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Dear Customer:

We are notifying you that PCA-6159 series has some compatibility issues with some Seagate hard disk drives.

Owing to some limitations with the Seagate controller's specifications, we found the Intel 430TX chipset cannot work with some Seagate hard disk drives. Seagate promises to solve this issue in the new controller. Please check with Seagate for further information.. We recommend users who plan to use the following Seagate hard disk drives models with the PCA-6159 check with Seagate regarding the availability of a new controller:

|           |         |
|-----------|---------|
| ST31277A  | 1.28 GB |
| ST31720A  | 1.7 GB  |
| ST32531AC | 2.5 GB  |
| ST33240AC | 3.2 GB  |

October 1997

## PCA-6159 series comparison table

| Model           | PCA-6159   | PCA-6159H  | PCA-6159F  | PCA-6159V  | PCA-6159L  |
|-----------------|--|--|--|--|--|
| CPU             | <b>Intel:</b> P54C, P55C (MMX) 75~200 MHz<br><b>AMD:</b> K5,K6<br><b>Cyrix:</b> M1, M2 | <b>Intel:</b> P54C, P55C (MMX) 75~200 MHz<br><b>AMD:</b> K5,K6<br><b>Cyrix:</b> M1, M2 | <b>Intel:</b> P54C, P55C (MMX) 75~200 MHz<br><b>AMD:</b> K5,K6<br><b>Cyrix:</b> M1, M2 | <b>Intel:</b> P54C, P55C (MMX) 75~200 MHz<br><b>AMD:</b> K5,K6<br><b>Cyrix:</b> M1, M2 | <b>Intel:</b> P54C, P55C (MMX) 75~200 MHz<br><b>AMD:</b> K5,K6<br><b>Cyrix:</b> M1, M2 |
| System Chipset  | 430TX  | 430TX  | 430TX  | 430TX  | 430TX  |
| BIOS            | Award, P&P   | Award, P&P   | Award, P&P   | Award, P&P   | Award, P&P   |
| L2 cache        | 512 KB   | 512 KB   | 512 KB   | 512 KB   | 512 KB   |
| Max. System RAM | 256 MB EDO   | 256 MB EDO   | 256 MB EDO   | 256 MB EDO   | 256 MB EDO   |
| VGA CRT/LCD     | x  | C&T 65550  | C&T 65550  | C&T 65550  | x  |
| LAN             | x  | 10 BaseT, RTL8029  | 10 BaseT, RTL8029  | x  | x  |
| SCSI            | Adaptec 7880 Ultra-Wide SCSI 16-bit  | Adaptec 7880 Ultra-Wide SCSI 16-bit  | Adaptec 7880 Ultra-Wide SCSI 16-bit  | x  | x  |
| High Drive      | x  | 64 mA  | x  | x  | x  |
| USB             | 2  | 2  | 2  | 2  | 2  |
| EIDE            | 4  | 4  | 4  | 4  | 4  |
| 2S/1P           |  |  |  |  |  |

Refer to the PCA-6159 series features directly in the following manual

## Packing list

---

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

- 1 PCA-6159 CPU card
- 1 utility disk with IDE Bus Master driver
- 1 utility disk with VGA BIOS (PCA-6159H/F/V only)
- 1 Ethernet driver disk (PCA-6159H/F only)
- 2 utility disks with PCI SVGA utility programs and drivers for Windows 3.1, Windows 95, Windows NT, and OS/2 (PCA-6159H/F/V only)
- 3 SCSI driver disks (PCA-6159/59H/F only)
- 2 IDE cables
- 1 FDD cable
- 1 PS/2 keyboard and mouse connector
- 1 Ultra SCSI cable (PCA-6159/H/F only)
- 1 serial/ 1 parallel bracket cable

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

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# 1

## **General Information**

This chapter gives background information on the PCA-6159 Series

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

## ***Introduction***

The PCA-6159 Series is a full-size CPU card. This card uses a Pentium processor based CPU and accommodates up to 256 MB DRAM. It also provides a secondary level 512 KB cache, 2 USB(Universal Serial Bus) ports and 63-level watchdog timer with jumperless setup.

The PCA-6159 Series offers power management features to minimize power consumption. It complies with the "Green Function" standard and supports three power saving features: doze, sleep, and suspended mode.

The PCA-6159H/F/V provides a PCI Ultra Wide SCSI controller with max data transfer rate at 40 MB/sec. In addition, the PCA-6159H is equipped with a ISA high drive at 64 mA, a C&T 65550 chipset and a 10Base-T networking controller, which makes the PCA-6159H a highly reliable CPU card perfect for IPC applications or computer telephony integration application.

## ***Features***

- Pentium up to 233 MHz, P54C, P55C (MMX), Cyrix 6x86, 6x86MX AMD K5, K6 processor
- Supports DoubleSpeed SCSI operation up to 40 MB/sec
- CPU overheat protection
- Flash BIOS, easy to update
- On-board VGA CRT/LCD
- On-board 10Base-T networking controller
- On-board PCI Ultra Wide SCSI controller
- 16C550 UARTs, two RS-232 ports
- Enhanced parallel port, supports SPP/EPP/ECP
- PS/2 mouse interface
- USB interface
- ISA High drive 64mA
- 63-level watchdog timer, jumperless setup
- Power management green function supported, APM 1.1 compliant

# ***Specifications***

## **Standard PC system**

- **CPU:**  
Intel Pentium up to 233 MHz, P54C, P55C(MMX)  
AMD K5, K6  
Cyrix 6x86, Cyrix 6x86MX
- **BIOS:** AWARD Flash BIOS, supports plug & play
- **Chipset:** Intel 430TX
- **Secondary level cache:** 512 KB on board
- **Green function:** Supports power management option via BIOS, activated by keyboard or mouse activity. Supports doze, sleep, and suspended mode. APM 1.1 compliant
- **RAM:** 8 MB to 256 MB, four 72-pin SIMM socket, accepts 4, 8, 16, 32 and 64 MB SIMMs. Compatible with both EDO and FDM memory
- **EIDE interface:** Supports up to four IDE devices and the Ultra DMA/33 bus
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB)
- **Parallel port:** One enhanced parallel port, supports SPP/EPP/ECP parallel mode
- **Serial ports:**16C550 UARTs, Two RS-232 ports
- **USB interface:** two USB connectors with fuse protection. Complies with USB Spec. Rev.1.0
- **Watchdog timer:** 63-level timer interval, jumperless with runtime setup, generates system reset or IRQ11
- **Keyboard/Mouse connector:** A 6-pin mini DIN connector is located on the mounting bracket for easy connection of a keyboard or a PS/2 mouse. An on-board keyboard 5-pin male keyboard header connector is also available.
- **ISA driver current:** 64mA (High Drive), 16 mA (Normal)

## **VGA interface**

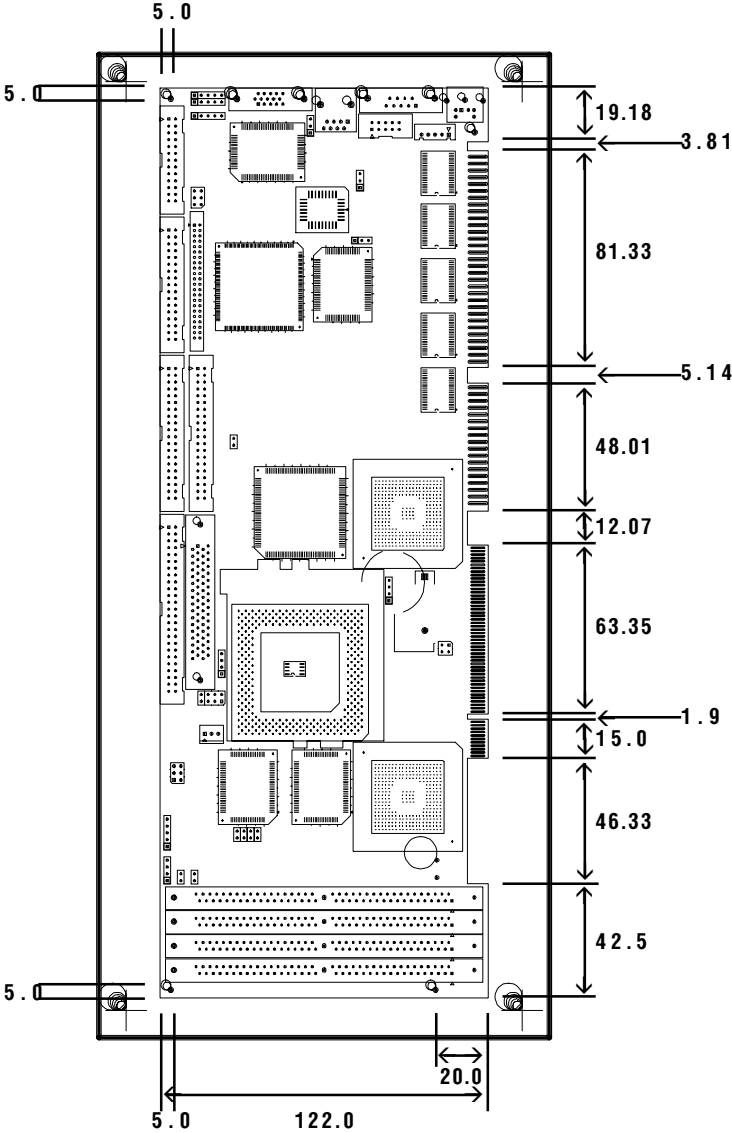
- **Controller:** C&T 65550 VGA controller with Windows accelerator
- **Display memory:** 1MB on-board DRAM, up to 2MB (optional)
- **VGA CRT/LCD Display resolution:**
  - Non-interlaced CRT monitor resolution up to 1024x768 @ 256 colors

- Panel resolution: Supports 640 x 480 @ 16M colors, up to 800 x 600 TFT panel
- Display output: DB-15 VGA connector, 44 pin header general purpose flat panel display connector
- **SCSI interface:**
- **PCI SCSI:** Supports Ultra Wide SCSI 8-bit or 16-bit interface. Supports DoubleSpeed SCSI operation up to 40 MB/s
- **Chipset:** Adaptec AIC-7880
- **LAN:**
  - Supports 10 BaseT Ethernet networking
  - Controller: Realtek RTL8029 chipset
  - Type: 16bits Novell NE2000 compatible
  - Connector: 10 BaseT connector

### **Mechanical and environmental**

- **Power supply:** 3.5 A @+5 V
- **Operating temperature:** 0 to 60° C (32 to 140° F)
- **Board size:** 338mm x 122mm

# Board layout and dimensions



Dimensions in mm

PCM-6159 dimensions



# 2

## **Installation**

This chapter tells how to set up the PCA-6159 Series hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedure.



