

## **PPC-102**

586-based Panel PC with 10.4"  
LCD flat panel display

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## **FCC Class A**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with this user's manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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# Packing List

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Before installing your panel PC, ensure that the following materials have been received:

- PPC-102 series panel PC
- User's manual
- Accessories for PPC-102
  - Power cable for both FDD and HDD/CD-ROM
  - FDD flat cable (35 cm)
  - Keyboard extension cable (5-pin DIN female to 6-pin PS/2 male)
  - FDD power cable
  - HDD flat cable (44-pin) (5 cm)
  - HDD flat cable (40-pin) (46 cm)
  - Line-in cable
  - Power cord (1.8 m) - USA type
  - Assembly mounting parts
  - Heat sink
  - HDD bracket
  - Utility disks
  - Screws

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

## **Note:**

1. The heat sink is included in the PPC-102's accessory box.
2. The CPU you intend to purchase may be sold together with a fan attached with adhesive.
3. Customers must buy the CPU separately. Do not buy a CPU that already has a fan attached with adhesive, because it is not easy to remove such fan.

If you install a 586 series CPU yourself, you must install a heat sink above the CPU in order to avoid heat damage to the CPU. The CPU and the heat sink are normally sold together with the fan attached to the CPU. Due to tight constraints within the PPC-102's housing, care must be taken to use the heat sink in the accessory box which will both cool the CPU and fit within the PPC-102. Thus you must buy a CPU without a fan attached.

## Additional Information and Assistance

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1. Visit the Advantech Web site at **www.advantech.com** where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

# Quick Start

---

| Category       | Item                                 | Default Setting               | Page Reference |
|----------------|--------------------------------------|-------------------------------|----------------|
| CPU            | System/PCI clock (J4, J15)           | CPU speed: 166 MHz            | 35             |
|                | CPU frequency ratio (J8)             | 2.5                           | 36             |
|                | P54C/P55C (J10)                      | P55C                          | 36             |
|                | Cache linear mode for Cyrix CPU (J3) | Disabled                      | 38             |
|                | CPU voltage (J14)                    | 2.8 V                         | 37             |
|                | CMOS port clear (J2)                 | 3.6 V battery on              | 38             |
| COM            | COM4 RI output (J16)                 | RI                            | 42             |
|                | COM3 RI output (J17)                 | RI                            | 42             |
|                | COM2 (J18, J19, J20)                 | RS-232                        | 40             |
|                | COM3, COM4 IRQ enable (J21)          | COM3 IRQ = 10<br>COM4 IRQ = 5 | 41             |
| VGA            | LCD power (J13)                      | 5 V                           | 44             |
| Watchdog timer | Watchdog timer invoke (J6)           | System reset                  | 46             |
| DOC® 2000      | DOC 2000 memory address (J7)         | D000                          | 48             |

**Table P-1:** PPC-102 quick start jumper settings

# Safety Instructions

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1. Please read these safety instructions carefully.
2. Please keep this User's Manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the socket-outlet must be installed near the equipment and must be easily accessible.
5. Please keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
  - a. The power cord or plug is damaged.
  - b. Liquid has penetrated into the equipment.
  - c. The equipment has been exposed to moisture.
  - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
  - e. The equipment has been dropped and damaged.
  - f. The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less than 70 dB(A).

**DISCLAIMER:** This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

# Wichtige Sicherheitshinweise

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1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Die NetzanschlusBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim AnschluB an das Stromnetz die AnschluBwerte.
9. Verlegen Sie die NetzanschlusBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
  - a - Netzkabel oder Netzstecker sind beschädigt.
  - b - Flüssigkeit ist in das Gerät eingedrungen.
  - c - Das Gerät war Feuchtigkeit ausgesetzt.
  - d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
  - e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
  - f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70 dB(A) oder weiger.

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# CHAPTER 1

## **General Information**

This chapter gives background information on the PPC-102.

Sections include:

- Introduction
- Specifications
- LCD Specifications
- Dimensions
- I/O Arrangement
- Cutout (Suggestion)
- Mounting

## 1.1 Introduction

---

The PPC-102 panel PC is a multimedia Pentium® processor-based industrial computer that is designed to serve as a human machine interface (HMI). It is a PC-based system with 10.4" color TFT or mono LCD display, on-board PCI Ethernet, multi-COM port interfaces, and a 16-bit audio controller. This simple, complete, compact and highly integrated multimedia system lets you easily build a panel PC into your applications. By incorporating the PPC-102 into your project, your product development time will be shortened.

The PPC-102 is a compact, network-compatible PC with extensive features to control a dedicated system in a wide variety of applications. Common industrial applications include factory automation systems, precision machinery, and production process control. It is also suitable for many nonindustrial applications, including terminal information systems, entertainment management systems, and car park automation systems. Our panel PC is a reliable, cost-effective solution to your application's processing requirements.

## 1.2 Specifications

---

### General

- **Disk drive housing:** Space for one 2.5" HDD
- **Dimensions:** 342 x 265 x 61.5 mm (W x H x D)
- **Weight:** 2.7 kg
- **Power supply:** 65 watts  
Input voltage: 100 V<sub>AC</sub>/2 A, 250 V<sub>AC</sub>/1A @ 47 ~ 63 Hz  
Output voltage: +5 V @ 5 A, +12 V @ 3 A  
(When power output is below 60 W, output voltage will be +5 V @ 8 A)
- **Cooling fan dimensions:** 60 x 60 x 15 mm (L x W x H)
- **Front panel:** IP65 protection

### Standard PC functions

- **CPU:** Intel Pentium® 75 ~ 233 MHz, P55C  
AMD K5, up to K6
- **BIOS:** AWARD 128KB Flash BIOS, supports Plug & Play, APM
- **Chipset:** SiS 5571
- **2nd level cache:** On-board 256 KB Pipeline Burst SRAM
- **RAM:** Two 72-pin SIMM sockets accept 8 ~ 128 MB EDO/FPM\*  
DRAM
- **PCI Bus Master IDE interface:** Supports two connectors (one internal, one external extension). Each connector supports two IDE devices on two channels (PIO modes 3/4). BIOS supports IDE CD-ROM boot-up and enable/disable
- **Floppy disk drive interface:** Supports up to two FDDs  
(360K/1.2MB/720K/1.44MB/2.88 MB)
- **Parallel port:** One parallel port, supports SPP/EPP/ECP parallel mode. BIOS configurable to LPT1, LPT2, LPT3 or disabled

\* Suggestion: Select EDO RAM which has higher compatibility than FPM mode.

- **Serial ports:** Four serial ports with three RS-232 ports (COM1, 3, and 4\*), one RS-232/422/485 port (COM2). All ports with 16C550 compatible UARTs.
- **Watchdog timer:** 63-level interval from 1 to 63 seconds. Automatically generates system reset or IRQ15 when the system stops due to a program error or EMI. Jumperless selection and software enabled/disabled.
- **Battery:** 3.6 V @ 600 mA lithium battery

### **Solid State Disk (SSD)**

- **Socket:** One 32-pin socket for M-system DOC® 2000
- **Size:** Optional 2, 4, 8, 12, 24 MB for DOC® 2000

Note: The 32-pin socket cannot accept a Flash/EPROM SSD (SanDisk). If you want to connect a Flash/EPROM SSD, you must use the 44-pin IDE port.

### **PCI SVGA/flat panel interface**

- **Chipset:** C&T 65550
- **Display memory:** 1 MB on-board memory, supports up to 2 MB
- **Display type:** Simultaneously supports CRT and flat panel (EL, LCD and gas plasma) displays
- **Display resolution:** Supports non-interlaced CRT and LCD displays up to 1024 x 768 @ 256 colors with 1 MB on-board display memory

### **Audio function:**

- **Chipset:** ESS 1868
- **Audio controller:** 16-bit codec, Sound Blaster Pro compatible
- **Stereo sound:** Full-duplex monophonic mode, half-duplex stereo mode
- **Audio interface:** Microphone-in, Line-in, Speaker out
- **Power:** Accepts +12 V source for improved audio quality

\* Note: The PPC-102 with the optionally installed touchscreen will share COM4.

## PCI bus Ethernet interface

- **Chipset:** REALTEK RTL 8139 PCI local bus Ethernet controller
- **Ethernet interface:** Full compliance with IEEE 802.3 100Base-T and 10Base-T specifications. Includes software drivers and boot ROM

## Touchscreen (optional)

- **Type:** Analog resistive
- **Resolution:** Continuous
- **Light transmission:** 75% (Surface meets ASTM-D-1044 standard, Taber Abrasion Test)
- **Controller:** RS-232 interface (uses COM4)
- **Power consumption:** +5 V @ 200 mA
- **Software driver:** Supports DOS, Windows 3.1, Windows 95 and Windows NT
- **Durability:** 30 million touch lifetime

## Optional modules

- **CPU:** Intel Pentium® or AMD K6 (including MMX versions)
- **Memory:** 8/16/32/64/128 MB EDO/FP DRAM
- **HDD:** 2.5" HDD
- **Operating system:** Windows 95, Windows NT, DOS, OS/2, Windows 3.1
- **Touchscreen:** Analog resistive

## Environment

- **Temperature:** 0° ~ 45° C (32° ~ 113° F)
- **Relative humidity:** 10 ~ 95% @ 40 °C, non-condensing
- **Shock:** 10G peak acceleration (11 msec duration)
- **Power MTBF:** 50,000 hrs
- **Certification:** Passed CE, FCC Class A certification; meets UL

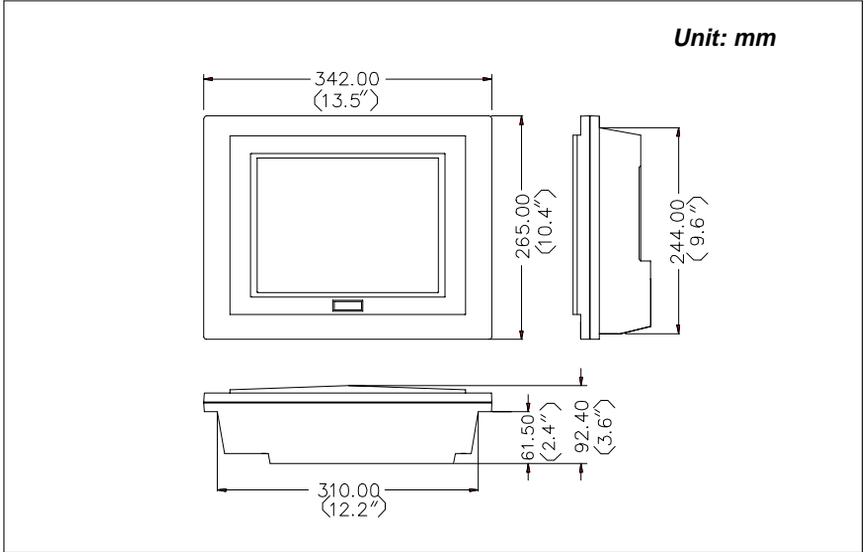
## 1.3 LCD Specifications

*Table 1-1: PPC-102 series LCD specifications*

| Model                     | PPC-102T                         | PPC-102TB                         | PPC-102S                              | PPC-102M                     |
|---------------------------|----------------------------------|-----------------------------------|---------------------------------------|------------------------------|
| <b>Display type (LCD)</b> | 10.4" TFT                        | 10.4" TFT                         | 10.4" STN                             | 10.4" mono                   |
| <b>LCD model</b>          | Toshiba LTM10C273 or compatibles | Toshiba LTM10C209A or compatibles | Kyocera KCB6448BSTT-X5 or compatibles | Sharp LM64P89 or compatibles |
| <b>Max. resolution</b>    | 800 x 600                        | 640 x 480                         | 640 x 480                             | 640 x 480                    |
| <b>Colors</b>             | 256 K colors                     | 256 K colors                      | 64 K colors                           | 64 gray scale levels         |
| <b>Dot size (mm)</b>      | 0.33 x 0.33                      | 0.33 x 0.33                       | 0.33 x 0.33                           | 0.33 x 0.33                  |
| <b>View angle</b>         | 90°                              | 90°                               | 90°                                   | 50°                          |
| <b>Luminance</b>          | 250 cd/m <sup>2</sup>            | 250 cd/m <sup>2</sup>             | 130 cd/m <sup>2</sup>                 | 75 cd/m <sup>2</sup>         |
| <b>Temperature</b>        | 0° ~ 50° C                       | 0° ~ 50° C                        | 0° ~ 45° C                            | 0° ~ 45° C                   |
| <b>VR controls</b>        | N/A                              | N/A                               | *Contrast                             | *Contrast                    |
| <b>Simultaneous mode</b>  | Yes                              | Yes                               | Yes                                   | Yes                          |
| <b>LCD MTBF</b>           | 50,000 hours                     | 50,000 hours                      | 50,000 hours                          | 50,000 hours                 |
| <b>Backlight MTBF</b>     | 20,000 hours                     | 20,000 hours                      | 25,000 hours                          | 10,000 hours                 |

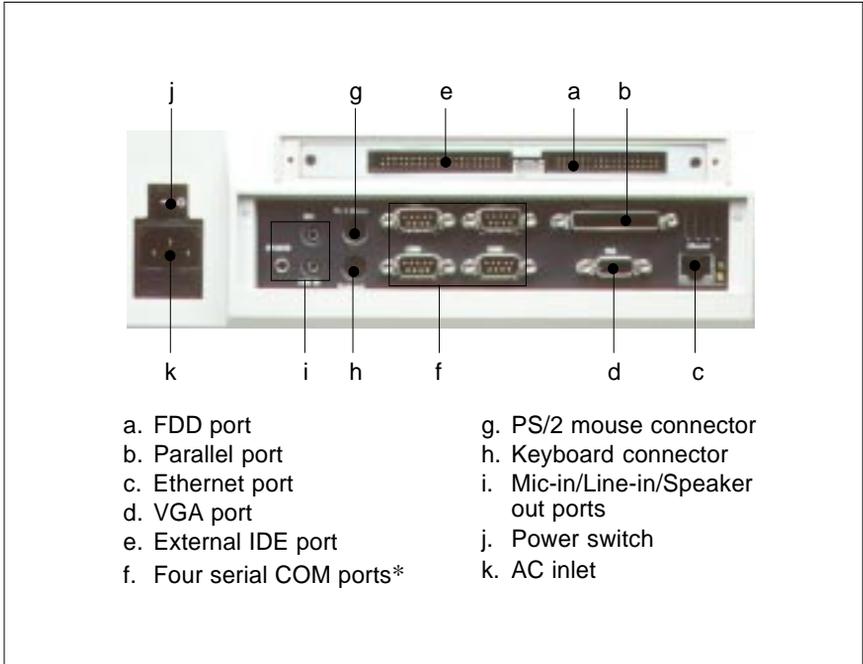
\* The VR control knob is located on the upper right rear cover of the PPC-102M/S. Use a flat head screwdriver to adjust the contrast VR of the LCD display.

