865G chipset varies and is determined using several factors. The key factors are system resources and system activity. The maximum video memory is up to 64MB SDRAM

5.3 Windows XP Driver Setup

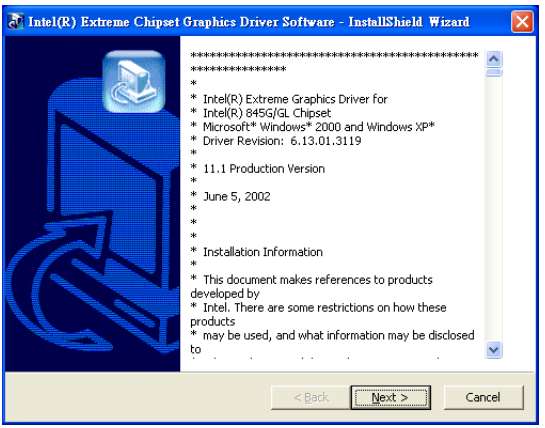
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility

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 "W2K XP", "WIN9X ME", and "WIN NT" respectively) according to the operating system you are using. The following

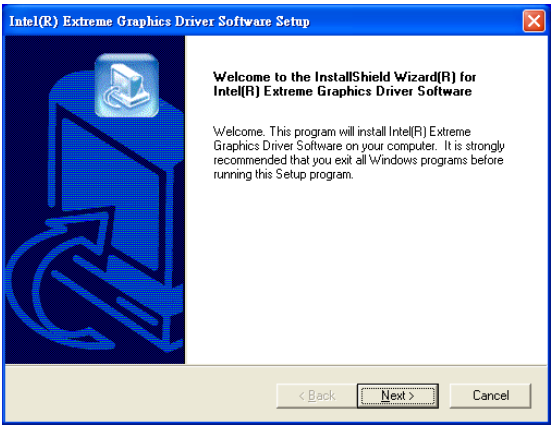
installation procedure is for Windows XP. For other operating systems, please follow the on-screen installation guide



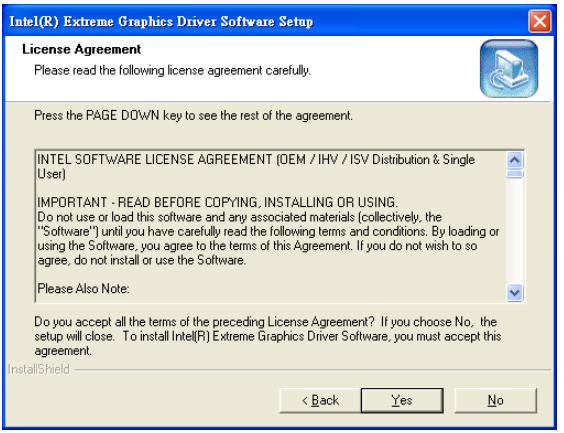
1. Please click on "Next" to continue the installation



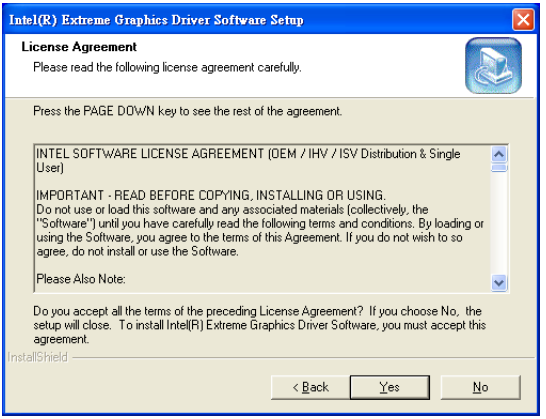
2. You will see a welcome window. Please chick on "Next" to continue the installation.



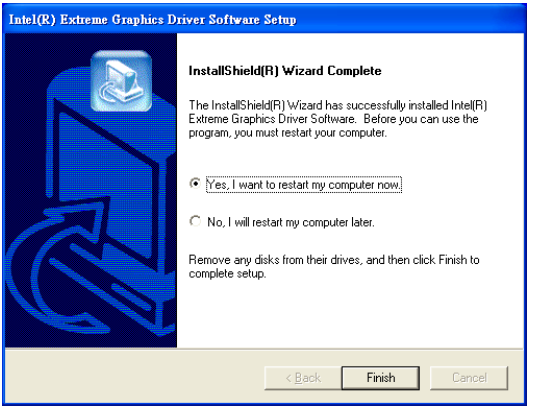
3. Click "Yes" when you see the following message.



