

PCA-6275

Pentium® II processor-based
PCI/ISA-bus CPU card

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

Initial Inspection

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

- 1 PCA-6275 Dual Pentium® II single board computer
- 2 Pentium II CPUs and 2 cooling fans (optional)
- 1 PCA-6275 user's manual
- 1 bus master & BIOS utility driver
- 2 disks, for OBS Win95 drivers
- 1 FDD cable
- 2 EIDE HDD cables
- 1 printer cable
- 2 temperature sensor cables
- 1 ivory cable for keyboard and mouse
- 1 USB cable
- 1 ATX-to-PS/2 power cable
- 1 dual Pentium II CPU retention module

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

We have carefully inspected the PCA-6275 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-6275, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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CHAPTER 1

Hardware Configuration

This chapter gives background information on the PCA-6275. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Card specifications
- Board layout
- Safety precautions
- Jumper settings

1.1 Introduction

The PCA-6275 industrial grade CPU card uses two of Intel's highly acclaimed Pentium® II processors, together with the Intel 440BX PCI chipset. The card works with standard ISA or PCI/ISA-bus passive backplanes.

The CPU provides 512 KB on-chip L2 cache, eliminating the need for external SRAM chips. It has two PCI EIDE interfaces (for up to four devices), and an FDD interface (for up to two devices). Other features include two RS-232 serial ports (16C550 UARTs with 16-byte FIFO or compatible), one enhanced parallel port (supports EPP/ECP), and support for two USB (Universal Serial Bus) ports. The PCI Bus Master IDE controller supports Ultra DMA/33 operation. This provides data transfer rates of over 33 MB/sec. System BIOS supports boot-up from an IDE CD-ROM, SCSI CD-ROM and LS-120.

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

1.2 Features

- Intel slot 1 architecture
- Dual Pentium® II processors up to 500 MHz
- Intel 82440BX PCIset, FSB 66/100 MHz
- Three DIMM sockets to support Intel PC100-compliant SDRAMs up to 768 MB; supports ECC
- Award Flash BIOS, 2 Mbit
- On-board ATX power control connector to meet ACPI requirements
- Two enhanced IDE ports, supporting Ultra DMA/33, PIO Mode 4 and DMA Mode 2
- Two USB ports
- Two serial ports
- One bidirectional parallel port, supports ECP/EPP/SPP
- One floppy port and one keyboard/mouse port
- PCI V2.1 compliant
- PICMG 2.0 compliant
- Additional metal bracket to provide board stability with Pentium II processor
- CMOS backup battery life of 7 years
- HISA (ISA High Drive)
- On-board security for hardware monitoring

1.3 Specifications

System

- **CPU:** Intel Pentium® II up to 500 MHz
- **BIOS:** Award Flash BIOS, 2 Mbit
- **Green function:** Supports power management operation via BIOS. Activated by keyboard or mouse activity
- **PCI enhanced IDE hard disk drive interface:** Supports up to four IDE (AT bus) large hard disk drives , or other enhanced IDE devices. Supports PIO Mode 4 (16.67 MB/s data transfer rate) and Ultra DMA/33 (33 MB/s data transfer rate). BIOS enabled/disabled
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB). BIOS enabled/disabled

Memory

- **RAM:** Up to 768 MB in three available 168-pin DIMM sockets. Supports PC100-compliant SDRAMs
- **ECC (parity DRAM only):** Modules can detect multi-bit memory errors. Correction of 1-bit memory errors

Input/Output

- **Bus interface:** PCI/ISA bus, PICMG compliant
- **Bus speed:**
 - ISA: 8 MHz
 - PCI: 33 MHz
- **DMA channels:** 7
- **Interrupt levels:** 15
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3 or disabled. Standard DB-25 female connector provided. Supports EPP/ECP/SPP

- **Serial ports:** Two RS-232 ports with 16C550 UARTs (or compatible) with 16-byte FIFO buffer. Supports speeds up to 115.2 Kbps. Ports can be individually configured to COM1, COM2 or disabled
- **Keyboard and PS/2 mouse connector:** A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse. An on-board keyboard pin header connector is also available
- **ISA driver current:** 64 mA (High Drive)

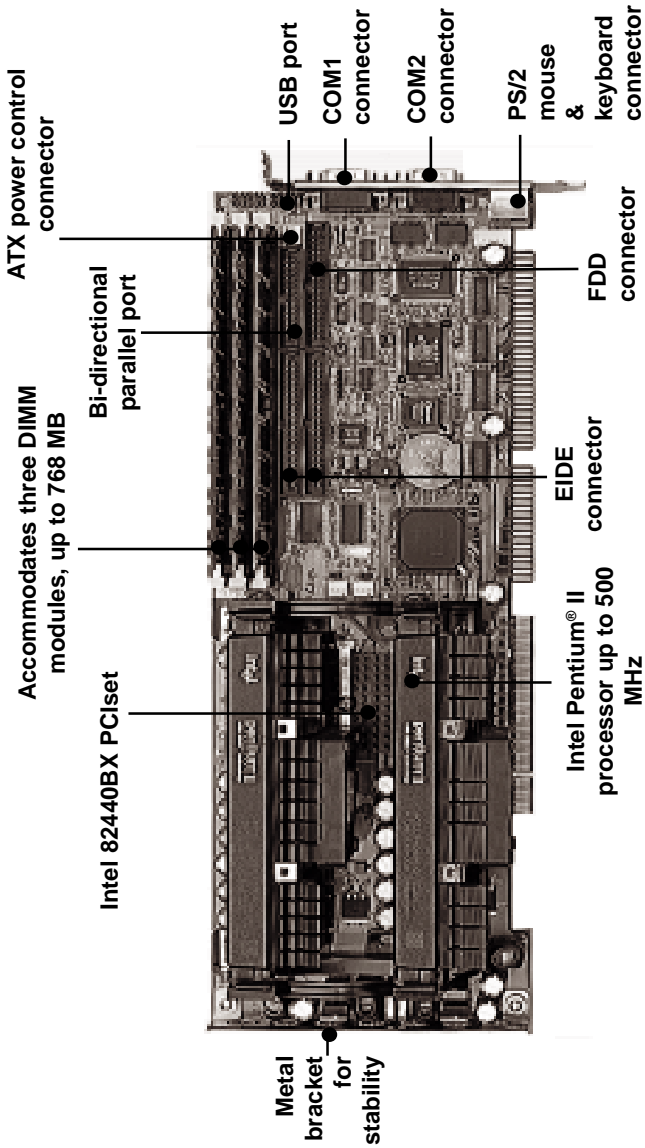
Industrial features

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

Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F)
- **Storage temperature:** -40 ~ 60° C (-40 ~ 140° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:**
 - +5 V @ 5.71 A (for dual Pentium® II 400 MHz)
 - +5 V @ 6.26 A (for dual Pentium® II 450 MHz)
- **Board size:** 338 x 122 mm (13.3" x 4.8")
- **Board weight:** 0.5 kg (1.2 lbs)