# 1.4 Dimensions



**Figure 1-a: PPC-102 panel PC dimensions**

## 1.5 I/O Arrangement

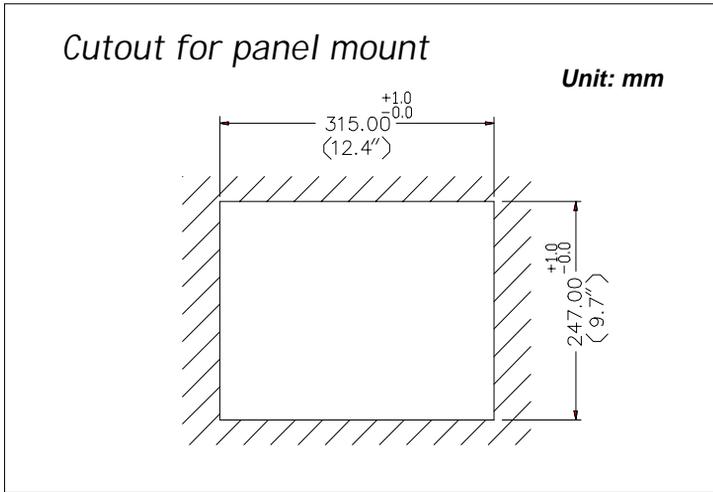


\* Three RS-232 (COM1, 3, 4) and one RS-232/422/485 (COM2)

**Figure 1-b:** PPC-102 back panel I/O arrangement and cable connections

## 1.6 Cutout (Suggestion)

The PPC-102 will stand on a shelf or a table, or you can mount it into a panel. Cutout panel dimensions are as follows:



**Figure 1-c:** PPC-102 panel mounting cutout dimensions

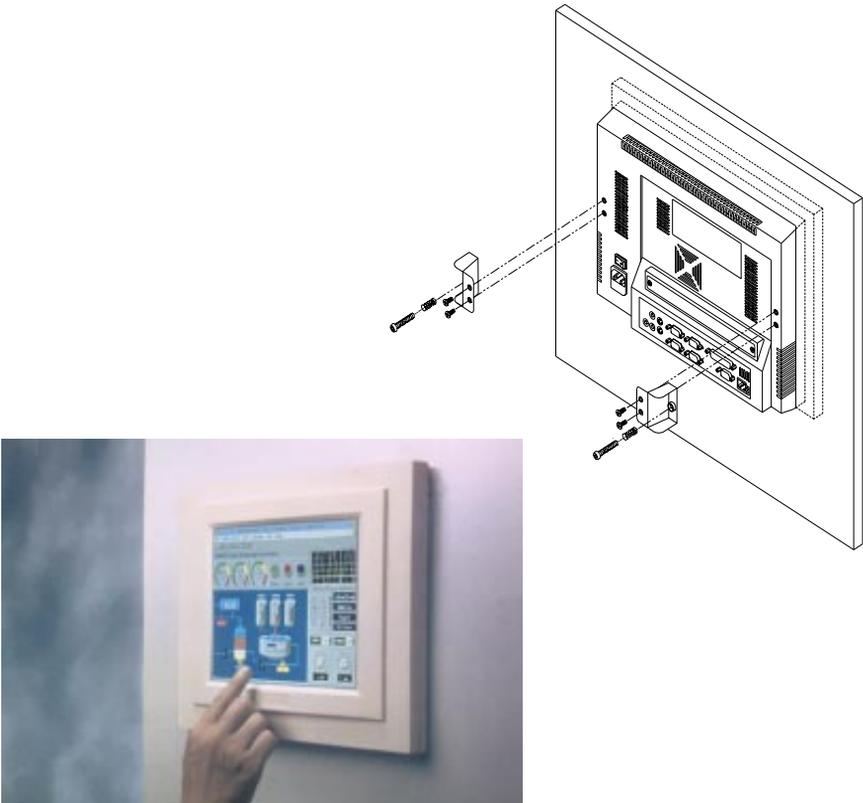
# 1.7 Mounting

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## 1.7.1 Panel mounting

If you decide to use a cutout within a panel to mount your PPC-102, we have included two panel-mount brackets. The brackets have two screws that fit in the keyhole slots on the panel PC.

Slide the PPC-102 backwards into the panel opening. Attach the two mounting brackets by sliding the two screw heads into the keyhole slots on the rear cover. Secure the PPC-102 against the back of the panel opening.



**Figure 1-d:** PPC-102 rear panel mounting brackets

## 1.7.2 Desktop stand (optional)

An optional stand is available for mounting the PPC as a desktop PC. The PPC-102 slides into the stand and is held in place by the screws provided. The compactness of the desktop-mounted PPC-102 saves desk space.



*Figure 1-e: PPC-102 desktop stand*

### 1.7.3 Wall-mounting (optional)

An optional wall-mounting attachment is also available for mounting the PPC at approximately 45° to a flat surface. Installation instructions follow:

1. The wall-mounting attachment is comprised of three parts: one back bracket, one support bracket, and one mounting bracket.
2. First attach the back bracket to the rear cover of the PPC-102, securing it in place with four of the philips-head screws provided.
3. Using a flat-head screwdriver, attach the support bracket to the back bracket using four of the flat-head screws provided, two on either side of the support bracket. The sides of the support bracket should overlap the sides of the back bracket, and the screws should secure one bracket to the other through the existing holes drilled into each bracket.
4. Mount the mounting bracket on the wall or other flat surface. The support bracket slides vertically from the top into the mounting bracket. It can then be secured to the mounting bracket by screwing one of the philips-head screws provided through the corresponding holes at the tops of the mounting bracket and the support bracket.



**Figure 1-f:** PPC-102 wall mounting configuration

# CHAPTER 2

## System Setup

- General
- Removing Rear Panel
- Installing Options
- Installing I/O Equipment
- Installing Software to the HDD
- Exploded Diagram
- PCM-5865 and I/O Adapter Replacement
- Power Supply and Cooling Fan Replacement

## 2.1 General

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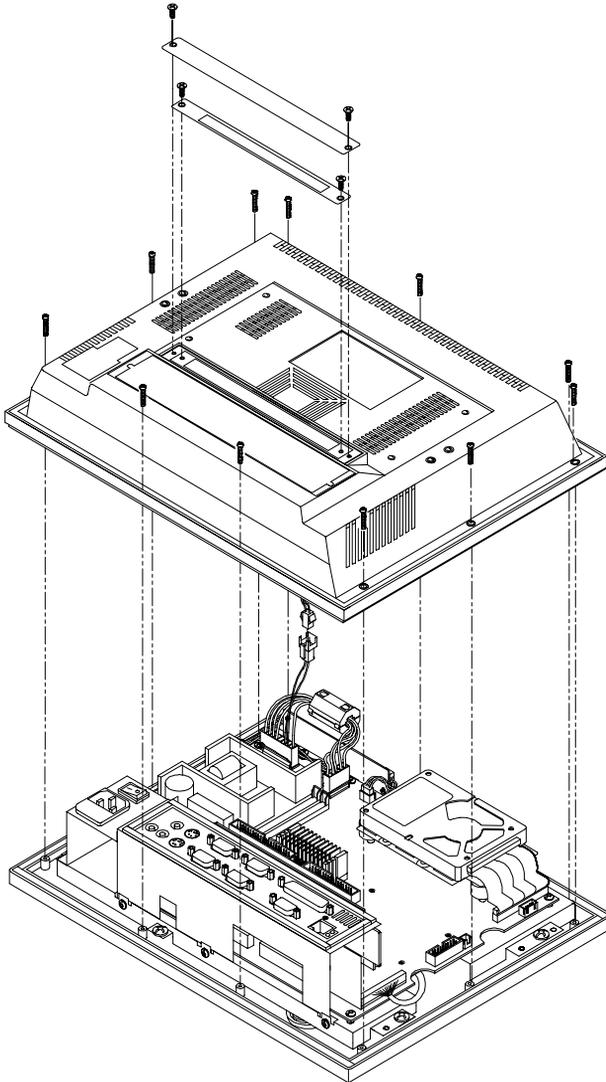
The PPC-102 consists of a PC-based industrial computer that is housed in a protective cover. Your HDD, DRAM, power supply and CPU are all readily accessible by removing the rear panel. Any maintenance or hardware upgrades can be carried out easily after removing the rear panel.

*Warning!*  *Do not remove the rear cover until you have verified that no power is flowing within the PPC-102. Power must be switched off, and the power cord must be disconnected. Every time you service the PPC-102, you should be aware of this.*

## 2.2 Removing Rear Panel

---

Unscrew the eleven screws that secure the rear cover, then remove the cover.



**Figure 2-a:** Removing the PPC-102's rear panel

## 2.3 Installing Options

---

### 2.3.1 Installing a primary 2.5" HDD (internal)

You can attach one enhanced Integrated Device Electronics (IDE) hard disk drive to the PPC-102's internal controller which uses a PCI local-bus interface. The advanced IDE controller supports faster data transfer rates and allows the IDE hard drive to exceed 528 MB. The following are instructions for installation:

1. Detach the rear panel and remove.
2. Place the HDD in the appropriate location inside the PPC-102, and tighten the screws.
3. Connect the cable included in this package (1x44-pin to 1x44-pin) from the HDD to the PC board (CN1). Make sure that the red/blue wire corresponds to pin 1 on the connector, which is labeled on the board. Plug the other end of the cable into the enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive.

 **Warnings:** (1) *Plug the other end of the cable into the HDD, with pin 1 on the cable corresponding to pin 1 on the hard drive. Improper connection will damage the HDD.*

(2) *Be careful not to damage the CPU board with your tools!*

(3) *The PCM-5865 board can accept installation of two hard disks. However, the compact housing of the PPC-102 has room for only one IDE HDD.*

(4) *Install two hard disks only if dictated by your own special requirements, or as a test. To install two disks, connect the single end of the appropriate cable to the PCM-5865 board, and connect the other two ends to each hard disk. When connecting two drives, one must be configured as the master and one as the slave. This is done using the jumpers on the drives. For installations involving only one drive, set the drive as the master.*



### 2.3.2 Installing a CPU

The PPC-102's CPU (Central Processing Unit) can be upgraded to improve system performance. The PPC-102 provides one 321-pin ZIF (Zero Insertion Force) socket which is backward compatible with ZIF socket 5 processors. The CPU must come with an attached heatsink to prevent overheating; the PPC-102 includes one unit.

*Warning! The CPU may be damaged if operated without a heatsink.*



*Caution! When buying a CPU, do not include a fan and do not apply thermal jelly to the CPU for fan installation. The compact size of the PPC-102 prevents using a fan.*

*Warning! Always disconnect the power cord from your PPC-102 when you are working on it. Do not make connections while the power is on as sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the PPC-102.*



1. Turn off the PPC-102 and remove the rear cover.
2. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket, then upwards to a 90-degree angle.
3. Insert the CPU in the correct orientation. The notched corner of the CPU (with the white dot) should point towards the end of the lever. The end of the lever is indicated as the blank area where one hole is missing from the corner of the square array of pin holes, and an arrowhead printed on the PCM-5865 board points to it.
4. Gently slide the CPU in. It should insert easily. If not, pull the lever up a little more and make sure the pin of the CPU corresponds with the hole of the socket. **DO NOT USE EXCESSIVE FORCE!**
5. Press the lever down. The plate will slide forward.

6. You must set jumpers including the those for the CPU, clock (J15, J4), frequency ratio (J8), voltage (J14), and P54C/P55C selection setting (J10).
7. To remove a CPU, pull the lever out to the side a little and raise it as far as it will go. Lift out the CPU chip.

**NOTE!**      *When you install a new CPU, be sure to adjust the board jumper settings. Improper settings may damage the CPU. (See Chapter 3 for jumper settings.)*

### **2.3.3 Installing DRAM (SIMMs)**

You can install from 8 MB to 128 MB of DRAM memory. The PCM-5865 CPU card provides two 72-pin SIMM (Single Inline Memory Module) sockets and supports either Fast Page Mode (FPM) or Extended Data Output (EDO) DRAM with a speed of 70 ns or greater.

**Note:**

The module can only fit into a socket one way. Pin 1 of the SIMM module must line up with the small arrowhead printed on the PCM-5865 next to the SIMM socket. The golden pins of the module must point down into the SIMM socket.

1. Ensure that all power sources are disconnected.
2. Slip the memory module into the socket at a 45 degree angle.
3. 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.
4. Repeat steps 2 and 3 for each module you install.

## 2.4 Installing I/O Equipment

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### 2.4.1 Installing one secondary HDD/CD-ROM device (external)

Two connectors are located on the rear panel above the PPC-102's I/O output connectors. The 40-pin connector is for an external set of master and slave hard disks. Connect the single end of the appropriate cable to the PPC-102, and connect the two remaining ends to your hard disk(s).

*Warning!* All warnings in Section 2.3.1 apply here.

*Notes:* (1) The 40-pin connector is a secondary channel.

(2) That part of the secondary HDD's cable which is below 45 cm in length is incorporated in the accessory box.

### 2.4.2 Installing an FDD

Up to two floppy drives can be attached to the PPC-102's I/O controller. Any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB) drives can be attached.

A 34-pin FDD connector is located on the rear panel of the PPC-102. Unscrew the two attachment screws and detach the metal cover. Connect one end of a 34-pin daisy-chain drive connector cable and one end of a power signal cable (one each of these is included in the accessory box) to the FDD connector on the rear panel, and connect each of the other ends to an FDD.

*Notes!* (1) Installation of two FDDs requires a flat ribbon connector with two plugs and a y-splitter for the power cable. The flat ribbon cable in the accessory kit has the required plugs. Users will have to procure an appropriate y-splitter for the power cable themselves.

(2) We recommend that only one FDD be installed on your PPC-102. The requisite power connector cable is included in the PPC-102 accessory box.

*Warning! Make sure that the red wire corresponds to pin 1 on the connectors.*

### **2.4.3 Parallel port connection**

Normally a parallel port is used to connect a printer to a system. The PPC-102 includes one multimode (ECP/EPP/SPP) parallel port with a 25-pin D-sub connector.

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

The parallel port interrupt channel is designated to be IRQ7 or IRQ5. The BIOS standard setup menu allows selection of "278H/IRQ5, 378H/IRQ7, 3BCH/IRQ7".

ECP/EPP DMA channels (DMA1 and DMA3) can be selected via the BIOS setup.

### **2.4.4 PS/2 keyboard and PS/2 mouse**

The PPC-102 provides a PS/2 keyboard connector that supports a PS/2 style keyboard and a 5-pin DIN keyboard extension cable. In most cases, especially in embedded applications, a keyboard is not used. The standard PC/AT BIOS will report an error or failure during power-on self-test (POST) after a reset if the keyboard is not present. The BIOS standard setup menu allows you to select\* "All , But Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications without the system halting under POST. Note that the mouse port on the PPC-102 is a PS/2 mouse port.

\* Note: "All, But keyboard" is the default setting.

### **2.4.5 Mic-in, line-in, speaker out**

The PPC-102 contains an ESS 1868 chipset, which is a single, mixed-signal audio chip designed into the PPC-102. It provides high-quality stereo sound and FM music synthesis, and is compatible with Sound Blaster Pro version 3.01 voice and music functions. The PPC-102 includes Mic-in, Line-in and Speaker out capabilities as part of its I/O adapter capabilities. These capabilities are provided under the Plug and Play (PnP) standard, which allows PnP configuration for your equipment.

To use the PPC-102's audio function:

1. Turn off the PPC-102.
2. Use speaker cables included in the accessory box to connect the speakers to the Speaker out port.
3. Plug in the microphone's cable to the Mic-in port.
4. Connect the Line-in cable (included in the PPC-102 accessory box) between the Lin-in port and a CD-ROM or other audio source.
5. When installing a CD-ROM, please refer to Section 2.4.1 "Installing one secondary HDD/CD-ROM device (external)".

*Note! When connecting the Line-in cable between the Line-out port of the CD-ROM and the Line-in port of PPC-102, the red cable should be connected to the R pin of the CD-ROM's Line-out port.*

## **2.4.6 External VGA**

The PPC-102 can be connected to an external CRT monitor. To connect an external CRT monitor, connect the monitor's VGA cable to the PPC-102's VGA port and connect the monitor's power cable to an AC outlet. The PPC-102's external CRT display (VGA) connector is a standard 15-pin D-SUB connector commonly used for VGA.

## **2.4.7 Four serial COM ports**

Many available peripherals, such as a serial mouse or an optional touchscreen, require connection to a serial COM port. **When an optional touchscreen is ordered with a PPC-102, it shares COM4, and COM4 is not available as a serial port.**

## **2.4.8 Ethernet**

The PPC-102 is equipped with a high performance 32-bit Ethernet chipset which is fully compliant with the IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. It is also both 100Base-T and 10Base-T compatible. The medium type can be configured via the RSET8139.EXE program included on the utility disk. (See Chapter 4 "Software Configuration" for detailed information.)

The Ethernet port provides a standard RJ-45 jack. The network boot feature can be utilized by incorporating the boot ROM image files for the appropriate network operating system. The boot ROM BIOS files are combined with system BIOS, which can be enabled/disabled in the BIOS setup.

## **2.5 Installing Software to the HDD**

---

Installing software requires an installed HDD. Software can be loaded in the PPC-102 using any of four methods:

### **2.5.1 Method 1: Use the Ethernet**

You can use the Ethernet port to download software to the HDD.

### **2.5.2 Method 2: Use an FDD**

The FDD port is located on the rear panel. Unscrew the two screws and detach the metal plate. Attach a communication cable and a power cable to the FDD port, then attach them to an FDD. Insert a disk containing the software and consult your software manual for installation procedures.

### **2.5.3 Method 3: Use the COM or parallel port**

You can use Lap Link 6 or similar transmission software. Connect another PC to the PPC-102 with an appropriate cable and transmit the software to the PPC-102.

