PPC-S154T

UltraSlim™ Mobile Intel® Pentium® 4 processor-M based 15" panel PC

User's Manual

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This manual is for the PPC-154T.

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 occurring, 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 the 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.*

iii

Packing List

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

• PPC-154T series panel PC

• User's manual (note 1)

• Accessories for PPC-154T

   - Y-shaped adapter for PS/2 mouse and keyboard

   - Warranty card

   - Power cord: USA type

   - AC/DC power adapter

   - Floppy disk with CD-ROM drive driver

   -"Drivers and Utilities" CD-ROM disc

   -VESA-standard bracket for mounting

   - Mounting kits and packet of screws

   - Heat sink (note 1)

   - Heat sink support plate kits (note 2)

   -Thermal pad (note 3)

   -Thernal grease (note 4)

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

Note 1:   *If the unit is without a CPU, this is included in the accessory box. If the unit comes with a CPU, the heat sink is installed in the unit*

Note 2:   *If the support plate kits are on the motherboard, then the heat sink can be installed on the plate*

Note 3:   *The thermal pad needs to put around the CPU die as a buffer between heat sink and CPU*

Note 4:   *Put the thermal grease on the CPU die for transferring the heat to heat sink*

Additional Information and Assistance

Step 1. Visit the Advantech web site at **www.advantech.com or www.advantech.com.tw** where you can find the latest information about the product.

Step 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

Warning!   1. *Input voltage rated 16 V ~ 25 V_{dc}, 3.5 A max*

2. *Use a 3 V @ 195 mA lithium battery*

3. *Packing: please carry the unit with both hands, handle with care*

4. *Maintenance: to properly maintain and clean the surfaces, use only approved products or clean with a dry applicator*

5. *CompactFlash: Turn off power before inserting or removing CompactFlash storage card.*

Contact information:

Our European representative:

Advantech Europe GmbH

Kolberger Straße 7

D-40599 Düsseldorf, Germany

Tel: 49-211-97477350

Fax: 49-211-97477300

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 ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED.REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUC-TIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

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

Wichtige Sicherheishinweise

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

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.

ADVARSEL!
Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage tilleverandøren.

CONTENTS

General Information

This chapter gives background information on the PPC-S154T panel PC.

Sections include:

- Introduction
- General Specifications
- LCD Specifications
- Dimensions

Chapter 1 General Information

1.1 Introduction

PPC-S154T panel PC is a mobile Pentium® 4-M processor-based UltraSlim panel computer that is designed to serve as a human machine interface (HMI) and multimedia computer. It is a PC-based system with 15" color TFT LCD display, on-board PCI Ethernet controller, multi-COM port interfaces and an 18-bit stereo audio controller. With a built-in CD-ROM drive, floppy drive and mini PCI expansion socket, the PPC-S154 is as compact and user-friendly as a multi-functional computer.

In addition, its "fit anywhere" design can be mounted in various kinds of installations. It can be wall mounted, swing arm mounted, or stand upright on a desktop.

For system integrators, this simple, complete, compact and highly integrated multimedia system lets you easily build a panel PC into your applications. Common industrial applications include factory automation systems, precision machinery, and production process control.

It is also suitable for many non-industrial applications, including interactive kiosk systems, entertainment management, and car park automation.

Our panel PC is a reliable, cost-effective solution to your application's processing requirements.

1.2 General Specifications

General

- **Dimensions (W x H x D):** 375 x 299 x 49 mm (14.76" x 11.77" x 1.39")
- **Weight:** 4.9 kg (10.78 lb)
- **Power supply:** 70 watts, ATX type

    Input Voltage: 16Vdc~25Vdc

    Onput Voltage : +5 V @ 12 A,+24 V @ 0.3 A

- **Power adaptor: AC/DC**

    Input voltage: $100 \sim 240$ V_{AC}
    Output voltage: 19 V@ 3.79 A

- **Disk drive housing:** Space for one 2.5" HDD, One slim type CD-ROM and one slim type 3.5" FDD
- **Front panel:** IP65/NEMA4 compliant

Standard PC functions

- **CPU:** Mobile Intel® Pentium® 4 Processor-M up to 2.2 GHz (Standard PPC-S154 is built-in 1.7 GHz CPU)
- **BIOS:** Award 256 KB Flash BIOS, supports Plug & Play, APM
- **System Chipset:** Intel 845GV and Intel 82801 DB ICH4
- **Front side bus:** 400 MHz
- **2nd level cache:** 512 KB on-die
- **System Memory:**

    Two 200-pin SO-DIMM sockets, accept up to 1 GB DDR 266 SDRAM

    (Standard PPC-S154 is built-in 1 pcs of 256 MB DDR266 SDRAM)

- **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 mode 0 ~ 2, and Ultra DMA 33/66/100 simultaneously. The secondary connector is designated for the CD-ROM drive or CompactFlash card. BIOS supports IDE CDROM boot-up
- **Keyboard/mouse connector:** Supports standard AT Keyboard and a PS/2 Mouse
- **Floppy disk drive:** Supports up to two FDDs (720 KB / 1.44 MB). One built-in FDD is included inside the FDD housing.

- **Serial ports:** Two serial ports with one RS-232 ports (COM 1), one RS-232/422/485 port (COM2). All ports are compatible with 16C550 UARTs, +5V/+12V power supply selectable

- **Universal serial bus (USB) port:** Supports up to two USB ports, Intel UHCI v2.0 compatible

- **Mini PCI bus expansion slot:** Accepts one type lll mini PCI bus card

- **Solid State Disk:** Supports one 50-pin socket for CompactFlash type I/II (True IDE mode) or IBM MicroDrive HDD

- **Watchdog timer:** 63-level timer intervals 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 @ 195 mA lithium battery

- **Power management:** Supports power saving modes including Normal/Standby/Suspend modes. APM 1.2 compliant

VGA/Flat panel interface

- **Chipset:** Integrated in Intel 845GV

- **Display memory:** 8 MB Share Main memory

- **Display type:** Simultaneously supports CRT and flat panel displays (EL, LCD and gas plasma)

- **Display mode:** CRT Modes: 2048x1536 @ 60hz; LCD/Simultaneous Modes: 1600x1200 @ 60hz

Audio function

- **Chipset:** Integrated in Intel 845GV south bridge

- **Audio controller:** AC97 Ver. 2.0 compliant interface, Multi stream Direct sound and Direct Sound 3D acceleration

- **Stereo sound:** 18-bit full-duplex codec

- **Audio interface:** Microphone in, Line in, Line out, Speaker L, Speaker R

PCI bus Ethernet interface

- **Chipset:** Intel RC82540Em local bus Ethernet controller

- **Ethernet interface:** Full compliance with IEEE 802.3u 100Base-T and 10 Base-T specifications. Includes software drivers and boot ROM

- **100/10Base-T auto-sensing capability**

- **Wake-on-LAN:** Supports Wake-on-LAN function with ATX power control

Touchscreen (Optional)

