PCA-6151

Half-size Pentium® CPU Card
with VGA Controller

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Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the unusual and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that it will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our number one concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. If you run into technical difficulties, we are here to help. But please consult this manual first.

If you still can't find the answer, gather all the information or questions that apply to your problem and, with the product close at hand, call your dealer. Our dealers are trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

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Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

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1.Collect all the information about the problem encountered (e.g. type of PC, CPU speed, Advantech products used, other hardware and software used etc.). Note anything abnormal and list any on-screen messages you get when the problem occurs.

2.Call your dealer and describe the problem. Please have your manual, product and any other information readily available.

3.If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.

4.Carefully pack the defective product, a completely filled-out Repair and Replacement Order Card and a photocopy of a dated proof of purchase (such as your sales receipt) in a shippable container. A product returned without dated proof of purchase is not eligible for warranty service.

5.Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing list

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

• 1 PCA-6151 CPU card

• 1 6-pin mini-DIN keyboard & PS/2 mouse adapter

• 2 Hard disk drive (IDE) interface cables (40-pin)

• 1 Parallel / 1 Serial port cable adapter

• 1 Floppy disk drive interface cable (34-pin)

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

Contents

Hardware Configuration

This chapter gives background information on the PCA-6151. It then shows you how to configure the card to match your application and prepare it for installation into your PC.

Sections include:

- Card specifications
- Board layout
- Safety precautions
- Jumper settings
- Installing DRAM (SIMMs)

Introduction

The PCA-6151 is a cost-effective, all-in-one single board Pentium CPU card which can release Pentium's full potential and provide unprecedented performance compared to current 64-bit processor board. The PCA-6151 offers all the functions of an industrial computer on a single board, half-size CPU card. This card uses a Pentium, AMD K5 CPU or Cyrix M1 and can have up to 64 MB DRAM. It also supports PB-SRAM 2nd level cache size from 256KB to 512KB through an on board COAST module.

The PCA-6151 utilizes a two-chip solution, allowing on board DRAM to be shared with the built-in VGA controller. In this configuration the chipset always acts as the arbiter between memory bus masters. This system insures efficient memory allocation while substantially reducing the overall system cost.

On-board features include one RS-232 port, one RS-232/422/485 port, one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard & PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and bus master modes. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives and other IDE devices.

The PCA-6151 also features power management to minimize power consumption. It complies with the "Green Function" standard and supports three types of power saving features: Doze mode, Standby mode and Suspend mode. A watchdog timer can automatically reset the system or generate an interrupt should the system stop due to a program bug or EMI.

Specifications

System

- **CPU:** Intel Pentium 75/90/100/120/133/150/166/200 MHz AMD K5, Cyrix M1
- **BIOS:** AWARD 128 KB memory; supports plug and play
- **Chipset:** SiS 5596/5513
- **L2 cache:** Direct map write-back or write-through cache module - 256 KB/512 KB Synchronous (Pipeline Burst) SRAM
- **Green function:** Features power management option via BIOS, activated by keyboard or mouse activity. Supports doze, sleep and suspend modes. APM 1.1 compliant
- **RAM:** Two 72-pin SIMM sockets. Supports 32-bit Normal or EDO DRAM with memory capacity from 1 MB to 64 MB.
- **EIDE interface:** Handles up to two IDE HDDs (up to 8.4 GB) or other IDE devices. Supports PIO mode 4 and DMA bus-master mode
- **FDD interface:** Supports up to two floppy disk drives.
- **Parallel port:** Configured to LPT1, LPT2, LPT3 or disabled. - Supports multi-mode parallel port (SPP/ECP/EPP)
- **Serial ports:** Two 16C550 UARTs, one RS-232, one RS-232/422/485 interface
- **Watchdog timer:** Can generate a system reset or IRQ 15. Software enabled/disabled. Time interval is from 1 to 63 seconds, jumperless with run-time setup
- **Keyboard/mouse connector:** 6-pin mini-DIN connector on the mounting bracket eases connection to a keyboard or PS/2 mouse. An on-board keyboard pin header connector is also available.
- **I/O bus expansion:** PC/104 connector with face-up installation

Mechanical and environmental

- **Board size:** 185 mm x 122 mm
- **Max. power requirements**: +5 V (4.75 ~ 5.25 V) @ 5.5 A
- **Operating temperature**: 32 ~ 140° F (0 ~ 60° C)
- **Board weight**: 1.2 lb (0.5 kg)

Board Layout

PCA-6151 Rev.A1 MADE IN TAIWAN R.O.C.