1.4 Board Layout: Main Features



1.5 Jumpers and Connectors

Connectors on the PCA-6275 board link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

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

Table 1-1: Jumpers

Label	Function
J1	CPU core frequency
J2	Watchdog output
J3	ATX soft power switch
J4	Clear CMOS

Table 1-2: Connectors

Label	Function
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Infrared (IR) connector
CN4	USB port
CN5	Parallel port
CN6	ATX feature connector
CN7	Floppy driver connector
CN8	CPU 2 fan power connector
CN9	CPU 1 fan power connector
CN10	External speaker
CN11	Keyboard lock and power LED
CN12	IDE LED
CN13	Reset connector
CN14	External SMI
CN15	Serial port: COM1
CN16	Serial port: COM2
CN17	External keyboard connector
CN18	PS /2 keyboard and mouse
RT1	CPU 1 temperature sensor
RT2	CPU 2 temperature sensor

1.6 Board Layout: Jumper and Connector Locations

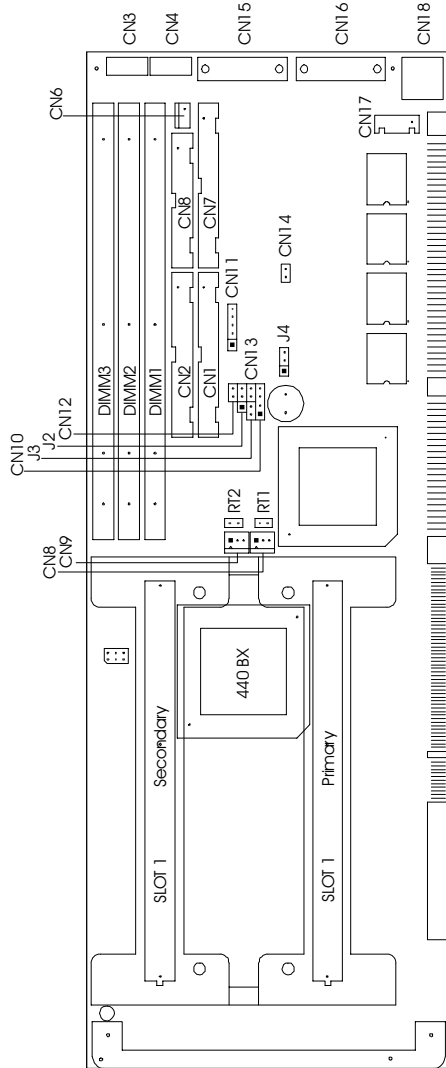


Figure 1-1: Board layout: jumper and connector locations

1.7 Safety Precautions

Warning!



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

Caution!



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

1.8 Jumper Settings

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

1.8.1 How to set jumpers

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

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

1.8.2 CPU core frequency (J1)

You must configure your PCA-6275 CPU card to the frequency of your Intel Pentium® II processor by setting jumper J1. The PCA-6275 is equipped to use Pentium processors with speeds of 233, 266, 300, 333, 350, 400, 450, and 500 MHz. Configure your PCA-6275 as follows:



Table 1-3: CPU core frequency (J1)

	1-2	3-4	5-6	
233 MHz	closed	closed	closed	<p>1 3 5 2 4 6</p>
266 MHz	open	open	open	<p>1 3 5 2 4 6</p>
300 MHz	open	open	closed	<p>1 3 5 2 4 6</p>
333 MHz	open	closed	open	<p>1 3 5 2 4 6</p>
350 MHz	closed	closed	closed	<p>1 3 5 2 4 6</p>
400 MHz	open	open	open	<p>1 3 5 2 4 6</p>
450 MHz	open	open	closed	<p>1 3 5 2 4 6</p>
500 MHz	open	closed	open	<p>1 3 5 2 4 6</p>

1.8.3 Watchdog timer output (J2)

The PCA-6275 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-6275 will recover from a software failure or an EMI problem. The J2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.



Table 1-4: Watchdog timer output (J2)

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

1.8.4 CMOS clear (J4)

The PCA-6275 CPU card contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J4 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1-5: CMOS clear (J4)

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

1.9 System Memory

The top-left edge of the PCA-6275 contains three sockets for 168-pin dual inline memory modules (DIMMs). All three sockets use 3.3 V unbuffered synchronous DRAMs (SDRAM). DIMMs are available in capacities of 16, 32, 64, 128, or 256 MB. The sockets can be filled in any combination with DIMMs of any size, giving your PCA-6275 single board computer between 16 and 768 MB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1-6: DIMM module allocation table

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

1.9.1 Sample calculation: DIMM memory capacity

Suppose you install a 128 MB DIMM into your PCA-6275's socket 1, a 32 MB DIMM into socket 2, and you leave socket 3 empty. Your total system memory is 160 MB, calculated as follows:

Table 1-7: DIMM memory capacity sample calculation

Socket number	168-pin DIMM memory	Total memory
1	128 MB x 1	128 MB
2	32 MB x 1	32 MB
3	- x 1	0 MB
Total memory		160 MB

1.9.2 Supplementary information about DIMMs

Your PCA-6275 can accept SDRAM memory chips (with or without parity). Also note:

- If the PCA-6275 operates at 100 MHz, only use PC100-compliant DIMMs. Most systems will not even boot if non-compliant modules are used. This is due to strict timing issues involved at this speed.
- SDRAM chips are usually thinner and have higher pin density than EDO chips.
- Chips with 9 chips/side support ECC; chips with 8 chips/side do not support ECC.
- Single-sided modules are typically 16 or 64 MB; double-sided modules are usually 8, 32, 128, or 256 MB.

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles remain outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. (See Figure 1-2.) To take away the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

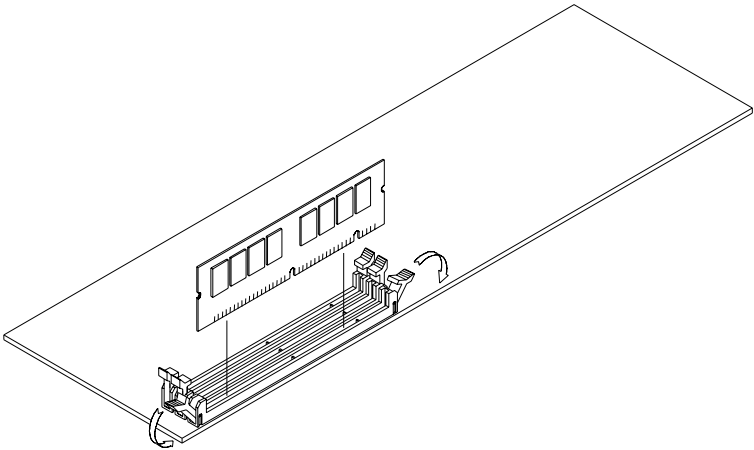


Figure 1-2: DIMM installation

1.11 Cache Memory

Since the second level cache has been embedded into the Pentium® II CPU, you do not have to take care of either SRAM chips or SRAM modules. The built-in second level cache in the Pentium II yields much higher performance than the external cache memories. The cache size in the Pentium II CPU is either 256 KB or 512 KB. Normally, for workstation and server application, the 256 KB version is enough. However, if your system is for heavy duty applications, the 512 KB version will help a lot. Specifically for our Pentium II based SBC, the Pentium II has another version that provides much better data security if combined with the DRAM ECC. Check with your vendor for various Pentium II models.