Type	Analog Resistive
Resolution	Continuous
Light Transmission	75%
Controller	RS232 interface (uses COM4)
Power Consumption	<5 V@ 100 mA
Software Driver	Supports Windows 98/2000/ME/XP

Optional modules

- **CPU:** Support Intel® Pentium® 4-M up to 2.2 GHz
- **Memory:** 128/256/512 MB DDR 266 SDRAM
- **HDD:** 2.5" HDD
- **Operating System:** Microsoft® DOS, Windows 98, 2000, XP
- **Touchscreen:** Analog resistive
- **DVD-ROM drive:** Compact 6X or above

Environment

- **Operating Temperature:** 0 ~ 45° C (32 ~ 122° F)
- **Storage Temperature:** -20° ~ 60° C
- **Relative humidity:** 10 ~ 95% @ 40° C (non-condensing)

- **Certification:** EMC: CE, FCC Safety: UL1950, EN60950, CSA and CB

1.3 LCD Specifications

- **Display type**: 15" TFT LCD
- **Max. resolution**: 1024 x 768
- **Colors**: 16.7 M
- **Dot size (mm)**: 0.297 x 0.297
- **Viewing angle**: 120° (minimum)
- **Luminance**: 200 cd/m^2
- **Temperature**: 0 ~ 50° C
- ***VR control**: Brightness
- **LCD MTBF**: 50,000 hours
- **Backlight lifetime**: 25,000 hours

   * The VR control is defined by hot key in DOS or BIOS mode as below: Ctrl-Alt-F3, Ctrl-Alt-F4.

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

1.4 Dimensions
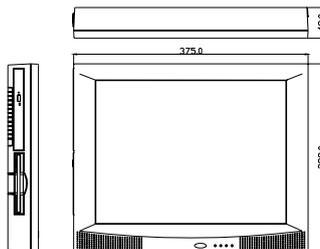
Figure 1.1: Dimensions of PPC-154T

System Setup

This chapter details system setup on the PPC-S154T panel PC.

Sections include:

- A Quick Tour of the Panel PC
- Installation procedures
- Running the BIOS Setup Program
- Installing System Software
- Installing the Drivers

Chapter 2 System Setup

2.1 A Quick Tour of the Panel PC

Before you start to set up the panel PC, take a moment to become familiar with the locations and purposes of the controls, drives, connectors and ports, which are illustrated in the figures below.

When you place the panel PC upright on the desktop, its front panel appears as shown in Figure 2-1.
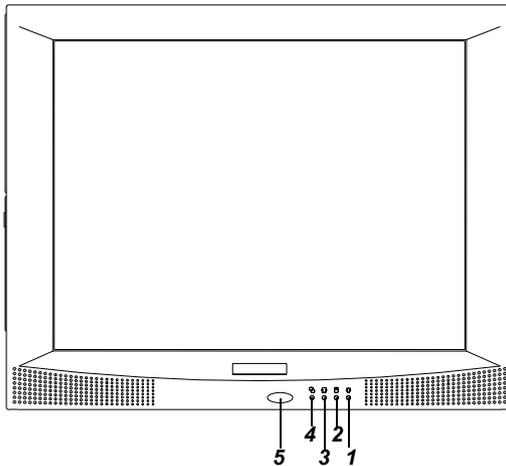
Figure 2.1: Front view of the panel PC

1, 2, 3, 4 are status LEDs which show the system status as noted below:

LED 1: Power On/Off

LED 2: HDD read/write

LED 3: Ethernet transmit/receive

LED 4: Ethernet link

5 is the IrDA sensor for the wireless transmission and reception of infra-red data.

When you look at the left side of the panel PC, you will see the floppy disk drive, CD-ROM drive and PCMCIA expansion sockets, as shown in Fig. 2-2.
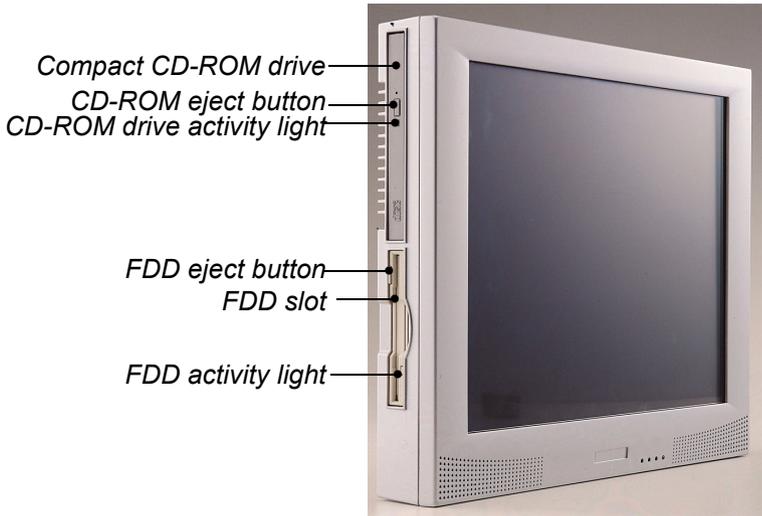
Figure 2.2: Left side view of the panel PC

When you turn the panel PC around and look at its rear cover, you will find the CPU and heat sink space located on the left-top side. This space is covered by a side panel cover and HDD bracket located on the right side, as shown in Figure 2-3. The sunken I/O section is at the bottom of the panel PC, as shown in Fig. 2-4. (The I/O section includes various I/O ports, including serial ports, VGA port, the Ethernet port, USB ports, the microphone jack, and so on.)

CPU and Heatsink cover

HDD bracket

Product label
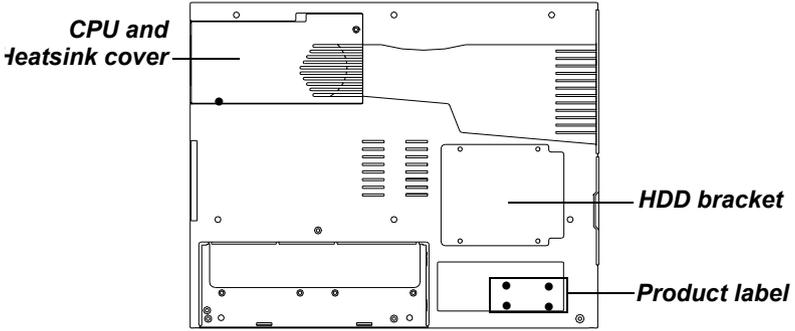
Figure 2.3: Rear view of the panel PC

DC inlet

USB ports

COM1

PS2 port

Line-out jack

COM2

VGA port **Ethernet Jack** **Mic-in jack** **Line-in jack**
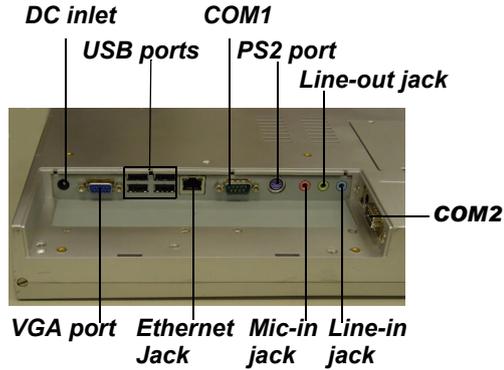
Figure 2.4: Rear and bottom view of the panel PC

Figure 2-4 shows the I/O section and power switch of the panel PC.