Jumpers and Connectors

Connectors on the board link it to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has jumpers which you use to configure it for your application.

The table below lists the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers and detailed information on each jumper setting. Chapter 2 gives instructions for connecting external devices to your card.

PCA-6151 Jumpers	
Number	**Function**
J2	CPU Power select
J3	CPU Clock Ratio
J4	CPU Clock Ratio
J5	Clock select
J6	Fan Power select
J7	Watchdog timer invoke function
J8	COM2 output select
J9	COM2 output select
J10	COM2 output select
J11	COM2 output select
J12	COM2 output select
J13	CMOS Setup
J14	Reset Input
J16	Speaker connector

PCA-6151 Connectors	
Number	**Function**
CN1	KB Lock
CN2	PC104 Con. A
CN3	PC104 Con. B
CN4	IDE connector
CN5	Printer connector
CN6	HD LED
CN7	Peripheral Power Input
CN8	FDD connector
CN9	COM2 connector
CN10	Aux. Keyboard connector
CN11	Main Power Input
CN12	VGA connector
CN13	COM1 connector
CN14	Keyboard & P/S2 Mouse connector

Safety Precautions

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

1. To avoid electric shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.

2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

3. Always ground yourself to remove any static charge before you touch your CPU card. Be particularly careful not to touch the chip connectors. Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the card in its antistatic packaging when it is not installed in the PC, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.
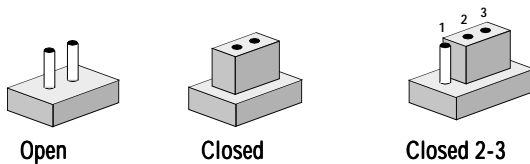
Jumper Settings

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

For the locations of each jumper, see the board layout diagram depicted earlier in this chapter.

How to set jumpers

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 connect either pins 1 and 2 or 2 and 3.


| | | |
| Open | Closed | Closed 2-3 |

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

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

CPU type select (J3, J4, J6, J7, J8)

In order for the system to function properly, the jumpers must be set to accommodate the CPU installed on the CPU card.

CPU type select (J3, J4, J5)			
Pentium CPU AMD K5, Cyrix M1	**J3**	**J4**	**J5**
75 MHz 1.5 x 50	○ ○	○ ○	○ ○ / ● ● / ● ●
90 MHz 1.5 x 60	○ ○	○ ○	○ ○ / ○ ○ / ● ●
100 MHz 2 x 50	● ●	○ ○	○ ○ / ● ● / ● ●
120 MHz 2 x 60	● ●	○ ○	○ ○ / ○ ○ / ○ ○
133 MHz 2 x 66	● ●	○ ○	○ ○ / ○ ○ / ○ ○
150 MHz 2.5 x 60	● ●	● ●	○ ○ / ○ ○ / ● ●
166 MHz 2.5 x 66	● ●	● ●	○ ○ / ○ ○ / ○ ○
200 MHz 3 x 66	● ●	● ●	○ ○ / ○ ○ / ○ ○

CPU voltage select (J1, J2)

CPU voltage select (J2)

Voltage	J2
3.3 V	
3.45 V	

Watchdog Timer (J7)

Watchdog timer system reset/IRQ 15 select (J7)

	Reset (default)	IRQ 15
J7		

COM2 settings for RS-232/422/485 (J8~12)

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

	RS-232	**RS-422**	**RS-485**
J8			
J9			
J10			
J11			
J12			

CMOS backup select (J13)

	Battery Backup (default)	**Clean CMOS**
J13		

Buzzer enable/disable (J16)

	Enable	**Disable**
J16		

Installing DRAM (SIMMs)

On the left end of the card (away from the mounting bracket) are the two SIMM(Single In-line Memory Module) sockets that hold the card's DRAM memory. See the board layout diagram depicted earlier in this chapter.

You can use anywhere from 1 MB to 64 MB of DRAM with your PCA-6151. The card provides two 72-pin SIMM sockets that accept from 1 to 32 MB each. The sockets (numbered from 1 to 2) are arranged into two banks.

Connecting Peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6151 board. You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed, or your chassis is very tight, you may need to partially remove the card to make all the connections.