4. Click on "Yes" to continue the installation



5. Click "Finish" to complete the installation and restart the computer now or later.



CHAPTER 6

LAN Configuration

Chapter 6 LAN Configuration

6.1 Introduction

The PCA-6187 features the 32-bit 10/100/1000 Mbps Ethernet network interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling with RJ-45 connectors for 10 Mbps, 100 Mbps and 1000 Mbps connections can be used. Extensive driver support for commonly-used network systems is also provided.

6.2 Features

- Optional single/dual Intel 82562/82551 10/100Base-T Ethernet LAN controller
- Optional single/dual Intel 82547/82541 10/100/1000 Base-T Ethernet LAN controller
- Supports Wake-on-LAN remote control function.
- PCI Bus Master complies with PCI Rev. 2.2
- MAC & PHY (10/100/1000 Mbps) interfaces.
- Complies with 1000Base-T, 100Base-TX, and 10Base-T applications.
- Fully supports 1000Base-T, 100Base-TX, and 10Base-T operation.
- Single RJ-45 connector gives auto-detection of 10 Mbps, 100 Mbps, or 1000 Mbps network data transfer rates and connected cable types.
- Plug and Play.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.1,
- ACPI Rev. 2.0, 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.

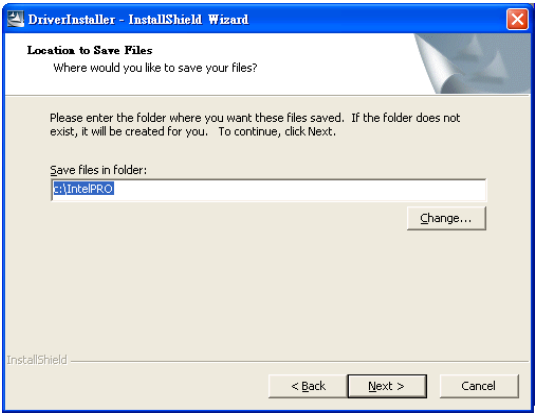
The PCA-6187's onboard Ethernet interface supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

6.4 Win XP Driver Setup (Intel 82547/41/62/51)

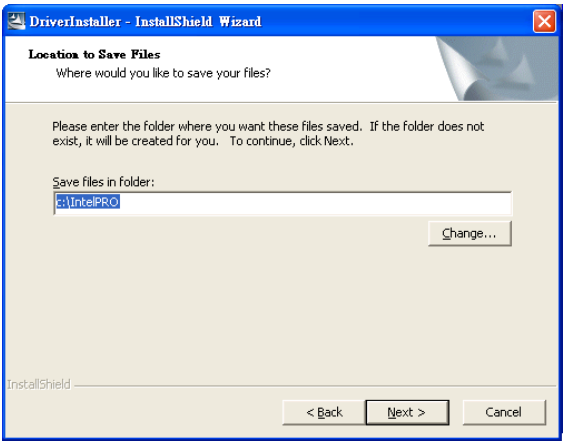
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "LAN Drivers" heading, click on the "Manual" to open file manager, then click "SETUP.EXE" to run the installation procedure.



2. Select "I accept the terms in the license agreement" and click "Next" to continue.



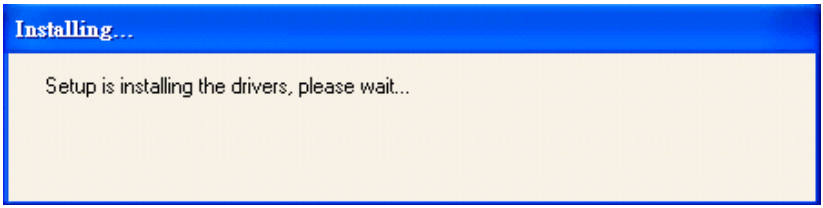
3. Click "Next" to continue.