2.2 Installation Procedures

2.2.1 Connecting the power cord

The panel PC can only be powered by a DC electrical outlet (16Vdc~25Vdc, 3.5A max.). Be sure to always handle the power cords by holding the plug ends only. Please follow the figure 2-5 to connect the male plug of the power cord to the DC inlet of the panel PC.

2.2.2 Connecting the keyboard or mouse

Before you start the computer, please connect the Y-shaped adaptor to the PS/2 mouse and keyboard port on the I/O section of the panel PC, then connect the necessary mouse or keyboard to the Y-shaped adapter or serial ports.

2.2.3 Switching on the power

When you look at the right side of the panel PC, you will see the power switch as shown in Figure 2-6 and Figure 2-7. When the switch is on horizontal position as Figure 2-6, it is in lock status. You can set it to avoid accidental open or close of the computer. When the switch is on vertical position as Figure 2-7, it can be pushed to open or close the computer.

DC inlet

AC/DC power adapter
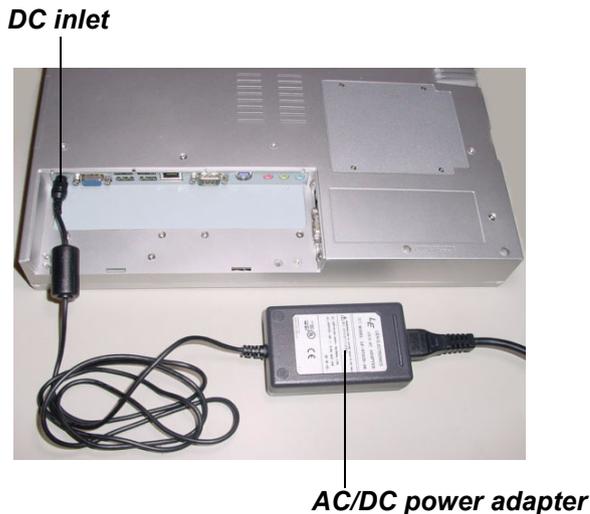
Figure 2.5: Connecting the power cord to the DC inlet

Power switch (Lock status)

Figure 2.6: Power switch in lock status

Power switch (Open status)

Figure 2.7: Power switch in open status

2.3 Running the BIOS Setup Program

Your panel PC is likely to have been properly set up and configured by your dealer prior to delivery. You may still find it necessary to use the panel PC's BIOS (Basic Input-Output System) setup program to change system configuration information, such as the current date and time or your type of hard drive. The setup program is stored in read-only memory (ROM). It can be accessed either when you turn on or reset the panel PC, by pressing the "Del" key on your keyboard immediately after powering on the computer.

The settings you specify with the setup program are recorded in a special area of memory called CMOS RAM. This memory is backed up by a battery so that it will not be erased when you turn off or reset the system. Whenever you turn on the power, the system reads the settings stored in CMOS RAM and compares them to the equipment check conducted during the power on self-test (POST). If an error occurs, an error message will be displayed on screen, and you will be prompted to run the setup program.

If you want to change the setup of BIOS, refer to Chapter 9 for more detailed information.

2.4 Installing System Software

Recent releases of operating systems from major vendors include setup programs which load automatically and guide you through hard disk preparation and operating system installation. The guidelines below will help you determine the steps necessary to install your operating system on the panel PC hard drive.

> *Note:* *Some distributors and system integrators may have already pre-installed system software prior to shipment of your panel PC.*

If required, insert your operating system's installation or setup diskette into the diskette drive until the release button pops out. (See Fig. 2-2.)

The BIOS of the panel PC supports system boot-up directly from the CD-ROM drive. You may also insert your system installation CD-ROM into the CD-ROM drive. (See Fig. 2-2.) Refer to Chapter 9 if you wish to change the BIOS settings.

Power on your panel PC or reset the system by pressing the "Ctrl"+"Alt"+"Del" keys simultaneously. The panel PC will automatically load the operating system from the diskette or CD-ROM.

If you are presented with the opening screen of a setup or installation program, follow the instructions on screen. The setup program will guide you through preparation of your hard drive, and installation of the operating system.

If you are presented with an operating system command prompt, such as A:\>, then you must partition and format your hard drive, and manually copy the operating system files to it. Refer to your operating system user's manual for instructions on partitioning and formatting a hard drive.

2.5 Installing the Drivers

After installing your system software, you will be able to set up the Ethernet, SVGA, audio, and touchscreen functions. All the drivers except the CD-ROM drive driver are stored in a CD-ROM disc entitled "Drivers and Utilities." The CD-ROM drive driver is stored in a floppy disk. Both the CD-ROM and the floppy disk can be found in your accessory box.

To set up the CD-ROM function, insert the floppy disk with the CD-ROM drive driver into the floppy disk drive and type "install" after the following prompt is displayed on screen:

A: > INSTALL

Press "Enter", and the installation process will be completed in a few seconds.

The standard procedures for installing the drivers are described in Chapters 5, 6, 7, 8 respectively.

The utility directory includes multimedia programs. Refer to the README.TXT file inside the VGA folders for more detailed information.

The various drivers and utilities in the CD-ROM disc have their own text files which help users install the drivers and understand their functions. These files are a very useful supplement to the information in this manual.

Note: *The drivers and utilities used for the PPC-S154T panel PCs are subject to change without notice. If in doubt, check Advantech's website or contact our application engineers for the latest information regarding drivers and utlities.*

Hardware and Peripheral Installation

This chapter details the installation of the PPC-S154T panel PC hardware.

Sections include:

- Overview of Hardware Installation and Upgrading

- Installing the 2.5" Hard Disk Drive (HDD)

- Installing the Central Processing Unit (CPU) and SDRAM Memory Module

Chapter 3 Hardware and Peripheral Installation

3.1 Overview of Hardware Installation and Upgrading

The panel PC consists of a PC-based computer that is housed in a plastic front and rear panel. Any maintenance or hardware upgrades can be completed after removing both panels. Meanwhile your HDD, SDRAM, CPU are all readily accessible by removing the CPU and heatsink cover and HDD bracket..