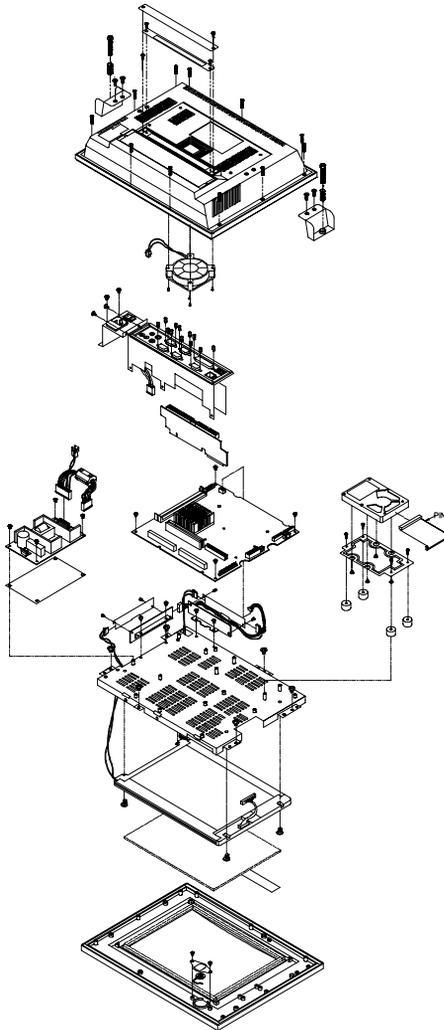
### **2.5.4 Method 4: Use a 3.5" HDD or CD-ROM**

Please refer to Section 2.4.1 "Installing one secondary HDD/CD-ROM device (external)".

## 2.6 Exploded Diagram

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This diagram shows all the components and parts that make up the PPC-102. Use it as a guide when assembling and disassembling your system.

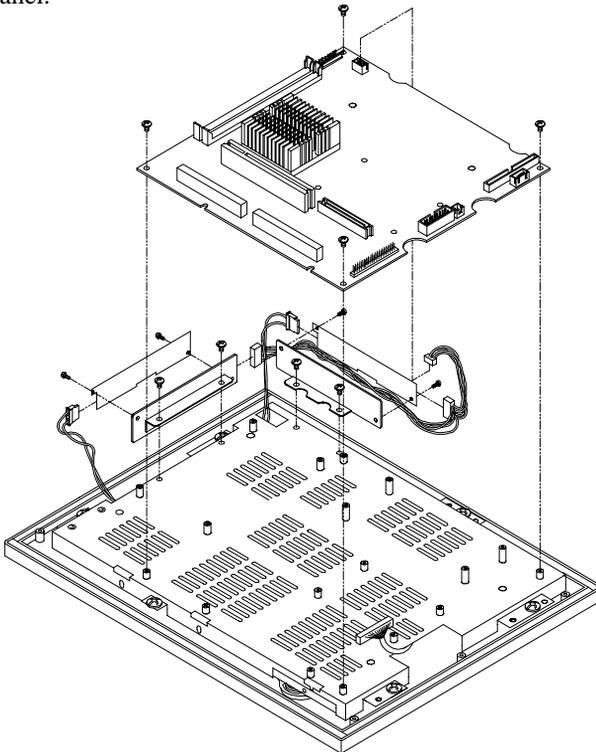


**Figure 2-c:** PPC-102 exploded diagram

## 2.7 PCM-5865 and I/O Adapter Replacement

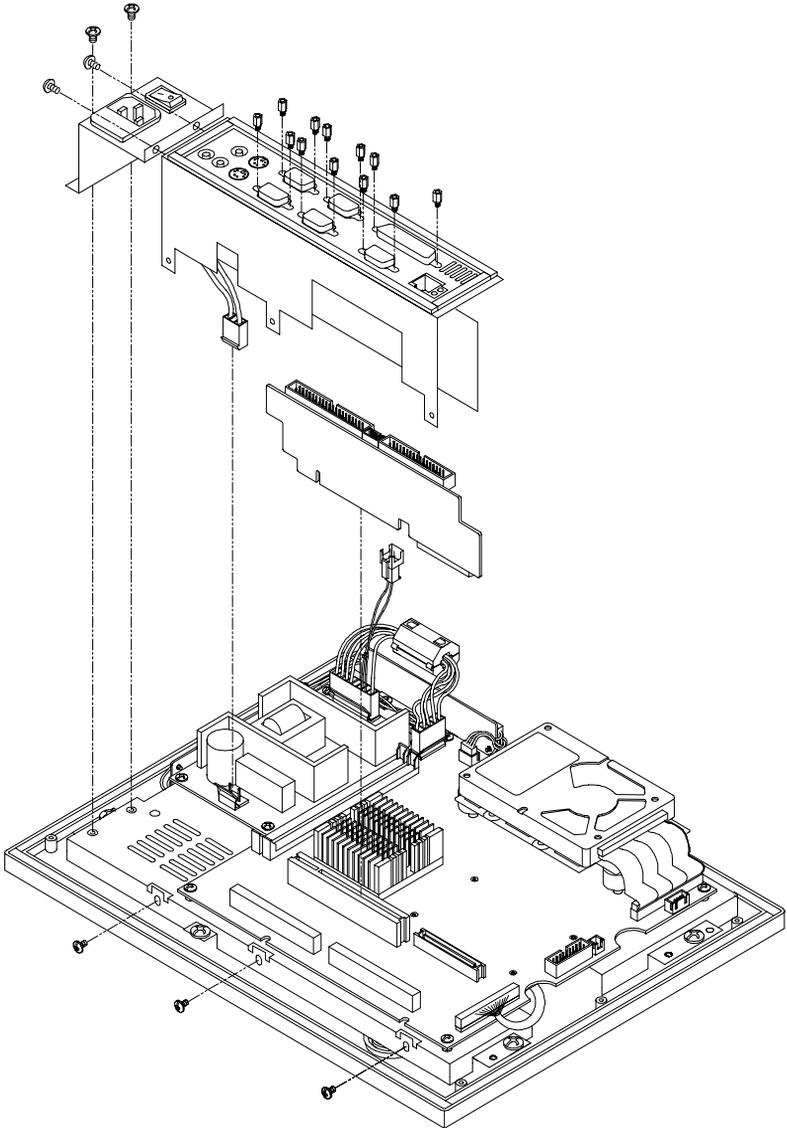
To replace or service the PCM-5865 (the all-in-one CPU board) and I/O adapter, complete the following steps:

1. Power off the PPC-102.
2. Remove the rear protective cover.
3. Install the PCM-5865 in the panel and screw in the four screws.
4. When the PCM-5865 is mounted in the panel, plug and press the adapter into the socket (see the assembly diagram below).
5. Some screws on your left hand side connect the I/O adapter to the PC, and also connect the adapter to the PCM-5865. Screw the screws into the panel.



**Figure 2-d:** Installing/removing the PCM-5865 in the PPC-102

You may change the jumper settings for RS-232/422/485 before installing the I/O adapter.



**Figure 2-e:** Installing/removing the I/O adapter in the PPC-102

## 2.8 Power Supply and Cooling Fan Replacement

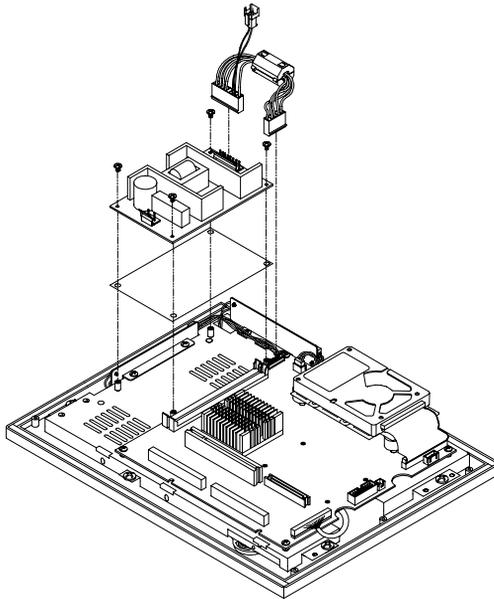
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To service or replace the power supply and/or the cooling fan, the back cover must first be removed.

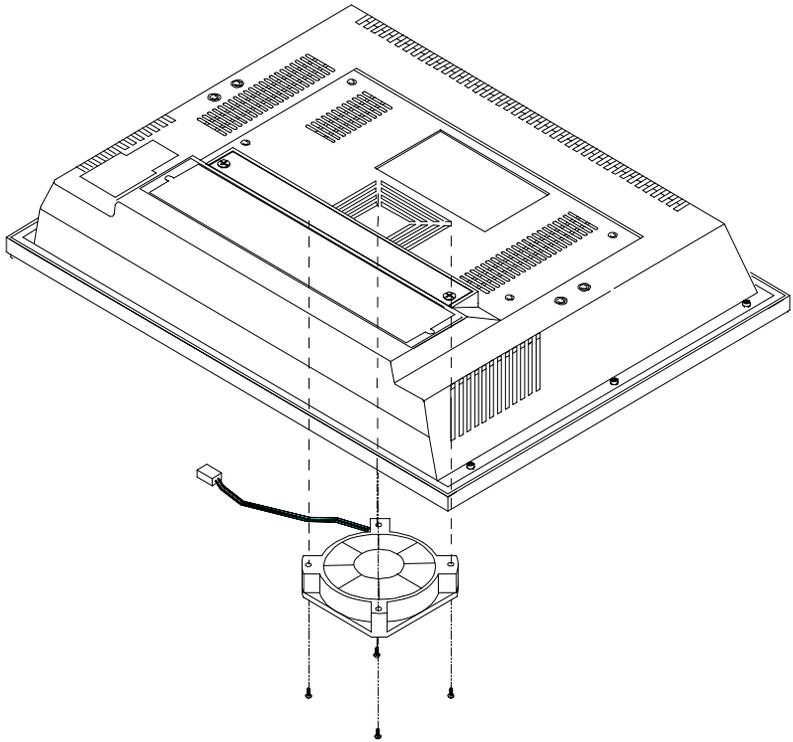
**Warning:** *Power cables must be detached before you attempt to repair the power supply.*



1. Disconnect the power cables and remove the four screws to detach the power supply from the panel PC.
2. Refer to Appendix B for detailed power supply specifications. Ensure that any replacement power supply matches the system's specifications.
3. The cooling fan is located inside the rear panel. You can remove the cooling fan by first removing the four screws.



**Figure 2-f:** Replacing the power supply



**Figure 2-g:** Replacing the cooling fan

# CHAPTER 3

## The Engine of the PPC-102: the PCM-5865

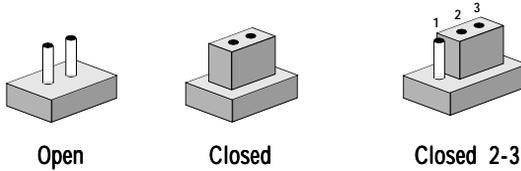
This chapter explains how to set up the PCM-5865 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

- Information on Jumpers and Connectors
- CPU Installation and Upgrading
- Power Connectors
- COM-port Interface
- VGA Interface
- Watchdog Timer Configuration
- DiskOnChip® 2000 Installation
- Touchscreen Connector

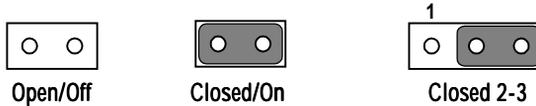
## 3.1 Information on Jumpers and Connectors

### 3.1.1 Setting jumpers

You configure the board 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.



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



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.

Generally, you simply need a standard cable to make most connections.

### 3.1.2 Jumpers

The PCM-5865 has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each of the board's jumpers.

Table 3-1: PCM-5865 jumpers and their functions

| Label | Function                                  |
|-------|---|
| J1    | Backlight control                         |
| J2    | CMOS clear                                |
| J3    | Cache linear mode setting (for Cyrix CPU) |
| J4    | System/PCI clock setting                  |
| J5    | V <sub>EE</sub> control                   |
| J6    | Watchdog invoke selection                 |
| J7    | DOC 2000 memory address selection         |
| J8    | CPU frequency ratio                       |
| J9    | V <sub>EE</sub> signal                    |
| J10   | P54C/P55C selection                       |
| J11   | Touchscreen power                         |
| J12   | Touchscreen com port (COM4)               |
| J13   | LCD power setting                         |
| J14   | CPU core voltage setting                  |
| J15   | SYS/PCI clock setting                     |
| J16   | COM4 RI output setting                    |
| J17   | COM3 RI output setting                    |
| J18   | COM2 RS-232/422/485 setting               |
| J19   | COM2 RS-232/422/485 setting               |
| J20   | COM2 RS-232/422/485 setting               |
| J21   | COM3, COM4 IRQ enable                     |

### 3.1.3 Locating jumpers

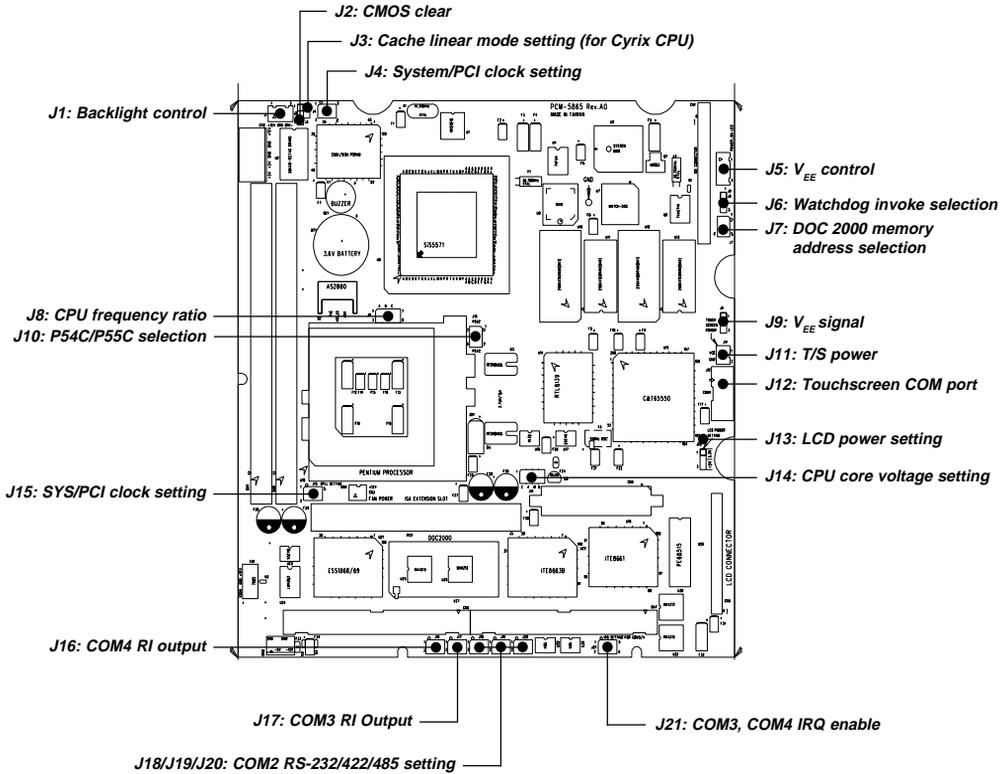


Figure 3-a: Locating jumpers on the PCM-5865

### 3.1.4 Connectors

On-board connectors link the PCM-5865 to external devices such as hard disk drives or floppy drives. The table below lists the function of each of the board's connectors.