## Jumpers

---

The PCA-6159 Series has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each of the board's jumpers.

| Jumpers |                                |
|---------|--------------------------------|
| Label   | Function                       |
| J1      | Voltage Select                 |
| J2      | Voltage Select                 |
| J3      | Voltage Select                 |
| J4      | Voltage Select                 |
| J5      | Frequency Ratio                |
| J7      | MTXC CLK Setting/P55CT Enabled |
| J8      | Clock Setting                  |
| J9      | Battery Select                 |
| J10     | SCSI Select                    |
| J11     | ISA Timing                     |
| J12     | LCD Power Select               |
| J13     | LCD/EL Select                  |
| J14     | Watchdog Select                |
| J15     | Dual Power Select              |

## Connectors

---

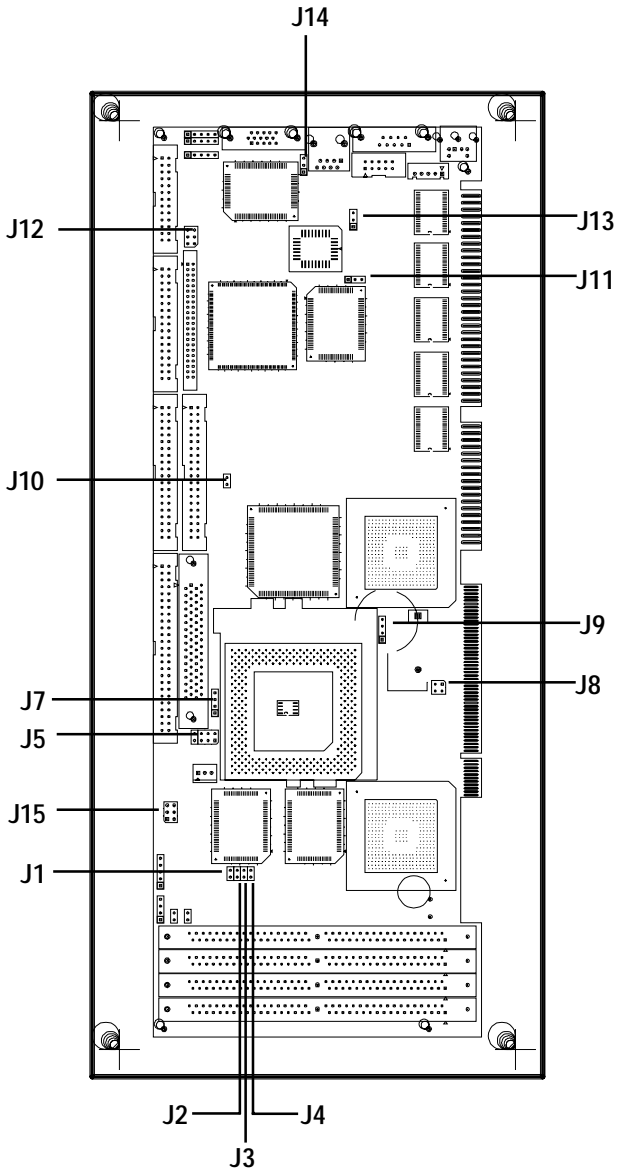
On-board connectors link the PCA-6159 Series to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

| Connectors |                              |
|------------|------------------------------|
| Label      | Function                     |
| CN1        | Speaker CON.                 |
| CN2        | HDD LED CON.                 |
| CN3        | Reset switch                 |
| CN4        | Power LED/keyboard Lock CON. |
| CN5        | Fan Power CON.               |
| CN6        | Wide SCSI CON.               |
| CN7        | SCSI CON.                    |
| CN8        | Primary IDE CON.             |
| CN9        | Secondary IDE CON.           |
| CN10       | Floppy CON.                  |
| CN11       | Flat Panel CON.              |
| CN12       | EXT Keyboard CON.            |
| CN13       | COM2                         |
| CN14       | Printer Port CON.            |
| CN15       | IR CON.                      |
| CN16       | CRT CON.                     |
| CN17       | COM1                         |
| CN18       | USB2                         |
| CN19       | PS/2 Mouse & Keyboard CON.   |
| CN20       | USB1                         |
| UTP1       | Ethernet CON.                |

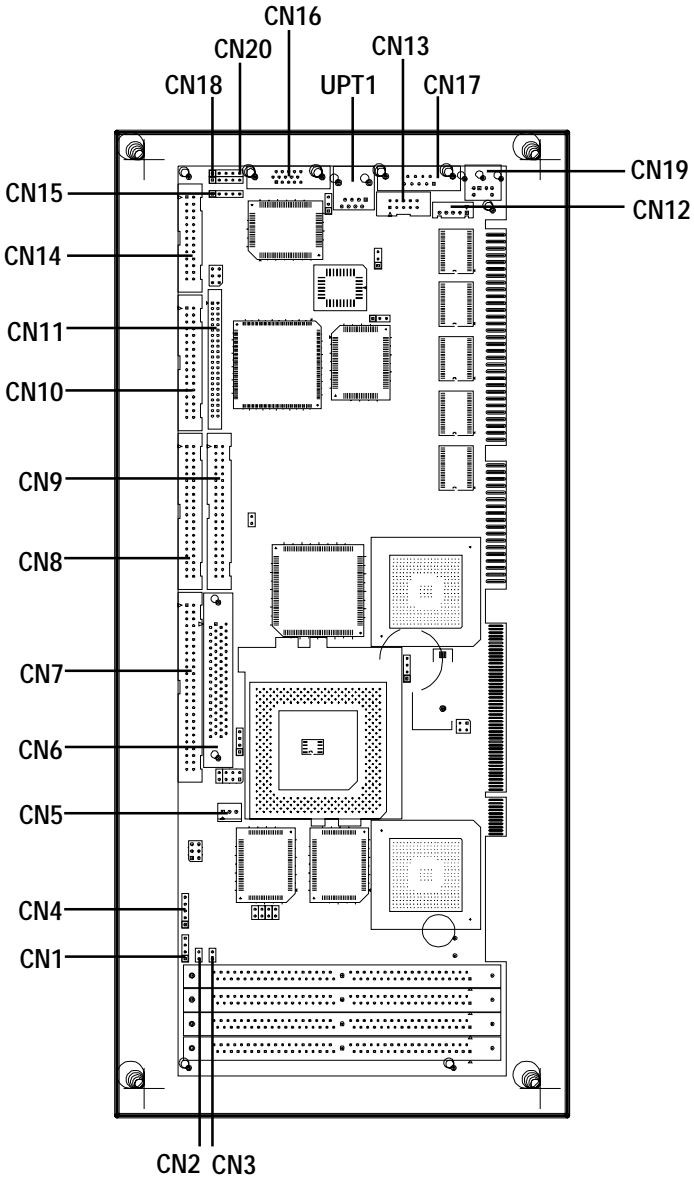
Please refer to Appendix B for pin assignment.

# Locating jumpers

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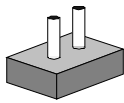
# Locating connectors



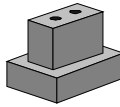
## Setting jumpers

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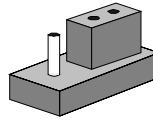
You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the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



**OPEN**



**CLOSED**



**CLOSED 2-3**

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



**Open**



**Closed**



**Closed 2-3**

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

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

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

## CPU installation and upgrading

---

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

### **Warning!**



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

### **Caution!**



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

### **Install a CPU in the ZIF socket**

PCA-6159 Series provides a Zero Insertion Force (ZIF) socket for easy CPU installation.

1. Make sure the ZIF socket lever is in the upright position. To raise the lever, pull it out to the side a little and raise it as far as it will go.
2. Place the CPU in the empty socket. Follow the instructions that came with the CPU. If you have no instructions, do the following: Carefully align the CPU so it is parallel to the socket and the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Gently slide the CPU in. It should insert easily. If it doesn't, pull the lever up a little more.

- Press the lever down. The plate will slide forward. You will feel some resistance as the pressure starts to secure the CPU in the socket. This is normal and won't damage the CPU.

When the CPU is installed, the lever should snap into place at the side of the socket.

**NOTE:** *To remove a CPU, pull the lever out to the side a little and raise it as far as it will go. Lift out the CPU chip.*

When you install a new CPU, be sure to adjust the board settings, such as CPU type and CPU clock. **Improper settings may damage the CPU.**

### Voltage Select (J1, J2, J3, and J4)

J1, J2, J3, and J4 must be set to match the CPU type. The chart below shows the proper jumper settings for their respective  $V_{cc}$  (core). (The  $V_{cc}$  (I/O) for CPU is fixed to be 3.3V).

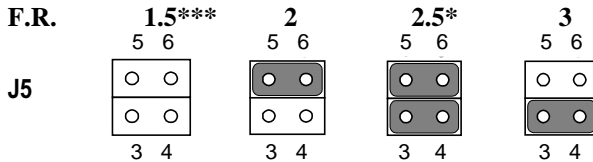
| V  | 2    | 2.1   | 2.2   | 2.4   | 2.5   | 2.6   | 2.7   | 2.8*  | 2.9   | 3.0   | 3.1   | 3.2   | 3.3   | 3.4   | 3.5   | 3.6   |
|----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| J1 | open | close | open  | close | open  | close | open  | close | open  | close | open  | close | open  | close | open  | close |
| J2 | open | open  | close | close | open  | open  | close | close | open  | open  | close | close | open  | open  | close | close |
| J3 | open | open  | open  | open  | close | close | close | close | open  | open  | open  | open  | close | close | close | close |
| J4 | open | open  | open  | open  | open  | open  | open  | open  | close | close | close | close | close | close | close | close |

\* default setting

## Frequency Ratio

This jumper sets the frequency ratio between the internal frequency of the CPU and the BUS Clock. If you use an AMD K6 CPU, please refer to J5 frequency ratio for K6 only.

### J5 Frequency Ratio\*\*

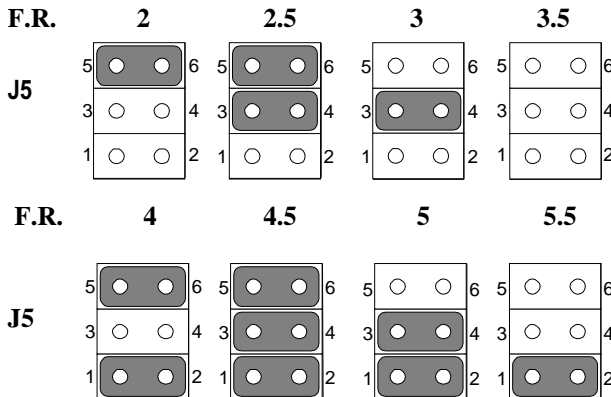


\* Default setting

\*\* Jumper settings for pins 1 and 2 do not affect this

\*\*\* For Intel 233 MHz MMX CPUs, F.R. is 3.5 for this setting

### J5 Frequency Ratio for K6 only





Please refer to the following table for CPU internal frequency (MHz) settings (for reference only).



|                        |     |     |     |     |     |     |     |     |     |     |     |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CPU Internal Frequency | 100 | 120 | 133 | 150 | 166 | 200 | 233 | 266 | 300 | 333 | 366 |
| F.R.                   | 1.5 | 2   | 2   | 2.5 | 2.5 | 3   | 3.5 | 4   | 4.5 | 5   | 5.5 |
| Clock                  | 66  | 60  | 66  | 60  | 66  | 66  | 66  | 66  | 66  | 66  | 66  |



## MTXC CLK Setting/P55C Enabled (J7)

This jumper setting provides Intel MTXC chipset 66/60 MHz frequency. You can Enable/Disable P55C CPUs with pin 1 and pin 2 close/open.





| J7 MTXC CLK Setting |   |   |
|---------------------|---|---|
|                     | 66 Hz*  | 60 Hz   |
| J7                  |  |  |
|                     | 3 4   | 3 4   |

| J7 P55C Enabled/Disabled |   |   |
|--------------------------|---|---|
|                          | Enabled*  | Disabled  |
| J7                       |  |  |
|                          | 1 2   | 1 2   |

\* default setting

## Clock Setting (J8)

J8 must be set together with J5 jumper to match the CPU internal frequency. The clock frequency times the Frequency Ratio equals the CPU's internal frequency.

| J8 Clock Setting |   |   |   |   |
|------------------|---|---|---|---|
| CPU              | 55  | 60  | 66*   | 75  |
| PCI              | 27.5  | 30  | 33.3  | 37.5  |
| J8               |  |  |  |  |

\* default setting

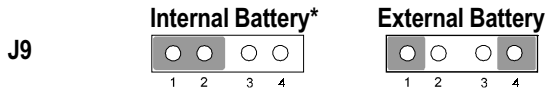
## Battery Select (J9)

This jumper sets the CMOS data retention power supply to internal battery or external battery.

---

### J9 Battery Select

---



---

\* default setting

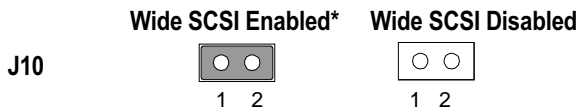
## SCSI Select (J10)

This jumper sets the data transferred by SCSI to 16-bit (Wide SCSI enabled) or 8-bit (Wide SCSI disabled).

---

### J10 SCSI Select

---



---

\* default setting

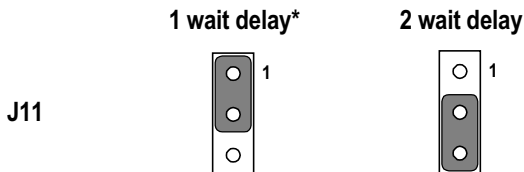
## ISA Timing (J11) (PCA-6159H only)

For high-drive ISA bus systems, in order to increase system stability, you may delay the ISA timing for 1 or 2 clock pulses. However, it will decrease system performance.

