PPC-57

386-based panel PC
with 5.7" LCD flat panel display

Copyright notice

Acknowledgments

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FCC Class B notes

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Packing List

Before you begin system installation, please make sure that the following materials have been shipped:

- One PPC-57 with PCM-3866 all-in-one single board
- Accessories:
  - One utility disk with BIOS and Ethernet utility programs
  - One utility disk with SVGA utility programs and drivers
  - One Y-type keyboard/mouse cable
  - One plug-in power terminal
  - One screw bag
  - One waterproof sponge
  - Four mounting clamps
  - One ground wire

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

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this installation reference guide for later reference.
3. 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 power outlet must be installed near the equipment and must be easily accessible.
5. 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 over-voltage.
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 any 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 installation reference guide.
    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 Sicherheishinweise

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 NetzanschluBsteckdose 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 NetzanschluBleitung 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 authorisiertem 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 70dB(A) oder weiger.

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Contents

CHAPTER 1

General Information

This chapter gives background information on the PPC-57.

Sections include:

- Introduction
- Specifications
- LCD Specifications
- I/O Arrangement
- Total Solution
- Dimensions
- Mounting

1.1 Introduction

The PPC-57 panel PC meets all of the requirements necessary to serve as an industrial operator interface. This panel PC provides an all-in-one 386 PC board with 5.7" STN color or mono LCD display, on-board VGA, two COM ports (one RS-232, one RS-232/422/485), one removable Compact Flash adapter, an external 16-bit PC/104 expansion slot, and optional touchscreen. The heart of the PPC-57 is a general purpose, miniature computer that is suitable for a variety of applications.

The PPC-57 is suitable for industry applications, including factory automation equipment, automated production lines, precision machinery, production process control, environmental control equipment, terminal information systems and entertainment management systems. Our panel PC is a reliable, cost-effective solution to your application's processing requirements.

1.2 Specifications

General

- **Construction:** Plastic molding with an optional PC/104 metal cover
- **Dimensions (W x H x D):** 197.5 x 142.8 x 63.4 mm (7.76" x 5.61" x 2.49")
- **Weight:** 1.5 kg (3.3 lbs)

Standard SBC functions (PCM-3866)

- **CPU with core logic**: ALi M6117C, 40 MHz 80386SX CPU
- **BIOS**: AMI 128 KB Flash memory
- **RAM**: One 72-pin SIMM socket, accepts 1, 4, 16 FPM or EDO DRAM (single side)
- **IDE hard disk drive interface**: Supports up to two Enhanced IDE devices, auto-detect BIOS
- **Multi-mode parallel port**: Configured to LPT1, LPT2, LPT3 or disabled. Supports SPP/EPP/ECP; D-SUB 25-pin connector (on I/O module)
- **Serial ports**: One serial RS-232 port, one serial RS-232/422/485 port (a DIP switch setting) on I/O module. Two 16C550 compatible UARTs
- **PS/2 keyboard/mouse connector**: Mini-DIN keyboard connector (on I/O module)
- **Watchdog timer:** Generates a system reset after an adjustable period up to 62 seconds. Can be software enabled/disabled. Default factory setting is disabled
- **External expansion Slot:** 104-pin connector, supports up to two cascaded 16-bit PC/104 cards with +5 V and +12 V only
- **Battery:** 3 V @ 195 mA Lithium battery for CMOS backup

Ethernet interface

- **Chipset:** Realtek RTL8019AS
- **Network (LAN):** Novell NE2000 compatible, on-board 10Base-T interface. Supports both boot ROM function and software drivers

SVGA/Flat panel interface (PCM-3866)

- **Chipset**: C&T 65545
- **Display memory**: 512 KB DRAM
- **Hardware Windows acceleration**: 32-bit graphics engine. Hardware line drawing and 64 x 64 x 2 hardware cursor
- **Resolution:** Panel resolution up to 640 x 480 @ 256 colors

Note: The resolution and hardware Windows acceleration of the SVGA/flat panel interface is partially dependent on the resolution of the flat panel.

Power supply

- **Output rating:** 25 W
- **Input voltage:** 18 ~ 30 V_{DC}
- **Output voltage:** +5 V @ 4 A, +12 V @ 0.5 A

Environmental specifications

- **Operating temperature**: 0 ~ 45°C (32° ~ 113° F)
- **Relative humidity**: 0 ~ 95% RH (non-condensing), 40° C
- **Safety:** Meets UL/CSA
- **FCC Class B, CE approved**
- **Vibration:** 10 ~ 18 Hz, 1.5 mm peak-to-peak displacement
  18 ~ 500 Hz, 1 G acceleration
- **Water resistance:** Meets NEMA 4 or IP65 (front panel)

Touchscreen (optional)

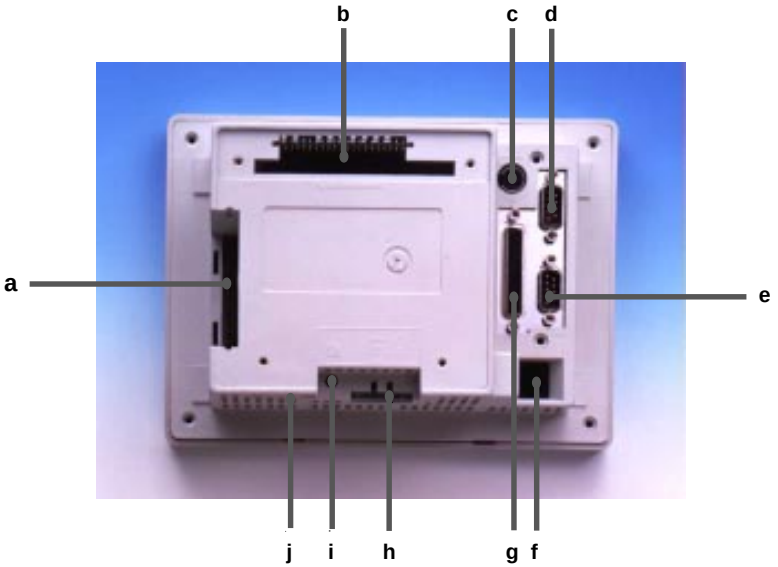
- **Type**: Resistive
- **Resolution**: 1024 x 1024
- **Light transmission:** 68%
- **Software driver**: Supports DOS
- **Lifetime**: More than 3 million touches

1.3 LCD Specifications

Model	PPC-57S	PPC-57M
Display type	STN color LCD	Mono LCD
Max. colors or grayscales	256 colors	8 grayscale levels
Size	5.7"	5.7"
LCD model	KCS3224ASTT-X6 or compatible	KS3224ASTT-FW-X1 or compatible
Resolution	320 x 240 (1/4 VGA)	320 x 240 (1/4 VGA)
Brightness	110 cd/m²	200 cd/m²
Dot size (W x H)	0.34 x 0.34	0.34 x 0.34
Viewing angle	50°	30°
Temperature	0 ~ 50° C	0 ~ 50° C
LCD MTBF	62,000 hours	62,000 hours
Backlight MTBF	10,000 hours	10,000 hours

1.4 I/O Arrangement

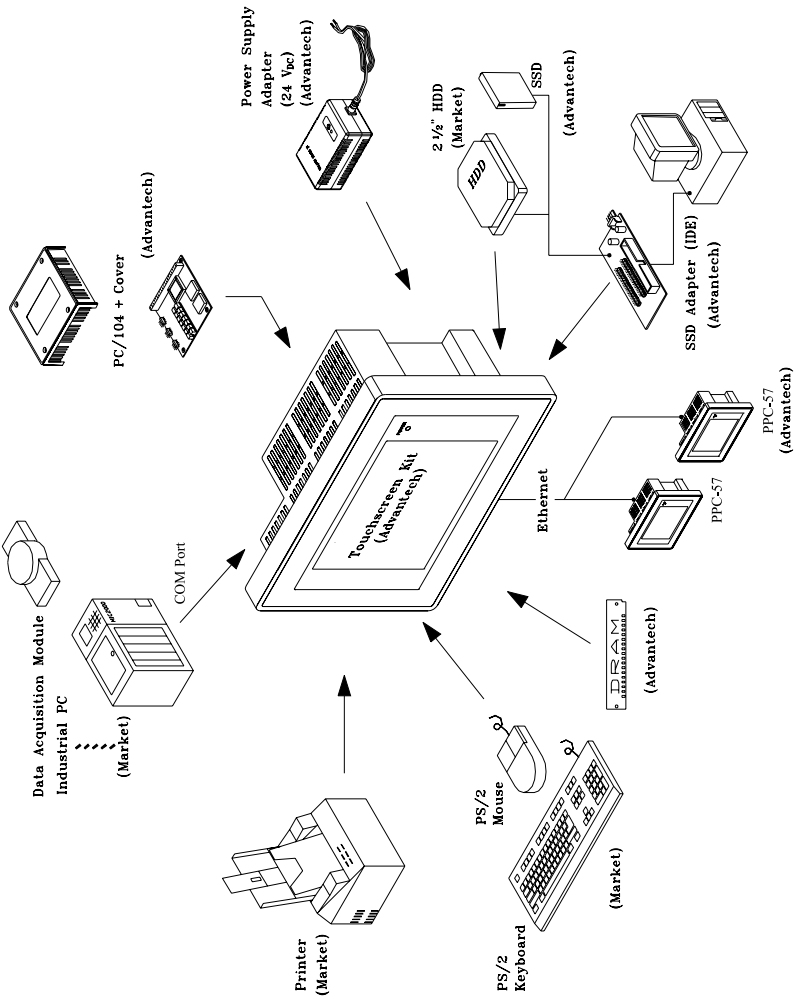
The I/O arrangement of the PPC-57 is shown below:



a. IDE connector
b. PC/104 slot
c. PS/2 keyboard and mouse connector
d. Serial COM2 port
e. Serial COM1 port
f. Ethernet port
g. Parallel port
h. 24 V_{DC} input connector & chassis GND
i. LCD contrast
j. Slide power switch

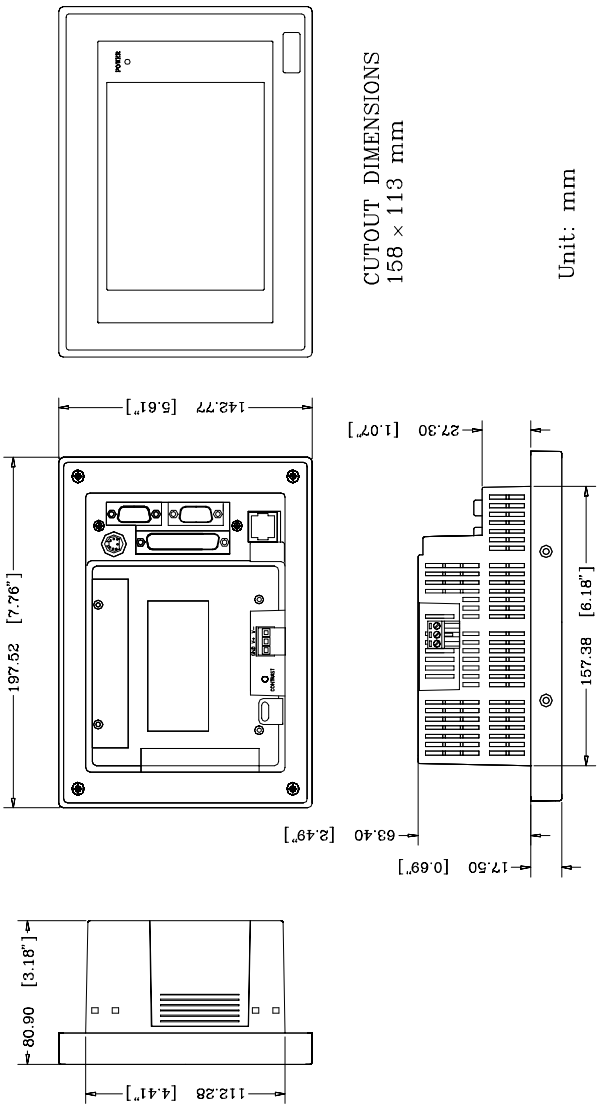
Note: Serial port COM2 can be configured to operate in RS-232, RS-422 or RS-485 mode. This is set by a DIP switch on the upper side of the back cover. Before attaching connectors, make sure the DIP switch settings are suitable. (See page 40 for COM2 port settings.)

