

# **PCM-4894**

All-in-One 486 single Board computer  
with Flat Panel / CRT SVGA, Ethernet,  
and 4 Serial Ports

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## Packing list

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

- 1 PCM-4894 Single board computer
- 1 Quick Installation Guide
- 1 CD-ROM contains the followings:
  - User's Manual (this manual in PDF file)
  - VGA drivers and utilities
  - Ethernet drivers and utilities
  - Latest BIOS (as of this CD-ROM was made)
- PC/104 Module mounting support kit

The PCM-4894 require several cables for operation. You can make them yourself or purchase an optional cable kit, PCM-10489-2 (Part No: 9681489010).

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

## Notice

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Dear Customer,

Thank you for purchasing the PCM-4894 board. The user's manual is designed to help you get the most out of the PCM-4894, please read it thoroughly before you install and use the board. The product that you have purchased comes with a two-year limited warranty, but AAEON will not be responsible for any misuse of the product. Therefore, we recommend you to read the manual before using the product.

To get the latest version of the user's manual, please visit our Web site at:

**<http://www.aaeon.com.tw>**

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## **General Information**

This chapter provides background information for the PCM-4894.

Sections include:

- Specifications
- Board layout
- Dimensions

# Introduction

---

The PCM-4894 is an all-in-one single board 486 computer with an **onboard flat panel/CRT SVGA controller** and **PCI Ethernet interface**. It offers all the functions of an industrial computer and its display capabilities on a single board, but fits in the space of a 5.25" floppy drive (only 5.75" x 8"). This means the PCM-4894 is your absolute best solution for embedded applications.

The onboard PCI-bus, flat panel/CRT SVGA controller uses the CHIPS 65550 chipset with up to 2 MB of video memory (on-board 1MB). This chipset, used with the local PCI-bus, enables 32-bit graphic throughput at up to 33 MHz. Excellent for display-intensive applications, it supports various LCD types including TFT, STN, B/W, and EL.

PCM-4894 A31 has one Realtek RTL 8139C PCI bus Ethernet controller on board to offer LAN function, while PCM-4894 A31-01 doesn't have any onboard LAN.

The PCM-4894 supports the M-Systems DiskOnChip 2000 (optional) which is a new generation of high performance single-chip Flash Disk. It provides a Flash Disk (as a BIOS expansion) which does not require any bus, slots, or connectors. It is also the optimal solution for Single Board Computers because of its small size, easy integration, plug-and-play functionality, and its low power consumption. The DiskOnChip is available in capacities from 2MB to 72MB and fits in a standard 32-pin DIP socket.

Another feature of the PCM-4894 is the inclusion of a high speed, local bus IDE controller. This controller supports (through ATA PIO) mode 3 and mode 4 hard disks, enabling data transfer rates in excess of 11 MB/second. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives, or other IDE devices. The built-in, enhanced IDE controller provides a 4-layer, 32-bit, posted write buffer and a 4-layer, 32-bit read-prefetch buffer to boost IDE performance.

Moreover, PCM-4894 provides one riser card slot and the function of digital I/O (4 in, 4 out), while PCM-4894-A31-01 is the exception for it doesn't provide the slot and this function.

# Specifications

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## STANDARD SBC FUNCTIONS

**CPU:** AMD 5X86-P75 (486DX5-133) SQFP

**BIOS:** Award 128KB FLASH BIOS

**Chipset:** ALI 1487/1489

**Super I/O Chipset:** WINBOND83877TF

**2<sup>nd</sup> Level Cache:** On board 128KB 2<sup>nd</sup> level cache. Could be upgraded to 512KB by factory.

**RAM memory:** 4MB to 128MB. Two 72-pin SIMM sockets on board.

**Enhanced IDE hard disk drive interface:** Support up to two hard disk drives. BIOS auto-detect. Supports PIO mode 4 and Bus Master. 22 x 2 header, pitch 2.00mm with housing.

**Floppy disk drive interface:** Supports up to two floppy disk drives, 5.25" (360KB and 1.2MB) and /or 3.5" (720KB, 1.44MB and 2.88MB). 17 x 2 header, pitch 2.54mm with housing.

**Multi-mode parallel port:** Configured to LPT1, LPT2, LPT3 or disabled. Supports SPP, ECP and EPP. 13 x 2 header, pitch 2.54mm with housing.

**Serial ports:** Three RS-232 and one RS-232/422/485 serial ports. Ports can be configured as COM1, COM2, COM3, COM4 or disabled individually. Four 16C550 serial UARTs. 20 x 2 header, pitch 2.54mm with housing for RS-232 x 4.

**Keyboard/mouse connector:** 8 pin connector supports standard PC/AT keyboard and PS/2 mouse.

**Real Time Clock/Calendar:** Dallas DS-12887A or equivalent, powered by lithium battery for data retention of up to 3 years.

**Watchdog Timer:** Can generate a system reset, IRQ15. Support Windows 3.1, Windows 95. Software selectable timeout interval. (1 ~ 255 sec., 1 sec./step)

**DMA channels:** 7

**Interrupt levels:** 15

**Power connector:** 4 pin 3.5" HDD male power connector.

Power management: I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.1 compliant.

## **FLAT PANEL VGA INTERFACE**

**Chipset:** C&T65550

**Display memory:** 2MB on board.

**Display type:** Supports CRT and flat panel (TFT, DSTN, mono and EL) display. Can display both CRT and flat panel simultaneously.

**Resolution:** Up to 1024x768@64K colors.

## **ETHERNET INTERFACE**

**Chipset:** Realtek RTL8139C PCI Ethernet controller.

**Ethernet interface:** On board RJ-45 connector. Software drivers optional.

**Notice: PCM-4894-A31-01 doesn't have any LAN on board.**

## **SSD INTERFACE**

One 32-pin DIP socket supports M-system DiskOnChip 2000 series, memory capacity from 2MB to 72MB.