The following table lists the connectors on the PCA-6151.

Connectors	
Number	**Function**
CN1	KB Lock
CN2	PC/104 Con. A
CN3	PC/104 Con. B
CN4	IDE Connector
CN5	Printer Connector
CN6	HD LED
CN7	Peripheral Power Input
CN8	FDD Connector
CN9	COM2 Connector
CN10	Aux. Keyboard Connector
CN11	Main Power Input
CN12	VGA Connector
CN13	COM1 Connector
CN14	Keyboard and PS/2 Mouse Connector

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable.

Warning! *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by 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 CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Enhanced IDE connectors (CN4)

You can attach two IDE (Integrated Device Electronics) drives to the PCA-6151's internal controller. The PCA-6151 CPU card has an EIDE connector, CN4.

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

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

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second drive as described above on CN4.

VGA display connector (CN12)

The PCA-6151 provides a VGA controller for high resolution VGA interface. CN12 is a DB-15 connector for VGA monitor input.

Floppy drive connector (CN8)

You can attach up to two floppy disk drives to the PCA-6151's on-board controller. You can use any combination of 5.25" (360 KB/1.2 MB) and/or 3.5" (720 KB/1.44/2.88 MB) drives.

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

Parallel port connector (CN5)

The parallel port is normally used to connect the CPU card to a printer. The PCA-6151 includes an on-board parallel port, accessed through a 26-pin flat-cable connector, CN5. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to CN5 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of CN5. Pin 1 is on the right side of CN5.

Keyboard & PS/2 mouse connectors (CN14)

The PCA-6151 board provides a keyboard connector. A 6-pin mini-DIN connector (CN14) on the card mounting bracket supports single-board computer applications. The card comes with an adapter to convert from the 6-pin mini-DIN connector to a standard DIN connector and to a PS/2 mouse connector.

Reset switch (J14)

You can connect an external switch to easily reset your computer. This switch restarts your computer as if you had turned off the power, then turned it back on. Install the switch so that it closes the two pins of J14.

Hard disk drive LED (CN6)

You can connect a LED to connector CN6 to indicate when the HDD is active. Marks on the circuit board indicate LED polarity.

Serial Ports

The PCA-6151 offers two serial ports: COM1 in RS-232, COM2 in RS-232/422/485. These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

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

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

Serial port connections (COM1, COM2)	
Connector	**Function**
COM1	RS-232
COM2	RS-232/422/485

RS-232 connection (COM1)

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector. The following table shows the pin assignments for the card's RS-232 port:

RS-232 connector pin assignments	
Pin	Signal
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

RS-232/422/485 connection (COM2)

COM2 is an RS-232/422/485 serial port. The specific port type is determined by jumper settings, as detailed in Chapter 1. The following table shows the pin assignments for COM2.

RS-232/485 connector pin assignments

Pin	RS-232	RS-422/485
1	RLSD	TX - or DATA -
2	DSR	
3	RX	TX + or DATA +
4	RTS	
5	TX	RX +
6	CTS	
7	DTR	RX -
8	RI	
9	GND	GND
10	NC	NC

Power connectors CN11

If you prefer not to acquire power through PCA-6151's backplane via the gold H-connectors, CN11 also provide power input connectors for +5 V and +12 V.

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

Award BIOS Setup

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

AWARD BIOS Setup

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING

ESC: Quit   ↑↓→←: Select Item
F10: Save & Exit Setup   <Shift> F2: Change Color

Time, Date, Hard Disk Type...

Setup program initial screen

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 RAM so that it retains the Setup information when the power is turned off.

Entering setup

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

Standard CMOS setup

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

ROM PCI/ISA BIOS (2A5IFAK9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

```
 Date <mm:dd:yy>    : Mon. Oct 7 1996
 Time <hh:mm:ss>    : 16 : 52 : 38

 HARD DISKS      TYPE  SIZE  CYLS   HEAD   PRECOMP   LANDZ   SECTOR    MODE
 Primary Master  :Auto  0    0      0      0         0       0         Auto
 Primary Slave   :None  0    0      0      0         0       0         ------


 Drive A: 1.44M.  3.5 in.
 Drive B: None                            Base Memory:        640K
                                          Extended Memory: 15360K
                                          Other Memory:       384K
 Video:  EGA/VGA                          ─────────────────────────
 Halt  On : All Errors                    Total Memory:      16384K

 ESC:  Quit               ↑↓→←: Select Item      PU/PD/+/-:  Modify
 F1:   Help               <Shift> F2: Change Color
```

CMOS setup screen

BIOS features setup

The "BIOS FEATURES SETUP" screen appears when choosing the BIOS FEATURES SETUP item from the CMOS SETUP UTILITY Menu It allows the user to configure the PCA-6151 according to his particular requirements.