1.5 Total Solution



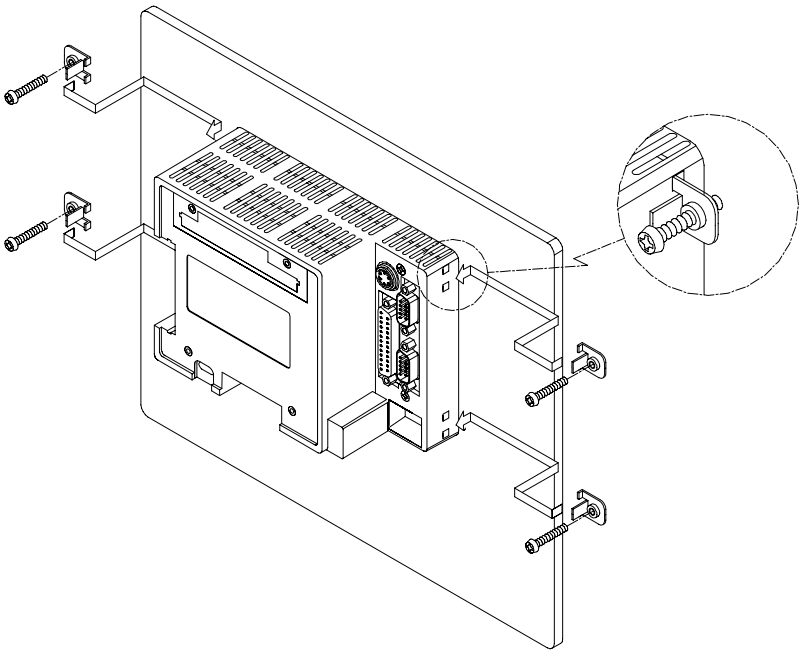
1.6 Dimensions

The PPC-57 can be placed on a shelf or a table, or mounted into a panel. Cutout panel dimensions are as follows:



1.7 Mounting

If you decide to panel mount your PPC-57, four brackets are included. Each bracket has one screw that fits in the keyhole slot on the panel PC.



CHAPTER 2

System Setup

This chapter explains how to set up the PPC-57's hardware.

Sections include:

- General
- Initial Setup
- Removing the Front or Rear Panel
- Installing Memory (DRAM)
- Installing a Compact Flash Adapter and 2.5" HDD
- Installing the Power Terminal and Power Adapter
- Installing a PC/104 Module
- Installing a Touchscreen
- Exploded Diagram

2.1 General

The PPC-57 PC-based system can monitor and sample the data of several traditional PLC controllers simultaneously. It is able to take full advantage of a wide range of available software programs, and upgrading can be achieved quickly and easily with the use of various optional modules.

Customizing the PPC-57 is a simple matter. The DRAM, power supply and I/O adapter are all readily accessible by removing the front or rear panel.

Warning!

Verify that all power sources have been disconnected from the PPC-57 before you install or service it or any of its components or accessories. No power must be flowing within the PPC-57 at the start of any installation or servicing.

2.2 Initial Setup

Initial setup requires installation of the DRAM, Compact Flash memory (or 2.5" HDD), power terminal, and 24 V_{DC} power adapter. A touchscreen or a PC/104 module can be added as options. This and the following sections describe how to complete the initial assembly, as well as how to install the touchscreen and PC/104 module upgrades.

Installing software to the Compact Flash memory

Software can be loaded in the PPC-57 using three methods:

Method 1: Use the COM or parallel port

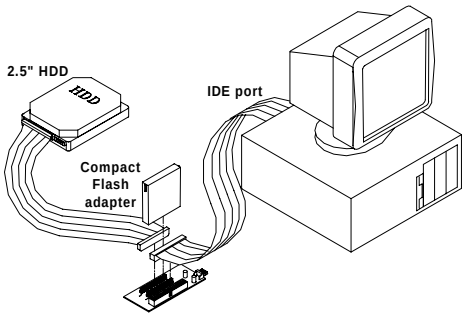
Using transmission software, connect another PC to the PPC-57 with an appropriate cable and transmit the software to the PPC-57.

Method 2: Use a connection adapter board: PCD-1230 (optional)

The connection adapter board has three connectors. One is a 40-pin connector to connect to a personal computer's IDE port. The other two are 44-pin connectors to connect with a Compact Flash adapter or a 2.5" HDD. Load software from a drive. When transferring software from an HDD or a Compact Flash memory, pay attention to which drive is master and which drive is slave.

Method 3: Use the Ethernet

You can use the Ethernet port to download software to the Compact Flash memory or HDD.



Installing a PS/2 mouse driver

This section is for customers who buy a PPC-57 **without** the touchscreen option. If you have purchased a PPC-57 with a touchscreen, the PS/2 mouse driver is installed when you set up the touchscreen driver (see Appendix B).

There is an execution file named INSTALL.COM in the root directory of the system utility software disk. Run INSTALL.COM to install the system software to your hard disk drive.

Installing the system software automatically creates a directory named AMS in the root directory of your hard disk drive. Go to the root directory of AMS, and then type M [Enter] or AMOUSE to finish the installation.

You can type T [Enter] to test your mouse and PS/2 mouse driver (for the PPC-57).

Warning! The LCD display is ¼ VGA, so the system utility software driver is used for ¼ VGA. This is different from the general mouse driver.

The touchscreen and PS/2 mouse can be operated simultaneously. If you install the touchscreen driver, you must also install the PS/2 mouse driver at the same time (see Appendix B for installation instructions). You do not need to install the PS/2 mouse driver again.

Installing a serial/COM port mouse driver into the system

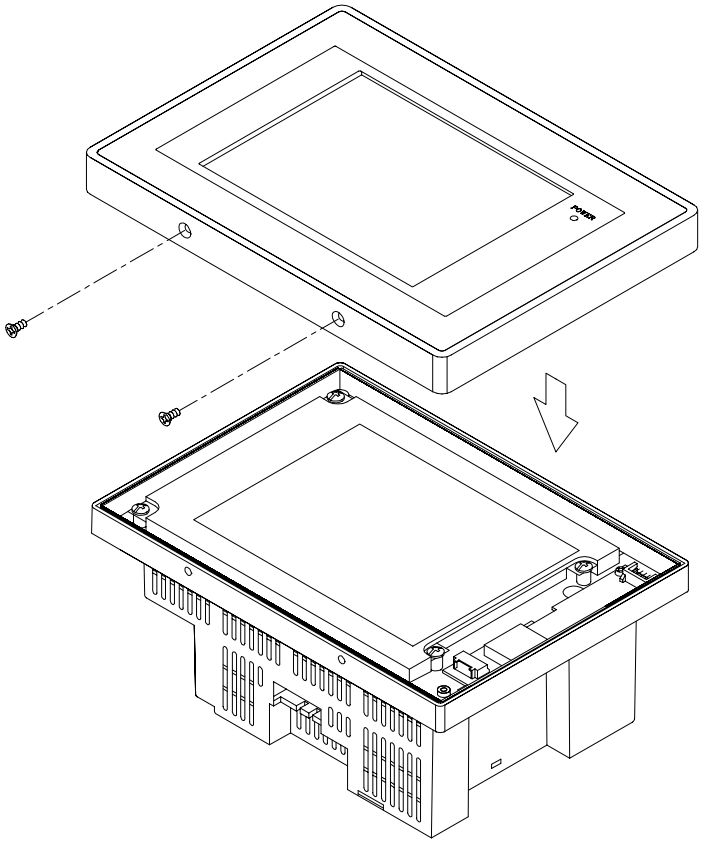
You can use a general mouse driver to install a serial or COM port mouse driver.

Warning! Before installing the serial port mouse driver, you must remove the touchscreen driver or PS/2 mouse driver from system memory. Change the root directory to ATS, and then type M [Enter] or ATSMOUSE to finish the removal.

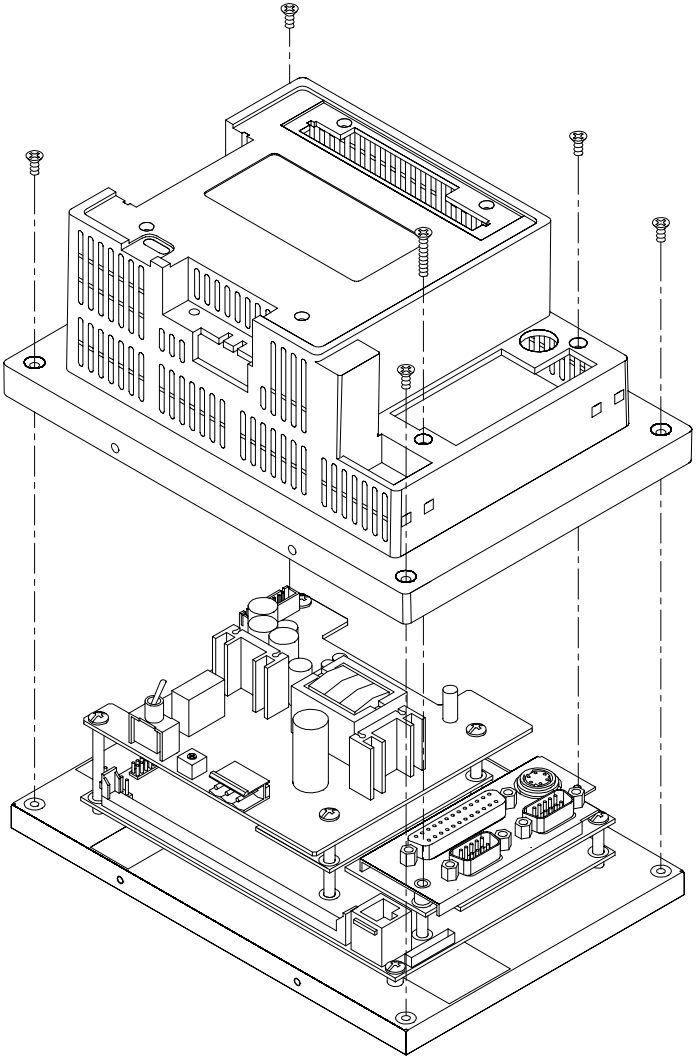
Note: The touchscreen driver or PS/2 mouse driver cannot be simultaneously installed with a serial/COM port mouse driver.

2.3 Removing the Front or Rear Panel

You only need to remove the front panel of your PPC-57 to replace your LCD or backlight. To remove the front panel, first verify that all power sources to the PPC-57 have been disconnected. Next, remove the two screws below the front panel. Then, pinching an upper corner of the front panel closed with one of your hands, pull the lower edge of the front panel firmly outward.



You need only remove the rear panel to replace the DRAM, power supply, I/O adapter, and certain other components. To remove the rear panel, first verify that all power sources to the PPC-57 have been disconnected. Then remove the six screws on the rear panel and pull it away from the PPC-57.