## **DIGITAL I/O INTERFACE**

4 TTL Digital Input bits & 4 Open Collector Digital Output bits.  
(Port address : 294H, Bit : 0, 1, 2, 3)

**Notice: PCM-4894-A31-01 doesn't have this function.**

## **EXPANSION SLOTS**

**PC/104 connector:** 104 pin connector for a 16 bit bus expansion.  
One PCI/ISA bus slot.

**Riser card slot:** one riser slot on board

**Notice: PCM-4894-A31-01 doesn't have the riser slot.**

## **MECHANICAL AND ENVIRONMENTAL**

**Power supply voltage:** +5V (4.75V to 5.25V)

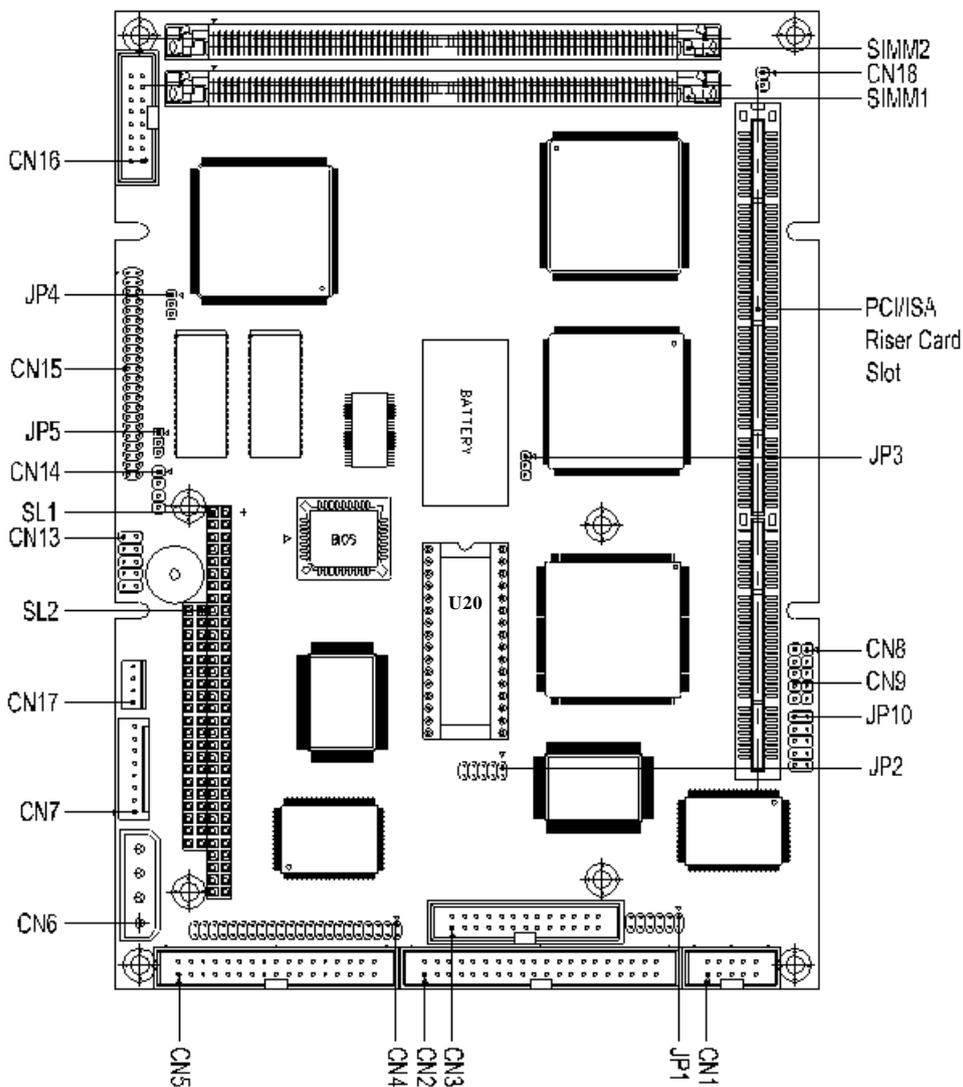
**Max. power requirements:** +5V @ 4A

**Operating temperature:** 32 to 140° F (0 to 60° C)

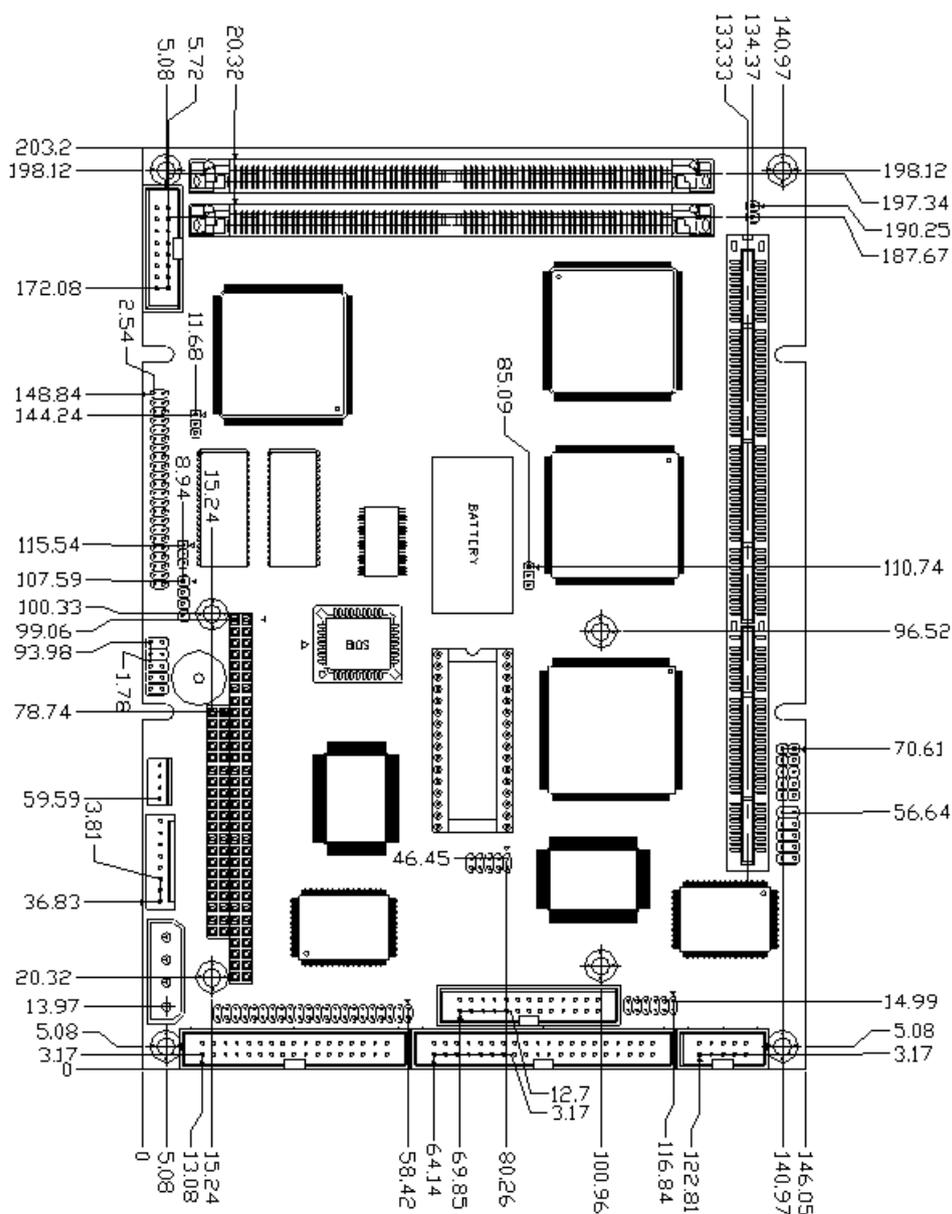
**Board Size:** 8''(L) x 5.75''(W) (203mm x 146mm)

**Weight:** 1.32 lb. (0.6 Kg)

## Board layout



# Card dimensions





## Installation

This chapter explains set up procedures for the PCM-4894 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

## Jumpers and connectors

---

Connectors on the board link it to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

The table below lists the function of each of the board jumpers and connectors:

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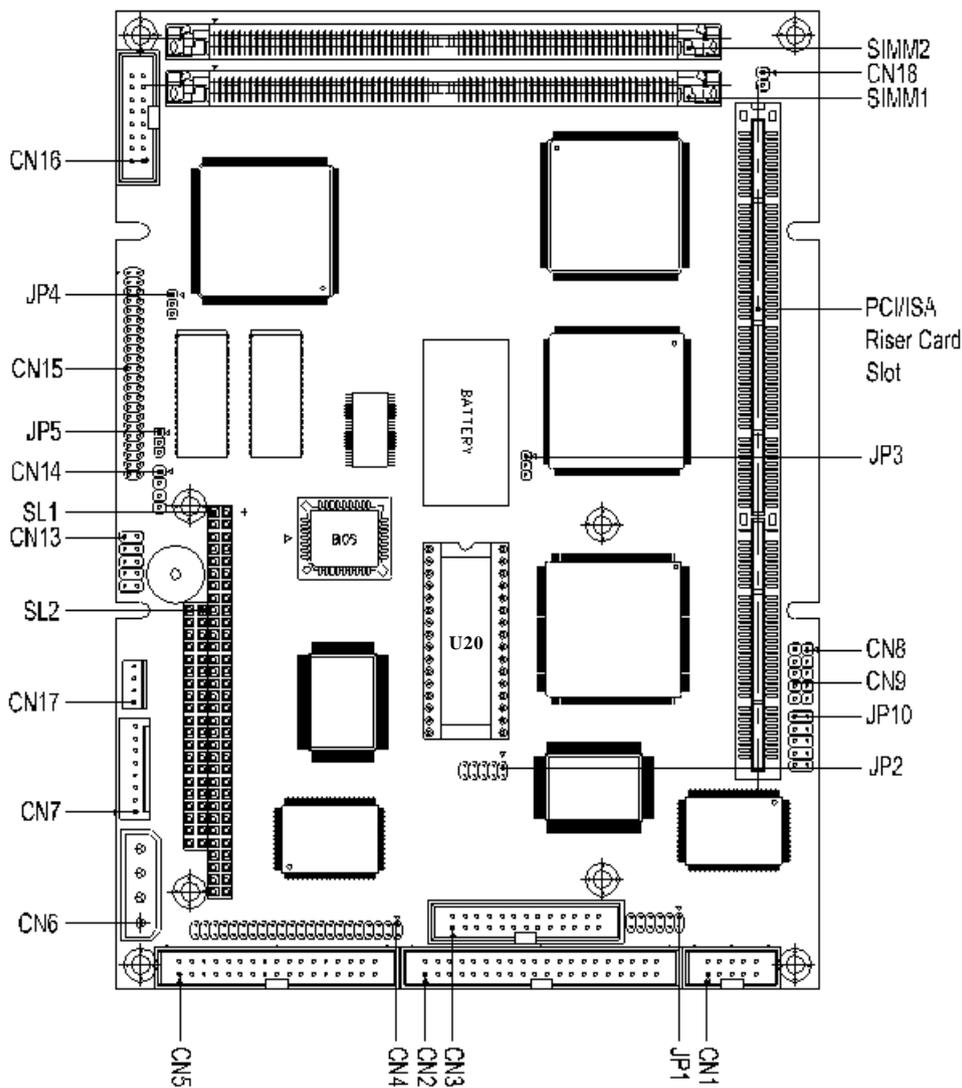
Jumpers and connectors

