PCN-6351 Series

(PCN-6351 and PCN-6351L)

Half-size all-in-one Pentium® CPU card with VGA/LCD and Fast Ethernet interface

User's Manual

Copyright notice

Acknowledgements

For more information on this and other Advantech products please visit our web sites at: **http://www.advantech.com**
http://www.advantech.com/epc

For technical support and service for please visit our support web site at: **http://www.advantech.com/support**

This manual is for the PCN-6351/6351L Series Rev. A1

Part No. 2006635110

1st Edition Printed in Taiwan January 2000

Packing List

Before installing your board, make sure that the following materials have been received:

- 1 PCN-6351 Series all-in-one single board computer
- 1 startup manual
- 1 hard disk drive (IDE) interface cable (40-pin) p/n: 1701440500
- 1 floppy disk drive interface cable (34-pin) p/n: 1701340600
- 1 parallel port adapter (26-pin) and COM2 adapter (9-pin) kit p/n: 1700260250 and p/n: 1701140201 respectively
- 1 6-pin mini-DIN keyboard and PS/2 mouse adapter p/n: 1700060201
- 1 ATX/AT power cable and converter p/n: 1700000450 and p/n: 1700040052 respectively
- 1 CD-ROM (or disks) for utility, drivers and manual (in PDF format)
- 1 warranty certificate

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

Optional Devices

- IrDA adapter p/n: 968900042
- 1 USB cable p/n: 1700100170

CHAPTER 1

Hardware Configuration

This chapter gives background information on the PCN-6351/6351L. It shows you how to configure the board to match your application and prepare it for installation into your PC.

Sections include:

- Introduction
- Specifications
- Board layout and dimensions
- Safety precautions
- Jumper settings
- Clock speed setup
- CPU setup
- Other setup
- Installing system memory (DIMMs)

1.1 Introduction

The PCN-6351/6351L is a half-size ISA-bus CPU card. It features powerful on-board functions such as VGA, LCD, LAN and SSD, making it is versatile enough to meet the needs of a host of different applications.

Embedded Pentium® MMX CPU

The PCN-6351/6351L is equipped with Intel's new embedded Pentium® MMX CPU (75 to 233 MHz). The CPU provides high performance with low power consumption and better thermal management. This makes the PCN-6351/6351L ideal for POS terminals, ATMs, and industrial and embedded applications.

Note 1: Wake-on-LAN must be set at "Active Low" in order to work properly.

Note 2: The PCA-6104NP2 and PCA-6106NP3 backplanes' PCI Slot 1 is set as "Passive PCI". If "Active PCI" is required in your application, please use other PCI slots.

Note 3: In order for the Power Up by Alarm function to work, you must wait until the FDD's POST procedure has been completed, and only then turn off the system.

Note 4: After a system shutdown, it is advisable to wait 10 seconds before turning on the system power again. This helps to protect the CPU board.

1.2 Specifications

Standard SBC functions

- **CPU**: Intel® Pentium® MMX CPU 75/233 MHz; AMD K5, K6, up to K6-300 MHz; NS M1 PR 166/20 GP, M2-300; IDT Winchip C6 up to 240 MHz
- **BIOS**: AWARD 2 Mbit Flash BIOS, supports Plug & Play, APM 1.2, Ethernet boot ROM, boot from CD-ROM, LS-120, and ZIP drive
- **Chipset**: SiS 5582 (PCN-6351), SiS 5598 (PCN-6351L)
- **L2 cache**: 512 KB PB SRAM
- **System memory**: One 128-pin DIMM RAM socket supports an SDRAM memory module from 8 to 256 MB
- **PCI IDE interface**: One Enhanced IDE interface. Supports 2 IDE devices, PIO modes 3 and 4 with bus mastering up to 14 MB/sec, Ultra DMA mode up to 33 MB/sec
- **Floppy disk drive interface**: Supports up to two floppy disk drives: 3½" (720 KB or 1.44 MB) and/or 5¼" (360 KB or 1.2 MB)
- **Parallel port**: One parallel port , supports SPP/EPP/ECP
- **IR port**: Supports up to 4 Mbps transmission rate
- **USB ports**: Supports two USB ports, USB 1.0 compliant
- **Serial ports**: One RS-232, one RS-232/422/485
- **Watchdog timer**: Can generate a system reset or IRQ 11. Software enabled/disabled. Time interval is from 1 ~ 62 seconds. Jumperless with run-time setup

VGA function

PCN-6351

- **Controller**: C&T 69000 / C&T 69030, supports 36-bit LCD and CRT displays
- **Display memory**: 2 MB SDRAM built-in (optional 4 MB with C&T 69030)
- **Display resolution**: Up to 1280 x 1024 @ 8bpp (1280 x 1024 @ 24 bpp @ 4MB

PCN-6351L

- **Controller**: SiS 5598 built-in VGA supports CRT displays
- **Display memory**: Share system up to 4 MB
- **Display resolution**: Up to 1280 x 1024 @ 8 bpp (1280 x 1024 @ 24 bpp @ 4MB

Ethernet controller functions (PCN-6351 only)

- **Controller**: RTL 8139, 10/100 Mbps
- **I/O address switchless setting**
- **Connector type**: RJ-45
- **Boot ROM**: Built-in system (optional)

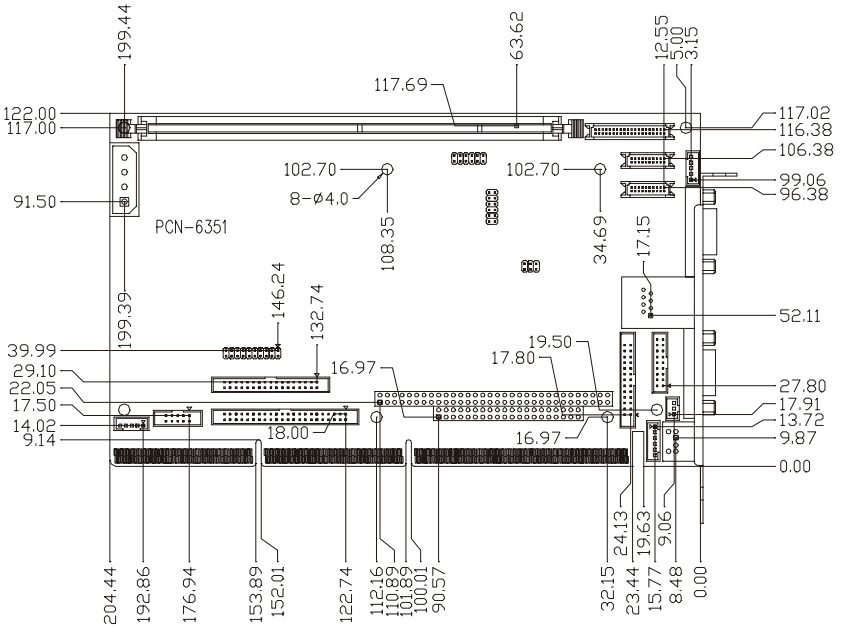
Solid state disk

- Supports CompactFlash™ disks

Mechanical and environmental specifications

- **Max. power requirement**: 5 A @ +5 V and 100 mA @ +12 V
- **Operating temperature**: 0 ~ 60° C (32 ~ 140° F)
- **Size**: 204 x 122 mm (8.03" x 4.8")

1.3 Board Layout and Dimensions



Unit: mm

Figure 1-1: PCN-6351/6351L board dimensions

1.4 Safety Precautions

Follow these simple precautions to protect yourself from harm and your PC from damage.

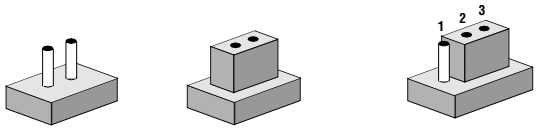
1. To avoid electric shock, always disconnect the power from your PC chassis before you work on it. Do not touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.
3. Always ground yourself to remove any static charge before you touch your CPU card. Be particularly careful not to touch the chip connectors. Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the card in its antistatic packaging when it is not installed in the PC, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.5 Jumper Settings

This section tells how to set the jumpers to configure your card. It gives the card default configuration and your options for each jumper. After you set the jumpers and install the card, you will also need to run the BIOS Setup program (discussed in Chapter 3) to configure the serial port addresses, floppy/hard disk drive types and system operating parameters. Connections, such as hard disk cables, are explained in Chapter 2.

For the location of each jumper, see the board layout diagram shown earlier in this chapter.

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal cap (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, connect the pins with the cap. To "open" a jumper, remove the cap. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case, connect either pins 1 and 2 or 2 and 3.



Open Closed Closed 2-3

You may find a pair of needle-nose pliers useful for setting the 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.

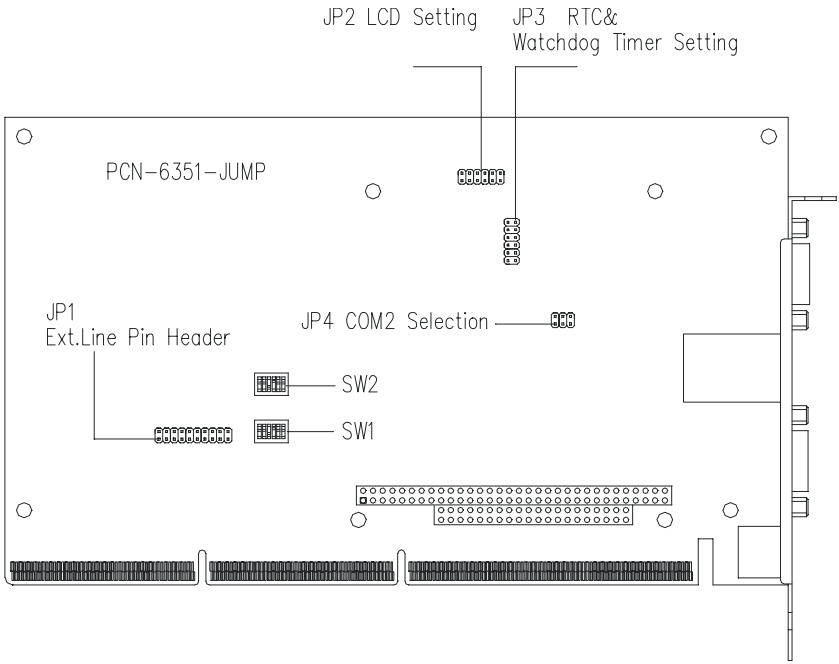


Figure 1-2: Locating jumpers

Table 1-1: Jumpers

Number	Function
SW1 (Pins 1-3)	PCI bus / CPU frequency setting
SW1 (Pin 4)	Cache RAM mode setting
SW1 (Pins 5-6)	CPU frequency setting
SW2 (Pin 1-4)	CPU core voltage select
SW2 (Pin 5-6)	Rev.
JP2	LCD setting
JP3	RTC and watchdog timer setting
JP4	COM2 setting for RS-232/422/485

1.6 Clock Speed Setup

1.6.1 CPU frequency ratio setting (SW1)

Clock speed setup procedure:

1. Check your CPU speed and type (eg. Intel® P-133).
2. From a suitable CPU relationship chart, find your CPU's corresponding clock speed and frequency ratio setting (eg. 133 MHz = 66 MHz x 2).
3. Set the CPU's frequency ratio on SW1, and consult your CPU's manufacturer for any further information regarding your selection.