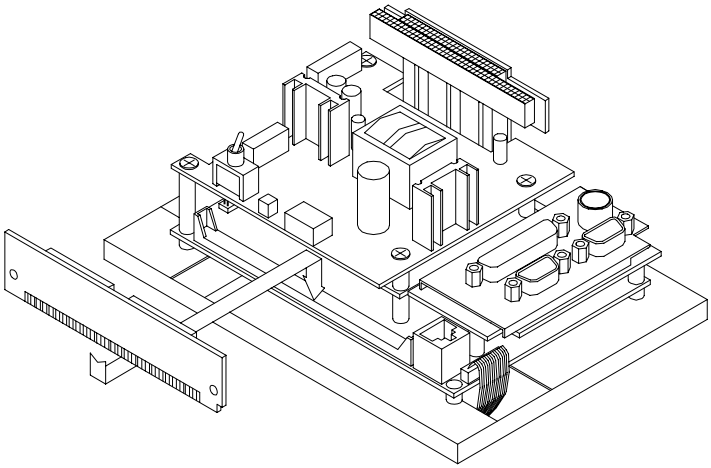
2.4 Installing Memory (DRAM)

The PPC-57 provides one 72-pin SIMM (single in-line memory module) socket for installation of a single DRAM module (with 1 MB, 4 MB, or 16 MB DRAM). To install DRAM modules, follow these steps:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Before installing DRAM, the rear panel must be opened. (See Section 2.3.)
3. Slip the memory module into the socket at a 45 degree angle.

Note: The module can only fit into the SIMM socket one way. Its chips must face the CHIPSET on the PCM-3866 (all-in-one board), and its golden pins must point down into the SIMM socket.

4. 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 socket 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.



2.5 Installing a Compact Flash Adapter and 2.5" HDD

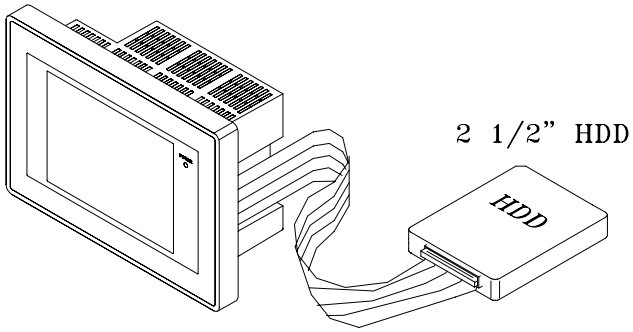
Installing a Compact Flash adapter

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Plug the Compact Flash adapter into the IDE-compatible slot as shown in the picture below.
3. A Compact Flash memory card can be easily inserted or removed from the adapter.

Installing a 2.5" HDD

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Connect a cable from the HDD to the IDE-compatible slot on the PPC-57 (CN3). Make sure that pin 1 on the cable corresponds to pin 1 on the HDD.

Warning! *When connecting the cable to the HDD, make sure that pin 1 on the cable corresponds to pin 1 on the HDD. Improper connection will damage the HDD.*

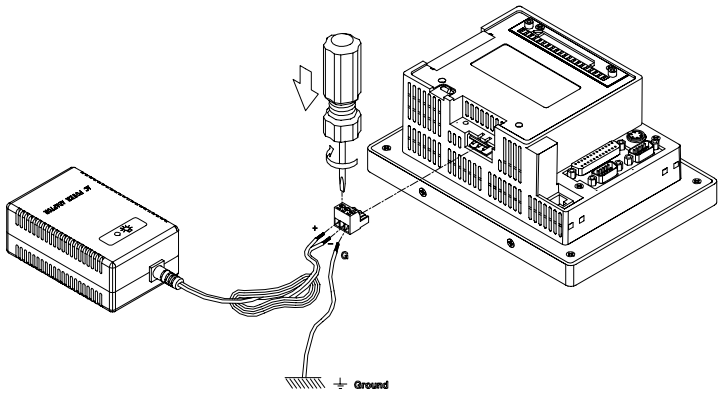


2.6 Installing the Power Terminal and Power Adapter

The power terminal supplied with the PPC-57 is plugged into its 24 V_{DC} connector socket located beneath the PPC-57.

To connect the power adapter:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Unscrew the screws on the power terminal. Insert the AC power adapter wires into their proper connector holes (+, -, GND) on the power terminal. Fasten the screws.

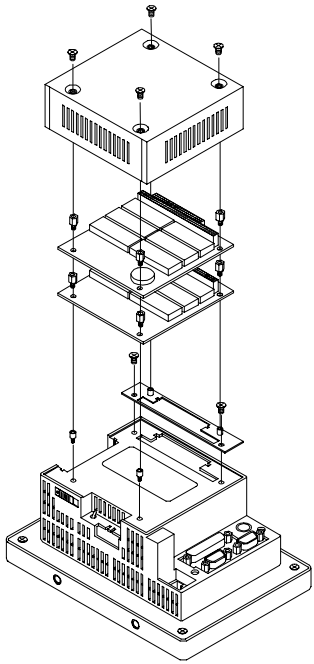


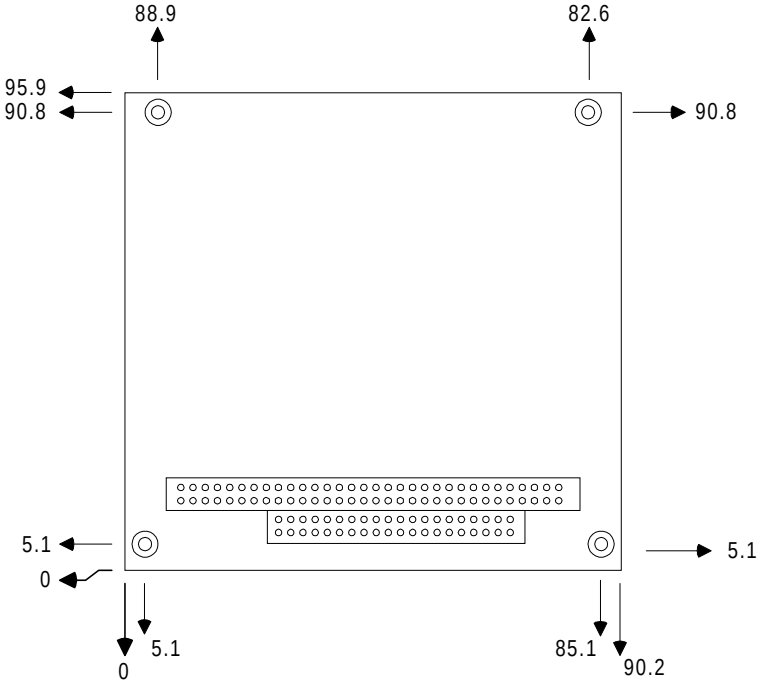
2.7 Installing a PC/104 Module

The PPC-57's PC/104 connector give you the flexibility to attach PC/104 expansion modules. These modules perform the same functions as traditional plug-in expansion cards. Using these modules save space and valuable slots.

To install a PC/104 module:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Detach the steel cover behind the rear panel.
3. Plug the PC/104 module's male connectors into the ISA expansion slot's female connectors by pressing the module firmly but carefully.
4. Secure the two PC/104 modules onto the PPC-57.
5. Affix the PC/104 cover.





PC/104 module dimensions (mm ±5 %)

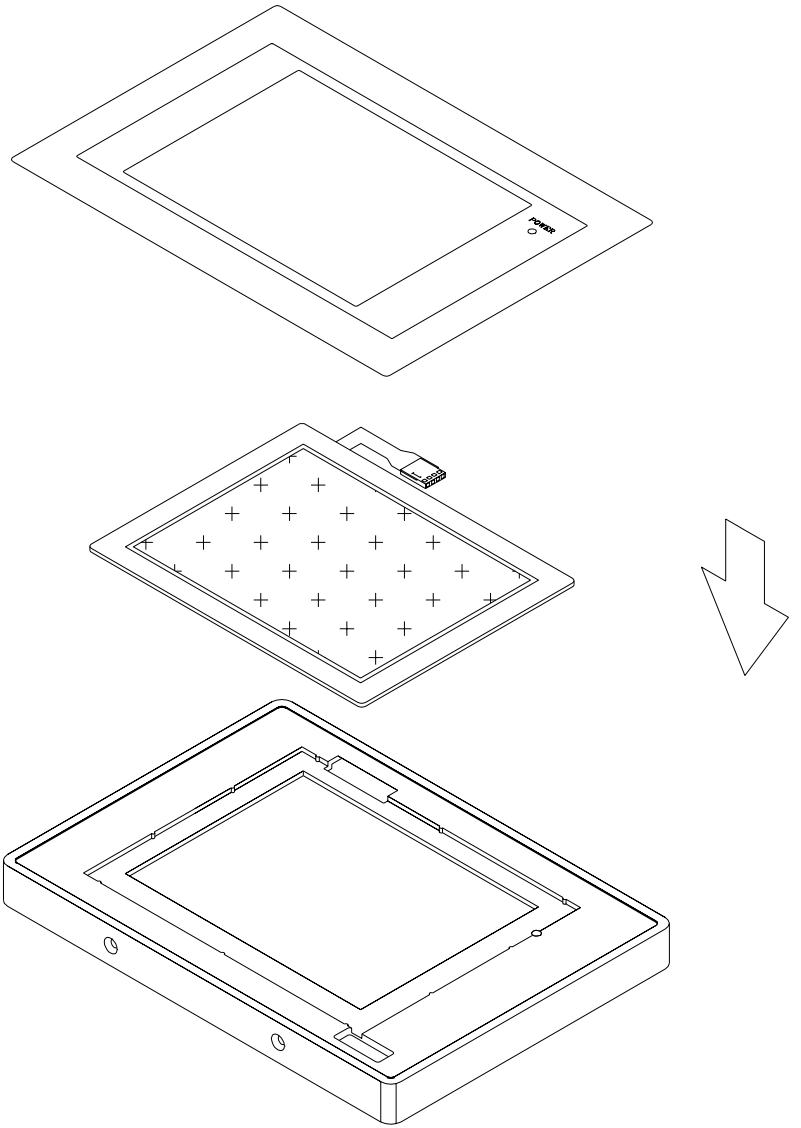
2.8 Installing a Touchscreen

A touchscreen should be installed only by a qualified technician. The steps to install a touchscreen are as follows:

1. Verify that all power sources to the PPC-57 have been disconnected, and disconnect the touchscreen cable.
2. Remove the front panel. (See Section 2.3.)
3. Detach the plastic face from the front panel.
4. Remove the glass or defective touchscreen from the front panel.
5. Attach the replacement touchscreen to the front panel with industrial glue.

Important note: The touchscreen cable must be at the reverse side of the front panel so that it can properly attach to the connector on the PCM-3866 board within the PPC-57.

