

PCA-6148/6148L

Full-size 486 All-in-one
CPU Card with
Flash/RAM/ROM disk

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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-6148/6148L CPU card
- 1 6-pin mini-DIN keyboard & PS/2 mouse adapter
- 1 Hard disk drive (IDE) interface cable (40 pin)
- 1 Floppy disk drive interface cable (34 pin)
- 1 Parallel port adapter (26 pin) and COM2 adapter (9 pin) kit
- 1 Utility disk with system BIOS, VGA BIOS and SSD Setup Utility
- 1 Utility disk with SVGA program and driver for Windows (PCA-6148 only)

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

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Hardware Configuration

This chapter gives background information on the PCA-6148/6148L. 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

Introduction

The PCA-6148/6148L is a full-size CPU card which allows the use of VGA and other enhanced I/O interfaces. This card uses an 80486 series DX, DX2, DX4 or 5x86 CPU and accommodates up to 128 MB DRAM. It also provides a secondary level 256/512 KB cache RAM.

The PCA-6148/6148L 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.

Its high performance VGA display supports an optional CRT and panel displays with a display memory of up to 1 MB and a resolution of up to 640x480 with 16.7 million colors. The VGA controller is a VL bus C&T 65545/48/50, which comes equipped with a windows accelerator.

The PCA-6148/6148L also offers several industrial features such as a 63-level watchdog timer with jumperless setup, a 1.44 MB Flash/ROM disk, and a face-up PC/104 connection for additional functions with PC/104 modules.

The PCA-6148/6148L is a highly reliable CPU card perfect for IPC applications or machine control.

Specifications

System

- **CPU:**
 - Intel 80486DX/DX2/DX4 series
 - AMD 80486DX2/DX4 series, 5x86
 - Cyrix 80486DX2/DX4 series, 5x86
- **BIOS:** AWARD Flash BIOS, supports plug & play
- **Chipset:** VIA VT82C496G
- **Secondary level cache:** 256 (standard)/ 512KB (optional)

- **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:** 1 MB to 128 MB, four 72-pin SIMM socket, accepts 1, 2, 4, 8, 16, and 32 MB SIMMs
- **EIDE interface:** Supports up to two IDE devices. BIOS supports larger than 528 MB HDD and up to 8.4 GB. 32-bit host data transfer, PIO Mode 3 transfer capabilities (>10 MB/sec)
- **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:** Two 16C550 UARTs, one RS-232, one RS-232/422/485 interface
- **Watchdog timer:** 63-level timer interval, jumperless setup, generates system reset or IRQ15
- **Flash/RAM/ROM disk:** 1.44 MB solid state disk, MS-DOS compatible, using Flash/ROM, SRAM and ROM device
- **Keyboard/ PS/2 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.
- **I/O bus expansion:** PC/104 connector with face-up installation

Local bus VGA interface (PCA-6148 only)

- **Controller:** VL-bus C&T 65545/48/50 VGA controller with Windows accelerator
- **Display memory:** 1 MB on-board DRAM
- **Display resolution (optional):**
 - Supports panel resolutions up to 1024x768 and 800x600
 - Supports non-interlaced CRT monitors, 1024x768 with 256 colors