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<b>Label</b>	<b>Function</b>
CN1	Ethernet connector
CN2	Serial ports connector
CN3	Parallel port connector
CN4	HDD connector
CN5	FDD connector
CN6	Main power connector
CN7	Keyboard / PS2 mouse connector
CN8	Power LED / Keyboard lock
CN9	Reserved IR connector
CN10	Digital I/O connector
CN13	LED indicators / Hardware reset
CN14	External speaker connector
CN15	LCD connector
CN16	VGA connector
CN17	Auxiliary power connector
CN18	CPU fan power connector
JP1	COM3/4 RI function selection
JP2	DOC address / COM2 mode setting
JP3	Clear CMOS
JP4	LCD voltage selection
JP5	LCD SHF/ASHF clock selection

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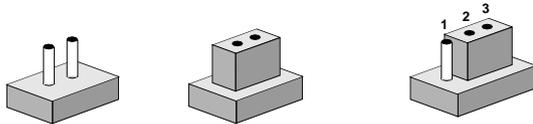
## Locating jumpers and connectors



# Setting jumpers

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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 will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



**Open**

**Closed**

**Closed 2-3**

The jumper settings are schematically depicted in this manual as follows:



**Open**

**Closed**

**Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

## Safety precautions

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**Warning!**  Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on because sensitive electronic components can be damaged by the sudden rush of power. 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. 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.

## Installing DRAM (SIMMs)

---

The PCM-4894 CPU card provides two 72-pin SIMM (Single In-line Memory Module) sockets and supports between 4MB and 64MB.

When installing SIMMs, make sure that Bank 1 is filled first.

### Installing SIMMs

*Note: that the modules can only fit into a socket one way.*

1. Insert the memory module into the socket at a moderate angle.
2. Push the module toward the vertical posts at both ends of the socket until the module is upright and the retaining clips at both ends of the module click into place. When positioned correctly, the pins on top of the vertical posts should correspond to the circular holes on the ends of the module.
3. Repeat steps 1 and 2 for each module you install.

### Removing SIMMs

If you need to remove a SIMM, follow the procedures below:

1. Supporting the SIMM with a finger, use a pen or a similarly shaped object and press one retaining clip straight down.
2. Repeat for the other side. When released, the retaining clips will push the SIMM up and out of its upright position.
3. Carefully pull the SIMM out of the socket with your fingers.
4. Repeat the above steps for each module you remove.

## Ethernet connector (CN1)

---

The Ethernet connects to the PCM-4894 via an adapter cable to a 10-pin polarized header (CN1). For 100Base-T RJ-45 operation, an adapter cable converting CN1 into a standard RJ-45 is required. Please notice that PCM-4894-A31-01 doesn't have this connector.

---

Ethernet connector (CN1)

---

<b>Pin</b>	<b>Signal</b>
1	+5V
2	Link LED
3	RX+
4	RX-
5	RX LED
6	GND
7	NC
8	GND
9	TX+
10	TX-

---

## Serial ports connector (CN2)

The mainboard offers four serial ports: three RS-232 and one RS-232/422/485. These ports allow you to connect them to serial devices (mouse, printers, etc.).

### COM 1-4 RS-232/422/485 serial ports (CN2)

COM1, COM2, COM3, COM4 RS-232/422/485 serial port (CN2)

	PIN	SIGNAL	PIN	SIGNAL
<b>COM1</b>	1	DCDA	2	DSRA
	3	RXDA	4	RTSA
	5	TXDA	6	CTSA
	7	DTRA	8	RIA
	9	GND	10	N.C.
<b>COM2</b>	11	DCDB (422TXD-/485DATA-)	12	DSRB
	13	RXDB (422TXD+/485DATA+)	14	RTSB
	15	TXDB (422RXD+)	16	CTSB
	17	DTRB (422RXD-)	18	RIB
	19	GND	20	N.C.
<b>COM3</b>	21	DCDC	22	DSRC
	23	RXDC	24	RTSC
	25	TXDC	26	CTSC
	27	DTRC	28	RIC/+5V/+12V
	29	GND	30	N.C.
<b>COM4</b>	31	DCDD	32	RSRD
	33	RXDD	34	RTSD
	35	TXDD	36	CTSD
	37	DTRD	38	RID/+5V/+12V
	39	GND	40	N.C.

## Parallel port connector (CN3)

---

Normally, the parallel port is used to connect the card to a printer. The PCM-4894 includes an onboard parallel port, accessed through the CN3 connector, a 26-pin flat-cable connector. The CPU 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.

### Pin assignments

---

Parallel port connector (CN3)

---

Pin	Signal	Pin	Signal
1	Strobe	14	-Auto feed
2	Data 0	15	-Error
3	Data 1	16	-Init printer
4	Data 2	17	-Select input
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	-Acknowledge	23	GND
11	Busy	24	GND
12	Paper empty	25	GND
13	+Select		

---

## **IDE hard drive connector (CN4)**

---

You can attach two Enhanced Integrated Device Electronics hard disk drives to the PCM-4894's internal controller. The card comes with a 40-pin flat piggyback cable. This cable has one 44-pin 2.0mm pitch and two identical 40-pin flat-cable connectors.

### **Connecting the hard drive**

Usually, wire number 1 on the cable is red or blue, and the other wires are gray.

1. Connect one end of the cable to the IDE connector. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board.
2. Plug the other end of the cable to the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

Unlike floppy drives, you can make the connections with any of the connectors on the cable. If you install two drives, you will need to set one as the master and one as the slave. You do this using jumpers on the drives. If you install just one drive, set it as the master.

### Pin assignments

The following table lists the pin numbers and their respective signals:

IDE Connector (CN4)			
Pin	Signal	Pin	Signal
1	Reset	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	NC
29	N.C.	30	GND
31	IRQ 14	32	-I/O CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND
41	+5V	42	+5V
43	NC	44	GND

## Floppy drive connector (CN5)

---

You can attach up to two floppy disks to the PCM-4894's on-board controller. You can use any combination of 5 1/4" (360 KB and 1.2 MB) and/or 3 1/2" (720 KB, 1.44 MB, and 2.88 MB) drives.

The PCM-4894 CPU card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. There are two sets of floppy disk drive connectors, one in the middle, and one on the other end. 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).

### Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into the CN5 connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: floppy. The set in the middle connects to the B: floppy.

### Pin assignments

The following table lists the pin assignments for the CN5 connector:

FLOPPY drive connector (CN5)			
Pin	Signal	Pin	Signal
1~33 (odd)	GND	2	High density
4	+5V	6	High density
8	Index	10	Motor enable A
12	Driver select B	14	Driver select A
16	Motor enable B	18	Direction
20	Step pulse	22	Write data
24	Write enable	26	Track 0
28	Write protect	30	Read data
32	Select head	34	Disk change

# Power connector (CN6, CN17, CN18)

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## Main power connector (CN6)

---

Main power connector (CN6)

---

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

---

## Auxiliary power connector (CN17)

---

Auxiliary power connector (CN17)

---

Pin	Signal
1	-12V
2	GND
3	GND
4	-5V

---

## CPU fan power connector (CN18)

---

CPU fan power connector (CN18)

---

Pin	Signal
1	+5V
2	GND

---

## Keyboard and PS/2 mouse connectors (CN7)

---

The mainboard provides a keyboard connector which supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. The standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset if the keyboard is not present. The mainboard BIOS Advanced setup menu allows you to select "System Keyboard" under the "Present" or "Absent" selection. This allows no-keyboard operation in embedded system applications without the system halting under POST (power-on-self-test).

---

Keyboard and PS/2 mouse connector (CN7)

---

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

---

# Power LED and keylock (CN8)

---

You can connect an LED to indicate when the CPU card is on. Pin 1 of CN8 supplies power to the LED; Pin 3 is the ground.

You can use a switch (or a lock) to disable the keyboard. In this state, the PC will not respond to any input. This is useful if you do not want anyone to change or stop a running program. Simply connect the switch between Pins 4 and 5. The pin assignments appear in the following table:

---

Power LED and keylock (CN8)

---

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

---

# Reserved IR connector (CN9)

---

---

Reserved IR connector (CN9)

---

Pin	Function
1	Vcc
2	FIR_RX
3	IR_RX
4	GND
5	IR_TX

---

## Digital I/O connector (CN10)

---

The digital I/O interface of PCM-4894 provides 4 TTL input bits & 4 Open-Collector output bits. But PCM-4894-A31-01 doesn't have this connector. The following table lists the pin assignment for CN10.