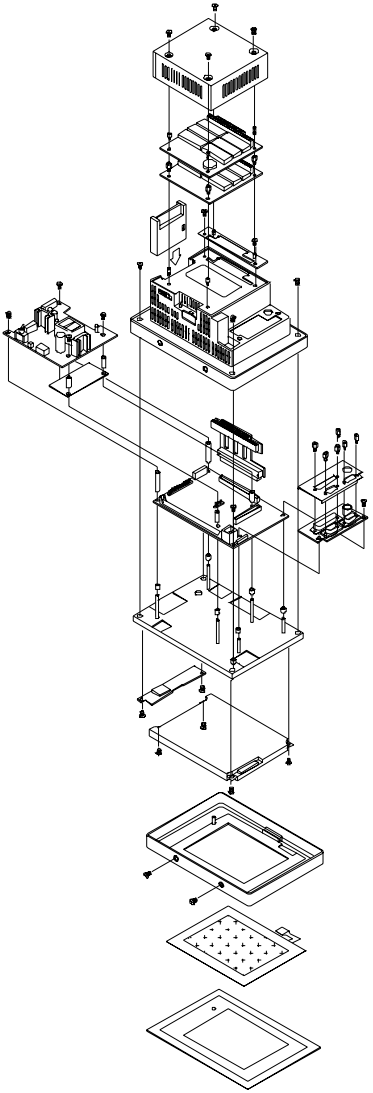
6. Reattach the plastic face to the front panel.
7. Connect the touchscreen cable to the touchscreen control board within the PPC-57, being careful to match the pin assignments.
8. Reattach the front panel to the PPC-57, all the while protecting the touchscreen cable from sharp bending or cracking.



Installing a touchscreen

2.9 Exploded Diagram

The following exploded diagram is provided to help with assembly or disassembly of the PPC-57.



CHAPTER 3

Maintenance

Sections include:

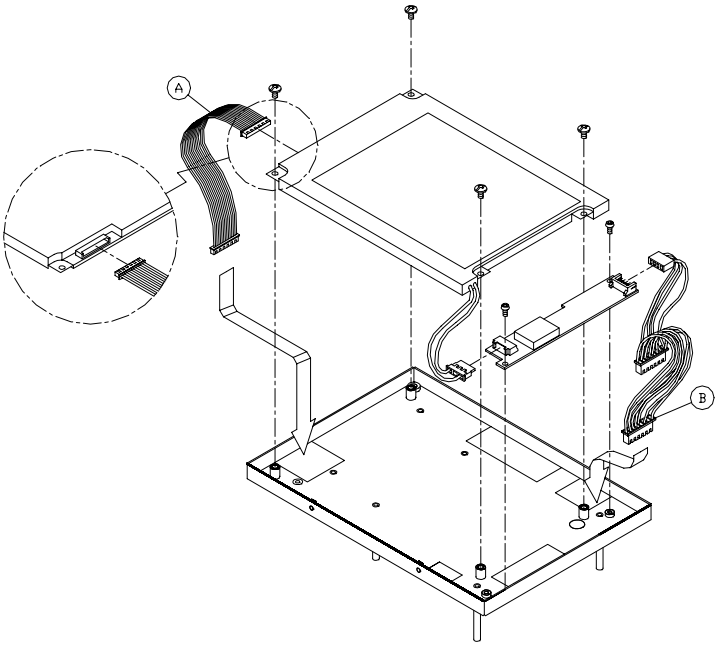
- LCD Display
- LCD Backlight
- Power Supply
- I/O Adapter
- PCM-3866 All-in-one Board

3.1 LCD Display

The LCD display should only rarely need replacing in the normal working life of a PPC-57.

To replace the LCD display:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Open the front panel. (See Section 2.3.)
3. Remove the LCD from the steel chassis by first removing the four screws.
4. Disconnect the cable from the LCD (marked "A" in the diagram below) and the LCD inverter (marked "B").

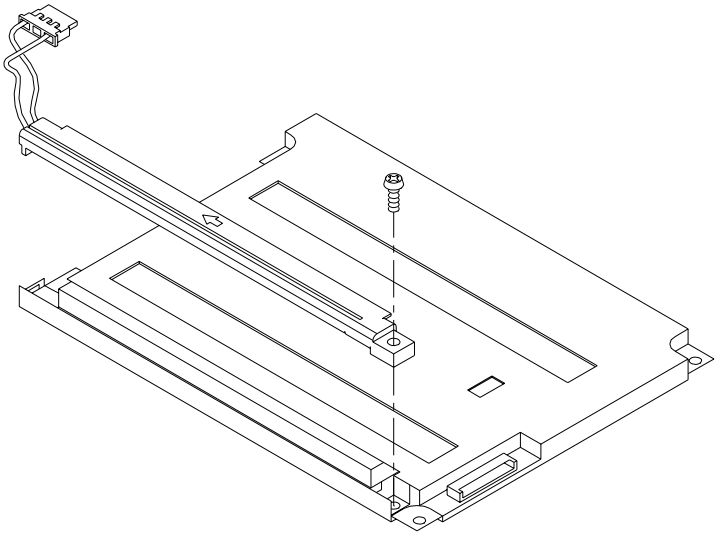


3.2 LCD Backlight

To replace the backlight:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Open the front panel. (See Section 2.3.)
3. Remove the LCD from the steel chassis.
4. Disconnect the cables from the LCD and the LCD inverter.
5. Remove the screw which attaches the LCD backlight to the LCD display. Pull the backlight out horizontally.
6. To insert the backlight and reassemble the unit, follow the reverse of the above procedures.

Warning: The backlight is fragile. Use caution when handing or replacing it.

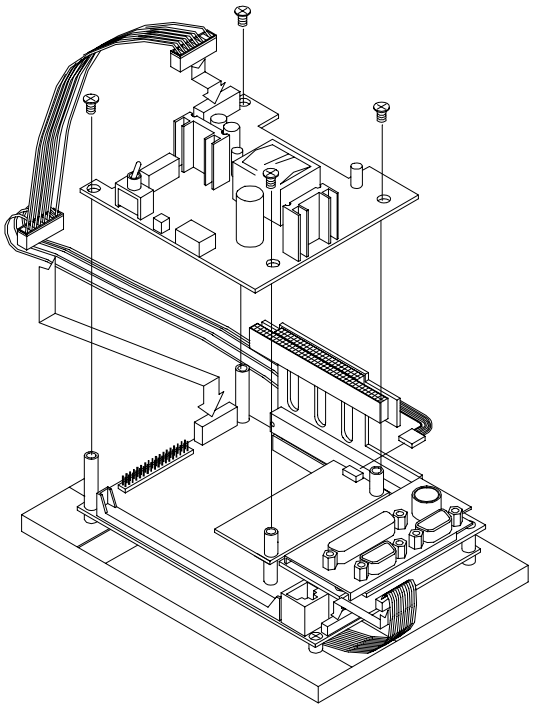


3.3 Power Supply

To repair or replace the power supply:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Open the rear cover. (See Section 2.3.)
3. Remove the four screws attaching the power supply to the CPU board.
4. Disconnect the cable from the power supply.
5. Replace the power supply and reassemble.

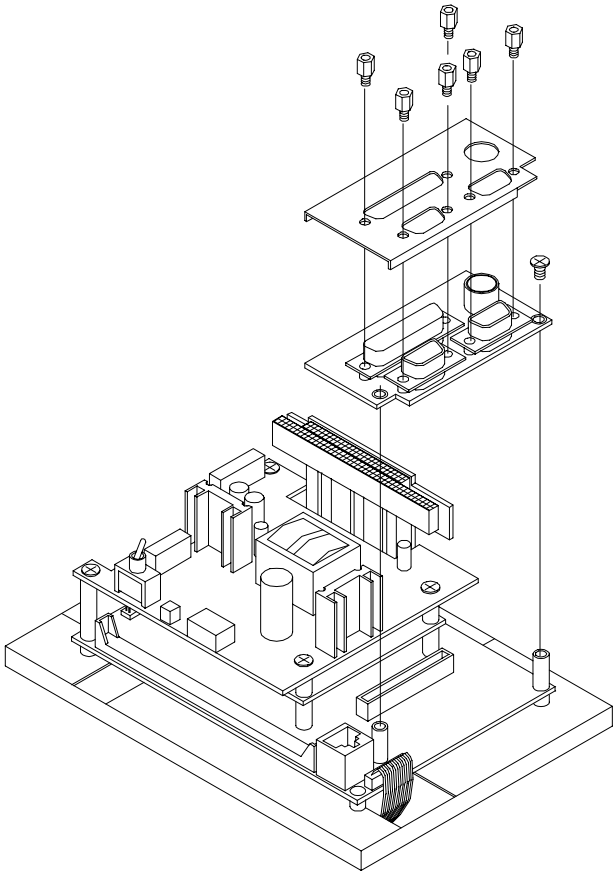
Warning: *Shut off all power to the PPC-57 before attempting to repair the power supply. Switch off the power and unplug the unit.*



3.4 I/O Adapter

To replace or service the I/O adapter, follow these steps:

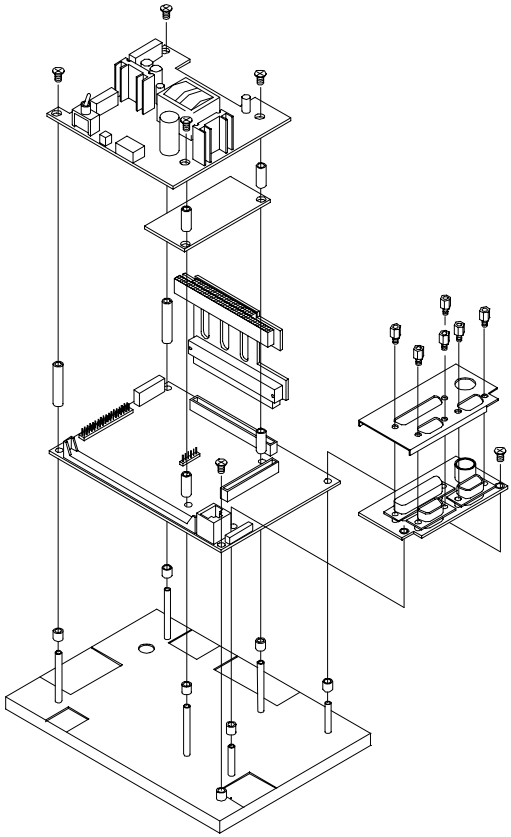
1. Verify that all power sources to the PPC-57 have been disconnected.
2. Remove the rear cover. (See Section 2.3.)
3. Remove the screw which attaches the I/O adapter to the CPU board (PCM-3866).
4. Replace the I/O adapter and reassemble the PPC-57.



3.5 PCM-3866 All-in-one Board

To replace or service the PCM-3866:

1. Verify that all power sources to the PPC-57 have been disconnected.
2. Remove the rear cover. (See Section 2.3.)
3. Remove the power supply, touchscreen control board, I/O adapter, and other attachments. (See Sections 3.3 and 3.4.)
4. Replace the PCM-3866, reattach the components previously removed, and reassemble the PPC-57.



CHAPTER 4

The Engine of the PPC-57 (PCM-3866)

This chapter tells how to set up the engine of the PPC-57. It contains instructions on jumpers, and on connecting peripherals, switches, and indicators.

Sections include:

- Introduction
- Jumpers and Connectors
- Locating Jumpers
- Locating Connectors
- Setting Jumpers
- Connector Pin Assignments
- I/O Connector Pin Assignments
- PC/104 Connector Pin Assignment
- Compact Flash Adapter Connector Pin Assignments

4.1 Introduction

The PCM-3866 in the PPC-57 is specially designed to be an ultra-compact all-in-one SBC which incorporates a PC/104 connector into its design, accommodating easy expansion to meet your application needs.

The board uses a newly-developed 386SX embedded microcontroller (ALi's M6117C). This highly integrated, low-voltage single chip combines Intel's 386SX compatible microprocessor and ALi's M1217 chipset. All the features required of a PC-compatible embedded controller are included in the CPU board.

The PCM-3866 is equipped with a 32-bit SVGA/LCD interface, a 72-pin DRAM SIMM socket, one Enhanced IDE connector, a multi-mode parallel port, a keyboard connector and two standard serial ports.