1.12 Mounting the CPU and Cooling Modules

The Pentium® II is a module-type CPU which runs at high speeds, for example 450 MHz, so the cooling mechanism becomes critical for system reliability. There are two types of cooling methods. one with a cooling fan attached to the heat sink of the Pentium II module, the other with a huge heat sink without any cooling fan attached. The first of these methods is recommended.

Both cooling methods for the Pentium II require a "retention module" to firmly fix the Pentium II CPU to slot 1. Figure 1-3 illustrates the steps involved in mounting the retention module and installing the CPU and cooling modules.

Step 1

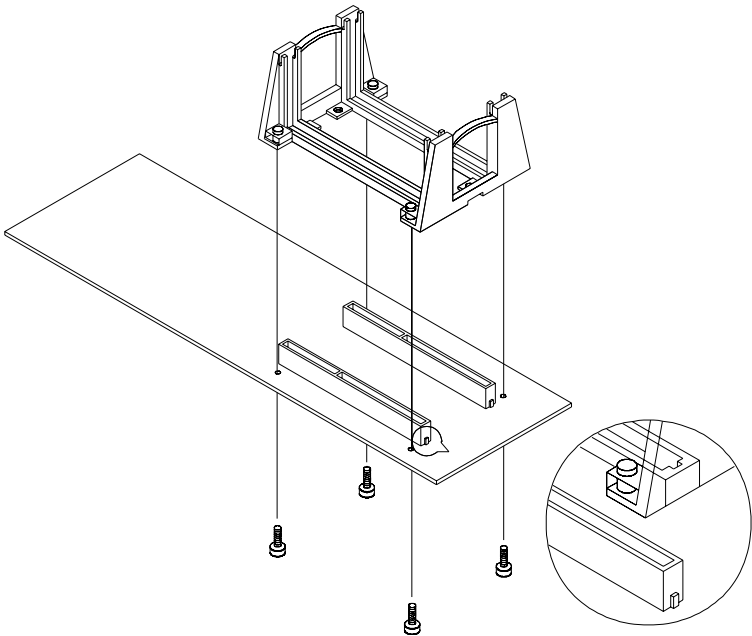


Figure 1-3: Mounting CPU and cooling modules - Step 1

Step 2

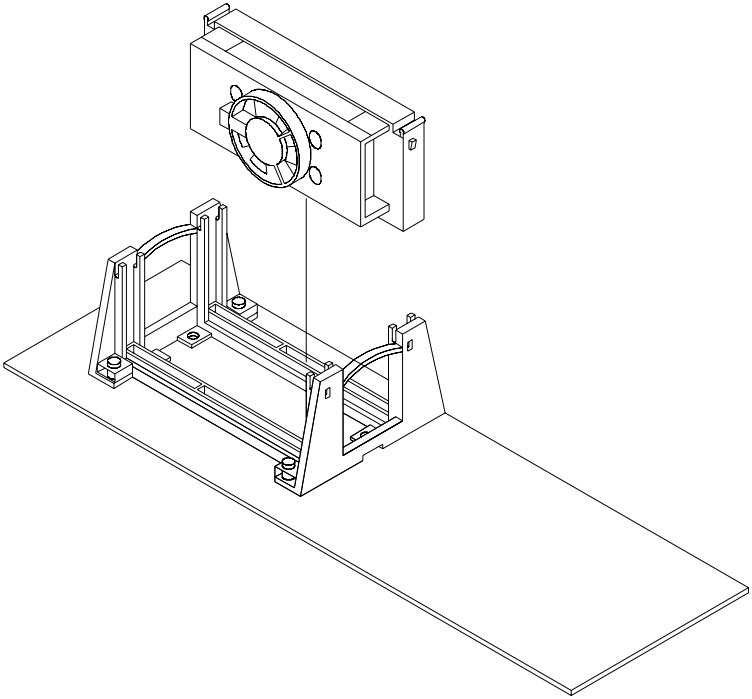


Figure 1-4: Mounting CPU and cooling modules - Step 2

Step 3

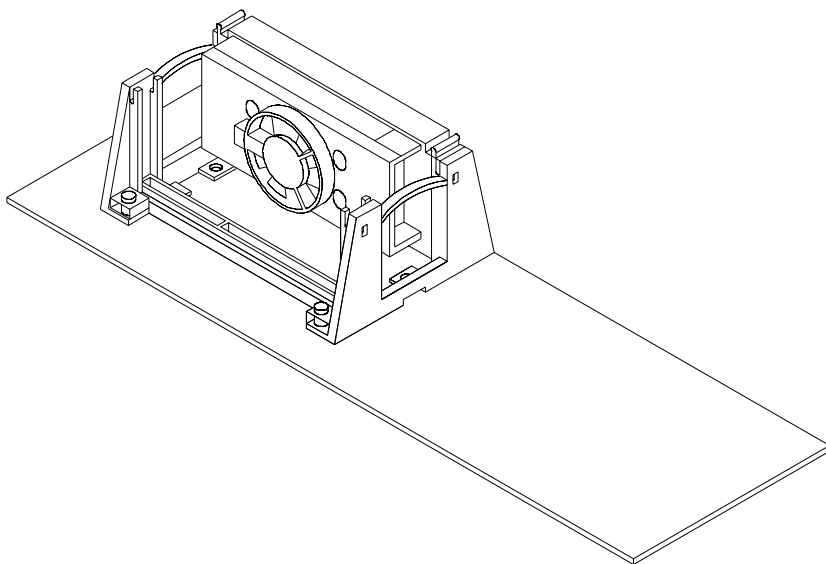


Figure 1-5: Mounting CPU and cooling modules - Step 3

1.13 On-board Support Bracket

Advantech's PCA-6275 Pentium® II also includes an on-board metal bracket to provide balanced support for the Pentium II processor cartridge.