---

### J11 ISA Timing

---



---

\* default setting

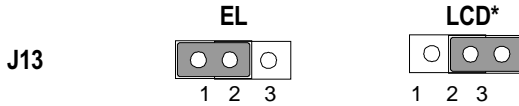
## LCD/EL Select (J13)

This jumper sets the display type for the CPU card.

---

### J13 LCD/EL Select

---



---

\* default setting

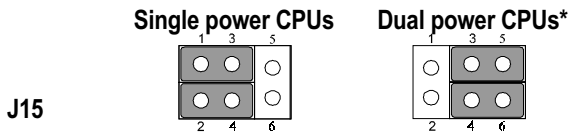
## Dual Power Select (J15)

This jumper sets single power/dual power CPU type. Current Intel CPUs marked “Pentium” have only a single power plane and those marked “Pentium with MMX” have dual power planes.

---

### J15 Dual Power Select

---



---

\* default setting

## Installing DRAM (SIMMs)

---

The PCA-6159 Series CPU card provides four 72-pin SIMM (Single In-line Memory Module) sockets and supports either Fast Page Mode (FPM) or Extended Data Output (EDO) DRAM with a speed of 70 ns or faster. You can install up to 256 MB of RAM.

### Installing SIMMs

**NOTE:** *The modules can only fit into a socket one way. Their chips must face the CPU, and their gold pins must point down into the SIMM socket.*

1. Ensure that all power sources are disconnected.
2. Slip the memory module into the socket at a 45-degree angle.
3. Push the module toward the vertical posts at both ends of the socket until the module is upright, and the retaining clips at both ends of the module click into place. When positioned correctly, the pins on top of the vertical posts should correspond to the circular holes on the ends of the module.
4. Repeat steps 2 and 3 for each module you install.

## Front panel connectors (CN1,CN2,CN3,CN4)

---

You may want to install external switches to monitor and control the PCA-6159 Series. These features are optional —install them only if you need them. The front panel connectors include a speaker connector (CN1), a HDD LED connector (CN2), an input switch (CN3) for resetting the card, and a keyboard lock connector (CN4).

### **Speaker connector (CN1)**

The PCA-6159 Series can drive an 8  $\Omega$  speaker at 0.5 watts. Ensure that alternatives to this specification do not overload the card. Close pins 3 and 4 to enable the buzzer.

### **HDD LED connector (CN2)**

The LED indicator for hard disk access is an active low signal (24 mA sink rate).

### **Reset switch (CN3)**

If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset. The switch should be rated for 10 mA, 5 V.

### **Power LED/keyboard lock connector (CN4)**

You can connect an LED to indicate if the CPU card is powered on. Pin 1 of CN4 supplies power to the LED, and pin 3 is the ground.

You can use a switch (or a lock) to disable the keyboard. In this state, the PC will not respond to any input from the keyboard. This is useful if you don't want anyone to change or stop a running program. Simply connect the switch between pin 4 and pin 5 of CN4.

If you need to make your own cable, you can find the pin assignments for the board's connector in Appendix B.

## **Fan power supply connector (CN5)**

---

CN5 provides power supply to optional CPU cooling fan. Only present when +12 V power is supplied to the board.

## **SCSI connectors (CN6, CN7)**

---

The PCA-6159 Series has a 50-pin, dual in-line connector for Ultra SCSI devices and a 68-pin, dual in-line connector for Ultra Wide SCSI devices. Connection of SCSI devices requires special attention, especially when determining the last drive on the SCSI chain. Refer to Chapter 6 and your device's operating manual for detailed installation advice.

## **IDE hard drive connector (CN8, CN9)**

---

You can attach up to four Enhanced Integrated Device Electronics hard disk drives to the PCA-6159 Series internal controller. The PCA-6159 Series IDE controller uses a PCI local-bus interface. This advanced IDE controller supports faster data transfer and allows the IDE hard drive to exceed 528 MB.

CN8 is the primary IDE connector, CN9 is the secondary IDE connector. Each connector supports up to two EIDE hard disk drives.

### **Connecting the hard drive**

The way to connecting drives to primary IDE connector or secondary IDE connector is same.

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

1. Connect one end of the cable to CN8/CN9. Make sure that the red (or blue) wire corresponds to pin 1 on the connector.
2. Plug the other end of the cable to the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

Connect a second drive as described above.

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

## **Floppy connector (CN10)**

---

You can attach up to two floppy drives to the PCA-6159 Series on-board controller. You can use any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. 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 used for 3½" drives) and a printed-circuit board connector (usually used for 5¼" drives).

## Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN10. Make sure that the red wire corresponds to pin one on the connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.
3. If you are connecting a 5¼" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3½" floppy drive, you may have trouble determining which pin is pin number one. Look for a number printed on the circuit board indicating pin number one. In addition, the connector on the floppy drive connector may have a slot. When the slot is up, pin number one should be on the right. Check the documentation that came with the drive for more information.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

If you need to make your own cable, you can find the pin assignments for the board's connector in Appendix B.

## VGA interface connections

---

The PCA-6159H/F/V PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The board has two



connectors to support these displays, one for standard CRT VGA monitors and one for flat panel displays.

### **CRT connector (CN16)**

CN16 is a standard 15-pin D-SUB connector commonly used for VGA.

Pin assignments for CRT connector CN16 are detailed in Appendix B.

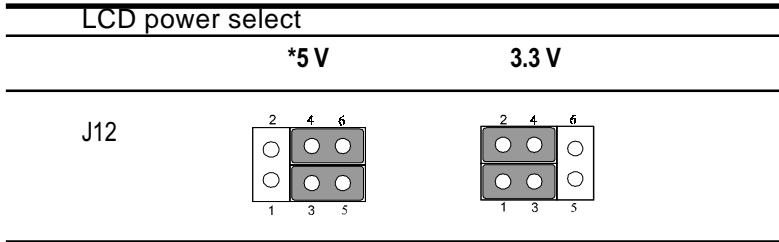
### **Flat panel connector (CN11)**

CN11 consists of a 44-pin, dual-in-line header.

The PCA6159H provides a bias control signal on CN11 that can be used to control the LCD bias voltage. It is recommended that the LCD bias voltage not be applied to the panel until the logic supply voltage (+5V or +3.3V) and panel video signals are stable. Under normal operation, the control signal (ENAVEE) is active high. When the PCA-6159H power is applied, the control signal is low until just after the relevant flat panel signals are present.

### **LCD power select (J12)**

The PCA-6159H/F/V PCI SVGA interface supports 5V and 3.3V LCD displays. By changing the setting of J12, you can select the panel video signal level to be 5V or 3.3V.



**\* default setting**

Configuration of the VGA interface is done completely via the software utility. You don't have to set any jumpers. Refer to Chapter 3 for software setup details.

Refer to Chapter 3 for details on connecting the four standard LCD's: Sharp LM64183P, LM64P89, Toshiba LTM10C042, Sharp 64C142, and Planar EL Display.

## Keyboard connectors (CN12, CN19)

The PCA-6159 Series board provides two keyboard connectors. A 5-pin connector (CN12) supports passive backplane applications. A second 6-pin mini-DIN connector (CN19) supports both a keyboard and a PS/2 style mouse.

## COM-port connectors (CN13, CN17)

The PCA-6159 Series has two serial ports, COM1 and COM2, to provide connections for serial devices (a mouse, etc.) or a

communication network. You can find the pin assignments for the COM port connectors in Appendix B.

The IRQ and the address range for COM1, 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 below shows the settings for the PCA-6159 Series serial ports.

---

| PCA-6159 Series serial port default settings |               |           |
|--|---------------|-----------|
| Port   | Address Range | Interrupt |
| COM1   | 3F8~3FF       | IRQ4      |
| COM2   | 2F8~2FF       | IRQ3      |

---

## Printer port connector (CN14)

---

Normally, the parallel port is used to connect the card to a printer. The PCA-6159 Series includes a multi-mode (ECP/EPP/SPP) parallel port, accessed through CN14, a 26-pin flat-cable connector. You will need an adapter cable if you use a traditional DB-25 connector. The adapter cable has a 26-pin connector on one end and a DB-25 connector on the other.

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

The parallel port interrupt channel is designated to be IRQ7.

You can select ECP/EPP DMA channel via BIOS setup.

## 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 setting through BIOS setup.

## **USB connectors (CN18, CN20)**

---

The PCA-6159 Series provides two USB (Universal Serial Bus) interfaces which gives complete plug and 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 two 5-pin flat-cable connectors, CN18 and CN20. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 5-pin connector on one end and an USB connector on the other.

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

## **Ethernet connector (UTP1, PCA-6159H/F only)**

---

The PCA-6159H/F is equipped with a high performance 16-bit PCI-bus Ethernet interface which is fully compliant with IEEE 802.3 10Mbps CSMA/CD standards. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible. On board RJ-45 jack provides convenient 10 Base-T RJ-45 operation.

The medium type can be configured via the RSET8029.EXE program included on the utility disk. (See Chapter 3 for detailed information.)

## **Watchdog timer configuration**

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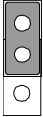

An on-board watchdog timer reduces the chance of disruptions which EMP (electro-magnetic pulse) interference can cause. This

is an invaluable protective device for standalone or unmanned applications. Setup involves one jumper and running the control software (refer to Appendix A).

### Watchdog select (J14)

When the watchdog timer activates (CPU processing has come to a halt), it can reset the system or generate an interrupt on IRQ11. This can be set via setting J14 as shown below:

---

| Watchdog select |   |   |
|-----------------|---|---|
|                 | *System reset   | IRQ11   |
| J14             |  1<br>2<br>3 |  1<br>2<br>3 |

---

**\* default setting**

For information on programming the watchdog timer, see Appendix A.

# 3

## Software Configuration

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements. AWARD System BIOS is covered in Chapter 4.

Sections include:

- Introduction
- Utility disk with IDE Bus Master driver
- Utility disk with VGA BIOS (PCA-6159H only)
- VGA display software configuration
- Connections for four standard LCDs
- Ethernet interface configuration

## Introduction

---

The PCA-6159 Series system BIOS and custom drivers are located in a 128 Kbyte, 32-pin (JEDEC spec.) Flash ROM device. A single Flash chip holds the system BIOS, VGA BIOS, and network Boot ROM image. The display can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

## Utility disk with IDE Bus Master Driver

---

The PCA-6159 Series is supplied with a software utility disk with IDE Bus Master driver which provides better system performance. The IDE Bus Master driver supports OS/2, Windows 95 and Windows NT O.S.

## Utility disk with VGA BIOS (PCA-6159H/F/V only)

---

The PCA-6159H/F/V is supplied with a software utility disk with VGA BIOS. This disk contains the necessary files for setting up the VGA display. Directories and files on the disk are as follows:

**VGA BIOS:** README.DOC  
AWDFLASH.EXE  
6159\_CRT.BIN  
6159\_TFT.BIN  
6159\_STN.BIN  
6159\_MON.BIN  
6159\_EL.BIN  
CBROM.EXE

**AWDFLASH.EXE**

This program allows you to write the VGA display driver files to the BIOS Flash ROM. The VGA files all come ready formatted for the PCA-6159H with .BIN extensions. They are custom written and can be made available upon request.

**6159\_CRT.BIN**

System BIOS which supports CRT only

**6159\_TFT.BIN**

System BIOS which supports 640X480 color TFT (Toshiba LTM10C042)

**6159\_STN.BIN**

System BIOS which supports 640X480 color STN DD 8/16-bit displays (Sharp LM64C142)

**6159\_MON.BIN**

System BIOS which supports 640X480 dual scan monochrome displays (Sharp LM64P83/64P89)

**6159\_EL.BIN**

System BIOS which supports 640X480 EL displays (PLANAR EL640X480-A series)

**CBROM.EXE**

This program allows you to combine your own VGA BIOS with system BIOS



## VGA display software configuration

---

The PCA-6159H/F/V on-board VGA interface supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. With on-board 1M display memory, the interface can drive CRT displays with resolutions up to 1024 x 768 in 256 colors. It is also capable of extending up to 2 MB of display memory to provide resolutions of 1024 x 768 in 64K colors.