Offering superior configuration flexibility, the PCM-3866 is a compact 145 mm (L) x 102 mm (W) (5.9" x 4.2"). Its built-in CPU, highly compact size and numerous features make it an ideal cost/performance solution for all kinds of embedded applications.

4.2 Jumpers and Connectors

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

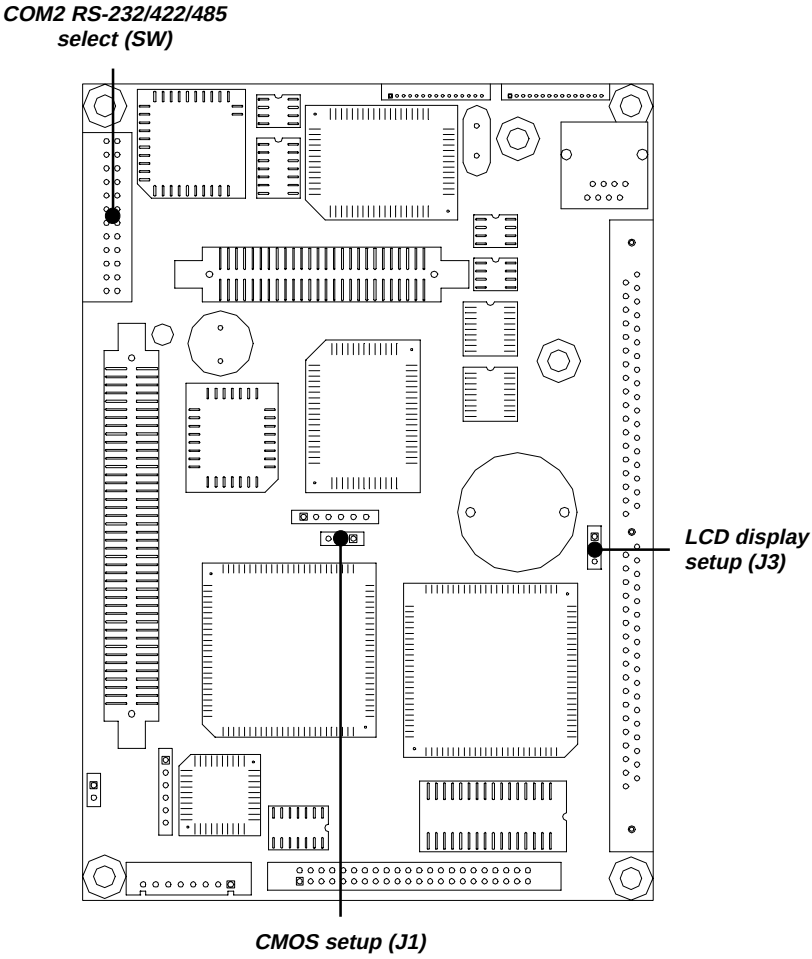
The table below lists the function of each of the board jumpers and connectors:

Jumpers	
Label	**Function**
J1	CMOS setup
J2	Reset
J3	LCD select

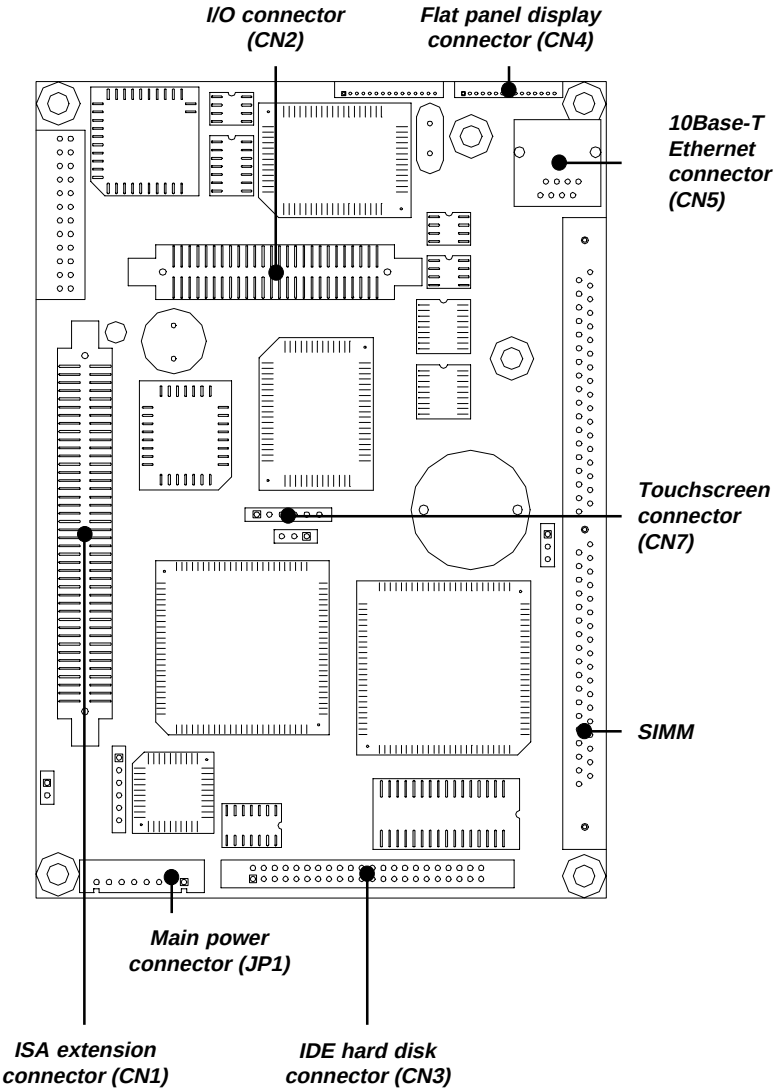
DIP switch	
Label	**Function**
SW1	COM2 RS-232/422/485 select

Connectors	
Label	**Function**
CN1	ISA extension connector
CN2	I/O connector
CN3	IDE hard disk connector
CN4	¼ VGA flat panel display connector
CN5	10Base-T Ethernet connector
CN6	Watchdog programming connector
CN7	Touchscreen connector
CN10	6.0" full VGA flat panel display connector
JP1	Main power connector

4.3 Locating Jumpers

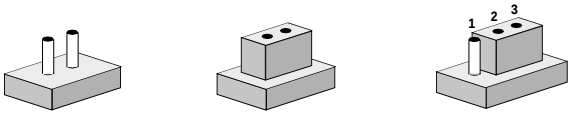


4.4 Locating Connectors



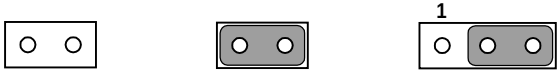
4.5 Setting Jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical 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, connect the pins with the clip. To "open" a jumper, remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, connect either pins 1 and 2 or 2 and 3.



Open **Closed** **Closed 2-3**

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



Open **Closed** **Closed 2-3**

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

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

Generally, a standard cable is all that is needed to make most connections.

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

Caution! *Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

CMOS setup (J1)

CMOS setup		
	***3.6 V Battery on**	**Clear CMOS**
J1	1-2	2-3

***** default setting

LCD display setup (J3)

LCD display setup		
	5 V LCD module	**3 V LCD module**
J3	1-2	2-3

COM2 port setup

PCM-3866 DIP switch settings

SW	RS-232*	RS-422	RS-485
1	ON	OFF	OFF
2	ON	OFF	OFF
3	ON	OFF	OFF
4	ON	OFF	OFF
5	OFF	ON	ON
6	OFF	ON	ON
7	OFF	ON	ON
8	OFF	ON	ON
9	ON	OFF	OFF
10	OFF	ON	OFF
11	OFF	OFF	ON
12	N/V	N/V	N/V

* default setting

Note: *Refer to page 51 for pin assignments.*

4.6 Connector Pin Assignments

IDE hard drive connector (CN3)

PCM-3866 IDE hard drive connector

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	N/C	22	GND
23	IO WRITE*	24	GND
25	IO READ*	26	GND
27	IO CHANNEL READY	28	BALE
29	N/C	30	GND
31	IRQ14	32	IOCS16*
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	N/C	40	GND
41	VCC	42	VCC
43	GND	44	N/C

* active low

The built-in Enhanced IDE (integrated device electronics) controller supports up to two IDE devices.

The system BIOS can automatically detect the IDE hard disk intalled in your system.

Connecting drives is done in a daisy-chain fashion and requires a 1 x 44-pin to 2 x 44-pin flat-cable connector.

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

1. Connect one end of the cable to CN3. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. 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. (See your hard drive's documentation for the location of the connector.)

Connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

Touchscreen PS/2 connector (CN7)

PCM-3866 touchscreen PS/2 connector

Pin	Signal
1	MS CLOCK
2	MS DATA
3	PS2MSCLOCK
4	PS2MSDATA
5	GND
6	VCC

10Base-T Ethernet connector (CN5)

PCM-3866 10Base-T Ethernet connector

Pin	Signal
1	TX+
2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

The PCM-3866 is equipped with a high performance 16-bit Ethernet interface which is fully compliant with IEEE 802.3 10 Mbps CSMA/CD standards. It is supported by all major network operating systems and is 100% Novell NE2000 compatible.

Configuration of the Ethernet is very easy and can be done via the RSET8019.EXE program included on the utility disk. This program enables you to view the current Ethernet configuration, to reconfigure the Ethernet interface (IRQ, I/O address, etc.), and to execute useful diagnostic functions. (See Chapter 5 for detailed information.)

The RSET8019.EXE program provides two ways to configure the Ethernet interface. Configuration can be done automatically when you choose the PnP (Plug and Play) option. Alternatively, when you choose the jumperless option, the following IRQ and I/O address settings are available (see over).

PCM-3866 Ethernet settings

	IRQ option	I/O address range
Jumperless configuration	2,3,4,5,10, 11,12,15	200-300H

Default settings: IRQ=11, I/O Address=300H

Note: You can select an IRQ from the options shown above, but make sure your selection does not conflict with other I/O devices.

Main power connector (JP1)

PCM-3866 main power connector

Pin	Signal
1	VCC
2	VCC
3	GND
4	ENAVEE
5	VEESAFE
6	GND
7	ENABKL
8	+12 V

Flat panel display connector (CN4)

PCM-3866 flat panel display connector

Pin	Signal
1	FLM
2	LP
3	SHFCLK
4	ENAVEE
5	VCC
6	GND
7	VEESAFE
8	P0
9	P1
10	P2
11	P3
12	P8
13	P9
14	P10
15	P11

CN4 consists of a 15-pin header. Power supplies (+12 V) present on JP1 depend on the supply connected to the board.

The PCM-3866 provides a bias control signal on JP1 which 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) and panel video signals are stable. Under normal operation, the control signal (ENAVEE) is active high.