Table 1-2: CPU frequency ratio setting (SW1)

Frequency ratio	Pin 1	Pin 2	Pin 3
1.5	OFF	OFF	OFF
2	ON	OFF	OFF
2.5	ON	ON	OFF
3	OFF	ON	OFF
3.5	OFF	OFF	OFF
4	ON	OFF	ON
4.5	ON	ON	ON
5	OFF	ON	ON
5.5	OFF	OFF	ON

1.6.2 Select cache RAM mode (SW1)

Table 1-3: Select cache RAM mode (SW1)

Cache RAM mode	Pin 4
Normal	OFF
NS linear mode	ON

1.6.3 PCI bus / CPU frequency setting (SW1)

Table 1-4: PCI bus / CPU frequency setting (SW1)

CPU frequency setting			
PCI	**CPU**	**Pin 5**	**Pin 6**
27.5	55	ON	ON
37.5	75	OFF	ON
30	60	ON	OFF
33.3	66	OFF	OFF

1.7 CPU Setup

1.7.1 CPU core voltage select (SW2)

SW2 must be set to match the CPU type. The chart below shows the proper jumper setting for their respective V_{CC}. A CPU's core voltage requirement is usually printed on top of the processor.

Select the voltage supply that is closest to the voltage printed on the CPU.

Table 1-5: CPU core voltage select (SW2)

Voltage setting	Pin 1	Pin 2	Pin 3	Pin 4
2	OFF	OFF	OFF	OFF
2.1	ON	OFF	OFF	OFF
2.2	OFF	ON	OFF	OFF
2.3	OFF	OFF	ON	OFF
2.4	OFF	OFF	ON	OFF
2.5	ON	OFF	ON	OFF
2.6	OFF	ON	ON	OFF
2.7	ON	ON	ON	OFF
2.8	OFF	OFF	OFF	ON
2.9	ON	OFF	OFF	ON
3	OFF	ON	OFF	ON
3.1	ON	ON	OFF	ON
3.2	OFF	OFF	ON	ON
3.3	ON	OFF	ON	ON
3.4	OFF	ON	ON	ON
3.5	ON	ON	ON	ON

1.7.2 Reserve (SW2)

Table 1-6: Reserve (SW2)

Function	Pin 5	Pin 6
Rev.	OFF	OFF

1.8 Other Setup

1.8.2 LCD panel select (JP2)

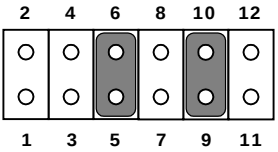


Table 1-7: LCD panel select (JP2)

Pin	Function	Pin	Function
1	NC	2	NC
3	NC	4	NC
5	SHFCLK+ *	6	SCLK
7	SHFCLK-	8	SCLK
9	ENABKL+ *	10	ENBKL
11	ENABKL-	12	ENBKL

* default setting

1.8.2 Watchdog timer and RTC settings (JP3)

An on-board watchdog timer reduces the chance of disruptions caused by EMP (elecro-magnetic pulse) interface. It is an invaluable protective for standalone or unmanned applications. Setup involves two jumpers and running the control software. (Refer to Appendix A.)

Table 1-8: Watchdog timer settings (JP3)

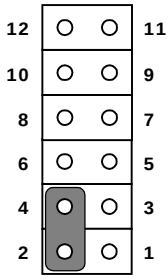
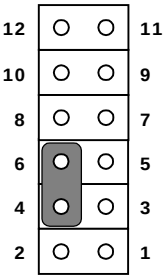
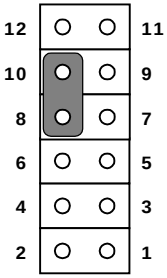
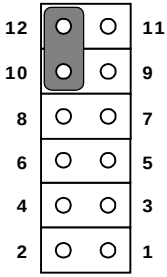
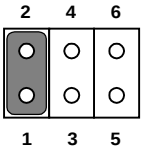
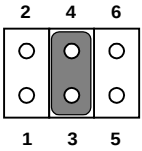
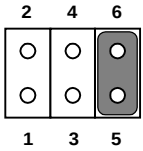
	Watchdog	IRQ11
JP3		

Table 1-9: RTC settings (JP3)

	RTC	RTC clean
JP3		

1.8.3 COM2 settings for RS-232/422/485 (JP4)

Table 1-10: COM2 settings for RS-232/422/485 (JP4)

	*RS-232	RS-422	RS-485
JP4			

* default setting

1.9 Installing System Memory (DIMMs)

You can install anywhere from 8 to 256 MB of SDRAM into your PCN-6351/6351L card. The card provides **two** 144-pin DIMM sockets. Each socket accepts 8, 16, 32, 64 or 128 MB 3.3 V power level DIMMs. If only one DIMM module is required, it can be installed in DIMM socket on the solder side of the PCN-6351/6351L board.

1.9.1 Installing DIMMs

The procedure for installing DIMMs is described below. Please follow these steps carefully. The nimber of pins is different on either side of the breaks, so the module can only fit in one way. SDRAM DIMM modules have different pin contacts on each side, and therefore have a higher pin density.

1. Make sure that all power supplies to the system are switched off.
2. Make sure that the two handles of the DIMM socket are in the "open" position. i.e. The handles remain leaning outward.
3. Slowly slide the DIMM module along the plastic guides on both ends of the socket.
4. Press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position on the DIMM socket.

To take out a memory module, just push both handles outward, and the module will be ejected by the mechanism in the socket.

CHAPTER 2

Connecting Peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCN-6351/6351L board. You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed, or your chassis is very tight, you may need to partially remove the card to make all the connections.

2.1 Board Layout: Connector Locations (Component Side)

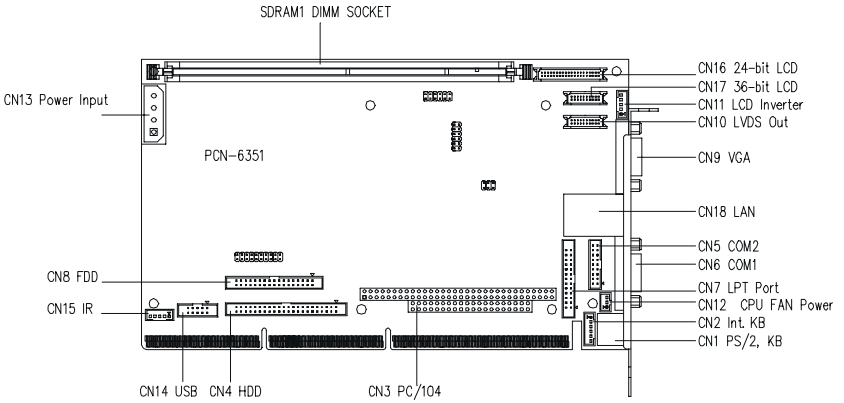


Figure 2-1: Connector locations on the component side

2.2 Board Layout: Connector Locations (Solder Side)

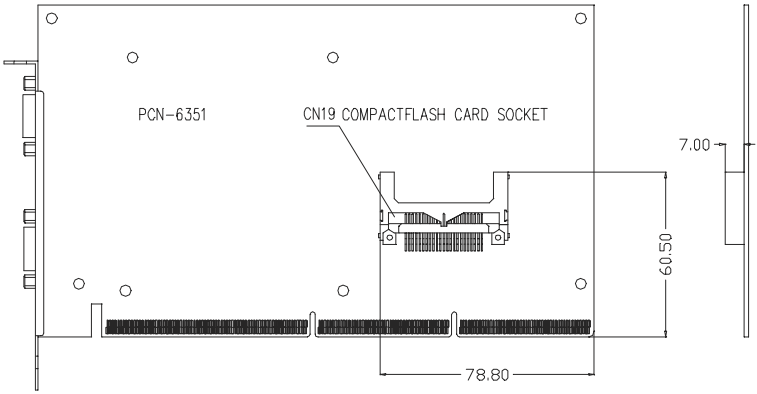


Figure 2-2: Connector locations on the solder side

Table 2-1: Connectors

Number	Function
A1	Socket 7
BT1	Battery socket
SDRAM1	DIMM connector
JP1	Ext. line pin header
CN1	PS/2 mouse and keyboard connector
CN2	Internal keyboard connector
CN3	PC/104 connector
CN4	HDD connector
CN5	COM2 connector
CN6	COM1 connector
CN7	LPT1 connector
CN8	FDD connector
CN9	VGA connector
CN10	LVDS connector
CN11	LCD inverter connector
CN12	FAN connector
CN13	Power connector
CN14	USB connector
CN15	IR connector
CN16	LCD 24-bit connector
CN17	LCD 36-bit connector
CN18	LAN connector
CN19	CompactFlash™ socket

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix C.

Warning! *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power. Only experienced electronics personnel should open the PC chassis.*

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

2.3 Extend Line Pin Header (JP1)

The PCN-6351/6351L provides a multi-function pin header for easy access to setting/connecting ATX power on/off, reset, hard disk LED, keyboard lock, and speaker.

Table 2-2: Ext. line pin header (JP1)

Function	Pin	Pin	Function
NC	1	2	NC
GND	3	4	NC
GND	5	6	ATX Power on/off
GND	7	8	RESET
HDD LED-	9	10	HDD LED +
Pwr LED +	11	12	NC
NC	13	14	Speaker +
GND	15	16	NC
KeyLock	17	18	Buzzer -
GND	19	20	Speaker -

Note 1: If you are using a buzzer, Pin 18 and Pin 20 need to be shorted.

Note 2. A speaker and buzzer cannot be used together.

2.4 PS/2 Mouse and Keyboard Connector (CN1)

The PCN-6351/6351L board provides a keyboard connector. A 6-pin mini-DIN connector (CN1) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

2.5 Internal Keyboard Connector (CN2)

The PCN-6351/6351L board provides an internal ketboard connector. A 6-pin header connector (CN2) on the board supports single-board computer applications.

2.6 PC/104 Connector (CN3)

The PCN-6351/6351L is equipped with a 16-bit ISA signal PC/104 connector for future expansion. Please see Appendix B for details.

