IPPC-920/950 Series

Industrial panel PC with
12.1"/15" LCD display

User's Manual

Copyright notice

Part No. 2002000100

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FCC Class B

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 when the equipment is operated in a residential 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. Note that even when this equipment is installed and used in accordance with this user's manual, there is still no guarantee that interference will not occur. If this equipment is believed to be causing harmful interference to radio or television reception, this can be determined by turning the equipment on and off. If interference is occuring, 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 the receiver
- Connect the equipment to a power outlet on a circuit different from that to which the receiver is connected
- Consult a dealer or an experienced radio/TV technician for help

Warning: *Any changes or modifications made to the equipment which are not expressly approved by the relevant standards authority could void your authority to operate the equipment.*

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact our dealer immediately.

The IPPC-920/950 Series industrial panel PCs include the following models:

1. **IPPC-920T**
   Industrial panel PC with 12.1” TFT LCD and aluminum front panel
2. **IPPC-920T-T**
   IPPC-920T with resistive type touchscreen
3. **IPPC-921T**
   Industrial panel PC with 12.1” TFT LCD and stainless steel front panel
4. **IPPC-921T-T**
   IPPC-921T with resistive type touchscreen
5. **IPPC-950T**
   Industrial panel PC with 15” TFT LCD and aluminum front panel
5. **IPPC-950T-T**
   IPPC-920T with resistive type touchscreen
7. **IPPC-951T**
   Industrial panel PC with 15” TFT LCD and stainless steel front panel
8. **IPPC-951T-T**
   IPPC-951T with resistive type touchscreen

Comparison Table

Item	IPPC-920T	IPPC-950T
Description	Socket 7 based industrial panel PC with LCD display	
LCD type	12.1" TFT SVGA	15" TFT XGA
Display resolution	800 x 600	1024 x 768
Motherboard	PCM-5868	
Floppy disk drive	3.5" slim type	
Power supply	80 W; 100 ~ 250 V AC	
Items in accessory box	One utility disc	
	One CPU fan with heat sink	
	One Y-shaped adapter for PS/2 mouse and PS/2 keyboard	
	Four mounting kits, and bag of screws	
Optional Devices		
Touchscreen	Three Dynapro touchscreen driver disks	
Slim type CD-ROM drive	Toshiba 24X slim type CD-ROM	
	One floppy disk with CD-ROM drive	

Additional Information and Assistance

1. Visit the Advantech websites at **www.advantech.com** or **www.advantech.com.tw**, 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 before you call:
   - 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

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located 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 may 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 may 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). THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70dB(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 funktioni ert 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.
15. Bitte lassen Sie das Gerät nicht unbehehrt hinten unter -20° C (-4° F) oder oben 60° C (140° F), weil diesen Temperaturen das Gerät zerstören könten.

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

DISCLAIMER: This set of instructions is given according to IEC704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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CHAPTER 1

General Information

- Introduction
- Specifications
- Dimensions

1.1 Introduction

The IPPC-920/950 Series industrial panel PC is specially designed to fit in space-limited environments where expansion is restricted. Its solid structure enables the system to operate under harsh industrial conditions.

Sturdy structure

The whole system is protected by a firm solid structure. The front panel is made of sturdy aluminum and has strengthened glass. It is shock resistant, and complies with NEMA4/IP65. The stainless steel case (SUS304) on the rear side is rugged and corrosion resistant, and enables the system to operate reliably in even the harshest of environments.

Easy maintenance

A back door with lock is located right above the motherboard. Thus users can easily maintain the CPU, HDD, SDRAM, FDD and CD-ROM drive. Jumpers can be easily set without removing a single screw. The lock protects the system from intruders.

Economical system

The PCM-5868 motherboard has Socket 7 architecture. It supports Intel® 233 MMX, AMD K6-2 and Cyrix M2. Socket 7 is an economical yet powerful system. Its reliability enables the system to operate faultlessly in industrial environments.

Friendly HMI

The IPPC-920/950 Series is equipped with a 12.1"/15" LCD, which provides high resolution display quality (IPPC-920: 800 x 600; IPPC-950: 1024 x 768). The result is vivid, bright, and sharp quality images. The IPPC-920/950 Series is perfectly suited for "Windows" OSs. The touschscreen version enables simple operation, making the IPPC-920/950 Series the premier industrial digital controller interface.

1.2 Specifications

General

- **Dimensions (W x H x D):**
  405 x 302 x 100 mm (15.94" x 11.88" x 3.93")
- **Weight:** 8.2 kg (18.11 lb)
- **Power supply:** 80 watts
  Input voltage: 115 V AC / 3 A ~ 230 V AC / 1.5 A @ 47 ~ 63 Hz
  Output voltage: +5 V @ 12 A, +12 V @ 1 A
- **Cooling fan dimensions (W x H x D):**
  60 x 60 x 10 mm (2.36" x 2.36" x 0.39")
- **Disk drive housing:** Supports one 2.5" HDD, one slim size CD-ROM drive, and one slim type FDD
- **Chassis:** Aluminum front frame complies with NEMA4/IP65. SUS304 stainless steel back case

Standard PC functions

- **CPU:** Intel Pentium® 75 ~ 233 MHz with MMX, P55C/P54C; AMD K5, K6, K6-2; Cyrix M1, M2
- **BIOS:** Award 256 KB Flash BIOS, supports Plug & Play, APM
- **Chipset:** SiS 5582
- **2nd level cache:** On-board 512 KB Pipeline Burst SRAM
- **RAM:** One 168-pin DIMM socket accepts 16 ~ 128 MB SDRAM (3.3 V)
- **PCI bus master IDE interface:** Supports two connectors. Each connector has one channel and supports two IDE devices. Each channel supports PIO modes 0 ~ 4, DMA modes 0 ~ 2, and Ultra DMA 33 simultaneously. The secondary connector is designated for the CD-ROM drive. BIOS supports IDE CD-ROM boot-up.
- **Parallel port:** One parallel port, supports SPP/EPP/ECP parallel mode. BIOS configurable to LPT1, LPT2, LPT3 or disabled

- **Serial ports:** Four serial ports with three RS-232 ports (COM1, COM3, and *COM4) and one RS-232/422/485 port (COM2). All ports are compatible with 16C550 UARTs
- **Universal serial bus (USB) port:** Supports up to two USB ports
- **PCI/ISA bus expansion slot:**
  Accepts either one ISA card or one PCI bus card
- **Watchdog timer:** 63-level, interval 1 ~ 63 seconds.
  Automatically generates system reset or IRQ11 when the system stops due to a program error or EMI. Jumperless selection and software enabled/disabled
- **Battery:** 3.0 V @ 190 mA lithium battery

PCI SVGA/flat panel interface

- **Chipset:** C&T 65555
- **Display memory:** 2 MB on-board memory, supports up to 4 MB
- **Display type:** Simultaneously supports CRT and flat panel displays (EL, LCD and gas plasma)
- **Display resolution:** Supports non-interlaced CRT and LCD displays up to 1024 x 768 @ 65536 colors. If display memory is expanded to 4 MB, supports CRT and LCD displays up to 1280 x 1024 with true-color resolution.

Audio function

- **Chipset:** ESS 1869
- **Audio controller:**
  16-bit codec, full-duplex stereo single-chip audio solution
- **Stereo sound:** Sound Blaster or Sound Blaster Pro compatible
- **Audio interface:** Microphone-in, line-in, line-out, and game ports

** Warning: COM port 4 on the IPPC-920/921T-T and IPPC-950/951T-T models is reserved for a touchscreen only. Improper use of this COM port will cause system failure.*

PCI bus Ethernet interface

- **Chipset:** Realtek RTL 8139 PCI local bus Ethernet controller
- **Ethernet interface:** Fully complies with IEEE 802.3u 100Base-T and 10 Base-T specifications. Includes software drivers and boot ROM
- **100/10Base-T auto-sensing capability**

Touchscreen (optional)

- **Type:** Analog resistive
- **Resolution:** Continuous
- **Light transmission:**
  72% (surface meets ASTM-D-3363-92A 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, Windows 98, Windows NT 4.0 and IBM OS/2

Optional modules

- **CPU:** Intel Pentium® 75 ~ 233 MHz with MMX, P55C/P54C; AMD K5, K6, K6-2; Cyrix M1, M2
- **Memory:** 16/32/64/128 MB SDRAM
- **CDR-950-24X:** 24X CD-ROM or above
- **PCD-250 series:** 2.5" IDE Flash drive
- **HDD:** 2.5" IDE HDD
- **IPPC-950 Rack-MT:** 19" rack mounting kit for IPPC-950

Environmental

- **Operating temperature:** 0 ~ 50° C (32 ~ 122° F)
- **Storage temperature:** -20 ~ 60° C (-4 ~ 140° F)
- **Relative humidity:** 10 ~ 90% @ 40° C (non-condensing)
- **Shock:** 30 G peak acceleration (11 ms duration)
- **Power MTBF:** 100,000 hrs
- **Certification:** CE, FCC Class A, VCCI; meets UL

1.3 Dimensions

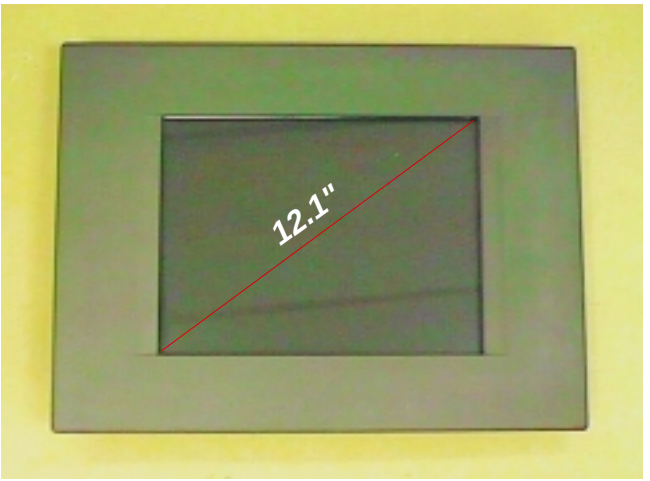


Figure 1-1: IPPC-920 front view

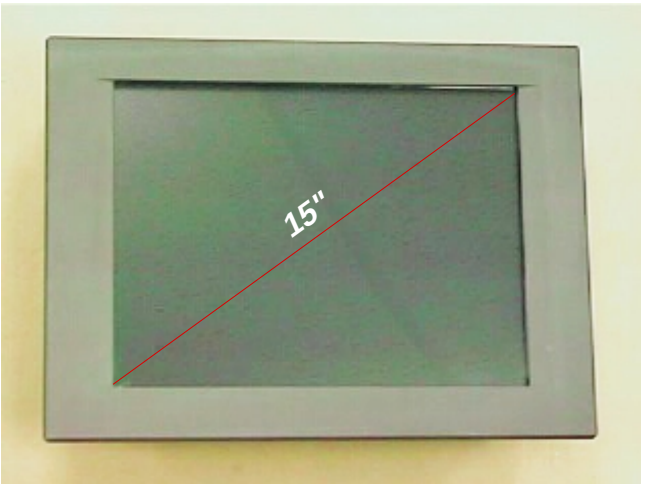


Figure 1-2: IPPC-950 front view

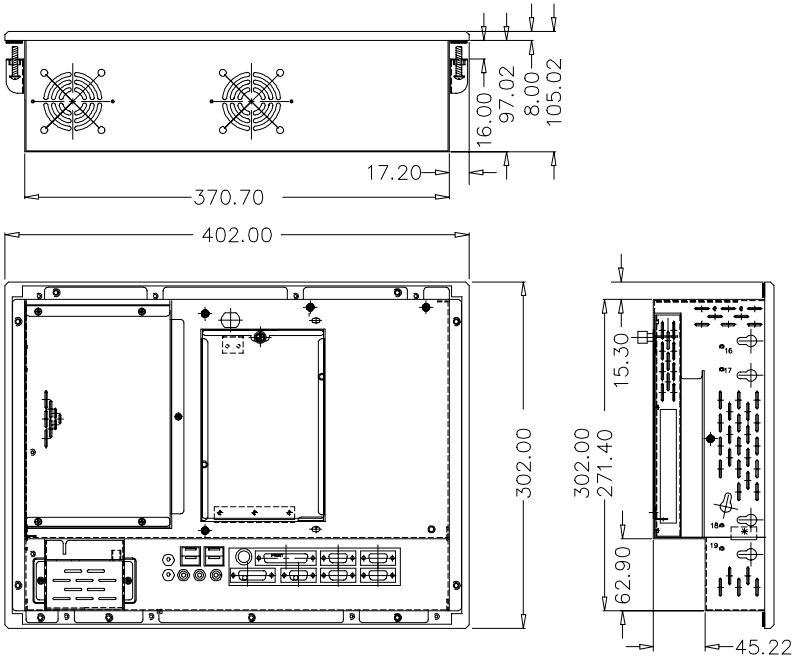


Figure 1-3: IPPC-920/950 Series dimensions

CHAPTER 2

System Setup

- General
- Installing SDRAM
- Installing a CPU
- Installing a 2.5" HDD
- Installing a CD-ROM Drive
- Installing Add-on Cards
- Mounting Instructions

2.1 A Quick Tour of the IPPC-920/950 Series

Before you start the computer, please follow these procedures to set up the system.

1. Adjusting jumpers on the motherboard
2. Installing SDRAM
3. Installing a CPU
4. Installing add-on cards
5. Connect the wires, cables and accessories
6. Mounting the computer
7. Programming BIOS settings
8. Installing an operating system

Warnings: 1. Every time you access the interior of the computer, please switch it off and unplug it.

2. The motherboard inside the system is composed of many delicate ICs, chips and other integrated circuit components. These components are easily damaged by static shock. When you begin to install components, please:

Avoid touching metal parts of the motherboard.

Wear an anti-static ring when handling a CPU or SDRAM module.

Put SDRAM modules and the CPU inside an anti-static bag or similar place before installation.

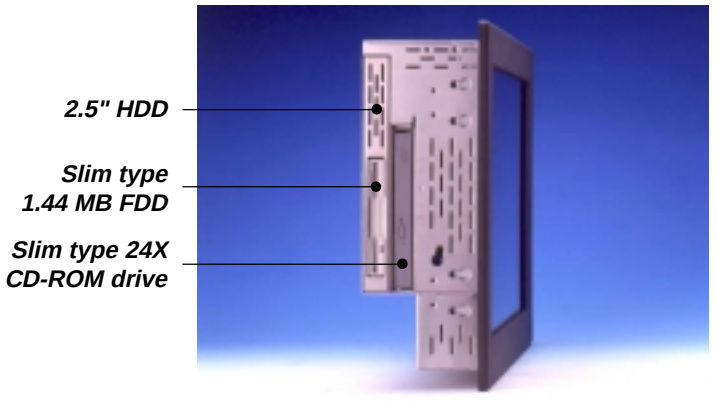


Figure 2-1: Side view

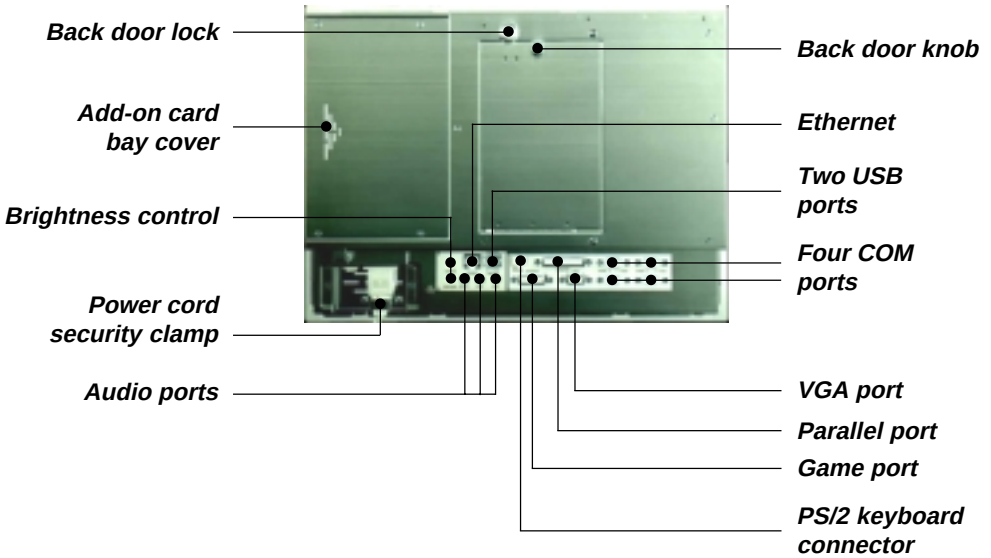


Figure 2-2: Rear view

2.1.1 PS/2 mouse and keyboard

If you wish to use a full-size desktop keyboard and PS/2 mouse with your panel PC, follow these instructions:

1. Be sure the panel PC is turned off.
2. Connect the Y-shaped adapter to the PS/2 mouse and keyboard port on the rear bottom side of the rear cover.
3. Attach the keyboard to the 5-pin port of the Y-shaped adapter.
4. Attach the PS/2 mouse to the 6-pin female PS/2 port of the Y-shaped adapter.
5. Turn on the panel PC.

2.1.2 Parallel port

The panel PC supports the latest EPP and ECP parallel port protocols for improved performance and versatility with compatible printers or other devices.

To connect the panel PC to a printer or other devices:

1. Make sure both the panel PC and the printer/devices are turned off.
2. Connect the 25-pin male connector of the printer cable to the 25-pin female port on the panel PC labelled "parallel port."
3. If necessary, attach the other end of your printer cable to your printer, and fasten any retaining screws.
4. Turn on the printer and any other peripheral devices you may have connected to the panel PC. Then turn on the panel PC.
5. If necessary, run the panel PC's BIOS setup program to configure the parallel port to respond as required by your printer and software operating environment.

2.1.3 Serial COM ports

There are four serial COM ports on the bottom of the rear cover. You can easily attach a serial device to the panel PC, such as an external modem or mouse. Follow these instructions:

1. Make sure the panel PC and any other peripherial devices you may have connected to the panel PC are turned off.
2. Attach the interface cable of the serial device to the panel PC's serial port. (See Fig. 2-2.) If necessary, attach the other end of the interface cable to your serial device. Fasten any retaining screws.
3. Turn on any other peripheral devices you may have connected to the panel PC, and then turn on the panel PC.
4. Refer to the manual(s) which accompanied your serial device(s) for instructions on configuring your operating environment to recognize the device(s).
5. Run the BIOS setup program and configure the jumper settings to change the mode of the COM ports.

2.1.4 VGA port

An external VGA-compatible device may be connected to the system via the 15-pin external port located on the rear of the system unit. The panel PC simultaneously supports an external CRT monitor in addition to its own LCD display.

1. Make sure the panel PC is turned off.
2. Connect the external monitor to the system.
3. Turn on the panel PC and the external monitor.

2.1.5 USB ports

An external USB device may be connected to the system via the 4-pin USB ports located on the rear side of the system unit.

1. Connect the external device to the system.
2. The USB ports support hot plug-in connection. You should install the device driver before you use the device.

2.1.6 Audio interface

The audio interface includes three jacks: microphone-in, line-out and line-in. Their functions are:

Microphone-in: Use an external microphone to record voice and sound.