Digital I/O (DIO) connector (CN10)	
Pin	Function
1	TTL Input Bit 0
2	O.C. Output Bit 0
3	TTL Input Bit 1
4	O.C. Output Bit 1
5	TTL Input Bit 2
6	O.C. Output Bit 2
7	TTL Input Bit3
8	O.C. Output Bit3
9	+5V
10	GND

# LED indicators / Hardware reset (CN13)

---

## Ethernet link signal LED (CN13, 1-2)

A continuously lit LED indicates good linkage between the PCM-4894 and its supporting hub.

## Ethernet active signal LED (CN13, 3-4)

A flashing LED indicates that the PCM-4894 is transmitting or receiving data.

## HDD LED (CN13, 5-6)

A flashing LED indicates that PCM-4894 is accessing the hard drive.

## Hardware reset (CN13, 9-10)

The following table lists the pin assignment of CN13:

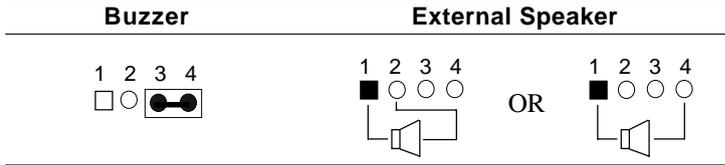
LED indicators / Hardware reset (CN13)	
Pin	Signal
1	LAN Link
2	+5V
3	LAN Active
4	+5V
5	HDD LED
6	+5V
7	Reserved
8	GND
9	Reset
10	GND

## Buzzer or external speaker (CN14)

The CPU card has its own buzzer. You can disable the internal buzzer and connect an external speaker to CN14. Enabling the external speaker automatically disables the internal buzzer.

---

### Buzzer or External Speaker



---

### Buzzer or External speaker (CN14)

Pin	Function
1	Vcc
2	Speaker output
3	Buzzer in
4	Speaker output

## LCD connector (CN15)

---

The board also features an LCD connector (CN15), which allows you to connect various flat panel displays. The following table lists their pin assignments:

LCD connector (CN15)			
Pin	Signal	Pin	Signal
1	+12 V <sub>DC</sub>	2	+12 V <sub>DC</sub>
3	GND	4	GND
5	Vcc(+5V/+3.3V)	6	Vcc(+5V/+3.3V)
7	ENA VEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM (V SYS)
37	M	38	LP (H SYS)
39	GND	40	ENABKL
41	NC	42	SHFCLK/ASHFCLK
43	NC	44	NC

## VGA connector (CN16)

---

The PCM-4894 CPU card's SVGA connector (CN16) with PCI bus supports monochrome display as well as high resolution color displays.

---

SVGA connector (CN16)

---

<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
1	Red video	9	Key (no pin)
2	Green video	10	Sync return (GND)
3	Blue video	11	Monitor ID (not used)
4	Not used	12	Monitor ID (not used)
5	GND	13	Horizontal sync
6	Red return (GND)	14	Vertical sync
7	Green return (GND)	15	Not used
8	Blue return (GND)	16	NC

---

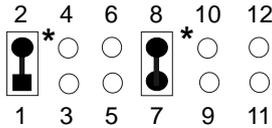
## COM3/4 RI function selection (JP1)

You can set the RI function mode of COM3/4 via JP1. The available configurations are as follows:

---

### COM3/COM4 RI function selection

---



---

1-2*	COM3 RI = RI function
3-4	COM3 RI = +5V output
5-6	COM3 RI = +12V output
7-8*	COM4 RI = RI function
9-10	COM4 RI = +5V output
11-12	COM4 RI = +12V output

---

\* default

## DOC address setting (JP2, 1-6)

The DiskOnChip 2000 occupies a 8 KB window in the upper memory address range of C800 to E000. You should ensure this does not conflict with any other device's memory address. JP2 pin 1-6 controls the memory address of the Flash disk.

### DOC address setting (JP2, 1-6)

CC00	D000	D400
2 4 6  1 3 5	2 4 6  1 3 5	2 4 6  1 3 5
D800	DC00	E000
2 4 6  1 3 5	2 4 6 *  1 3 5	2 4 6  1 3 5

\* default

## COM2 RS-232/422/485 select (JP2, 7-10)

The serial port COM2 of this board can be configured as RS-232, RS-422, or RS-485.

The settings are as follows:

### COM2 RS-232/422/485 select (JP2, 7-10)

RS-232	RS-422	RS-485
7 ○ ○ 8 * 9 ○ ○ 10	7  8 9  10	7  8 9 ○ ○ 10

\* default

## Clear CMOS (JP3)

---

You can use JP3 to clear the CMOS data if necessary. To reset the CMOS data, set JP3 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed.

---

### Clear CMOS (JP3)

---

	Protect*	Clear CMOS
<b>JP3</b>	1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/>

---

\*default

## LCD panel's voltage setting(JP4)

---

You can select the LCD connector (CN15) driving voltage by setting JP4. The configuration is as follows:

---

### LCD panel's voltage setting (JP4)

---

3.4 V	5 V
1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/>	1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> *

---

\* default

## LCD SHF/ASHF clock select (JP5)

---

You can select the LCD control signals by setting JP5. The following charts show the available options.

---

### LCD SHF/ASHF Clock select (JP5)

---

#### SHF CLK from C&T65550



#### ASHF CLK



---

\* default

# DiskOnChip socket

The DiskOnChip 2000 family of products provides a single chip solid-state flash disk in a standard 32-pin DIP package. The DiskOnChip 2000 is a solid-state disk with no moving parts, resulting in a significant reduction in power consumption and an increase in reliability. If your system is Win9X series (except Win2K), you can install this useful tool.

The DiskOnChip 2000 family of products is available in capacities ranging from 2MB up to 72 MB, unformatted. In order to manage the disk, the DiskOnChip 2000 includes the TrueFFS, M-Systems' Flash File System proprietary software. The DiskOnChip 2000 package is pin-to-pin compatible with standard 32-pin EPROM devices.

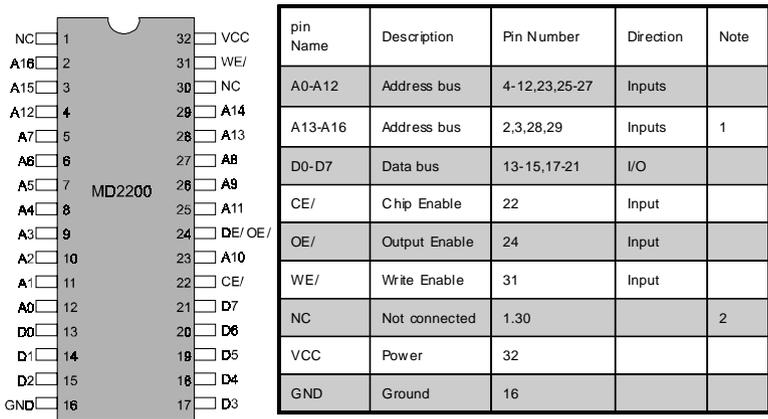


Figure1-MD2200 Pin-out Note 1: Pins A13 through A16 are not used by the MD2200. They are kept for socket backward compatibility with ED 1100 (DiskOnChip 1000)

Note 2: Pins 1 and 30 are not used by MD2200

CHAPTER

# 3

## **Award BIOS Setup**

This chapter describes how to configure the BIOS for the PCM-4894.

## System test and initialization

---

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and nonfatal. The system can usually continue the boot up sequence with nonfatal errors. Nonfatal error messages usually appear on the screen along with the following instructions:

```
press <F1> to RESUME
```

Write down the message and press the F1 key to continue the bootup sequence.

### System configuration verification

These routines check the current system configuration against the values stored in the card's CMOS memory. If they don't match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory has lost power and the configuration information has been erased.

# Award BIOS setup

---

## Entering setup

Power on the computer and press <DEL> immediately. This will allow you to enter the utility and the utility screen should appear (below).

```
ROM PCI/ISA BIOS (2A4KDAK9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP
BIOS FEATURES SETUP
CHIPSET FEATURES SETUP
POWER MANAGEMENT SETUP
PCI CONFIGURATION SETUP
LOAD BIOS DEFAULTS
LOAD SETUP DEFAULTS

INTEGRATED PERIPHERALS
PASSWORD SETTING
IDE HDD AUTO DETECTION
HDD LOW LEVEL FORMAT
SAVE & EXIT SETUP
EXIT WITHOUT SAVING

Esc : Quit
F10 : Save & Exit Setup
↑ ↓ → ← : Select Item
(Shift)F2 : Change Color
```

## Setup Utility Initial Screen

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

Many fields in the setup screens have on-line help descriptions available: press F1 to access this help.