Warning! *Do not remove the plastic covers until you have verified that no power is flowing within the panel PC. Power must be switched off and the power cord must be unplugged. Every time you service the panel PC, you should be aware of this.*

3.2 Installing the 2.5" Hard Disk Drive (HDD)

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

1. Detach the HDD bracket by unscrewing the four screws on the top of the HDD bracket.

2. Place the HDD inside the HDD bracket and tighten four screws from both sides of the HDD bracket.

3. The HDD cable (1 x 44-pin to 1 x 44-pin) is next to the HDD bracket. Connect the HDD cable to the HDD. Make sure that the red wire corresponds to Pin 1 on the connector, which is labelled on the board. Plug the other end of the cable into the HDD, with Pin 1 on the cable corresponding to Pin 1 on the HDD.

4.   Put the HDD bracket with HDD back to original position, then screw the four screws to fix it.
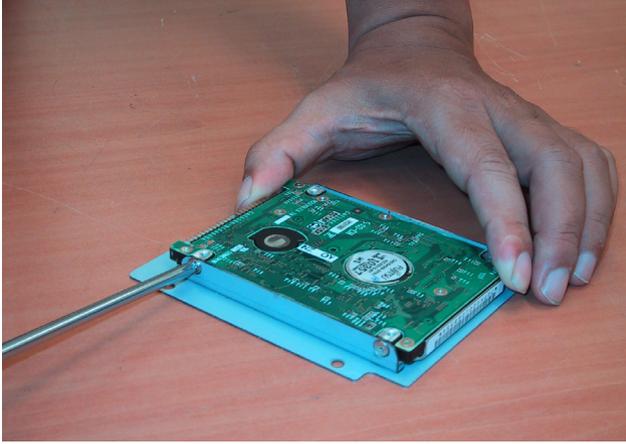
Figure 3.1: Install the HDD on the HDD bracke

t
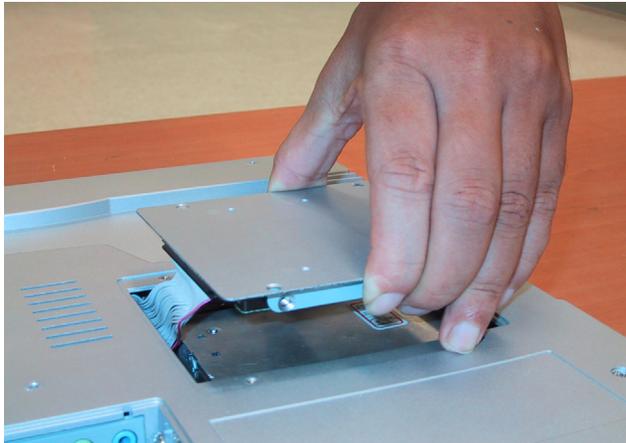
Figure 3.2: Connect HDD to the HDD cable

3.3 Installing the SDRAM Memory Module and Central Processing Unit (CPU)

The panel PC's central processing unit (CPU) can be upgaded to improve system performnace. The panel PC provides one 478-pin ZIF (Zero Insertion Force) socket (Socket 478). The CPU must come with an attached heat sink and CPU fan to prevent overheating. THe panel PC also privides two 200-pin SODIMM sockets which can accept two DDR 266 SDRAM memory modules up to 1 GB

Warning: *The CPU may be damaged if operated without a heat sink and a fan.*

Caution: *Always disconnect the power cord from your panel PC when you are working on it. Do not make connections while the power is on as sensitive electronic components can be damaged by the sudden rush of power. Only experience electornics personnel should open the panel PC.*

1.   Unscrew the screw on the right side for CPU and heat sink cover, slide leftwrad and detach the cover, then you can find one 478-pin CPU socket and one 200-pin SODIMM socket (DIMM1).

Figure 3.3: Detaching the CPU plastic cover and heat sink

2. Locate the ZIF socket and open it by first pulling the lever side ways away from the socket, then upwards at an angle of 90 degrees.

3. Insert the CPU with the correct orientation

4. 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!

5. Press the lever down. The plate will slide across slightly.

6. In order to improve heat disspation, apply a thermal padpaste around the CPU and thermal grease on the CPU die then place the heat sink on the top of CPU and north chipset.

Heat sink support plate
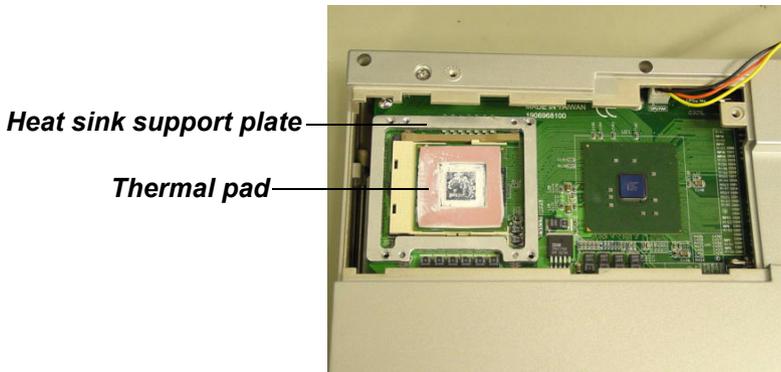
Thermal pad

Figure 3.4: CPU with thermal pad

7. Next, install an SDRAM module. Slip the memory module into the socket at a 45 degree angle.

8. Push the module toward the horizontal ports at both ends of the socket until the module is upright and the retaining clips at both ends of the module click into place. When positioned correctly, the pins on top of the vertical posts should correspond to the circular holes on the ends of the module.

9. If a second 200-pin SODIMM socket is requested to install a second memory module, you have to disassemble the panel PC. Recommend you to contact our techincal support before disassembling the PPC.

10.   Finally, put the heatsink with the fan back and tighten the four screws, then put back and fix the plasticcover.

Jumper Settings and Connectors

This chapter tells how to set up the panel PC hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedures.

Sections include:

- Jumpers and Connectors
- CPU Installation
- CMOS Clear for External RTC (JP3)
- COM-port Interface
- VGA Interface
- Watchdog Timer Configuration

Chapter 4 Jumper Settings and Connectors

4.1 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 ìcloseî a jumper, you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either pins 1 and 2 or pins 2 and 3.
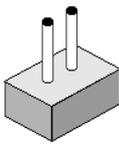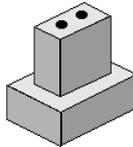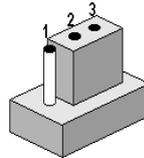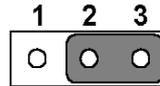
A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

4.1.1 Jumpers and switch

The motherboard of the panel PC has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each of the boardís jumpers.