2.7 HDD Connector (CN4)

You can attach two IDE (Integrated Device Electronics) drives to the PCN-6351's internal controller. The PCN-6351 CPU card has an EIDE connector, CN4.

Wire number 1 on the cable is red or blue, while the other wires are gray. Connect one end to connector CN4 on the CPU card. Make sure that the red (or blue) wire corresponds to pin 1 on the connector (on the right side). See Section 2-1 for information on finding the connector.

Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive, you should set it as the master. See the documentation provided with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. For more information, please refer to any documentation provided with your drive.

See the above for connecting the second drive to CN4.

2.8 Serial Ports (CN6: COM1; CN5: COM2/RS-232/422/485)

The PCN-6351/6351L offers two serial ports: COM1 in RS-232 and COM2 (CN5: RS-232/422/485). These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (For example, 3F8H [COM1], 2F8H [COM2]) or disable it, by using the BIOS Advanced Setup program.

The card mounting bracket holds the serial port connector for the one port, and the parallel port and serial port adapter kit (supplied with the card) holds the connector for the other port. This lets you connect and disconnect cables after you install the card. The DB-9 connector on the bottom of the bracket is the first RS-232 port, COM1. The DB-9 connector on the adapter kit is the second serial port, COM2.

Table 2-3: Serial port connections (COM1, COM2)

Connector	Function
COM1	RS-232
COM2	RS-232/422/485

2.8.1 RS-232 connection (COM1-CN6)

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8.2 RS-232/422/485 connection (COM2-CN5: RS-232; CN14: RS-422/485)

COM2 is an RS-232/422/485 serial port. The specific port type is determined by jumper settings (JP1), as detailed in Chapter 1.

The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the PCN-6351/6351L board's ports:

Table 2-4: Serial port default settings

Port	Address	Interrupt	Default
COM1	3F8, 3E8	IRQ4	3F8
COM2	2F8, 2E8	IRQ3	2F8

2.9 Parallel Port Connector (CN7)

The parallel port is normally used to connect the CPU card to a printer.

The PCN-6351/6351L includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN7. The card comes with an adapter cable, which allows you to use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

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

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Take the bracket and fit it in stead of the plate. Next, attach the flat-cable connector to CN7 on the CPU card. Wire 1 of the cable is red or blue, while the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN7. Pin 1 is on the right side of CN7.

2.10 FDD Connector (CN8)

You can attach up to two floppy disk drives to the PCN-6351/6351L's on-board controller. You can use any combination of 5.25" (360 KB / 1.2 MB) and/or 3.5" (720 KB / 1.44/2.88 MB) drives.

The card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually for 3.5" drives) and a printed circuit board connector (usually for 5.25" drives). You can use only one connector in each set. The set on the end (after the twist in the cable)connects to the A: floppy. The set in the middle connects to the B: floppy.

2.11 VGA Display Connector (CN9)

The PCN-6351/6351L provides a VGA controller for a high resolution VGA interface. CN9 is the designated DB-15 connector for VGA monitor input. Pin assignments for the CRT display are detailed in Appendix C.

2.12 LVDS Interface (CN10)

The user can utilize this interface for long distance connections to an LCD panel. Data can be transferred over distances up to 5 meters. The PCN-6351/6351L suppports 18-bit LVDS TFT LCD panel via an LVDS interface (CN10). It cinsists of a 20-pin dual in-line header.

2.13 LCD Inverter Connector (CN11)

The LCD inverter is connected to CN11 via a 5-pin connector to provide +12 V power to the LCD display. Pin 4 of CN7 provides LCD brightness control and can be ajusted via the VR1 (located on the uppper right corner of CN11)

2.14 CPU Fan Power Supply Connector (CN12)

The PCN-6351/6351L is equipped with a low power dissipation Intel® MMX CPU. With only a heatsink, it will work normally at temperatures up to 60° C. At temperatures greater than 60° C, a fan is needed. A CPU fan power supply connector is provided (+5/+12 V input) in addition to the CPU power supply.

This provides power supply to the optional CPU cooling fan. This connector is only available when +5 V, -12 V and +12 V power is supplied to the board.

Warning! *Before making the connection, make sure the voltage is absolutely correct and matched with the correct connector.*

2.15 AT Power Connector (CN13)

If you prefer not to acquire power through the PCN-6351/6351L's backplane via the gold H-connectors. CN13 also provides power input connectors for +5 V, -12 V and +12 V.

2.16 USB Connector (CN14)

The PCN-6351/6351L board provides two USB (Universal Serial Bus) interfaces, which give complete Plug & Play, hot attach/detach for up to 127 external devices.The USB interfaces comply with USB specification rev. 1.0 and are fuse protected.

The USB interfaces are accessed through a 10-pin flat-cable connector, CN9. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

The USB interfaces can be disabled in the system BIOS setup.

2.17 IR Connector (CN15)

This connector supports the optional wireless infrared transmitting and receiving module. This module mounts on the system case. You must configure the settings through BIOS setup.

2.18 24-bit LCD Connector (CN16)

CN16 is a 40-pin dual in-line header and is used to connect an LCD display to the PCN-6351/6351L. The PCN-6351/6351L has bias control, which can be used to control the LCD signal voltage. Pin 7 of CN16 is for LCD contrast adjustments.

The VGA interface is completely controlled with the software utility provided. Please refer to Chapter 4 for details.

2.19 36-bit LCD Connector (CN17)

The PCN-6351/6351L supports a 36-bit LCD that must be connected to both CN16 (40-pin) and CN17 (20-pin).

The pin assignments for CN16 and CN17 can be found in Appendix C.

2.20 Ethernet Connector (CN18) (PCN-6351 only)

The PCN-6351 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE 802.3u 100/10Base-T specifications. It is supported by all major network operating systems.

The medium type can be configured via the RSET8139.EXE program included on the utility disk. (See Chapter 5 for detailed information.)

2.20.1 RJ-45A connector (CN18)

100/10Base-T networking is available via an adapter cable which connects to the PCN-6351's RJ-45A standard jack.

2.20.2 Network boot

The Network Boot feature can be built into the BIOS, if required. It can be enabled/disabled in the chipset setup of the CMOS configuration. Refer to "BIOS Setting" in Chapter 4 for more information.

2.21 CompactFlash™ Socket (CN19)

The PCN-6351/6351L is equipped with a CompactFlash™ disk socket on the solder side that supports the IDE interface for Compact Flash Cards. The on-board CompactFlash Socket is designed to prevent incorrect installation. Be sure that the system power is off when installing and removing CompactFlash cards.

The CompactFlash card is defaulted as the E: drive on your PC system.

CHAPTER 3

Award BIOS Setup

This chapter describes how to set the card's BIOS configuration data.

3.1 Award BIOS Setup

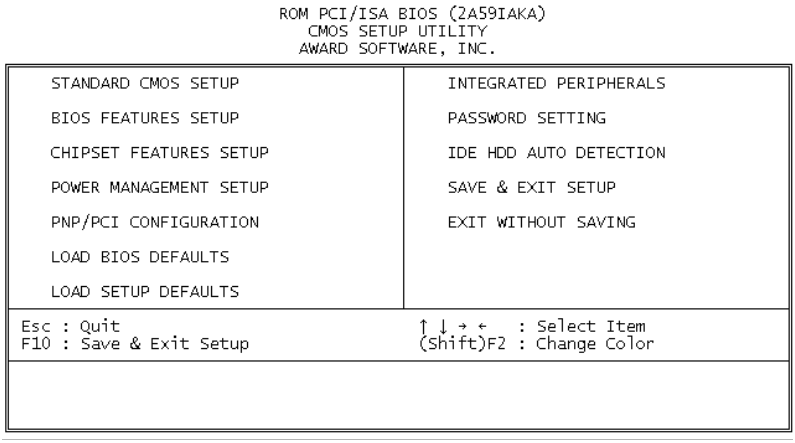


Figure 3-1: Setup program initial screen

Award's BIOS ROM has a built-in Setup program that allows users to modify basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

3.1.1 Entering setup

Turning on the computer and pressing <DEL> immediately will allow you to enter Setup.

3.1.2 Standard CMOS setup

Choose the “STANDARD CMOS SETUP” option from the INITIAL SETUP SCREEN menu, and the screen below is displayed. This standard Setup menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

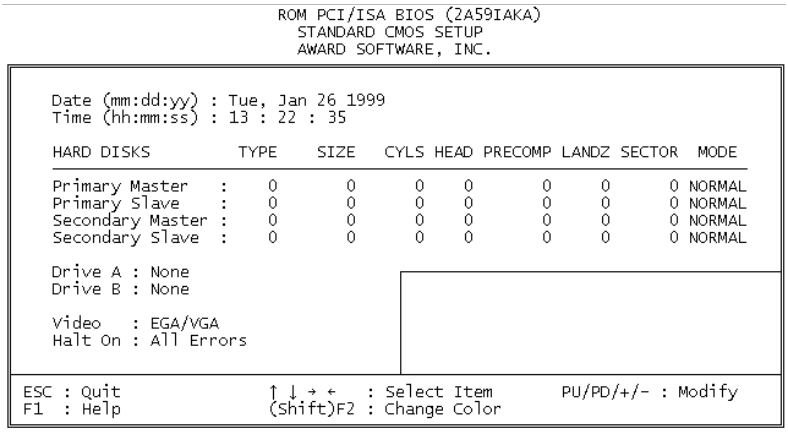


Figure 3-2: CMOS setup screen

3.1.3 BIOS features setup

The “BIOS FEATURES SETUP” screen appears when choosing the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY menu. It allows the user to configure the PCN-6351/6351L according to his particular requirements.

Below are some major items that are provided in the BIOS FEATURES SETUP screen:

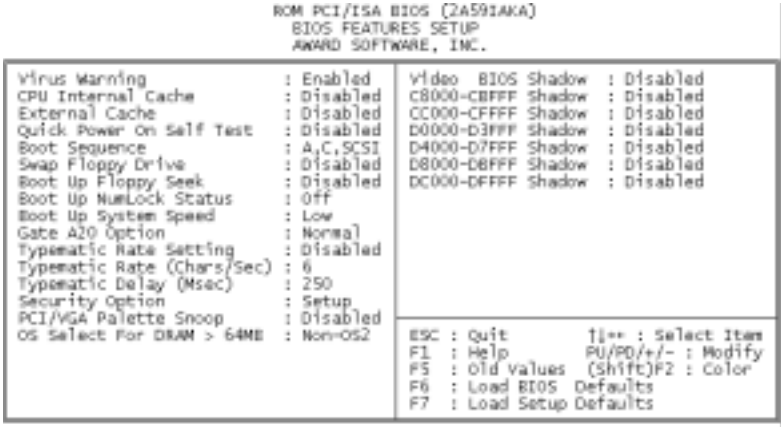


Figure 3-3: BIOS features setup screen

Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can run the anti-virus program to locate the problem.