I/O connector (CN2)

PCM-3866 I/O connector

Pin	Signal	Pin	Signal
1	STROBE*	31	VCC
2	D0	32	D4
3	D1	33	D5
4	D2	34	D6
5	D3	35	D7
6	BUSY	36	ACK*
7	SLCT	37	PE
8	INIT*	38	SLCTINI*
9	AUTOFD*	39	ERR*
10	GND	40	GND
11	KBDATA	41	PS2MSDATA
12	KBCLOCK	42	PS2MSCLOCK
13	GND	43	GND
14	NC	44	NC
15	NC	45	NC
16	NC	46	GND
17	GND	47	DCD1
18	RxD1	48	Tx1
19	DTR1	49	DSR
20	RTS1	50	CTS1
21	RI1	51	GND
22	GND	52	DCD2/TxD-
23	RxD2/TxD+	53	TxD2/RxD+
24	DTR2/RxD-	54	DSR2
25	RTS2	55	CTS2
26	RI2	56	GND
27	GND	57	GND
28	GND	58	GND
29	GND	59	GND
30	GND	60	VCC

* active low

ISA extension connector (CN1)

PCM-3866 ISA extension connector (pins 1 through 60)

Pin	Signal	Pin	Signal
1	IOCHK*	31	GND
2	GND	32	M16
3	RESETDRV	33	IQ16
4	VCC	34	IRQ10
5	IRQ9	35	IRQ11
6	DRQ2	36	IRQ12
7	0WS*	37	IRQ15
8	+12 V	38	IRQ14
9	GND	39	DACK0
10	SMEMW*	40	DRQ0
11	SMEMR*	41	DACK5
12	IOW*	42	DRQ5
13	IOR*	43	DECK6
14	DACK3*	44	DRQ6
15	DRQ3	45	DACK7
16	DACK1*	46	DRQ7
17	DRQ1	47	VCC
18	REFRESH*	48	MST
19	SYSCLK	49	GND
20	IRQ7	50	GND
21	IRQ6	51	SD7
22	IRQ5	52	SD6
23	IRQ4	53	SD5
24	IRQ3	54	SD4
25	DACK2*	55	SD3
26	TC	56	SD2
27	BALE	57	SD1
28	VCC	58	SD0
29	OSC	59	IORDY
30	GND	60	AEN

* active low

See overleaf for details of pins 61 through 100.

PCM-3866 ISA extension connector (pins 61 through 100)

Pin	Signal	Pin	Signal
61	SA19	81	GND
62	SA18	82	SBHE
63	SA17	83	LA23
64	SA16	84	LA22
65	SA15	85	LA21
66	SA14	86	LA20
67	SA13	87	LA19
68	SA12	88	LA18
69	SA11	89	LA17
70	SA10	90	MRD
71	SA9	91	MWT
72	SA8	92	SD8
73	SA7	93	SD9
74	SA6	94	SD10
75	SA5	95	SD11
76	SA4	96	SD12
77	SA3	97	SD13
78	SA2	98	SD14
79	SA1	99	SD15
80	SA0	100	VCC

See previous page for details of pins 1 through 60.

4.7 I/O Connector Pin Assignments

COM1 RS-232 serial port (CN1)

PCM-3866-I/0 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

Parallel port connector (CN3)

PCM-3866-I/O 1 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

COM2 RS-232/422/485 serial port (CN2)

PCM-3866-I/O 1 COM2 RS-232/422/485 serial port

Pin	RS-232 Signal	RS-422 Signal	RS-485 Signal
1	DCD	TxD-	TxD- (Data-)
4	DTR	RxD-	RxD- (Data-)
2	RxD	TxD+	TxD+ (Data+)
3	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.

Keyboard/mouse connector (CN5)

PCM-3866-I/O 1 keyboard/mouse connector

Pin	Signal
1	KB DATA
2	PS2MSDATA
3	GND
4	VCC
5	KB CLOCK
6	PS2MSCLOCK

4.8 PC/104 Connector Pin Assignments

PC/104 connector (JP2)

PCM-3866-ISA 1 PC/104 connector

	CN2		CN3	
Pin	**Signal Row A**	**Signal Row B**	**Signal Row A**	**Signal Row B**
1	IOCHK*	GND	GND	GND
2	SD7	RESTDRV	SBHE*	MB16*
3	SD6	VCC	LA23	IO16*
4	SD5	IRQ9	LA22	IRQ10
5	SD4	N/C	LA21	IRQ11
6	SD3	DRQ2	LA20	IRQ12
7	SD2	N/C	LA19	IRQ15
8	SD1	0WS*	LA18	IRQ14
9	SD0	+12 V	LA17*	DACK0*
10	IORDY	GND	MRD*	DRQ0*
11	AEN	SMEMW*	MWT*	DACK5
12	SA19	SMEMR*	SD8	DRQ5
13	SA18	IOW*	SD9	DACK6*
14	SA17	IOR*	SD10	DRQ6
15	SA16	DACK3*	SD11	DACK7*
16	SA15	DRQ3	SD12	DRQ7
17	SA14	DACK1*	SD13	
18	SA13	DRQ1	SD14	MST*
19	SA12	RFSH*	SD15	GND
20	SA11	ATCLKO	(KEY)	GND
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2*		
27	SA4	TC		
28	SA3	BALE		
29	SA2	VCC		
30	SA1	OSC		
31	SA0	GND		
32	GND	GND		

* active low

4.9 Compact Flash Adapter Connector Pin Assignments

PCM-3866 IDE Compact Flash adapter connector

Pin	Signal	Pin	Signal
1	GND	26	CD1*
2	SD3	27	SD11
3	SD4	28	SD12
4	SD5	29	SD13
5	SD6	30	SD14
6	SD7	31	SD15
7	H1CS0*	32	H1CS1*
8	--	33	--
9	HOE*	34	IOR
10	--	35	IOW
11	--	36	WE*
12	--	37	IRQ14
13	VCC	38	VCC
14	--	39	CSEL*
15	--	40	--
16	--	41	RST
17	--	42	IORDY
18	SA2	43	DRQ
19	SA1	44	DACK
20	SA0	45	BVD1
21	SD0	46	--
22	SD1	47	SD8
23	SD2	48	SD9
24	IO16	49	SD10
25	CD2*	50	GND

* active low

CHAPTER 5

Software Configuration

This chapter shows you how to configure the card to match your application requirements. AMI System BIOS is covered in Chapter 6.

Sections include:

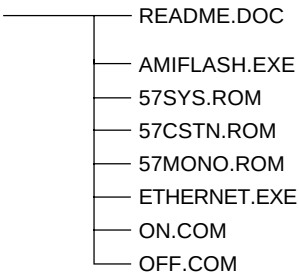
- Introduction
- Utility Disk
- How to Update BIOS
- Ethernet Utility

5.1 Introduction

The PCM-3866 system BIOS and custom drivers are located in a 128 KB, 32-pin Flash ROM device, designated U5. A single Flash chip holds the system BIOS and VGA BIOS. The display type can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

5.2 Utility Disk

The PCM-3866 is supplied with a software utility disk. This disk contains the necessary files for setting up the VGA display. Directories and files on the disk are as follows:



AMIFLASH.EXE
This program allows you to write the VGA BIOS files to the BIOS Flash ROM. All the VGA files are already formatted for the PCM-3866 with .ROM extensions. See README.DOC. They are custom written and can be made available upon request.

57SYS.ROM
This binary file contains the system BIOS.

57CSTN.ROM
Supports 320 x 240 color STN DD 8-bit displays (KYOCERA KCS3224ASTT-X6 5.7").

57MONO.ROM
Supports 320 x 240 monochrome displays (KYOCERA KS3224ASTT-FW-X1 5.7").

ETHERNET.EXE
This is a compressed file containing ethernet drivers and the utility for the Realtek 8019AS chip (see page 58).

5.3 How to Update BIOS

You can program your on-board BIOS as follows:

1. Apply power to the PCM-3866 with a color STN display attached. This is the default setting for the PCM-3866. Make sure that the AMIFLASH.EXE and *.ROM files are located in the working drive.

Note: Make sure that you do not run AMIFLASH.EXE while your system is operating in EMM386 mode.

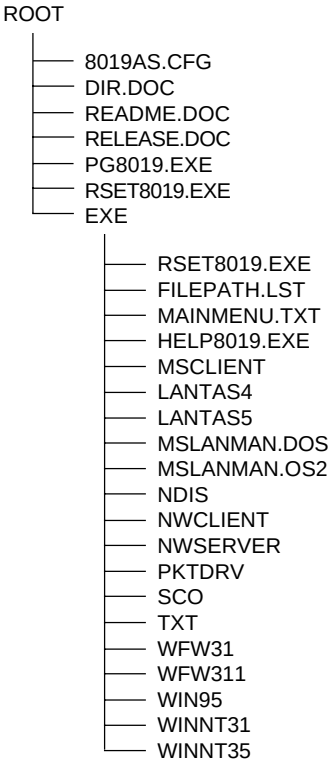
2. At the prompt, type AMIFLASH.EXE and press <Enter>. The VGA configuration program will then display the VGA Setup screen.
3. At the prompt, type in the ROM file which supports your display. When you are sure that you have entered the file name correctly, press <Enter>. The screen will display "Flash EPROM programming is going to start". If you wish to continue, press Y. If you change your mind or have made a mistake, press N to abort and end the setup procedure.
4. When programming is finished, press any key to reboot.

The new VGA configuration will then write to the ROM BIOS chip. This configuration will remain the same until you run the AMIFLASH.EXE program and change the settings.

5.4 Ethernet Utility

The PPC-57 Ethernet driver utility disk (ETHERNET.EXE) contains files required for installing and setting up the Ethernet controller.

Copy ETHERNET.EXE to a selected drive. You can extract the file by typing: ETHERNET-Y.



RSET8019

This program enables you to view the Ethernet configuration, reconfigure the Ethernet interface media, and execute useful diagonstic functions.

PG8019.EXE
The PPC-57 is set at the factory by using this program. Upon receipt of the PPC-57, you should use RSET8019.EXE to configure your system for the working environment. If by chance the Ethernet EEPROM is corrupted, the PG8019.EXE program allows you to configure the card.

8019AS.CFG
This file contains the configuration parameters that are used by PG8019.EXE.

Users can configure Ethernet settings by using the PG8019.EXE programming utility. Follow these steps:

1. Edit the 8019AS.CFG file by using any text editor (e.g. Windows Notepad, or the MS-DOS Edit command). Modify "IOBASE" and "IRQ" to the setting for your system. Exit after you have finished modifying and saving the file.
2. Make sure that PG8019.EXE and 8019AS.CFG are under the same directory. Execute the programming utility.

   ```
   C:\PG8019 8019AS.CFG
   ```

3. Reboot your computer.

Ethernet software configuration

The PPC-57's on-board Ethernet interface supports all major network operating systems. To configure the media type, view the current configuration, or run diagnostics, follow these steps:

1. Turn on the power to the PPC-57. Ensure that the RSET8019.EXE file is located on the working drive.
2. At the prompt, type RSET8019.EXE and press <Enter>. The Ethernet configuration program will then be displayed.

3. All the available options for the Ethernet interface will be displayed. Highlight the option to be changed using the Up and Down keys. To change a selected item, press <Enter>, whereupon 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 with additional information.

4. After you have made your selections and are sure that 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 Run Diagnostics item in the Ethernet Main Menu also offers three very useful diagnostic functions:

1. Run EEPROM test.

2. Run Diagnostics on Board.

3. Run Diagnostics on Network.

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

CHAPTER 6

AMI Flash BIOS Setup

This chapter describes how to set BIOS configuration data.

Since the PPC-57's LCD display is only one quarter the size of a normal VGA display, the messages that appear on your screen will be only one quarter of the messages that appear in this manual. Any screen display illustrated in this manual is merely for your reference, to assist you in setting up BIOS.

6.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot sequence with non-fatal errors. Non-fatal 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.

System configuration verification

These routines check the current system configuration against the values stored in the card'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-57 board's CMOS memory has an integrated lithium battery backup. The battery backup should last ten years in normal service. When it finally runs down, you will need to replace the complete unit.