Line-out: Output audio to external devices such as speakers or earphones. The built-in speaker will not be disabled when the line-out jack is connected to external audio devices.

Line-in: Input audio from an external CD player or radio.

1. Connect the audio device to the system.
2. Install the driver before you use the device.

2.1.7 Ethernet

External devices on your network may be connected to the system via the external Ethernet port located on the rear side of the system unit.

1. Make sure the panel PC is turned off.
2. Connect the external device(s) to the panel PC.
3. Turn on the panel PC and the external device(s).
4. Under DOS, run the RSET8139 program to check the hardware network status before installing the Ethernet driver.
5. Run the Ethernet driver to connect up to the network.

2.1.8 Adjusting the LCD brightness

The brightness control knob allows you to adjust the brightness of the LCD display panel.

2.2 Installing SDRAM

You can install from 16 to 128 MB of SDRAM memory. The panel PC system provides one 168-pin DIMM (Double Inline Memory Module) socket, and supports 3.3 V SDRAM with a minimum speed of 12 ns.

1. Unlock the back door and open it.
2. Push the two white eject levers on each side of the DIMM outward until they are separated from the black vertical posts.
3. Insert the memory module into the socket at an angle of 90 degrees.
4. Push the two eject levers toward the vertical posts at each end of the socket until the module is upright.

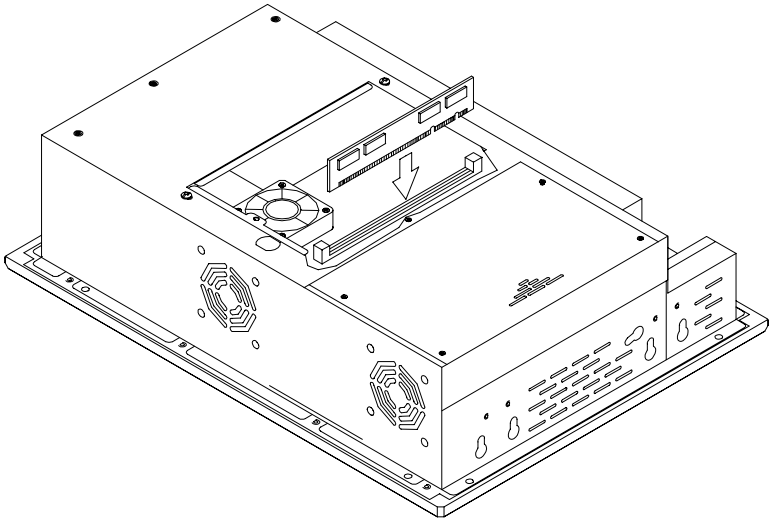


Figure 2-3: Installing SDRAM

2.3 Installing a CPU

The CPU can be upgraded to improve system performance. The system provides Socket 7 architecture which accepts Intel® Pentium® P55C/P54C 75 ~ 233 MHZ with MMX, AMD K5, K6, K6-2, and Cyrix M1, M2 CPUs.

Warning: Always disconnect the power cord from your panel PC when you are working on it. Do not make connections while the power is on, because sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the panel PC.

1. Unlock the back door and open it.
2. Set up the CPU's voltage and frequency ratio jumpers, located beside the CPU socket (refer to Chapter 3).
3. Open the CPU socket by pulling up the lever sideways from the socket, then upwards at an angle of 90 degrees.
4. Insert the CPU with the correct orientation. The notched corner of the CPU (with the white dot) should point toward the end of the lever. The end of the lever is the blank area where one hole is missing from the corner of the square array of pin holes. An arrowhead printed on the motherboard points to the end of the lever.
5. Slide the CPU in gently. It should insert easily. If not, pull the lever up a little more and make sure the pins of the CPU correspond with the holes of the socket. DO NOT USE EXCESSIVE FORCE!
6. Press the lever down. The plate will slide forward.
7. Place the heat sink on top of the CPU, and secure it with the heat sink clip.
8. Connect the CPU's cooling fan power connector.

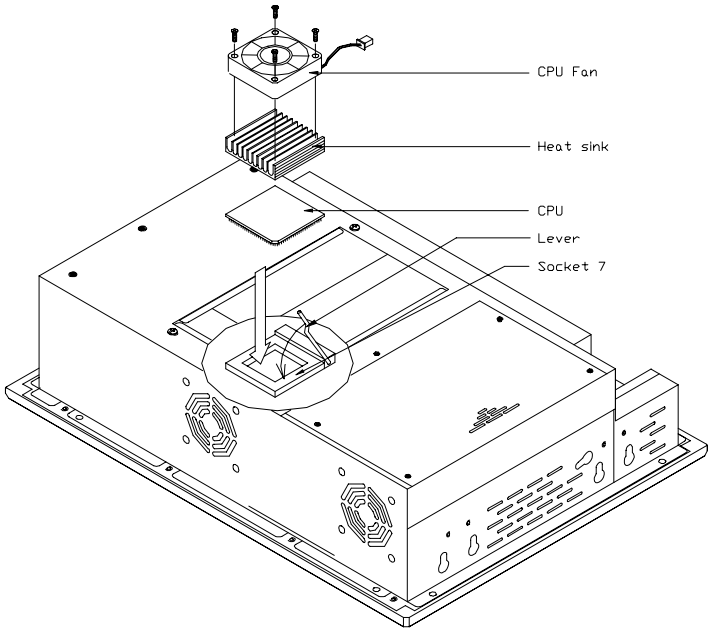


Figure 2-4: Installing a CPU

2.4 Installing a 2.5" HDD

The system supports one 2.5" slim type IDE HDD. The IDE controller, which uses a PCI local bus interface, allows the HDD to exceed 528 MB.

When installing an HDD, follow these steps:

1. Unlock the back door and open it.
2. Unscrew the bolt in the center of the HDD-FDD bracket.
3. Detach the FDD flat cable.
4. Adjust the CPU's jumper setting (refer to Section 3.2).
5. Remove the five screws on the back case (see Fig. 2-5).
6. Take out the HDD-FDD bracket.
7. Remove the four screws in the bottom of the HDD-FDD bracket (see Fig. 2-6).
8. There are two HDD support assemblies. Unscrew the two screws on the side of each HDD support assembly.
9. Mount the HDD support assemblies, one on each side of the HDD.
10. Fasten the four screws in the bottom of the HDD-FDD bracket (see Fig. 2-6).
11. Put in the HDD-FDD bracket.
12. Fasten the five screws on the back case (see Fig. 2-5).
13. Attach the FDD flat cable.
14. Fasten the bolt in the center of the HDD-FDD bracket.
15. Close the back door and lock it.

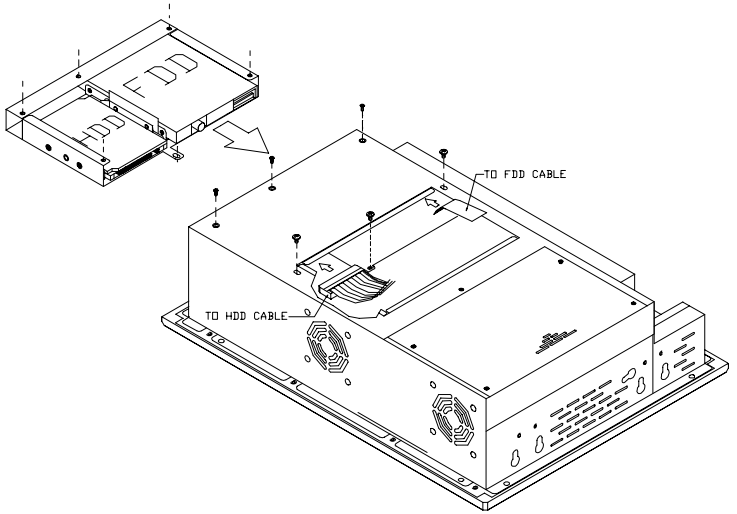


Figure 2-5: Removing the back case screws

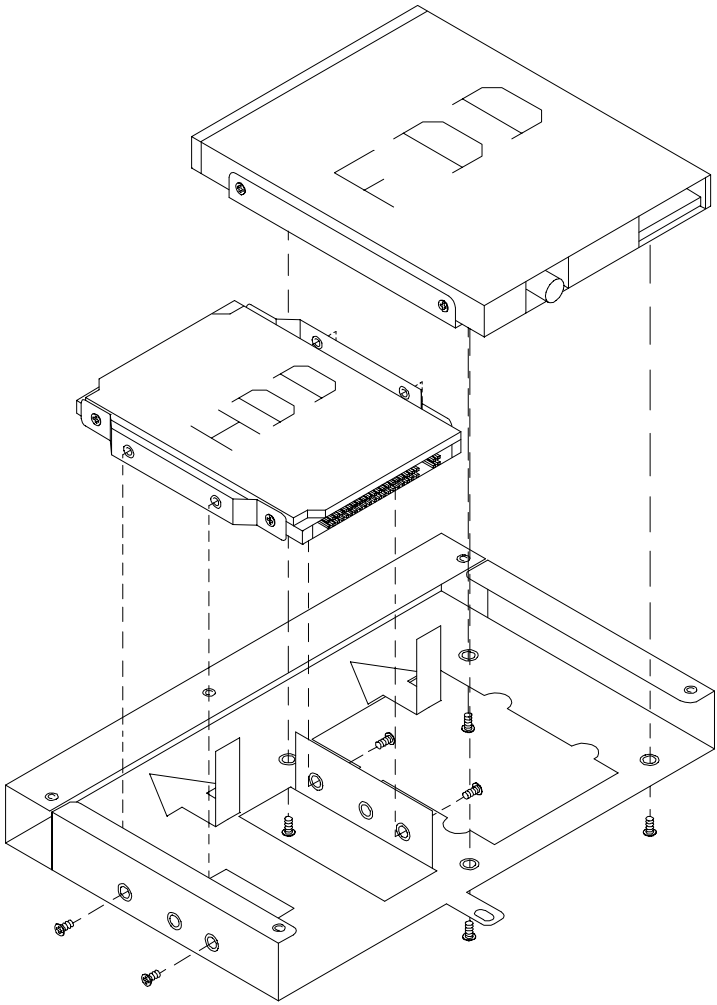


Figure 2-6: Removing the HDD/FDD bracket screws

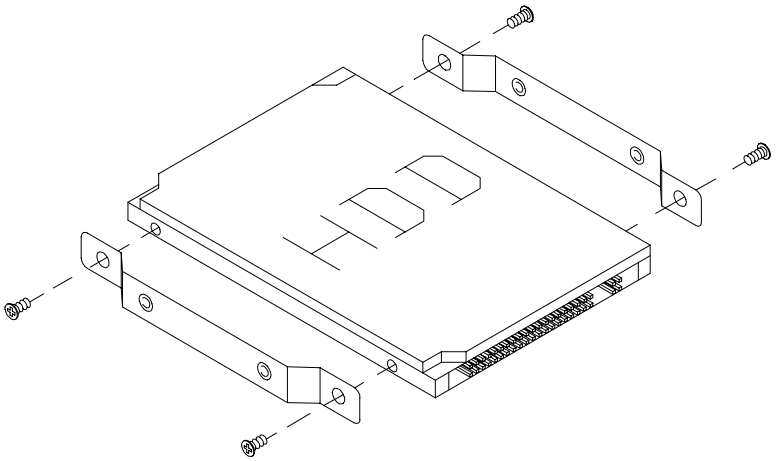


Figure 2-7: Assembling the HDD

2.5 Installing a CD-ROM Drive

One slim type CD-ROM drive can be installed in the system. Before installing the CD-ROM drive, take out the FDD-HDD bay. (Refer to Section 2.4)

1. Remove the three screws on the bottom of back case (see Fig. 2-8).
2. Pull out the drive bay cage, and attach the CD-ROM drive's cable to connector J9 on the motherboard.
3. Install "CDR-950-24X" into the drive bay by inserting it directly into the end. Then attach the cable to the CD-ROM drive.
4. The securing ("fix") clip is located on back of the CDR-950-24X. Move the short arm of the clip so that the lug at its end engages into the hole in the long arm of the clip. Then press the connector tightly onto the CD-ROM. (See Fig. 2-9.)

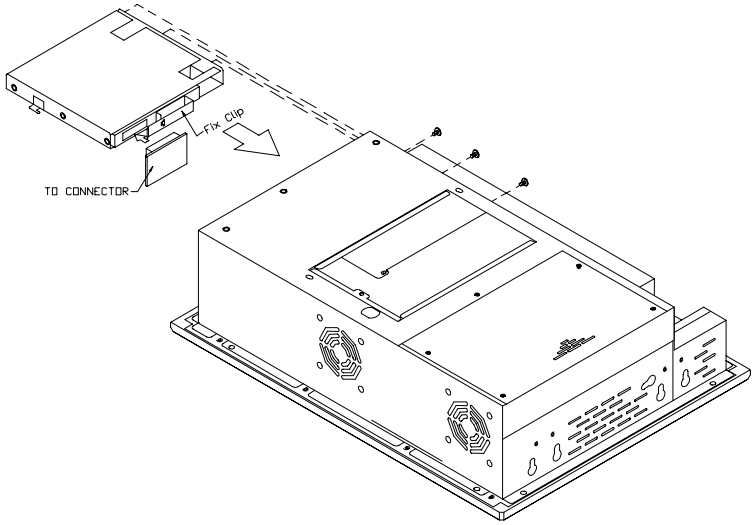


Figure 2-8: Removing the back case screws

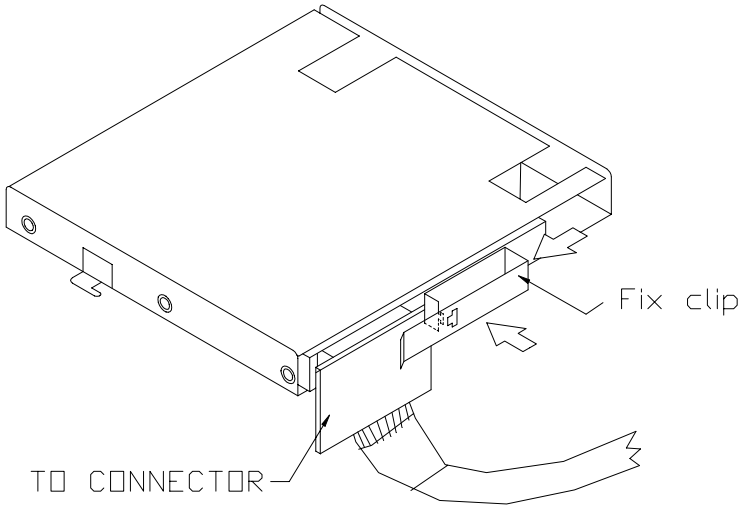


Figure 2-9: Attaching the connector to the CD-ROM

2.6 Installing Add-on Cards

This system supports one PCI or ISA expansion card.

1. Detach the five screws on the back to open the lid.
2. Take away the adapter bracket by detaching the screw which is mounted in the little box (see Fig. 2-10).
3. Insert the add-on card, and put on the lid.

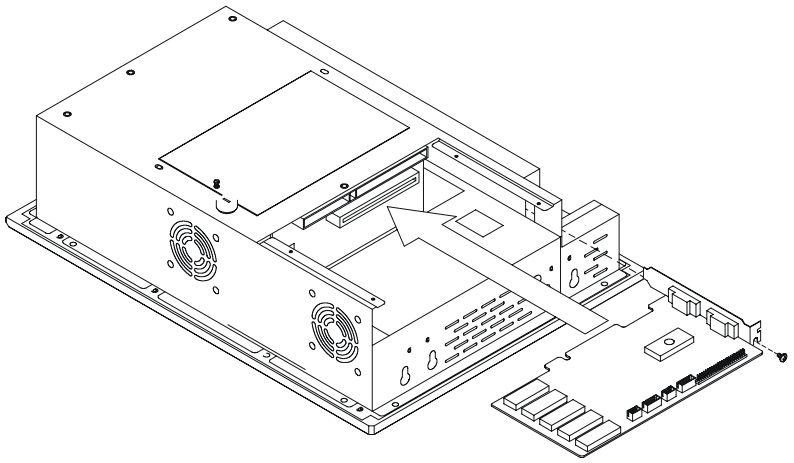


Figure 2-10: Installing an add-on card

2.7 Mounting Instructions

There are two ways to mount the system: panel mounting or rack mounting.

2.7.1 Panel mounting

1. Take the four mounting brackets out of the accessory box.
2. Attach the four mounting brackets by inserting the screws into the keyhole slots on the cover of the monitor.
3. Use the screws to secure the brackets to the cover. Tighten the screws to secure the monitor to the back panel.

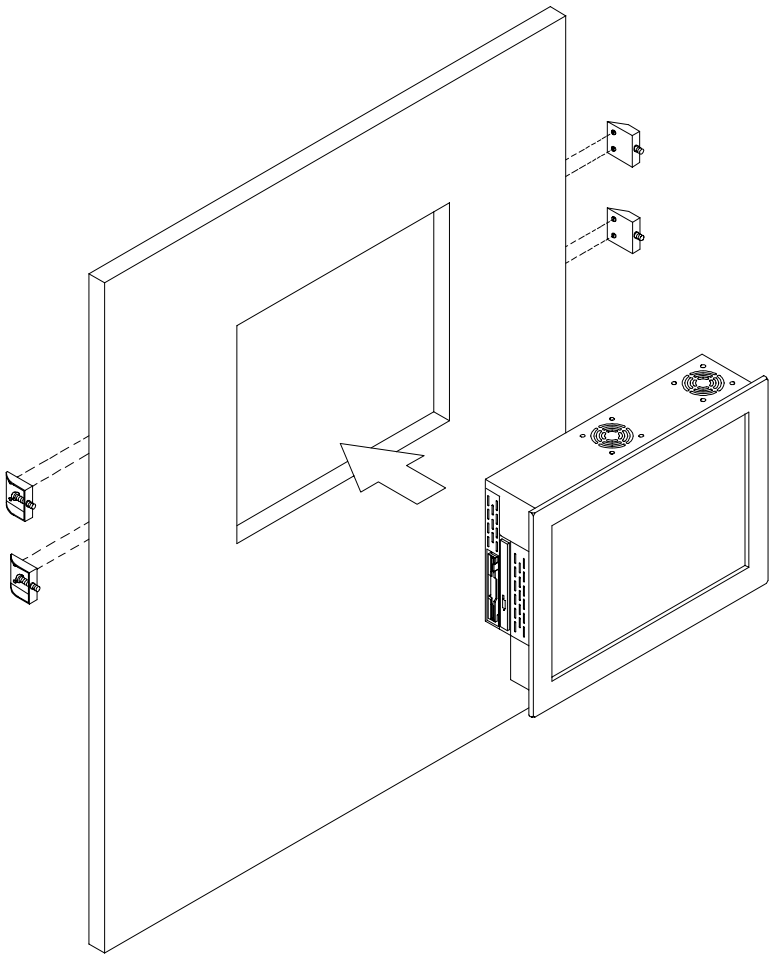


Figure 2-11: Panel mounting

2.7.2 Rack mounting

The monitor can be mounted to a 19" industrial rack. Please order the optional bracket "IPPC-950 Rack-MT".