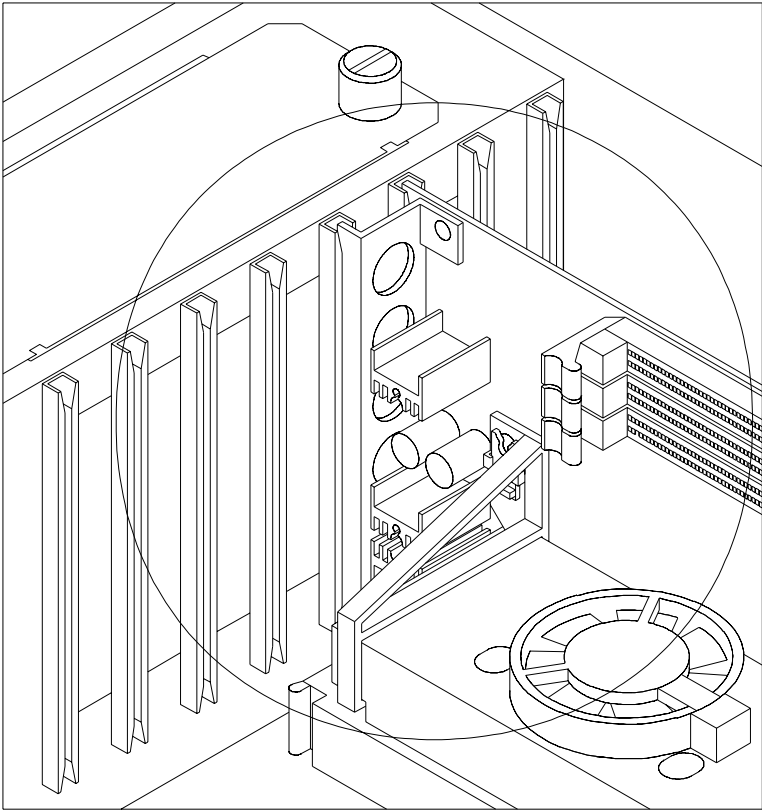


Figure 1-6: On-board support bracket

CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6275 board. You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed, or your chassis is very tight, you may need to partially remove the card to make all the connections.

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

You can attach up to four IDE (Integrated Device Electronics) drives to the PCA-6275's internal controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

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

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

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

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

2.2 IR Connector (CN3)

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

2.3 USB Connector (CN4)

The PCA-6275 CPU card provides one USB (Universal Serial Bus) interface, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interface complies with USB Specification Rev. 1.0, and is fuse-protected.

The USB interface is accessed through a 10-pin flat-cable connector, CN4. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

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

2.4 Parallel Port Connector (CN5)

The parallel port is normally used to connect the CPU card to a printer. The PCA-6275 includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN5. 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 CN5 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 CN5. Pin 1 is on the upper right side of CN5.

2.5 ATX Power Control Connectors (CN6 and J3)

2.5.1 ATX feature connector (CN6) and soft power switch connector (J3)

The PCA-6275 can support an advanced soft power switch function if an ATX power supply is used. To enable the soft power switch function:

1. Take the specially designed ATX-to-PS/2 power cable out of the PCA-6275's accessory bag.
2. Connect the 3-pin plug of the cable to CN6 (ATX feature connector).
3. Connect the power on/off button to J3. (A momentary type of button should be used.)

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



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

Important: Be sure that the ATX power supply can take at least a 10 mA load on the 5 V standby lead (5VSB). If not, you may have difficulty powering on your system.

2.5.2 Controlling the soft power switch

The soft power switch enables your system to continue running in "system off" mode or "system suspend" mode. For details, refer to Section 3.6. Users can also identify the current power mode by checking the system's power LED. For details, refer to Section 2.8.2.

2.6 Floppy Drive Connector (CN7)

You can attach up to two floppy disk drives to the PCA-6275's on-board controller. You can use any combination of 5.25" (360 KB/1.2 MB) and/or 3.5" (720 KB/1.44/2.88 MB) drives.

The card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed circuit-board connector (usually used for 5.25" drives). You can use only one connector in each set. The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

2.7 CPU Fan Connectors (CPU1: CN9; CPU2: CN8)

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

2.8 Front Panel Connectors (CN10, CN11, CN12, CN13 and J3)

There are several external switches to monitor and control the PCA-6275.

2.8.1 External speaker (CN10)

CN10 is a 4-pin connector for an external speaker connection. If there is no external speaker, the PCA-6275 provides an on-board buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed.

2.8.2 Keyboard lock and power on LED (CN11)

CN11 is a 5-pin connector for the "keyboard lock" and "power on" LED connection. Refer to Appendix B.12 for detailed information on the pin assignments. The system's power LED status is indicated below, according to the power supply used:

<u>Power Mode</u>	<u>LED (PS/2 Power)</u>	<u>LED (ATX Power)</u>
System On	On	On
System Suspend	Flashes fast	Flashes fast
System Off	Off	Flashes slowly

If an ATX power supply is used, refer to Section 2.5.1.

2.8.3 IDE LED (CN12)

You can connect an LED to connector CN12 to indicate when the HDD is active.

2.8.4 Reset (CN13)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button to CN13.

2.8.5 ATX soft power switch (J3)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to J3. This connection enables you to turn your computer on and off.

2.9 External Suspend Switch Lead (SMI) (CN14)

This allows the user to manually place the system into a suspend mode or "Green" mode when the system is not in use. System activity is decreased to save electricity and prolong the life of certain components. The 2-pin connector connects to the case-mounted suspend switch. If you do not have a switch for the connector, you may use the "turbo switch", because it does not have any other function. SMI is activated when it detects a "short to open" moment. Therefore, leaving it shorted will not cause any problems. It may require one or two pushes depending on the position of the switch. Wake-up can be controlled by settings in the BIOS, but the keyboard will always allow wake-up. (The SMI lead cannot wake up the system.) If you want to use the SMI connector, the "Suspend" switch in the Power Management Setup of the BIOS software should be on the default setting "Enable".

2.10 Serial Ports (CN15: COM1; CN16: COM2)

The PCA-6275 offers two serial ports, CN15 as COM1 and CN16 as COM2. These ports can connect to serial devices (such as a mouse, printers, and so on) or to a communication network.

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

Connector	Port	Address	Interrupt
CN15	COM1	3F8*, 3E8	IRQ4
CN16	COM2	2F8*, 2E8	IRQ3

* default settings

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

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

2.11 External Keyboard Connector (CN17)

In addition to the keyboard connector on the PCA-6275's rear plate, there is also an extra on-board external keyboard connector. This gives system integrators greater flexibility in designing their systems.