Table 4.1: Jumpers and their functions

Label	Function
JP2	LCD power connector
JP3	CMOS clear for external RTC
JP4	COM2 RS232/422/485 setting
JP5	COM1 / COM2/ COM3 ping 9 output type setting
SW1	Panel type setting

4.1.2 Locating jumpers and switch
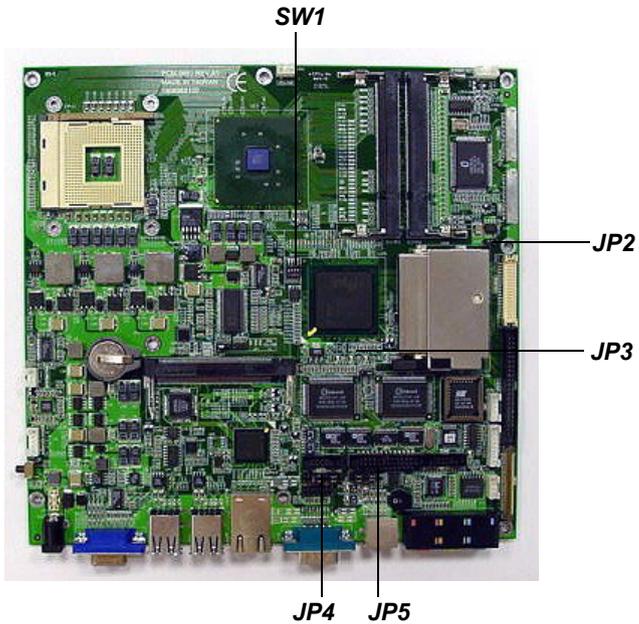
Figure 4.1: Locating jumpers on the PPC-S154T motherboard

4.1.3 Installing the 2.5" Hard Disk Drive (HDD)

Onboard 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 ís connectors.

Table 4.2: Panel PC connectors

Label	Function
CN3, CN5	Flat panel display connector (24-24 bits)
CN4	Inverter power connector
CN6	TV output (S-Viedo)(Reserved)
CN7	Mini PCI socket
CN8	Print port connector
CN9	FDD connector
CN11	COM2 connector
CN12	COM 3 connector
CN13	Touch screen sensor connector
CN16	Speaker-out connector
CN18	2.5 " IDE connector
CN19	Slim type CD-ROM/IDE connector
CN25	Panel control connector
CN26	SIR connector
FAN1	CPU fan power connector
FAN2	System fan power connector

4.1.4 Locating connectors
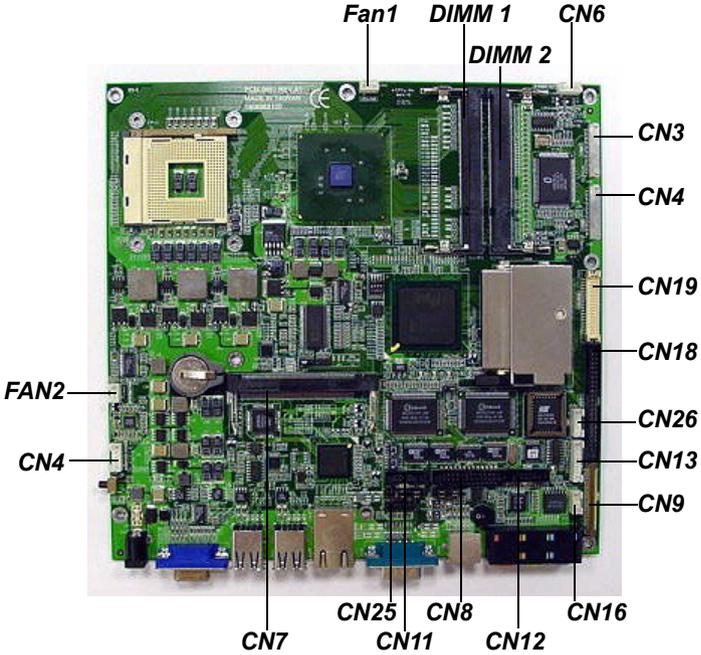
Figure 4.2: Locating connectors on the PPC-S154T motherboard

4.2 CPU Installation

You can install an Intel® Pentium®-M CPU without setting any frequency ratio or voltage.

4.3 CMOS Clear for External RTC (JP3)

Warning: *To avoid damaging the computer, always turn
                off the power supply before setting "Clear
                CMOS". Set the jumper back to ìNormal opera-
                tionî before turning on the power supply.*

Table 4.3: Clear CMOS / External RTC (JP3)

*Normal operation	Clear CMOS

1 2 3	1 2 3
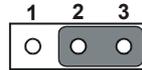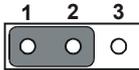
* default setting

4.4 COM-port Interface

The panel PC provides two serial ports,COM1 : RS-232, COM2:RS-232/
422/485 (in one COM port connector)

4.4.1 COM2 RS-232/422/485 setting (JP4)

COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode.

This is done via J4 settings.

Table 4.4: COM2 RS-232/422/485 setting (JP4)

*RS-232

2   6   10   14   18
1   5   9   13   17
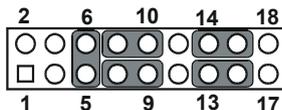
* default setting

Table 4.5: COM2 RS-232/422/485 setting (JP4)

RS-422
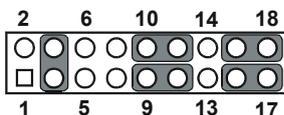
* default setting

Table 4.6: COM2 RS-232/422/485 setting (J4)

RS-485
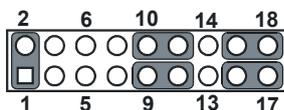
* default setting

The IRQ and the address ranges for COM1 and 2 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 PCís 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.

Table 4.7: Serial port default settings

Port	Address Range	Interrupt
COM1	3F8 ~ 3FF	IRQ4
COM2	2F8 ~ 2FF	IRQ3

4.4.2 COM1/COM2/COM3/ pin 9 output setting (JP5)

Table 4.8: COM1/2/3 pin 9 output setting(JP5)

*Normal

```
11  9   7   5   3   1
 O   O   O   O   O   O
 O   O   O   O   O   O
12  10  8   6   4   2
```

+5 V output

```
11  9   7   5   3   1
 O  [==][==] O  [==][==]
 O  [==][==] O  [==][==]
12  10  8   6   4   2
```

+12 V output

```
11  9   7   5   3   1
[==][==] O  [==][==] O
[==][==] O  [==][==] O
12  10  8   6   4   2
```

*Default setting

NOTE: *Pins 3,5 are for COM1*
   Pins 4,6 are for COM2
   Pins 9,11 are for COM3

4.5 VGA Interface

The panel PC's AGP VGA 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.

Pin assignments for the flat panel display connector, backlight connector and other related connectors are shown in Appendix C.

4.5.1 LCD panel power setting

The panel PC's AGP SVGA interface supports 5 V and 3.3 V LCD displays. The LCD cable already has a built-in default setting. You do not need to adjust any jumper or switch to select the panel power.

4.5.2 Panel type select (SW1)

SW1 is a 8-pin dip switch for selecting panel type and display mode. A 1024 x 768 TFT LCD is used in the PPC-S154T, so the switch is preset according to the table below. The switch is already defaulted for the PPC-S154T's LCD, so it should not be modified. If you require modification for a special purpose, we recommend that you consult your distributor or our sales representative for detailed information.