Mount the monitor to the bracket by following the instructions in Section 2.7.1 on the previous page. Then attach the bracket with the monitor to the 19" industrial rack. (See Fig. 2-12.)

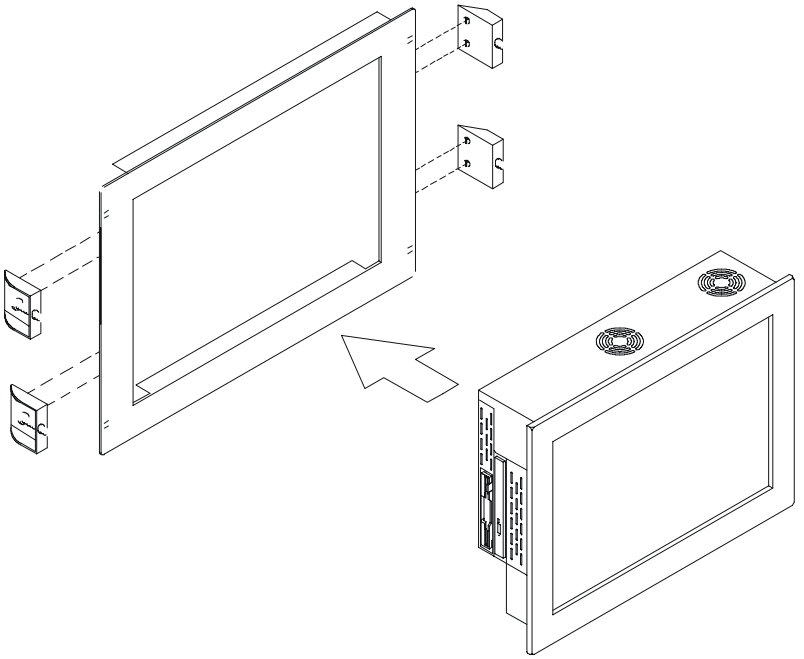
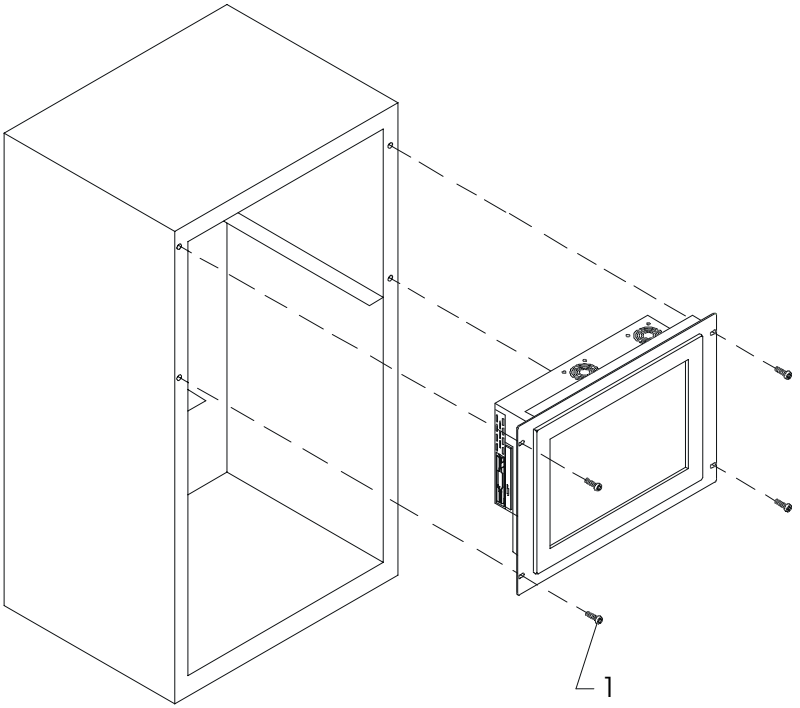


Figure 2-12: Mounting the IPPC-920/950 Series into a frame



Item	Part Name	Quantity
1	Screw M5x10	4

Figure 2-13: Mounting the IPPC-920/950 Series and frame assembly into a rack

CHAPTER 3

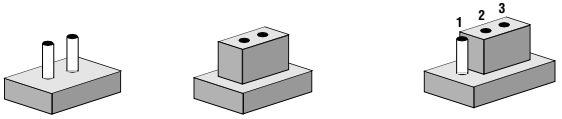
Jumper Settings and Connectors

- Jumpers and Connectors
- CPU Installation and Upgrading
- COM-port Interface
- VGA Interface
- Watchdog Timer Configuration

3.1 Jumpers and Connectors

3.1.1 Setting jumpers

You can configure your panel PC 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, you would connect either pins 1 and 2 or pins 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.

3.1.2 Jumpers

The motherboard of the panel PC 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's jumpers:

Table 3-1: Jumpers and their functions

Label	Function
JP1	COM3 RI pin setting (Reserved)
JP2	COM4 RI pin setting (Reserved)
JP3	COM2 RS-232/422/485 setting
JP4	COM2 RS-232/422/485 setting
JP5	COM2 RS-232/422/485 setting
JP6	Panel V_{CC} setting
JP7	ENVEE pin setting
JP8	PCI bus clock setting
JP9	Panel type select
JP10	Cyrix linear mode enable
JP11	System/PCI clock setting
JP12	CMOS clear for external RTC
JP13	CPU V_{CORE} voltage setting
JP14	CPU frequency ratio setting
JP15	Watchdog timer action
JP16	Reset
JP17	CMOS clear for 5582 internal RTC (Reserved)
JP18	AT/ATX power select (Reserved)

3.1.3 Locating jumpers

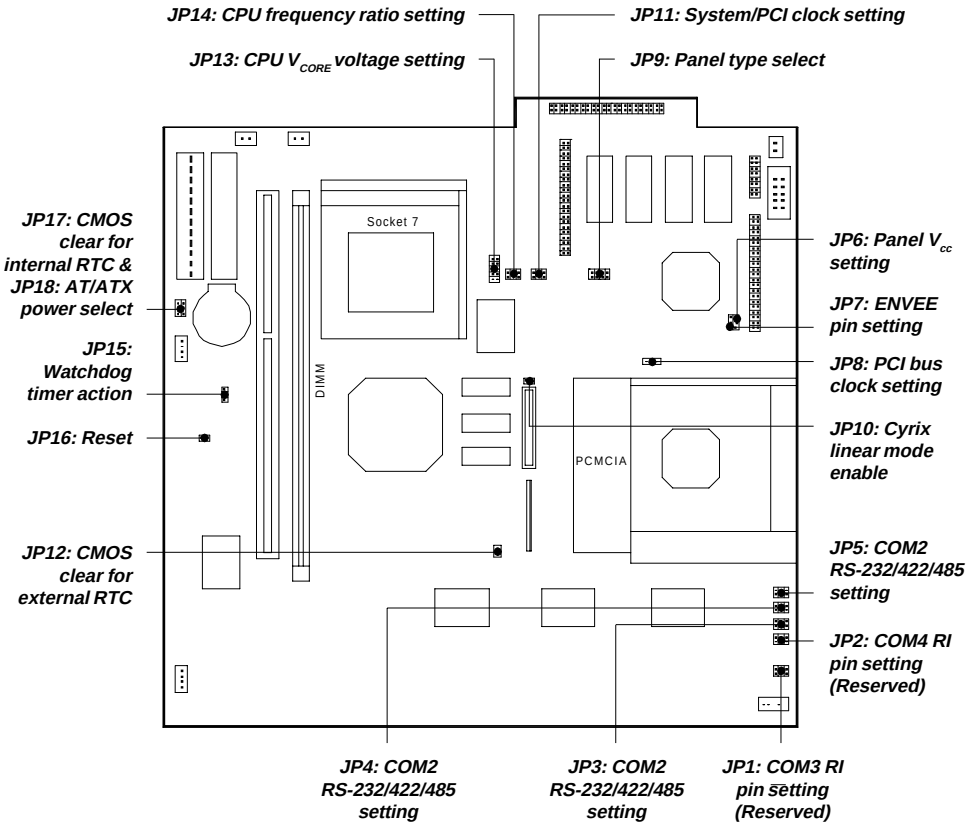


Figure 3-1: Locating jumpers on the IPPC-920/950 Series motherboard

3.1.4 Connectors

On-board connectors link the panel PC 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: Connectors and their functions

Label	Function
J1	IR connector
J2	Flat panel display connector
J3	Flat panel display connector
J4	Internal COM4 connector
J5	Touchscreen power connector
J6	Sandisk SSD connector
J7	EIDE hard disk driver connector
J8	Floppy driver connector
J9	CD-ROM connector
J10	CPU fan power connector
J11	PCI/ISA bus expansion connector
J12	Fan power connector
J13	AT power connector
J14	ATX power connector (Reserved)
J15	Internal speaker connector
J16	Inverter power connector

3.1.5 Locating connectors

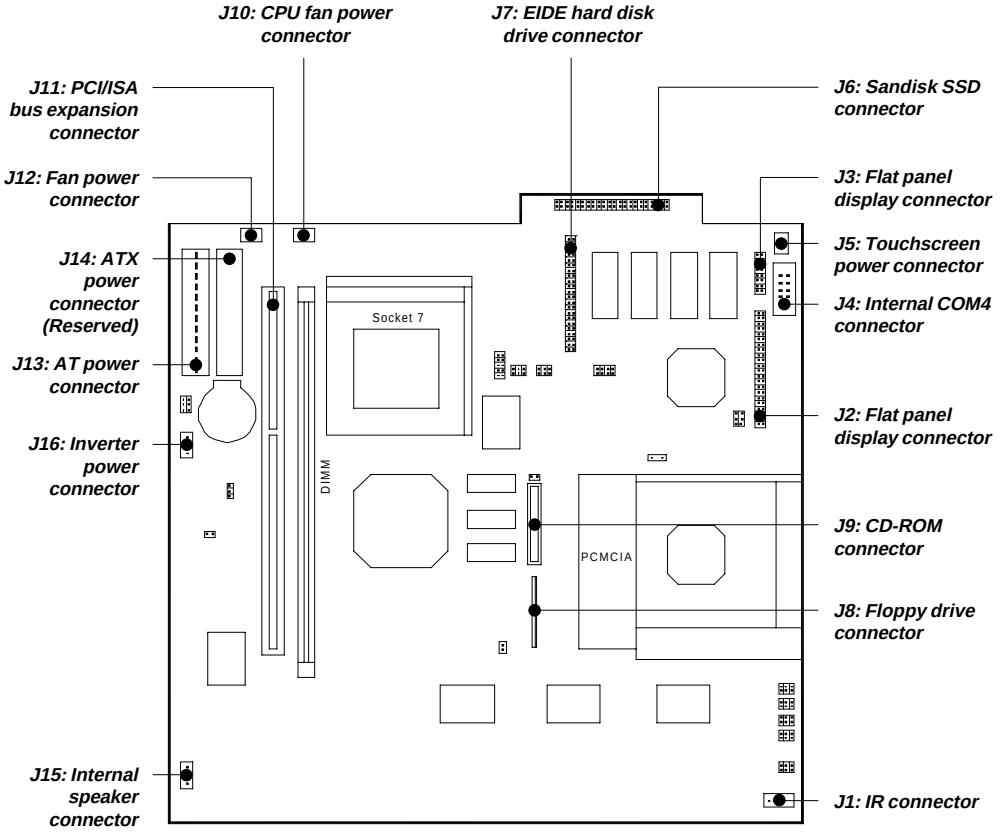


Figure 3-2: Locating connectors on the IPPC-920/950 Series motherboard

3.2 CPU Installation and Upgrading

You can use either a Pentium®, AMD or Cyrix processor at any time. The frequency ratio setting is fixed at 66 MHz.

3.2.1 System clock setting (JP11, JP8)

JP11 and JP8 are used to set the CPU and PCI bus speeds respectively, to optimize the system's performance. The system chipset will sense the JP8 setting to get the bus frequency, then adjust its internal timing. JP11 is used to set the CPU and PCI clock. Refer to the CPU speed reference table for instructions on adjusting the internal clocks according to the base CPU speed.

Table 3-3: System/PCI clock setting (JP11)

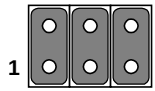
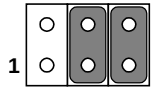
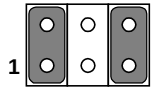
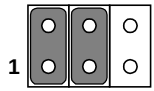
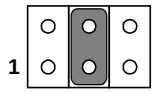
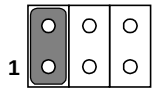
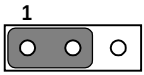
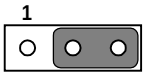
PCI clock	CPU clock	
25 MHz	50 MHz	
30 MHz	60 MHz	
33 MHz	66 MHz	
28 MHz	55 MHz	
38 MHz	75 MHz	
42 MHz (Reserved)	83 MHz	

Table 3-4: PCI bus clock setting (JP8)

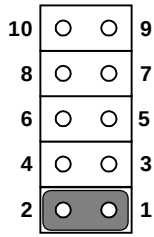
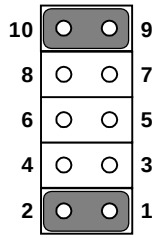
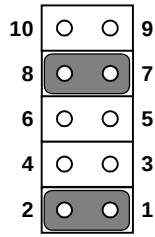
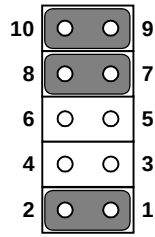
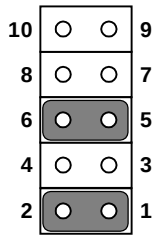
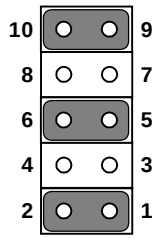
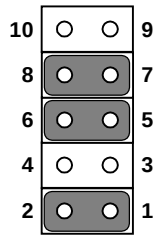
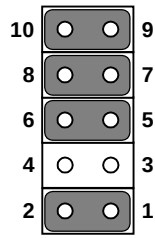
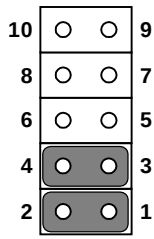
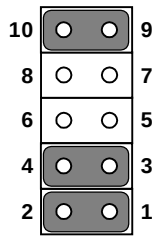
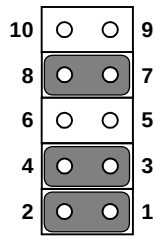
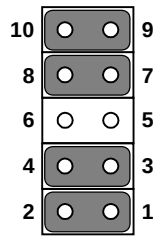
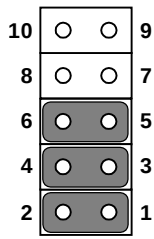
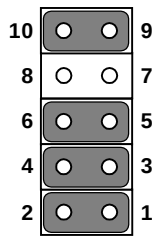
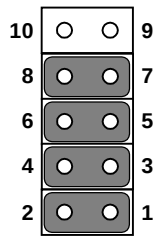
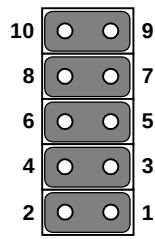
PCI clock
* CPUCLK/2 
32MHz 

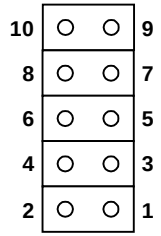
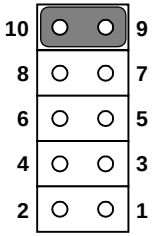
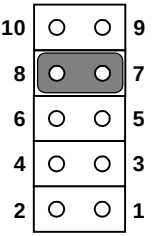
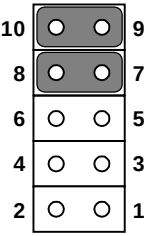
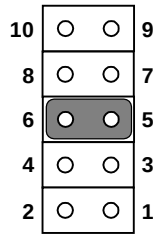
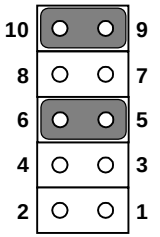
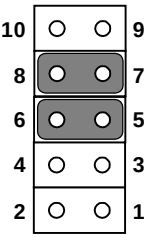
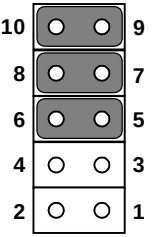
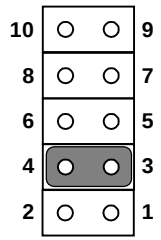
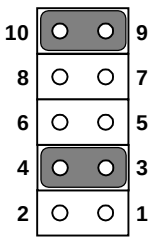
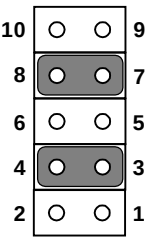
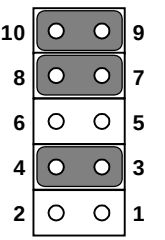
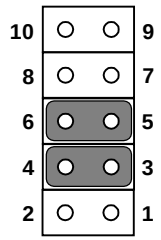
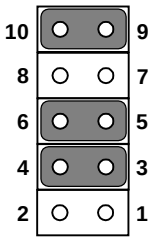
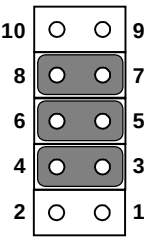
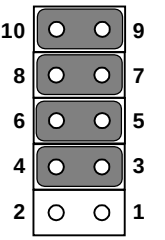
* default setting

3.2.2 CPU core voltage setting (JP13)

JP13 must be set to match the CPU type. The following chart shows the proper jumper settings for their respective $V_{CC\ (CORE)}$. (The $V_{CC\ (I/O)}$ for the CPU is fixed at 3.3 V.)

Table 3-5: CPU voltage setting (JP13)

$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$
1.30 V	1.35 V	1.40 V	1.45 V
			
1.50 V	1.55 V	1.60 V	1.65 V
			
1.70 V	1.75 V	1.80 V	1.85 V
			
1.90 V	1.95 V	2.00 V	2.05 V
			

$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$	$V_{CC\ (CORE)}$
NONE	2.10 V	2.20 V	2.30 V
			
2.40 V	2.50 V	2.60 V	2.70 V
			
2.80 V	2.90 V	3.00 V	3.10 V
			
3.20 V	3.30 V	3.40 V	3.50 V
			

3.2.3 CPU frequency ratio setting (JP14)

Table 3-6: CPU frequency ratio (for Intel) (JP14)

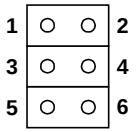
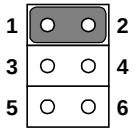
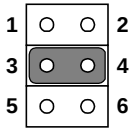
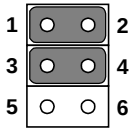
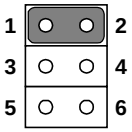
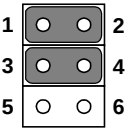
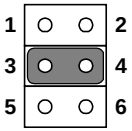
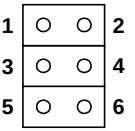
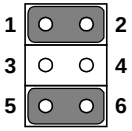
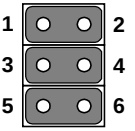
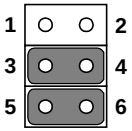
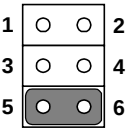
P55C	P54C	
3.5x	1.5x	
2x	2x	
3x	3x	
2.5x	2.5x	

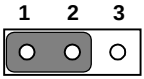
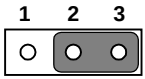
Table 3-7: CPU frequency ratio (for AMD K6) (JP14)

2x 	2.5x 
3x 	3.5x 
4x 	4.5x 
5x 	5.5x 

3.2.4 CMOS clear for external RTC (JP12)

Warning: *To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS". Set the jumper back to "3.0 V Battery On" before turning on the power supply.*

Table 3-8: Clear CMOS/External RTC (JP12)

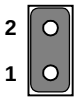
* Normal operation	
Clear CMOS	

* default setting

3.2.5 Cyrix linear mode enable (JP10)

The panel PC supports a Cyrix M1 CPU with its linear access mode on L2 cache. This mode is set via JP10.