2.12 PS/2 Keyboard & Mouse Connector (CN18)

The PCA-6275 board provides a keyboard connector. A 6-pin mini-DIN connector (CN18) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

2.13 CPU Temperature Sensors (CPU1: RT1; CPU2: RT2)

This connector supports hardware, which monitors the CPU temperature. If you have purchased the specially designed fan and thermal monitor heat sinks, you can connect the temperature sensors cables to RT1/RT2.

CHAPTER 3

Award BIOS Setup

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

3.1 Introduction

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

3.2 Entering Setup

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

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

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

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

3.3 Standard CMOS Setup

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

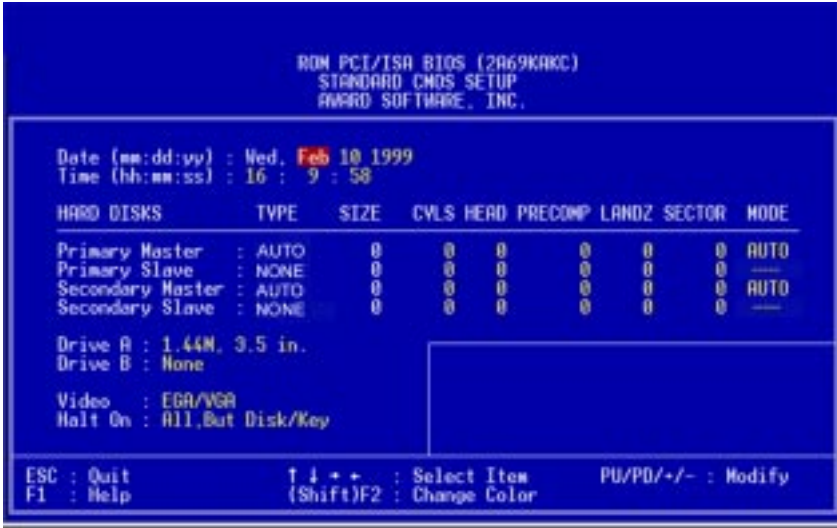


Figure 3-1: CMOS setup screen

3.4 BIOS Features Setup

The "BIOS FEATURES SETUP" screen appears when choosing the "BIOS FEATURES SETUP" item from the "CMOS SETUP UTILITY" menu. It allows the user to configure the PCA-6275 according to his particular requirements.

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

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

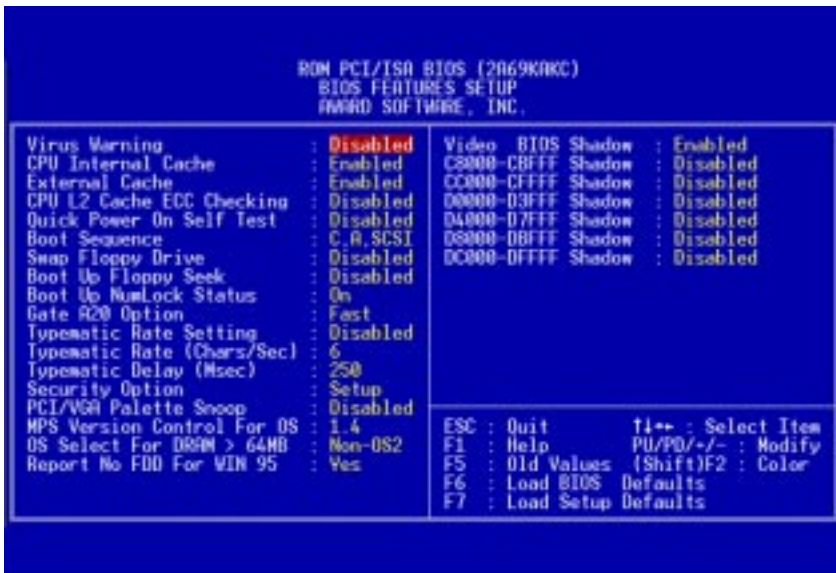


Figure 3-2: BIOS features setup screen

3.4.1 Virus Warning

While the system is booting up, and after boot-up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can run the anti-virus program to locate the problem.

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

3.4.2 Quick Power On Self Test

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

3.4.3 Boot Sequence

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

- A,C, SCSI
- C,A, SCSI (Default)
- C, CDROM, A
- CDROM, C, A
- D, A, SCSI
- E, A, SCSI
- F, A, SCSI
- SCSI, A, C
- SCSI, C, A
- C only
- LS120, C

3.4.4 Boot Up Floppy Seek

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

- Enabled** BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.
- Disabled** BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

3.4.5 Boot Up NumLock Status

The default is “On”.

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

3.4.6 Gate A20 Option

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

3.4.7 Typematic Rate Setting

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

3.4.8 Typematic Rate (Chars/Sec)

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

3.4.9 Typematic Delay (msec)

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

3.4.10 Security Option

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

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

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

3.4.11 PCI/VGA Palette Snoop

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

3.4.12 OS Select for DRAM > 64 MB

This setting is under the OS/2 system.

3.4.13 Video BIOS Shadow

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

3.4.14 C8000-CBFFF Shadow / DC000-DFFFF Shadow

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

Enabled Optional shadow is enabled.

Disabled Optional shadow is disabled.

3.5 Chipset Features Setup

By choosing the “CHIPSET FEATURES SETUP” option from the INITIAL SETUP SCREEN menu, the screen below will be displayed. This sample screen contains the manufacturer’s default values for the PCA-6275.

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

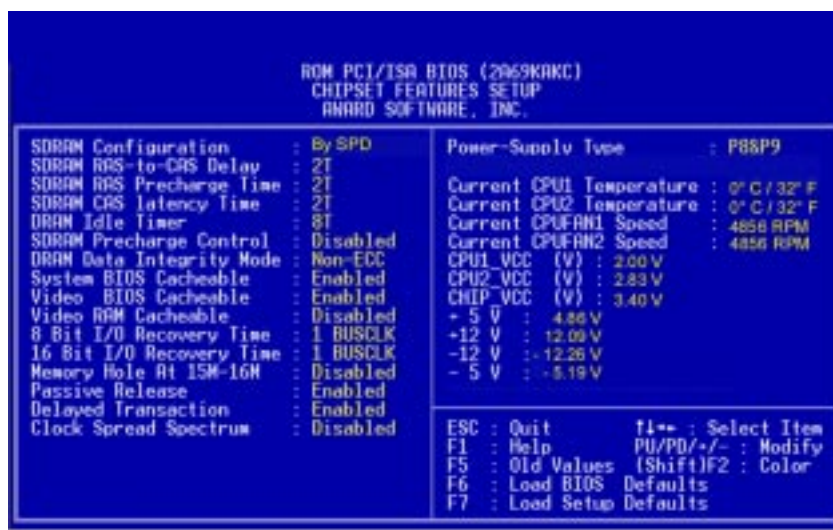


Figure 3-3: CHIPSET features setup screen

Note: If you enable the IDE HDD block mode, the enhanced IDE driver will be enabled.