The VGA interface is configured completely via the software utility, so you don't have to set any jumpers. Configure the VGA display as follows:

1. Apply power to the PCA-6159H/F/V with a color TFT display attached. This is the default setting for the PCA-6159H. Ensure that the AWDFLASH.EXE and \*.BIN files are located in the working drive.

**NOTE:** *Ensure that you do not run AWDFLASH.EXE while your system is operating in EMM386 mode.*

2. At the prompt, type AWDFLASH.EXE and press <Enter>.
3. At the prompt, enter the new BIN file that supports your display. When you are sure that you have entered the file name correctly, press <Enter>.
4. The screen will ask "Do you want to save BIOS?" Press Y if you wish to save the existing configuration before changing it. Then type the name under which you want to save the current configuration.
5. The prompt will then ask "Are you sure to program?" Press Y if you want the new file to be written into the BIOS. Press N to exit the program.

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

## Connections for four standard LCDs

---

### Connections to Sharp LM64183P, LM64P89 (640 x 480 DSTN MONO LCD)

| LM64183/64P89 |          | PCA-6159H CN11 |                 |
|---------------|----------|----------------|-----------------|
| Pin           | Pin name | Pin            | Pin name        |
| CN1-1         | S        | 36             | FLM             |
| CN1-2         | CP1      | 38             | LP              |
| CN1-3         | CP2      | 35             | SHFCLK          |
| CN1-4         | DISP     | 5              | +5 V            |
| CN1-5         | VDD      | 6              | +5 V            |
| CN1-6         | VSS      | 3              | GND             |
| CN1-7         | VEE      | -              | external power* |
| CN1-8         | DU0      | 12             | P3              |
| CN1-9         | DU1      | 11             | P2              |
| CN1-10        | DU2      | 10             | P1              |
| CN1-11        | DU3      | 9              | P0              |
| CN1-12        | DL0      | 16             | P7              |
| CN1-13        | DL1      | 15             | P6              |
| CN1-14        | DL2      | 14             | P5              |
| CN1-15        | DL3      | 13             | P4              |

\*LM64183P -17V  
LM64P89 -20V

## Connections to PLANAR EL (640 x 480 AD4 EL)

| PLANAR 640 x 480 AD4 |          | PCA-6159H CN11 |          |
|----------------------|----------|----------------|----------|
| Pin                  | Pin name | Pin            | Pin name |
| 1                    | GND      | 3              | GND      |
| 2                    | DO       | 21             | P12      |
| 3                    | GND      | 3              | GND      |
| 4                    | D1       | 22             | P13      |
| 5                    | GND      | 3              | GND      |
| 6                    | D2       | 23             | P14      |
| 7                    | NC       | —              | —        |
| 8                    | D3       | 24             | P15      |
| 9                    | NC       | —              | —        |
| 10                   | D4       | 17             | P8       |
| 11                   | NC       | —              | —        |
| 12                   | D5       | 18             | P9       |
| 13                   | NC       | —              | —        |
| 14                   | D6       | 19             | P10      |
| 15                   | GND      | 4              | GND      |
| 16                   | D7       | 20             | P11      |
| 17                   | GND      | 4              | GND      |
| 18                   | VCLK     | 42             | ASHFCLK  |
| 19                   | GND      | 4              | GND      |
| 20                   | /BLANK   | —              | —        |
| 21                   | GND      | 8              | GND      |
| 22                   | HS       | 37             | M        |
| 23                   | NC       | —              | —        |
| 24                   | VS       | 36             | FLM      |
| 25                   | NC       | —              | —        |
| 26                   | SELTST   | 39             | GND      |
| 27                   | COLMAP   | 39             | GND      |
| 28                   | ENABLE   | —              | —        |
| 29                   | RESERVED | —              | —        |
| 30                   | /LOWPOW  | —              | —        |
| 31,32                | NC       | —              | —        |
| 33                   | RESERVED | —              | —        |
| 34                   | NC       | —              | —        |

## Connections to Toshiba LTM10C042 (640 x 480 TFT Color LCD)

| LTM10C042 |          | PCA-6159H CN11 |          |
|-----------|----------|----------------|----------|
| Pin       | Pin name | Pin            | Pin name |
| 1         | GND      | 3              | GND      |
| 2         | CLK      | 35             | SHFCLK   |
| 3         | GND      | 4              | GND      |
| 4         | R0       | 27             | P18      |
| 5         | R1       | 28             | P19      |
| 6         | R2       | 29             | P20      |
| 7         | GND      | 8              | GND      |
| 8         | R3       | 30             | P21      |
| 9         | R4       | 31             | P22      |
| 10        | R5       | 32             | P23      |
| 11        | GND      | 33             | GND      |
| 12        | G0       | 19             | P10      |
| 13        | G1       | 20             | P11      |
| 14        | G2       | 21             | P12      |
| 15        | GND      | 33             | GND      |
| 16        | G3       | 22             | P13      |
| 17        | G4       | 23             | P14      |
| 18        | G5       | 24             | P15      |
| 19        | GND      | 34             | GND      |
| 20        | ENAB     | 37             | M        |
| 21        | GND      | 34             | GND      |
| 22        | B0       | 11             | P2       |
| 23        | B1       | 12             | P3       |
| 24        | B2       | 13             | P4       |
| 25        | GND      | 39             | GND      |
| 26        | B3       | 14             | P5       |
| 27        | B4       | 15             | P6       |
| 28        | B5       | 16             | P7       |
| 29        | GND      | 39             | GND      |
| 30        | VDD      | 5              | +5V      |
| 31        | VDD      | 6              | +5V      |

## Connections to Sharp LM64C142 (640 x 480 DSTN Color LCD)

| LM64C142 |          | PCA-6159H CN11 |          |
|----------|----------|----------------|----------|
| Pin      | Pin name | Pin            | Pin name |
| CN1-1    | YD       | 36             | FLM      |
| CN1-2    | LP       | 38             | LP       |
| CN1-3    | XCX      | 35             | SHFCLK   |
| CN1-4    | DISP     | 5              | +5 V     |
| CN1-5    | VDD      | 6              | +5 V     |
| CN1-6    | VSS      | 3              | GND      |
| CN1-7    | VEE      | -              | +27 V*   |
| CN1-8    | DU0      | 20             | P11      |
| CN1-9    | DU1      | 19             | P10      |
| CN1-10   | DU2      | 18             | P9       |
| CN1-11   | DU3      | 17             | P8       |
| CN1-12   | DU4      | 12             | P3       |
| CN1-13   | DU5      | 11             | P2       |
| CN1-14   | DU6      | 10             | P1       |
| CN1-15   | DU7      | 9              | P0       |
| CN2-1    | VSS      | 4              | GND      |
| CN2-2    | DL0      | 24             | P15      |
| CN2-3    | DL1      | 23             | P14      |
| CN2-4    | DL2      | 22             | P13      |
| CN2-5    | DL3      | 21             | P12      |
| CN2-6    | DL4      | 16             | P7       |
| CN2-7    | DL5      | 15             | P6       |
| CN2-8    | DL6      | 14             | P5       |
| CN2-9    | DL7      | 13             | P4       |
| CN2-10   | VSS      | 8              | GND      |

\*external power

## Ethernet software configuration

---

The PCA-6159H/F on-board Ethernet interface supports all major network operating systems. To configure the medium type, to view the current configuration, or to run diagnostics, do the following:

1. Power the PCA-6159H on. Ensure that the RSET8029.EXE file is located in the working drive.
2. At the prompt type RSET8029.EXE and press <Enter>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and Down keys. To change a selected item, press <Enter>, and a screen will appear with the available options. Highlight your option and press <Enter>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.
4. After you have made your selections and are sure this is the configuration you want, press ESC. A prompt will appear asking if you want to save the configuration. Press Y if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

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



# 4

## **Award BIOS Setup**

This chapter describes how to set BIOS configuration data.



## System test and initialization

---

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

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

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

### System configuration verification

These routines check the current system configuration against the values stored in the board's CMOS memory. If they don't match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The PCA-6159 Series CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service, but when it finally runs down, you will need to replace the complete unit.

# AWARD BIOS setup

---

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

## Entering setup

Power on the computer and press <Del> immediately. The CMOS SETUP UTILITY main program screen will appear with the following options:



Setup program initial screen

## Load Defaults

The “**LOAD BIOS DEFAULTS**” option loads the minimized settings for troubleshooting. “**LOAD SETUP DEFAULTS**”, on the other hand, is for loading optimized defaults for regular use. Choosing defaults at this level, will modify all applicable settings.

## STANDARD CMOS SETUP

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



\*CMOS setup screen

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## BIOS FEATURES SETUP

The “BIOS FEATURES SETUP” option consists of configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference.

By choosing the “BIOS FEATURES SETUP” option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCA-6159 Series.



\*BIOS features setup

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## CHIPSET FEATURES SETUP

This “CHIPSET FEATURES SETUP” option controls the configuration of the board’s chipset.

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 PCA-6159 Series.



\*CHIPSET features setup

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## POWER MANAGEMENT SETUP

The “POWER MANAGEMENT SETUP” option allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

By choosing the “POWER MANAGEMENT SETUP” option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCA-6159 Series.



\*Power management setup

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## PnP/PCI CONFIGURATION

The “PnP/PCI CONFIGURATION” option configures the PCI bus slots.

By choosing the “PnP/PCI CONFIGURATION” option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCA-6159 Series.



**\*PnP/PCI Configuration**

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## INTEGRATED PERIPHERALS

By choosing the “INTEGRATED PERIPHERALS” option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer’s default values for the PCA-6159 Series.



\*Integrated Peripherals

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions



## Load BIOS defaults

“LOAD BIOS DEFAULTS” loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the PCA-6159 Series on.



\*Load BIOS defaults screen

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## USER PASSWORD

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

1. If the CMOS is bad or this option has never been used, a default password is stored in the ROM. The screen will display the following messages:

### Enter Password:

Press <Enter>.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

### Confirm Password:

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password can be at most eight (8) characters long.

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

## AUTO DETECT HARD DISK

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration.

|  |             |              |              |                |              |                |             |
|--|-------------|--------------|--------------|----------------|--------------|----------------|-------------|
| <b>ROM PCI/ISA BIOS (2A51HAKA)</b><br><b>CMOS SETUP UTILITY</b><br><b>AWARD SOFTWARE, INC.</b>                                     |             |              |              |                |              |                |             |
| <b>HARD DISK TYPE</b>  | <b>SIZE</b> | <b>CYLS.</b> | <b>HEADS</b> | <b>PRECOMP</b> | <b>LANDZ</b> | <b>SECTORS</b> | <b>MODE</b> |
| DRIVE C:   | (MB)        | 790          | 15           | 65535          | 789          | 57             |             |
| <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;">SELECT SECONDARY SLAVE OPTION (N=Skip): N</div> |             |              |              |                |              |                |             |
| <u>ESC = SKIP</u>  |             |              |              |                |              |                |             |

**\*IDE HDD auto detection screen**

\*Your BIOS configuration screen will look similar to this screen capture. The actual screen may vary, owing to different BIOS versions

## Save & exit setup

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

## Exit without saving

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

# 5

## **PCI SVGA Setup (PCA-6159H/F/V only)**

The PCA-6159H/F/V features an on-board PCI flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

## Before you begin

---

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The enhanced display drivers for the PCA-6159H/F/V board are located on the software installation diskette. You must install the drivers and utility software by using the supplied SETUP program for DOS drivers

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

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

## Installation

---

- Disk 1: Windows 3.1, Windows 95, and Windows NT drivers
- Disk 2: OS/2 drivers

## Simultaneous display mode

---

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

Both CRT and panel displays can be used simultaneously. The PCA-6159H/F/V can be set in one of three configurations: on a CRT, on a flat panel display, or on both simultaneously. The system is initially set to simultaneous display mode. In the utility diskette, there are three .COM files that can be used to select the display. Simply type the filename at the DOS prompt:

**CT.COM** Enables CRT display only

**FP.COM** Enables panel display only

**SM.COM** Enables both displays at the same time.

## Sleep mode

---

The display driver diskette contains two files that support sleep mode. Simply type the filename at the DOS prompt:

**ON.COM** switches to normal display mode.

**OFF.COM** switches to sleep mode.

# Driver installation

---

## **Necessary prerequisites**

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver or utility you should: know how to copy files from a floppy disk to a directory on the hard disk, understand the MS-DOS directory structure, and know how to format a floppy disk. If you are uncertain about any of these concepts, please refer to the DOS or Windows user reference guides for more information before you proceed with the installation.