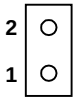
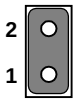
Table 3-9: Cyrix linear mode enable (JP10)

* open = disable (normal operation)	
closed = Cyrix linear mode	

* default setting

3.2.6 Reset system (JP16)

Table 3-10: Reset system (JP16)

* open = normal operation	
closed = reset system	

* default setting

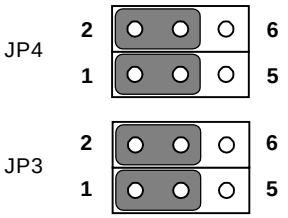
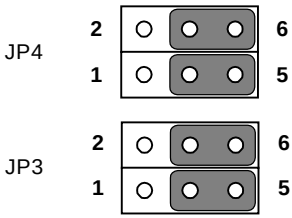
3.3 COM-port Interface

The panel PC provides four serial ports (COM1, 3, 4: RS-232; COM2: RS-232/422/485) in one COM port connector.

3.3.1 COM2 RS-232/422/485 setting (JP3, JP4, JP5)

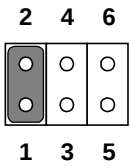
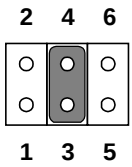
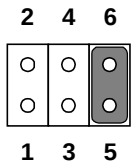
COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode. This is done via JP6 and JP5.

Table 3-11: COM2 RS-232/422/485 setting (JP3, JP4)

* RS-232	RS-422/485
	

* default setting

Table 3-12: COM2 RS-232/422/485 setting (JP5)

* RS-232	RS-422	RS-485
		

* default setting

The IRQ and the address ranges 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 overleaf shows the default settings for the panel PC's serial ports.

COM1 and COM2 are one set. You can exchange the address range and interrupt IRQ of COM1 for the address range and interrupt IRQ of COM2. After exchanging, COM1's address range is 2F8 ~ 2FF and its request IRQ is IRQ3: and COM2's address range is 3F8 ~ 3FF and its interrupt IRQ is IRQ4.

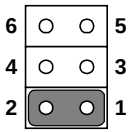
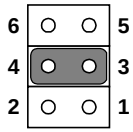
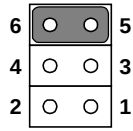
COM3 and COM4 are another set. Their selectable function is the same as the COM1/COM2 set.

Table 3-13: Serial port default settings

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

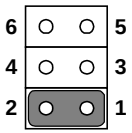
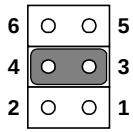
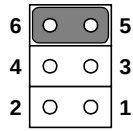
3.3.2 COM3/COM4/RI pin setting (JP2, JP1) (reserved)

Table 3-14: COM4/RI pin setting (JP2)

+5 V output	+12 V output	* RI output
		

* default setting

Table 3-15: COM3/RI pin setting (JP1)

+5 V output	+12 V output	* RI output
		

* default setting

3.4 VGA Interface

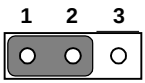
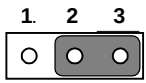
The panel PC's's PCI SVGA interface can drive conventional CRT displays. It is also capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The board has two connectors to support these displays simultaneously; one for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

The pin assignments for the flat panel display connector, backlight connector and other related connectors are detailed in Appendix C.

3.4.1 LCD panel power setting (JP6)

The panel PC's's PCI SVGA interface supports 5 V and 3.3 V LCD displays. By changing the setting of JP6, you can select the panel video signal level to be 5 V or 3.3 V.

Table 3-16: Panel V_{CC} setting (JP6)

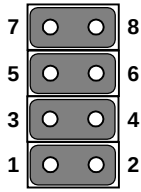
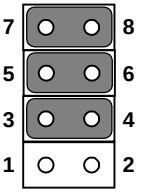
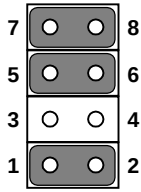
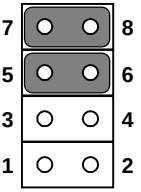
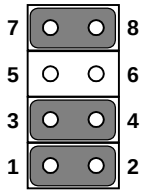
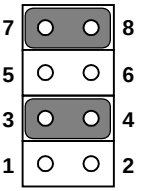
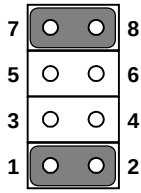
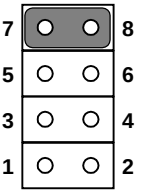
* 5 V		3.3 V	

* default setting

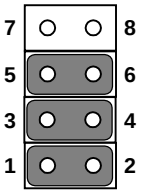
Configuration of the VGA interface is done exclusively via the software utility. You do not have to set any jumpers. Refer to Chapter 4 for software setup details.

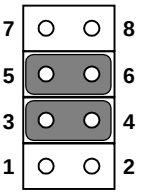
3.4.2 Panel type select (JP9)

Table 3-17: Panel type select (JP9)

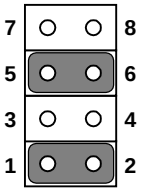
	Maximum Resolution	Display Type		Maximum Resolution	Display Type
1.	1024 x 768	DSTN color	2.	1280 x 1024	TFT color
					
3.	640 x 480	DSTN color	4.	800 x 600	DSTN color
					
5.	640 x 480	TFT color	6.	640 x 480	18-bit TFT color
					
7.	1024 x 768	TFT color	8.	800 x 600	TFT color
					

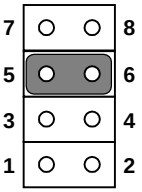
Maximum Resolution	Display Type	Maximum Resolution	Display Type
9. 800 x 600	TFT color (44 K BIOS only)	10. 800 x 600	TFT color



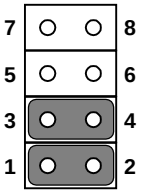


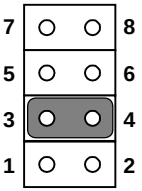
11. 800 x 600	DSTN color (44 K BIOS only)	12. 800 x 600	DSTN color



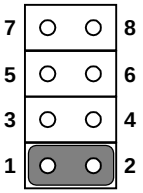


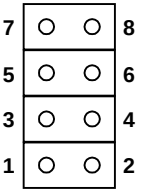
13.1024 x 768	TFT color (44 K BIOS only)	14. 1280 x 1024	DSTN color (44 K BIOS only)





15. 1024 x 600	TFT color (48•K BIOS only)	16. 1024 x 600	TFT color





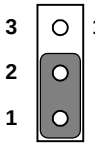
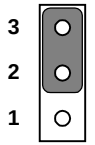
3.5 Watchdog Timer Configuration

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

3.5.1 Watchdog activity selection (JP15)

When the watchdog timer activates (i.e. CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ11. This can be set via jumper JP15 as shown below:

Table 3-18: Watchdog activity selection (JP15)

* System reset	IRQ11
	

* default setting

CHAPTER 4

PCI XGA/SVGA Setup

- Introduction
- Installation of SVGA Driver
  - for Windows 95
  - for Windows 98/NT
- Further Information

4.1 Introduction

The IPPC-920/950 Series has an on-board PCI flat panel/VGA interface. The specifications and features are described below.

4.1.1 Chipset

The IPPC-920/950 Series uses a C&T 65555 chipset for its PCI/SVGA controller. It supports LCD, EL, and gas plasma flat panel displays as well as conventional analog CRT monitors. The 65555 VGA BIOS supports monochrome LCD, EL, color TFT and STN LCD flat panel displays. In addition, it also supports interlaced and non-interlaced analog monitors (color and monochrome VGA) 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 handled as if they were analog monitors.

4.1.2 Display memory

With on-board 2 MB display memory, the VGA controller can drive CRT displays or color panel displays with resolutions up to 1024 x 768 @ 64 K colors.

4.1.3 Display types

CRT and panel displays can be used simultaneously. The IPPC-920/950 Series 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. The CD-ROM disc includes three *.COM files in the subdirectory `Utility\vga\` which can be used to configure the display. In order to use these configuration programs, type the file name and path at the DOS prompt.

CT.COM: Enables CRT display only

FP.COM: Enables panel display only

SM.COM: Enables both displays simultaneously

4.2 Installation of SVGA Driver

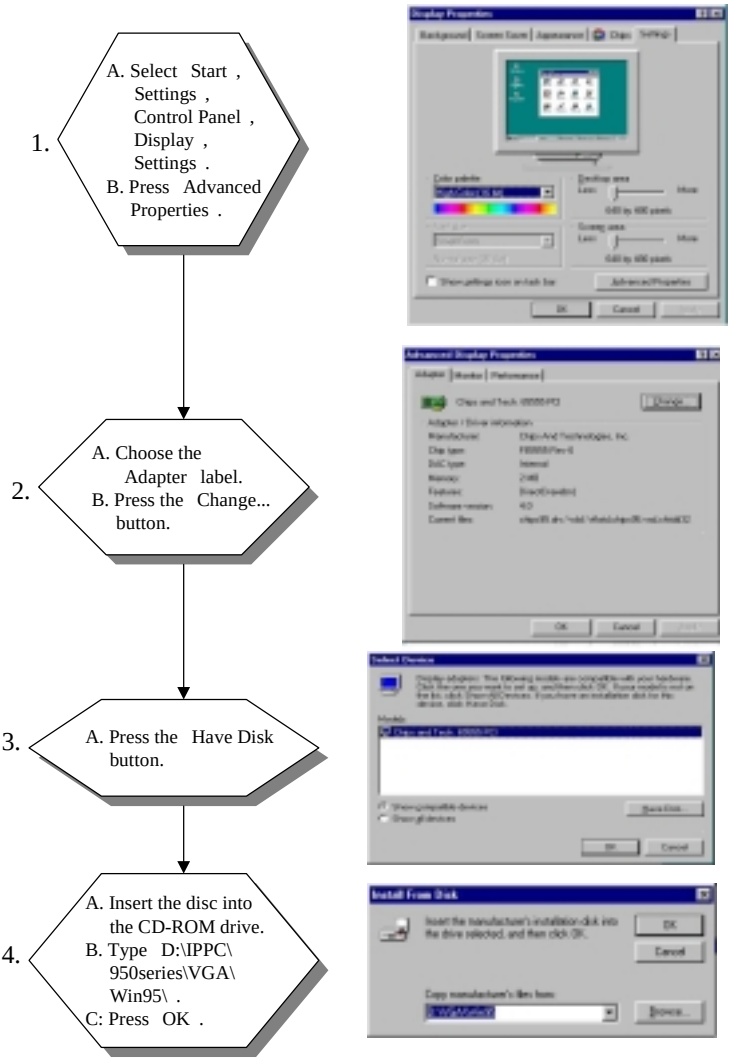
To install the SVGA driver, follow the procedures in the flow chart that apply to the operating system that you are using within your IPPC-920/950 Series.

Important: 1. The following windows illustrations are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.
2. The resolution of the IPPC-920 is 800 x 600 pixels (SVGA), whereas the resolution of the IPPC-950 is 1024 x 768 pixels (XVGA).

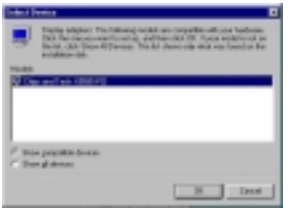
Note 1: The CD-ROM drive is designated as the "D:" drive throughout this chapter.

Note 2: <Enter> means pressing the “Enter” key on the keyboard.

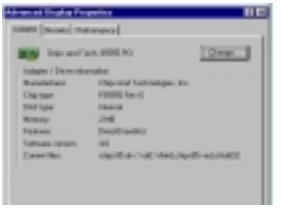
4.2.1 Installation for Windows 95



5. A. Select the highlighted item.
B. Click the OK button.



6. A. C&T65555 appears in the Adapter label.
B. Click the Apply button, then click OK .

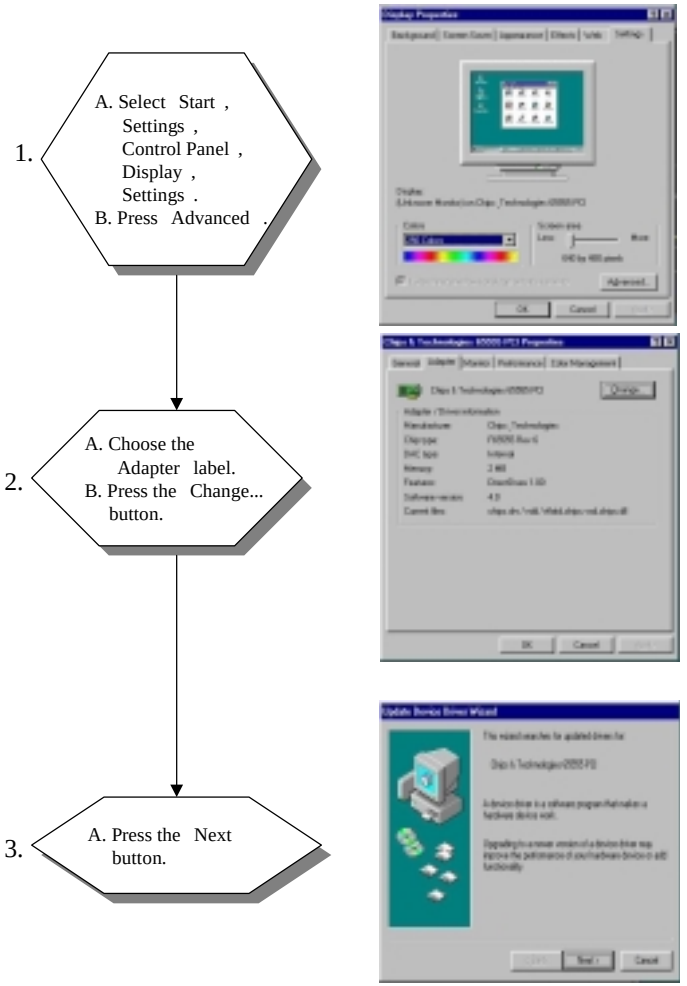


7. A. Adjust Screen area to:
1. 1024 by 768 pixels for IPPC-950.
2. 800 by 600 pixels for IPPC-920.
B. Click the Apply button.

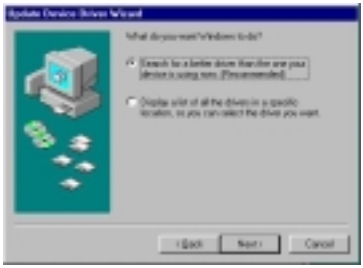
8. A. Click No to exit the window.

9. A. Click OK , whereupon the display will jump to full screen size.

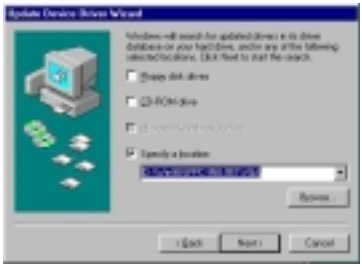
4.2.2 Installation for Windows 98/NT



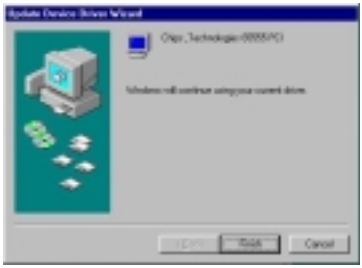
4. A. Choose the upper dialog icon.
B. Press Next .



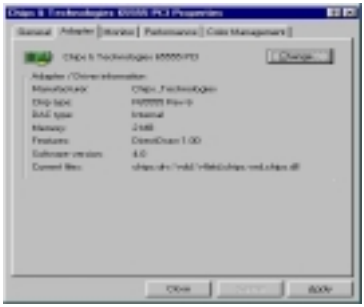
5. A. Insert the disc into the CD-ROM drive.
B. Choose the Specify a location icon.
C: Type D:\IPPC\950series\VGA\Win98(NT)
D: Press Next .



6. A. Click the Finish button.



7. A. Click the Apply button.



4.3 Further Information

For further information about PCI/SVGA installation in your IPPC-920/950 Series, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

C&T website: **www.chips.com**

Advantech websites: **www.advantech.com**
www.advantech.com.tw

CHAPTER 5

Ethernet Setup

- Introduction
- Installation of Ethernet Driver
  - for Windows 95
  - for Windows 98
  - for Windows NT
- Further Information

5.1 Introduction

The IPPC-920/950 is equipped with a high performance 32-bit Ethernet chipset which is fully compliant with 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.

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.

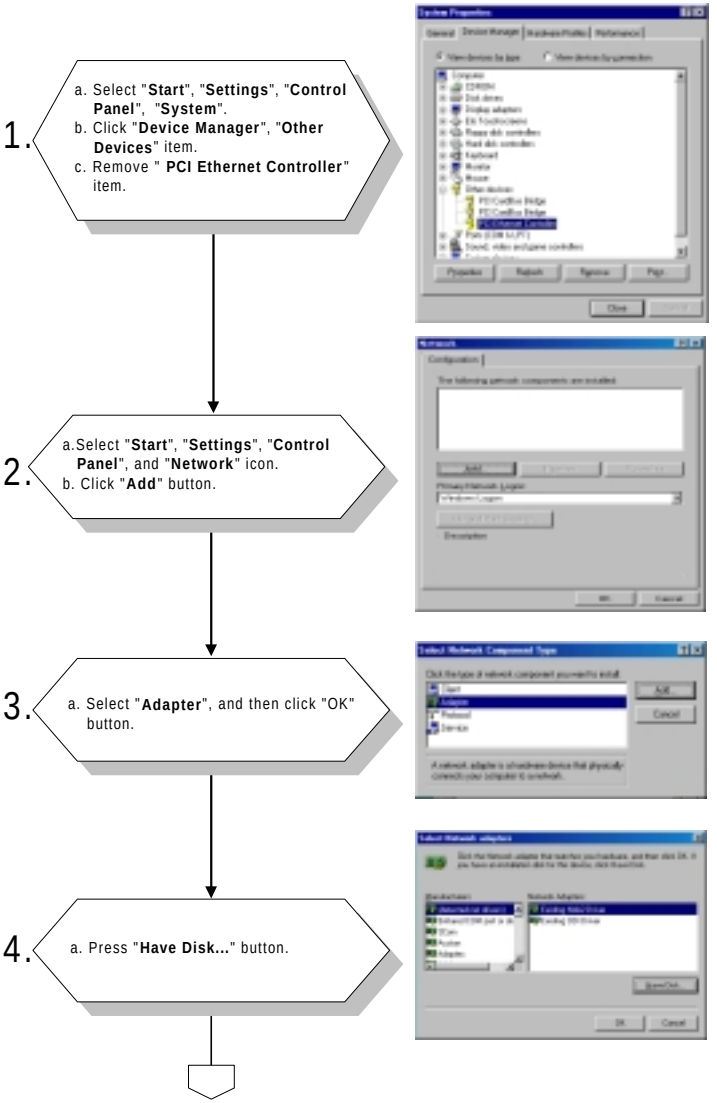
5.2 Installation of Ethernet Driver

Before installing the Ethernet driver, note the procedures below. Confirm which operating system you are using, and then refer to the corresponding installation flow chart. Then just follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for Windows.