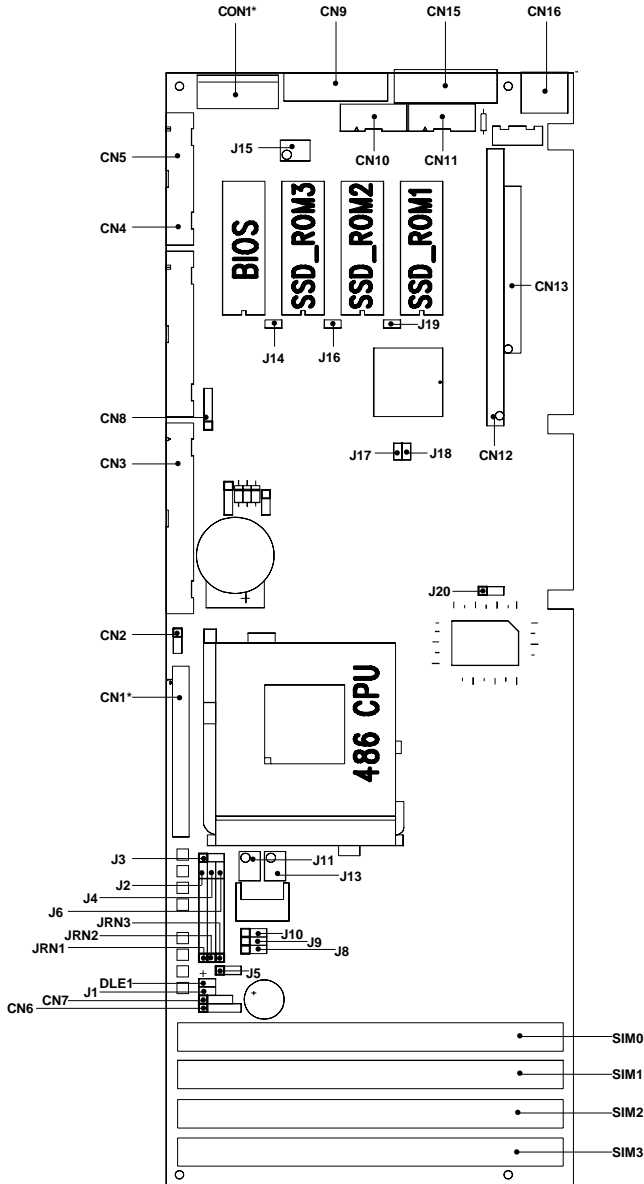
-True-color and Hi-color display capability, resolutions up to 640x480 with 16.7 million colors

- **Display output:** DB-15 VGA connector, 22x2 pin header general purpose flat panel display connector
- **Display BIOS:** default CRT/Toshiba TFT panel BIOS, Flash BIOS can be easily updated
- **DRAM Module:** 50,60,70 ns

Mechanical and environmental

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

Board layout



*PCA-6148 only

PCA-6148/6148L PCB Layout

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 a number of 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-6148/6148L Jumpers	
Number	Function
J1	Reset
J2	Reserve
J3	CPU select
J4	CPU select
J5	Watchdog select
J6	Reserve
J7	Battery select
J8	CPU frequency select
J9	CPU frequency select
J10	CPU frequency select
J11	CPU voltage select
J12	CMOS erase
J13	CPU voltage select
J14	SSD memory select
J15	COM2 RS-232/422/485 select
J16	SSD memory select
J17	SSD I/O address select
J18	SSD I/O address select
J19	SSD memory select
J20	IRQ 12 setting
DLE1	LED
JRN1	CPU Select
JRN2	CPU Select
JRN3	CPU Select

PCA-6148/6148L Connectors

Number	Function
*CN1	Flat panel display connector
CN2	fan power connector
CN3	IDE connector
CN4	floppy connector
CN5	parallel port connector
CN6	power LED and keylock connector
CN7	external speaker
CN8	infraredTx/Rx header
*CN9	VGA display connector
CN10	COM2 RS-232 connector
CN11	COM2 422/485 connector
CN12	PC-104 connector
CN13	PC-104 connector
CN14	external keyboard connector
CN15	COM1 RS-232 connector
CN16	keyboard/PS/2 connector
CON1	power connector
U1	CPU socket
U12	SSD memory
U16	SSD memory
U28	SSD memory

*:PCA-6148

Safety precautions

Follow these simple precautions to protect yourself from hard and your PC from damage:

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.*



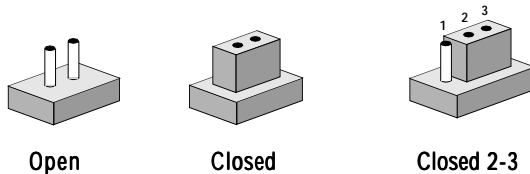
Jumper settings

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

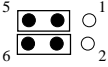
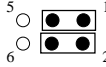
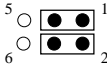
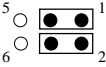
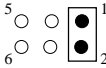
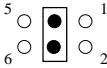
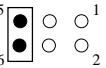
You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the 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.