## Standard CMOS setup

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory. Online help for each field can be accessed by pressing F1.

```
ROM PCI/ISA BIOS (2A4KDAK9)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Thu, Jul 4 2002
Time (hh:mm:ss) : 10 : 8 : 5

          CYLS.  HEADS  PRECOMP  LANDZONE  SECTORS  MODE
Drive C :  0 (  0Mb)  0      0      0      0      0  AUTO
Drive D :  0 (  0Mb)  0      0      0      0      0  AUTO

Drive A : 1.44M, 3.5 in.
Drive B : None

LCD&CRT : CRT
Panel   : 640X480 18BIT TFT

Halt On : All,But Keyboard

ESC : Quit          ↑ ↓ → ← : Select Item          PU/PD/+/- : Modify
F1  : Help          (Shift)F2 : Change Color
```

### Date and Time Configuration

Select the Date and Time in the Standard setup. The current values for each category are displayed. Enter new values through the keyboard.

### Drive C/D

The BIOS supports up to four IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or about other hard drive types, such as SCSI drives.

**NOTE:** We recommend that you select type AUTO for all drives.

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select type AUTO for a hard drive, the BIOS detects its specifications during POST, every time the system boots.

If you do not want to select drive type AUTO, other methods of selecting the drive type are available:

1. Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for drive types 1 through 45.
2. Select USER and enter values into each drive parameter field.
3. Use the IDE HDD AUTO DETECTION function in Setup.

Here is a brief explanation of drive specifications:

**Type:** The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.

**Size:** Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

**Cyls:** Number of cylinders

**Head:** Number of heads

**Precomp:** Write precompensation cylinder

**Landz:** Landing zone

**Sector:** Number of sectors

**Mode:** Auto, Normal, Large, or LBA

- **Auto:** The BIOS automatically determines the optimal mode.
- **CHS:** This allows the user to enter their own hardware values
- **Large:** For drives that do not support LBA and have more than 1024 cylinders.
- **LBA (Logical Block Addressing):** During drive access, the

IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater than 1024 cylinders.

**Drive A**  
**Drive B**

Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

**LCD & CRT**

In the display selection item, you can use PageUp/PageDown key to select Both , LCD, CRT or Auto.

**Pannel**

This selection item allow user to select LCD BIOS to match the LCD types. There are eight LCD types available for users to select as their LCD display modes as the next table:

Brand name	Model name	Format
Sharp	LX 15X80	1024 x 768 DSTN
Sharp	LM 64183P	640 x 480 MONO
Sharp	LM 64C35P	640 x 480 DSTN
Sharp	LM 12S40	800 x 600 DSTN
NEC	NL 6448AC33-10	640 x 480 TFT (12 bits)
Toshiba	LTM 10C209A	640 x 480 (18 bits)TFT
NEC	NL 8060AC26-04	800 x 600 TFT
Sharp	14x 03	1024x768 TFT (36 bits)

### **Halt On**

During the power-on-self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

**No errors:** POST does not stop for any errors.

**All errors:** the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.

**All, But Keyboard:** POST does not stop for a keyboard error, but stops for all other errors

**All, But Diskette:** POST does not stop for diskette drive errors, but stops for all other errors.

**All, But Disk/Key:** POST does not stop for a keyboard or disk error, but stops for all other errors.

## BIOS features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

ROM PCI/ISA BIOS (2A4KDAK9) BIOS FEATURES SETUP AWARD SOFTWARE, INC.			
Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CFFFF	Shadow : Disabled
External Cache	: Enabled	D0000-D7FFF	Shadow : Disabled
Quick Power On Self Test	: Disabled	D8000-DFFFF	Shadow : Disabled
Boot Sequence	: A,C		
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Enabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disabled		
OS Select For DRAM > 64MB	: Non-OS2		
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

### BIOS features setup

#### Virus Warning

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any modification attempts. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, you can run an anti-virus program to locate and remove the problem before any damage is done.

#### **! WARNING !**

Disk boot sector is to be modified

Type "Y" to accept write or "N" to abort write

Award Software, Inc.

### **CPU Internal Cache/External Cache**

These two categories, if enabled, can speed up memory access. However, it depends on the CPU/chipset design.

### **Quick Power On Self Test**

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to *Enabled*, BIOS will shorten or skip some check items during POST.

### **Boot Sequence**

This category determines which drive to search first for the operating system.

### **Swap Floppy Drive**

This item allows you to swap the floppy drive assignments so that drive A is treated as drive B and drive B is treated as drive A under DOS. The default setting is *Disabled*.

### **Boot Up Floppy Seek**

During POST, the BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360KB type is 40 tracks while 760KB, 1.2MB, and 1.44MB are all 80 tracks.

### **Boot Up NumLock Status**

This allows you to determine the default state of the numeric keypad on an IBM-compatible extended keyboard.

### **Boot Up System Speed**

This allows you to determine the Boot Up Speed. The choices are *High/Low*.

### **Gate A20 Option**

This entry allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 MB. Initially, gate A20 was handled via a pin on the keyboard. Today keyboards still provide this support, however it is more common and much faster for the system chipset to provide support for gate A20. The choices are thus: *Normal* and *Fast*.

### **Memory Parity Check**

Select Enabled if the DRAM chips in your system support parity.

### **Typematic Rate Setting**

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

**The choices: Enabled/Disabled**

### **Typematic Rate (Chars/Sec)**

When the typematic rate setting is enabled, you can select a typematic rate ( the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, 30.

### **Typematic Delay (Msec)**

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

### **Security Option**

This category allows you to limit access to the system. The choices are *System*: which requires a password at boot up and *Setup*: which only requires a password to access the setup utility.

### **PCI/VGA Palette Snoop**

Leave this field at Disabled.

### **OS Select For DRAM>64M**

Select the operating system that is running with greater than 64MB or RAM on the system.

**The choices: Non-OS2/OS2**

**Video BIOS Shadow**

Determines whether the video display card BIOS will be copied into system DRAM in order to increase display speed and is required for system performance. However, it is optional depending on the chipset design. The default setting is *Enabled*.

**Shadowing Address Ranges**

The next 3 lines, from C8000-CBFFF Shadow to DC000-DFFFF Shadow are address ranges for shadowing other expansion card ROMs. If there are any expansion cards with ROMs installed in your system, you have to know the address range they use in order to shadow them specifically. The default setting for all of these is *Disabled*.

## CHIPSET features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

```
ROM PCI/ISA BIOS (2A4KD4K9)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration      : Enabled
AT-BUS Clock           : 7.19MHz
DRAM Read Timing       : Slow
DRAM Write Timing      : Fast
SRAM Read Timing       : 3-2-2-2
SRAM Write Timing      : 0 Wait

Hidden Refresh         : Disabled
Memory Hole (15M -16M) : Disabled
ISA I/O Recovery      : Enabled
Fast-Back-to-Back     : Enabled

ESC : Quit          ↑↓←→ : Select Item
F1  : Help         PU/PD/+/- : Modify
F5  : Old Values   (Shift)F2 : Color
F6  : Load BIOS Defaults
F7  : Load Setup Defaults
```

### CHIPSET features setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Because of the complexity and technical nature of some of the options, not all of the options are described here.