If Virus Warning is disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

CPU Internal Cache/External Cache

Depending on the CPU/chipset design, these options can speed up memory access when enabled.

Quick Power-On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, normal POST procedures are followed.

Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The default value is “C, A”.

A,C	System will first search the FDD, then the HDD.
C,A	System will first search the HDD, then the FDD.
C only	System will only search the HDD.
•	•
•	•
•	•

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360 KB type is 40 tracks; while 720 KB, 1.2 MB, and 1.44 MB are all 80 tracks.

Enabled	BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.
Disabled	BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

Boot Up NumLock Status
The default is “On”.

On	Keypad boots up to number keys.
Off	Keypad boots up to arrow keys.

Boot Up System Speed

High	Sets the speed to high.
Low	Sets the speed to low.

IDE HDD Block Mode

Enabled	Enable IDE HDD Block Mode. BIOS will detect the block size of the HDD and send a block command automatically.
Disabled	Disable IDE HDD Block Mode.

Gate A20 option

Normal	The A20 signal is controlled by the keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

Typematic Rate Setting
The typematic rate determines the characters per second accepted by the computer. The Typematic Rate setting enables or disables the typematic rate.

Typematic Rate (Char/Sec)
BIOS accepts the following input values (character/second) for Typematic Rate: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (msec)
When holding down a key, the Typematic Delay is the time interval between the appearance of the first and second characters. The input values (msec) for this category are: 250, 500, 750, 1000.

Security Option
This setting determines whether the system will boot if the password is denied, while limiting access to Setup.

System	The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING in the main menu. At this point, you will be asked to enter a password. Simply press the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

OS Select for DRAM>64 MB
This setting is under OS/2 system.

Video BIOS Shadow
This determines whether video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video Shadow increases the video speed.

C8000 - CFFFF Shadow/DC000-DFFFF Shadow
These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled	Optional shadow is enabled.
Disabled	Optional shadow is disabled.

3.1.4 Chipset features setup

By choosing the “CHIPSET FEATURES SETUP” option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCN-6351/6351L.

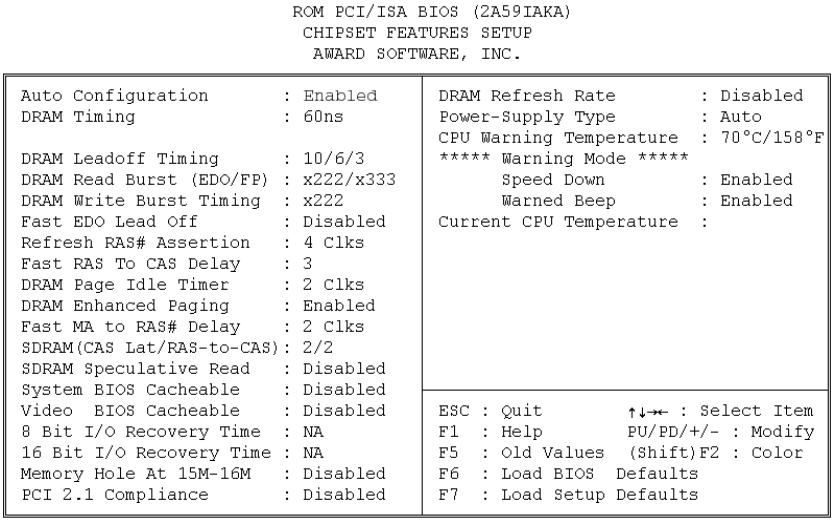


Figure 3-4: Chipset features setup screen

3.1.5 Power management setup

The power management setup controls the CPU card's “green” features. The following screen shows the manufacturer’s defaults.

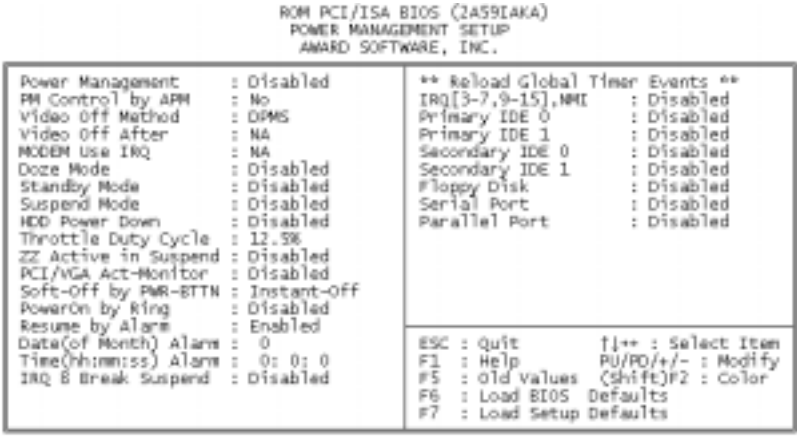


Figure 3-5: Power management setup screen

Power Management

This option allows you to determine if the values in power management are disabled, user-defined, or predefined.

HDD Power Management

You can choose to turn the HDD off after a one of the time intervals listed, or when the system is in Suspend Mode. If in a power saving mode, any access to the HDD will wake it up.

Note: The HDD will not power down if the Power Management option is disabled.

IRQ Activity

IRQ can be set independently. Activity on any enabled IRQ will wake up the system.

3.1.6 PnP PCI configuration setup

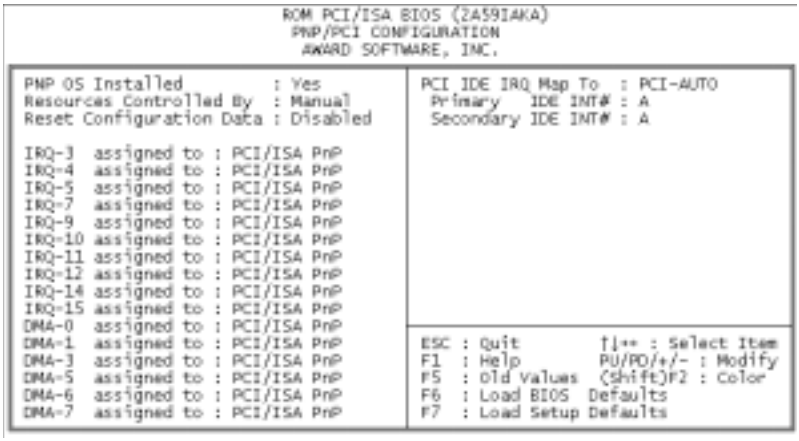


Figure 3-6: PCI configuration screen

3.1.7 Load BIOS defaults

"LOAD BIOS DEFAULTS" indicates the most appropriate values for the system parameters for minimum performance. These default values are loaded automatically if the stored record created by the Setup program becomes corrupted (and therefore unusable).

3.1.8 Load setup defaults

"LOAD SETUP DEFAULTS" loads the values required by the system for maximum performance.

3.1.9 Integrated peripherals

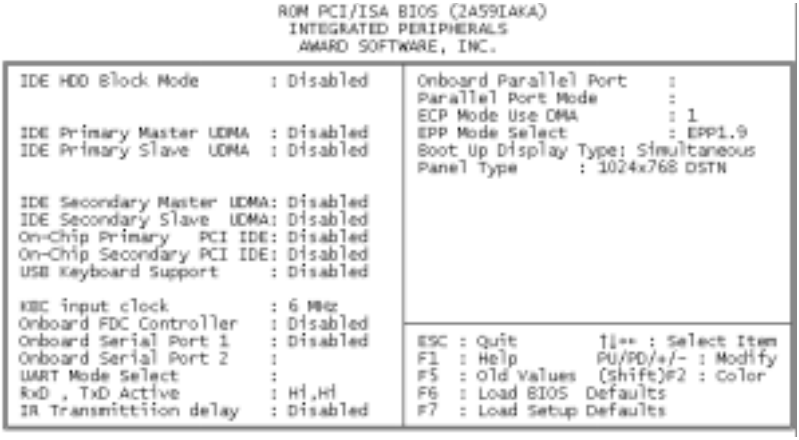


Figure 3-7: Integrated peripherals

Note: Enabling the IDE HDD block mode, will also activate the enhanced IDE driver.

3.1.10 Password setting

To change, confirm, or disable the password, choose the “PASSWORD SETTING” option from the Setup main menu and press [Enter]. The password can be at most 8 characters long.

Remember, to enable this feature, you must first select the Security Option in the BIOS FEATURES SETUP to be either “Setup” or “System”. Pressing [Enter] again without typing any characters will disable the password setting function.

3.1.11 IDE HDD auto detection

“IDE HDD AUTO DETECTION” automatically checks for the correct hard disk type.

3.1.12 Save & exit setup

If you select this and press the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.1.13 Exit without saving

Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.

CHAPTER 4

PCI SVGA Setup

- Introduction
- Installation of SVGA driver
  - for Windows 3.1
  - for Windows 95
  - for Windows NT
- Further information

4.1 Introduction

The PCN-6351/6351L has an on-board PCI flat panel/VGA interface. The specifications and features are described as follows:

4.1.1 Chipset

The PCN-6351 uses a C&T 69000/69030 chipset for its PCI/SVGA controller. It supports many popular LCD, EL, and gas plasma flat panel displays and conventional analog CRT monitors. The 69000/69030 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 mono-chrome 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 at 64 K colors. The display memory can be expanded to 4 MB for true-color resolution of 1024 x 768 with C&T 69030.

4.1.3 Display types

CRT and panel displays can be used simultaneously. The PCN-6351 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 utility disks 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

4.1.4 VGA display software configuration (PCN-6351L)

The PCN-6351L's on-board VGA interface supports traditional analog CRT monitors. The VGA controller is built into the system's chip (SIS5598) It can supports 1 to 4 MB of video memory share with the system memory. The interface can drive CRT displays with resolutions up to 1024 x 768 in 256 colors at 1 MB share memory, as well as up to 1280 x 1024 in 64 K colors at 3 MB share memory. The VGA interface is configured completely via the software utility, so you do not have to set any jumpers.

4.2 Installation of SVGA Driver (PCN-6351 only)

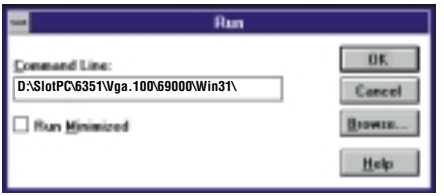
Complete the following steps to install the SVGA driver. Follow the procedures in the flow chart that apply to the operating system that you are using within your PCN-6351.