Note 1: *The windows illustrations in this chapter are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.*

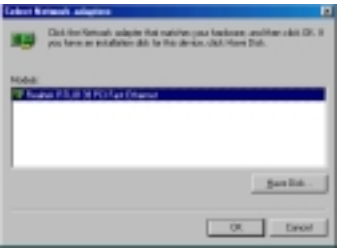
Note 2: *The CD-ROM drive is designated as the "D:" drive throughout this chapter.*

5.2.1 Installation for Windows 95

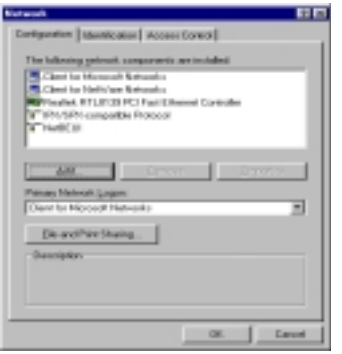


5. a. Type the path "**D:\LAN\WIN95**".
b. Click "**OK**" button.

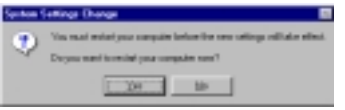
6. a.Choose the lightened "**Realtek...**" item.
b. Click "**OK**" button.



7. a. Press "**Add...**" button to select suitable services or protocol.
b. Press "**OK**" button to finish network configuration.

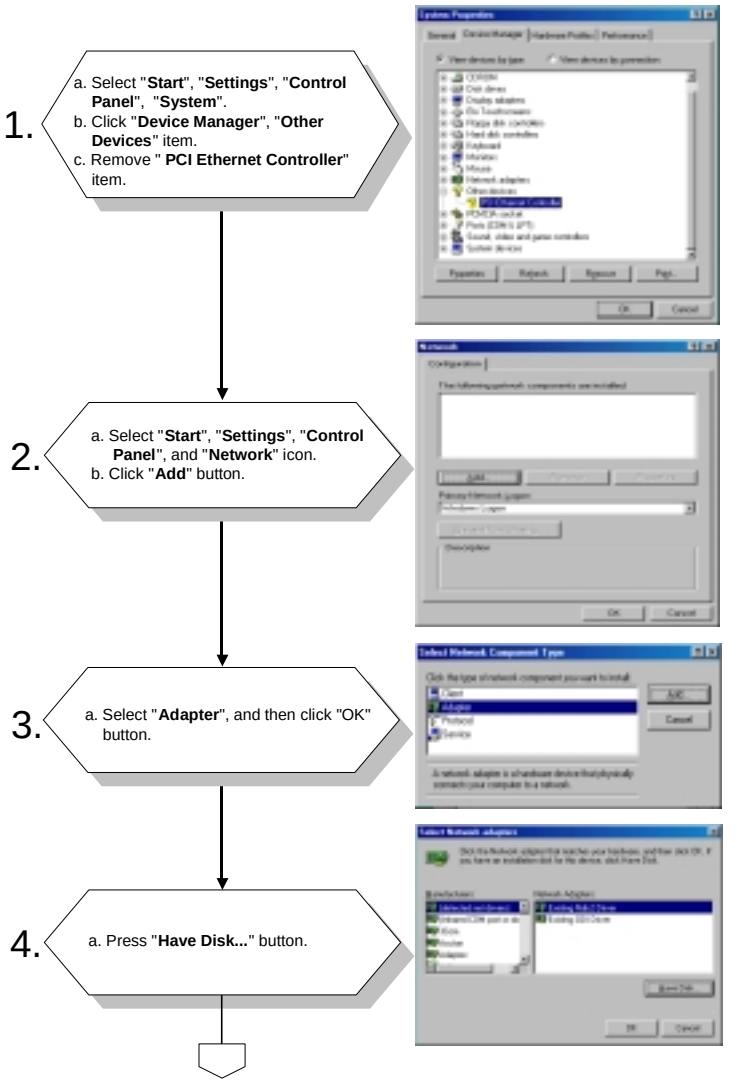


8. a. Press "**Yes**" button to start your computer.



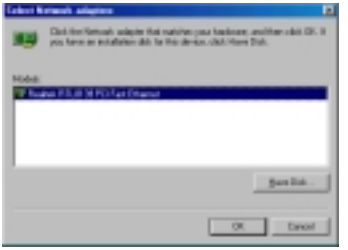
End

5.2.2 Installation for Windows 98

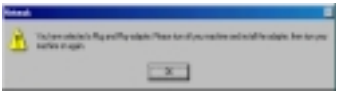


5. a. Type the path "**D:\LAN\WIN98**".
b. Click "**OK**" button.

6. a.Choose the lightened "**Realtek...**" item.
b. Click "**OK**" button.

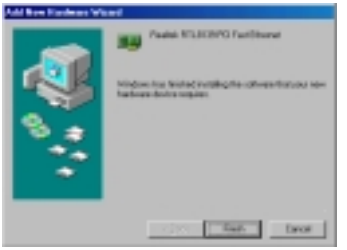


7. a. Press "**OK**" button to restart your computer.
b. After rebooting, Win98 will recognize RTL8139 and ask you to insert the "Windows98" CD-ROM.

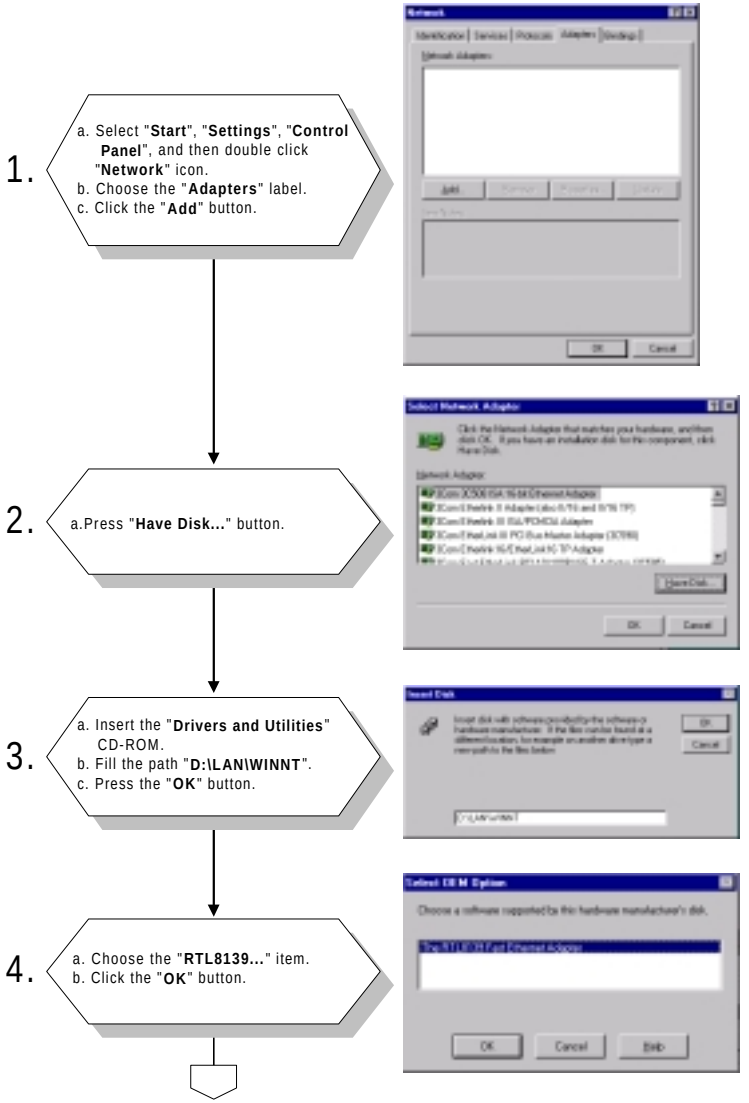


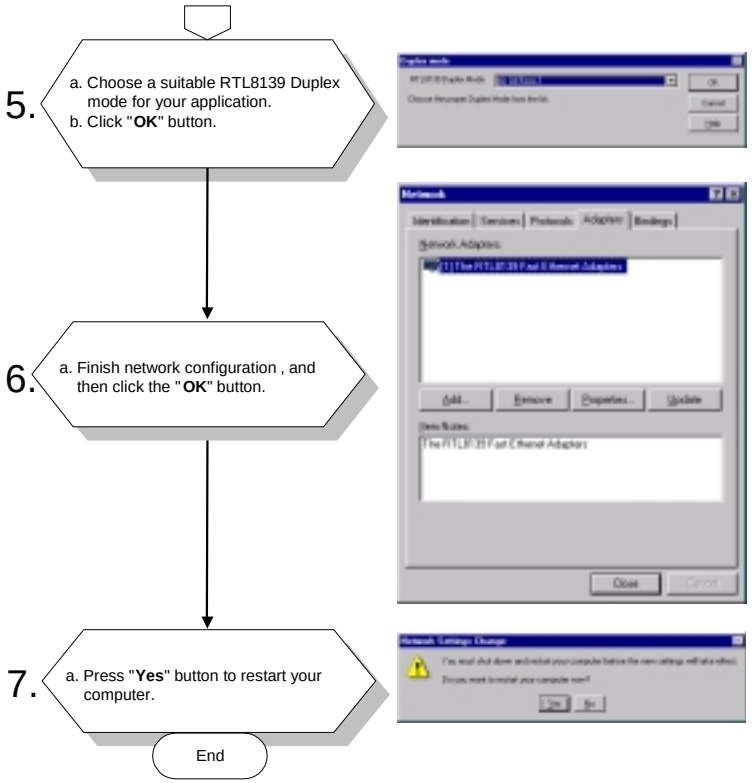
8. a. Press "**Finish**" button.

End



5.2.3 Installation for Windows NT




5.
a. Choose a suitable RTL8139 Duplex mode for your application.
b. Click "OK" button.
6.
a. Finish network configuration , and then click the "OK" button.
7.
a. Press "Yes" button to restart your computer.
End

5.3 Further Information

Realtek website: **www.realtek.com**

Advantech websites: **www.advantech.com**
www.advantech.com.tw

CHAPTER 6

Audio

- Introduction
- Installation of Audio Driver
  - for Windows 95
  - for Windows 98
  - for Windows NT
- Further Information

6.1 Introduction

The IPPC-920/950 Series' on-board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the ES1869 audio controller from ESS Technology, Inc. The audio interface can record, compress, and play back voice, sound, and music with a built-in mixer control. The IPPC-920/950 Series' on-board audio interface also supports the Plug and Play (PnP) standard, and provides PnP configuration for audio, FM, and MPU-104 logical devices. It is compatible with Sound Blaster, Sound Blaster Pro version 3.01, voice, and music functions. The ESFM synthesizer is register compatible with OPL3, and has extended capabilities.

6.2 Installation of Audio Driver

Before installing the audio driver, please read the procedures detailed below. You must know which operating system you are using in your IPPC-920/950 Series, and then refer to the corresponding installation flow chart. Just follow the steps in the flow chart. You can quickly and successfully complete the installation, even though you are not familiar with Windows.

Note 1: The windows illustrations in this chapter are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.

Note 2: The CD-ROM drive is designated as the "D:" drive throughout this chapter.

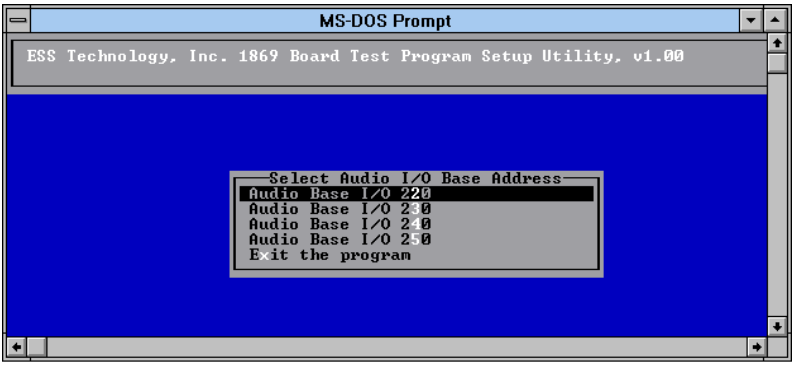
6.2.1 Installation for Windows 95

The ES1869 audio controller supports PC games and applications for Sound Blaster and SoundBlaster Pro, with no need for a device driver in a DOS environment. The default settings for the audio controller in DOS are:

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

6.2.2 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 CD-ROM. To change the settings, simply type DOSSET at the DOS prompt. Follow the instructions on screen to choose the new settings for the ES1869 audio controller.



6.2.3 Controlling volume in DOS

The ES1869 audio controller provides software control of the settings for audio volumes. The VOLUME CONTROL utility located in the `UTILITY\Audio\` subdirectory of the CD-ROM is used to control the volume settings in DOS. To control the volume settings, simply type "ESSVOL" at the DOS prompt with appropriate parameters. The script for ESSVOL is:

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

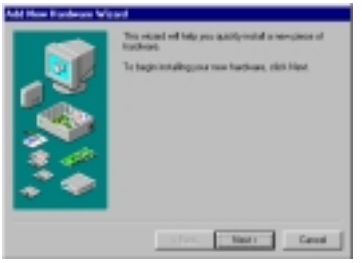
`no option`	Display all volume settings
`/?`	Display this message
`/v`	Change master volume
`/l`	Change line volume
`/w`	Change wave volume
`/m`	Change microphone volume
`/c`	Change CD volume
`/s`	Change synthesizer volume
`/a`	Change AuxB volume
`/p`	Change PC speaker volume
`xx`	Volume. Note: no `xx` means 0

The value range for volume is 0 ~ 15.

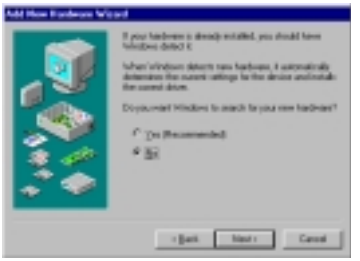
(The PC speaker volume range is 0 ~ 7.)

6.2.4 Installation for Windows 95

1. a. Remove items related to **ESS1869** in "**Other devices**" folder of Device Manager.
   b. Click "Close" button to escape " **Device Manager**".
   c. Click the "Add new hardware" icon, Then click "Next".

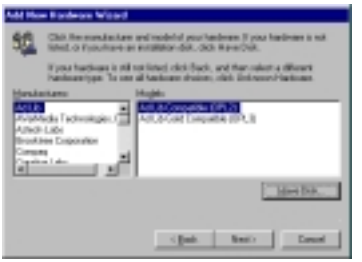


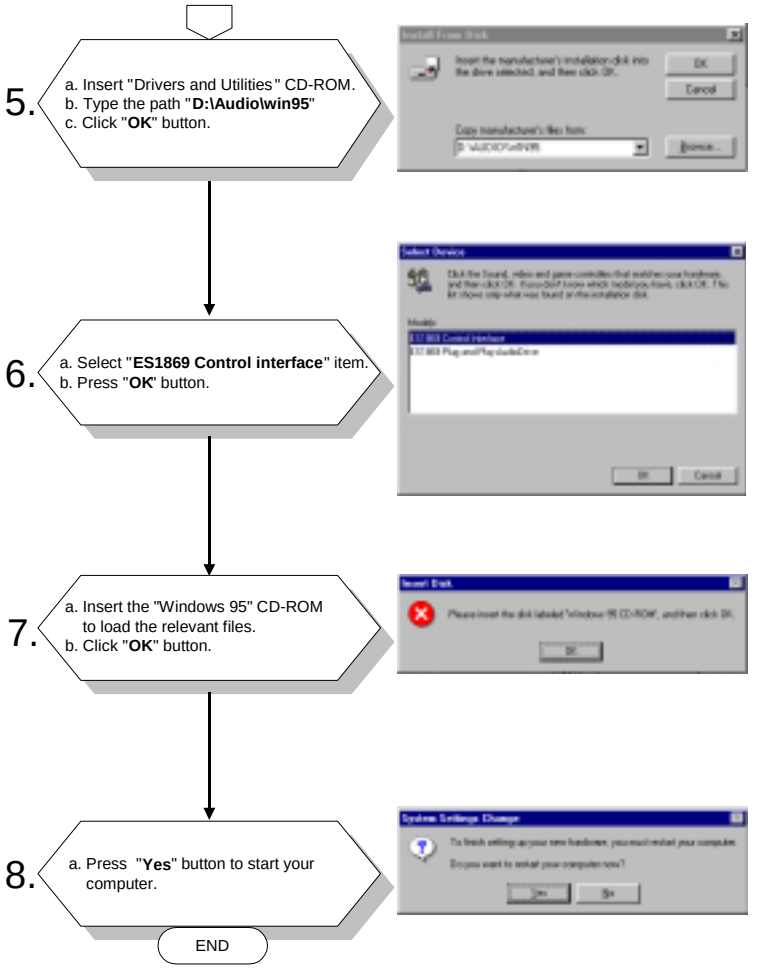
2. a. Select "**No**", and then click "**Next**" button.



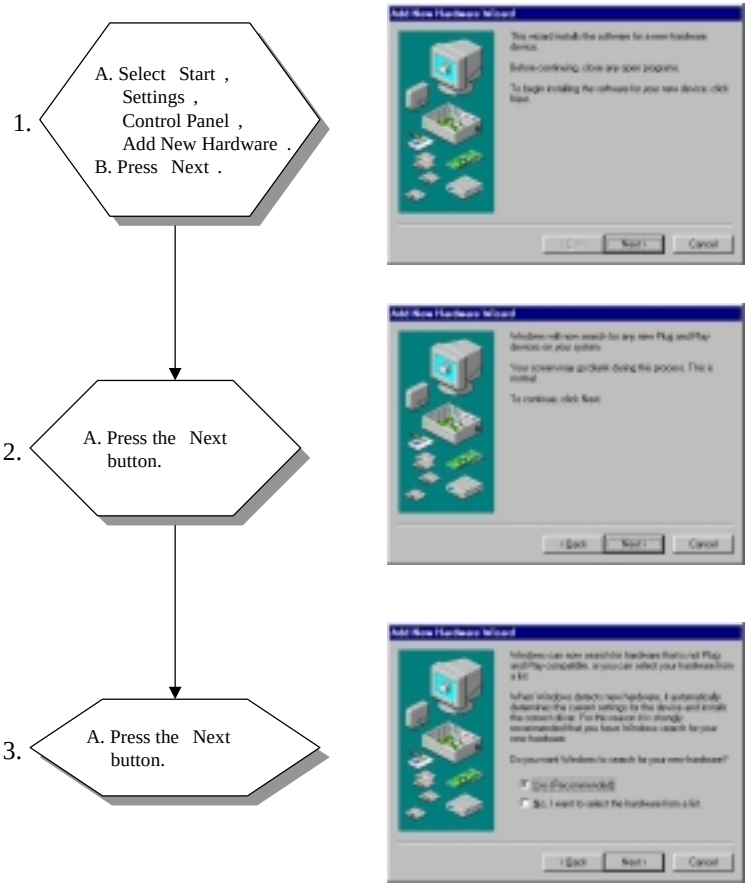
3. a. Choose "**Sound, Video and game controllers**" item.
   b. Click "**Next**" button.