6.2 AMI BIOS setup

Setup program initial screen

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

Entering setup

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

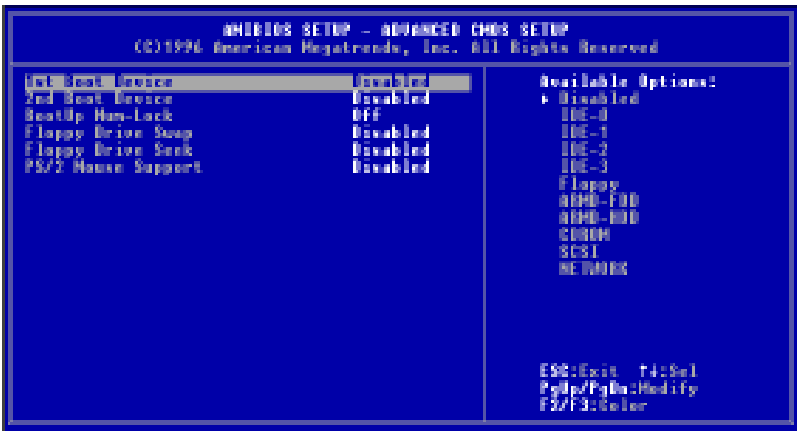
Standard CMOS setup

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 and floppy drive. Once a field is highlighted, on-line help information is displayed at the bottom left of the menu screen.

Standard CMOS setup screen

Advanced CMOS setup

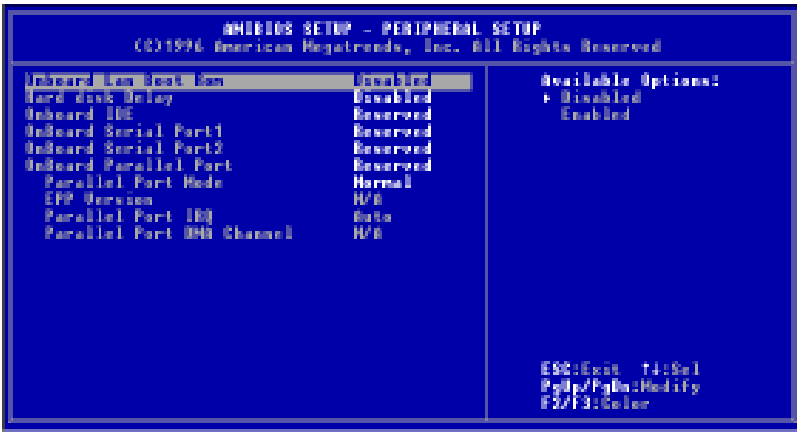
By choosing the ADVANCED CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-3866.



Advanced BIOS setup screen

Peripheral setup

By choosing the INTEGRATED PERIPHERALS option from the INITAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCM-3866.



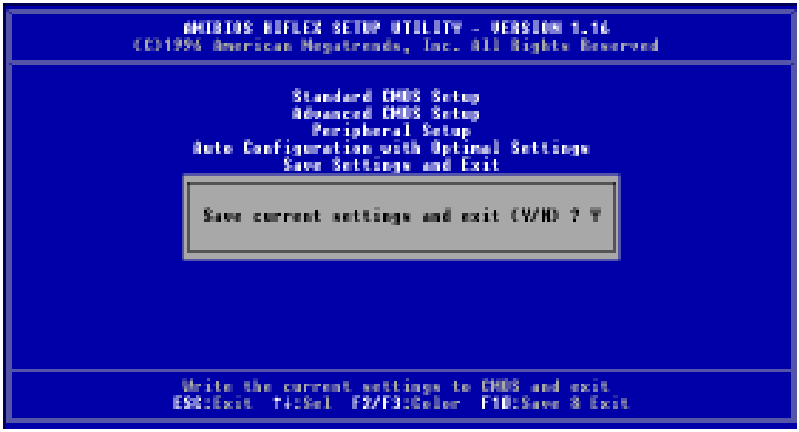
Auto configuration with optimal settings

This option allows the user to load optimal settings. It 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 on the PPC-57.

You can load optimal default settings by choosing "Y" in the screen above. The high-performance settings are the most favorable values for optimum system performance.

Save settings and exit

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.



Exit without saving

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

CHAPTER 7

SVGA Setup

The PPC-57 features an on-board flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the display driver diskette included in your package.

When reading this chapter, remember that the PPC-57's screen is only one quarter the size of a typical VGA display.

- Sleep Mode
- Software Support
- Driver Installation

7.1 Sleep Mode

The utility diskette contains two files that support sleep mode. Simply type the file name at the DOS prompt:

ON.COM switches to normal display mode

OFF.COM switches to sleep mode

7.2 Software Support

The drivers support the following applications using the file names and resolutions listed:

Application	File Name	Resolution	Colors
Windows 3.1	LINEAR4.DRV	640 x 480	16
		800 x 600	16
		1024 x 768	16
	LINEAR8.DRV	640 x 480	256
		800 x 600	256
		1024 x 768	256
	LINEAR16.DRV	640 x 480	64 K
	LINEAR24.DRV	640 x 480	16 M
AutoCAD R12	RCTURBOC.EXP	640 x 480	16
		800 x 600	16
		1024 x 768	16
		640 x 480	256
		800 x 600	256
		1024 x 768	256
		640 x 480	32 K
		640 x 480	64 K
		640 x 480	16 M
Lotus 1-2-3 2.0 and	V132X25.DRV	132 x 25 (Text)	16
Lotus Symphony 1.0, 1.1	V132X50.DRV	132 x 50 (Text)	16
VESA 1.2	VESA.COM	800 x 600	16
		1024 x 768	16
		640 x 400	256
		640 x 480	256
		800 x 600	256
		1024 x 768	256
		640 x 480	32 K
		640 x 480	64 K
Word 5.0	VGA600.VID	800 x 600	16
	VGA768.VID	1024 x 768	16
Word 5.5	VGA55600.VID	800 x 600	16
	VGA55768.VID	1024 x 768	16
WordPerfect 5.0	CHIPS600.WPD	800 x 600	16
	CHIPS768.WPD	1024 x 768	16
WordPerfect 5.1	VGA600.VRS	800 x 600	16
	VGA768.VRS	1024 x 768	16

7.3 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 of the driver in order to work properly, so make sure you know which version of the application you have.

Windows

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

Windows setup

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:\WINSETUP**. 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 ***WINSETUP.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.

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 above. Apart from 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 Windows3.1.

AutoCAD R12

These drivers are designed to work with Autodesk AutoCAD R12. They conform to the Autodesk Device Interface (ADI) for Rendering drivers and Display drivers. These display list drivers accelerate redraw, pan, and zoom functions.

Driver installation

Step 1: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the SETUP program. Press any key to get to the applications list. Using the arrow keys, select ***AutoCAD Release 12*** and press <ENTER>. This will display a list of supported driver resolutions. Using the arrow keys and the <ENTER> key, select the resolutions that are appropriate for your monitor. When all of the desired resolutions have been selected, press <END> to begin the installation. At this point you will be asked for a drive and directory to copy the driver files. Enter the drive and directory that contains the installed AutoCAD R12. If the destination directory does not exist you will be asked for confirmation. When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 2: Go to the AutoCAD directory where the new drivers were installed and run the driver installation program by typing **ACAD12 -r** <ENTER>. This program will configure your AutoCAD R12 to use the new display drivers. Select ***TurboDLD Classic***.

Configuring TurboDLD

Select ***Configure Video Display***. In Display Device Configuration, choose ***Select Graphics Board/Resolution***. Then choose ***Select Display Graphics Board***. After choosing a graphics board, go to ***Select Display Resolution***. After selecting the display resolution, save the new configuration, and return to the main menu.

Basic configuration menu

This menu allows you to modify:

Number of AutoCAD Command Lines	
Font Size	6x8/8x8/8x14/8x16/12x20/12x24
Dual Screen	Enable/Disable
User Interface Configuration	
Double Click Interval Time	
BP Button	
BP Highlight	Patt Line/Xor Rect/Both
BP Refresh	Enable/Disable
BP Cache	Enable/Disable

Expert configuration menu

This menu allows you to modify:

Display List	Enable/Disable
Drawing Cache	Enable/Disable
Use Acad 31-bit Space?	Yes/No
Internal Command Echo	Enable/Disable
BP Zoom Mode	Freeze/Float
Regen Mode	Incremental/Fast

If your previously installed driver is not TurboDLD, you will have to reconfigure the RENDER command the first time you use it.

Lotus 1-2-3 and Lotus Symphony

These drivers are designed to work with Lotus 1-2-3 versions 2.0, 2.01 and 2.2, and with Lotus Symphony versions 1.0 and 1.1.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select ***Lotus/Symphony,*** and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired.) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the 123 directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS. Copy all the files that were just created in the temporary directory on to a formatted floppy diskette.

Step 2: Go to your 123 directory, and start the installation program. Type the following commands:

C: <ENTER>

INSTALL <ENTER>

Step 3: The Lotus installation program will load and present the installation menu. From this menu, select ***Advanced Options***. From the Advanced Options menu, select ***Add New Drivers To Library***. From the Add New Drivers Menu, select ***Modify Current Driver Set***. From the Modify Driver Set Menu, select ***Text Display***. From the Text Display menu, select one of the drivers.

Step 4: After the selection of the appropriate VGA display driver, you will need to exit this menu and return to the Main Lotus Installation Menu. Do this by selecting ***Return To Menu***.

Step 5: At the Main Lotus Installation Menu, select ***Save Changes***.

Step 6: At this point, the Installation Menu will prompt you for the name of your new Lotus configuration file. The Lotus system will prompt you with the default value — 123.SET, but you may want to use a file name that indicates the resolution of its driver. For example, if you installed the 132 column by 25 line driver, you could name this driver 132X25.SET, or if you installed the 80 by 50 driver, you may want to call the file 80X50.SET.

Step 7: The installation of your Lotus 1-2-3 driver is now complete. You will need to exit the Lotus installation program at this point. At the main Lotus Installation Menu, select ***Exit***.

Note: *If your driver set is not 123.SET, you must type the file name of your driver set in the command line when you start Lotus 1-2-3. For example, if you named your driver set 132X25.SET, type the following to start Lotus 1-2-3:*

123 132X25.SET <ENTER>

VESA

The Video Electronics Standards Association (VESA) has created a standard for a Super VGA BIOS extension (VBE). This defines a standard software interface to allow application programs to set and control extended video modes, such as 800 x 600 graphics, on video adapters from different manufacturers.

The VESA driver adds this Super VGA BIOS extension to the VGA BIOS. Any application program which supports the VESA standard driver interface can be used with this driver. The VESA driver conforms to the VESA Super VGA Standard #VS891001.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select VESA Driver ***Version 1.2*** and press <ENTER>. Press the <ENTER> key to select ***All Resolutions***, and press <END> to begin the installation. A default drive and directory path will be displayed. Use the backspace key to erase this and type in a directory that is in the directory path (such as C:\BIN or C:\UTILS). After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: To install the VESA driver, type either **VESA** <ENTER> or **VESA +** <ENTER> at the DOS prompt. The optional + command line parameter enables all of the available modes. Make sure that your monitor is capable of displaying these high resolution modes before enabling them.

Note: *If the video BIOS already supports VBE extended video modes, DO NOT use this driver. Run the VTEST.EXE program to see if the video BIOS supports the VBE modes.*

Word

These drivers are designed to work with Microsoft Word 5.0 and 5.5.

Driver installation

If you have already installed Word on your computer, go to Step 2 to install the new video driver.

Step 1: Install Word as normal.

Step 2: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select ***Word*** and press <ENTER>. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired.) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this and type in your Word directory. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 3: Copy the driver file for the desired resolution that was just installed to SCREEN.VID.