## Power management setup

By choosing the POWER MANAGEMENT SETUP option from the initial SETUP SCREEN menu, the screen below is displayed. The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

ROM PCI/ISA BIOS (2A4KDAK9)		
POWER MANAGEMENT SETUP		
AWARD SOFTWARE, INC.		
Power Management	: User Define	IRQ5 (LPT 2) : ON
PM Control by APM	: Yes	IRQ6 (Floppy Disk) : ON
Video Off Option	: Susp,Stby -> Off	IRQ7 (LPT 1) : ON
Video Off Method	: Blank Screen	IRQ8 (RTC Alarm) : OFF
MODEM Use IRQ	: 3	IRQ9 (IRQ2 Redir) : ON
** PM Timers **		
HDD Power Down	: Disable	IRQ10 (Reserved) : OFF
Doze Mode	: Disable	IRQ11 (Reserved) : OFF
Standby Mode	: Disable	IRQ12 (PS/2 Mouse) : ON
Suspend Mode	: Disable	IRQ13 (Coprocessor) : OFF
** PM Events **		
VGA	: OFF	IRQ14 (Hard Disk) : ON
FDD (3F0h)	: ON	IRQ15 (Reserved) : OFF
LPT & COM	: LPT/COM	ESC : Quit
HDD (1F0h)	: ON	F1 : Help
NMI	: OFF	F5 : Old Values (Shift)F2 : Color
IRQ3 (COM 2)	: ON	F6 : Load BIOS Defaults
IRQ4 (COM 1)	: ON	F7 : Load Setup Defaults
		↑↓←→ : Select Item
		PU/PD/+/- : Modify

### Power management setup

#### Power Management

Power management lets you set up your computer to save electricity when it is not actively in use by putting the system into progressively greater power saving modes. In the power management scheme there are four system states which proceed in the following sequence:

*Normal* → *Doze* → *Standby* → *Suspend*

There are four selections for Power Management (PM):

<i>Disabled</i>	Turns off PM
<i>Max Saving</i>	Maximized power saving by activating maximum power saving settings after one minute of system inactivity.
<i>Min Saving</i>	Produces less power saving by activating moderate power saving settings after one hour of system inactivity.
<i>User Defined</i>	You set the power saving options manually.

With the exception of *Disabled*, three of the above selections have "fixed-mode" settings. Therefore, when PM is set to *Disabled*, some items which are predefined will become unmodifiable.

### **PM Control by APM**

When this is set to *Yes*, the Advanced Power Management feature in Microsoft Windows controls power management operation. The default setting is *No*.

### **Video Off Option**

User can select 4 different modes for turning off the video. The modes are a function of the PM mode of the computer. The choices are *All Modes* → *Off*, *Always On*, *Suspend* → *Off*, and *Susp, Stby* → *Off*.

The table below summarizes the behavior of the monitor in relation to the four PM modes.

PM Mode	Monitor Behavior
<i>All Modes</i>	<i>Off</i>
-	<i>Always On</i>
<i>Suspend</i>	<i>Off</i>
<i>Susp, Stby</i>	<i>Off</i>

For example, if you choose *Suspend* → *Off*, then the monitor will turn off if the computer is in the *Suspend* PM mode.

### Video Off Method

This governs monitor power saving by controlling how power management blanks the monitor screen. The default setting blanks the screen and turns off vertical and horizontal scanning and requires a monitor with "green" features. If you don't have this type of monitor, use the *Blank* option. DPMS (Display Power Management System) allows the BIOS to control the video display card if the card has the DPMS feature.

### V/H SYNC+Blank (Default)

BLANK	(non-green monitor, less saving)
DPMS	(Display card must support DPMS)

### Modem Use IRQ

If you have a modem installed in your system, you can enter which IRQ it is using so that APM can control it.

### HDD Power Down

When enabled and after the selected time of system inactivity, the hard disk drive will be powered down while all other devices will remain active.

### Doze Mode

This sets the period of system inactivity after which the system goes into *Doze* mode, the most limited power saving state. The settings range from 10 seconds to 1 hour and can be set manually when power management is in *User Define* mode. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

### Standby Mode

This sets the period of system inactivity after which the system goes into *Standby* mode, the intermediate power saving state. The settings range from 10 seconds to 1 hour and can be set manually when power management is in *User Define* mode. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

## **Suspend Mode**

This sets the period of system inactivity after which the system goes into *Suspend* mode, the maximum power saving state. The settings range from 10 seconds to 1 hour and can be set manually when power management is in *User Define* mode. The default setting is *Disabled*. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

## **PM Events**

PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *Enabled*, even when the system is in a power down mode.

When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ (Interrupt Request) to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. The following is a list of IRQs, which can be disabled:

- COM Ports Activity
- LPT Ports Activity
- HDD Ports Activity
- VGA Activity
- IRQ3 (COM 2)
- IRQ4 (COM 1)
- IRQ5 (LPT 2)
- IRQ6 (Floppy Disk)
- IRQ7 (LPT 1)
- IRQ8 (RTC Alarm)
- IRQ9 (IRQ2 Redir)
- IRQ10 (Reserved)
- IRQ11 (Reserved)
- IRQ12 (PS/2 Mouse)
- IRQ13 (Coprocessor)
- IRQ14 (Hard Disk)
- IRQ15 (Reserved)

## PCI configuration setup

By choosing the PCI CONFIGURATION SETUP option from the initial SETUP SCREEN menu, the screen below is displayed.

The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

```
ROM PCI/ISA BIOS (2A4KD4K9)
PCI CONFIGURATION SETUP
AWARD SOFTWARE, INC.

PnP BIOS Auto-Config: Enabled
Slot 1 Using INT# : AUTO
Slot 2 Using INT# : AUTO
Slot 3 Using INT# : AUTO
Slot 4 Using INT# : AUTO

CPU to PCI Write Buffer : Enabled
CPU to PCI Byte Merge : Enabled
PCI to DRAM Buffer : Enabled

PCI IRQ Activated By : Level
PCI IDE 2nd Channel : Enabled
PCI IDE IRQ Map To : PCI-AUTO
Primary IDE INT# : A
Secondary IDE INT# : B

ESC : Quit          ↑↓←→ : Select Item
F1 : Help          PU/PD/+/- : Modify
F5 : Old Values   (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults
```

PCI configuration setup

This section describes configuring the Peripheral Component Interconnect (PCI) bus system which allows I/O devices to operate at speeds nearing the speed of the CPU when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users make any changes to the default settings.

### PnP BIOS Auto-Config

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices.

However, this will only work if you are running a Plug and Play operating system such as Windows™ 95.

### **Slot 1/2/3/4 Using INT#**

Some PCI devices use interrupts to signal that they need to use the PCI bus. Other devices do not need interrupt service at all. Each PCI slot can activate up to four interrupts, INT# A, INT# B, INT# C and INT# D. By default, a PCI slot is allowed INT# A. Assigning INT# B has no meaning unless the device in the slot requires two interrupt services rather than just one. Likewise, using INT# C can only mean the device requires three interrupts; and using INT# D, four interrupts. Selecting the default, AUTO, allows the PCI controller to automatically allocate the interrupts.

### **PCI IRQ Activated By**

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised by your system manufacturer. The choices are *Level/Edge*.

### **PCI IDE 2nd Channel**

Since your chipset supports a second IDE channel, you can use this selection to enable or disable the second channel. The second channel may connect to a CD-ROM.

### **PCI IDE IRQ Map To**

This allows you to configure your system to the type of IDE disk controller in use. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B, C, D) is associated with the connected hard drives.

This setting refers to the hard disk drive itself, rather than individual partitions.

Selecting *PCI Auto* allows the system to automatically determine how your IDE disk system is configured.

**Primary & Secondary IDE INT#**

Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.



# Integrated Peripherals

ROM PCI/ISA BIOS (2A4KDAK9) INTEGRATED PERIPHERALS AWARD SOFTWARE, INC.	
On-Chip Local Bus IDE : <b>Enabled</b>	Onboard Serial Port 3 : 3E8H/IRQ11
IDE Buffer for DOS & Win : Enabled	Onboard Serial Port 4 : 2E8H/IRQ5
The 2nd channel IDE : Enabled	
IDE HDD Block Mode : Enabled	
IDE Primary Master PIO : Auto	
IDE Primary Slave PIO : Auto	
IDE Secondary Master PIO : Auto	
IDE Secondary Slave PIO : Auto	
Onboard FDC Controller : Enabled	
Onboard Serial Port 1 : 3F8/IRQ4	
Onboard Serial Port 2 : 2F8/IRQ3	
UART Mode Select : Normal	
UART2 Duplex Mode : Half	
RxD , TxD Active : Hi,Lo	
IR Transmission delay : Enabled	
Onboard Parallel Port : 378/IRQ7	
Parallel Port Mode : SPP	
ECP Mode Use DMA : 3	
EPP Mode Select : EPP1.7	
ESC : Quit                   ↑↓←→ : Select Item	
F1 : Help                    PU/PD/+/- : Modify	
F5 : Old Values (Shift)F2 : Color	
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

## On-Chip Local Bus IDE

The integrated peripheral controller contains a IDE interface with support for two IDE channels. Select Enabled to activate the IDE interface.

## IDE Buffer for DOS & Win

Select Enabled to increase throughput to and from IDE devices by using the on-chip read-ahead and posted-write IDE buffers. Note that use of the buffers may cause some slow IDE devices to be even slower. When in doubt, experiment with this setting for optimal performance and data integrity.