## **Before you begin**

Before you begin installing software drivers, you should make a backup copy of the display driver diskette and store the original in a safe place. The display driver diskette contains drivers for several versions of certain applications. You must install the correct version in order for the driver to work properly so make sure you know which version of the application you have.

## Windows setup

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

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

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

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

### Changing Display Drivers in Windows

To change display drivers in Windows, select the *Windows Setup* icon from the Main window. You will be shown the current setup configuration. Select *Change System Settings* from the Option menu. Click on the arrow at the end of the Display line. You will be shown a list of display drivers. Click on the driver you want. Then click on the **OK** button. Follow the directions to complete the setup.

### Changing Color Schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. To change the color scheme, select the *Control Panel* from the Main window. Select the *Color* icon. You will be shown the current color scheme. Choose a new color scheme and click the **OK** button.



## DOS Setup

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

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

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

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

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

### **Changing Display Drivers in DOS**

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

|           |                    |
|-----------|--------------------|
| VGA       | 640x480, 16 colors |
| Super VGA | 800x600, 16 colors |

### **Panning Drivers**

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

### **Linear Acceleration Drivers**

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

## **Windows 95 Drivers Setup Procedure**

---

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

# Windows NT Drivers Setup Procedure

---

## Step 1

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

## Step 2

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

## Step 3

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

# OS/2 Drivers Setup Procedure

---

## Preliminary Steps

The following steps must be performed before you install the 65550/554 display driver:

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

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

## Installing from Diskette

To install this driver, do the following steps:

1. Open an OS/2 full screen or windowed session.
2. Place the 65550 PCI Display Driver Diskette in drive A.
3. At the OS/2 command prompt, type the following commands to copy the files to the OS/2 drive:

Type:

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

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

where A: is the floppy disk drive and

C: is the hard disk partition containing \OS2

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

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

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

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

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

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

When the system has restarted, the display driver will be initialized for 640x480x256 Color, 60Hz refresh. To switch to a different video resolution color depth, or refresh rate, follow the steps below.

## Selecting Monitor Type

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

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

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

## Selecting Screen Resolution/Refresh Rate

To switch to a different video resolution, color depth or refresh rate,

follow the steps below.

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

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

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

## Installation Notes

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

# 6

## **SCSI Setup and Configurations**

The PCA-6159/H/F is equipped with two SCSI interfaces. This chapter provides basic SCSI concepts and instructions for installing the software drivers with the included SCSI driver diskettes. At the end of this chapter provides the SCSI device troubleshooting tips.



## **Installation and Setup**

The PCA-6159/H/F is equipped with an Adaptec AIC-7880 Ultra Wide PCI-to-Ultra SCSI host adapter which provides a powerful multitasking interface between your computer's PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.). Up to a total of 15 SCSI devices can be connected to the internal or external SCSI connector on AIC-7880.

If you need to configure the SCSI, the onboard SCSI Select configuration utility allows you to change host adapter settings without opening the computer or handling the board. The SCSI Select utility also contains a utility to low-level format and verifies the disk media on your hard disk drives.

## **SCSI Configuration Guidelines**

Before installing your SCSI devices, you should understand the basic SCSI concepts described in this section. The information will help you set up your host adapter and devices so they function properly.

### **SCSI ID Numbers**

Each device attached to the host adapter, as well as the host adapter itself, must have a unique SCSI ID number (0-15). The SCSI ID serves two purposes:

- It uniquely defines each SCSI device on the SCSI bus.
- It determines the device's priority on the SCSI bus.

SCSI ID7 has the highest priority. The priority of the remaining IDs, in descending order, is 6 to 0 and 15 to 8.

*Note: SCSI IDs play no role in determining the order in which devices are cabled to the host adapter.*

The AIC-7880 supports the SCSI Configured AutoMatically (SCAM) protocol, which assigns SCSI IDs dynamically and resolves SCSI ID conflicts automatically at bootup. If your system includes SCSI disk drives or other devices that support SCAM, you do not need to manually assign SCSI IDs to these devices.

Most SCSI devices currently in use, however, do not support SCAM. The SCSI IDs on these devices must be set manually. To change the SCSI IDs on these devices, refer to the device's documentation.

If you install more than one SCSI host adapter in the computer, each adapter forms a separate SCSI bus. SCSI IDs can be reused as long as the ID is assigned to a device on a separate SCSI bus (e.g., each SCSI bus can have a device with SCSI ID 0).

## **SCSI Terminators**

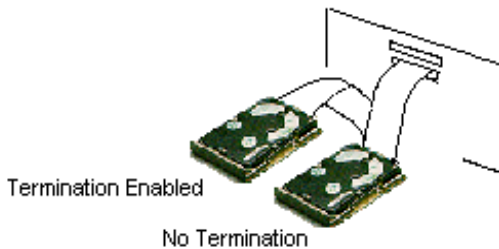
To ensure reliable communication, the SCSI bus must be properly terminated. Termination is controlled by a set of electrical resistors, called terminators. Terminators must be placed (or enabled) at the two extreme ends of the SCSI bus. All devices that lie between the ends must have their terminators removed (or disabled).

Termination on the Ultra Wide SCSI itself is controlled by software commands via the SCSISelect utility. The default setting is set to Automatic. When set to Automatic, if the AIC-7880 detects that SCSI cables are connected to any of its two SCSI connectors, it automatically sets the termination setting for the low and high bytes of the 16-bit Wide SCSI bus. The low byte controls 8-bit SCSI; the low and high bytes together control 16-bit Wide SCSI.

We recommend that you leave SCSI set to its default setting of Automatic. The following table lists the termination configurations.

| Devices Connected                     | Termination |      |
|---------------------------------------|-------------|------|
|                                       | Low         | High |
| 68-pin internal connector only        | ON          | ON   |
| 50-pin internal connector only        | ON          | ON   |
| 50-pin and 68-pin internal connectors | OFF         | ON   |

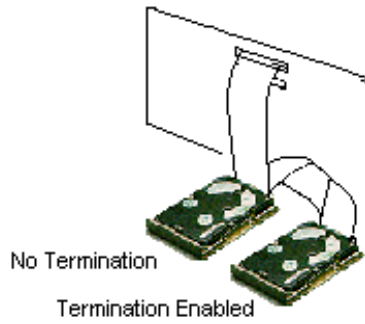
The following figures show termination examples for the AIC-7880.



#### AIC-7880 Ultra Wide SCSI

##### Termination

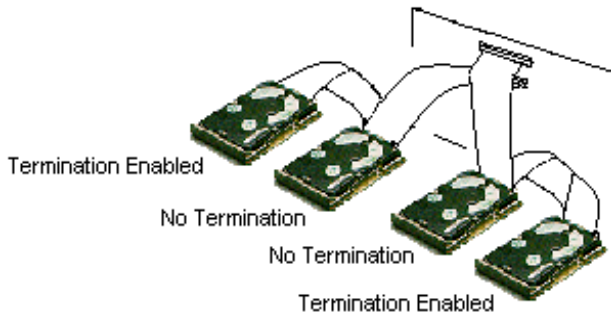
|     |      |
|-----|------|
| Low | High |
| ON  | ON   |



AIC-7880 Ultra Wide SCSI

**Termination**

|     |      |
|-----|------|
| Low | High |
| ON  | ON   |



## AIC-7880 Ultra Wide SCSI

### Termination

|     |      |
|-----|------|
| Low | High |
| OFF | ON   |

## SCSI Termination Examples

### Installing SCSI Devices

You can connect up to 15 devices (seven standard internal and eight Wide (16-bit) internal SCSI devices, or 15 Wide internal SCSI devices) to the Ultra Wide SCSI.

### Connecting Internal SCSI Devices

If you are connecting internal SCSI devices, make sure you have an internal SCSI cable with enough connectors to accommodate all of your devices.

1. Prepare each SCSI device for installation; configure the device SCSI ID and terminators (terminate the last internal device attached to the cable).

2. Install the SCSI device in your computer. Refer to your computer and device documentation for instructions.
3. Plug the connector at one end of the internal SCSI cable into the host adapter's internal SCSI connector.

Make sure the colored stripe on one side of the cable is aligned with pin-1 of the host adapter's connector. Pin-1 of the connector is usually designated by a small triangle "Δ", or a "1" on the connector.

4. Plug the remaining connectors on the cable into the connectors on the back of the devices.

Make sure the colored stripe on the cable is aligned with pin-1 of the device's connector.

5. Connect a DC power cable (from your computer's power supply) to the power connector on the SCSI device.

## Configuring the SCSI Adapter

Access the SCSI BIOS by holding down both CTRL and A keys when you see the BIOS banner message listing the driver name and the attached devices. For example:

*Adaptec AIC-7880 Ultra /Wide W BIOS v1.26*

*(c) 1996 Adaptec, Inc. All Rights Reserved.*

<<<Press <Ctrl><A> for SCSISelect(TM) Utility>>>

The SCSISelect screen will come up. Instructions on how to move the cursor and select options are listed on the bottom of the program windows. You can select either Configure/View Host Adapter Settings or SCSI Disk Utilities.

Configure/View Host Adapter Settings

Host Adapter SCSI Termination. Low ON/High ON

- When using 50-pin connector only, choose “Low ON/High ON” (Default)
- When using 68-pin connector only, choose “Low ON/High ON” (Default)
- When using both 50-pin & 68-pin, choose “Low OFF/High ON”

Select the default of “Low ON/High ON?” and press Enter, then use the up and down arrows to make your new selection and press Enter. Press ESC to go back to the Options menu. Press ESC again and select Yes to exit the program.

| <b>Basic Host Adaptec Settings</b> | <b>Default</b> |
|------------------------------------|----------------|
| Host Adapter SCSI ID               | 7              |
| SCSI Parity Checking               | Enabled        |
| Host Adapter SCSI Termination      | Low ON/High ON |

| <b>Boot Device Settings</b>  | <b>Default</b> |
|------------------------------|----------------|
| Boot Target ID               | 0              |
| Boot LUN Number <sup>1</sup> | 0              |

| <b>SCSI Device Settings</b> | <b>Default</b> |
|-----------------------------|----------------|
| Initiate Sync Negotiation   | Yes (Enabled)  |
| Maximum Sync Transfer Rate  | Yes (Enabled)  |
| Enable Disconnection        | 20 MBytes/sec  |
| Initiate Wide Negotiation   | Yes (Enabled)  |
| Send Start Unit Command     | No (Disabled)  |

| <b>Advanced Host Adapter Settings</b>                            | <b>Default</b> |
|--|----------------|
| Plug and Play SCAM Support                                       | Disabled       |
| Host Adapter BIOS  | Enabled        |
| Support Removable Disks Under BIOS as Fixed Disks <sup>2</sup>   | Boot only      |
| Extended BIOS Translation for DOS Drives >1 GByte <sup>2</sup>   | Enabled        |
| Display <Ctrl-A> Message During BIOS Initialization <sup>2</sup> | Enabled        |
| Multiple LUN Support   | Disabled       |
| Support for Ultra SCSI Speed                                     | Disabled       |

<sup>1</sup> Setting is valid only if multiple LUN Support is enabled.

<sup>2</sup> Settings are valid only if host adapter BIOS is enabled.

## Basic Host Adapter Settings

The basic host adapter settings are the SCSISelect settings most likely to require any modification.

- **Host Adapter SCSI ID** - This option sets the host adapter's SCSI ID. The default setting is SCSI ID 7, which give the



host adapter the highest priority on the SCSI bus. We recommend that you leave the host adapter set to SCSI ID7.

- **SCSI Parity Checking** - This option determines whether the host adapter verifies the accuracy of data transfer on the SCSI bus. The default setting is Enabled. You should disable SCSI Parity Checking if any SCSI device connected to the PCA-6159/59H does not support SCSI parity; otherwise, leave it enabled. Most SCSI devices do support SCSI parity. If you are not sure whether a device supports SCSI parity, consult the documentation for the device.
- **Host Adapter SCSI Termination** - This option sets termination on the host adapter. The default setting for the on-board SCSI is low ON/High ON. If you want to manually set the termination setting, see SCSI Terminators for appropriate settings.