4. Click "Install Software" to start the installation procedure.



5. The driver will be installed automatically and the LAN function will be enabled after the installation.



CHAPTER 7

SCSI Setup & Configuration

Chapter 7 SCSI Setup & Configuration

7.1 Introduction

The PCA-6187 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.

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 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 switch 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.
- 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 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 switched 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.

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 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.		

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.)

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 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 controller. The Adaptec SCSI controller AIC-7899 is set at 7, which gives 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 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 jukebox. 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 SCSI Select (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.

7.7 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

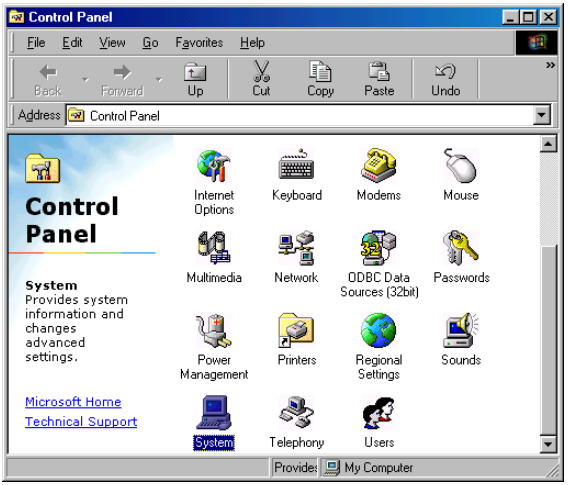
7.8 Installation under Windows 2000

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

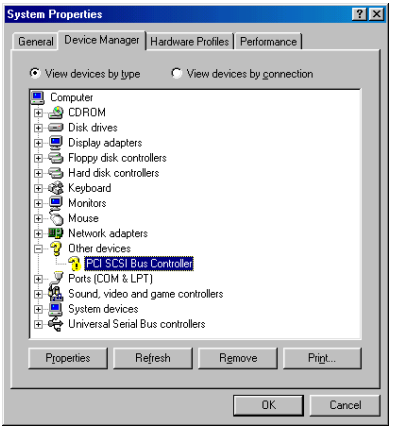
1. Insert Windows 2000 CD Disk.
2. Press F6 immediately when it displays: “Set up is inspecting your computer’s hardware configuration.”
3. Then it enter SCSI installation. Please insert SCSI driver floppy disk.

7.9 Windows 9X Driver setup procedure

1. In the window 9x screen, click on “start” and select “setting”. Then click on the “Control Panel” icon to select .System.



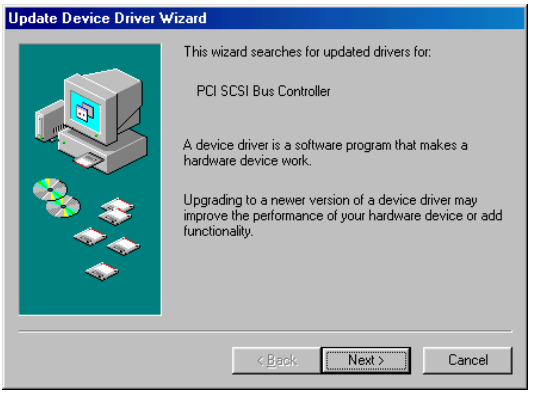
2. In the “System properties”, choose “PCI SCSI Bus Controller.” Then click on “Properties.”



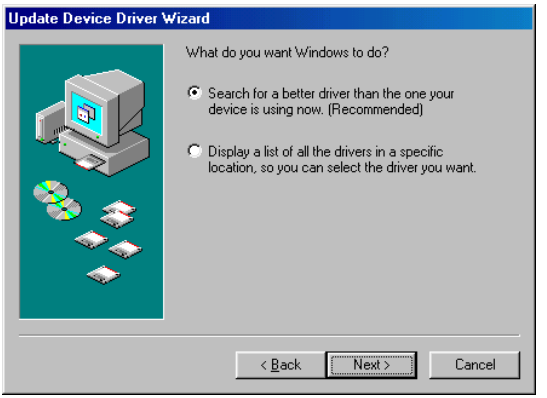
3. Click on "Update Driver"