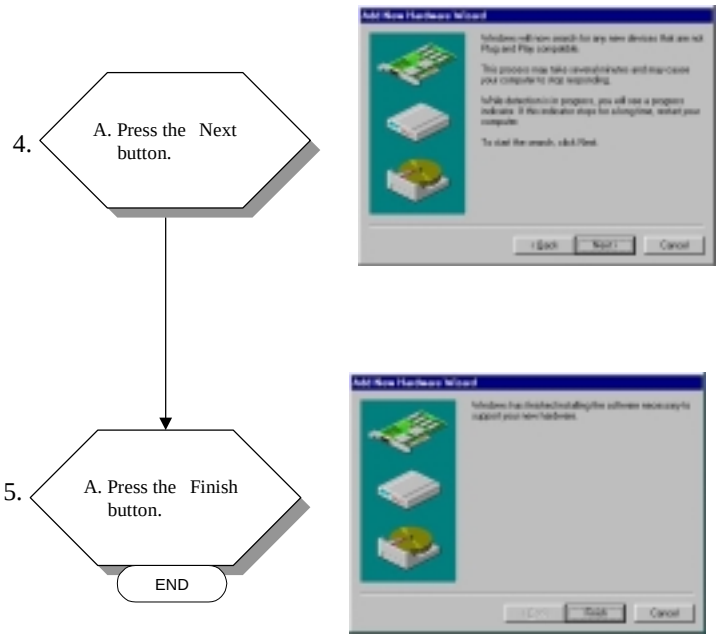
4. a. Press "**Have Disk...**" button.




5.
a. Insert "Drivers and Utilities" CD-ROM.
b. Type the path "D:\Audio\win95"
c. Click "OK" button.
6.
a. Select "ES1869 Control interface" item.
b. Press "OK" button.
7.
a. Insert the "Windows 95" CD-ROM to load the relevant files.
b. Click "OK" button.
8.
a. Press "Yes" button to start your computer.
END

6.2.5 Installation for Windows 98



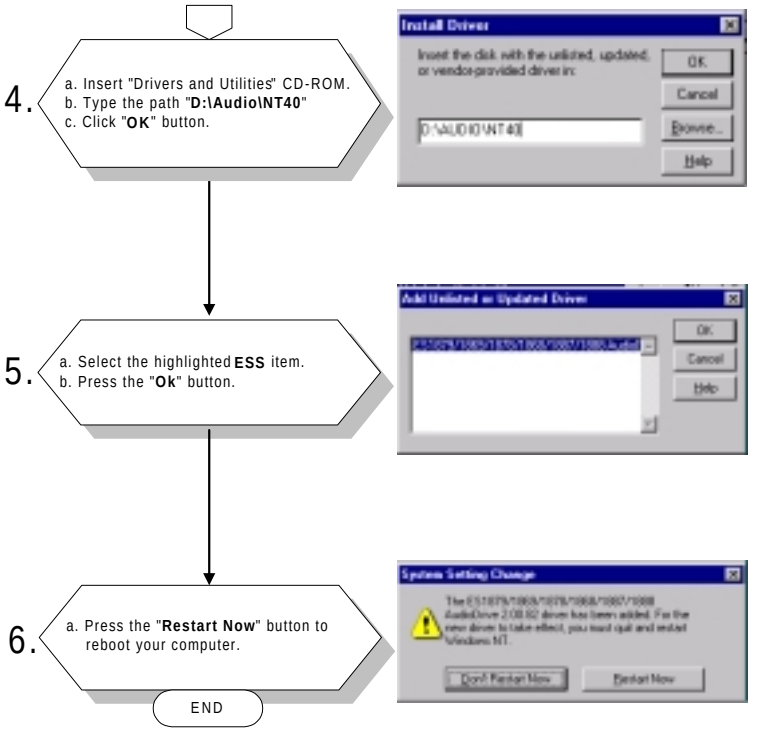

4.
A. Press the Next button.
5.
A. Press the Finish button.
END

6.2.6 Installation for Windows NT

1. a. Select "**Start**", "**Settings**", "**Control Panel**".
   b. Double click "**Multimedia**" icon.

2. a. Select the "**Devices**" item.
   b. Click the "**Add...**" button.

3. a. Choose "**Unlisted or Updated Driver**" item.
   b. Click the "**OK**" button.


4.
a. Insert "Drivers and Utilities" CD-ROM.
b. Type the path "D:\Audio\NT40"
c. Click "OK" button.
Install Driver
Insert the disk with the unlisted, updated, or vendor-provided driver in:
OK
Cancel
Browse...
Help
D:\AUDIO\NT40
5.
a. Select the highlighted ESS item.
b. Press the "Ok" button.
Add Unlisted or Updated Driver
OK
Cancel
Help
6.
a. Press the "Restart Now" button to reboot your computer.
END
System Setting Change
Don't Restart Now
Restart Now

6.3 Further Information

Audio chip website: **www.esstech.com**

Advantech websites: **www.advantech.com**
www.advantech.com.tw

CHAPTER 7

Award BIOS Setup

This chapter describes how to set BIOS configuration data.

7.1 Award BIOS Setup

The IPPC-920/950 Series comes with an Award BIOS chip that contains the ROM setup for your system. This chip serves as an interface between the processor and the rest of the mainboard's components. This chapter explains the information contained in the setup program, and tells you how to modify the settings according to your system configuration. Some setup items will not be explained, because it is recommended that users do not change such items.

Note: *Values for the various setup items that appear on your own screen (including default values) may not be the same as the values shown on the screen figures in this chapter. This is because the BIOS is revised and updated from time to time. If in doubt, check Advantech's website for the latest BIOS versions and related information.*

7.2 CMOS Setup Utility

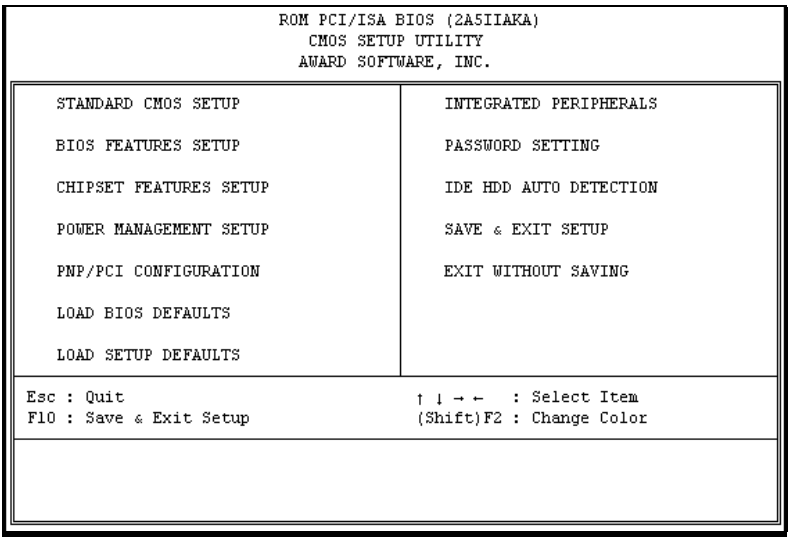


Figure 7-1: Setup program initial screen

A setup program, built into the system BIOS, is stored in the CMOS RAM that allows the configuration settings to be changed. This program is executed when the user changes the system configuration; when the user changes the system backup battery; or when the system detects a configuration error and asks the user to run the setup program. At power-on RAM testing, the message "Press DEL to enter Setup" appears. After pressing the "DEL" key, the CMOS setup utility screen will appear as shown in Fig. 7-1. Use the arrow keys to highlight the desired item, and press "Enter" to run the selected program.

7.3 Standard CMOS Setup

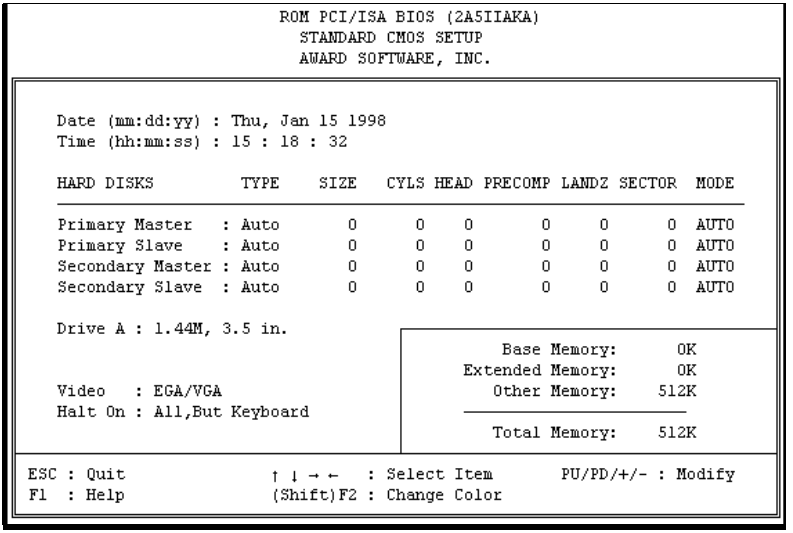


Figure 7-2: CMOS setup screen

The standard CMOS setup screen is shown above. System BIOS automatically detects memory size, so no changes are necessary. It has a few items requiring setting. Each item may have one or more optional settings. System BIOS allows you to change the system date and time, IDE hard disk, floppy disk drive types for drives A: and B:, boot-up video display mode, and POST error handling selection. Use the arrow keys to highlight the item, and then use the "PgUp" or "PgDn" keys to select the value you want for each item.

7.3.1 Hard disk configurations

TYPE
Select from 1 to 45, to fill the remaining fields with predefined values for disk drives. Select "User" to fill the remaining fields. Select "Auto" to detect the HDD type automatically.

SIZE
Hard disk size. The unit is megabytes (MB).

CYLS
The cylinder number of the hard disk.

HEAD
The read/write head number of the hard disk.

PRECOMP
The cylinder number at which the disk drive changes the write timing.

LANDZ
The cylinder number where the disk drive heads (read/write) are seated when the disk drive is parked.

SECTOR
The sector number of each track defined on the hard disk.

MODE
Select "Auto" to detect the mode type automatically. If your hard disk supports LBA mode, select "LBA" or "Large." Note that if your hard disk supporting cylinder is more than 1024 MB and does not support the LBA function, you must select "Large." If your hard disk supporting cylinder is below 1024 MB, select "Normal."

7.4 BIOS Features Setup

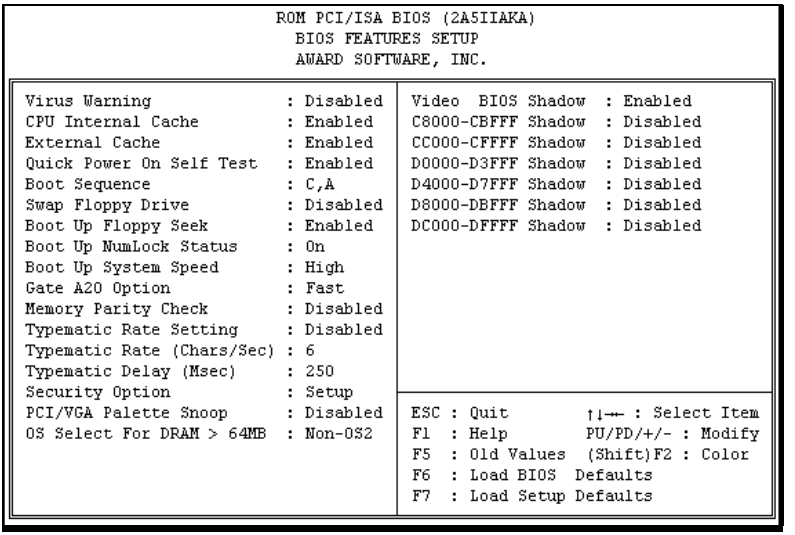


Figure 7-3: BIOS features setup screen

Moving around the BIOS Features and Chipset Features setup programs works the same way as moving around the Standard CMOS setup program. (Refer to the next section for Chipset Features setup.) The BIOS Features setup program is shown above. Users are not encouraged to run the BIOS and Chipset Features setup programs. Your system should have been fine-tuned before shipping. Improper setup may cause the system to fail, so consult your dealer before making any changes.

Virus Warning

When enabled, it assigns the BIOS to monitor the master boot sector and the DOS sector of the first hard disk drive.

The options are: Disabled (Default), Enabled.

CPU Internal Cache

When enabled, it improves system performance. Disable this item when testing or troubleshooting.

The options are: Enabled (Default), Disabled.

External Cache
When enabled, supports an external cache SRAM.

The options are: Enabled (Default), Disabled.

Quick Power On Self Test
When enabled, allows the BIOS to bypass the extensive memory test.

The options are: Disabled (Default), Enabled.

Boot Sequence
Allows the system BIOS to first try to boot the operating system from the selected disk drive.

The options are: A, C (Default); C (only); C, CDROM, A; CDROM, C, A.

Swap Floppy Drive
When enabled, allows you to switch the order in which the operating system accesses the floppy drives during boot-up.

The options are: Disabled (Default), Enabled.

Boot Up Floppy Seek
When enabled, assigns the BIOS to perform floppy disk drive tests by issuing seek commands. Note that such tests are time-consuming.

The options are: Enabled (Default), Disabled.

Boot Up NumLock Status
When set to "On", allows the BIOS to automatically enable the NumLock function when the system boots up.

The options are: On (Default), Off.

Memory Parity Check
The options are: Disabled (Default), Enabled.

Typematic Rate Setting
The term typematic rate means that when a keyboard key is held down, the character is repeatedly entered at a certain rate until the key is released. When this item is enabled, you may change the typematic rate.

The options are: Disabled (Default), Enabled.

Typematic Rate (Chars/Sec)
Sets the rate of repeated entry of a character when a keyboard key is held down.

The options are: 6 (Default), 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (msec)
Sets the time delay before a character is repeated.

The options are: 250 (Default), 500, 750, 1000 milliseconds.

Security Option
Allows you to set the security level of the system.

The options are: Setup (Default), System.

PCI/VGA Palette Snoop
When enabled, allows you to install an enhanced graphics adapter card. If your graphics adapter card does not support the Palette Snoop function, set as "Disabled" to avoid system malfunctions.

The options are: Disabled (Default), Enabled.

OS Select For DRAM > 64MB
If your operating system (OS) is OS/2, select "OS2". Otherwise, stay with the default setting Non-OS2.

Video BIOS Shadow
When enabled, allows the BIOS to copy the video ROM code of the add-on video card to the system memory, giving faster access.

The options are: Enabled (Default), Disabled.

C8000-CBFFF Shadow through to DC000-DFFFF Shadow
When enabled, allows the BIOS to copy the BIOS ROM code of the add-on card to the system memory for faster access. It may improve the performance of the add-on card. Some add-on cards will not function properly if their BIOS ROM codes are shadowed. To use this option correctly, you need to know the memory address range used by the BIOS ROM of each add-on card.

The options are: Disabled (Default), Enabled.

7.5 Chipset Features Setup

Note: It is strongly recommended that setup items in this section NOT be changed, because advanced knowledge is required to effect such changes.

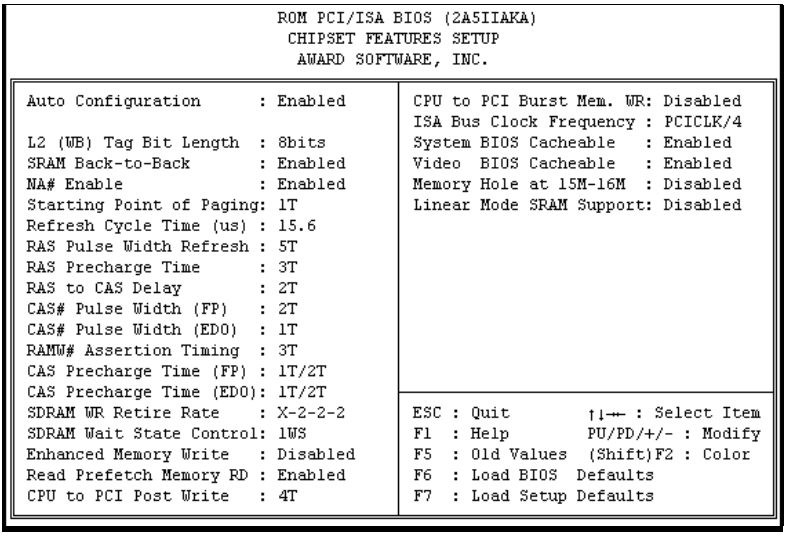


Figure 7-4: Chipset features setup screen

System BIOS Cacheable
When enabled, allows the ROM area FOOOH-FFFFH to be cacheable when the cache controller is activated. The recommended setting is "Disabled", especially for high speed CPUs (200 MHz and above).

Video BIOS Cacheable
When enabled, allows the system to use the video BIOS codes from SRAMs, instead of the slower DRAMs or ROMs.

The options are: Enabled (Default), Disabled.

Memory Hole at 15M-16M

When enabled, the memory hole at the 15 MB address will be relocated to the 15 ~ 16 MB address range of the ISA cycle when the processor accesses the 15 ~ 16 MB address area.

When disabled, the memory hole at the 15 MB address will be treated as a DRAM cycle when the processor accesses the 15 ~ 16 MB address.

The options are: Disabled (Default), Enabled.

7.6 Power Management Setup

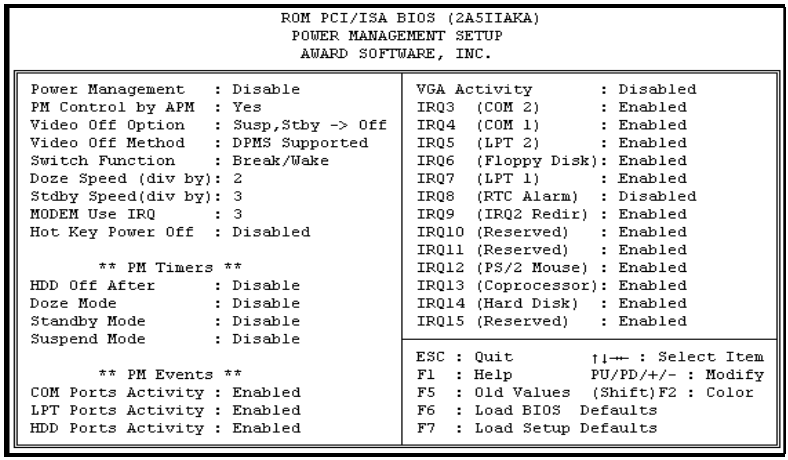


Figure 7-5: Power management setup screen

Power Management

When enabled, allows you to use Power Management features.

The options are: Disabled (Default), Enabled.