Important: 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.

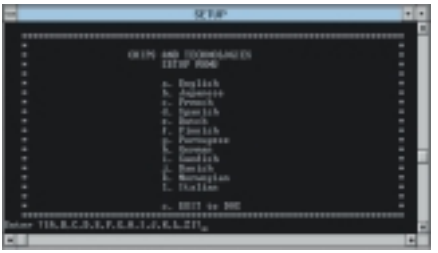
Note: <Enter> means pressing the “Enter” key on the keyboard.

4.2.1 Installation for Windows 3.1

1. a. Insert the CD-ROM into the CD-ROM drive.
   b. Select "File" in Program Manager.
   c. Click "Run" and type: "D:\SlotPC\6351\Vga.100\69000\Win31\"

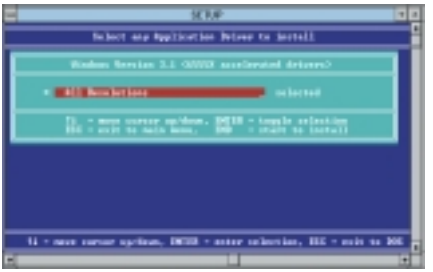


2. a. Choose the language you want to use during installation.

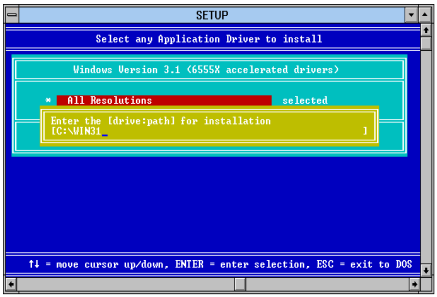


3. a. Select the highlighted item.
   b. Press "ENTER".

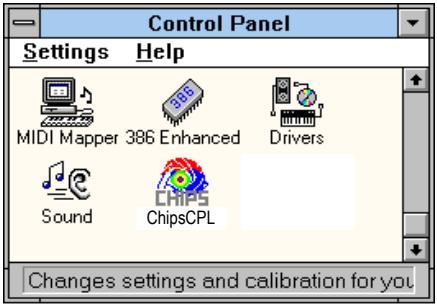
4. a. Press "ENTER" to install all resolutions.



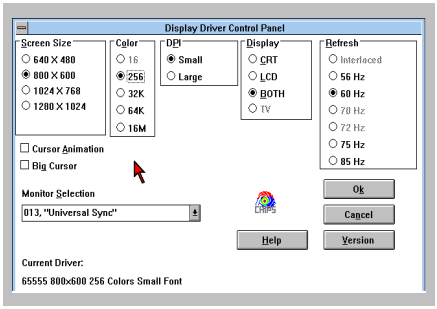
5. a. Type the path of the operating system.



6. a. When installation is completed, reboot the system.
b. You will see the "ChipsCPL" icon in the control panel.



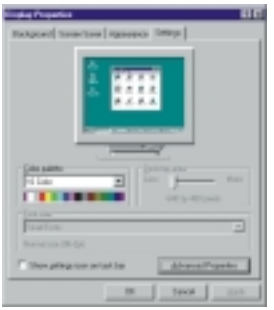
7. a. Double click "ChipsCPL".
b. Adjust screen size, color and refresh rate to your preferences.



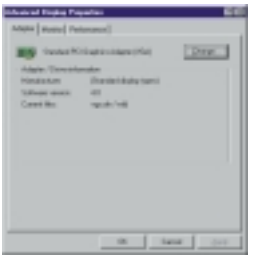
END

4.2.2 Installation for Windows 95

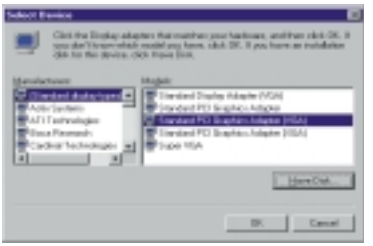
1. a. Select "Start", "Settings", "Control Panel", "Display", "Settings".
   b. Press "Advanced Properties".



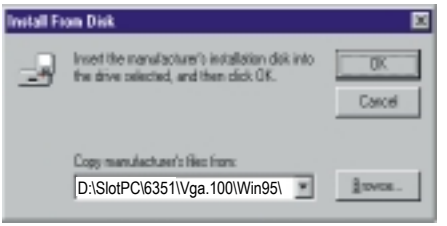
2. a. Choose the "Adapter" label.
   b. Press the "Change..." button.



3. a. Press the "Have Disk" button.

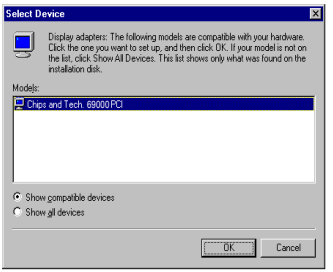


4. a. Insert the CD-ROM into the CD-ROM drive.
   b. Type "D:\SlotPC\6351\Vga.100\Win95\"
   c. Press "OK".



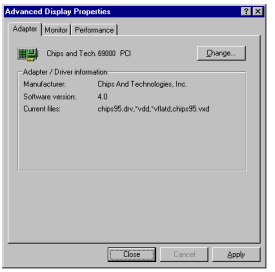
5.

a. Select the highlighted item.
b. Click the "OK" button.



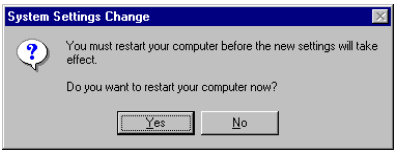
6.

a. C&T69000/69030 appears in the adapter label.
b. Click the "Apply" button.



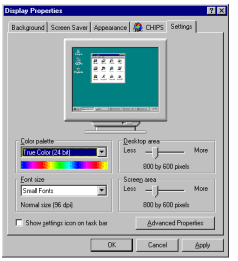
7.

a. Press "Yes" to reboot.



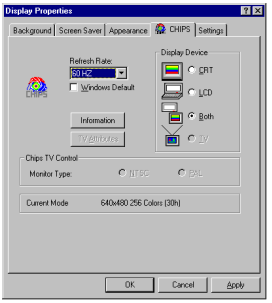
8.

a. Repeat Step 1 on the previous page of this manual. The "CHIPS" label appears in "Display".
b. Adjust resolution and color.



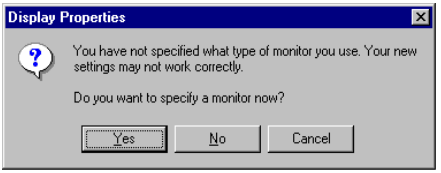
9.

a. Click the "CHIPS" label.
b. Adjust the refresh rate and display type.
c. Press "OK" to exit.



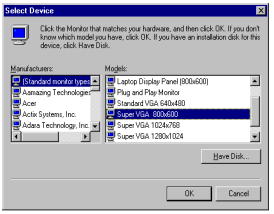
10.

a. Press "Yes" to set the monitor type.



11.

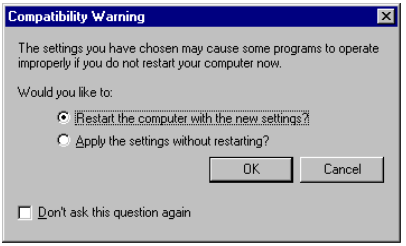
a. Select "Standard", "Super VGA 800 x 600", or "XGA".
b. Press the "OK" button.



12.

a. Choose "Restart" to reboot.

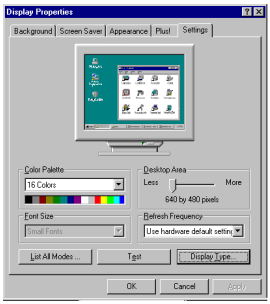
END



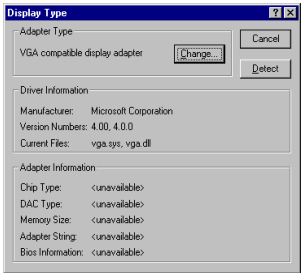
4.2.3 Installation for Windows NT

1. a. Select "Start", "Settings", "Control Panel".
   b. Double click the "Display" icon.

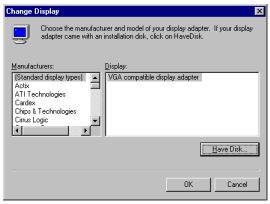
2. a. Choose the "Settings" label.
   b. Press the "Display Type" button.



3. a. Press the "Change..." button.

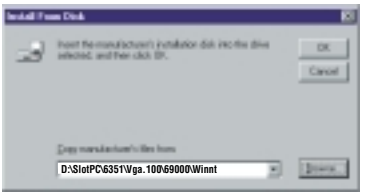


4. a. Click the "Have Disk..." button.



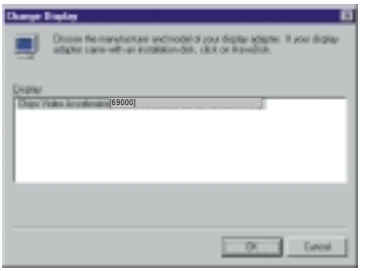
5.

a. Insert the CD-ROM into the CD-ROM drive.
b. Type: "D:\SlotPC\6351\Vga.100\69000\Winnt"
c. Press the "OK" button.



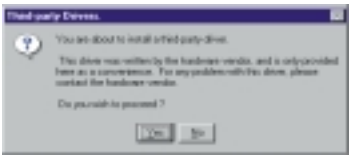
6.

a. Select the highlighted item.
b. Press the "OK" button.



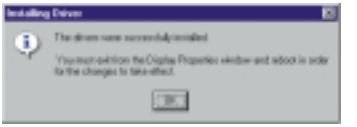
7.

a. Press "Yes" to proceed.



8.

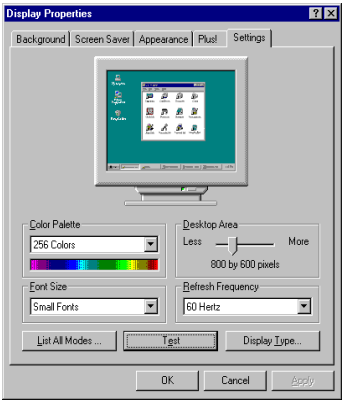
a. Press "OK" to reboot.



9.

a. Repeat Step 1 in this manual, to select the "Settings" label.
b. Adjust resolution and color.
c. Click "Test" to see the result.
d. Click "OK" to save the setting.

END



4.3 Further Information

For further information about the PCI/SVGA installation in your PCN-6351/6351L, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

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

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

CHAPTER 5

PCI Bus Ethernet Interface (PCN-6351 only)

This chapter provides information on Ethernet configuration.