---

Table 3-2: PCM-5865 connectors

---

| Label | Function                                     |
|-------|--|
| CN1   | Primary IDE drive connector                  |
| CN2   | Main power connector                         |
| CN3   | Fan power connector                          |
| CN4   | Floppy drive / secondary IDE drive connector |
| CN5   | Flat panel display (LCD) connector           |
| CN6   | I/O connector (A)                            |
| CN7   | I/O connector (B)                            |
| CN8   | Aux. power connector                         |

---

### 3.1.5 Locating connectors

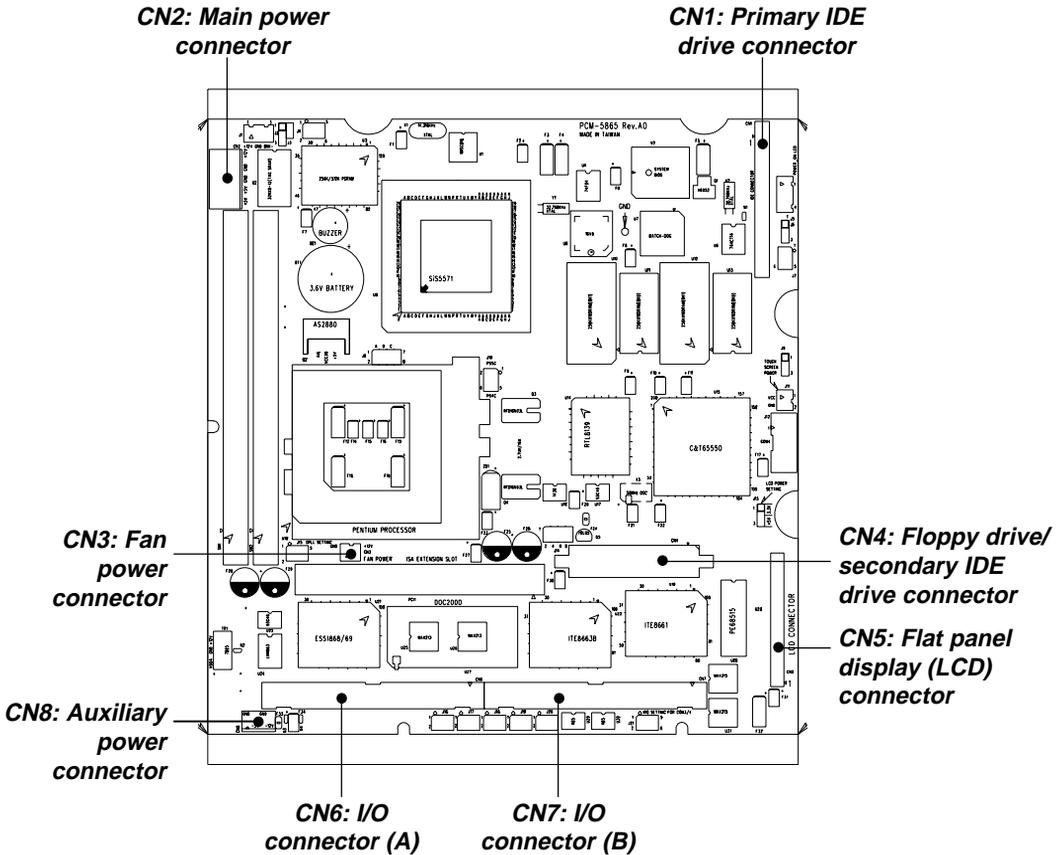


Figure 3-b: Locating connectors on the PCM-5865

## 3.2 CPU Installation and Upgrading

You can upgrade to a higher power Pentium® processor at any time. Simply remove the old CPU, install the new one, and set the jumpers for the new CPU type and speed.

### 3.2.1 System clock setting (J4 and J15)

J4 and J15 are used to set the CPU and PCI bus speed to optimize the system performance. The system chipset will sense the J15 setting to get the bus frequency, then adjust its internal timing. J4 is used to set the CPU and PCI clock. J10 is the P55C or P54C selection. Refer to the CPU speed reference table (below) for instructions on adjusting the internal clocks according to the base CPU speed.

Table 3-3: PCM-5865 CPU speed reference table

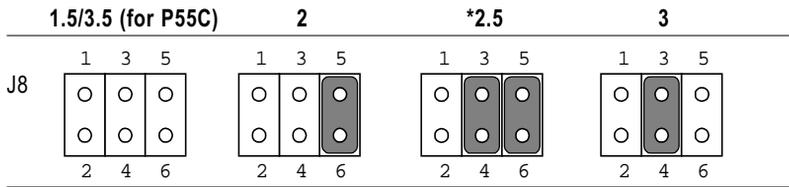
| CPU Speed (MHz) | 75  | 100 | 133 | 150 | *166 | 200 |
|-----------------|-----|-----|-----|-----|------|-----|
| Clock setting   | 50  | 66  | 66  | 60  | 66   | 66  |
| Frequency ratio | 1.5 | 1.5 | 2   | 2.5 | 2.5  | 3   |

\* default setting

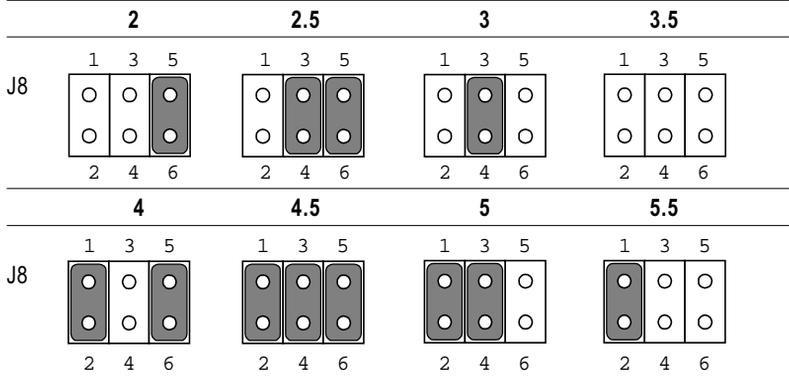
Table 3-4: PCM-5865 system/PCI clock setting

|        | 50MHz   | 60MHz | *66MHz   | 75MHz |
|--------|---------|-------|----------|-------|
| System |         |       |          |       |
| PCI    | 33.3MHz | 30MHz | *33.3MHz | 32MHz |
| J15    |         |       |          |       |
|        |         |       |          |       |
| J4     |         |       |          |       |
|        |         |       |          |       |

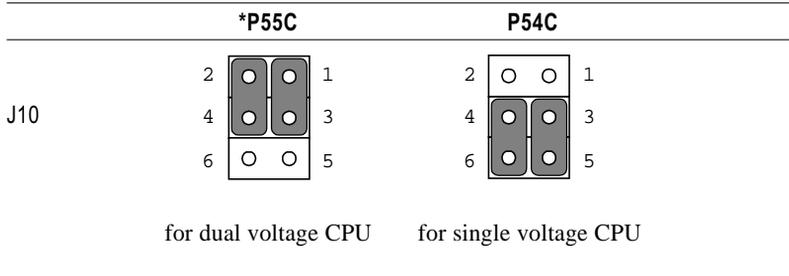
**Table 3-5: CPU frequency ratio (for Intel)**



**CPU frequency ratio (for AMD K6)**



**Table 3-6: P54C/P55C selection**



### 3.2.2 CPU core voltage setting (J14)

J14 must be set to match the CPU type. The chart below shows the proper jumper settings for their respective  $V_{cc}$  (core). (The  $V_{cc}$  (I/O) for CPU is fixed to be 3.3 V.)

Table 3-7: CPU voltage setting (J14)

| VCC_CORE | A   | B   | C   | D   |
|----------|-----|-----|-----|-----|
| 2.1 V    | OFF | OFF | OFF | OFF |
| 2.2 V    | ON  | OFF | OFF | OFF |
| 2.3 V    | OFF | ON  | OFF | OFF |
| 2.4 V    | ON  | ON  | OFF | OFF |
| 2.5 V    | OFF | OFF | ON  | OFF |
| 2.6 V    | ON  | OFF | ON  | OFF |
| 2.7 V    | OFF | ON  | ON  | OFF |
| 2.8 V*   | ON  | ON  | ON  | OFF |
| 2.9 V    | OFF | OFF | OFF | ON  |
| 3.0 V    | ON  | OFF | OFF | ON  |
| 3.1 V    | OFF | ON  | OFF | ON  |
| 3.2 V    | ON  | ON  | OFF | ON  |
| 3.3 V    | OFF | OFF | ON  | ON  |
| 3.4 V    | ON  | OFF | ON  | ON  |
| 3.5 V    | OFF | ON  | ON  | ON  |
| 3.6 V    | ON  | ON  | ON  | ON  |

\* default setting 2.8 V:

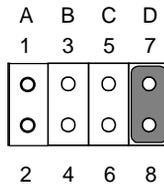


Figure 3-c: PCM-5865 CPU voltage setting jumper (J14)

### 3.2.3 M1 cache linear mode setting (J3)

The PCM-5865 supports the Cyrix M1 CPU with its linear access mode on L2 cache. This mode is set through J3.

---

Table 3-8: Cache linear mode enabled/disabled

---

|    | Enabled   | *Disabled   |
|----|---|---|
| J3 |  |  |

---

\* default setting

### 3.2.4 CMOS clear (J2)

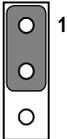
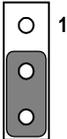
**Warning:**

To avoid damaging the computer, always turn off the power supply before setting “Clear CMOS.” Set the jumper back to “3.6 V Battery On” before turning on the power supply.

---

Table 3-9: CMOS clear

---

|    | *3.6 V Battery On  | Clear CMOS   |
|----|--|--|
| J2 |  1 |  1 |

---

\* default setting

## 3.3 Power Connectors (CN3, CN2)

---

### 3.3.1 Main power connector, +5 V, +12 V (CN2)

This supplies main power to the PCM-5865 (+5 V) and devices that require +12 V.

---

Table 3-10: PCM-5865 main power connector (CN2)

---

| Pin | Function |
|-----|----------|
| 1   | +12 V    |
| 2   | GND      |
| 3   | GND      |
| 4   | +5 V     |
| 5   | +5 V     |

---

### 3.3.2 Fan power supply connector (CN3)

This provides power supply to the cooling fan which is located on the rear cover of the PPC-102. It is only present when +5 V and +12 V power is supplied to the board.

---

Table 3-11: Fan power supply connector

---

| Pin | Function |
|-----|----------|
| 1   | +12 V    |
| 2   | GND      |

---

### 3.3.3 Auxiliary power connector (CN8)

---

Table 3-12: Auxiliary power connector

---

| Pin | Function |
|-----|----------|
| 1   | GND      |
| 2   | -5 V     |
| 3   | GND      |
| 4   | -12 V    |

---

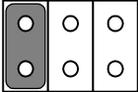
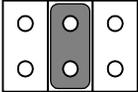
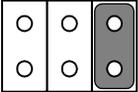
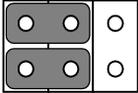
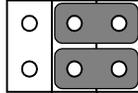
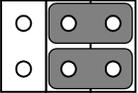
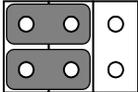
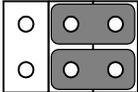
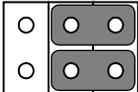
### 3.4 COM-port Interface

The PCM-5865 provides four serial ports (COM1, 3, 4: RS-232; COM2: RS-232/422/485).

#### 3.4.1 COM2 RS-232/422/485 setting (J18, J19, J20)

COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode. This is done via J18, J19 and J20.

Table 3-13: COM2 RS-232/422/485 setting

|     | *RS-232  | RS-422   | RS-485   |
|-----|--|--|--|
| J18 | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   |
|     | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  |
| J19 | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>   |
|     | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  |
| J20 | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>1</span> <span>3</span> <span>5</span> </div>  |
|     | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  | <div style="display: flex; justify-content: space-around;"> <span>2</span> <span>4</span> <span>6</span> </div>  |

\* default setting

The IRQ and the address range for COM1, 2, 3, and 4 are fixed. However, if you wish to disable the port or change these parameters later you can do this in the system BIOS setup. The table below shows the settings for the PCM-5865's serial ports.

COM1 and COM2 are one set. You can exchange the address range and interrupt level of COM1 for the address range and interrupt level of COM2. After exchanging, COM1's address range is 2F8 ~ 2FF and its interrupt level is IRQ3, COM2's address range is 3F8 ~ 3FF and its interrupt level is IRQ4. COM3 and COM4 are another set. Their selectable function is the same as the set of COM1 and COM2.

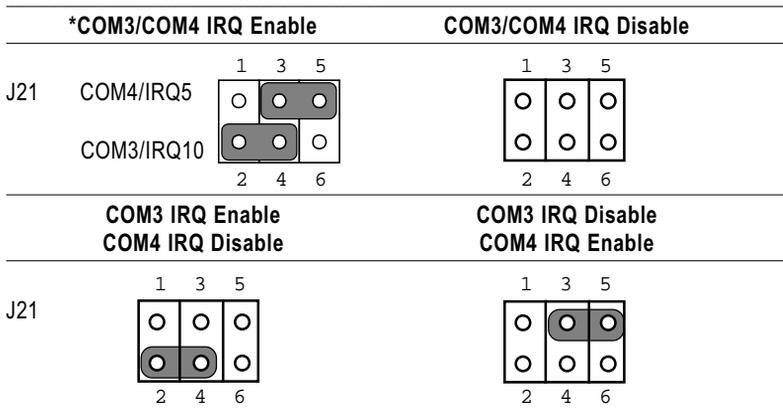
Table 3-14: PCM-5865 serial port default settings

| Port | Address Range | Interrupt |
|------|---------------|-----------|
| COM1 | 3F8 ~ 3FF     | IRQ4      |
| COM2 | 2F8 ~ 2FF     | IRQ3      |
| COM3 | 3E8 ~ 3EF     | IRQ10     |
| COM4 | 2E8 ~ 2EF     | IRQ5      |

### 3.4.2 COM3/COM4 IRQ enable (J21)

COM3 and COM4 are designed to use IRQ10 and IRQ5 by default. If you are using COM3 or COM4 with no need for interrupt, the IRQ of COM3 or COM4 can be released to other peripherals by setting J21.

Table 3-15: COM3/COM4 IRQ enable



### 3.4.3 COM3/COM4 RI pin setting (J17, J16)

COM3 and COM4 can supply +5 V or +12 V power to the serial devices via the RI pins of the COM port connector. The outputs of the COM3 and COM4 RI pins are selected by setting J17 and J16 respectively.

Table 3-16: COM3 RI output setting

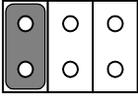
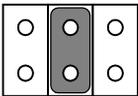
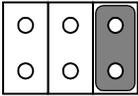
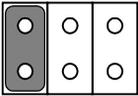
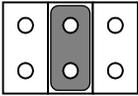
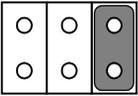
|     | +5 V  | +12 V   | *RI   |
|-----|---|---|---|
| J17 |  |  |  |
|     | 1 3 5<br>2 4 6  | 1 3 5<br>2 4 6  | 1 3 5<br>2 4 6  |

Table 3-17: COM4 RI output setting

|     | +5 V  | +12 V   | *RI   |
|-----|---|---|---|
| J16 |  |  |  |
|     | 1 3 5<br>2 4 6  | 1 3 5<br>2 4 6  | 1 3 5<br>2 4 6  |

\* default setting

## 3.5 VGA Interface

---

The PCM-5865's PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The board has two connectors to support these displays, one for standard CRT VGA monitors and one for flat panel displays.

### 3.5.1 CRT display port (I/O port)

Refer to Section 2.4.6 for detailed information.

### 3.5.2 Flat panel display connector (CN5)

CN5 consists of a 44-pin, dual-in-line header. Power supply (+12 V) present on CN5 depends on the supply connected to the board. Ensure that CN2 is connected for +12 V power supply.

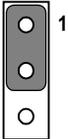
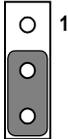
The PCM-5865 provides a bias control signal on CN5 that can be used to control the LCD bias voltage. It is recommended that the LCD bias voltage not be applied to the panel until the logic supply voltage (+5 V or +3.3 V) and panel video signals are stable. Under normal operation, the control signal (/ENVEE) is active low. When the PCM-5865's power is applied, the control signal is low until just after the relevant flat panel signals are present.

Refer to Section 4.4 for CN5's pin assignment.

### 3.5.3 LCD power setting (J13)

The PCM-5865's PCI SVGA interface supports 5 V and 3.3 V LCD displays. By changing the setting of J13, you can select the panel video signal level to be 5 V or 3.3 V.

Table 3-18: LCD power setting

|     | *5 V  | 3.3 V   |
|-----|---|---|
| J13 |  |  |

\* default setting

Configuration of the VGA interface is done completely via the software utility. You do not have to set any jumpers. Refer to Chapters 4 or 6 for software setup details.

Refer to Chapter 4 for details on connecting the four standard LCDs: Sharp LM64P89, Toshiba LTM10C209A, Toshiba LTM10C273 and Kyocera KCB6448BSTT-X5.