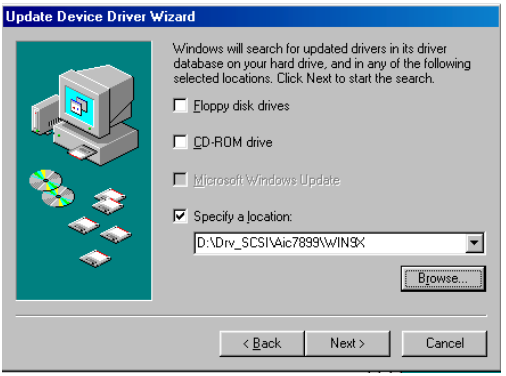
4. Click on “Next”



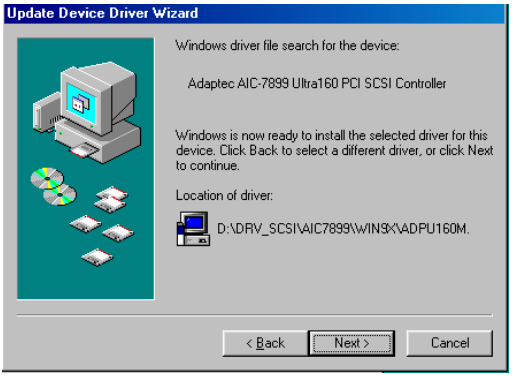
5. Recommend to search for a better driver



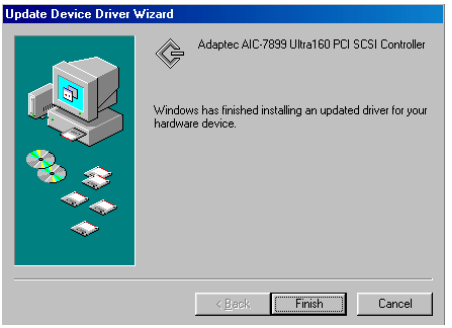
6. If the SCSI driver is supplied in floppy disk, click on “Floppy disk drives.” Then, click on “Next.” If the SCSI driver is supplied in CD-ROM disk, click on “Specify a location:" then enter "E:\Drv_SCSI\AIC7899\Windows\Win9X"



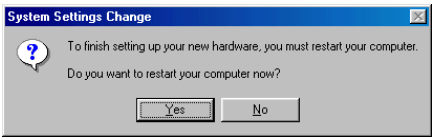
7. In the "Update Device Driver Wizard" click on "Next."



8. The installation is completed. Click on "Finish."



9. Click on "Yes" to restart the system.



CHAPTER 8

USB 2.0 Configuration

Chapter 8 USB 2.0 Configuration

8.1 Introduction

The PCA-6187 is designed with Intel ICH5 which supports both USB1.1 and USB 2.0 high-speed transmission. It still remains the compatibility with today's USB device. High-speed USB 2.0 provides data transfer up to 480Mb/s which is 40 times faster than USB 1.1. It is ideal for today's speed-demanding I/O peripherals.

8.2 Features

- Provides data transmission rate up to 480Mb/s
- Offer 40 greater bandwidth than USB 1.1
- Offers complete compatibility with current USB device

8.3 Installation

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

Note: USB 2.0 driver is not available for Windows 98SE/ME from PCA-6187 driver CD. Under these operating systems, the USB device will operate at USB 1.1 speeds.

Note: Install service pack 4 under Windows 2000 to enable USB 2.0.

Note: Install service pack 1 under Windows XP to enable USB 2.0.

CHAPTER 9

Onboard Security Setup

Chapter 9 Onboard Security Setup

9.1 Introduction

The PCA-6187's hardware monitor is designed with Winbond W83782D. Onboard security (OBS) functions monitor key hardware. They help you maintain your system's stability and durability. The PCA-6187 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 1.8 V.
- Chipset voltage: typically 3.3 V.
- Main voltage: +5 V, +12 V.