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 Jumper Settings

Voltage				
	5V	3.3V	3.45V	3.6V
J11				
J13	N/A			

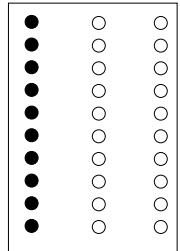
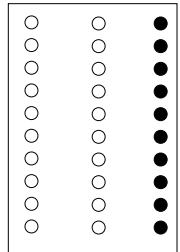
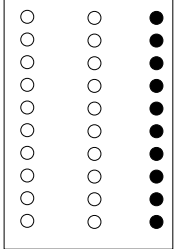
Frequency			
	25M	33M	40M
J8			
J9			
J10			

CPU type select

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













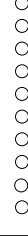

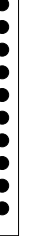


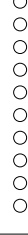


CPU type select

CPU Type	Voltage	Frequency	J3	J4	JRN1	JRN2	JRN3
Cyrix 5x86-100	3.45V*	33M*					
Cyrix 5x86-120	3.45V*	40M*					
AMD DX2-66 (NV8T)	3.3V*	33M*					





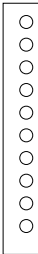




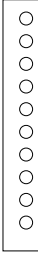

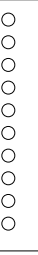


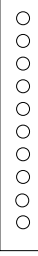




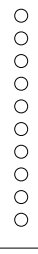

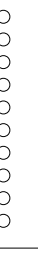
*Please refer to jumper settings on page 10 of chapter 1

CPU type select

CPU Type	Voltage	Frequency	J3	J4	JRN1	JRN2	JRN3
AMD DX4-100 (NV8T)	3.3V*	33M*					
AMD DX4-100 (SV8B)	3.3V*	33M*					
AMD DX4-120 (SV8B)	3.3V*	40M*					
AMD 5x86-133	3.3V*	33M*					








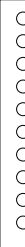






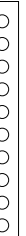





*Please refer to jumper settings on page 10 of chapter 1

CPU type select

CPU Type	Voltage	Frequency	J3	J4	JRN1	JRN2	JRN3
SGS DX2-66	5V*	33M*					
SGS DX4-100	3.3V*	33M*					
Intel DX-33	5V*	33M*					
Intel DX2-50	5V*	25M*					





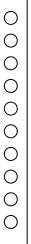
*Please refer to jumper settings on page 10 of chapter 1

CPU type select

CPU Type	Voltage	Frequency	J3	J4	JRN1	JRN2	JRN3
Intel DX2-66	5V*	33M*					
Intel DX4-100	3.3V*	33M*					
Cyrix DX2-66	5V*	33M*					
Cyrix DX2-80	3.6V*	40M*					

*Please refer to jumper settings on page 10 of chapter 1



CPU type select

CPU Type	Voltage	Frequency	J3	J4	JRN1	JRN2	JRN3
Cyrix DX4-100	3.45V*	33M*					

*Please refer to jumper settings on page 10

Watchdog timer (J5)

Watchdog timer system reset/IRQ15 select (J5)



	Reset (default)	IRQ15
JP5		

COM2 settings for RS-232/422/485 (J15)



COM2 settings for RS-232/422/485

	RS-232 (CN10)	RS-422 (CN11)	RS-485 (CN11)
J15	1 ○ ○ ○ ○ 5 ● ●	1 ○ ○ ● ● 5 ○ ○	1 ● ● ○ ○ 5 ○ ○
	(default)		

CMOS backup select

	Battery Backup (default)	Clean CMOS
JP12		

IRQ12 setting





	PS2 Mouse (default)	IRQ12
JP20		

SSD Device Select [J14 (U12), J16 (U16), J19 (U28)]

	J14 (U12)	J16 (U16)	J19 (U28)
Flash	open	open	open
ROM	open	open	open
SRAM	closed	closed	closed

BATTERY Select (J7)

Battery Installation Setup (J7)

Pin	None (default)	Internal	4 pin external	2 pin external
1 SSD power				
2 Internal battery				
3 SSD Power				
4 GND				

SSD I/O address select (J17, J18)

SSD	J17	J18
disabled	closed	closed
210H	open	closed
220H	closed	open
230H	open	open

CHAPTER 2

Connecting peripherals

This chapter tells how to connect peripherals, switches and indicators to the PCA-6148/6148L 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.