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

```
                  ROM PCI/ISA BIOS (2A5IFAK9)
                      CMOS SETUP UTILITY
                     AWARD SOFTWARE, INC.
┌──────────────────────────────────┬──────────────────────────────────┐
│ Virus Warning          : Disabled │ Video Bios Shadow    : Enabled   │
│ CPU Internal Cache     : Enabled  │ C8000-CBFFF Shadow : Disabled    │
│ External Cache         : Enabled  │ CC000-CFFFF Shadow : Disabled    │
│ Quick Power On Self Test : Disabled │ D0000-D3FFF Shadow : Disabled   │
│ Boot Sequence          : A, C     │ D4000-D7FFF Shadow : Disabled    │
│ Swap Floppy Drive      : Disabled │ D8000-DBFFF Shadow : Disabled    │
│ Boot Up Floppy Seek    : Enabled  │ DC000-DFFFF Shadow : Disabled    │
│ Boot Up NumLock Status : On       │                                  │
│ Boot Up System Speed   : High     │                                  │
│ Gate A20 Option        : Fast     │                                  │
│                                   │                                  │
│ Typematic Rate Setting  : Disabled │                                 │
│ Typematic Rate (Char/sec): 6      │                                  │
│ Typematic Delay (Msec)  : 250     │                                  │
│ Security Option         : Setup   ├──────────────────────────────────┤
│ PCI/VGA Palette Snoop   : Disabled │ Esc : Quit      ↑↓→←: Select Item │
│ OS Select for DRAM >64M : Non-OS2 │ F1  : Help      PU/PD/+/- : Modify │
│                                   │ F5  : Old Values <Shift>F2 : Color │
│                                   │ F6  : Load BIOS Defaults         │
│                                   │ F7  : Load Setup Defaults        │
└──────────────────────────────────┴──────────────────────────────────┘
```

Virus Warning

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

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

CPU Internal Cache/External Cache

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

Quick Power On Self Test

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

Boot Sequence

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

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

Boot Up Floppy Seek

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

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

Boot Up NumLock Status
The default is "On".

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

Boot Up System Speed

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

IDE HDD Block Mode

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

Gate A20 option

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

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

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

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

Security Option

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

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

Note: *To disable security, select PASSWORD SETTING in the main menu. At this point, you will be asked to enter a password. Simply hit the <ENTER> key to disable security. When security is disabled, the system will boot, and you can enter Setup freely. OS select for DRAM>64 MB. This setting is underOS/2 system.*

Video BIOS Shadow

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

C8000 - CFFFF Shadow/DC000-DFFFF Shadow

These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

CHIPSET features setup

By choosing the "CHIPSET FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCA-6151**.**

```
ROM PCI/ISA BIOS (2A5IFAK9)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
```

```
Auto Configuration      : Enabled      Slow Refresh (1:4)     : Enabled
L2 Cache Update Mode    : WB           System BIOS Cache      : Enabled
L2 (WB) Tag Bit Length  : 7bits        Video BIOS Cache       : Enabled
SRAM Back to Back       : Enabled      Memory Hole 15M-16M    : Disabled
SRAM Leadoff Timing     : 3 Ck         CPU-PCI Post Wr. rate  : 4 Ck
DRAM Leadoff Timing     : 6 Ck         Latency for CPU-PCI    : 1 Ck
MDLE Delay Timing (ns)  : 4            CPU-PCI Burst Write    : Disabled
DRAM RAS to CAS Delay   : 3 Ck         CPU-PCI Post Write     : Enabled
RAS Active When Refresh : 5 Ck         VGA Shared Mem Size    : 1 MB
CAS Delay in Posted-WR  : 1 Ck         VGA Mem Clock (MHz)    : 55
FP DRAM CAS Pr. Timing  : 1 Ck         Linear SRAM Support    : Disabled
FP DRAM RAS Pr. Timing  : 3 Ck
EDO CAS Pulse Width     : R1  W2  Ck
EDO CAS Precharge Time  : 1 Ck
EDO MDLE Timing         : 1 Ck
EDO BRDY# Timing        : 1 Ck         Esc : Quit          ↑↓→←: Select Item
EDO RAS Prech. Timing   : 3 Ck         F1  : Help          PU/PD/+/- : Modify
EDO RAMW# Pwr Saving    : Disabled     F5  : Old Values <Shift>F2 : Color
ISA Bus Clock Frequency : PCICLK/4     F6  : Load BIOS Defaults
                                       F7  : Load Setup Defaults
```

CHIPSET features setup

Note: If you enable the IDE HDD block mode, the enhanced IDE driver will be enabled.