The negative system voltage sets which can be monitored include:

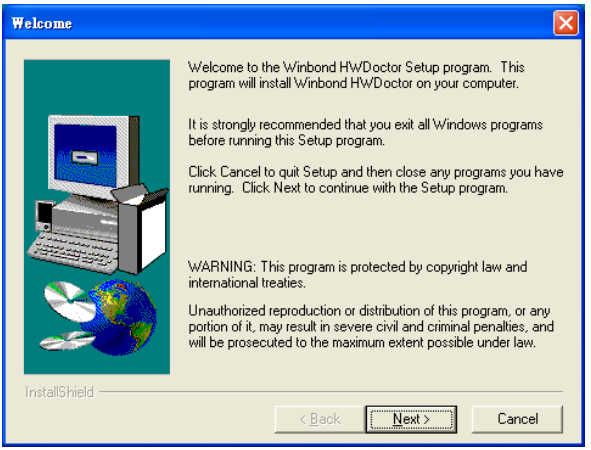
- Main voltage: -5 V, -12 V.

9.2 Windows XP Driver Setup

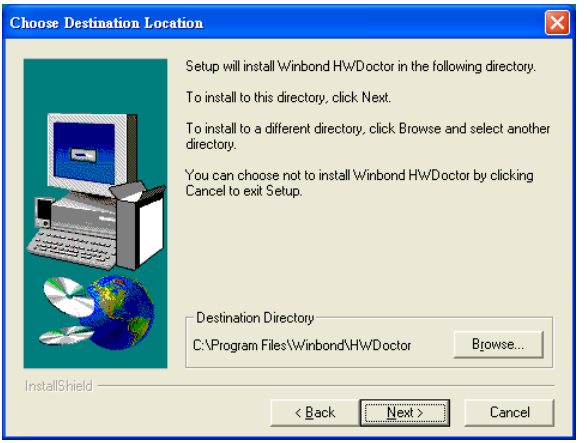
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Click on the "Install" button under the "OBS DRIVERS" heading.



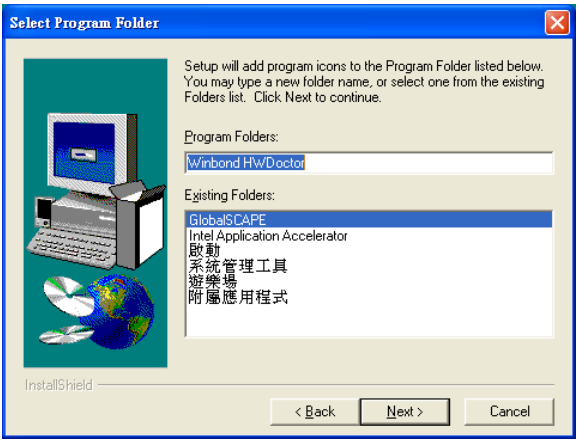
2. Click "Next" when you see the following message.



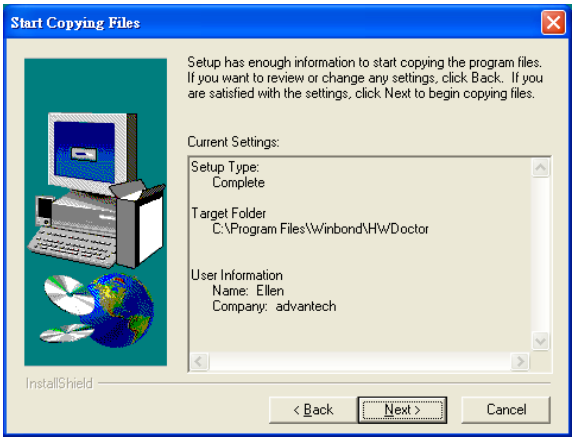
3. Click "Next" when you see the following message.



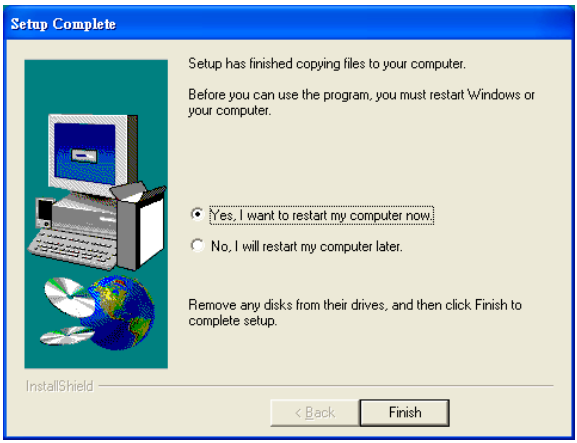
4. Click "Next" when you see the following message.