PCA-6148/6148L Jumper and Connector List

PCA-6148/6148L Connectors

Number	Function
*CN1	Flat panel display connector
CN2	fan power connector
CN3	IDE connector
CN4	floppy connector
CN5	parallel port connector
CN6	power LED and keylock connector
CN7	external speaker
CN8	infraredTx/Rx header
*CN9	VGA display connector
CN10	COM2 RS-232 connector
CN11	COM2 422/485 connector
CN12	PC-104 connector
CN13	PC-104 connector
CN14	external keyboard connector
CN15	COM1 RS-232 connector
CN16	keyboard/PS/2 connector
CON1	power connector

*:PCA-6148 only

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

Safety Precautions

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.*



IDE connectors (CN3)

You can attach two IDE (Integrated Device Electronics) drives to the PCA-6148/6148L's internal controller. The PCA-6148/6148L CPU card has an EIDE connector, CN3.

Wire number 1 on the cable is red or blue, the other wires are gray. Connect one end to connector CN3 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 CN3.

Flat panel interface connection (CN1)

Flat panel display connector (PCA-6148 only)

CN1 consists of a 44-pin, dual-in-line header. The PCA-6148 provides a bias control signal on CN1 which can be used to control the LCD bias voltage. It is recommended that the LCD bias voltage (+5V) and panel video signals are stable. Under normal operation the control signal (ENAVEE) is active high. When the PCA-6148/6148L's power is applied, the control signal is low until just after the relevant flat panel signal is present.

Configuration of the VGA interface is done completely via the software utility. You don't have to set any jumpers. Refer to Chapter 4 for software setup details.

Floppy drive connector (CN4)

You can attach up to two floppy disk drives to the PCA-6148/6148L's on-board controller. You can use any combination of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB and 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.

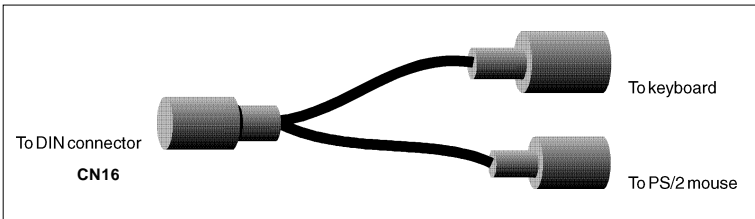
Parallel port connector (CN5)

The parallel port is normally used to connect the CPU card to a printer. The PCA-6148/6148L 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, CN16)

CN16, the card's keyboard connector, is a 6-pin mini-DIN connector on the card mounting bracket. The PCA-6148/6148L also comes with an adapter to convert to a standard DIN connector and to a PS/2 mouse connector.



The PCA-6148/6148L provides a second connector designed for external keyboard input (CN14). To locate CN14 and CN16, please see the board layout on page 5 of chapter 1.

Reset switch (J1)

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 J1.

Hard disk drive LED (DLE1)

You can connect a LED to connector DLE1 to indicate when the HDD is active. Marks on the Board layout (chapter 1, p. 5) indicate LED polarity.

VGA display connector (CN9)

The PCA-6148 provides a VGA controller for high resolution VGA interface. CN9 is a DB-15 connector for VGA monitor input.