Table 4.9: Panel type select (SW1)

Panel type	Pin 1	Pin 2	Pin 3	Pin 4
1024 x 768 (48-bit)	OFF	ON	ON	OFF

4.6 Watchdog Timer Configuration

An onboard 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. When the watchdog timer activates (i.e. CPU processing has come to a halt), it can reset the system. (Refer to Appendix A.)

Intel Chipset

This chapter provides information on Intel chipset configuration

- Introduction
- Installation of Intel INF driver
  -Installation of Intel IAA driver
- Further information

Chapter 5 Intel Chipset

5.1 Introduction

The PPC-S154T uses the combination of Intel 845GV north bridge and Intel 82801 DB ICH4 south bridge.

The Intel® 845GV chipset is an innovative integrated graphics chipset developed with DDR266 memory and optimized to support the Intel Pentium® 4/ Pentium® 4-M processor, adding intelligence to help manage and prioritize multiple threads received from the microprocessor. The Intel 845GV chipset also includes the extremely stable and innovative Intel Extreme Graphics technology, running at 266 MHz core speed.

The Intel 82801DB I/O Controller Hub 4 (ICH4) is a highly integrated multifunctional I/O Controller Hub that provides the interface to the PCI Bus and integrates many of the functions needed in todayís PC platforms.

Important: *The following are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

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

5.1.1 Installation INF driver for Windows 98/2000/XP

1.   Path: D:\PPC-S154\Chipset Software\INF Drivers\4.30 1006\infinst_auto.exe

2.   Press "Next ìto proceed, then press "Finish".

3.   Choose "Yes, I want to restart my computer", and press "Finish", the system will reboot automatally

5.1.2 Installation IAA driver for Windows 98/2000/XP

1. Path: D:\PPC-S154\Chipset Software\IAA Drivers\2.3\iaa23_multi

2. Press "Next "to proceed, and press "Finish".

3. Choose "Yes, I want to restart my computer", and press "Finish", the system will reboot automatally

5.2 Further Information

Intel website: http://www.intel.com

Advantech websites: www.advantech.com

www.advantech.com.tw

CHAPTER **6**

AGP SVGA Setup

Chapter 6 AGP SVGA Setup

6.1 Introduction

The PPC-S154T has an on board integrated VGA chipset The specifications and features are described as follows:

6.1.1 Chipset

The PPC-S154T uses a integrated graphics chipset in Intel 845GV chipset . The Intel 845GV chipset contains an entirely new 32bpp graphics hardware engine, known as Intel Extreme Graphics, which has been designed and built by Intel to optimize the performance of the Intel Processor. Intel Extreme Graphics delivers higher 2D/3D graphics performance and a rich, high quality video experience to the user.

6.1.2 Display memory

The integrated VGA chipest can support 8MB Share Main memory.

• **Dynamic video Memory:** If the system memory is bigger or equal to 256MB, the video memory will be set to 64MB. If the system memory is between 128MB to 256MB, the video memory will be set to 32MB

6.2 Installation of SVGA Driver

Important:　　*The following are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

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

6.2.1 Installation for Windows 98

1. Click the 'Start' button in the task bar, click 'Run' and then select 'Setup.exe' from D:\PPC-S154\845G Graphics Driver\WIN9X_ME\Setup.exe. The Install dialog will appear.

2. click 'Next' to continue.

3. Read License Agreement and click "Yes" to proceed.

4. When the 'Setup COMPLETE' message appears click 'Finish' to restart PPC-S154T.

5. After the system reboot, the screen show "Insert Disk", click "OK"

6. click "browse"

7. Find the folder as following : D:\PPC-S154\845GV Graphics Driver\win9x_me\win9x, click "OK"

6.2.2 Installation for Windows 2000/XP

AUTOMATED INSTALL USING SETUP.EXE :

The easiest way to install the Intel Extreme Graphics Driver is to run the InstallShield* Setup program. The Intel Extreme Graphics Driver is packaged in a self-extracting executable.

1. Click the 'Start' button in the task bar, click 'Run' and then select 'Setup.exe' from D:\PPC-S154\845G Graphic Driver\WIN2K_XP\Setup.exe. The Install dialog will appear.

2. click 'Next' to continue.

3. Read License Agreement and click "Yes" to proceed.

4. When the 'Setup COMPLETE' message appears click 'Finish' to restart PPC-S154.

6.3 Further Information

For further information about the AGP/SVGA installation in your PPC-S154T, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

Intel support website: http://downloadfinder.intel.com

Advantech websites: www.advantech.com

www.advantech.com.tw

PCI Bus Ethernet Interface

This chapter provides information on Ethernet configuration.

- Introduction
- Installation of Ethernet Driver
    - for Windows 98
    - for Windows 2000/XP
- Further Information

Chapter 7 PCI Bus Ethernet Interface

7.1 Introduction

The PPC-S15T4 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 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.

7.2 Installation of Ethernet Driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your PPC-S154T, 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.

Important: *The following are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

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

7.2.1 Installation for Windows 98/NT/ME/2000

Upon installing on Windows 98, the system will automatically detect the Ethernet hardware and install the Ethernet driver. It is recommended that you upgrade to the Intel driver as following :

1.   a Select "Start", "Settings", "Control Panel", "System"
     b. Click "Device Manager" and highlight "PCI Ethernet Controller"
     c. Select "Properties"

2.   Choose "Driver" folder

3.   Click "Update Driver"

4.   a. Follow the instructions
     b. Click "Next"

5.   Choose "search for a better driver than the one your device is using now[Recommended] ", Click "Next"

6.   Select "CD-ROM drive", click "Next" to proceed

7.   Choose Drive "d", click "OK" to proceed

8.   Insert Windows98 Disk, click "Finish" to finish the installation

7.2.2 Installation for Windows 2000/ME/XP

After finishing the Windows 2000/XP installation, the system will automatically detect the Ethernet hardware and install the Ethernet driver from the drivers database from Windows 2000, Windows XP when the system reboots.

It is recommended that you upgrade to the Intel driver provided with the CD. To upgrade the driver, path : D:\PPC-S154\Intel Lan 6.2\setup.exe

7.3 Further Information

Intel website :

- Main Intel web support site: http://support.intel.com

- Network products information: http://www.intel.com/network

Advantech websites: www.advantech.com

www.advantech.com.tw

Audio

- Introduction
- Installation of Audio Driver

Chapter 8 Audio

8.1 Introduction

The ALC202 is an 18-bit, full duplex AC'97 2.2 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR based designs. The ALC202 AC'97 CODEC supports multiple CODEC extensions with independent variable sampling rates and built-in 3D effects.

8.2 Installation of Audio Driver

Before installing the audio driver, please take note of the procedures detailed below. You must know which operating system you are using in your PPC-S154T, and then refer to the corresponding installation procedure.