- Introduction
- Installation of Ethernet driver
  - for Windows 95/98
  - for Windows NT
- Further information

5.1 Introduction

The PCN-6351 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 on board. 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. You must know which operating system you are using in your PCN-6351, 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 MS-DOS or Windows.

Note: 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.

5.2.1 Installation for MS-DOS and Windows 3.1

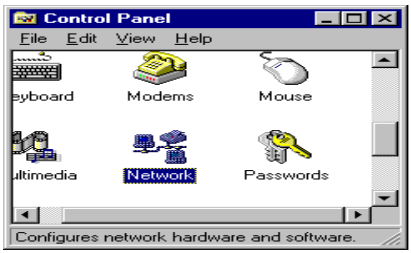
If you want to set up your Ethernet connection under the MS-DOS or Windows 3.1 environment, you should first check your server system model. For example, MS-NT, IBM-LAN server, and so on.

Then choose the correct driver to install in your panel PC.

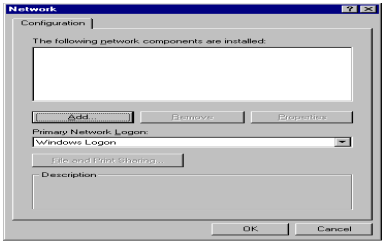
The installation procedures for various servers can be found on CD-ROM. The file path is:
D:\SlotPC\6351\Lan.100\8139b\wfw311

5.2.2 Installation for Windows 95/98

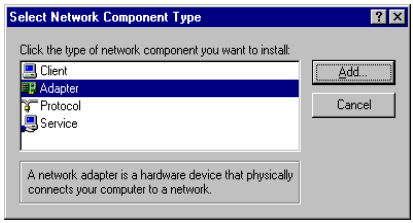
1. a. Select "Start", "Settings", "Control Panel".
   b. Double click "Network".



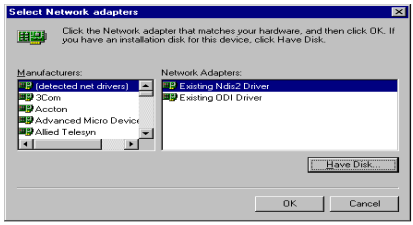
2. a. Click "Add" and prepare to install network functions.



3. a. Select the "Adapter" item to add the Ethernet card.

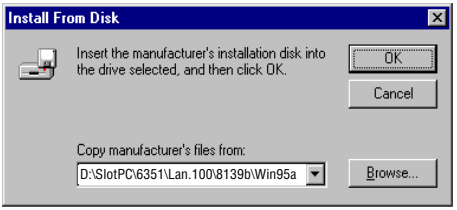


4. a. Click "Have Disk" to install the driver.



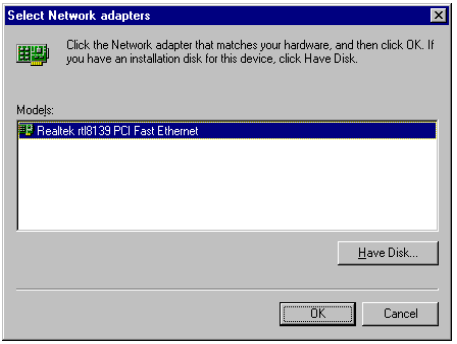
5.

a. Insert the CD into the D:\ drive.
b. Type: "D:\SlotPC\6351\Lan.100\8139b\Win95a"
c. Click "OK".



6.

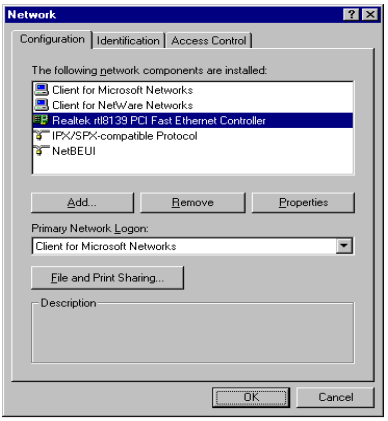
a. Choose the "Realtek" item.
b. Click "OK".



7.

a. Make sure the configurations of relevant items are set correctly.
b. Click "OK" to reboot.

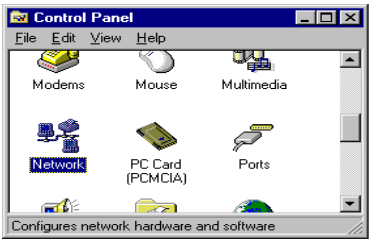
END



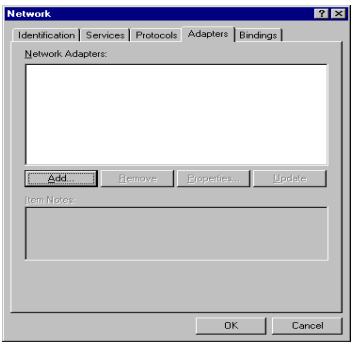
Note: *The correct path for Windows 98 is:* ***D:\SlotPC\6351\Lan.100\8139b\Win98***

5.2.3 Installation for Windows NT

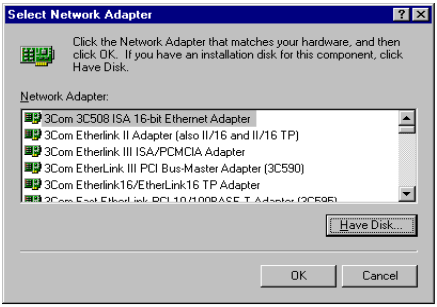
1. a. Select "Start", "Settings", "Control Panel".
   b. Double click "Network".



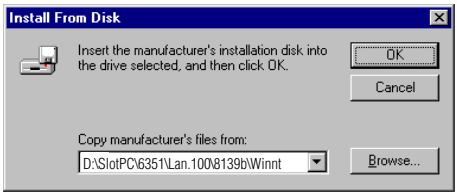
2. a. Choose the "Adapters" label.
   b. Click the "Add" button.



3. a. Press "Have Disk".

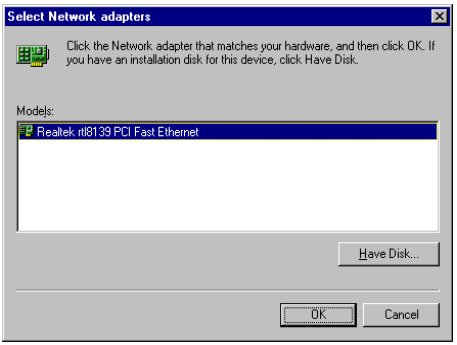


4. a. Insert the CD into the D:\ drive.
   b. Type: "D:\SlotPC\6351\Lan.100\8139b\Winnt"
   c. Click "OK".



5.

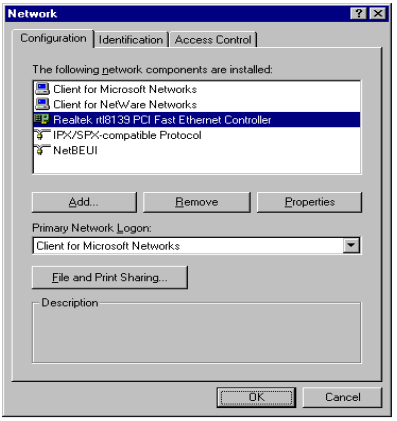
a. Choose the "Realtek" item.
b. Click "OK".



6.

a. Make sure the configurations of relevant items are set correctly.
b. Click "OK" to reboot.

END



5.3 Further Information

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

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

APPENDIX A

Programming the Watchdog Timer

The PCN-6351/6351L 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.

A.1 Programming the Watchdog Timer

Jumper J3 controls the watchdog settings. The default configuration of the timer is enabled via a system reset.

To enable the watchdog timer, you must write a program which writes 1 to I/O port address 443 (hex) at regular intervals. The first time your program reads the port, it enables the watchdog timer. After that, your program must write 1 to the port at time interval of less than 1.6 seconds, otherwise the watchdog timer will activate and reset the CPU or generate an interrupt on IRQ11. When you want to disable the watchdog timer, your program should write 0 to I/O port 443.

If CPU processing comes to a standstill because of EMI or a software bug, your program's signals to I/O port 443 to the timer will be interrupted. The timer will then automatically reset the CPU or invoke an IRQ, and data processing will continue normally.

You must write your program so that it writes 1 to I/O port 443 at an interval shorter than the timer's preset interval. The timer's intervals have a tolerance of ± 30%, so you should program an instruction that will refresh the timer about every second.

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

```
10      REM  Watchdog timer example program
20      X=Out &H443, 1 REM  Enable and refresh the watchdog
30      GOSUB 1000 REM  Task #1, takes 1 second to  complete
40      X=Out &H443, 1 REM  Refresh the watchdog
50      GOSUB 2000 REM  Task #2, takes 1 second to  complete
60      X=Out &H443, 0 REM  Disable the watchdog
70      END
1000    REM  Subroutine #1, takes 1 second to complete
  .
  .
  .
1070    RETURN
2000    REM  Subroutine #2, takes 1 second to complete
  .
  .
  .
2090    RETURN
```

APPENDIX B

Installing PC/104 Modules

This appendix gives instructions for installing PC/104 modules.

B.1 Installing PC/104 Modules

The PCN-6351/6351L's PC/104 connectors provide you with flexibility to attach PC/104 modules.

Installing these modules on the PCN-6351/6351L is quick and simple. The following steps show how to mount the PC/104 modules:

1. Remove the PCN-6351/6351L from your system. Please pay particular attention to the safety instructions already mentioned earlier in this manual.
2. Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted you may have difficulty in accessing these.
3. Normal PC/104 modules have male connectors and mount directly onto the main card. (Refer to the diagram on the following page.)
4. Mount the PC/104 module onto the CPU card by pressing the module firmly but carefully onto the mounting connectors.
5. Secure the PC/104 module onto the CPU card using the four mounting spacers and screws.