3.6 Power Management Setup

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



Figure 3-4: Power management setup screen

3.6.1 Power Management

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

3.6.2 HDD Power Management

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

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

3.6.3 Soft-Off by PWR-BTTN

If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode, whereas pushing the button again will put the system in "system on" 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.

3.6.4 IRQ Activity

IRQ can be set independently. Activity on any enabled IRQ will wake up the system.

3.7 PCI Configuration Setup

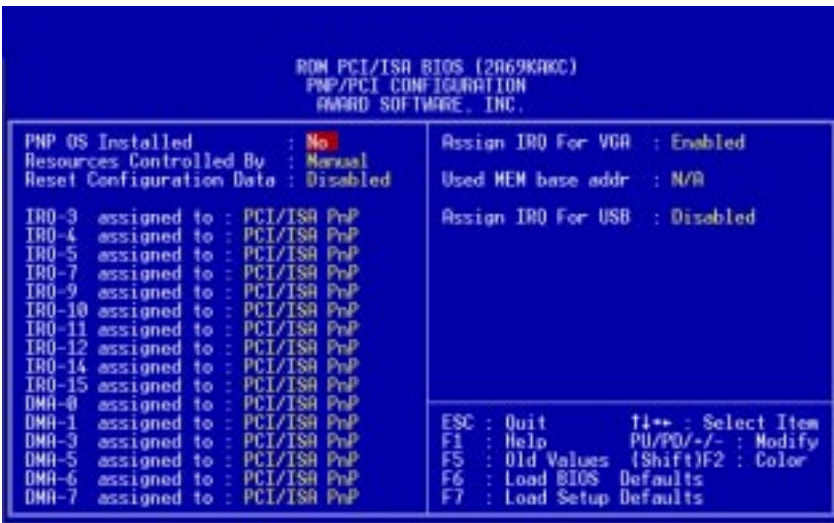


Figure 3-5: PCI configuration screen

3.7.1 IRQ-xx assigned to : PCI/ISA PnP

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

3.7.2 DMA-x assigned to : PCI/ISA PnP

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

3.7.3 Used MEM base addr : N/A

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

3.8 Load BIOS Defaults

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

3.9 Load Setup Defaults

“Load SETUP Defaults” loads the values required by the system for maximum performance.

3.10 Integrated Peripherals



Figure 3-6: Integrated peripherals

3.11 Password Setting

To change the password:

1. Choose the "PASSWORD SETTING" option from the Setup main menu and press <Enter>.

The screen will display the following message:

```
Enter Password:
```

Press <Enter>.

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

```
Confirm Password:
```

Enter the current password and press <Enter>.

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

Remember, to enable the password setting feature, you must first select either Setup or System to secure your option in "BIOS FEATURES SETUP".

3.12 IDE HDD Auto Detection

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

3.13 Save & Exit Setup

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

3.14 Exit Without Saving

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

CHAPTER 4

On-board Security Setup

This chapter explains OBS concepts and provides instructions for installing the relevant software drivers. This is done using the OBS driver disks included in your PCA-6275 package.

4.1 Introduction

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

The PCA-6275 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: 1.7 V ~ 3.3 V, according to Intel specifications
- Transmission voltage from CPU to chipset: typically 1.5 V
- Chipset voltage: typically 3.3 V
- Main voltage: +5 V, +12 V

The negative system voltage sets which can be monitored include:

- Main voltage: -5 V, -12 V

4.2 Installation of OBS Devices

After you have mounted the CPU and cooling modules, enable the OBS functions as follows:

1. Take the specially designed temperature sensor cables out of the accessories bag.
2. Connect the 2-pin header of each cable to connector RT1 and RT2 respectively.
3. Attach the sticker to the heat sink, but NOT on the plastic portion of the heat sink.
4. Place the sensor on the nearest part of the CPU, to ensure that true CPU temperature is measured.

4.3 Driver Installation

4.3.1 Necessary prerequisites

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

4.3.2 Before you begin

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

Utility disk 1: OBS Monitor Win95/98 V 1.10 #1

Utility disk 2: OBS Monitor Win95/98 V 1.10 #2

4.3.3 Windows 95 drivers setup procedure

1. Insert the OBS driver disk into drive A:.

Type:

A:\setup.exe

Press <Enter> to run the driver SETUP program.