## Boot Device Settings

The boot device settings allow you to specify the device from which you wish to boot your computer.

- **Boot Target ID** - This option specifies the SCSI ID of the device you wish to boot from. The default setting is SCSI ID 0. The SCSI ID selected here must correspond to the ID configured on the boot device.
- **Boot LUN number** - If your boot device has multiple LUNs (Logical Unit Numbers) and Multiple LUN Support is enabled, this option allows you to specify which LUN to boot from on your boot device. The default setting is LUN 0.

## SCSI Device Settings

The SCSI device settings allow you to configure certain parameters for each device on the SCSI bus. To configure a specific device, you must know the SCSI ID assigned to that device. If you are not sure of the SCSI ID, see Using the SCSI Disk Utilities on page78.

- **Initiate Sync Negotiation** - This option determines whether the host adapter initiates synchronous data transfer negotiation (Sync Negotiation) between the device and host adapter. The default setting is Yes.

Synchronous negotiation is a SCSI feature that allows the host adapter and its attached SCSI devices to transfer data in synchronous mode. Synchronous data transfer is faster than asynchronous data transfer.

The host adapter always responds to Sync Negotiation if the SCSI device initiates it. If neither the host adapter nor the SCSI device initiate Sync Negotiation, data is transferred asynchronously.

Normally, you should leave the Initiate Sync Negotiation setting enabled, because most SCSI devices support synchronous negotiation and it allows for faster data transfer.

*Note: Some older SCSI-1 devices do not support Sync Negotiation. This may cause your computer to operate erratically or hang if Initiate Sync Negotiation is set to yes. Set Initiate Sync Negotiation to No for these devices.*

- **Initiate Wide Negotiation** —This option determines whether the host adapter attempts 16-bit data transfer (Wide negotiation) instead of 8-bit data transfer. The default setting is Yes.

*Note: Some 8-bit SCSI devices may have trouble handling Wide negotiation, which may result in erratic behavior or a hang condition. For these devices, set Initiate Wide Negotiation to No.*

When set to Yes, the host adapter attempts 16-bit transfer. When set to No, 8-bit data transfer is used unless the SCSI

device itself requests Wide negotiation. The effective transfer rate is doubled when 16-bit data transfer is used because the data path for Wide SCSI is twice the size of normal 8-bit SCSI. For example, a transfer rate of 10 Mbytes/sec becomes 20Mbytes/sec, and a transfer rate of 20 Mbytes/sec (Ultra SCSI) becomes 40 Mbytes/sec.

- **Maximum Sync Transfer Rate** – This option sets the maximum synchronous data transfer rate that the host adapter supports. The default setting is 20.0 for the Ultra Wide SCSI. The host adapter supports rate up to the Ultra SCSI maximum of 20.0 Mbytes/sec (Ultra Wide SCSI provides an effective maximum synchronous transfer rate of 40.0 Mbytes/sec). If your device is an Ultra SCSI device, you can use the maximum value of 20.0. If your device is not an Ultra SCSI device select a transfer rate of 10.0. If the host adapter is set not to negotiate for synchronous data transfer (that is, Initiate Sync Negotiation is set to no), then the maximum synchronous transfer rate is the maximum rate that the host adapter accepts from the device during negotiation. (This is standard SCSI protocol.).
  
- **Enable Disconnection** – This option determines whether the host adapter allows the SCSI device to disconnect from the SCSI bus (sometimes called Disconnect/Reconnect). Enabling disconnection allows the host adapter to perform other operations on the SCSI bus while the SCSI device is temporarily disconnected. The default setting is Yes. You should leave Enable Disconnection set to yes if two or more SCSI devices are connected to the host adapter. This optimizes SCSI bus performance. If only one SCSI device is connected to the host adapter, set Enable Disconnection to No to achieve slightly better performance.
  
- **Send Start Unit Command** – This option determines whether the Start Unit Command is sent to the SCSI devices at boot up (most devices do not require this). The default setting is No.

Setting this option to yes reduces the load on your computer's power supply by allowing the host adapter to start SCSI devices one-at-a-time when you boot your computer. When set to No, the devices are allowed to start at the same time. Most devices require you to set a jumper before they can respond to this command.

*Note: If the Send Start Unit Command is set to yes for many devices, the boot time will vary depending on how long it takes each drive to start.*

## **Advanced Host Adapter Settings**

The advanced host adapter settings should not be changed unless absolutely necessary.

- **Plug and Play SCAM Support** - This option determines whether the SCSI automatically assigns SCSI Ids to attached SCSI Devices that support the SCAM protocol. The default setting is Disabled. Most non-SCAM devices tolerate SCAM protocol, so you can enable this option even for non-SCAM devices. In rare cases, an old SCSI-1 device may not tolerate SCAM and may cause the computer to hang or operate erratically. If this happens, disable this option.
  
- **Host Adapter BIOS** – This option enables or disables the host adapter BIOS. The default setting is Enabled.

*Note: Several SCSISelect options are not valid unless the host adapter BIOS is enabled.*

If you are booting from a SCSI disk drive connected to the host adapter, the BIOS must be enabled. You should disable the host adapter BIOS if the peripherals on the SCSI bus (for example, CD-ROM drives) are all controlled by device drivers and do not need the BIOS.

- **Support Removable Disks Under BIOS as Fixed Disks**  
— This option controls which removable-media drives are supported by the host adapter BIOS. This default setting is Boot Only. The following choices are available:
  - Boot Only** – Only the removable-media drive designated as the boot device is treated as a hard disk drive.
  - All Disks** – All removable-media drives supported by the BIOS are treated as hard disk drives.
  - Disabled** – No removable-media drives are treated as hard disk drives. In this situation, software drivers are needed because the drives are not controlled by the BIOS.

*Caution: If a removable-media SCSI device is controlled by the host adapter BIOS, do not remove the media while the drive is on or you may lose data! If you want to be able to remove media while the drive is on, install your removable-media device driver and set this option to Disabled.*

- **Extended BIOS Translation for DOS Drives >1 Gbyte** – This option determines whether extended translation is available for SCSI hard disks with capacities greater than 1 GByte. The default setting is Enabled.

*Caution: If you decide to change the translation scheme, back up your disk drives first! All data is erased when you change from one translation scheme to another.*

The standard translation scheme for SCSI host adapters provides a maximum accessible capacity of 1 GByte. To support disk drives larger than 1 GByte, the Ultra Wide SCSI includes an extended translation scheme. This scheme supports disk drives as large as 8 GBytes under MS\_DOS with a maximum partition size of 2 GBytes.

Extended BIOS Translation is used only with MS-DOS 5.0 or above. You do not need to enable this option if you are using another operating system such as NetWare, OS/s, Windows NT, or UNIX.

When you partition a disk larger than 1 GByte, use the MS-DOS disk utility as you normally would. Because the cylinder size increases to 8 Mbytes under extended translation, the partition size you choose must be a multiple of 8Mbytes. If you request a size that is not a multiple of 8MBytes, fdisk rounds up to the nearest whole multiple of 8MBytes.

- **Display <Ctrl-A> Message during BIOS Initialization** – This option determines whether the Press <Ctrl> <A> for SCSISelect™ Utility message appears on your screen during system boot up. The default setting is Enabled. If this setting is disabled, you can still invoke the SCSISelect utility by pressing <Ctrl> <A> after the host adapter BIOS banner appears.
- **Multiple LUN Support** – This option determines whether booting from a SCSI device that has multiple LUNs is supported. The default setting is Disabled. Enable this option if your boot device has multiple LUNs.
- **Support for Ultra SCSI Speed** – This option determines whether the host adapter supports the fast transfer rates (13.4, 16,20.0) of Ultra SCSI devices. The default setting is Disabled.

## Using SCSISelect Menus

SCSISelect menus list options you can select. To select an option, use the ↑ and ↓ keys to move the cursor to the option, then press Enter.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing Esc. To restore the original SCSISelect default values, press F6. To toggle the display between color and monochrome modes, press F5 (this feature may not work on some kinds of monitors).

## Using the SCSI Disk Utilities

To access the SCSI disk utilities, select the SCSI Disk Utilities option from the menu that appears after starting SCSISelect. Once the option is selected, SCSISelect immediately scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the devices assigned to each ID.

When you select a specific ID and device, a small menu appears, displaying the options Format Disk and Verify Disk Media.

- **Format Disk** – This utility allows you to perform a low-level format on a hard disk drive. Most SCSI disk devices are preformatted at the factory and do not need to be formatted again. The Adaptec Format Disk utility is compatible with the vast majority of SCSI disk drives.

*Caution: A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You cannot abort a low-level format once it is started.*

- **Verify Disk Media** – This utility allows you to scan the media of a hard disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select yes, those blocks are no longer used. You can press Esc at any time to abort the utility.

## Installing Device Drivers

Some operating systems embed (included) the AIC-7880 Ultra Wide SCSI device driver as part of their installation software. These drivers work fine with your AIC-7880 Ultra Wide SCSI; however, the most recent version of the driver should be installed in order for your AIC-7880 Ultra Wide SCSI to perform at its optimum level.

- **Adaptec EZ-SCSI** – allows you to install software drivers for DOS/Windows 3.x and several additional utilities.
- **Adaptec 7800 Family Manager Set** – allows you to install software drivers for NetWare, OS/2, Windows 95, Windows NT, and UNIX. Refer to the 7800 Family Manager Set User's Guide.



# ADAPTEC EZ-SCSI UTILITY

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Adaptec EZSCSI gives you what you need to use your SCSI devices most effectively with Windows 95 and Windows NT. You can also use Adaptec EZSCSI on computers running DOS, Windows 3.1x, or Windows for Workgroups 3.1x.

## Quick Start Instructions

First, install SCSI devices (see the hardware documentation for details). Then follow the instructions for your operating system software in one of the following sections. We recommend that after you install Adaptec EZSCSI you run SCsITutor to learn more about the features of SCSI.

## Windows 95 or Windows NT

If you want to install Windows 95 or Windows NT on a new computer system, you may not be able to access your SCSI CDROM drive at first. (Usually, you install Windows 95 and Windows NT from a CDROM disc.) To gain access to your CDROM drive, follow the DOS Quick Start instructions. Then reboot your computer and follow these instructions:

1. Install Windows 95 or Windows NT version 3.51 or above, and start it running on your computer.
2. Insert the Adaptec EZSCSI Setup Diskette in your floppy disk drive.
3. Click the Start button and select Run.
4. Type `a:\setup` if you are using the A drive or `b:\setup` if you are using the B drive. Then click OK.
5. Follow the instructions that appear on the screen.

## **Windows / Windows for Workgroups 3.1X**

1. Install Windows 3.1x or Windows for Workgroups 3.1x and start it running on your computer.
2. Insert the Adaptec EZSCSI Setup Diskette in your floppy disk drive.
3. Select File/Run from the Program Manager menu.
4. When the Run dialog box appears, type a:\setup if you are using the A drive or b:\setup if you are using the B drive. Then click OK.
5. Follow the instructions that appear on the screen.

## **DOS**

1. Install DOS 6.x or above and start it running on your computer.
2. Insert the Adaptec EZSCSI Setup Diskette in your floppy disk drive.
3. At the DOS prompt, type a:\install (assuming your 3.5" floppy is A: drive). Then press Enter.
4. Follow the instructions that appear on the screen.

## **Troubleshooting Tips**

### **SCSI Device Troubleshooting**

Review this checklist if your newly installed SCSI disk drives, CDROM drives, and other devices do not seem to work properly:

Be sure that termination is correctly set for all devices on the SCSI bus, as described in your host adapter documentation.

Be sure there are no hardware conflicts such as devices in your computer trying to use the same interrupts (IRQs) or DMA channels.

Be sure the cables connecting the external and internal SCSI devices and the host adapter are attached securely. Also be sure the pin-1 orientation is correct for internal cables.

Be sure that each SCSI device connected to the host adapter has a unique SCSI ID.

Be sure CD-ROM drives and other SCSI devices are attached to a power source and are turned ON.