Important: *The following are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

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

Run the setup.exe program to finish the installation. Path : D:\PPC-S154\Audio\98_ME_2K_XP

USB 2.0

This chapter describes how to install
USB 2.0 driver

Chapter 9 USB 2.0

9.1 Installation of USB 2.0 driver

Before installing the audio driver, please take note of the procedures detailed below. You must know which operating system you are using in your PPC-S154T, and then refer to the corresponding installation procedure

> *Important :*   *The following windows illustrations are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

> *Note:*   *The CD-ROM drive is designated as "D" throughout ths chapter.*

1.   Select "Start", "Settings", "Control Panel", and double click the "System" icon.

2.   Click the "Device Manager" and "PCI Universal Serial Bus" items.

3.   Click "Properties"

4.   Select "Driver" tab, click ìUpdate Driver"

5.   Click "Next"

6.   Choose "Display a list of all the drivers in a specific location..." then Click "Next "

7.   Choose "Other devices", click "Next", Click "Have disk", Click " Browse",

8.   a. For Windows 98/SE, find the folder : D:\PPC-S154\ich4 usb 2.0\98se", click ok

b. For Windows 2000,find the folder : D:\PPC-S154\ich4 usb

2.0\2k\2k\EHCI Pakage

c. For Windows XP, find the folder :D:\PPC-S154\ich4 usb

2.0\xp\xp

9.   Click "Next" to proceed

Touchscreen

- Introduction
- Installation of Touchscreen Drivers
- for Windows 98/ME
- for Windows 2000/XP

Chapter 10 Touchscreen

10.1 Introduction

10.1.1 General information

The PPC-S154T's optional touchscreen incorporates advanced second-generation resistive, impact-resistant technology. It allows 75% light transmission. The resistive model has an antiglare surface. This model provides greatly enhanced visual resolution. It also has new improved scratch-resistant features.

The touchscreen is manufactured from UL-recognized components. When properly installed, the touchscreen's ball impact resistance meets the UL 1950 standard. Its fire resistance meets the UL-746C, 19 mm (0.75") flame test standard. Systems incorporating the touchscreen, controllers, and cables have been approved to FCC Class A and Class B standards.

For more detailed information, please visit the following websites:

www.dynapro.com

www.3m.com/us/electronics_mfg/touch_systems

www.elotouch.com

Advantech Co.,Ltd. reserves the right to alter the touchscreen at any time without notice.

10.1.2 General specifications

Please refer to Chapter 1, Section 1.2 of this manual.

10.1.3 Environmental specifications

Temperature:-10° ~ 50° C (operating)

      -40° ~ 71° C (storage)

Relative humidity:

90 RH at 35° C (operating)

90 RH at 35° C for 240 hours, non-condensing (storage)

Chemical resistance: The active area of the touchscreen is resistant to the following chemicals when exposed for a period of one hour at a temperature of 21° C (71° F):

-     Acetone

-     Methylene chloride

- Methyl ethyl ketone

- Isopropyl alcohol

- Hexane

- Ammonia-based glass cleaners

- Turpentine

- Mineral spirits

- Foods and beverages

10.2 Installation of Touchscreen Drivers

The touchscreen driver for Windows contains a native, 32-bit driver and a 32-bit control panel program for the PPC-S154T system.

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

Important: *The following are examples only. You must follow the instructions and pay attention to the instructions which then appear on your screen.*

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

10.2.1 Installation for Windows 98/ME

To install the software to PPC-S154T, your PPC-S154T must have Windows 98/Me system running and installed PenMount Series Interface control board already. If you have an older version of PenMount Windows 98/Me driver installed in your PPC-S154T, please remove it first.

1.   You will find out "Unknown Device" when start the system, please choose "Cancel"

2. Select from "D:\PPC-S154\TouchScreen\Windows 98-Me Driver V3.1\setup.exe" to install PenMount windows 98/ME driver to system

3. The screen display PenMount logo, copying "installation wizard" and "PenMount Utilities" screen plus "welcome" message appears. Selete "Next"

4. The next screens is "Software License Agreement", select "Yes"

5. The next screens is "Information", select "Next"

6. The next screen is "Choose Destination Location". It is for setup installing PenMount Utilities in the folder: C:\Program Files\Pen-Mount\Win9x, select "Next" or modify the folder name you like to use

7. The next screen is "Select Program Folder", the default is set at "PenMount Utilities", select "Next" or change it

8. The next screen is "Start Copying Files", select "Next" for starting copy files to system

9. The next screen is "Setup Compelete", select "Finish"

10. The next screen is " Restarting Windows", select "Yes I want to restart my computer now", and "OK"

10.2.2 Installation for Windows 2000/XP

To install the software to PPC-S154T, your PPC-S154T must have Windows 2000/XP system running and installed PenMount Series Interface control board already. If you have an older version of PenMount Windows 2000/XP driver installed in your PPC-S154T, please remove it first.

Follow up the steps below to install the PenMount Window 2000/XP driver.

1. Select from "D:\PPC-S154\TouchScreen\Windows 2000-XP Driver V4.01\setup.exe" to install PenMount windows 2000/XP driver to system

2. The screen displays copying "installation wizard" and "PenMount Utilities" screen plus "welcome" message appears. Selete "Next"

3. The next screens is "Software License Agreement", select "I accept the terms in the license" and "Next"

4. The next screens is " Ready to install the Program", select "Install"

5.   The next screen is "Hardware Installation" , select " Continue Anyway"

6.   The next screen is "InstallShield Wizard Completed", Select "Finish"

10.3 Further Information

Dynapro website: **www.dynapro.com**

www.3m.com/us/electronics_mfg/touch_systems

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

www.advantech.com.tw

Salt website: **www.salt.com.tw**

Programming the Watchdog Timer

The PPC-S154T 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.

Appendix A Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

To program the watchdog timer, you must write a program which writes I/O port address 440 (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.

ï   ï

ï   ï

ï   ï

3F   63 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 440 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 440 (hex).