Power management setup

The power management setup controls the CPU cards' "green" features. The following screen shows the manufacturer's default.

ROM PCI/ISA BIOS (2A5IFAK9)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

```
Power Management        : Disable       VGA  Activity           : Disable
PM Control by APM       : Yes           IRQ3 (COM2)             : Enable
Video Off Option        : Susp → Off    IRQ4 (COM1)             : Enable
Video Off Meathod       : V/H SYNC      IRQ5 (LPT2)             : Enable
Suspend Switch          : Enable        IRQ6 (Floppy Disk)      : Enable
Doze Speed (div by)     : 2             IRQ7 (LPT1)             : Enable
Stdby Speed (div by)    : 3             IRQ8 (RTC Alarm)        : Disable
Modem Use IRQ           : 3             IRQ9 (IRQ2 Redir)       : Enable
        **PM Timers**                   IRQ10 (Reserved)        : Enable
HDD Off After           : Disable       IRQ11 (Reserved)        : Enable
Doze Mode               : Disable       IRQ12 (PS/2 Mouse)      : Enable
Standby Mode            : Disable       IRQ13 (Coprocessor)     : Enable
Suspend Mode            : Disable       IRQ14 (Hard Disk)       : Enable
        **PM Events**                   IRQ15 (Reserved)        : Enable
COM Ports Activity      : Enable
LPT Ports Activity      : Enable        Esc : Quit       ↑↓→←: Select Item
HDD Ports Activity      : Enable        F1  : Help       PU/PD/+/- : Modify
PCI/ISA Master Activity : Enable        F5  : Old Values <Shift>F2 : Color
IRQ-15 Activity         : Enable        F6  : Load BIOS Defaults
                                        F7  : Load Setup Defaults
```

Power management

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

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

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

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

PCI configuration setup

```
Resources Controlled By : Manual        PCI IRQ Activated By  : Level
Reset Config. Data       : Disabled      PCI IDE 2nd Channel   : Enabled
                                         PCI IDE IRQ Map To    : PCI-AUTO
IRQ-3 assigned to        : Legacy ISA      Primary IDE INT#    : A
IRQ-4 assigned to        : Legacy ISA
IRQ-5 assigned to        : PCI/ISA PnP    PCI Spec. Ver 2.1    : Disabled
IRQ-7 assigned to        : Legacy ISA
IRQ-9 assigned to        : PCI/ISA PnP
IRQ-10 assigned to       : PCI/ISA PnP
IRQ-11 assigned to       : PCI/ISA PnP
IRQ-12 assigned to       : PCI/ISA PnP
IRQ-14 assigned to       : Legacy ISA
IRQ-15 assigned to       : Legacy ISA
DMA-0 assigned to        : PCI/ISA PnP
DMA-1 assigned to        : PCI/ISA PnP
DMA-3 assigned to        : PCI/ISA PnP   Esc : Quit          ↑↓→←: Select Item
DMA-5 assigned to        : PCI/ISA PnP   F1  : Help          PU/PD/+/-  : Modify
DMA-6 assigned to        : PCI/ISA PnP   F5  : Old Values <Shift>F2 : Color
DMA-7 assigned to        : PCI/ISA PnP   F6  : Load BIOS Defaults
                                         F7  : Load Setup Default
```