PM Control by APM

The option "No" allows the BIOS to ignore the APM (Advanced Power Management) specification. Selecting "Yes" will allow the BIOS to wait for APM's prompt before it enters Doze mode, Standby mode, or Suspend mode. If the APM is installed, it will prompt the BIOS to set the system into power saving mode after all tasks are done.

The options are: Yes (Default), No.

Video Off Option

This feature provides the selections for the video display power saving mode. The option "Susp, Stby → Off" allows the video display to go blank if the system enters Suspend or Standby mode. The option "Suspend → Off" allows the video display to go blank if the system enters Suspend mode. The option "All Modes → Off" allows the video display to go blank if the system enters Doze mode or Suspend mode. The option "Always On" allows the video display to stay in Standby mode even when the system enters Doze or Suspend mode.

The options are: Susp, Stby → Off (Default), Suspend → Off, All Modes → Off, Always On.

Video Off Method

"DPMS Supported" allows the BIOS to blank off the screen display with your VGA card which supports DPMS (Display Power Management Signaling function). "Blank Screen" allows the BIOS to blank the screen display by turning off the red-green-blue signals.

The options are: DPMS Supported (Default), Blank Screen.

Doze Speed (div by)

The options are: 2 (Default), 1, 3, 4, 5, 6, 7, 8.

Stdby Speed (div by)

The options are: 3 (Default), 1, 2, 4, 5, 6, 7, 8.

MODEM Use IRQ

This feature allows you to select the IRQ# to meet your modem's IRQ#.

The options are: 3 (Default), 4, 5, 7, 9, 10, 11, NA.

Hot Key Power Off
This function is designated as "Disabled."

HDD Off After
Selecting "Disabled" will turn off the hard disk drive (HDD) motor. Selecting "1 Min.. 15 Min" allows you to define the HDD idle time before the HDD enters Power Saving Mode.

The options "1 Min.. 15 Min" and "When Suspend" will not work concurrently. When the HDD is in Power Saving Mode, any access to the HDD will wake it up.

The options are: Disabled (Default), 1 Min.. 15 Min.

Doze Mode
The system will not enter Doze mode, because this option is designated as "Disabled."

Standby Mode
The system will not enter Standby mode, because this option is designated as "Disabled."

Suspend Mode
The system will not enter Suspend mode, because this option is designated as "Disabled."

COM Ports Activity
Selecting "Enabled" will enable the power management timer when a no activity event is detected in the COM ports. Selecting "Disabled" will disable the PM timer even if a no activity event is detected.

The options are: Enabled (Default), Disabled.

LPT Ports Activity
Selecting "Enabled" will enable the power management timer when a no activity event is detected in the LPT ports. Selecting "Disabled" will disable the PM timer even if a no activity event is detected.

The options are: Enabled (Default), Disabled.

HDD Ports Activity

Selecting "Enabled" will enable the power management timer when a no activity event is detected in the hard disk drive. Selecting "Disabled" will disable the PM timer even if a no activity event is detected.

The options are: Enabled (Default), Disabled.

VGA Activity

Selecting "Enabled" will enable the power management timer when a no activity event is detected in the VGA. Selecting "Disabled" will disable the PM timer even if a no activity event is detected.

The options are: Disabled (Default), Enabled.

IRQ# Activity

After the time period which you set in the Suspend Mode feature elapses, the system advances from Doze Mode to Suspend Mode, in which the CPU clock stops and the screen display is off. At this moment, if the IRQ activity which is defined as enabled occurs, the system goes directly back to Full-on Mode.

If the IRQ activity which is defined as "Disabled" occurs, the system enters another low power state, Dream Mode. In Dream Mode, the system functions the same as in Full-on Mode, except that the screen display remains off until the corresponding IRQ handler finishes, whereupon the system reverts to Suspend Mode.

For instance, if the system is connected to a LAN and receives an interruption from its file server, the system will enter Dream Mode to execute the corresponding calling routine.

The options are: Enabled, Disabled.

The default values of IRQ3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15 are all: Enabled.

The default value of IRQ8 is: Disabled.

Note: Under certain operating systems such as Windoes NT 4.0 (Build 1381), the CD auto-insertion feature might have some effect on power management. It is recommended that the CD-ROM drive use the secondary channel, and that the following Power Management Setup features be set:
HDD & FDD: Off
IRQ15 (Reserved): Secondary

7.7 PNP/PCI Configuration Setup

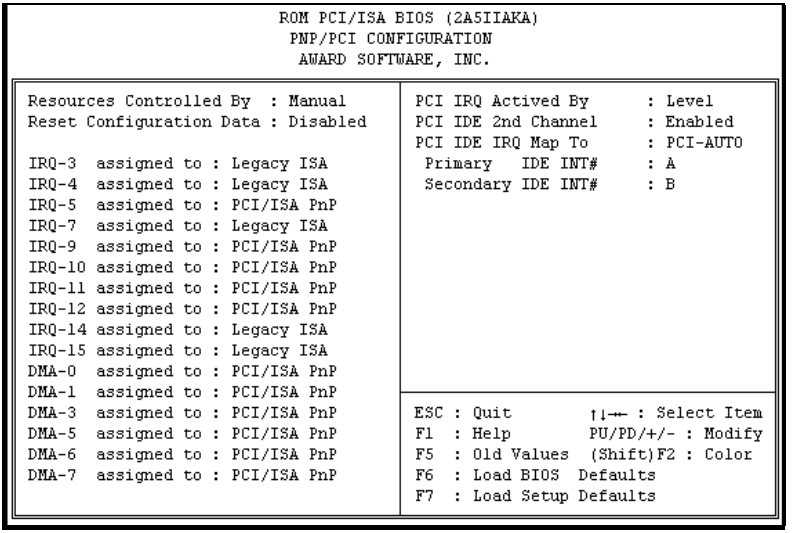


Figure 7-6: PNP/PCI configuration setup screen

Resources Controlled By

If set at "Auto", the BIOS automatically arranges all system resources for you. If there are conflicts or you are not satisfied with the configuration, simply set all the resources listed in the above figure by selecting "Manual".

The options are: Manual (Default), Auto.

The manual options assigned to IRQ-/DMA- are: Legacy ISA, PCI/ISA PnP.

Reset Configuration Data

When enabled, this feature allows the system to clear the last BIOS configuration data, and then reset the data with the default BIOS configuration data.

The options are: Disabled (Default), Enabled.

PCI IRQ Activated By

If your IDE card is triggered by edge, set it at "Edge".

The options are: Level (Default), Edge.

PCI IDE 2nd Channel

This item allows you to designate an IDE controller board inserted into one of the PCI slots as your secondary IDE controller.

The options are: Enabled (Default), Disabled.

PCI IDE IRQ Map To

This item allows you to configure your system to the type of IDE disk controller that you are using. By default, Setup assumes that your controller is a PCI device rather than an ISA controller. The more apparent difference is the type of slot being used.

Your system is equipped with a PCI controller. Selecting PCI-AUTO allows you to specify which slot has the controller and which PCI interrupt (A, B, C or D) is associated with the connected hard drives.

The options are: PCI-AUTO (Default), ISA.

Primary IDE INT#

Remember that this setting refers to the hard disk drive itself, rather than individual partitions.

Secondary IDE INT#

Since each IDE controller supports two separate hard drives, you can select the INT# for each. You will note that the primary has a lower interrupt than the secondary.

Selecting PCI-AUTO allows the system to automatically determine how your IDE disk system is configured.

7.8 Load BIOS Defaults

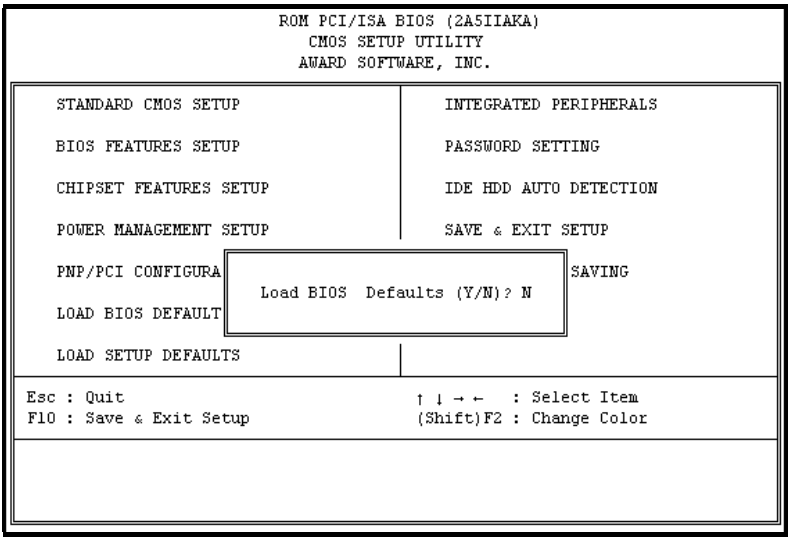


Figure 7-7: Load BIOS defaults screen

The BIOS defaults screen contains the most appropriate values of the system parameters that allow minimum system performance.

7.9 Load Setup Defaults

Selecting this field loads the factory defaults for BIOS and Chipset Features. The system will automatically detect these defaults.

7.10 Integrated Peripherals

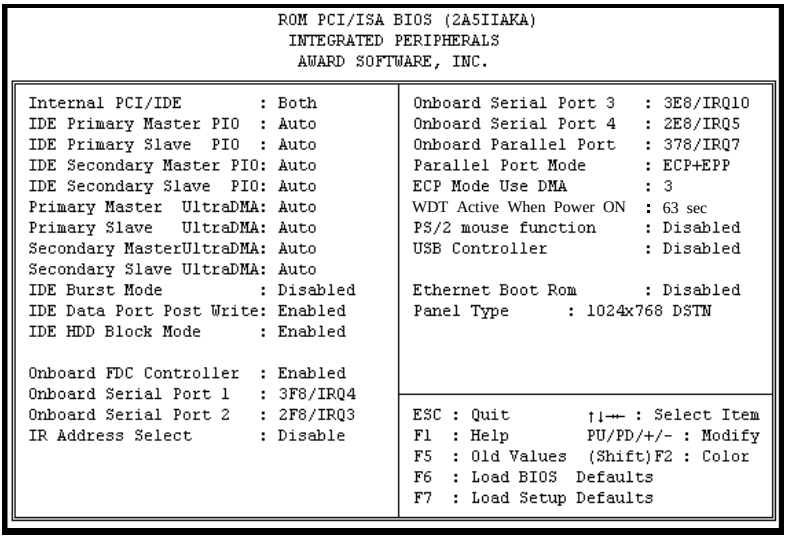


Figure 7-8: Integrated peripherals screen

Internal PCI/IDE

When you select "Both", two PCI/IDE ports will be enabled. If you select "Disabled", both PCI/IDE ports will be enabled. You can also choose one of two ports to be enabled. by selecting "Primary" or "Secondary."

The options are: Both (Default), Disabled, Primary, Secondary.

IDE Primary/Secondary Master/Slave PIO

IDE hard disk drive controllers can support up to two separate hard drives.

These drives have a master/slave relationship which is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers, a primary and a secondary. Thus you have the ability to install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than having the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the task by themselves.

Your system supports five modes, numbered from 0 through 4, which differ primarily in timing. When "Auto" is selected, the BIOS will choose the best available mode.

The options are: Auto (Default), Disabled.

Primary/Secondary Master/Slave Ultra DMA

DMA means Direct Memory Access. Ultra DMA is faster than DMA. DMA is a method of transferring data to or from memory at a fast rate, without involving the CPU.

When you select "Auto", the BIOS will choose the best available mode.

The options are: Auto (Default), Disabled.

IDE Burst Mode

When enabled, data transfer on IDE buses will improve.

The options are: Disabled (Default), Enabled.

IDE HDD Block Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

The options are: Enabled (Default), Disabled.

Onboard FDD Controller

When enabled, the floppy disk drive (FDD) controller is activated.

The options are: Enabled (Default), Disabled.

WDT Active When Power ON

This is Advantech's patented watchdog function which can reboot the system should the computer hang in the BIOS checkup.

The options are: 63 sec (Default), Disabled, 31 sec, 15 sec.

Onboard Serial Ports 1 & 2

If the serial ports use the on-board I/O controller, you can modify your serial port parameters.

The options for Port 1 are: 3F8/IRQ4 (Default), 2E8/IRQ3, Disabled, 2F8/IRQ3, 3E8/IRQ4.

The options for Port 2 are: 2F8/IRQ3 (Default), 3E8/IRQ4, 2E8/IRQ3, Disabled, 3F8/IRQ4.

IR Address Select

When enabled, the infrared receptor is activated.

The options are: Disabled (Default), Enabled.

Onboard Serial Ports 3 & 4

If the serial ports use the on-board I/O controller, you can modify your serial port parameters.

The options for Port 3 are: 3E8/IRQ10 (Default), 2E8/IRQ5, Disabled.

The options for Port 4 are: 2E8/IRQ5 (Default), Disabled, 3E8/IRQ10.

Onboard Parallel Port

If the parallel port uses the on-board I/O controller, you can modify your parallel port paramaters. When you select "Disabled", the next two setup items will disappear.

The options are: 378/IRQ7 (Default), 3BC/IRQ7, 278/IRQ5, Disabled.

Parallel Port Mode

You can choose different data transfer modes for your system.

The options are: ECP & EPP (Default), SPP, EPP, ECP.

ECP Mode Use DMA

You can choose different DMA modes for data transfer.

The options are: 3 (Default), 1.

PS/2 mouse function
When enabled, the PS/2 mouse is activated.

The options are: Disabled (Default), Enabled.

USB Controller
When enabled, the USB devices are activated.

The options are: Disabled (Default), Enabled.

Ethernet Boot ROM
When enabled, your system will be able to boot up through the Ethernet.

The options are: Disabled (Default), Enabled.

Panel Type
The panel type is designated by the manufacturer, according to your LCD panel type.

7.11 Password Setting

To enable the password setting, select this item from the Standard CMOS Setup. You will be prompted to create your own password. Type your password up to eight characters and press "Enter". You will be asked to confirm the password. Type the password again and press "Enter". You may also press "Esc" to abort the selection and not enter a password. To disable the password, press "Enter" when you are prompted to enter the password. A message will appear, confirming the password is disabled.

Under the BIOS Features setup, if "System" is selected under the Security Option field and the Supervisor Password is enabled, you will be prompted for the supervisor password every time you try to enter the CMOS Setup utility. If "System" is selected and User Password is enabled, you will be requested to enter the user password every time you reboot the system. If "Setup" is selected under the Security Option field and User Password is enabled, you will be prompted only when you reboot the system.

7.12 IDE HDD Auto Detection

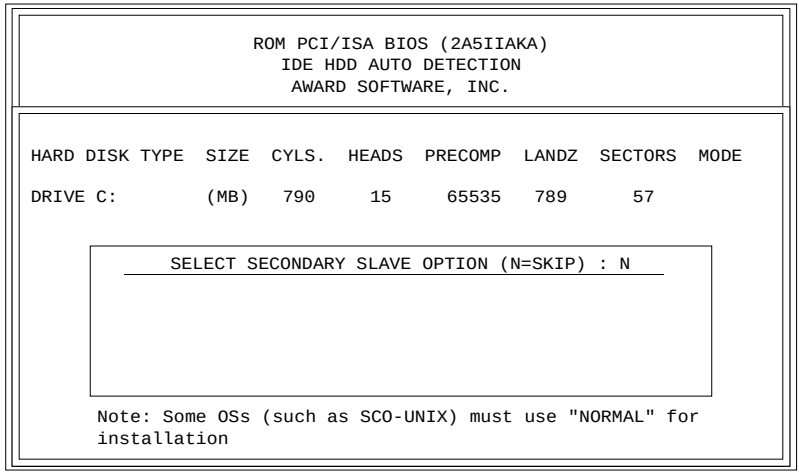


Figure 7-9: IDE HDD auto detection screen

The IDE Hard Disk Drive Auto Detection feature automatically configures your new hard disk. Use it for quick configuration of new hard disk drives. This feature allows you to set the parameters of up to four IDE HDDs. The option with "(Y)" is recommended by the system BIOS. You may also key in your own parameters instead of setting them according to the system BIOS. After keying in all settings, press "Esc" to return to the main menu. For confirmation, enter the Standard CMOS Setup feature.

7.13 Save and Exit Setup

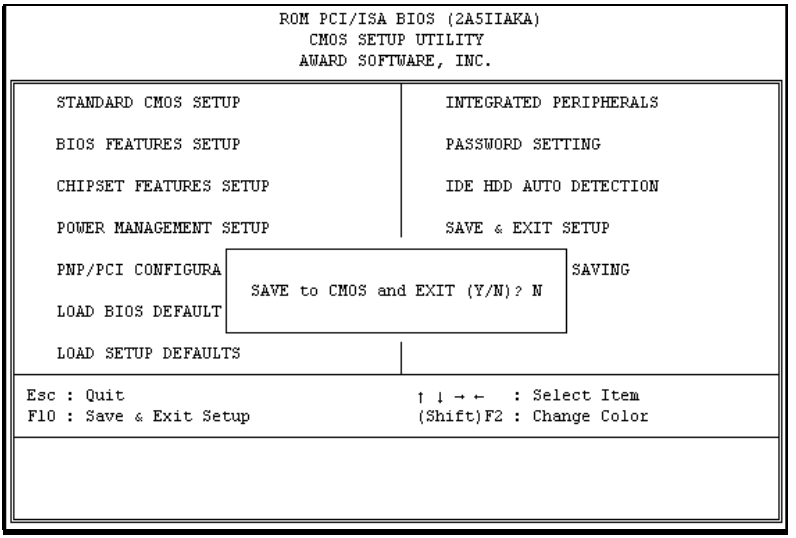


Figure 7-10: Save and exit setup screen

After you have made changes in the BIOS setup, press "Esc" to return to the main menu. Move the cursor to "Save and Exit Setup", or press "F10" and then press "Y", to change the CMOS Setup. If you did not change anything, press "Esc" again or move the cursor to "Exit Without Saving" and press "Y" to retain the setup settings. The following message will appear at the center of the screen to allow you to save data to CMOS and exit the setup utility:

```
SAVE to CMOS and EXIT (Y/N)?
```

7.14 Exit Without Saving

If you select this feature, the following message will appear at the center of the screen to allow you to exit the setup utility without saving CMOS modifications:

```
Quit Without Saving (Y/N)?
```

CHAPTER 8

Touchscreen

- Introduction
- Installation of Touchscreen Driver
  - for Windows 95
  - for Windows 98
  - for Windows NT

8.1 Introduction

8.1.1 General information

The IPPC-920/950 Series' optional touchscreen uses advanced 8-wire resistive technology. It provides more accurate sensing capability than ever before. It has been specially designed for industrial environments, and has been approved to FCC Class A and Class B standards.