WordPerfect

These drivers are designed to work with WordPerfect 5.0 or 5.1. They support 132-column display in editing mode, and high-resolution graphics display in PreView mode.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select ***WordPerfect*** and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired.) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the WordPerfect directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: Start WordPerfect, and press <SHIFT>+<F1> to enter the setup menu. Select ***D*** for Display and ***G*** for Graphics Screen Type, and then choose the desired Chips VGA resolution.

Configuring WordPerfect 5.0 for 132 columns

Follow these instructions to configure WordPerfect 5.0 for 132 column text mode:

Step 1: To use the SETCOL program to set 132 columns and 25 rows, type the following command:

SETCOL 132, 25 <ENTER>

Step 2: Start WordPerfect. The program will detect the number of rows and columns automatically. If for some reason WordPerfect is unable to adapt to 132 columns by 25 rows, start WordPerfect with the following command:

WP /SS=25,132 <ENTER>

Configuring WordPerfect 5.1 for 132 columns

Start WordPerfect and press <SHIFT>+<F1> to enter the setup menu. Select ***D*** for Display and ***T*** for Text Screen Type and then select ***Chips 132 Column Text***.

APPENDIX A

Programming the Watchdog Timer

The PPC-57 is equipped with a watchdog timer that resets the CPU 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

To enable the watchdog timer, you must write a program which writes I/O port address 443 (hex) at regular intervals. The output data is a timer value. You can write from 01(hex) to 3E(hex), and the related timer is 1 sec. to 62 sec.

Data	Time Interval
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
•	•
•	•
•	•
3E	62 sec.

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

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

```
10      REM  Watchdog timer example program
20      OUT &H443, data REM  Start and restart the
                             watchdog
30      GOSUB 1000 REM  Your application task #1,
40      OUT &H443, data REM  Reset the timer
50      GOSUB 2000 REM  Your application task #2,
60      OUT &H043, data REM  Reset the timer
70      X=INP (&H043) REM  Disable the watchdog timer
80      END
1000    REM  Subroutine #1, your application task
•       •
•       •
•       •
1070    RETURN
2000    REM  Subroutine #2, your application task
•       •
•       •
•       •
2090    RETURN
```

APPENDIX B

Touchscreen (Optional)

- Touchscreen Specifications
- Installation
- Running the Setup Program
- Removing the Touchscreen Driver
- Touchscreen Driver Application Interface (API)

B.1 Touchscreen Specifications

The touchscreen is a 4-wire analog resistive type. It is constructed of one glass sheet overlayed with two layers of PET. The PET layers are coated with ITO and are separated by printed spacers. The touchscreen is designed to be activated by the pressure of any stylus.

Specifications

- **Thickness**: 1.7 mm (including protective screen cover)
- **Screen surface hardness**: > 2 H
- **Transparency**: ≥ 68%
- **Resolution**: 1024 x 1024
- **Type**: Analog resistive
- **Operating pressure**: 15 g (standard)
- **Lifetime**: More than 3 million touches
- **Operating temperature**: 0 ~ 60° C
- **Operating humidity range**: 20 ~ 95% RH
- **Power input**: 5 volts DC
- **Current draw**: < 7 mA
- **Interface**: PS/2 port
- **Conversion speed**: 1200 baud
- **Resistance**: 300 Ω

Operating system requirements

Software Driver: Supports MS-DOS Version 5.0 or above

Appropriate applications

The touchscreen must be used with mouse-driven applications.

B.2 Installation

You can find the executable file named INSTALL.COM in the root directory of the system utility software disk. Run INSTALL.COM to completely install the system software to your hard disk drive.

Executing INSTALL.COM

The command prompt is INSTALL<Sd><Td> [Enter].

The symbol <Sd> stands for source disk, which is the disk drive in which the system sofware disk is inserted. Key in A: or B:.

The symbol <Td> stands for target disk, which is that disk onto which you wish to install the system sofware. Key in C: or D:.

Installing the system software automatically creates a directory named ATS in the root directory of your hard disk drive.

Installing the touchscreen driver

1. Go to the root directory of ATS.
2. Type M [Enter] (or ATSMOUSE).

Calibrating the touchscreen

1. Run the Setup program (see Section B3).
2. Select the VGA modes which your program requires.
3. Run the calibration function for each VGA mode which has been selected. You can test them after calibration, and then exit to save the settings.

B.3 Running the Setup Program

1. Go to the root directory of ATS.
2. Key in S [Enter] (or ATSDOSCP).

Operation keys

1. Use the [↑] and [↓] keys to move the cursor up or down to the desired function.
2. Use the [←] and [→] keys to select the desired variable setting.
3. Press [Enter] to confirm the setting.

Settings for running the touchscreen setup program are:

1. Device type: PS/2 port (factory default)
   This setting allows the touchscreen's operating software to locate the proper device type. The proper device for the PPC-57 is the PS/2 port.
2. Button Mode
   This is the way in which the touchscreen simulates the action of a left mouse button. Four options are presented:

   a) Stream mode: The touchsreen does not simulate the button mode, but only outputs its coordinates. This mode is normally not selected.

   b) Lift-off mode: Activates the moment a finger or stylus lifts off the touchscreen.

   c) Touch down mode: Activates the moment a finger or stylus presses against the touchscreen.

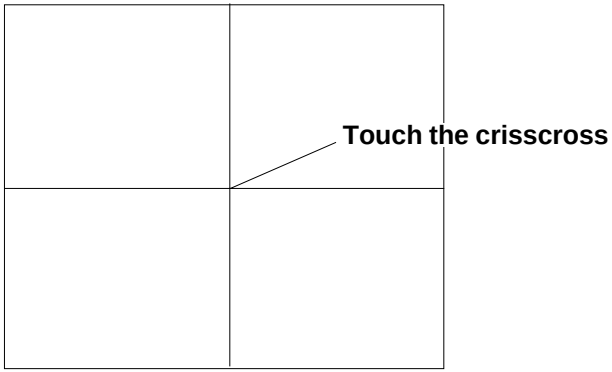
   d) Drag drop mode: Activates whenever a finger or stylus presses against the touchscreen. This is the factory default setting.
3. Calibration settings
   These are the corresponding location file numbers for different VGA mode resolutions.

Calibration settings

Location file number	VGA mode resolution
VGA #0D	320 x 200 (40 x 75)
VGA #0E	640 x 200 (80 x 25)
VGA #0F	640 x 350 (80 x 25)
VGA #10	640 x 350 (80 x 25)
VGA #11	640 x 480 (80 x 30)
VGA #12	640 x 480 (80 x 30)
VGA #13	320 x 200 (40 x 25)

We suggest that you select the location file number VGA #12.

Use the [←] and the [→] keys to select the desired variable, then press [Enter] to set the four corners of the screen (top-left, top-right, bottom-left, and bottom-right, following the directions on the screen). Test the touchscreen by touching it.



4. Save and Exit
   This saves all selected variables to data files and leaves the setup program.

B.4 Removing the Touchscreen Driver

1. Go to the root directory to ATS.
2. Type M [Enter] or ATSMOUSE to finish the removal.

File name: ATSMOUSE.API

Description:

A user's application program that can perform the same functions as the driver via Int 33h. The driver will perform some functions according to data in the AX register. The ATSMOUSE.API application program can transfer the parameter to the driver by BX, CX and DX registers, and some functions may be transferred to the ES, DI and SI registers.

B.5 Touchscreen Driver Application Interface (API)

The device driver supports some functions compatible with the mouse driver, as listed below:

Compatible functions supported by the device driver

AX	Description
0000h	Install flag and reset
0001h	Show cursor
0002h	Hide cursor
0003h	Get position and button status
0004h	Set cursor position
0005h	Get button press information
0006h	Get button release information
0007h	Set minimum and maximum horizontal position
0008h	Set minimum and maximum vertical position
0009h	Set graphics cursor block
000Ah	Set text cursor
000Bh	Read motion counters
000Ch	Set user-defined subroutine input mask
0014h	Swap user interrupt vector

Device drivers provide some functional support for application software which sets the following touchscreen functions:

Touchscreen functions supported by device drivers

AX	Description
8000h	Get touchscreen device driver information
8002h	Get touchscreen position and status
8003h	Get touchscreen raw input
8005h	Set touchscreen options
8006h	Get touchscreen options table address

Function: Get touchscreen device driver information

Input: AX = 8000h
Output:
AX = "AT" identification code
BL = 4, Type: PS/2
BH = interrupt request number IRQ
CX = Interrupt vector number
DX = device driver version e.g. 0864h=8.64

Function: Get touchscreen position and status

Input: AX = 8002H
Output:
BL = button status: BIT-0 left button status, 0: release, 1: press BIT-1 right button status, 0: release, 1: press other bytes retained
BH = press status: BIT-3 press flag, 0: release, 1: press other bytes retained
CX = Horizontal vector (X)
DX = Vertical vector (Y)

Function: Get touchscreen initial input

Input: AX = 8003H
Output:
CX = Horizontal vector (X)
DX = Vertical vector (Y)
BL = press status: BIT-3 press flag, 0: release, 1: press other bytes retained

Function: Set touchscreen function

Input: AX = 8005H
BX = Function type
DX = parameter 1
CX = parameter 2
DI = parameter 3
SI = parameter 4

Output:

AX = 0, execute OK
AX = 1, execute fail

Example:

When BX = 1, it is set for fictitious button mode
DL (fictitious button mode)

= 1: Stream mode
= 2: Lift off mode
= 3: Touch down mode
= 4: Drag drop mode

When BX = 2, set calibration address
DL (calibration address)

= 1: address table #1
= 2: address table #2
= 3: address table #3
...
=15: address table #15

When BX = 3, download addresses to address table which is selected by the address table selector.

DX = Horizontal (X) minimum value
CX = Vertical (Y) minimum value
SI = Horizontal (X) maximum value
DI = Vertical (Y) maximum value

When BX = 4, start using select address table is present addresses
DL (start using select address table number)

= 1: address table #1
= 2: address table #2
= 3: address table #3
...
= 15: address table #15

Function: Get touchscreen parameter function table address

Input: AX = 8006H
Output:
AX = 0
ES: BX = address of parameter table (segment = offset)

Illustration:
When the system starts, the T/S driver will load ATSMOUSE.INI into the parameter table area to support the obtaining of video mode addresses for switching to any one video mode automatically.

Parameter format

Fictitious button mode	: 1 byte
Address selection	: 1 byte
Address table #1	: 4 word (video mode: 00h)
Address table #2	: 4 word (video mode: 01h)
Address table #3	: 4 word (video mode: 02h)
Address table #4	: 4 word (video mode: 03h)
Address table #5	: 4 word (video mode: 04h)
Address table #6	: 4 word (video mode: 05h)
Address table #7	: 4 word (video mode: 06h)
Address table #8	: 4 word (video mode: 07h)
Address table #9	: 4 word (video mode: 0Dh)
Address table #10	: 4 word (video mode: 0Eh)
Address table #11	: 4 word (video mode: 0Fh)
Address table #12	: 4 word (video mode: 10h)
Address table #13	: 4 word (video mode: 11h)
Address table #14	: 4 word (video mode: 12h)
Address table #15	: 4 word (video mode: 13h)
Reserved	: 4 word
Parameter file name	: 126 byte, includes path and end character = CHR(0)

Address table format

Horizontal (X) minimum value: 1 word
Vertical (Y) minimum value: 1 word
Horizontal (X) maximum value: 1 word
Vertical (Y) maximum value: 1 word

Note: Do not change the contents of the parameter directly, because this may cause the touchscreen to malfunction. Set the parameters of each touchscreen function, and the drivers will subsequently change the contents of the parameters automatically. This is the best way to reach your application.