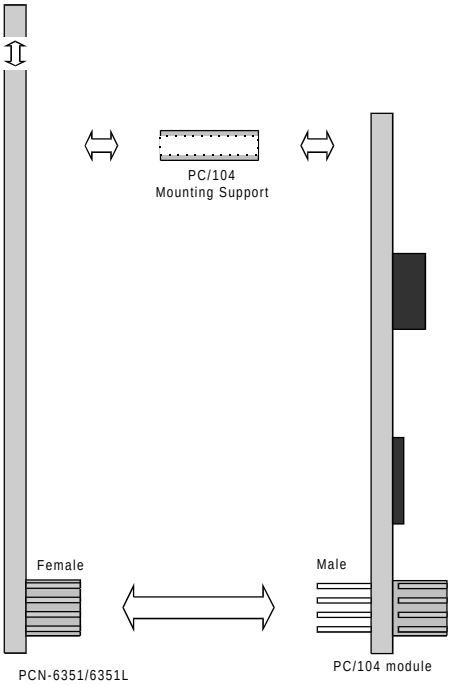


Figure B-1: PC/104 module mounting diagram

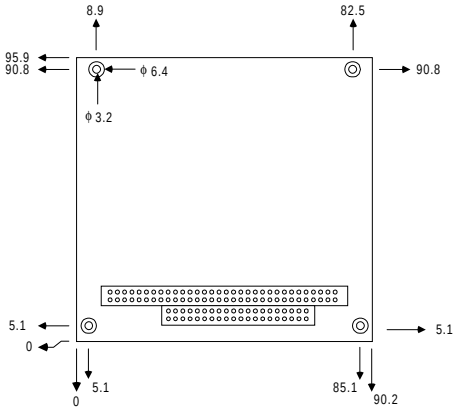


Figure B-2: PC/104 module dimensions (mm) (±0.1)

Table B-1: PC/104 connectors (CN3)

Pin Number	Signal (CN3) Row A	Row B	Signal (CN3) Row C	Row D
0	—	—	0 V	0 V
1	IOCHCHK*	0 V	SBHE*	MEMCS16*
2	SD7	RESETDRV	LA23	IOCS16*
3	SD6	+5 V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5 V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12 V	LA18	IRQ14
8	SD1	ENDXFR*	LA17	DACK0*
9	SD0	+12 V	MEMR*	DRQ0
10	IOCHRDY	N/C	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5 V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0 V
19	SA12	REFRESH*	KEY	0 V
20	SA11	SYSCLK	—	—
21	SA10	IRQ7	—	—
22	SA9	IRQ6	—	—
23	SA8	IRQ5	—	—
24	SA7	IRQ4	—	—
25	SA6	IRQ3	—	—
26	SA5	DACK2*	—	—
27	SA4	TC	—	—
28	SA3	BALE	—	—
29	SA2	+5 V	—	—
30	SA1	OSC	—	—
31	SA0	0 V	—	—
32	0 V	0 V	—	—

* low active

APPENDIX C

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- Ext. line pin header
- PS/2 keyboard connector
- Internal keyboard connector
- PC/104 connector
- HDD connector
- COM2 connector
- COM1 connector
- Parallel port connector
- FDD connector
- CRT display connector
- LVDS connector
- LCD inverter connector
- Fan connector
- Power connector
- USB connector
- IR connector
- 24-bit LCD display connector
- 36-bit LCD display connector
- LAN connector
- CompactFlash™ socket

C.1 Ext. Line Pin Header (JP1)

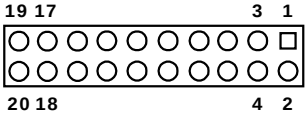


Table C-1: Ext. line pin header (JP1)

Pin	Function	Pin	Function
1	NC	2	NC
3	GND	4	NC
5	GND	6	ATX Power on/off
7	GND	8	RESET
9	HD LED -	10	HD LED +
11	Power LED +	12	NC
13	NC	14	Speaker +
15	GND	16	NC
17	KeyLock	18	Buzzer -
19	GND	20	Speaker -

Note 1: To use a buzzer, you must short pins 18 and 20.

Note 2: The speaker and buzzer functions cannot be used simultaneously.

C.2 PS/2 Keyboard Connector (CN1)

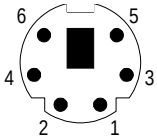


Table C-2: PS/2 keyboard connector (CN1)

Pin	Function
1	KEYBOARD DATA
2	PS/2 MOUSE DATA
3	GND
4	V_{cc} (+5 V)
5	KEYBOARD CLOCK
6	PS/2 MOUSE CLOCK

C.3 Internal Keyboard Connector (CN2)

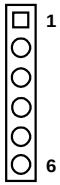


Table C-3: Internal keyboard connector (CN2)

Pin	Function	Pin	Function
1	KB CLK		
2	KB Data		
3	PS/2 Mouse CLK		
4	GND		
5	Vcc (+5 V)		
6	PS/2 Mouse Data		

C.4 PC/104 Connector (CN3)

Refer to Appendix B in this manual.

C.5 HDD Connector (CN4)

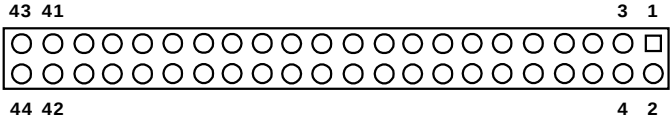


Table C-4: HDD connector (Standard) (CN4)

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	DRQ*	22	GND
23	IO WRITE*	24	GND
25	IO READ*	26	GND
27	IO CHANNEL READY	28	N/C
29	ACK	30	GND
31	IRQ14 (IDE IRQ)	32	IOCS16*
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0	38	HARD DISK SELECT 1
39	IDE ACTIVE*	40	GND
41	VCC	42	VCC
43	GND	44	N/C

* low active

C.6 COM2 Connector (CN5)

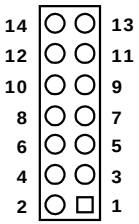


Table C-5: COM2 connector (CN5)

Pin	RS-232 port	RS-422 port	RS-485 port
1	DCD	N/C	N/C
2	DSR	N/C	N/C
3	RxD	N/C	N/C
4	RTS	N/C	N/C
5	TxD	N/C	N/C
6	CTS	N/C	N/C
7	DTR	N/C	N/C
8	RI	N/C	N/C
9	GND	N/C	N/C
10	N/C	N/C	N/C
11	N/C	TxD+	DATA+
12	N/C	TxD-	DATA-
13	N/C	RxD+	N/C
14	N/C	RxD-	N/C

C.7 COM1 Connector (CN6)

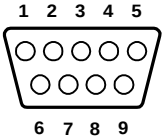


Table C-6: COM1 (standard COM port) (CN6)

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

C.8 Parallel Port Connector (CN7)

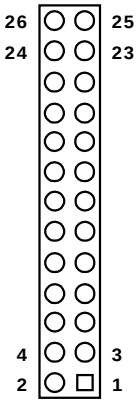


Table C-7: Parallel port connector (standard printer port) (CN7)

Pin	Signal	Pin	Signal
1	STROBE*	14	GND
2	AUTOFD*	15	D6
3	D0	16	GND
4	ERROR*	17	D7
5	D1	18	GND
6	INIT*	19	ACK*
7	D2	20	GND
8	SLCTINI*	21	BUSY
9	D3	22	GND
10	GND	23	PE
11	D4	24	GND
12	GND	25	SLCT
13	D5	26	GND

C.9 FDD Connector (Standard) (CN8)

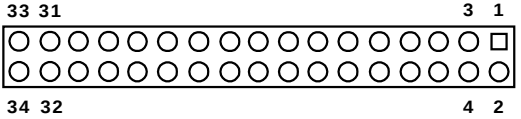


Table C-8: FDD connector (standard) (CN8)

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT*
3	GND	4	N/C
5	GND	6	N/C
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*

* low active

C.10 VGA Connector (CN9)

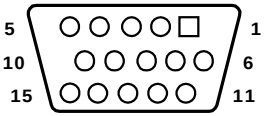


Table C-9: VGA connector (CN9)

Pin	Function	Pin	Function
1	R	2	G
3	B	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDAT
13	HSYNC	14	VSYNC
15	DCLK		

C.11 LVDS Connector (CN10)

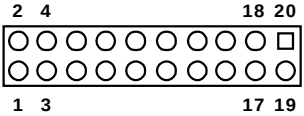


Table C-10: LVDS connector (CN10)

Pin	Function	Pin	Function
1	Vcc (+5 V)	2	Vcc (+5 V)
3	Vcc3 (+3.3 V)	4	Vcc3 (+3.3 V)
5	GND	6	GND
7	TX0-	8	TX0+
9	GND	10	GND
11	TX1-	12	TX1+
13	GND	14	GND
15	TX2-	16	TX2+
17	GND	18	GND
19	TXCK-	20	TXCK+

C.12 LCD Inverter Connector (CN11)

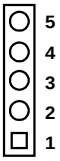


Table C-11: LCD inverter connector (CN11)

Pin	Function
1	+12 V
2	GND
3	ENBKL
4	NC
5	Vcc (+5 V)

C.13 Fan Connector (CN12)

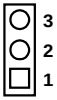


Table C-12: Fan connector (CN12)

Pin	Function
1	NC
2	+12 V
3	GND

C.14 Power Connector (CN13)

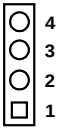


Table C-13: Power connector (CN13)

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

C.15 USB Connector (CN14)

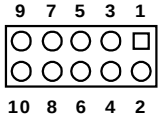


Table C-14: USB connector (CN14)

Pin	Function	Pin	Function
1	Vcc (+5 V)	2	Vcc (+5 V)
3	DATA0 -	4	DATA1 -
5	DATA0 +	6	DATA1 +
7	GND	8	GND
9	SG	10	SG

C.16 IR Connector (CN15)

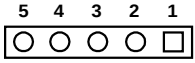


Table C-15: IR connector (CN15)

Pin	Function
1	Vcc (+5 V)
2	FIRRX
3	IRRX
4	GND
5	IRTX

C.17 24-bit LCD Display Connector (CN16)

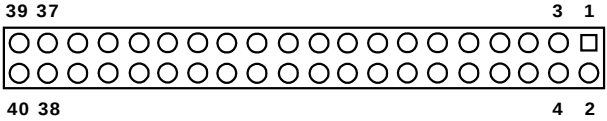


Table C-16: LCD 24-bit LCD display connector (CN16)

Pin	Function	Pin	Function
1	Vcc (+5 V)	2	Vcc (+5 V)
3	GND	4	GND
5	Vcc3 (+3.3 V)	6	Vcc3 (+3.3 V)
7	NC	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	SCLK	36	FLMM
37	M	38	LP
39	PCLK	40	ENAVEE

C.18 36-bit LCD Display Connector (CN17)

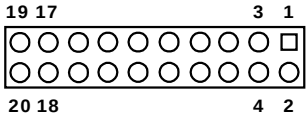


Table C-17: 36-bit LCD display connector (CN17)

Pin	Function	Pin	Function
1	GND	2	GND
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
17	NC	18	NC
19	NC	20	NC

C.19 LAN Connector (CN18)

Table C-18: Ethernet 10Base-T connector

Pin	Signal
1	XMT+
2	XMT-
3	RCV+
4	N/C
5	N/C
6	RCV-
7	N/C
8	N/C

C.20 CompactFlash™ Socket (CN19)

Table C-19: CompactFlash™ socket (CN19)