### 3.5.4 LCD back light connector (J1)

The LCD's back light inverter supplies power through this connector.

Table 3-19: LCD back light connector

| Pin | Function |
|-----|----------|
| 1   | +12 V    |
| 2   | GND      |
| 3   | BLANK*   |

\* active low

### 3.5.5 VEE control (J5)

The VEE control supports the power supply for monochrome LCDs.

Table 3-20: VEE control (J5)

| Pin | Function |
|-----|----------|
| 1   | GND      |
| 2   | /ENVEE*  |
| 3   | VSAFE    |
| 4   | VCC      |

\* active low

### 3.6.6 I/O connector (CN6, CN7)

You can find the I/O arrangement in Section 1.5. All input and output connectors come from CN6 and CN7 through the I/O PC board to connect all the cables of the PPC-102's peripherals.

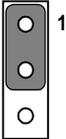
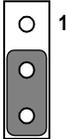
## 3.6 Watchdog Timer Configuration

An on-board watchdog timer reduces the chance of disruptions which EMP (electromagnetic pulse) interference can cause. This is an invaluable protective device for stand-alone or unmanned applications. Setup involves one jumper and running the control software (refer to Appendix A).

### 3.6.1 Watchdog invoke selection (J6)

When the watchdog timer activates (CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ15. This can be set via jumper J6 as shown below:

Table 3-21: Watchdog timer action

|    | *System reset   | IRQ15   |
|----|---|---|
| J6 |  1 |  1 |

\* default setting

## 3.7 DiskOnChip® 2000 Installation

---

### 3.7.1 Installing a DOC® 2000 into the socket

The PPC-102's DiskOnChip® 2000 provides a Flash disk in a standard 32-pin DIP package. This unique data storage solution offers a better, faster and economical Flash disk for single board embedded systems, Internet devices and portable applications with limited space and modest disk capacity requirements. DiskOnChip 2000 incorporates a Flash component technology called NAND. These high density, low cost components enable faster read/write speeds, higher capacity and better prices than previous generations of Flash components.

DiskOnChip 2000 provides a Flash disk (BIOS expansion only) which does not require any bus, slot or connector. Simply insert the DiskOnChip 2000 into a 32-pin socket on the PCM-5865. With minimal installation costs, you have a bootable small, fully-functional, easy to integrate Plug and Play Flash disk with very low power consumption

*Note: Verify the direction is correct (pin 1 of the DiskOnChip 2000 is aligned with pin 1 of the socket). For other notes and installation guidelines, refer to the DiskOnChip 2000 Installation Guide.*

*Warning: The DiskOnChip 2000's socket cannot be used to install solid state disks made by SanDisk Corporation, because the PPC-102's BIOS cannot support them. If you want to install SanDisk's SSD, you must use the IDE port.*

### 3.7.2 DOC® 2000 memory address selection (J7)

The DOC® 2000 memory address is used to avoid conflicts with other address settings, for example, Ethernet addressing. If a conflict occurs, the jumper setting for J7 will be changed for this Flash memory address selection.

Table 3-22: DOC® 2000 memory address selection (J7)

|   | C8000   | CC00  | *D000   | D400  |
|---|---|---|---|---|
| J7  | 2  1 | 2  1 | 2  1 | 2  1 |
|   |  1   |  1   |  1   |  1   |
|   | 6  5 | 6  5 | 6  5 | 6  5 |
| J7  | D800  | DC00  | E000  | disable   |
|   | 2  1 | 2  1 | 2  1 | 2  1 |
|   |  1   |  1   |  1   |  1   |
| 6  5 | 6  5 | 6  5 | 6  5 |   |

\* default setting

For additional DOC® 2000 instructions, please refer to the DOC 2000 Installation Guide.

## 3.8 Touchscreen Connector

---

The PCM-5865's touchscreen interface supports  $V_{CC}$  and GND for touchscreen power consumption.

---

Table 3-23: Touchscreen power (J11)

---

| Pin | Function |
|-----|----------|
| 1   | $V_{CC}$ |
| 2   | GND      |

---

As described in the PPC-102's specifications, the PPC-102, with the optionally installed touchscreen, will share COM4. J12 is for the touchscreen COM port's pin assignment.

---

Table 3-24: Touchscreen COM port (COM4)

---

| Pin | Function |
|-----|----------|
| 1   | NRLSD    |
| 2   | RX       |
| 3   | TX       |
| 4   | DTR      |
| 5   | GND      |
| 6   | DSR      |
| 7   | RTS      |
| 8   | CTS      |
| 9   | RI       |
| 10  | NC       |

---



# CHAPTER 4

## Software Configuration

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements. Award system BIOS is covered in Chapter 5.

Sections include:

- Introduction
- Utility Disk
- VGA Display Software Configuration
- Connections for Four Standard LCDs
- Ethernet Software Configuration

## 4.1 Introduction

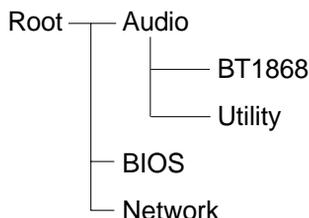
---

The PPC-102 system BIOS and custom drivers are located in a 128 Kbyte, 32-pin (JEDEC spec.) Flash ROM device, designated U19. A single Flash chip holds the system BIOS, VGA BIOS, and network Boot ROM image. The display can be configured via software. This method minimizes the number of chips and eases configuration. The display BIOS is changed by reprogramming the Flash chip for different display usages.

## 4.2 Utility Disk

---

The PPC-102 is supplied with a software utility disk in the accessory box.



<BIOS>

BIOS utility

<Audio>

Audio controller test program

<Network>

Network controller setup and test program

## 4.3 VGA Display Software Configuration

---

The PPC-102's on-board VGA interface supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. With on-board 1 MB display memory, the interface can drive CRT displays or color panel displays with resolutions up to 1024 x 768 in 256 colors. It is also capable of extending up to 2 MB of display memory to provide resolutions of 1024 x 768 in 64 K colors.

## 4.4 Connections for Four Standard LCDs

---

### Connections to Sharp LM64P89 (640 x 480 mono LCD)

Table 4-1: Connections to Sharp LM64P89 LCD (CN5)

| Pin    | Pin name | Pin | Pin name        |
|--------|----------|-----|-----------------|
| CN1-1  | S        | 36  | FLM             |
| CN1-2  | CP1      | 38  | LP              |
| CN1-3  | CP2      | 35  | SHFCLK          |
| CN1-4  | DISP     | 5   | +5 V            |
| CN1-5  | VDD      | 6   | +5 V            |
| CN1-6  | VSS      | 3   | GND             |
| CN1-7  | VEE      | -   | external power* |
| CN1-8  | DU0      | 12  | P3              |
| CN1-9  | DU1      | 11  | P2              |
| CN1-10 | DU2      | 10  | P1              |
| CN1-11 | DU3      | 9   | P0              |
| CN1-12 | DL0      | 16  | P7              |
| CN1-13 | DL1      | 15  | P6              |
| CN1-14 | DL2      | 14  | P5              |
| CN1-15 | DL3      | 13  | P4              |

\* LM64P89 -20 V

## Connections to Kyocera KCB6448BSTT-X5 (640 x 480 STN LCD)

Table 4-2: Connections to Kyocera KCB6448BSTT-X5 LCD (CN5)

| Pin    | Pin Name | Pin    | Pin Name        |
|--------|----------|--------|-----------------|
| CN1-1  | FRM      | CN5-36 | FLM             |
| CN1-2  | NC       |        |                 |
| CN1-3  | DISP     | CN5-40 | ENABKL          |
| CN1-4  | LOAD     | CN5-38 | LP              |
| CN1-5  | VSS      | CN5-33 | GND             |
| CN1-6  | CP       | CN5-35 | SHFCLK          |
| CN1-7  | VSS      | CN5-34 | GND             |
| CN1-8  | HD0      | CN5-20 | P11             |
| CN1-9  | HD1      | CN5-19 | P10             |
| CN1-10 | HD2      | CN5-18 | P9              |
| CN1-11 | HD3      | CN5-17 | P8              |
| CN1-12 | HD4      | CN5-12 | P3              |
| CN1-13 | HD5      | CN5-11 | P2              |
| CN1-14 | HD6      | CN5-10 | P1              |
| CN1-15 | HD7      | CN5-09 | P0              |
| CN2-1  | LD0      | CN5-24 | P15             |
| CN2-2  | LD1      | CN5-23 | P14             |
| CN2-3  | LD2      | CN5-22 | P13             |
| CN2-4  | LD3      | CN5-21 | P12             |
| CN2-5  | LD4      | CN5-16 | P7              |
| CN2-6  | LD5      | CN5-15 | P6              |
| CN2-7  | LD6      | CN5-14 | P5              |
| CN2-8  | LD7      | CN5-13 | P4              |
| CN2-9  | VDD      | CN5-05 | V <sub>CC</sub> |
| CN2-10 | VSS      | CN5-03 | GND             |
| CN2-11 | NC       |        |                 |
| CN2-12 | NC       |        |                 |
| CN2-13 | NC       |        |                 |
| CN2-14 | VCONT    | CN5-07 | VEESAFE         |

## Connections to Toshiba LTM10C273 (800 x 600 TFT color LCD)

Table 4-3: Connections to Toshiba LTM10C273 LCD (CN5)

| Pin    | Pin Name | Pin    | Pin Name |
|--------|----------|--------|----------|
| CN1-1  | GND      | CN5-39 | GND      |
| CN1-2  | CLK      | CN5-35 | SHFCLK   |
| CN1-3  | GND      | CN5-34 | GND      |
| CN1-4  | R0       | CN5-27 | P18      |
| CN1-5  | R1       | CN5-28 | P19      |
| CN1-6  | R2       | CN5-29 | P20      |
| CN1-7  | GND      | CN5-33 | GND      |
| CN1-8  | R3       | CN5-30 | P21      |
| CN1-9  | R4       | CN5-31 | P22      |
| CN1-10 | R5       | CN5-32 | P23      |
| CN1-11 | GND      | CN5-33 | GND      |
| CN1-12 | G0       | CN5-19 | P10      |
| CN1-13 | G1       | CN5-20 | P11      |
| CN1-14 | G2       | CN5-21 | P12      |
| CN1-15 | GND      | CN5-8  | GND      |
| CN1-16 | G3       | CN5-22 | P13      |
| CN1-17 | G4       | CN5-23 | P14      |
| CN1-18 | G5       | CN5-24 | P15      |
| CN1-19 | GND      | CN5-8  | GND      |
| CN1-20 | ENAB     | CN5-37 | M/DE     |
| CN1-21 | GND      | CN5-4  | GND      |
| CN1-22 | B0       | CN5-11 | P2       |
| CN1-23 | B1       | CN5-12 | P3       |
| CN1-24 | B2       | CN5-13 | P4       |
| CN1-25 | GND      | CN5-4  | GND      |
| CN1-26 | B3       | CN5-14 | P5       |
| CN1-27 | B4       | CN5-15 | P6       |
| CN1-28 | B5       | CN5-16 | P7       |
| CN1-29 | GND      | CN5-3  | GND      |
| CN1-30 | VDD      | CN5-5  | +5 V     |
| CN1-31 | VDD      | CN5-6  | +5 V     |

## Connections to Toshiba LTM10C209A (640 x 480 TFT color LCD)

Table 4-4: Connections to Toshiba LTM10C209A LCD (CN5)

| Pin    | Pin Name | Pin    | Pin Name |
|--------|----------|--------|----------|
| CN1-1  | GND      | CN5-39 | GND      |
| CN1-2  | CLK      | CN5-35 | SHFCLK   |
| CN1-3  | GND      | CN5-34 | GND      |
| CN1-4  | R0       | CN5-27 | P18      |
| CN1-5  | R1       | CN5-28 | P19      |
| CN1-6  | R2       | CN5-29 | P20      |
| CN1-7  | GND      | CN5-33 | GND      |
| CN1-8  | R3       | CN5-30 | P21      |
| CN1-9  | R4       | CN5-31 | P22      |
| CN1-10 | R5       | CN5-32 | P23      |
| CN1-11 | GND      | CN5-33 | GND      |
| CN1-12 | G0       | CN5-19 | P10      |
| CN1-13 | G1       | CN5-20 | P11      |
| CN1-14 | G2       | CN5-21 | P12      |
| CN1-15 | GND      | CN5-8  | GND      |
| CN1-16 | G3       | CN5-22 | P13      |
| CN1-17 | G4       | CN5-23 | P14      |
| CN1-18 | G5       | CN5-24 | P15      |
| CN1-19 | GND      | CN5-8  | GND      |
| CN1-20 | ENAB     | CN5-37 | M/DE     |
| CN1-21 | GND      | CN5-4  | GND      |
| CN1-22 | B0       | CN5-11 | P2       |
| CN1-23 | B1       | CN5-12 | P3       |
| CN1-24 | B2       | CN5-13 | P4       |
| CN1-25 | GND      | CN5-4  | GND      |
| CN1-26 | B3       | CN5-14 | P5       |
| CN1-27 | B4       | CN5-15 | P6       |
| CN1-28 | B5       | CN5-16 | P7       |
| CN1-29 | GND      | CN5-3  | GND      |
| CN1-30 | VDD      | CN5-5  | +5 V     |
| CN1-31 | VDD      | CN5-6  | +5 V     |

## 4.5 Ethernet Software Configuration

---

The PPC-102's on-board Ethernet interface supports all major network operating systems. To configure the medium type, to view the current configuration, or to run diagnostics, do the following:

1. Power the PPC-102 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 are sure this is the configuration 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 that shows the format and result of any diagnostic tests undertaken.

**Note:** The PPC-102 is supplied with a software utility disk in the accessory box. The file RSET8139.EXE is located on the utility disk.



# CHAPTER 5

## Award BIOS Setup

This chapter describes how to set BIOS configuration data.

- System Test and Initialization
- Award BIOS Setup

## 5.1 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 sequence with nonfatal errors. Nonfatal error messages usually appear on the screen along with the following instruction:

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

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

### 5.1.1 System configuration verification

These routines check the current system configuration against the values stored in the board's CMOS memory. If they do not 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.

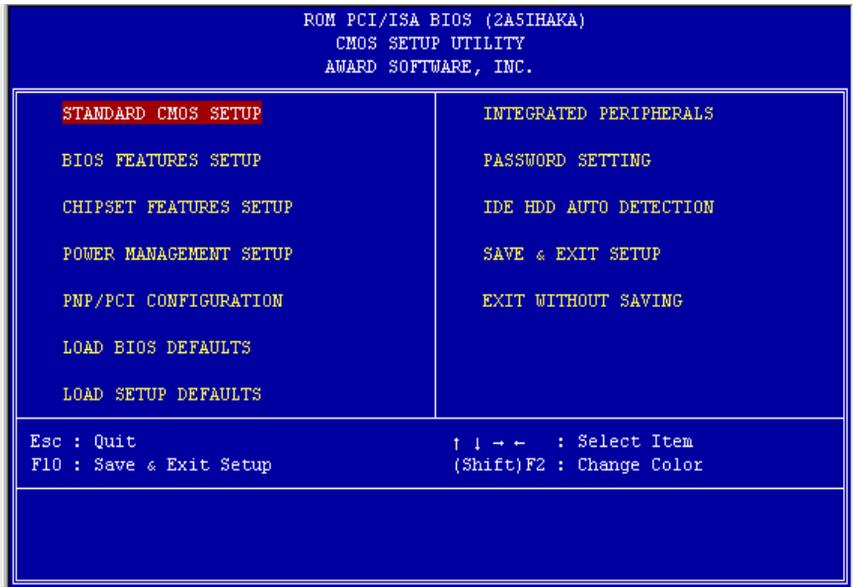
The PPC-102's CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service, but when it finally runs down, you will need to replace the complete unit.

## 5.2 Award BIOS Setup

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 CMOS RAM so that it retains the setup information when the power is turned off.

### 5.2.1 Entering setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.



*Figure 5-a: BIOS setup program initial screen*

## 5.2.2 Standard CMOS setup

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen shown below is displayed. This standard setup menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed at the bottom of the menu screen.