8.1.2 Specifications

Electrical

- **Contact bounce:** < 10 ms
- **Operating voltage:** 5 V (typical)
- **Contact current:** 20 mA (maximum)
- **Circuit resistance (open):** > 30 mohms
- **Circuit resistance (closed):** < 2000 mohms
- **Sheet resistance variation:** Within one screen: ± 5% nominal
  From screen to screen: ± 20% of nominal

Durability

- **Test conditions:** 4 H hardness, 0.04" stylus pen, 350 gram load
- **Point activation:**
  Single point, position of stylus controlled to ± 0.0005"
  Result: > 1 million activations
- **Linear activation:**
  2" diagonal line, position of stylus controlled to ± 0.0005"
  Result: > 250,000 cycles
- **Chemical resistance:**
  Hard coating is highly resistant to most solvents and chemicals

Optical

- **Visible light transmission:** 72% (typical)
- **Reflection:** > 25% @ 550 nm

Sensor board

- Chemical strengthened glass with 4 H hardness standard. (Test condition: ASTM D3363-92A)

Ball drop test

- Able to bear a 225 g steel ball dropped from 660 mm elevation without breaking

Environmental specifications

- **Operating pressure:** 30 ~ 45 grams for finger; 10 grams for stylus pen
- **Operating temperature:** 0 ~ 50° C (humidity 20 ~ 90% RH)
- **Storage temperature:** -25 ~ 70° C (humidity 20 ~ 95% RH)

8.2 Installation of Touchscreen Driver

The touchscreen built into the IPPC-920/950 Series uses a driver for operating Windows 95, Windows 98, or Windows NT 4.0.

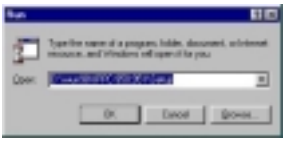
To facilitate installation of the touchscreen driver, you should read the instructions in this chapter carefully before you attempt installation.

Note 1: The following windows illustrations are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.

Note 2: The CD-ROM drive is designated as "D" throughout this chapter.

8.2.1 Installation for Windows 95/98

1. A. Select: Start ; Run ,
   B. Type
   D;\win98\IPPC-950;951\Setup
   C. Press OK
   D: Follow the instructions in the setup process

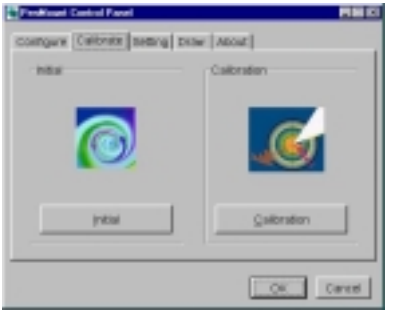


2. Press OK , then reboot the system

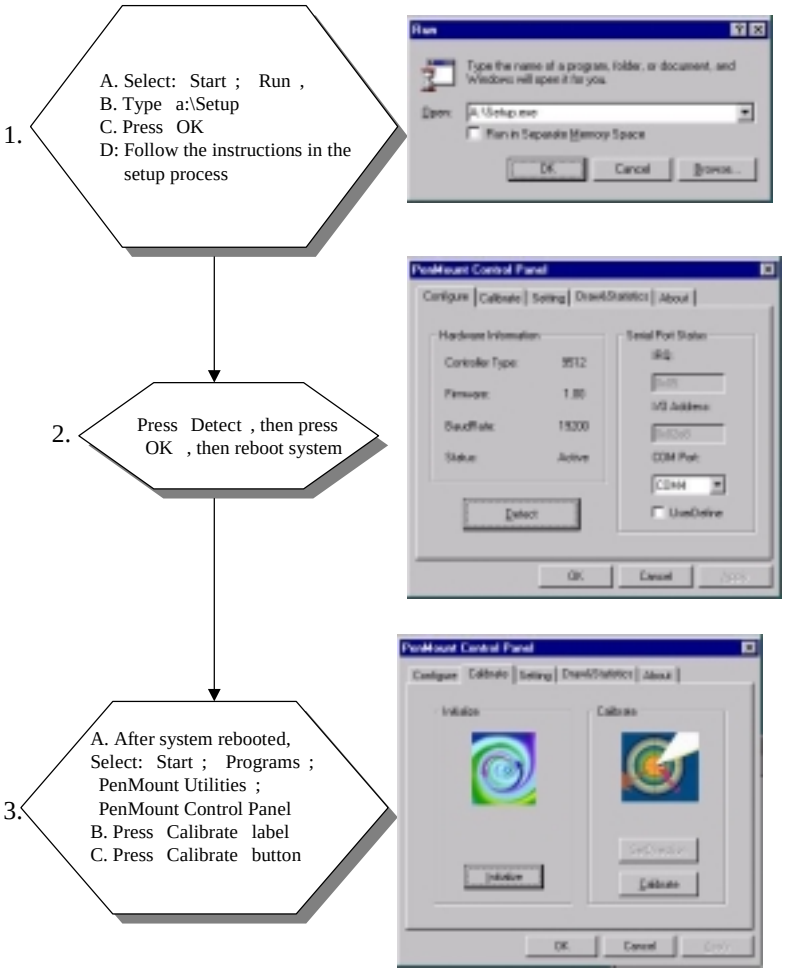
3. A. After system rebooted,
   Select: Start ; Programs ;
   PenMount Utilities ;
   PenMount Control Panel
   B. Press Calibrate label
   C. Press Calibrate button in the right

4. A. Use a soft stylus to press the little red dot, which the finger icon is pointing at.
B. Repeat the process according to each top; right; bottom and left side

5. Press OK , then the touchscreen will begin to function



8.2.2 Installation for Windows NT



4. A. Use a soft stylus to press the little dot.
B. Repeat the process according to each top; right; bottom and left side

5. Press OK , then the touchscreen will begin to function

APPENDIX A

LCD Specifications and Selection Settings

Table A-1: IPPC-920/950 Series LCD specifications

Model	IPPC-920T	IPPC-950T
Display type (LCD)	12.1" TFT LCD	15" TFT LCD
Max. resolution	800 x 600	1024 x 768
Colors	256 K colors	256 K colors
Dot pitch (mm)	0.31 x 0.31	0.29 x 0.29
Viewing angle	110	110
Luminance	250 cd/sq meter	200 cd/sq meter
Viewing area	246 x 184.5 mm	304 x 228 mm
Power consumption	+5 V @ 1 A max.	+5 V @ 1 A max.
Operating temperature	0 ~ 50 C	0 ~ 50 C
Storage temperature	-20 ~ 60 C	-20 ~ 60 C
LCD MTBF	50,000 hours	50,000 hours
Backlight MTBF	25,000 hours	25,000 hours

Note: The color LCD display installed in the IPPC-920/950 Series is high-quality and reliable. However, it may contain a few defective pixels which may not always illuminate. With current technology, it is impossible to completely eliminate defective pixels. Advantech is actively working to improve this technology.

APPENDIX B

Programming the Watchdog Timer

The IPPC-920/950 Series is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

B.1 Programming the Watchdog Timer

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

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

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

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

APPENDIX C

Pin Assignments

- IR Connector (J1)
- Flat Panel Display Connector (J2)
- Flat Panel Display Connector (J3)
- Internal COM4 Connector (J4)
- Touchscreen Power Connector (J5)
- Sandisk SSD Connector (J6)
- EIDE Hard Disk Drive Connector (J7)
- Floppy Drive Connector (J8)
- CD-ROM Connector (J9)
- CPU Fan Power Connector (J10)
- PCI/ISA Bus Expansion Connector (J11)
- Fan Power Connector (J12)
- AT Power Connector (J13)
- ATX Power Connector (J14) (Reserved)
- Internal Speaker Connector (J15)
- Inverter Power Connector (J16)
- COM2

IR Connector (J1)

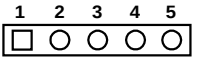


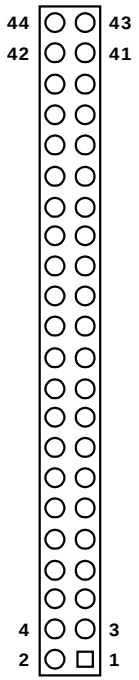
Table C-1: IR connector (J1)

Pin	Signal
1	V_{cc}
2	Mode_Select
3	IR_IN
4	GND
5	IR_out

Flat Panel Display Connector (J2)

Table C-2: Flat panel display connector (J2)

Pin	Signal	Pin	Signal
1	+12 V	2	+12 V
3	GND	4	GND
5	V_{DD} SAFE	6	V_{DD} SAFE
7	ENAVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M/DE	38	LP
39	GND	40	ENABKL
41	NC	42	NC
43	NC	44	NC



Flat Panel Display Connector (J3)

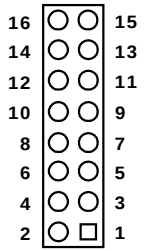


Table C-3: Flat panel display (J3)

Pin	Signal	Pin	Signal
1	V_{DD} SAFE	2	+5 V
3	P24	4	P25
5	P26	6	P27
7	P28	8	P29
9	P30	10	P31
11	P32	12	P33
13	P34	14	P35
15	GND	16	GND

Internal COM4 Connector (J4)

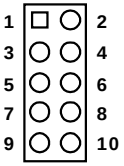


Table C-4: Internal COM4 connector (J4)

Pin	Signal	Pin	Signal
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	GND

Touchscreen Power Connector (J5)

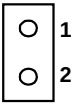


Table C-5: Touchscreen power connector (J5)

Pin	Signal
1	+5 V
2	GND

Sandisk SSD Connector (J6)

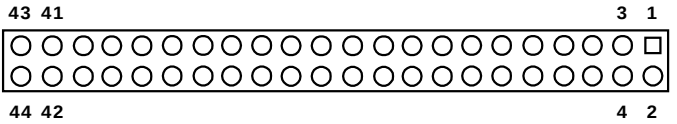


Table C-6: Sandisk SSD connector (J6)

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	HDD 0	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	HD READY	28	N/C
29	HDACK 0 #	30	GND
31	IRQ14	32	N/C
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HDD SELECT 0 #	38	HDD SELECT 1 #
39	IDE ACTIVE 0 #	40	GND
41	GND	42	V_{CC}
43	GND	44	N/C

low active

EIDE Hard Disk Drive Connector (J7)

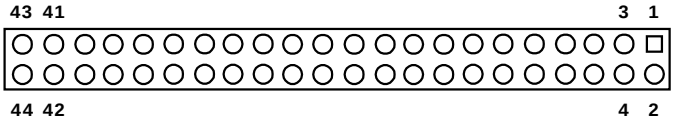


Table C-7: EIDE hard disk drive connector (J7)

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	HDD 0	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	HD READY	28	N/C
29	HDACK 0 #	30	GND
31	IRQ14	32	N/C
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HDD SELECT 0 #	38	HDD SELECT 1 #
39	IDE ACTIVE 0 #	40	GND
41	GND	42	V_{CC}
43	GND	44	N/C

low active

Floppy Drive Connector (J8)

Table C-8: Floppy drive connector (J8)

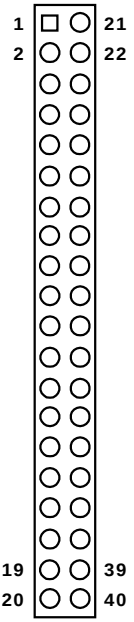
Pin	Signal	Pin	Signal
1	V_{cc} (+5 V)	14	STEP
2	INDEX	15	GND
3	V_{cc} (+5 V)	16	WRITE DATA
4	DRIVE SELECT	17	GND
5	V_{cc} (+5 V)	18	WRITE DATA
6	DISK CHANGE	19	GND
7	NC	20	TRACK 0
8	NC	21	GND
9	NC	22	WRITE PROTECT
10	MOTOR ON	23	GND
11	NC	24	READ DATA
12	DIRECTION	25	GND
13	DENSITY SELECT	26	SIDE 1 SELECT

CD-ROM Connector (J9)

Table C-9: CD-ROM connector (J9)

Pin	Signal	Pin	Signal
1	Audio_L	2	Audio_R
3	GND	4	GND
5	IDE RESET #	6	DATA8
7	DATA7	8	DATA9
9	DATA6	10	DATA10
11	DATA5	12	DATA11
13	DATA4	14	DATA12
15	DATA3	16	DATA13
17	DATA2	18	DATA14
19	DATA1	20	DATA15
21	DATA0	22	HDD 0
23	GND	24	IO READ
25	IO WRITE	26	GND
27	HD READY	28	HD ACK 0 #
29	IRQ 15	30	NC
31	ADDR1	32	NC
33	ADDR0	34	ADDR2
35	HDD SELECT 0 #	36	HDD SELECT 1 #
37	V_{cc} (+5 V)	38	V_{cc} (+5 V)
39	GND	40	GND

low active



CPU Fan Power Connector (J10)

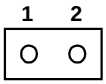


Table C-10: CPU fan power connector (J10)

Pin	Signal
1	+12 V
2	GND

PCI/ISA Bus Expansion Connector (J11)

side view

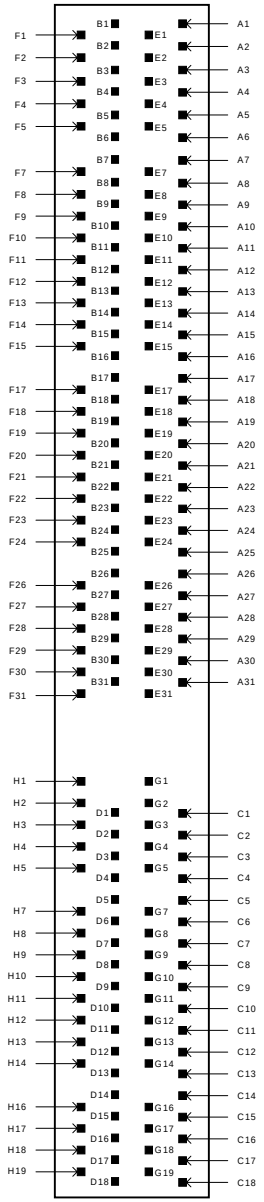


Table C-11: PCI/ISA slot pin assignments (pins A and B)

Pin	Signal	Pin	Signal
A1	IOCHK	B1	GND
A2	SD7	B2	RST
A3	SD6	B3	V_{cc}
A4	SD5	B4	IRQ9
A5	SD4	B5	-5 V
A6	SD3	B6	DRQ2
A7	SD2	B7	-12 V
A8	SD1	B8	OWS
A9	SD0	B9	+12 V
A10	IORDY	B10	GND
A11	AEN	B11	SMW
A12	SA19	B12	SMR
A13	SA18	B13	IOW
A14	SA17	B14	IOR
A15	SA16	B15	DACK3
A16	SA15	B16	DRQ3
A17	SA14	B17	DACK1
A18	SA13	B18	DRQ1
A19	SA12	B19	REF
A20	SA11	B20	SCLK
A21	SA10	B21	IRQ7
A22	SA9	B22	IRQ6
A23	SA8	B23	IRQ5
A24	SA7	B24	IRQ4
A25	SA6	B25	IRQ3
A26	SA5	B26	DACK2
A27	SA4	B27	TC
A28	SA3	B28	ALE
A29	SA2	B29	V_{cc}
A30	SA1	B30	OSC
A31	SA0	B31	GND

Table C-12: PCI/ISA slot pin assignments (pins C and D)

Pin	Signal	Pin	Signal
C1	SBHE	D1	MEM16
C2	LA23	D2	IO16
C3	LA22	D3	IRQ10
C4	LA21	D4	IRQ11
C5	LA20	D5	IRQ12
C6	LA19	D6	IRQ15
C7	LA18	D7	IRQ14
C8	LA17	D8	DACKO
C9	MEMR	D9	DRQ0
C10	MEMW	D10	DACK5
C11	SD8	D11	DRQ5
C12	SD9	D12	DACK6
C13	SD10	D13	DRQ6
C14	SD11	D14	DACK7
C15	SD12	D15	DRQ7
C16	SD13	D16	V_{cc}
C17	SD14	D17	MASTER
C18	SD15	D18	GND

Table C-13: PCI/ISA slot pin assignments (pins E and F)

Pin	Signal	Pin	Signal
E1	GND	F1	GND
E2	GND	F2	GND
E3	INT 1	F3	INT3
E4	INT 2	F4	INT4
E5	V_{cc}	F5	V_{cc}
E6	---	F6	---
E7	V_{cc}	F7	V_{cc}
E8	RST	F8	PCLK2
E9	GNT2	F9	(V)
E10	REQ2	F10	GNT3
E11	GND	F11	GND
E12	PCLK1	F12	REQ3
E13	GND	F13	AD31
E14	AD30	F14	AD29
E15	NC	F15	NC
E16	---	F16	---
E17	NC	F17	NC
E18	AD28	F18	AD27
E19	AD26	F19	AD25
E20	AD24	F20	CBE3
E21	AD22	F21	AD23
E22	AD20	F22	AD21
E23	AD18	F23	AD19
E24	NC	F24	NC
E25	---	F25	---
E26	---	F26	NC
E27	AD16	F27	AD17
E28	FRAME	F28	IRDY
E29	CBE2	F29	DEVSEL
E30	TRDY	F30	LOCK
E31	STOP	F31	PERR

Table C-14: PCI/ISA slot pin assignments (pins G and H)

Pin	Signal	Pin	Signal
G1	---	H1	SERR
G2	---	H2	AD15
G3	CBE1	H3	AD14
G4	PAR	H4	AD12
G5	GND	H5	GND
G6	---	H6	KEY
G7	GND	H7	GND
G8	AD13	H8	AD10
G9	AD11	H9	AD8
G10	AD9	H10	AD7
G11	CBEO	H11	AD5
G12	AD6	H12	AD3
G13	AD4	H13	AD1
G14	AD2	H14	AD0
G15	---	H15	KEY
G16	V_{cc}	H16	V_{cc}
G17	V_{cc}	H17	V_{cc}
G18	GND	H18	GND
G19	GND	H19	GND

Fan Power Connector (J12)

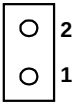


Table C-15: Fan power connector (J12)

Pin	Signal
1	+12 V
2	GND

AT Power Connector (J13)

Table C-16: AT power connector (J13)

Pin	Signal
1	NC
2	+5 V
3	+12 V
4	-12 V
5	GND
6	GND
7	GND
8	GND
9	-5 V
10	+5 V
11	+5 V
12	+5 V

ATX Power Connector (J14) (*Reserved)

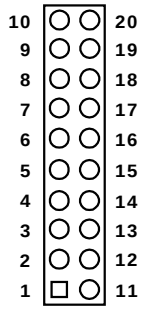


Table C-17: ATX power connector (J14)

Pin	Signal	Pin	Signal
1	+3.3 V	11	+3.3 V
2	+3.3 V	12	-12 V
3	GND	13	GND
4	+5 V	14	PS -ON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	NC	18	-5 V
9	5VSB	19	+5 V
10	+12 v	20	+5 V

** Reserved for future expansion. There is no connector on the PC board.*

Internal Speaker Connector (J15)

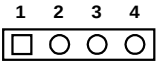


Table C-18: Internal speaker connector (J15)

Pin	Signal
1	Speaker out_L
2	GND
3	GND
4	Speaker out_R

Inverter Power Connector (J16)

Table C-19: Inverter power connector (J16)

Pin	Signal
1	+12 V
2	GND
3	ENABKL
4	Brightness Adj.
5	+5 V

COM2

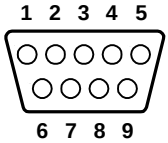


Table C-20: COM2

Pin	Signal RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	---
4	DTR	RX-	---
5	GND	GND	---
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---
9	RI	---	---