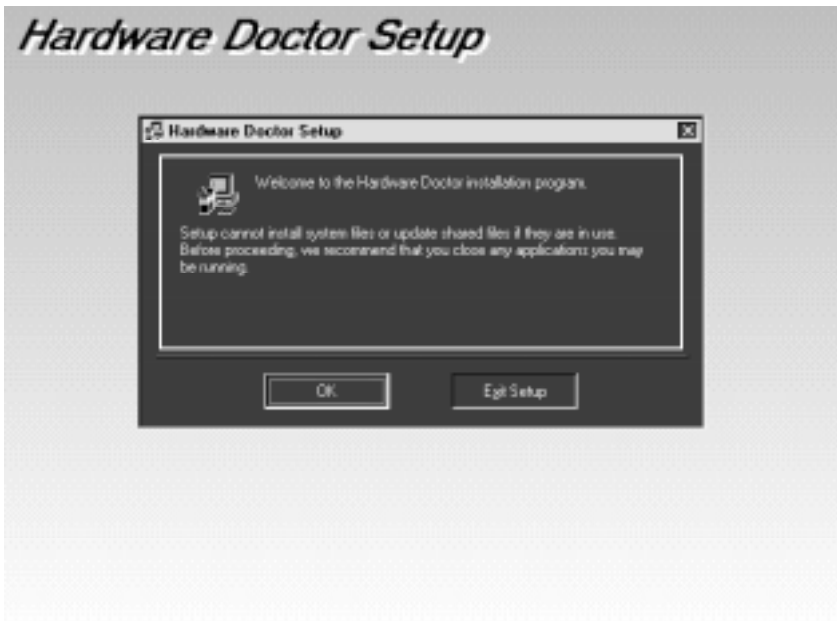


Figure 4-1: Hardware Doctor setup - initial screen

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



Figure 4-2: Setup under Win95



Figure 4-3: Restarting Windows

3. Follow the screen instructions to install the software.



Figure 4-4: Hardware Doctor setup - installation screen

4. Complete the setup.

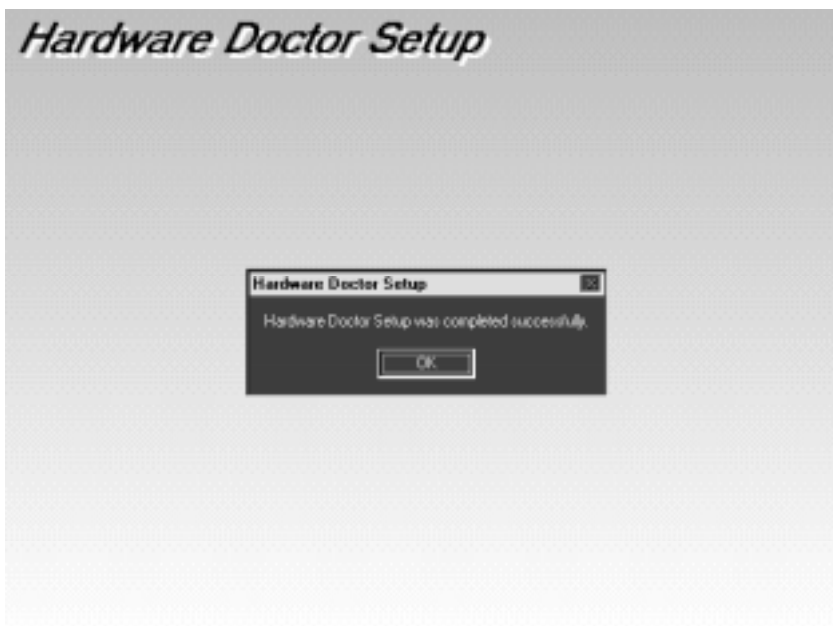


Figure 4-5: Hardware Doctor setup - completion screen

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



Figure 4-6: Exploring - Hardware Doctor

- 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.

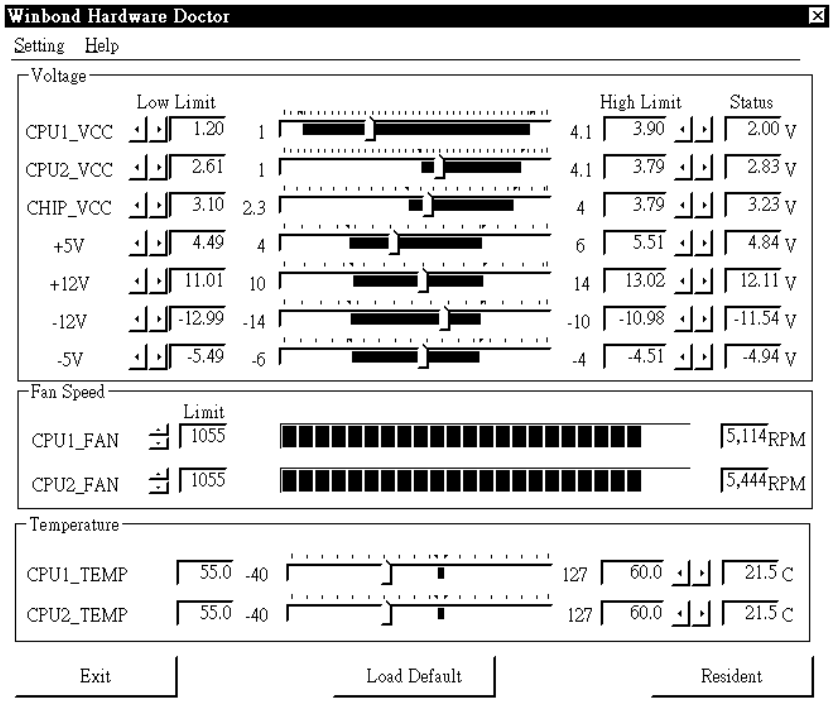


Figure 4-7: Winbond Hardware Doctor

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

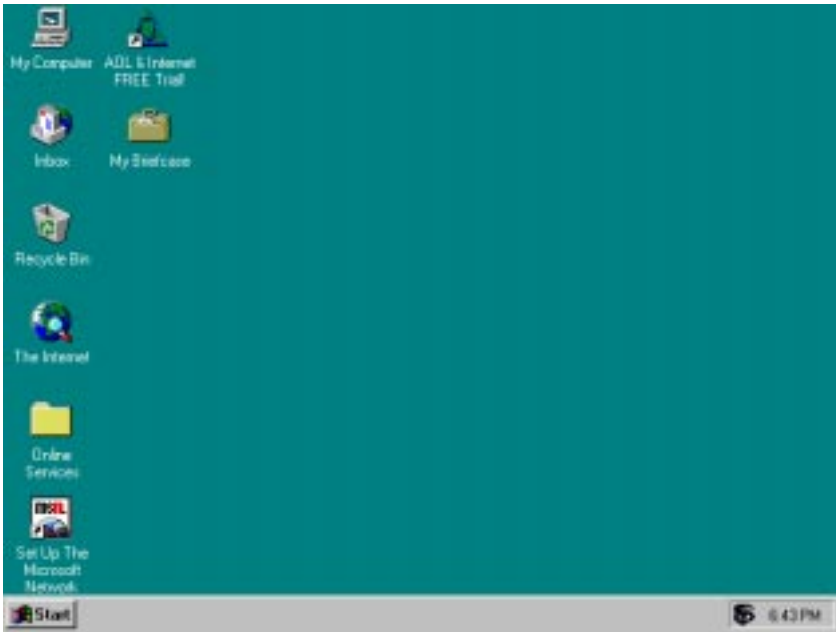


Figure 4-8: "Terminate and Stay Resident" (TSR) icon on the right side of the bottom window bar

- Click on "Setting", then "Monitoring Config." While enabling each OBS function, you can choose "Faults 1". This will result in a warning message being delivered as soon as any monitored reading exceeds safe limits for the first time. Alternatively, you can set up "Count 3". This will result in a warning message being delivered only after any monitored reading exceeds safe limits for a third time. It is recommended that you load the default settings for all the OBS functions.