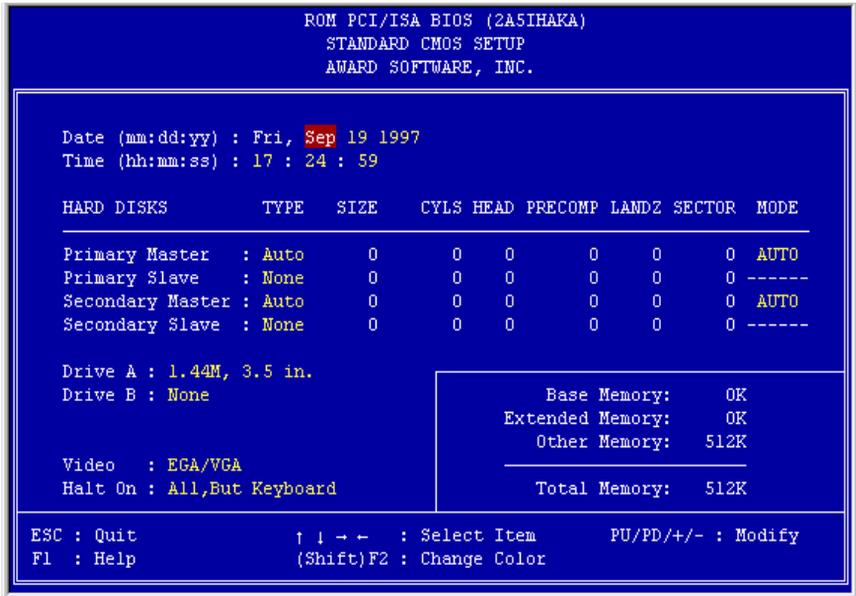


Figure 5-b: CMOS setup screen

## 5.2.3 BIOS features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-5865.

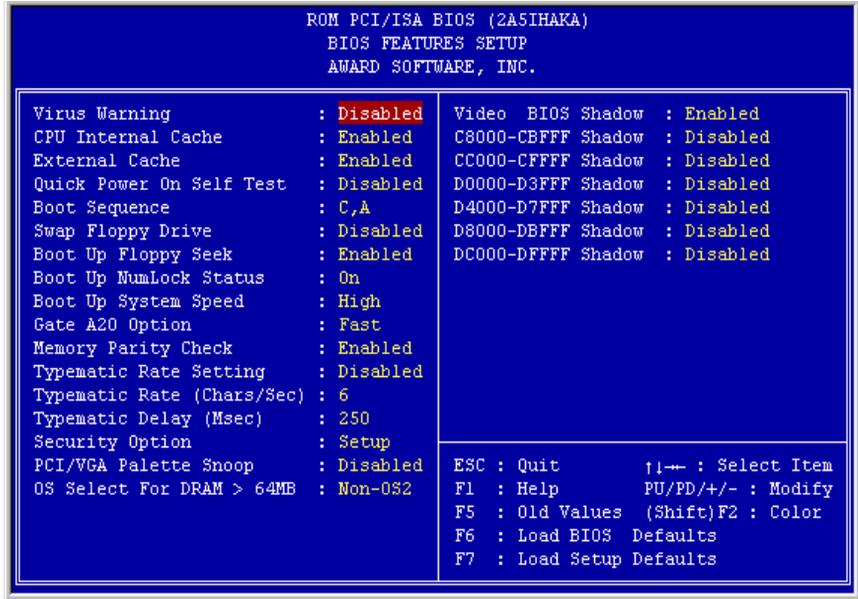
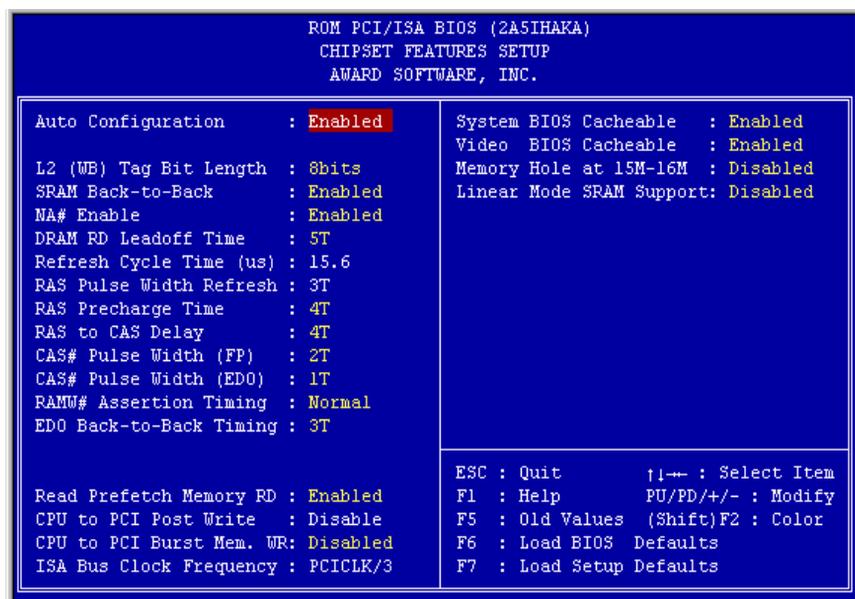


Figure 5-c: BIOS features setup

## 5.2.4 Chipset features setup

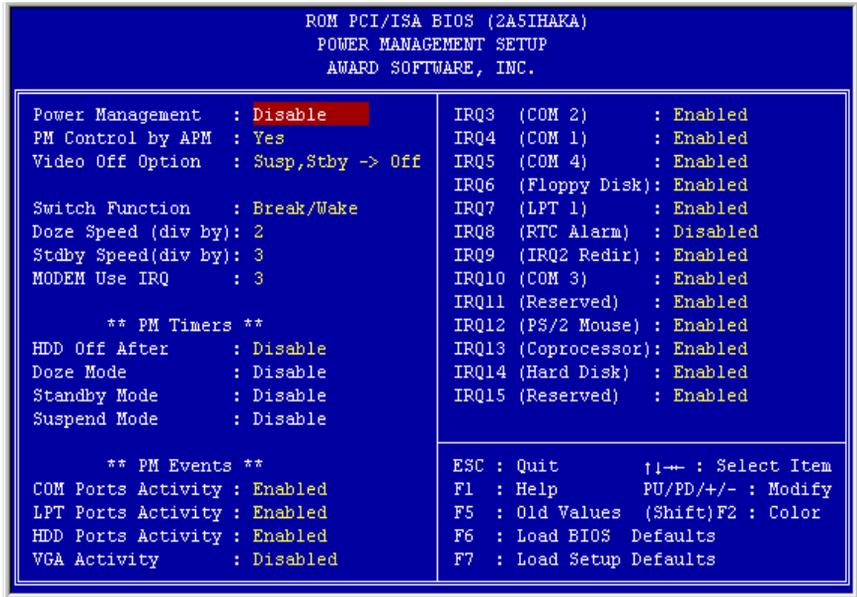
By choosing the CHIPSET FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-5865.



*Figure 5-d: BIOS chipset features setup*

## 5.2.5 Power management setup

By choosing the POWER MANAGEMENT SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-5865.



*Figure 5-e: Power management setup*

## 5.2.6 PnP/PCI configuration

By choosing the PnP/PCI CONFIGURATION option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-5865.

```
ROM PCI/ISA BIOS (2A51HAKA)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By : Manual
Reset Configuration Data : Disabled

IRQ-3 assigned to : Legacy ISA
IRQ-4 assigned to : Legacy ISA
IRQ-5 assigned to : Legacy ISA
IRQ-7 assigned to : Legacy ISA
IRQ-9 assigned to : PCI/ISA PnP
IRQ-10 assigned to : Legacy ISA
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : Legacy ISA
IRQ-15 assigned to : Legacy ISA
DMA-0 assigned to : PCI/ISA PnP
DMA-1 assigned to : PCI/ISA PnP
DMA-3 assigned to : PCI/ISA PnP
DMA-5 assigned to : PCI/ISA PnP
DMA-6 assigned to : PCI/ISA PnP
DMA-7 assigned to : PCI/ISA PnP

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
```

Figure 5-f: PnP/PCI configuration

## 5.2.7 Integrated peripherals

By choosing the INTEGRATED PERIPHERALS option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-5865.

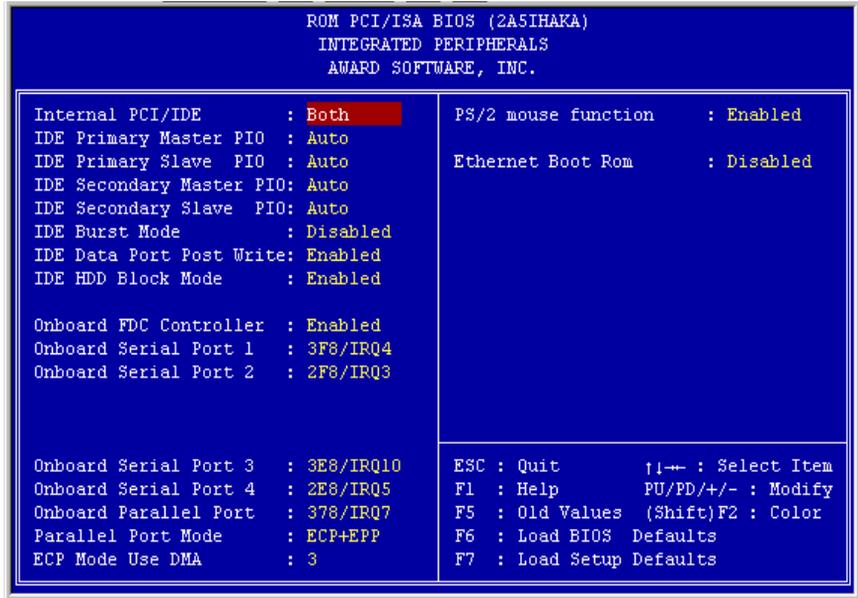
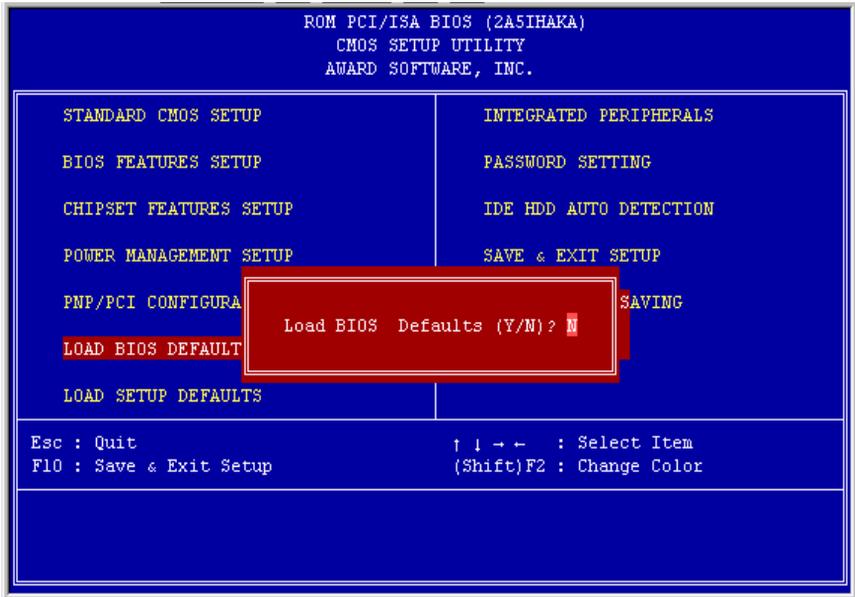


Figure 5-g: Integrated peripherals

## 5.2.8 Load BIOS defaults

LOAD BIOS DEFAULTS loads the default system values directly from ROM. If the stored record created by the setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the PCM-5865 on.



*Figure 5-h: Load BIOS defaults screen*

## 5.2.9 Change password

To change the password, choose the PASSWORD SETTING option from the setup main menu and press <Enter>.

1. The screen will display the following message:

Enter Password:

Press <Enter>.

2. If the CMOS is good or 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 can be at most eight (8) characters long.

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

### **5.2.10 Auto detect hard disk**

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.

### **5.2.11 Save & exit setup**

If you select this option and press <Enter>, the values entered in the setup utilities 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.

### **5.2.12 Exit without saving**

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

## PCI SVGA Setup

The PPC-102 features an on-board PCI flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

- Before You Begin
- Installation
- Simultaneous Display Mode
- Driver Installation
- Windows 95 Drivers Setup Procedure
- Windows NT Drivers Setup Procedure
- OS/2 Drivers Setup Procedure

## 6.1 Before You Begin

---

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The enhanced display drivers for the PPC-102 board are located on the software installation diskette. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers.

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

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

## 6.2 Installation

---

Disk 1: Windows 3.1, Windows 95, and Windows NT 4.0 drivers

Disk 2: OS/2 4.0 drivers

## 6.3 Simultaneous Display Mode

---

The 65550 VGA BIOS supports monochrome LCD, EL, color TFT and STN LCD flat panel displays. It also supports interlaced and non-interlaced analog monitors (VGA color and VGA monochrome) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multisync) monitors are supported as analog monitors.

Both CRT and panel displays can be used simultaneously. The PPC-102 can be set in one of three configurations: on a CRT, on a flat panel display, or on both simultaneously. The system is initially set to simultaneous display mode. In the utility diskette, there are three .COM files that can be used to select the display. Simply type the file name at the DOS prompt:

CT.COM Enables CRT display only.

FP.COM Enables panel display only.

SM.COM Enables both displays at the same time.

## 6.4 Driver Installation

---

### **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 the DOS or Windows user reference guides for more information before you proceed with the installation.

### **Before you begin**

Before you begin installing software drivers, you should make a backup copy of the display driver diskette and store the original in a safe place. The display driver diskette 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.

## 6.4.1 Windows setup

These drivers are designed to work with Microsoft Windows 3.1. You may install these drivers through Windows or in DOS.

**Step 1:** Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly.

**Step 2:** Place the display driver diskette in drive A. In Windows Program Manager, choose **File** from the Options Menu. Then from the pull-down menu, choose **Run . . .** At the command line prompt, type **A:\SETUP**. Press the <ENTER> key or click **OK** to begin the installation. 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. Press <ENTER> to complete the installation. Once completed, the Display Driver Control Panel appears on the screen. This Control Panel allows you to select and load the installed drivers.

Another method of installing these drivers is through the File Manager. Click on **Drive A:**. Then double-click on **SETUP.EXE** to begin installation.

### Changing display drivers in Windows

To change display drivers in 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. Then click on the **OK** button. 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. To change the color scheme, select the **Control Panel** from the Main window. Select the **Color** icon. You will be shown the current color scheme. Choose a new color scheme and click the **OK** button.

## 6.4.2 DOS setup

**Step 1:** Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly. Then exit Windows.

**Step 2:** Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the driver SETUP program. Press any key to get to the applications list. Using the arrow keys, select **Windows Version 3.1** and press the <ENTER> key. Press the <ENTER> key to select **All Resolutions**, and then press <END> to begin the installation. At this point, you will be asked for the path to your Windows System directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

**Step 3:** Change to the directory where you installed Windows (usually C:\WINDOWS).

**Step 4:** Type **SETUP** <ENTER> to run the Windows Setup program. It will show the current Windows configuration. Use the up arrow key to move to the Display line and press <ENTER>. A list of display drivers will be shown. Use the arrow keys to select one of the drivers starting with an asterisk (\*) and press <ENTER>.

**Step 5:** Follow the directions on the screen to complete the setup. In most cases, you may press <ENTER> to accept the suggested option. When Setup is done, it will return to DOS. Type **WIN** <ENTER> to start Windows with the new display driver.

### **Changing display drivers in DOS**

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous page. Besides the special display drivers marked by an asterisk (\*), you should be able to use the following standard drivers:

|           |                      |
|-----------|----------------------|
| VGA       | 640 x 480, 16 colors |
| Super VGA | 800 x 600, 16 colors |

### **Panning drivers**

Special panning drivers are provided to allow high-resolution modes to be displayed on a flat panel or CRT. These drivers will show a section of a larger screen and will automatically pan, or scroll, the screen horizontally and vertically when the mouse reaches the edge of the display.

### **Linear acceleration drivers**

A special high-performance linear acceleration driver is provided for 256-color modes. This driver may require special hardware and may not be supported on all systems. It is only available for Windows 3.1.

## **6.5 Windows 95 Drivers Setup Procedure**

---

1. Boot system with VGA or SuperVGA driver.
2. Select properties from a menu after right button press.
3. Select display.
4. Select Change Display.
5. Select Change Monitor.
6. Select Change Adapter.
7. Select Have Disk.