## **Windows 95 / Windows NT Troubleshooting**

### **What is a miniport driver, and how do I make sure that the miniport driver is installed correctly?**

Miniport drivers are new kind of 32bit protect mode device drivers used by Windows 95 and Windows NT to control host adapters and other kinds of devices. Windows 95 and Windows NT include a set of miniport drivers for various types of SCSI host adapters. The host adapter miniport driver is automatically installed and configured during Windows 95 and Windows NT installation if your host adapter is already installed. To make sure the driver is installed correctly in systems running Windows 95, open the Control Panel, double-click on System, and click the Device Manager tab. Then double-click the SCSI Controllers icon; you should see the model name of the SCSI host adapter(s) installed in your system.

### **What if there is no SCSI controller icon under Device Manager, or the model name of the SCSI chipset does not appear under Device Manager:**

If the SCSI controllers icon or your host adapter's model name do not appear, open Control Panel and double-click the Add New Hardware icon. Let Windows search for the host adapter by selecting Yes on the second screen of the Add New Hardware Wizard.

If Windows does not detect the host adapter, run the Add New Hardware Wizard again. This time, select No on the second screen of the wizard, then select SCSI controllers on the next screen. Select the name of your host adapter when it appears.

**If the name of your SCSI chipset does not appear, you may be able to find its miniport driver on the Windows 95 CD-ROM.**

**Follow these steps:**

1. Place the Windows 95 CD-ROM in your CD-ROM drive and run the Add New Hardware wizard.
2. Select No on the second screen, and select SCSI controllers on the next screen.
3. Click on the Have Disk button, then click the browse button.
4. Look in the \drivers\storage directory of the CD-ROM and select the name of your SCSI host adapter if it appears.

**What if a yellow exclamation point or a red X appears in Device Manager in front of my host adapter?**

1. Open the Control Panel, double-click on System, and click the Device Manager tab.
2. Double-click the SCSI Controllers icon, select the name of the old host adapter, and click Remove.
3. Turn OFF the computer and physically remove the currently installed host adapter.
4. Install the new host adapter according to the instructions in the hardware documentation.
5. Turn the computer ON. If the new host adapter supports Plug and Play, Windows will install and configure it automatically. Otherwise, run Add New Hardware to make sure the new driver is loaded.

**If I am running under Windows 95, do I need lines for the Adaptec real mode ASPI drivers and mscdex in my config.sys and autoexec.bat files?**

Usually, you do not need to use these real mode ASPI drivers, because the new Windows miniport drivers support most SCSI host adapters and SCSI devices. However, you need to load the drivers (including mscdex, if you have a CD-ROM drive) if any of the following is true:

- You are running in MSDOS mode.
- You are using a scanner or another SCSI device with config.sys - or autoexec.bat- based drivers, such as HP's sjiix.sys.

- You have an older model SCSI-1 CD-ROM drive that Windows 95 does not support.
- You are using a CD-Recorder drive (however, some newer models of CD-Recorder drives can use the embedded Windows miniport drivers).

To install the Adaptec EZSCSI DOS drivers, click the Start button and select Restart the computer in MS-DOS mode. When the DOS prompt appears, follow the Quick Start instructions for DOS.

**My CD-ROM drive doesn't work properly under Windows 95.**

Some older models of SCSI CD-ROM drives are not compatible with the embedded Windows 95 CD-ROM driver. You can add support for the CD-ROM drive by doing the following:

1. Click the Start button and select Restart the computer in MS-DOS mode.
2. When the DOS prompt appears, follow the Quick Start instructions for DOS.
3. When you are finished running Adaptec EZSCSI for DOS, find the file named `cdtsd.vxd` in the `windows\system\iosubsys` directory and rename it `cdtsd.sav`.

**My CD-ROM drive shows up as more than one icon under My Computer.**

The mapping between `mscdex`, which runs in real mode, and the Windows95 CDROM driver does not match. You can correct this in one of two ways:

- Comment out the line that loads `mscdex.exe` in the `autoexec.bat` file.
- Change the `/L` switch on the line that loads `mscdex.exe` in the `autoexec.bat` file so it assigns the CD-ROM drive the next highest logical drive letter after the hard disk drives.

## Information for DOS/Windows 3.1x Users

The following information may be useful if you install Adaptec EZSCSI on a computer running DOS, Windows 3.1x, or Windows for Workgroups 3.1x.

*Note: The Windows 95/Windows NT Troubleshooting section describes a few situations when you may need to use the DOS/Windows 3.1x drivers and ASPI managers under Windows 95 or Windows NT.*

## DOS and Windows 3.1x Device Drivers

Device drivers are software programs that enable your computer to communicate with SCSI devices such as hard disk drives, CD-ROM drives, and scanners. Each kind of device requires a different device driver. Adaptec EZSCSI includes several DOS/Windows 3.1x device drivers that are copied to your hard disk during installation. Adaptec EZSCSI adds command lines to your config.sys and autoexec.bat files to load these device drivers if it finds these kinds of devices on your computer.

To learn more about the Adaptec EZSCSI device drivers, including their command line option information, see the online Adaptec EZSCSI Online Reference, a Windows Help application.

## DOS and Windows 3.1x ASPI Managers

ASPI (Advanced SCSI Programming Interface) managers are software programs that enable the SCSI device drivers, your host adapter, and your SCSI devices to communicate with each other. ASPI managers are written for a specific operating system, such as DOS, and a specific family of Adaptec host adapters.

Adaptec EZSCSI includes several ASPI managers for DOS/Windows 3.1x. When you install Adaptec EZSCSI on these operating systems, it detects what kind of host adapter is installed in your computer and automatically configures your system with

the correct ASPI manager. To learn more about these ASPI managers, including their command line option information, see the Adaptec EZSCSI Online Reference, a Windows Help application.

## DOS Formatting Utilities

Adaptec EZSCSI includes several DOS-based formatting utilities;

### **Low-level Formatter (*scsifmt*)**

Use the DOS-based *scsifmt* utility for low-level formatting of SCSI hard disk drives, removable media, Floptical® drives. You can also use it to scan a disk device for surface defects before you store data on it.

Run *scsifmt* from the DOS prompt, not from the Windows MSDOS prompt. Before you run it, be sure the disk devices you want to format are connected to the host adapter and that they are powered. Then follow these steps:

1. Change to the directory where *scsifmt.exe* is located (usually *c:\scsi*), type *scsifmt* at the DOS prompt, and press Enter.

*NOTE: If you are formatting a SCSI disk device that supports more than one LUN (for example, Iomega's Bernoulli dual multidrive) type *scsifmt/L* at the command line.*

2. When the first screen appears, read it and press Enter to continue. (Press F1 at any time to view Help). Information about your SCSI disk devices appears on the screen.
3. Use the arrow keys to move the highlight bar to a disk device you want to format or verify, then press Enter.
4. When the next screen appears, select either Format or Verify (to verify that the disk is free of surface defects), then press Enter.

**WARNING:** Back up important data before you format the disk device! A low-level format erases all data from the disk.

5. If you select Format, confirm that you want to format the disk, then wait while the disk device is formatted. This may take a long time if the disk is large.  
If you select Verify, you can press Esc at any time to stop the verification process. (This does not damage the disk.) If the utility finds bad blocks on the disk, it displays information about them. You can reassign the bad block(s) to prevent data from being stored there.
6. Repeat steps 3,4, and 5, as needed, to format or verify other disk devices. When you are finished, press Esc to exit.

## **Formatter and Partitioner (afdisk)**

Use the DOS-based afdisk utility to partition and format SCSI hard disk drives, Floptical® drives, and magneto-optical drives. You can also use afdisk to remove DOS and non-DOS partitions from a disk drive and to format removable media in standard hard disk format, OS/2 floppy format, or DOS V (Japanese) format.

*NOTE: Use afdisk only if the disk device is not controlled by the host adapter BIOS – that is, if the host adapter does not have BIOS or if its BIOS is not enables. If the disk device is controlled by the host adapter BIOS, use the DOS fdisk utility to partition and format the disk device. (See the MSDOS documentation.).*

Run afdisk from the DOS prompt only, not from the Windows MSDOS prompt. Before you run it, be sure the disk devices you want to format and partition are connected to the host adapter



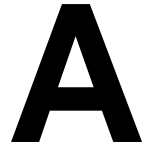
and that they are powered. Then follow these steps:

1. Change to the directory where `afdisk.exe` is located (usually `c:\scsi`), type `afdisk` at the DOS prompt, and press Enter. Information about your SCSI disk devices appears on the screen. (The number that appears after Target is the device's SCSI ID).
2. Use the arrow keys to move the highlight bar to the disk device you want to partition, then press Enter.
  - If the selected disk device is controlled by the host adapter BIOS, you can view information about it but you cannot partition it with `afdisk` (Use the DOS `fdisk` and format utilities.)
  - If the selected disk device is unpartitioned, you must partition it before you can format it. To do this, follow the instructions on the screen. (Press F1 to see an explanation of the partitioning options.)  
Information about the selected disk device appears in the lower left of the screen. Disks smaller than 1Gbyte have 64 heads, 32 sectors per track, and cylinders equal to the number of MBytes of available capacity. Disks larger than 1Gbyte have 255 heads, 63 sectors per track, and one cylinder per 8MBytes of available capacity.
3. To create a new partition on the disk device, press Ins. The "Create a DOS Partition" window appears in the lower right of the screen and suggests that you create one partition on the disk device, equal to its entire capacity. If this is what you want to do, skip to step 5.
4. To change the size of the partition, use the arrow keys to select Start Cylinder and End Cylinder, and type in the numbers you want. Partitions up to 2GBytes are supported.
5. When the number of cylinders is what you want, press Esc. When the confirmation prompt appears, select Yes and press Enter to create the partition. To create more partitions

on the same disk device, repeat steps 3,4, and 5. As you create partitions on the disk., they are added to the window at the upper right of the screen.

6. Press Esc to return to the “Select SCSI Device to Partition” window. If you want to partition a different disk device, select the device from the list and repeat the earlier steps.
7. To quit afdisk, press Esc and select Yes to confirm that you want to quit.





## **Programming the Watchdog Timer**

The PCA-6159 Series is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial standalone, or unmanned, environments.

## Programming the Watchdog Timer

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In order to program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a value of time interval. The value range is from 01(hex) to 3F(hex), and the related time interval is 1 sec. to 63 sec.

| Data | Time Interval |
|------|---------------|
| 01   | 1 sec.        |
| 02   | 2 sec.        |
| 03   | 3 sec.        |
| 04   | 4 sec.        |
|      | .             |
|      | .             |
|      | .             |
| 3F   | 63 sec.       |

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 043 (hex).

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

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

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

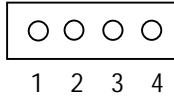
# B

## Pin Assignments

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

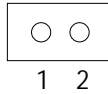
- Speaker connector
- HDD LED connector
- Reset connector
- Power LED/keyboard lock connector
- Fan power connector
- Wide SCSI connector
- SCSI connector
- IDE hard drive connectors
- Floppy connector
- Flat panel connector
- EXT keyboard connector
- COM port connectors
- Printer port connector
- IR connector
- CRT connector
- USB connectors
- Keyboard and PS/2 mouse connector
- Ethernet connector

## Speaker connector (CN1)



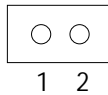
| PCA-6159 Series Speaker connector |        |
|-----------------------------------|--------|
| Pin                               | Signal |
| 1                                 | VCC    |
| 2                                 | NC     |
| 3                                 | BZ     |
| 4                                 | SP     |

## HDD LED connector (CN2)



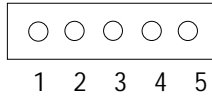
| PCA-6159 Series HDD LED connector |        |
|-----------------------------------|--------|
| Pin                               | Signal |
| 1                                 | GND    |
| 2                                 | +      |

## Reset connector (CN3)



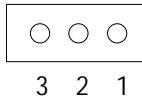
| PCA-6159 Series Reset connector |        |
|---------------------------------|--------|
| Pin                             | Signal |
| 1                               | GND    |
| 2                               | +      |

## Power LED/keyboard lock connector (CN4)



| PCA-6159 Series Keyboard lock connector |        |
|---|--------|
| Pin                                     | Signal |
| 1                                       | PWLED  |
| 2                                       | NC     |
| 3                                       | GND    |
| 4                                       | KLOCK  |
| 5                                       | GND    |