## The 2nd Channel IDE

Select Enable to activate the second IDE interface.

## IDE HDD Block Mode

Select Enabled only if your hard drives support block mode.

### **IDE Primary/Secondary Master/Slave PIO**

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

### **Onboard FDC Controller**

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

### **Onboard Serial Port 1/2/3/4**

Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.

### **UART Mode Select**

The choices: Normal, IrDA, ASKIR.

### **UART2 Duplex Mode**

In an infrared port mode, this field appears. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time. Select the value required by the IR device connected to the IR port.

### **RxD, TxD Active**

This feature enables you to set the IR reception/transmission polarity as High or Low. You'll need to consult your IR peripheral's documentation to determine the correct polarity.

### **IR Transmission Delay**

This item allows you to enable/disable IR transmission delay.

The choice: Enabled, Disabled.

### **Parallel Port Mode**

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.

### **ECP Mode Use DMA**

Select a DMA channel for the port.

### **EPP Mode Select**

Select EPP port type 1.7 or 1.9.

## Password Setting



When you select this function, a message appears at the center of the screen:

### ENTER PASSWORD:

Type the password, up to eight characters, and press Enter. Typing a password clears any previously entered password from CMOS memory.

Now the message changes:

### CONFIRM PASSWORD:

Again, type the password and press Enter.

To abort the process at any time, press Esc.

In the Security Option item in the BIOS Features Setup screen, select System or Setup:

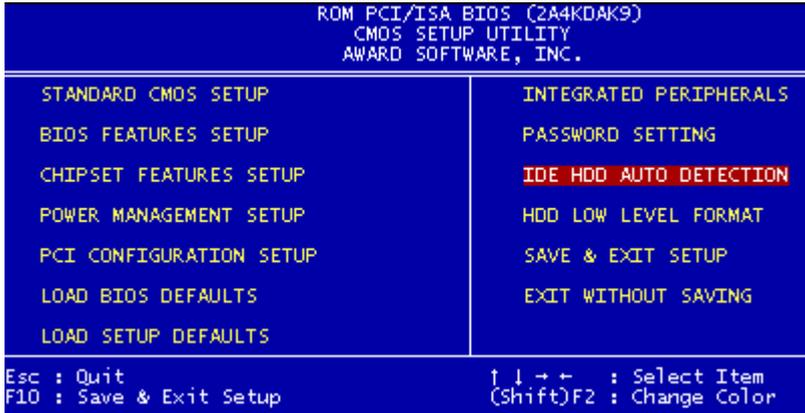
**System** Enter a password each time the system boots and when ever you enter Setup.

**Setup** Enter a password when ever you enter Setup.

**NOTE:** To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.

# IDE HDD Auto Detection

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration. You need to repeat the setup for each of the IDE combinations:



## HDD Low Level Format

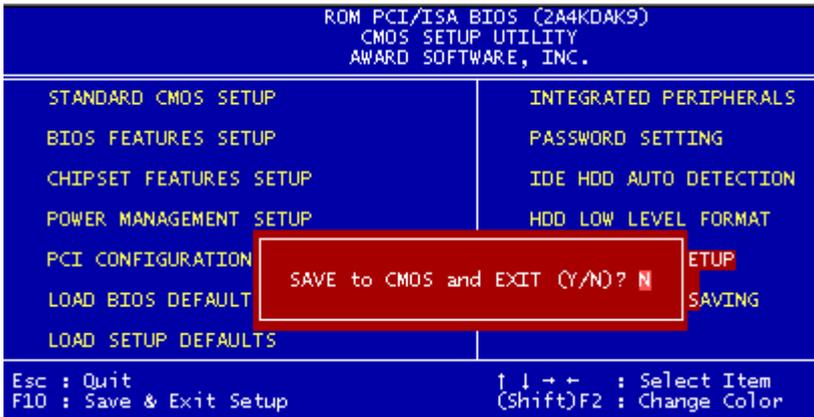
---

This item lets you search for bad tracks and format a hard disk drive, but **this will destroy all data on the hard disk**. It is a useful tool for detecting and marking bad sectors on a IDE drive if the drive refuses to format under DOS first. Some hard disk drive manufacturers supply their own low-level formatting program.



## Save & Exit Setup

If you select this option and press <ENTER>, the values entered in the setup utility will be recorded in the chipset's CMOS memory. 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.



## Exit without Saving

If you select this option and press <ENTER>, the values entered in the setup utility will be recorded in the chipset's CMOS memory. 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.



## **Flat Panel/CRT Controller Display Drivers and Utilities**

This chapter provides information about:

- Driver types and installation
- Software utility installation and use

## Software drivers

---

This chapter describes the operation and installation of the software drivers supplied on the *Supporting CD-ROM* that are shipped with your product.

The onboard VGA adapter is based on the CHIPS VGA Flat Panel/CRT controller and is fully IBM VGA compatible. This controller offers a large set of extended functions and higher resolutions. If you intend to use your VGA adapter in standard VGA modes only, you do not need to install any of these drivers. Since your VGA adapter is fully compatible, it does not require any special driver to operate in standard modes.

The purpose of the enclosed software drivers is to take advantage of the extended features of the CHIPS VGA Flat Panel/CRT controller.

### Hardware configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If the driver does not display correctly, please try the following steps:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.
2. If a high-resolution mode is not supported on your system, try to use a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode is supported on most.

## Necessary to know

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 CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the **DOS or OS/2 user reference guides for more information** *before* you proceed with the installation.

## Before you begin

Make sure you know the version of the application for which you are installing drivers. The *Supporting CD-ROM* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

# Windows 95

---

These drivers are designed to work with Microsoft Windows. You can install these drivers through the Windows operating system.

## Driver installation

1. Click **Start**, then **Settings**, then **Control Panel**.
2. Start the "**Display**" applet program.
3. Select the "**Settings**" page, press the "**Change Display Type**" button.
4. Press the "**Change**" button in the "**Adapter Type**" area.
5. Push the "**Have Disk**" button and press "**OK**".
6. Specify the path to the new driver and press the **<ENTER>** key:

*Example1:* Key in the name of the directory where you copied the drivers, either on your local hard drive or on a network share.

*Example2:* If you're not sure exactly where the drivers are, choose the "Browse..." button to find them.

The "**Select Device**" dialog box will appear.

7. Select the adapter that corresponds to the one you installed in your machine and click **OK**.

Windows 95 will copy the display drivers to the proper directories on your system.

8. Continue to choose **Close** until asked to restart your machine from the "Systems Settings Change" dialog box.

After the system has restarted, you can go back into the Display applet and select alternate screen resolutions and color depths.

## Windows 3.1

---

These drivers are designed to work with Microsoft Windows Version 3.1. You should install these drivers through Windows.

### Driver installation

1. Install Windows as you normally do for a VGA display and run Windows to make sure that it is working correctly.
2. Place the *Supporting CD-ROM* into your CD-ROM drive. In Windows Program Manager, choose **File** from the Options Menu. Then from the pull-down menu, choose **Run**. At the Command Line prompt, type.

**"cd-rom"**: \driver\vga\win31\setup.exe

Press <ENTER> key or click **OK** to begin the installation.

**"cd-rom"**: the drive letter of your CD-ROM drive

At this point the setup program locates the directory where Windows is installed. **For proper operation, the drivers must be installed in the Windows subdirectory.**

3. Press <ENTER> to complete the installation. Once completed, you can find the icon Chips CPL under the **Control Panel**. The icon allows you to select and load the installed drivers.

## Changing Display Drivers from Windows

To change display drivers from Windows, select the *Windows Setup* icon from the *Main* window. You will be shown the current setup configuration. Select *Change System Settings* from the *Option* menu. Click on the arrow at the end of the *Display* line. You will be shown a list of display drivers. Click on the driver you want to select. Then click on the *OK* button and follow the directions to complete the setup.

## Changing color schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. You can correct this by choosing the same color scheme or a new color scheme. First select the *Control Panel* from the *Main* window. Then select the *Color* icon and you will be shown the current color scheme. Choose a new color scheme and click the *OK* button.

## Software Utilities

---

This chapter describes the operation and installation of the following software utilities supplied on the *Supporting CD-ROM*:

- CHIPSDSP
- CHIPSCPL

### The CHIPSDSP utility program

This utility program is designed to work with Microsoft Windows 95.