## 6.6 Windows NT Drivers Setup Procedure

---

### Step 1

1. Install Windows NT as you normally would for a VGA display.
2. First click the Start button, choose Settings and click on Control Panel.
3. Choose the Display icon and click on the icon.
4. In the Display Properties window, click on the Settings tab.
5. Click on Change Display Type. In the Change Display Type window, click on the Change button under Adapter Type. This will bring up the Select Device window.

### Step 2

1. In the Select Device window, click on the Other button. Enter source directory where the Windows NT driver files are located.
2. Press <ENTER> and the name of the Chips and Technologies Video Accelerator driver will appear at the end of Models list box. Scroll to the end of the list box and double click on the driver.
3. Once the installation is complete, the system must be shut down and restarted.

### Step 3

1. Upon restarting your computer, select the desired display settings from the Display property dialog box.
2. Click on Test to test the newly selected graphics mode. A color test screen should appear, followed by the Testing Mode window.
3. Click on Yes to continue. The Display Settings Change window will appear.
4. Click on Restart Now for the new settings to take effect.

## 6.7 OS/2 Drivers Setup Procedure

---

### 6.7.1 Preliminary steps

The following steps must be performed before you install the display driver:

1. OS/2 DOS Support must be installed.
2. If you previously installed SVGA support, you must reset the system to VGA mode. VGA is the default video mode enabled when OS/2 is installed.

To restore VGA mode, use Selective Install and select VGA for Primary Display. For more information on this procedure, see the section on Changing Display Adapter Support in the OS/2 User's Guide.

### 6.7.2 Installing from diskette

To install this driver, do the following steps:

1. Open an OS/2 full screen or windowed session.
2. Place the Display Driver Diskette in drive A.
3. At the OS/2 command prompt, type the following commands to copy the files to the OS/2 drive:

Type:

```
A: <ENTER> to make this the default drive.
```

```
SETUP A: C: <ENTER>
```

where A: is the floppy disk drive; and  
C: is the hard disk partition containing the OS/2 subdirectory

When the Setup Program is completed, you will need to perform a shutdown and then restart the system in order for changes to take effect.

A log of the information output during the installation can be found in  
<root>:\OS2\INSTALL\DISPLAY.LOG

4. After restarting the system, perform the following steps:

- 1) Open the OS/2 System folder.
- 2) Open the System Setup folder.
- 3) Open the Display Driver Install object.

This step will execute the Display Driver Installation (DSPINSTL) utility program to finish installation of the new drivers.

- 4) When the Display Driver Install window appears, select Primary Display and then select OK.
- 5) When The Primary Display Driver List window appears, select "Chips and Technologies 65550/554" from the list of adapter types, then select OK to install the video driver.
- 6) When the installation is complete, you will need to shut down and then restart the system for the changes to take effect. Make sure you remove the install diskette before restarting the system.

When the system has restarted, the display driver will be initialized for 640 x 480 x 256 color, 60 Hz refresh. To switch to a different video resolution, color depth, or refresh rate, follow these steps:

### **6.7.3 Selecting monitor type**

Monitor type is initially set to DEFAULT. This DEFAULT setting may not allow you to select all resolution/refresh combinations that are available for your monitor. The following steps can be done to select monitor type. This section applies only after installation, or when a different monitor is used.

1. Open the OS/2 System folder.
2. Open the System Setup folder.
3. Open the System object.
4. When the System - Settings notebook appears, select the Screen tab. This will take you to page 2 of the settings.
5. On Screen page 2, select your monitor type from the Display Name list. If your monitor is not listed, select DEFAULT. Return to Screen page 1.

It may be necessary to restart your system to have all refresh rate options available.

### **6.7.4 Selecting screen resolution/refresh rate**

To switch to a different video resolution, color depth or refresh rate, follow the steps below.

1. Open the OS/2 System folder.
2. Open the System Setup folder.
3. Open the System object.
4. From the selection windows provided, select a new screen resolution and screen refresh rate.

Please note, refresh rates, other than 60 Hz, are only valid when the display is switched to CRT only display mode.

5. Close the System-Settings notebook.
6. Perform a shutdown and restart for the changes to take effect.

## 6.7.5 Installation notes

1. During the installation of this driver, DISPLAY.LOG and DSPINSTL.LOG files are created in the \OS2\INSTALL directory. These files identify the OS/2 system files that were updated, and indicate whether the installation was successful. The DISPLAY.LOG file also contains a string that identifies the version of driver that was installed. This information may be important when reporting an installation problem.
2. During installation, DSPINSTL will invoke the SVGA configuration program SVGA.EXE to determine the hardware configuration, and create the file \OS2\INSTALL\SVGADATA.PMI. If this file is not created, the adapter will not be supported. When this step is done, the display will be blanked, and you may see a series of flashes on the display and/or what appears to be a “corrupted” display. This is normal, as the configuration process is performing Video BIOS mode sets to determine which screen resolutions BIOS supports. This configuration information is then used to provide the System-Settings resolution and refresh selections.



# CHAPTER 7

## Audio Setup

The PPC-102 is equipped with an audio interface that records and plays back CD-quality audio. This chapter provides instructions for installing the software drivers on the included audio driver diskettes.

- Introduction
- DOS Utilities
- Driver Installation

## 7.1 Introduction

---

The PPC-102 on-board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the ES1868 audio controller from ESS Technology, Inc. The audio interface can record, compress, and play back voice, sound, and music with built-in mixer control.

The PPC-102 on board audio interface also supports the Plug and Play (PnP) standard and provides PnP configuration for the audio, FM and MPU-104 logical devices. It is compatible with Sound Blaster™ and Sound Blaster Pro™ version 3.01 voice and music functions. The ESFM synthesizer is register compatible with the OPL3 and has extended capabilities.

## 7.2 DOS Utilities

---

The ES1868 audio controller supports PC games and applications for Sound Blaster™ and Sound Blaster Pro™ with no need for a device driver in a DOS environment. The default settings for the audio controller in DOS are listed as follows:

```
Address : 220H
IRQ      : 9
DMA      : 1
MPU-401: Disabled
```

### **Changing settings in DOS**

The audio controller settings can be changed in the DOS environment by using the DOS SETUP utility located in the UTILITY subdirectory of the audio driver diskette.

To change the settings, simply type **DOSSET** at the DOS prompt. Follow the instructions on screen to choose the new settings for the ES1868 audio controller.

## Controlling volume in DOS

The ES1868 audio controller provides software control of the setting of audio volume. The VOLUME CONTROL utility located in the UTILITY subdirectory of the audio driver diskette is used to control the volume setting in DOS.

To control the volume setting, simply type **ESSVOL** at the DOS prompt with appropriate parameters. The syntax of ESSVOL is shown as follows:

**ESSVOL** [/?] [/v:xx] [/l:xx] [/w:xx] [/m:xx] [/c:xx] [/s:xx] [/a:xx]

|           |   |
|-----------|---|
| no option | Display all volume settings.  |
| /?        | Display this message.   |
| /v        | Change master volume.   |
| /l        | Change line volume.   |
| /w        | Change wave volume.   |
| /m        | Change microphone volume.   |
| /c        | Change CD volume.   |
| /s        | Change synthesizer volume.  |
| /a        | Change AuxB volume.   |
| /p        | Change PC speaker volume.   |
| xx        | Volume. Note: no xx means 0<br>The value range of volume is 0 ~ 15.<br>[PC speaker volume range is 0 ~ 7] |

## 7.3 Driver Installation

---

### 7.3.1 Before you begin

To facilitate the installation of the audio drivers, you should read the instructions in this chapter carefully before you attempt installation. The audio drivers for the PPC-102 board are located on the audio driver diskettes. You must install the drivers by using the supplied SETUP program.

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

### 7.3.2 Windows 3.1 drivers

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

1. Run Windows to make sure that it is working correctly.
2. Place the audio driver diskette in drive A. In the Windows Program Manager, choose **File** from the Options Menu. Then from the pull-down menu, choose **Run . . .**. At the command line prompt, type **A:\WIN31\SETUP**. Press the <ENTER> key or click **OK** to begin the installation.
3. Click **Continue** when the “AudioDrive Setup” screen appears. Click the **Driver Installation** button to install the audio driver.
4. At this point, the setup program displays the “Set Hardware Setting” screen, which allows you to change the hardware settings of the audio controller in Windows. For proper operation, make sure the address, IRQ, and DMA settings are not used by other hardware. Press the <ENTER> key or click **OK** to complete the installation.

Once completed, you can change the settings or remove the audio driver by using the Windows Control Panel program.

### 7.3.3 Windows 95 drivers

1. Boot your system and place the audio driver diskette in drive A.
2. Select *Add New Hardware* from the Windows Control Panel.
3. Click *Next* to bring up the Windows search for a new hardware setup screen.
4. Select *No* and click the *Next* button.
4. Select *Sound, video and game controllers* from the *Hardware types* list and click the *Next* button.
5. Click *Have Disk*, type **A:\WIN95** and press <ENTER> at the prompt.
6. Select *ES1868 Control Interface* and *ES1868 Plug and Play AudioDrive*. Press the <ENTER> key or click **OK** to begin the installation.
7. Restart your computer after the installation is completed.

### 7.3.4 Windows NT 4.0 drivers

1. Boot your system and place the audio driver diskette in drive A.
2. Select *Add New Hardware* from the Windows Control Panel.
3. Click *Next* to bring up the Windows search for a new hardware setup screen.
4. Select *No* and click the *Next* button.
4. Select *Sound, video and game controllers* from the *Hardware types* list and click the *Next* button.
5. Click *Have Disk*, type **A:\WINNT** and press <ENTER> at the prompt.
6. Select *ES1868 Control Interface* and *ES1868 Plug and Play AudioDrive*. Press the <ENTER> key or click **OK** to begin the installation.
7. Restart your computer after the installation is completed.



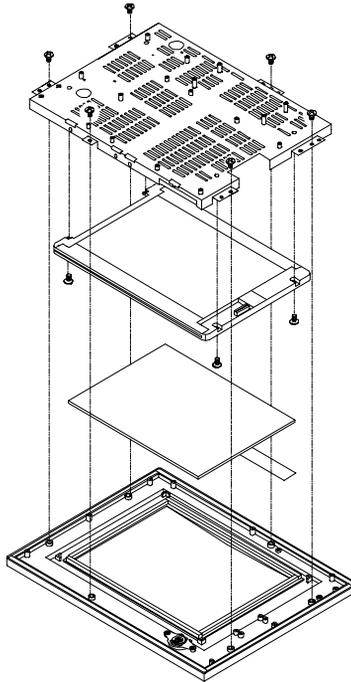
CHAPTER **8**

## **Touchscreen (Optional)**

- General Information
- Specifications
- Environmental Specifications
- Driver Installation

## 8.1 General Information

---



**Figure 8-a:** PPC-102 optional touchscreen exploded diagram

- 75% light transmission
- Advanced second-generation 5-wire resistive technology
- Enhanced visual resolution, antiglare surface treatment
- Enhanced scratch-resistant hard coat
- Accutouch touchscreens are UL-recognized components (file no. E133802)
- When properly installed, ball impact compliance meets UL 1950 standard
- Fire retardation compliance meets UL-746C, 0.75" (19 mm) flame test
- Systems incorporating these touchscreens, controllers, and cables have been approved to FCC Classes A and B compliance

## 8.2 Specifications

---

- **Light transmission:** Typically 75% at 550 nanometer wavelength, optimized for flat-panel displays. All measurements per ASTM D 10036-61
- **Visual resolution:** Antiglare: 6:1 minimum. Measured according to USAF 1951 Resolution Chart, under 30x magnification, with test unit located approximately 3.8 mm (1.5") from surface of resolution chart
- **Haze:** Antiglare - less than 15%. Per ASTM D 103-61
- **Gloss:** Antiglare -  $96 \pm$  gloss units. Per ASTM D 2457-70

## 8.3 Environmental Specifications

---

- **Temperature:** -10° ~ 50° C (operating)  
-40° ~ 71° C (storage)
- **Relative humidity:** 90RH at 35° C (operating)  
90RH at 35° C for 240 hours  
noncondensing (storage)
- **Chemical resistance:** The active area of the touchscreen is resistant to the following chemicals when exposed for a period of one hour at a temperature of 21° C (71° F):
  - Acetone
  - Methylene chloride
  - Methyl ethyl ketone
  - Isopropyl alcohol
  - Hexane
  - Ammonia-based glass cleaners
  - Turpentine
  - Mineral spirits
  - Foods and beverages

## 8.4 Driver Installation

---

The touchscreen driver for Windows 95 contains a native, 32-bit driver designed for Windows 95 and a 32-bit Control Panel program for the PPC-102 system.

To facilitate the installation of the touchscreen drivers, you should read the instructions in this chapter carefully before you attempt installation.

### 8.4.1 Touchscreen driver for DOS

This disk contains DOS and Windows drivers for the PPC-102's touchscreen, a demo program, and diagnostic and utility programs. This disk includes the ELODEV™, MonitorMouse® for DOS, MonitorMouse for Windows, and TouchBack™ drivers. A VGA version of ELODEMO is also included. Follow the steps below to install the DOS and Windows driver software on your hard disk:

1. Start your computer.
2. Insert the "Touchscreen Driver for DOS/Windows 3.1" disk or CD into drive A or D.
3. Type "a:\install" or "d:\install" and press Enter.
4. Follow the directions on the screen.
5. The Touchscreen Install dialog box will appear. Specify the type of touchscreen controller you are using and how it is connected. Press Enter to confirm that the setup is correct.
6. Complete the Install program.
7. INSTALL updates your AUTOEXEC.BAT file with the drivers you select. INSTALL makes a copy of your original AUTOEXEC.BAT file, called AUTOEXEC.OLD. If you already have Elo driver commands in your AUTOEXEC.BAT file, they will be commented out.
8. When Install is finished, it leaves a file called GO.BAT in the subdirectory you specified. GO loads the touchscreen driver, runs the calibration program ELOCALIB, and gives you some final instructions.
9. If you are using Windows, you will also calibrate the touchscreen within Windows using the Touchscreen Control Panel.

## 8.4.2 Touchscreen driver for Windows 95

1. Install the touchscreen hardware in the PPC-102 and configure the touchscreen to resources (COM port, IRQ, etc.) that are not already in use by other devices.
2. Start your computer.
3. Insert the "Touchscreen Driver for Windows 95" disk or CD into drive A or D.
4. Click the Start button, and then click Run.
5. Type "d:\monmouse\win95" in the space provided and press Enter.
6. Follow the directions on the screen.
7. The Touchscreen Setup Wizard will appear. You do not need to specify the type of touchscreen controller you are using or how it is connected.
8. Complete the Setup program, and refer to the section "Using the touchscreen on serial port COM4" on the next page of this manual.
9. Restart Windows 95.
10. Click the Start button, then click Settings, then click Control Panel.
11. Double-click Touchscreen to run the Touchscreen Control Panel.
12. Click the Calibrate button and touch each of the three targets as they appear on the screen. Click Yes when the cursor lines up correctly with your finger. Click OK to close the Touchscreen Control Panel.

### Note

1. Full-screen DOS mode is not supported. However, windowed DOS mode is fully supported. A touch to a full-screen DOS session will cause your system to immediately return to your Windows desktop. A mouse can be used to access programs running in full-screen DOS mode.
2. The PPC-102 with the optionally installed touchscreen will share COM4, but not COM1, COM2, and COM3.

3. Windows 95 may lock up during startup if the resource settings in the Setup dialog of the Touchscreen Control Panel do not match the actual controller configuration. Use Safe Mode to start Windows 95 and change the resource settings to match the controller configuration, then restart Windows 95.
4. The touchscreen driver may cause Windows 95 to lock up during shutdown if the touchscreen is activated after shutdown is initiated.
5. **Programming Examples**

The Custom installation option allows you to install example programs (with source code) that access capabilities of the "Touchscreen Driver for Windows 95" driver and Touchscreen Control Panel. These programs are installed in the C:\Elo directory (default).

**Calib.exe** is an example of how to call the exported function CalibrateScreen() in the Touchscreen Control Panel (Monmouse.cpl). This allows you to calibrate the touchscreen directly from your application without having to run the Touchscreen Control Panel.

**Zaxis.exe** is an example of how to access the IntelliTouch Z-axis capabilities. The program uses a custom meter control, which reports the amount of pressure applied to a button on the screen (0 ~ 100%).