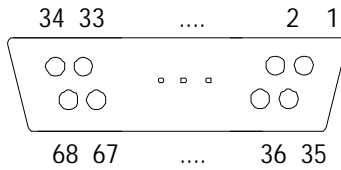
## Fan power connector (CN5)



| PCA-6159 Series Fan power connector |        |
|-------------------------------------|--------|
| Pin                                 | Signal |
| 1                                   | N/C    |
| 2                                   | GND    |
| 3                                   | +12 V  |

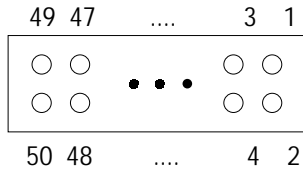


## Wide SCSI connector (CN6)



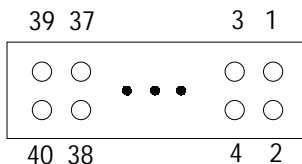
| PCA-6159/H/F Wide SCSI connector |          |     |          |
|----------------------------------|----------|-----|----------|
| Pin                              | Function | Pin | Function |
| 1                                | GND      | 2   | GND      |
| 3                                | GND      | 4   | GND      |
| 5                                | GND      | 6   | GND      |
| 7                                | GND      | 8   | GND      |
| 9                                | GND      | 10  | GND      |
| 11                               | GND      | 12  | GND      |
| 13                               | GND      | 14  | GND      |
| 15                               | GND      | 16  | GND      |
| 17                               | TRMPWR   | 18  | TRMPWR   |
| 19                               | NC       | 20  | GND      |
| 21                               | GND      | 22  | GND      |
| 23                               | GND      | 24  | GND      |
| 25                               | GND      | 26  | GND      |
| 27                               | GND      | 28  | GND      |
| 29                               | GND      | 30  | GND      |
| 31                               | GND      | 32  | GND      |
| 33                               | GND      | 34  | GND      |
| 35                               | SCD12    | 36  | SCD13    |
| 37                               | SCD14    | 38  | SCD15    |
| 39                               | SCDPH    | 40  | SCD0     |
| 41                               | SCD1     | 42  | SCD2     |
| 43                               | SCD3     | 44  | SCD4     |
| 45                               | SCD5     | 46  | SCD6     |
| 47                               | SCD7     | 48  | SCDPL    |
| 49                               | GND      | 50  | GND      |
| 51                               | TRMPWR   | 52  | TRMPWR   |
| 53                               | NC       | 54  | GND      |
| 55                               | SATIN-   | 56  | GND      |
| 57                               | SBSY-    | 58  | SACK-    |
| 59                               | SRST-    | 60  | SMSG-    |
| 61                               | SSEL-    | 62  | SCD-     |
| 63                               | SREQ-    | 64  | SIO-     |
| 65                               | SCD8     | 66  | SCD9     |
| 67                               | SCD10    | 68  | SCD11    |

## SCSI connector (CN7)



| PCA-6159/H/F SCSI connector |          |     |          |
|-----------------------------|----------|-----|----------|
| Pin                         | Function | Pin | Function |
| 1                           | GND      | 2   | SCD0     |
| 3                           | GND      | 4   | SCD1     |
| 5                           | GND      | 6   | SCD2     |
| 7                           | GND      | 8   | SCD3     |
| 9                           | GND      | 10  | SCD4     |
| 11                          | GND      | 12  | SCD5     |
| 13                          | GND      | 14  | SCD6     |
| 15                          | GND      | 16  | SCD7     |
| 17                          | GND      | 18  | SCDPL    |
| 19                          | GND      | 20  | GND      |
| 21                          | GND      | 22  | GND      |
| 23                          | GND      | 24  | GND      |
| 25                          | GND      | 26  | TRMPWR   |
| 27                          | GND      | 28  | GND      |
| 29                          | GND      | 30  | GND      |
| 31                          | GND      | 32  | SATIN-   |
| 33                          | GND      | 34  | GND      |
| 35                          | GND      | 36  | SBSY-    |
| 37                          | GND      | 38  | SACK-    |
| 39                          | GND      | 40  | SRST-    |
| 41                          | GND      | 42  | SMSG-    |
| 43                          | GND      | 44  | SSEL-    |
| 45                          | GND      | 46  | SCD-     |
| 47                          | GND      | 48  | SREQ-    |
| 49                          | GND      | 50  | SIO-     |

## IDE hard drive connectors (CN8, CN9)

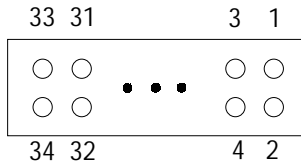


| PCA-6159 Series IDE hard drive connector |                     |     |                     |
|--|---------------------|-----|---------------------|
| Pin                                      | Signal              | Pin | Signal              |
| 1  | IDE RESET*          | 2   | GND                 |
| 3  | DATA 7              | 4   | DATA 8              |
| 5  | DATA 6              | 6   | DATA 9              |
| 7  | DATA 5              | 8   | DATA 10             |
| 9  | DATA 4              | 10  | DATA 11             |
| 11                                       | DATA 3              | 12  | DATA 12             |
| 13                                       | DATA 2              | 14  | DATA 13             |
| 15                                       | DATA 1              | 16  | DATA 14             |
| 17                                       | DATA 0              | 18  | DATA 15             |
| 19                                       | SIGNAL GND          | 20  | N/C                 |
| 21                                       | HDD 1               | 22  | GND                 |
| 23                                       | IO WRITE            | 24  | GND                 |
| 25                                       | IO READ             | 26  | GND                 |
| 27                                       | HD READY            | 28  | N/C                 |
| 29                                       | HDACK 0*            | 30  | GND                 |
| 31                                       | IRQ15/IRQ14**       | 32  | N/C                 |
| 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                 |

\* Low active

\*\*CN8 IRQ14  
CN9 IRQ15

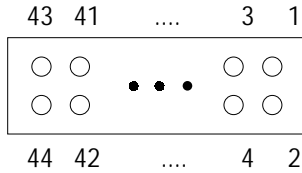
## Floppy connector (CN10)



| PCA-6159 Series Floppy connector |        |     |                 |
|----------------------------------|--------|-----|-----------------|
| 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

## Flat panel connector (CN11)

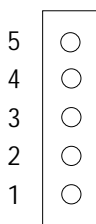


| PCA-6159H/F/V Flat panel connector |                |     |          |
|------------------------------------|----------------|-----|----------|
| Pin                                | Function       | Pin | Function |
| 1                                  | +12 V          | 2   | +12 V    |
| 3                                  | GND            | 4   | GND      |
| 5                                  | 5V/3.3V        | 6   | 5V/3.3V  |
| 7                                  | ENAVEE*        | 8   | GND      |
| 9                                  | P0             | 10  | P1       |
| 11                                 | P2             | 12  | P3       |
| 13                                 | P4             | 14  | P5       |
| 15                                 | P6             | 16  | P7       |
| 17                                 | P8             | 18  | P9       |
| 19                                 | P10            | 20  | P11      |
| 21                                 | P12            | 22  | P13      |
| 23                                 | P14            | 24  | P15      |
| 25                                 | P16            | 26  | P17      |
| 27                                 | P18            | 28  | P19      |
| 29                                 | P20            | 30  | P21      |
| 31                                 | P22            | 32  | P23      |
| 33                                 | GND            | 34  | GND      |
| 35                                 | SHFCLK/ASHFCLK | 36  | FLM      |
| 37                                 | M              | 38  | LP       |
| 39                                 | GND            | 40  | ENABKL*  |
| 41                                 | KB_DT          | 42  | KB_CK    |
| 43                                 | N/C**          | 44  | 5V/3.3V  |

\* Low active

\*\* If R60 is connected, this pin is ENAVDD

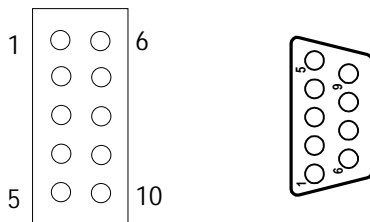
## External keyboard connector (CN12)



PCA-6159 Series External keyboard connector

| Pin | Signal |
|-----|--------|
| 1   | KB_CK  |
| 2   | KB_DT  |
| 3   | NC     |
| 4   | GND    |
| 5   | VCC    |

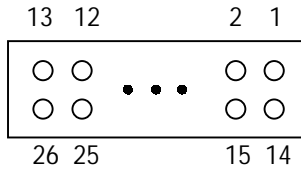
## COM port connectors (CN13: COM2, CN17: COM1)



PCA-6159 Series COM port connectors

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

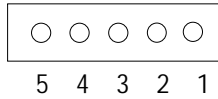
## Printer port connector (CN14)



| PCA-6159 Series printer port connector |         |     |          |
|--|---------|-----|----------|
| Pin                                    | Signal  | Pin | Signal   |
| 1                                      | STROBE* | 14  | AUTOFD*  |
| 2                                      | D0      | 15  | ERR      |
| 3                                      | D1      | 16  | INIT*    |
| 4                                      | D2      | 17  | SLCTINI* |
| 5                                      | D3      | 18  | GND      |
| 6                                      | D4      | 19  | GND      |
| 7                                      | D5      | 20  | GND      |
| 8                                      | D6      | 21  | GND      |
| 9                                      | D7      | 22  | GND      |
| 10                                     | ACK*    | 23  | GND      |
| 11                                     | BUSY    | 24  | GND      |
| 12                                     | PE      | 25  | GND      |
| 13                                     | SLCT    | 26  | N/C      |

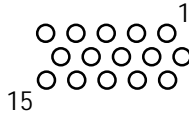
\* Low active

## IR connector (CN15)



| PCA-6159 Series IR connector |        |
|------------------------------|--------|
| Pin                          | Signal |
| 1                            | VCC    |
| 2                            | NC     |
| 3                            | IR IN  |
| 4                            | GND    |
| 5                            | IR OUT |

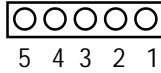
## CRT connector (CN16)



| PCA-6159/H/F CRT display connector |        |     |        |
|------------------------------------|--------|-----|--------|
| Pin                                | Signal | Pin | Signal |
| 1                                  | RED    | 9   | N/C    |
| 2                                  | GREEN  | 10  | GND    |
| 3                                  | BLUE   | 11  | N/C    |
| 4                                  | N/C    | 12  | N/C    |
| 5                                  | GND    | 13  | H-SYNC |
| 6                                  | GND    | 14  | V-SYNC |
| 7                                  | GND    | 15  | N/C    |
| 8                                  | GND    |     |        |



## USB connectors (CN18, CN20)

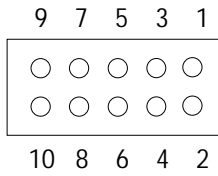


| PCA-6159 Series USB connectors |        |
|--------------------------------|--------|
| Pin                            | Signal |
| 1                              | +5 V   |
| 2                              | UV-    |
| 3                              | UV+    |
| 4                              | GND    |
| 5                              | N/C    |

## Keyboard and PS/2 mouse connector (CN19)

| PCA-6159 Series Keyboard and mouse connector |        |
|--|--------|
| Pin  | Signal |
| 1  | KB_DT  |
| 2  | MS_DT  |
| 3  | GND    |
| 4  | VCC    |
| 5  | KB_CK  |
| 6  | MS_CK  |

## Ethernet 10BASE-T connector (UPT1)



| PCA-6159H/F 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    |
| 9                                       | N/C    |
| 10                                      | N/C    |



# C

## **IRQ Default Settings**

## IRQ Default Settings

|       |              |
|-------|--------------|
| IRQ15 | IDE 2        |
| IRQ14 | IDE 1        |
| IRQ12 | (PS/2 mouse) |
| IRQ11 | USB/(SCSI)   |
| IRQ10 | (LAN)        |
| IRQ9  |              |
| IRQ7  | LPT1         |
| IRQ6  | Floppy disk  |
| IRQ5  | LPT 2        |
| IRQ4  | COM1         |
| IRQ3  | COM2         |

\* IRQ 0, 1, 2, 8, 13 have been reserved for the system.

For PCA-6159/59H/59L, Rev. A1 01-2 and *before*, do not plug bus master add on cards, such as a SCSI card, into the 3rd PCI slot of the backplane.

For PCA-6159/59H/59L, Rev. A1 02-2 and *thereafter*, do not plug bus master add on cards, such as a SCSI card, into the 4th PCI slot of the backplane.