Pin	Signal	Pin	Signal
1	GND	2	D03
3	D04	4	D05
5	D06	6	D07
7	-CS0	8	A10[2]
9	-ATA SEL	10	A09[2]
11	A08[2]	12	A07[2]
13	VCC	14	A06[2]
15	A05[2]	16	A04[2]
17	A03[2]	18	A02
19	A01	20	A00
21	D00	22	D01
23	D02	24	-IOCS16
25	-CD2	26	-CD1
27	D11[1]	28	D12[1]
29	D13[1]	30	D14[1]
31	D15[1]	32	-CS1[1]
33	-VS1	34	-IORD
35	-IOWR	36	-WE[3]
37	INTRQ	38	V_{CC}
39	-CSEL	40	-VS2
41	-RESER	42	IORDY
43	-INPACK	44	-REG[3]
45	-DASP	46	-PDIAG
47	D08[1]	48	D09[1]
49	D10	50	GND

APPENDIX D

System Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- System I/O ports
- DMA channel assignments
- Interrupt assignments
- 1st MB memory map

D.1 System I/O Ports

Table D-1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register,
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT 3)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

* PNP audio I/O map range from 220 ~ 250 H (16 bytes)
  MPU-401 select from 300 ~ 330 H (2 bytes)

D.2 DMA Channel Assignments

Table D-2: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 0, 1 or 3

D.3 Interrupt Assignments

Table D-3: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Cascaded to IRQ 2
IRQ 10	Available
IRQ 11	Watchdog timer
IRQ 12	PS/2 mouse (non-releasable)
IRQ 13	INT from co-processor
IRQ 14	Fixed disk controller (Primary)
IRQ 15	Fixed disk controller (Secondary)
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Parallel port 2
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

* PNP audio IRQ select: 5, 7, 9 or 10
* Ethernet function is auto-sensing

D.4 1st MB Memory Map

Table D-4: 1st MB memory map

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
C800h - EFFFh	System ROM
C000h - C7FFh	Expansion ROM
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Unused
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

APPENDIX E

LCD Services

This appendix contains interface information of a detailed or specialized nature. It includes:

- Color STN LCDs
- DSTN LCDs
- EL LCDs
- Mono STN LCDs
- TFT LCDs

E.1 LCD Services

LCD screens are very popular on Advantech's CPU cards, Biscuit PCs and POS series products, such as the PCA-6145/6153, and PCN-6351/6351L. "Lighting" LCDs is virtually impossible without technical expertise. Advantech provides LCD lighting and integration services to assist our customers in setting up their systems. Advantech's LCD lighting guide explains how to make connections between LCD interfaces and LCD panels, as well as how to control contrast, brightness, V_{EE} source, LCD inverter and all other factors that affect the successful installation of LCD panels.

The following information details our LCD lighting services:

a) This policy is only valid for Advantech products that include LCD support.

b) The customer should **send** the following LCD components for service:

   - DC-AC inverter and cable (i.e. connector with/without wires) and datasheet.
   - LCD flat panel and cable (connector with/without wires) and complete datasheet.

c) Advantech will normally charge the customer a deposit. The deposit will be refunded when servicing exceeds a minimum volume.

d) The customer must sign the agreement and fax it to us prior to sending the LCD package. Advantech reserves the right to refuse service if the customer cannot provide the required documents and auxiliary parts.

e) Advantech will supply a BIOS file and connection cable to the customer upon completing the service.

f) A minimum of seven working days is required for completion of service, starting from receipt of the LCD package by Advantech.

The table shows the TFT display support list. Please contact our customer service department for more detailed information and service files. See our website at:
http://www.advantech.com/support

Model Number	PCM-5862/E/L, 5862/L, 4862, 4825/L PCM-4823/L, 3864, PCA-6153, 6145B, 6145L		
	VGA BIOS Type	Size	Resolution
COLOR STN			
SHARP			
LM32C04P	standard	5.5	320 x 240
LM64C04P	standard	5.5	320 x 240
DSTN			
CITIZEN			
K6483-FF/K6488-FF	standard	7.7	640 x 480
K6484L-FF	standard	8.6	640 x 480
DENSITRON			
LMG8336E-DF2	standard	11.6	640 x 480
LMG8343E-DF2	standard		
HITACHI			
LMG8328E-DF2	standard		
LMG8334E-DF	standard		
LMG9460XUCC	standard	10.4	640 x 480
KYOCERA			
KCS3224ASTT-X6	standard	5.7	320 x 240
KCS6448BSTT-X1	standard	10.5	640 x 480
OPTREX			
DMF-50414NCU-FW	standard	9.6	640 x 480
SAMSUNG			
UG-64L-011A	standard		
UG-64L-011A	standard		
SANYO			
LCM5328-22NK	standard	8	640 x 480
LCM5331-22NK	standard	9.7	640 x 480
LCM5333	standard		
LCM5334/5343	standard		
LCM5365-22NK	800x600.exe	11.6	800 x 640
LM-CH53-22NK	standard	10.4	640 x 480
SHARP			
LM10V33	standard	10.4	640 x 480
LM14X82		13.8	1024 x 768
LM64C08P/C142	standard	9.5	640 x 480
LM64C152	standard	9.5	640 x 480
LM64C21P/C35P	standard	10.5	640 x 480

Model Number	PCM-5862/E/L, 5862/L, 4862, 4825/L PCM-4823/L, 3864, PCA-6153, 6145B, 6145L		
	VGA BIOS Type	Size	Resolution
EL			
PLANAR			
320.240.36	Standard	5.7	320 x 240
EL640.400-CB1	640400	9.1	640 x 480
EL640.480-A4	Standard	10.4	640 x 480
EL640.480-AA1	Standard	10.4	640 x 480
EL640.480-AD4	Standard	10.4	640 x 480
EL640.480-AM1	ELDD	10.4	640 x 480
SHARP			
LJ64H052	ELDD	10.4	640 x 480
LJ64ZU50/52	Standard	10.4	640 x 480
LJ64ZU51	Standard	9.4	640 x 480
MONO STN			
FPD			
LDH096T-11	Standard	9.5	640 x 480
HITACHI			
LMG5278XUFC/7550XUF	Standard		
LMG6910PGR	Standard	7.6	320 x 240
HOSIDEN			
HLM8619	Standard		
NAN-YA	Standard		
LLHSHTO24G	Standard		
OPTREX			
DMF-50081NF-FW	Standard	5.1	320 x 240
DMF-5075SNFU-FW	Standard		640 x 480
SAMSUNG			
UG-64I-0003 BP	Standard		
SANYO			
LM5541-23NK	Standard		
LM5571-32NK	Standard		
SEIKO			
G321E	Standard	4.7	320 x 240
SHARP			
LM320081	Standard		
LM32008F	Standard	5	320 x 240
LM32P07	Standard	6	320 x 240

Model Number	PCM-5862/E/L, 5862/L, 4862, 4825/L PCM-4823/L, 3864, PCA-6153, 6145B, 6145L		
	VGA BIOS Type	Size	Resolution
SHARP (cont...)			
LM64183P	Standard	9.7	640 x 480
LM64P11	Standard		
LM64P81/83/86/839/101	Standard	9.7	640 x 480
SOLOMON			
LM6430FBF	SOLOMAN	4.5	320 x 200
TFT			
FPD			
LDE052T-12	16BTFT		
LDH102T-10 (24-bit)	LDH102T		
LDH102T-20 (12-bit)	16BTFT		
LDH102T-20 (24-bit)	16BTFT	10.4	640 x 480
HITACHI			
TX24D55VC1CAA	16BTFT	10.4	640 x 480
HLSIDEN			
HLD1209	18BTFT	12.1	800 x 600
HOSIDEN			
HLD0912	16BTFT		
HLD1036	18BTFT		
IBM			
ITVS50D	18BTFT		
ITVS50N	18BTFT		
LG			
LC95VA01A	16BTFT		
LCA4SE01A (18-bit)	800x600	10.4	800 x 600
MITSUBISHI			
AA12SB6C-ADFD	18BTFT	12.1	800 x 600
NEC			
NL6448AC20-05	16BTFT	6.4	640 x 480
NL6448AC20-06	18BTFT		
NL6448AC30-06	18BTFT		
NL6448AC30-10			
NL6448AC32-01 (16-bit)	16BTFT	9.4	
NL6448AC32-01 (18-bit)	18BTFT	10.2	
NL6448AC33-10	16BTFT	10.4	640 X 480
NL6448AC33-13		10.4	640 X 480

Model Number	PCM-5862/E/L, 5862/L, 4862, 4825/L PCM-4823/L, 3864, PCA-6153, 6145B, 6145L		
	VGA BIOS Type	Size	Resolution
TFT (cont...)			
NEC (cont...)			
NL6448AC33-18	18BTFT	10.4	640 X 480
NL8060AC26-11	18BTFT	10.4	640 X 480
NL8060AC31-12	18BTFT	12.1	800 X 600
NL8060BC31-01/02	18BTFT	12.1	800 X 600
NL8060BC31-09	18BTFT	12.1	800 X 600
SAMSUNG			
LT104V3-101/102	18BTFT	10.4	800 X 600
LT104V4-101	18BTFT	10.4	800 X 600
LT121S1-103	18BTFT	12.1	800 X 600
SHARP			
LQ10D131	16BTFT	10.4	640 X 480
LQ10D321(15-bit)	16BTFT	10.4	640 X 480
LQ10D321(18-bit)	18BTFT	1.04	640 X 480
LQ10D341(18-bit)	18BTFT	10.4	640 X 480
LQ10D344(18-bit)	18BTFT	10.4	640 X 480
LQ10D361(18-bit)	18BTFT	10.4	640 X 480
LQ10D42	18BTFT	10.4	640 X 480
LQ10DS01/05(18-bit)	18BTFT	10.4	800 X 600
LQ10DS21(18-bit)	18BTFT	10.4	800 X 600
LQ12S31	18BTFT	12.1	800 X 600
LQ12S41	18BTFT	12.1	800 X 600
LQ14X03E		13.8	1024 X 768
LQ64D141	18BTFT	6.4	640 X 480
LQ64D321(18-bit)	18BTFT	6.4	640 X 480
LQ64D341(18-bit)	18BTFT	6.4	640 X 480
LQ94D021	16BTFT		
LQ9D011	16BTFT	9.4	640 X 480
LQ9P341(18-bit)	18BTFT	8.4	
TOSHIBA			
LTM09C015A/016	16BTFT	9.4	640 X 480
LTM10C042(18-bit)	18BTFT	10.4	640 X 480
LTM10C2091(18-bit)	18BTFT	10.4	640 X 480
LTM11C016/062	18BTFT		800 X 600
LTM12C275A	800x600		800 X 600