#### **Using the touchscreen on serial port COM4:**

1. Make sure that the serial touchscreen controller is connected to serial port COM4.
2. Install "Touchscreen Driver for Windows 95" as described above. Choose the appropriate serial touchscreen controller on COM4 when running Setup, to allow for a complete driver installation.
3. Run the Windows 95 Registry Editor by clicking the Start button. Click Run, then type "regedit" and press Enter. (c:\windows\regedit")
4. Edit the values of the following registry keys in the following registry key folder to match the number, I/O port address, and IRQ of the COM port to which the touchscreen is connected:

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD\  
MonMouse\TouchScreen00
```

```
\ComPort (the COM port number)
```

```
Com 4 example:          04 00
```

```
\ControllerAddress (low byte followed by high byte)
```

```
Com 4 example:   e8 02
```

```
\ControllerIRQ (hexidecimal)
```

5. Close the Registry Editor by clicking the Close box.
6. Restart the computer.

### **Removing the mouse pointer**

If you wish to eliminate the touchscreen driver, you may replace it with the null cursor file, NULL.CUR, supplied with "Touchscreen Driver for Windows 95". Install the null cursor file as follows:

1. Open the Control Panel and select Mouse.
2. Select the Pointers tab.
3. Highlight the Normal Select cursor then select Browse.
4. Type "null.cur" in the space provided and select Open.
5. Select OK to select the option.
6. Exit from the Mouse Control Panel. You should notice that the arrow cursor has disappeared. Note that all other cursors will still function as before.

### **Touchscreen driver for Windows 95 uninstall procedure**

1. Close the Windows Control Panel if it is open.
2. Delete the following files from your \Windows\System folder:  
MONMOUSE.VXD, MONMOUSE.HLP, and MONMOUSE.CPL.
3. Start the REGEDIT.EXE program to edit the registry. (Click the Start button, click Run, type "regedit" and press Enter). Delete the following keys from the registry:

```
HKEY_CURRENT_USER\Control Panel\desktop\DoubleClickHeight
```

```
HKEY_CURRENT_USER\Control Panel\desktop\DoubleClickWidth
```

Delete the following registry key folders and their contents:

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD\MonMouse
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\Elo TouchSystems
```

4. Using Notepad, delete the following line from the [386Enh] section of the SYSTEM.INI file: `device=monmouse.vxd`
5. Delete the directory C:\Elo to remove the touchscreen diagnostic programs and sample Z-axis and calibration programs.
6. Restart Windows 95.

### **8.4.3 Touchscreen driver for Windows NT**

1. Make sure you have installed the touchscreen hardware in the PPC-102 (assuming you have purchased the PPC-102 with touchscreen) and configured the touchscreen to resources (COM port, IRQ, etc.) that are not already in use by other devices.
2. Start your computer.
3. Insert the "Touchscreen Driver for Windows NT" disk into drive D.
4. Click the Start button, and then click Run.
5. Type "d:\monmouse\winnt" in the space provided and press Enter.
6. Follow the directions on the screen.
7. The Touchscreen Setup Wizard will appear. You do not need to specify the type of touchscreen controller that you are using or how it is connected. Do specify the language you want to use in the Touchscreen Control Panel.
8. Complete the Setup program, and refer to the section "Using the touchscreen on serial port COM4" on the next page of this manual.
9. Shut down and restart Windows NT.
10. Click the Start button, then click Settings, then click Control Panel.
11. Double-click Elo Touchscreen to run the Touchscreen Control Panel.
12. Click the Calibrate button and touch each of the three targets as they appear on the screen. Touch Yes when the cursor lines up correctly with your finger. Touch OK to close the Touchscreen Control Panel.

## Windows NT auto boot

Windows NT normally displays the system logon dialog when started. Use the following procedure to disable the display of the logon dialog and automatically start up without user intervention.

1. Run REGEDT32.EXE.
2. Locate the Registry subkey:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows  
NT\CurrentVersion\Winlogon.
```

3. Establish your domain name, account name and password, using the values you normally type when logging on. (More than likely you will already have the keys “DefaultDomain” and “DefaultUserName” and will want to add a password to that account - ”DefaultPassword”).)
4. To add a “DefaultPassword” value, choose Add Value from the Edit menu. In the Value name field, type: “DefaultPassword” (without quotation marks). Select REG\_SZ for the Data type. In the String field, type your password. Save your changes.
5. From the Edit menu, choose Add Value. Enter “AutoAdminLogon” (without quotation marks) in the Value Name field. Select REG\_SZ for the Data type. Enter 1 in the String field. Save your changes.
6. Exit REGEDT32.
7. Reboot your computer. You should log on automatically.

### Using the touchscreen on serial port COM4:

1. Make sure that the serial touchscreen controller is connected to serial port COM4.
2. Install "Touchscreen Driver for Windows NT" as described above. Choose the appropriate serial touchscreen controller on COM4 when running Setup, to allow for a complete driver installation.
3. Run the Windows NT Registry Editor by clicking the Start button. Click Run, then type “regedit” and press Enter. (c:\winnt\regedit)

4. Edit the values of the following registry keys in the following registry key folder to match the number, I/O port address and IRQ of the COM port to which the touchscreen is connected:

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\MonMouse\  
Parameters\ComPort      (the COM port number)
```

```
Com 4 example:  04  00
```

```
\ControllerAddress (low byte followed by high byte)
```

```
Com 4 example:  e8  02 (or choice 2e8)
```

```
\ControllerLevel
```

```
Select 5
```

5. Close the Registry Editor by clicking the Close box.
6. Restart the computer.

### **Removing the mouse pointer**

If you wish to eliminate the touchscreen driver, you may replace it with the null cursor file, NULL.CUR, supplied with "Touchscreen Driver for Windows NT". Install the null cursor file as follows:

1. Open the Control Panel and select Mouse.
2. Select the Pointers tab.
3. Highlight the Normal Select cursor then select Browse.
4. Type "null.cur" in the space provided and select Open.
5. Select OK to select the option.
6. Exit from the Mouse Control Panel. You should notice that the arrow cursor has disappeared. Note that all other cursors will still function as before.

## **Programming the Watchdog Timer**

The PPC-102 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial stand-alone or unmanned environments.

## A.1 Programming the Watchdog Timer

---

In order to program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a value of time interval. 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 the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 043 (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 (&H043) REM Disable the watchdog timer
80   END

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

## **Power Supply Specifications**

- Introduction
- Input Specifications
- Output Specifications
- Mechanical Specifications
- Environmental Specifications
- Features

## B.1 Introduction

---

The power supply of the PPC-102 is a 60 W double output, universal input switching power supply. It has been designed for medical technology applications.

## B.2 Input Specifications

---

- **Input voltage:** 85 V<sub>AC</sub> to 264 V<sub>AC</sub>
- **Input frequency:** 47 Hz to 63 Hz at AC input
- **Input current:** Less than 2 A at 115 V<sub>AC</sub> or 1.5 A at 230 V<sub>AC</sub>
- **Inrush current:** Will not exceed 30 A at 115 V<sub>AC</sub> input or 60 A at 230 V<sub>AC</sub> input, cold start at 25° C

## B.3 Output Specifications

---

Table B-1: Load range

| Output | Min Load | Rated Load | Peak Load | Voltage Accuracy |
|--------|----------|------------|-----------|------------------|
| +5 V   | 0 A      | 5 A        | 8 A       | 4.95 ~ 5.05 V    |
| +12 V  | 0 A      | 3 A        | 5.5 A     | 11.4 ~ 12.6 V    |

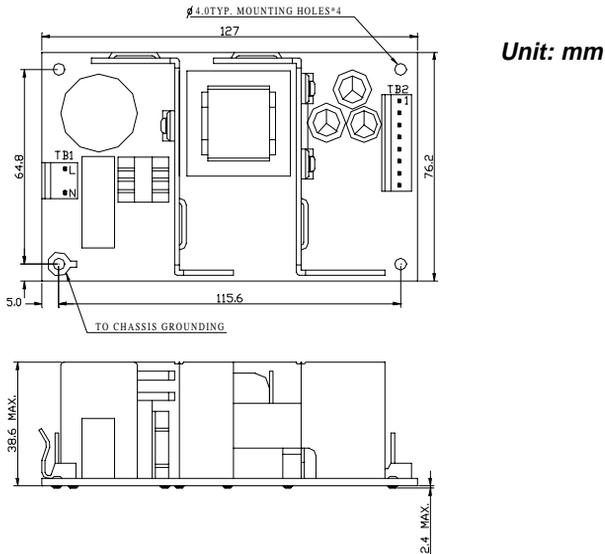
**Factory settings:** The adjustable range of the +5 V output is from about 4.5 to 6 V. The +5 V output is factory-set between 4.95 and 5.05 V at 60% of the rated load. Similarly, the +12 V output is checked at the factory, to ensure that it is within the specified voltage accuracy range. The peak load can take less than 5 seconds to reach.

**Ripple peak and noise:** The peak to peak ripple and noise for each output is less than 1% of the output voltage. Measuring and termination of each output is done with a 15 MHz bandwidth limited oscilloscope with a 0.47 uF capacitor.

**Line regulation:** The line regulation for each output is less than  $\pm 1\%$  of the rated load and  $\pm 10\%$  for input voltage changing.

**Load regulation:** The load regulation for + 5 V is less than  $\pm 1\%$ . For + 12 V, it is less than  $\pm 5\%$ . Measuring is performed by changing the measured output load  $\pm 40\%$  from 60% of the rated load, and keeping other outputs at 60% of the rated load.

## B.4 Mechanical Specifications



**Figure B-a:** PPC-102 dimensions diagram

**Dimensions:** Shown in mm as above. Tolerance specified is  $\pm 0.4$  mm.

### Connectors:

TB1 - AC input: Using Molex 5277-02A or equivalent.

TB2 - DC output: Using Molex 5273-08A or equivalent.

### DC output pin assignments:

|     |   |       |
|-----|---|-------|
| Pin | 1 | +5 V  |
|     | 2 | +5 V  |
|     | 3 | GND   |
|     | 4 | GND   |
|     | 5 | GND   |
|     | 6 | GND   |
|     | 7 | +12 V |
|     | 8 | +12 V |

**Note:** *The outputs do not meet the requirements of SELV according to IEC 601-1. Thus they are not recommended for patient use or user-connected environments.*

## B.5 Environmental Specifications

---

**Operating temperature:** 0 ~ 50° C, rated load

**Storage temperature:** -40 ~ 85° C

## B.6 Features

---

**Efficiency:** Higher than 70% (typical) while measuring at nominal line and rated load.

**Hold up time:** Longer than 16 ms at 115 V<sub>AC</sub> input and rated load, which is measured from the end of the last charging pulse to when the main output drops down to 95% output voltage.

**Protection:** If the power supply fails to control itself, the built-in excess voltage protection circuit will shut down the outputs to avoid damaging external circuits. The trip point of the crowbar circuit is around 5.7 V to 7.0 V for output voltage. The power supply will go into latch-off mode under short circuit or overload conditions. Recovery from these adverse conditions should be set as cycle AC, input OFF and ON.

**Safety ground leakage current:** It should be less than 100 µA at 244 V<sub>AC</sub> input.

### International standards

#### Safety standards:

Designed to meet the following standards:

- UL 544
- CSA 22.2 NO.601
- TUV (DIN. VDE 0750T.1/12.91/EN 60601-1:1990)

#### EMI standards:

Designed to met the following limits:

- FCC docket 20780 curve "B"
- EN55011 "B"
- EN61000-3-2

**EMS standards:**

- IEC-801-2 8: kV air discharge criteria B
- IEC-801-3 3: V/m
- IEC-801-4: 0.5 kV



APPENDIX

C

## I/O Pin Assignments

## Line-in terminal (CON8)

---

### Line-in terminal

| Pin | Signal |
|-----|--------|
| 1   | XMT+   |
| 2   | XMT-   |
| 3   | N/A    |
| 4   | N/A    |
| 5   | RCV+/- |
| 6   | N/A    |
| 7   | N/A    |

---

## Keyboard connector (CON6-1)

---

### Keyboard connector

| Pin | Signal |
|-----|--------|
| 1   | KB_DT  |
| 2   | N/A    |
| 3   | GND    |
| 4   | +5 V   |
| 5   | KB_CK  |
| 6   | N/A    |

---

## Mouse connector (CON6-2)

---

### Mouse connector

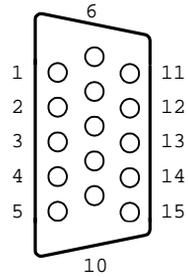
| Pin | Signal |
|-----|--------|
| 1   | MS_DT  |
| 2   | N/A    |
| 3   | GND    |
| 4   | +5 V   |
| 5   | MS_CK  |
| 6   | N/A    |

---

## VGA connector (CON15)

### VGA connector

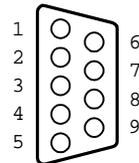
| Pin | Signal |
|-----|--------|
| 1   | RED    |
| 2   | GREEN  |
| 3   | BLUE   |
| 4   | N/A    |
| 5   | GND    |
| 6   | GND    |
| 7   | GND    |
| 8   | GND    |
| 9   | N/A    |
| 10  | GND    |
| 11  | N/A    |
| 12  | N/A    |
| 13  | HSYNC  |
| 14  | VSYNC  |
| 15  | N/A    |



## COM1 RS-232 serial port (CON9-1)

### COM1 RS-232 serial port

| Pin | Signal |
|-----|--------|
| 1   | DCD    |
| 2   | RxD    |
| 3   | TxD    |
| 4   | DTR    |
| 5   | GND    |
| 6   | DSR    |
| 7   | RTS    |
| 8   | CTS    |
| 9   | RI     |



## COM3 RS-232 serial port (CON9-2)

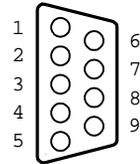
### COM3 RS-232 serial port

| Pin | Signal |
|-----|--------|
| 1   | DCD    |
| 2   | RxD    |
| 3   | TxD    |
| 4   | DTR    |
| 5   | GND    |
| 6   | DSR    |
| 7   | RTS    |
| 8   | CTS    |
| 9   | RI     |

## COM4 RS-232 serial port (CON9-3)

### COM4 RS-232 serial port

| Pin | Signal |
|-----|--------|
| 1   | DCD    |
| 2   | RxD    |
| 3   | TxD    |
| 4   | DTR    |
| 5   | GND    |
| 6   | DSR    |
| 7   | RTS    |
| 8   | CTS    |
| 9   | RI     |



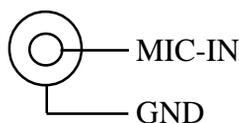
## COM2 RS-232/422/485 serial port (CON9-4)

COM2 RS-232/422/485 serial port

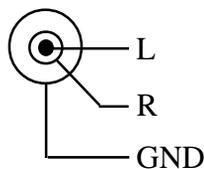
|     | RS-232 | RS-422 | RS-485       |
|-----|--------|--------|--------------|
| Pin | Signal | Signal | Signal       |
| 1   | DCD    | TxD-   | TxD- (Data-) |
| 2   | DTR    | RxD-   | RxD- (Data-) |
| 3   | RxD    | TxD+   | TxD+ (Data+) |
| 4   | TxD    | RxD+   | RxD+ (Data+) |
| 5   | GND    | GND    | GND          |
| 6   | DSR    | DSR    | DSR          |
| 7   | RTS    | RTS    | RTS          |
| 8   | CTS    | CTS    | CTS          |
| 9   | RI     | RI     | RI           |

In a typical RS-485 application, the host device requests data from a slave module that listens for the response. The host transmits and receives data on the same pair of wires. Software handles the flow control; no other wires are needed. Pin assignments appear in the table. Pins 1 and 4 share the Data- wire. Pins 2 and 3 share the Data+ wire.

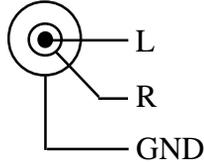
### J8-1 Microphone



### J8-2 Line-in



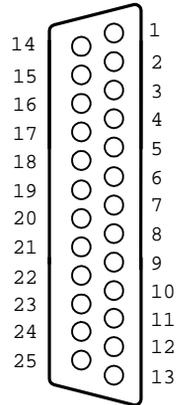
## J9 Speaker out



## Parallel port connector (CON25)

### Parallel port connector

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



\* active low