5. Click "Next" to continue.



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



9.3 Using the OBS Hardware Doctor Utility

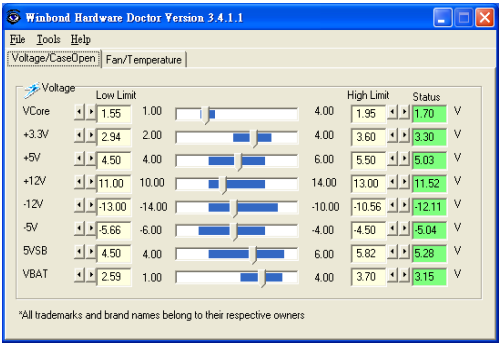
After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

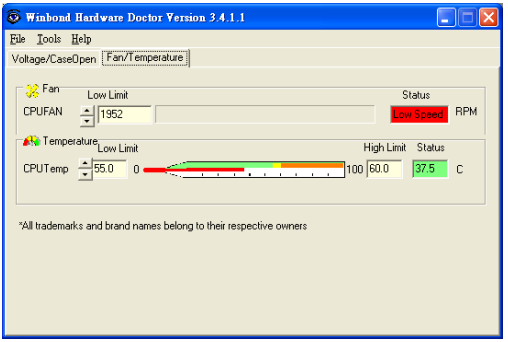
OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security

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" , select "Winbond HWDoctor" and click "HWDOCTOR."
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.




Winbond Hardware Doctor Version 3.4.1.1
File Tools Help
Voltage/CaseOpen Fan/Temperature
Fan
Low Limit
Status
CPUFAN
1952
Low Speed
RPM
Temperature
Low Limit
High Limit
Status
CPUTemp
55.0
0
100
60.0
37.5
C
*All trademarks and brand names belong to their respective owners

Appendix A

Programming the Watchdog Timer

Appendix A Programming the watchdog

A.1 Programming the Watchdog Timer

The PCA-6187'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.

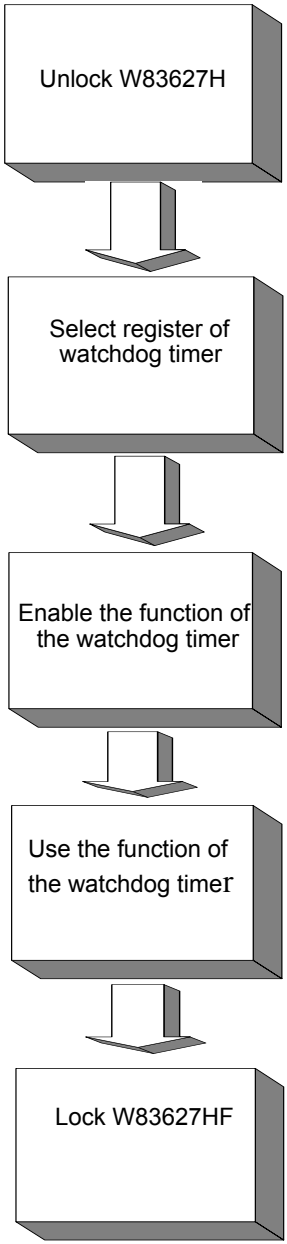
Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