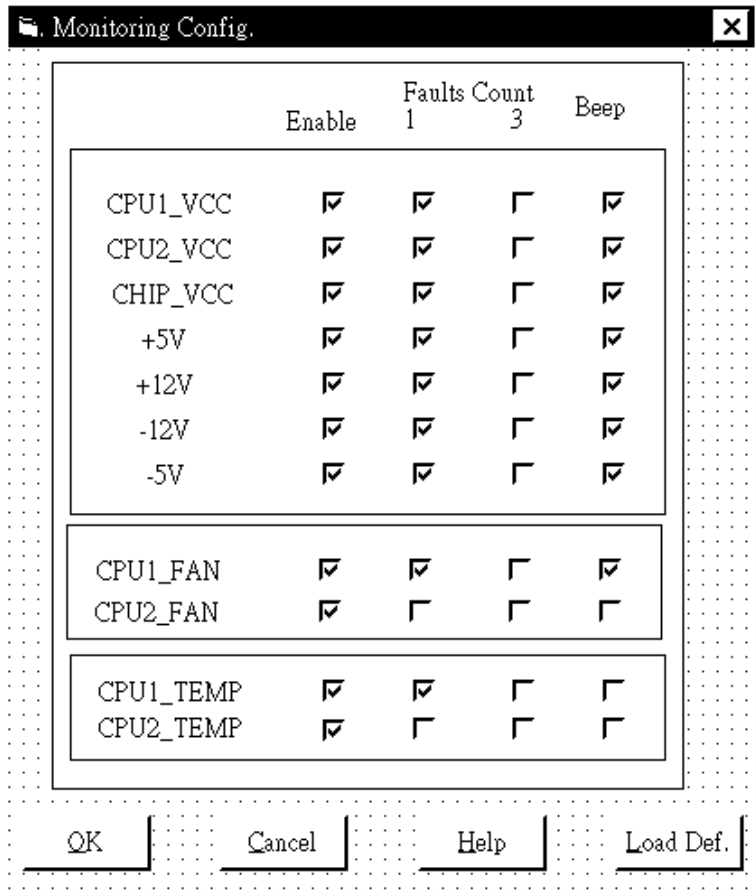


Figure 4-9: Monitoring Config.

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

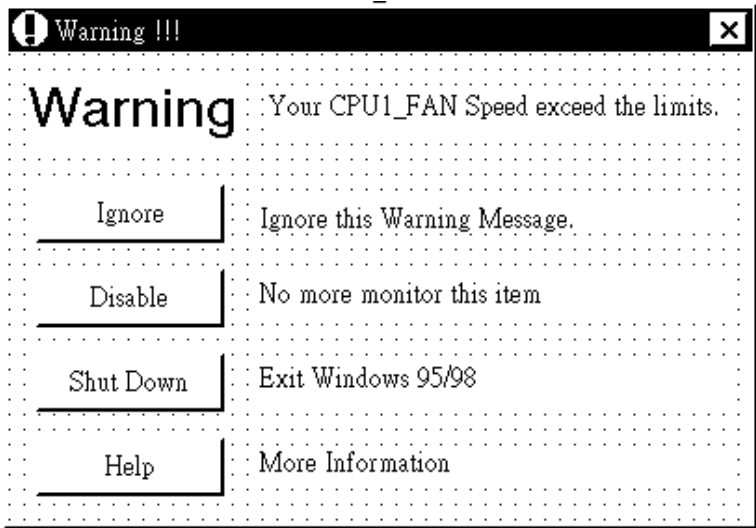


Figure 4-10: Warning display

Programming the Watchdog Timer

The PCA-6275 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

A.1 Programming the Watchdog Timer

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

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

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

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

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

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


APPENDIX **B**

Pin Assignments

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

- COM1/COM2 RS-232 serial port
- Keyboard and mouse connector
- External keyboard connector
- ATX feature connector
- IDE hard drive connector
- USB connector
- CPU fan power connector
- Floppy drive connector
- Parallel port connector
- IR connector
- HDD LED connector
- Power LED and keylock connector
- External speaker
- System I/O ports
- DMA channel assignments
- Interrupt assignments
- 1st MB memory map

B.1 COM1/COM2 RS-232 Serial Port (CN15, CN16)

Table B-1: COM1/COM2 RS-232 serial port (CN15, CN16)

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

B.2 Keyboard and Mouse Connector (CN18)

Table B-2: Keyboard and mouse connector (CN18)

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

B.3 External Keyboard Connector (CN17)

Table B-3: External keyboard connector (CN17)

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

B.4 ATX Feature Connector (CN6)

Table B-4: ATX feature connector (CN6)

Pin	Signal
1	5VSB
2	VCC
3	PS-ON

B.5 IDE Hard Drive Connector (CN1, CN2)

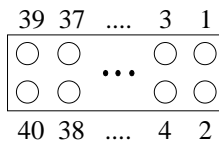


Table B-5: IDE hard drive connector (CN1, CN2)

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	N/C	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	N/C
29	HDACKO*	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND

* low active

B.6 USB Connector (CN4)

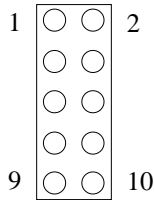


Table B-6: USB1/USB2 connector (CN4)

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

B.7 CPU Fan Power Connectors (CN8, CN9)

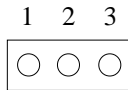


Table B-7: CPU fan power connector (CN8/9)

Pin	Signal
1	GND
2	+12 V
3	Detect

B.8 Floppy Drive Connector (CN7)

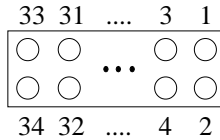


Table B-8: Floppy drive connector (CN7)

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT*
3	GND	4	N/C
5	GND	6	N/C
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.9 Parallel Port Connector (CN5)

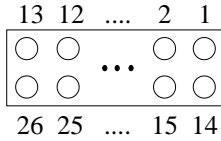


Table B-9: Parallel port connector (CN5)

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

B.10 IR Connector (CN3)

Table B-10: IR connector (CN3)

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

B.11 HDD LED Connector (CN12)

Table B-11: HDD LED connector (CN12)

Pin	Signal
1	V_{cc}
2	LED

B.12 Power LED and Keylock Connector (CN11)

You can use an LED to indicate when the CPU card is on. Pin 1 of CN11 supplies the LED's power, and Pin 3 is the ground.

You can use a switch (or a lock) to disable the keyboard so that the PC will not respond to any input. This is useful if you do not want anyone to change or stop a program which is running. Simply connect the switch from Pin 4 to Pin 5 of CN11.

Table B-12: Power LED and keylock connector (CN11)

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

B.13 External Speaker (CN10)

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

Table B-13: External speaker (CN10)

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

B.14 System I/O Ports

Table B-14: 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 (LPT 3)
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1
443	WDT

B.15 DMA Channel Assignments

Table B-15: DMA channel assignments

Channel	Function
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.16 Interrupt Assignments

Table B-16: Interrupt assignments

Priority	Interrupt#	Interrupt source
1	NMI	Parity error detected
2	IRQ 0	Interval timer
3	IRQ 1	Keyboard
-	IRQ 2	Interrupt from controller 2 (cascade)
4	IRQ 8	Real-time clock
5	IRQ 9	Cascaded to INT 0A (IRQ 2)
6	IRQ 10	Available
7	IRQ 11	Available
8	IRQ 12	PS/2 mouse
9	IRQ 13	INT from co-processor
10	IRQ 14	Fixed disk controller
11	IRQ 15	Available
12	IRQ 3	Serial communication port 2
13	IRQ 4	Serial communication port 1
14	IRQ 5	Parallel port 2
15	IRQ 6	Diskette controller (FDC)
16	IRQ 7	Parallel port 1 (print port)

B.17 1st MB Memory Map

Table B-17: 1st MB memory map

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

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