### Installing the utility

You can find the CHIPDSP.DLL in the following path:

*"cd-rom"*:\driver\vga tools\chipsdsp

*"cd-rom"*: the dirve letter of your CD-ROM dirve

This file is a Winsows 95 based utility for selecting display type and refresh rate. It is a *Display Properties Refresh* window that is automatically installed when installing CHIPS Windows 95 display drivers. The **Display** icon is in the **Control Panel** group. To invoke the **Display** icon, simply click on the **Start** button, go to **Settings**, click on **Control Panel**, and then double click on the **Display** icon. Click on the property sheet with the heading *Refresh*.

### How to use the utility

**DISPLAY DEVICE** allows you to select the display type from the following:

- CRT Only **<ALT C>**
- LCD (Flat Panel) only **<ALT I >**
- Both CRT and LCD (Flat Panel) **<ALT B>**

**REFRESH RATE** allows you to select the refresh rate from the following:

- Interlaced
- 56 Hz
- 60 Hz
- 70 Hz
- 72 Hz
- 75 Hz
- 85 Hz

The refresh rate is available in **CRT Mode** only.

- Note: 1. The refresh rates that are supported by the selected monitor are the only refresh rates that will show and be selectable.
2. The above refresh rates may not be supported by all Chips products.

**WINDOWS DEFAULT** allows you to return to the default refresh rate setting for the selected monitor in Windows 95.

## The CHIPSCPL utility program

This utility program is designed to work with Microsoft Windows Version 3.1.

### Installing the utility

CHIPSCPL.CPL is a Windows based utility to select resolutions and color depth. It is a Control Panel Applet with its own icon that is automatically installed when installing CHIPS Windows 3.1 linear drivers. The **Control Panel** icon is in the *Main* Windows group. To invoke the control panel applet, simply click on the icon. The driver resolution and color depth take effect only after Windows is rebooted with the new driver.

### How to use the utility

SCREEN SIZE <ALT S> allows you to select from the following resolutions:

- 640 x 480
- 800 x 600
- 1024 x 786
- 1280 x 1024

By selecting the resolution first, it will determine the allowable selections for color depth.

COLOR <ALT O> allows you to select the number of colors from the following:

- 16 (4bits per pixel)
- 256 (8 bpp)
- 32K (15 bpp)
- 64K (16 bpp)
- 16M (24 bpp)

By selecting the color depth first, it will display the allowable resolutions.

**DPI<ALT P>** allows you to select a large or small font.

**DISPLAY<ALT D>** allows you to select the display type from the following:

- CRT only
- LCD (Flat Panel) only
- Both CRT and LCD (Flat Panel)

**MONITOR SELECTION <ALT M>** allows you to select from the list of monitors.

**REFRESH<ALT R>** allows you to select the refresh rate from the following:

- Interlaced
- 56 Hz
- 60 Hz
- 70 Hz
- 72 Hz
- 75 Hz

The refresh rate is available on **CTR Mode** only. The refresh rates supported by the selected monitor are the only available refresh rates that can be selected.

**CURSOR-ANIMATION <ALT A>** allows you to select an animated cursor instead of the hour glass wait cursor.

**BIG CURSOR <ALT G>** allows you to select a big cursor for better visibility on the Flat Panel.

**Version <ALT V>** displays version information about the current driver.

**HELP <ALT H>** displays help information on how to use the Display Driver Control Panel.

## **Ethernet Software Configuration**

This chapter describes how to configure the onboard Ethernet to match your application requirements.

## Ethernet software configuration

---

The onboard Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the BIOS Setup. To configure the medium type, to view the current configuration, or to run diagnostics, please refer to the following instructions:

1. Power the mainboard on. Ensure that the Rset8139.EXE file is located in the working drive.
2. At the prompt, type Rset8139.EXE and press <ENTER>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and DOWN keys. To change a selected item, press <ENTER>, and a screen will appear with the available options. Highlight your option and press <ENTER>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.
4. After you have made your selections and the configuration is what you want, press <ESC>. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen which shows the format and result of any diagnostic tests undertaken.

## **Watchdog Timer Demo Program**

The following demo program illustrates the programming steps required to enable, set, and disable the watchdog timer.

# Watchdog timer demo program

---

## How to program the WATCHDOG TIMER

1. To enable the time-out interval of watchdog timer:

-- output the desired value to port 0x443. The resolution of watchdog timer is 1 sec. Since the data is of 1 byte, the time-out interval will be 1 sec ~ 255 sec.

Whenever the value of timer is not zero, the timer will automatically count down

e.g. `outportb(0x443, 30);`      *// set interval to 48 sec and count down*

2. To set the time-out event:

-- output data to port 0x444. The default setting is “reset system”.

- 0: reset system (default)
- 1, 2, 3: IRQ 10, 15, 11 respectively
- 4: NMI

e.g. `outportb(0x444, 0);`      *// set time-out event to reset-system*

3. To disable watchdog timer:

-- output value “0” to port 0x443.

e.g. `outportb(0x443, 0);`      *// disable watchdog timer*

4. To refresh watchdog timer:

-- output the desired value to port 0x443. The timer will reset to the new value and count down.

```
e.g. outportb(0x443,10);           // set time-out interval to  
                                           16 sec  
...  
      outportb(0x443,20);           // reset watchdog timer to  
                                           32 sec
```

## Demo program in C

```
outportb(0x444, 0);           // set time-out event to reset-system  
outportb(0x443, 10);         // set time-out interval to 16 seconds  
job1();                       // execute your job here, be sure your job  
                                           will finished within 16 seconds  
  
outputb(0x443,20);           // set time-out interval to 32 seconds and  
                                           refresh watchdog timer, otherwise the  
                                           system will reset after time-out  
  
job2();                       // another job finished within 32 seconds  
outportb(0x443, 0);           // disable watchdog timer  
...  
...  
...
```



APPENDIX

# B

## **Installing PC/104 Modules**

This appendix gives instructions for installing PC/104 modules.

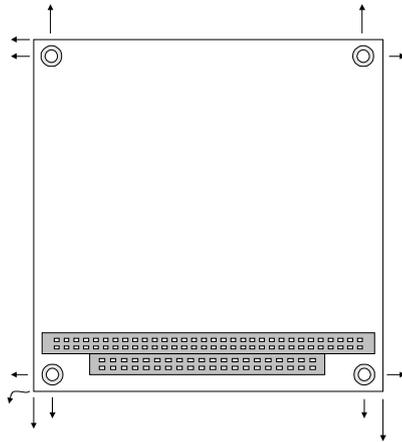
## Installing PC/104 modules

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The PCM-4894's PC/104 connectors give you the flexibility to attach PC/104 expansion modules. These modules perform the functions of traditional plug-in expansion cards, but save space and valuable slots. Modules include:

- **PCM-3110B** PCMCIA Module (one-slot)
- **PCM-3115B** PCMCIA Module (two-slot)
- **PCM-3200** PC/104 Sound Module
- **PCM-3420** PC/104 Fast SCSI Module
- **PCM-3521** Advanced Flat-Panel/CRT VGA Module
- **PCM-3522** LCD Panel Adapter
- **PCM-3600** PC/104 Fax/Modem Module
- **PCM-3610** Isolated RS-232 and RS-422/485 Module
- **PCM-3640** PC/104 4-port RS-232 Module
- **PCM-P50** PC/104 Vehicle Power Supply
- **PCM-3660** Ethernet Module
- **PCM-3718** 30 KHz A/D Module
- **PCM-3724** 48-channel DIO Module
- **PCM-3910** Breadboard Module
- **PCM-3810** Solid State Disk Module
- **PCM-3820** High Density Flash Solid State Disk Module





**PC/104 module dimenstions (inches  $\pm 5\%$ )**

APPENDIX

C

## Optional Extras

**PCM-10489-2 Cable kit for PCM-4894  
(P/N : 9681489010)**

The mainboard requires several cables for normal operation. You can make them yourself or purchase an optional cable kit assembly which includes the following:

<b>Part No.</b>	<b>Cable description</b>	<b>Termination connector</b>
1701440350	2.5" and 1.8" IDE	44-pin, 2 mm, female IDC (350 mm)
1701440500	3.5" IDE (40P)	40-pin, 2.54 mm, female IDC (500 mm)
1701340700	Dual floppy, 3.5" and 5.25" (34P)	34-pin dual floppy
1701260301	Parallel port	25-pin female DSUB
1701150150	VGA CRT	15-pin DSUB
1700060200	Keyboard and PS/2 mouse	5-pin circular DIN 6-pin circular DIN
1703040301	Peripheral power (-5V and -12V)	4 conductor
1701080300	Front panel	8-conductor pigtail
1701400220	RS-232 Serial Port, 4 COM Port	40 pin, 2.54 mm
1701100201	Network 10/100BASE-T	RJ-45 8-pin modular jack