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
```

Appendix B

I/O Pin Assignments

Appendix B Pin Assignments

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

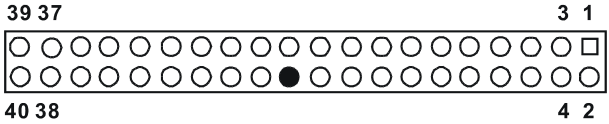


Table B.1: IDE hard drive connector (CN1, CN2)			
Pin	**Signal**	**Pin**	**Signal**
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	IDSC16-
33	ADDR 1	34	PDIAG
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)

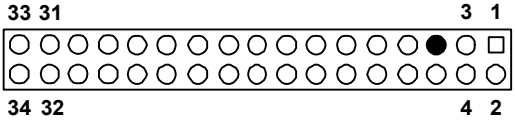


Table B.2: Floppy drive connector (CN3)

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)

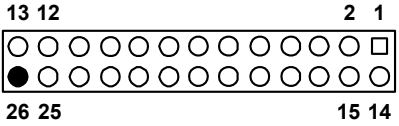


Table B.3: Parallel port connector (CN4)

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)

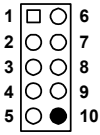


Table B.4: USB1/USB2 connector (CN6)			
Pin	**USB1 Signal**	**Pin**	**USB2 Signal**
1	+5 V	6	+5 V
2	UV-	7	UV-
3	UV+	8	UV+
4	GND	9	GND
5	Chassis GND	10	N/CA

B.5 VGA Connector (CN7)

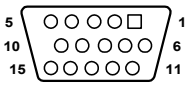


Table B.5: VGA connector (CN7)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.6 COM1/COM2 RS-232 Serial Port (CN9, CN10)

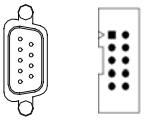


Table B.6: COM1/2 RS-232 serial port (CN9/10)	
Pin	**Signal**
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.7 Keyboard and Mouse Connnector (CN11)

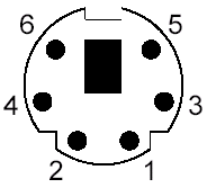


Table B.7: Keyboard and mouse connector (CN11)	
Pin	**Signal**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.8 External Keyboard Connector (CN12)

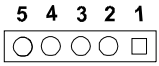


Table B.8: External keyboard connector (CN12)	
Pin	**Signal**
1	CLK
2	DATA
3	NC
4	GND
5	VCC

B.9 CPU Fan Power Connector (CN14)



Table B.9: CPU Fan Power Connector (CN14)	
Pin	Signal
1	GND
2	+12V
3	Detect

B.10 Power LED (CN16)

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

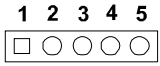


Table B.10: Power LED and keylock conn (CN16)	
Pin	**Function**
1	LED power (+5 V)
2	NC
3	GND
4	NC
5	GND

B.11 External Speaker Connector (CN17)

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

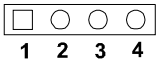


Table B.11: External Speaker Connector (CN17)	
Pin	Function
1	Internal buzzer
2	NC
3	Internal buzzer
4	Speaker out

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	IDE LED (LED-)
2	VCC (LED+)

B.14 ATX Feature Connector (CN20)

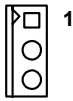


Table B.14: ATX feature connector (CN20)	
Pin	Signal
1	PS-ON
2	VCC
3	VCCSB

B.15 ATX Soft Power Switch (CN21))



Table B.15: ATX soft power switch (CN21)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.16 H/W Monitor Alarm (CN22)



Table B.16: H/W monitor alarm (CN22)	
Pin	**Signal**
1	Enable OBS alarm
2	Disable OBS alarm

B.17 AC-97 Audio Interface (CN43)

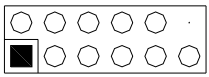


Table B.17: AC-97 Audio Interface (CN43)	
1 VCC	**2 GND**
3 SYNC	4 BITCLK
5 SDOUT	6 SDIN0
7 SDIN1	8 AC-RST
9 +12V	10 GND
11 GND	12 N/C

B.18 SM Bus Connector (CN29)



Table B.18: SM Bus Connector (CN 29)	
Pin	**Signal**
1	SMB_DATA
2	SMB_CLK

B.19 System I/O Ports

Table B.19: System I/O ports	
Addr. range (Hex)	**Device**
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI)
	mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT3)
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

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

B.22 1st MB Memory Map

Table B.22: 1st MB memory map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.23 PCI Bus Map

Table B.23: PCI bus map				
Function Signals	Device ID	INT# pin	GNT	REQ
Onboard LAN1		INT E		
OnboardLAN2	AD21	INT H	GNT F	REQ F
SCSI	AD19	INT F, G	GNT A	REQ A
Bridge	AD22		GNT E	REQ E
PCI slot 1	AD31	INT B, C, D, A	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT D, A, B, C	GNT C	REQ C
PCI slot 4	AD28	INT A, B, C, D	GNT D	REQ D

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