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

```
;-------------------------------------------------------------------------------
; Enter the extended function mode , interruptible double-write |
;-------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
```

```
;----------------------------------------------------------------------
; Configure logical device 8, configuration register CRF6 |
;----------------------------------------------------------------------
MOV DX,2EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,2FH
MOV AL,08H ; select logical device 8
OUT DX,AL
;
MOV DX,2EH
MOV AL,30H ;Set watch dog activate or inactivate
OUT DX,AL
MOV DX,2FH
MOV AL,01H  ; 01:activate 00:inactivate
OUT DX,AL
;
MOV DX,2EH
MOV AL,F5H ; Setting counter unit is second
OUT DX,AL
MOV DX,2FH
MOV AL,00H
OUT DX,AL
;
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
MOV AL,05H ; Set 5 seconds
```

OUT DX,AL

;--
; Exit extended function mode |
;--
MOV DX,2EH
MOV AL,AAH

Pin Assignments

Appendix B Pin Assignments

B.1 Inverter Power Connector (CN4)

Table B.1: Inverter power connector (CN4)

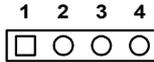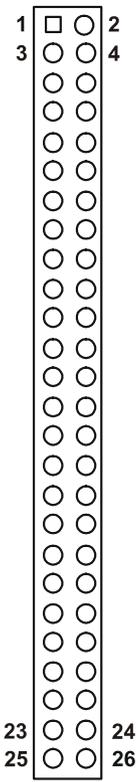| Pin	Signal
1	+24V
2	GND
3	ENABKL
4	Brightness Adj.
5	+5 V

B.2 Internal Speaker Connector (CN15)

Table B.2: Internal speaker connector (CN15)

Pin	Signal
1	Speaker out_R -
2	Speaker out_R +
3	Speaker out_L +
4	Speaker out_L -

B.3 Floppy Drive Connector (CN9)

Table B.3: Floppy drive connector (CN9)

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

B.4 IDE Hard Disk Drive Connector (CN18)

Table B.4: EIDE hard disk drive connector (CN18)

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 DREQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	HD READY	28	CABLE SELECT
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	Vcc	42	VCC
43	GND	44	N/C

low active

B.5 CD-ROM Connector (CN19)

Table B.5: CD-ROM connector (CN19)

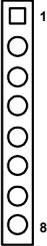| Pin	Signal	Pin	Signal
1	Audio_L	2	Audio_R
3	GND	4	GND
5	IDE RESET #	6	DATA8
7	DATA7	8	DATA9
9	DATA6	10	DATA10
11	DATA5	12	DATA11
13	DATA4	14	DATA12
15	DATA3	16	DATA13
17	DATA2	18	DATA14
19	DATA1	20	DATA15
21	DATA0	22	HDD DREQ
23	GND	24	IO READ
25	IO WRITE	26	GND
27	HD READY	28	HD ACK 0 #
29	IRQ 15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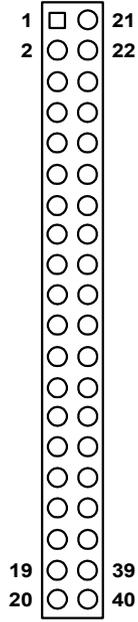
low active

B.6 Touch Screen Sensor Connector (CN13)

Table B.6: Touch Screen Sensor Connector (CN13)

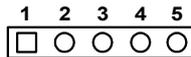| Pin	Signal
1	YE-
2	YS-
3	YS+
4	YE+
5	XE-
6	XS-
7	XS+
8	XE+

B.7 IR Connector (CN26)

Table B.7: IR connector (CN26)

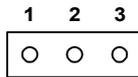| Pin	Signal
1	VCC
2	NC
3	IR_IN
4	GND
5	IR_OUT

B.8 CPU Fan Power Connector (FAN1)

```
  1   2   3
 ┌─────────┐
 │ ○   ○   ○ │
 └─────────┘
```

Table B.8: CPU fan power connector (FAN1)

Pin	Signal
1	GND
2	+5 V
3	FAN_DET

B.9 System Fan Power Connector (FAN2)
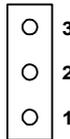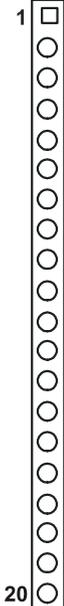
```
 ┌───┐
 │ ○ │ 3
 │ ○ │ 2
 │ ○ │ 1
 └───┘
```

Table B.9: Fan power connector (FAN2)

Pin	Signal
1	GND
2	+5 V
3	FAN_DET

B.10 Flat Panel Display Connector (CN3)

Table B.10: Flat Panel Display Connector (CN3)	
1	VDD(3.3V)
2	VDD(3.3V)
3	GND
4	GND
5	RXIN0-
6	RXIN0+
7	GND
8	RXIN1-
9	RXIN1+
10	GND
11	RXIN2-
12	RXIN2+
13	GND
14	CLK-
15	LCK+
16	GND
17	RXIN3-
18	RXIN3+
19	RSV
20	RSV
21	GND
22	GND

B.11 Flat Panel Display Connector (CN5)

Table B.11: Flat Panel Display Connector (CN5)

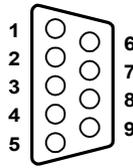| 1	VDD(3.3V)
2	VDD(3.3V)
3	GND
4	GND
5	RXIN0-
6	RXIN0+
7	GND
8	RXIN1-
9	RXIN1+
10	GND
11	RXIN2-
12	RXIN2+
13	GND
14	CLK-
15	LCK+
16	GND
17	RXIN3-
18	RXIN3+
19	RSV
20	RSV
21	GND
22	GND

B.12 COM1

Table B.12: COM1

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

B.13 COM2

```
 1  2  3  4  5
 ○ ○ ○ ○ ○
  ○ ○ ○ ○
 6  7  8  9
```
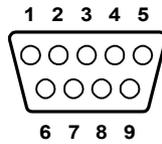
Table B.13: COM2

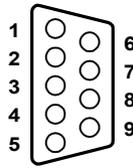| Pin	Signal		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	---
4	DTR	RX-	---
5	GND	GND	---
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---
9	RI	---	---

B.14 COM3

Table B.14: COM1

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

B.15 14 VGA connector (CN2)

```
15                      1
┌──────────────────────┐
│ ○ ○ ○ ○ ○ ○ ○ □ │
│ ○ ○ ○ ○ ○ ○ ○ ○ │
└──────────────────────┘
16                      2
```
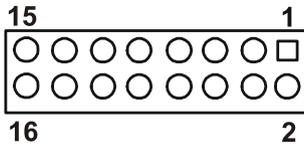
Table B.15: VGA connector (CN2)

Pin	Signal	Pin	Signal
1	RED	9	VGA G
2	Vcc	10	VGA H
3	GREEN	11	VGA G
4	VGA G	12	VGA V
5	BLUE	13	VGA G
6	N/C	14	DDCSCL
7	N/C	15	VGA G
8	DDCSDA	16	N/C

B.16 Parallel Port Connector (CN8)(Reserved)

Table B.16: Parallel Port Connector (CN8)

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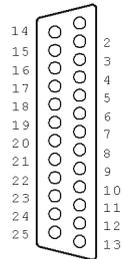
* low active

B.17 TV OUT (S-VIDEO) connector (Reserved)(CN6)

Table B.17: TV OUT (S-VIDEO) connector (Reserved)(CN6)

Pin	Signal
1	TV_Y
2	TV_C
3	GND
4	GND

B.18 PS/2 Keyboard & mouse port (CN14)

Table B.18: PS/2 Keyboard & mouse port(CN14)

Pin	Signal
1	KB_DTA
2	MS_DTA
3	GND
4	+5V
5	LB_CLK
6	MS_CLK