PCI configuration

Load BIOS defaults

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

Load setup defaults

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

Integrated Peripherals

```
┌─────────────────────────────────────┬───────────────────────────────────────┐
│                                      │   PS/2 mouse function   : Enabled     │
│   IDE Primary Master PIO  : Auto     │                                       │
│   IDE Primary Slave       : Auto     │                                       │
│                                      │                                       │
│   Primary IDE Prefetch    : Master   │                                       │
│   Secondary IDE Prefetch  : Disabled │                                       │
│   IDE Burst Mode          : Disabled │                                       │
│   IDE Post Write          : Disabled │                                       │
│   IDE HDD Block Mode      : Enabled  │                                       │
│                                      │                                       │
│   Onboard FDD Controller  : Enabled  │                                       │
│   Onboard Serial Port 1   : Auto     │                                       │
│   Onboard Serial Port 2   : Auto     ├───────────────────────────────────────┤
│   Onboard Parallel Port   : 378/IRQ7 │  Esc :  Quit        ↑↓→←: Select Item │
│   Onboard Parallel Mode   : ECP/EPP  │  F1  :  Help      PU/PD/+/-  :  Modify│
│   ECP Mode Use DMA        : 3        │  F5  :  Old Values <Shift>F2 :  Color │
│                                      │  F6  :  Load BIOS Defaults            │
│                                      │  F7  :  Load Setup Default            │
└─────────────────────────────────────┴───────────────────────────────────────┘
```

Integrated Peripherals

Password setting

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

Remember, to enable this feature. You must first select the Security Option in the BIOS FEATURES SETUP to be either "Setup" or "System."

IDE HDD auto detection

"IDE HDD AUTO DETECTION" automatically self-detect for the correct hard disk type.

Save & Exit setup

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

Exit without saving

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

Programming the Watchdog Timer

The PCA-6151 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 and unmanned environments.

Programming the Watchdog Timer

If you decide to program the watchdog timer, you must write a program which reads I/O port address 443 (hex). The output data is a value timer. You can write from 01 (hex) to 3E (hex), and the related timer is 1 sec. to 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 is an example of a program for the watchdog timer:

```
Step 1   Out 443h data REM Start and reset the watchdog timer
Step 2   Your application task #1
Step 3   Out 443h, data REM Reset the timer
Step 4   Your application task #2
Step 5   Out 443h, data REM Reset the timer
Step 6   in 043h,  REM Disable the watchdog timer
```

Data Values
```
01      1 sec.
02      2 sec.
03      3 sec.
04      4 sec.
        .
        .
        .
3E      63 sec.
```

APPENDIX

B

Upgrading

This appendix gives instructions for increasing the capabilities of your CPU card. It covers:

- Installing PC/104 modules

- DRAM installation (SIMMs)

Installing PC/104 modules (CN2,CN3)

The PCA-6151 card's PC/104 connector lets you attach PC/104 modules. These modules perform the functions of traditional plug-in expansion cards, but save space and valuable slots. Advantech modules include:

- PCM-3110   PCMCIA module
- PCM-3520   Flat Panel/CRT VGA module
- PCM-3810   Solid State Disk module
- PCM-3820/C   High density Solid State Disk modules
- PCM-3610   Isolated RS-232/422/485 module
- PCM-3640   4 Port RS-232 module
- PCM-3290   GPS module
- PCM-3660   Ethernet module
- PCM-3718   30 KHz A/D module
- PCM-3724   48-channel DIO module

PC/104 modules are produced by over a dozen manufacturers, and the PC/104 form factor is being advanced as an appendix to the ISA bus standard.

If you want to make your own PC/104 module, make sure that your module dimensions are correct. A PC/104 breadboard module (PCM-3910) is also available. For further information, contact your Advantech distributor or sales representative.

Installing DRAM (SIMMs)

You can use anywhere from 1 MB to 32 MB of DRAM with your PCA-6151. The card provides one 72-pin SIMM (single in-line memory module) socket that accepts from 1 to 32 MB DRAM. The following table shows the bank assignment for the SIMM socket:

Bank	SIMM socket(s)	Size
1	SIMM1	72-pin
2	SIMM2	72-pin

You can use 256 KBx36, 256 KBx72, 1 MBx36, 1 MBx72, 4 MBx36 or 4 MBx72 DRAM SIMMs.

Memory sizes

The board accepts 1 MB, 2 MB, 4 MB, 8 MB, 16 MB and 32 MB 72-pin SIMMs. The following table lists some of the different memory configurations for the PCA-6151 card.

SIMM 1	SIMM 2	Total
1 MB	1 MB	2 MB
2 MB	2 MB	4 MB
4 MB	4 MB	8 MB
8 MB	8 MB	16 MB
16 MB	16 MB	32 MB
32 MB	32 MB	64 MB