Serial Ports

The PCA-6148/6148L 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 (3F8H [COM1], 2F8H [COM2] or 2E8H) 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 (CN15, CN10, CN11)

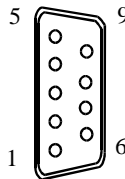
Connector	Address
CN15	(COM1)RS-232
CN10	(COM2)RS-232
CN11	(COM2)RS-422/485

RS-232 connection (CN15)

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



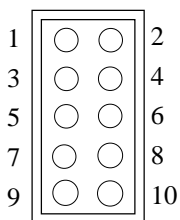
CN15

RS-232/422/485 connection

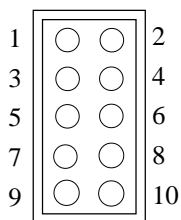
COM2 is an RS-232/422/485 serial port. The following table shows the pin assignments for COM2.

RS-232/422/485 connector pin assignments (CN10, CN11)

Pin	RS-232 (CN10)	RS-422/485 (CN11)
1	DCD	TX - or send data - (DTE)
2	RX	TX + or send data + (DTE)
3	TX	RX + or receive data + (DTE)
4	DTR	RX - or receive data - (DTE)
5	GND	GND
6	DSR	DSR
7	RTS	RTS
8	CTS	CTS
9	RI	RI



CN10

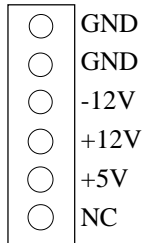


CN11

Power connectors (CON1)

If you prefer not to acquire power through PCA-6148/6148L's backplane via the gold H-connectors, J1 also provides 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.



CON1

CPU cooling fan power connector (CN2)

The CN2 is a connector for the CPU cooling fan. It provides both +5V and +12V when the power is on.

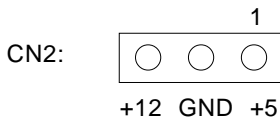
CPU cooling fan power connector (CN2)

Pin	Function
-----	----------

1	+5V
---	-----

2	GND
---	-----

3	+12V
---	------

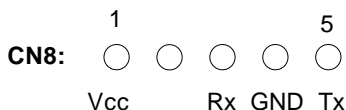


Infrared Tx/Rx Header (CN8)

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts onto a small opening on system cases that support this feature. You must also configure the setting through BIOS setup to select whether UART2 is directed for use with COM2 or IrDA.

IrDA Tx/Rx header (CN8)

Pin	Function
1	Vcc
2	No Connection
3	Rx
4	GND
5	Tx



External Speaker (CN7)

The CPU has its own buzzer. You can also connect to the external speaker on your computer chassis. Pin assignments for CN7 are the following:

External speaker (CN7)

Pin	Function
1	Speaker out
2	No connection
3	GND
4	+5 VDC

Power LED and Keylock (CN6)

You can use a LED to indicate when the CPU card is on. Pin 1 of CN6 supplies the LED's power, and Pin 3 is the ground.

You can use a switch (or a lock) to disable the keyboard so the PC will not respond to any input. This is useful if you do not want anyone to change or stop running a program. Connect the switch between Pins 4 and 5 of CN6.

Power LED and keylock (CN6)

Pin	Function
------------	-----------------

1	LED power (+5V)
---	-----------------

2	NC
---	----

3	GND
---	-----

4	Keyboard lock
---	---------------

5	GND
---	-----

CHAPTER 3

AWARD BIOS SETUP

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

AWARD BIOS Setup

ROM ISA BIOS (2C4L6AK1) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
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 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 ISA BIOS (2C4L6AK1) STANDARD CMOS SETUP AWARD SOFTWARE, INC.								
Date (mm:dd:yy) : Thu, Sep 12 1996								
Time (hh:mm:ss) : 15 : 24 : 55								
HARD DISKS	TYPE	SIZE	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Primary Master:	Auto	0	0	0	0	0	0	AUTO
Primary Slave:	Auto	0	0	0	0	0	0	AUTO
Secondary Master:	Auto	0	0	0	0	0	0	-----
Secondary Slave:	Auto	0	0	0	0	0	0	-----
Drive A : 1.44M, 3.5 in.				Base Memory :		640K		
Drive B : None				Extended Memory :		31744K		
Video : EGA/VGA				Other Memory :		384K		
Halt On : All Errors				Total Memory :		32768K		
ESC : Quit	←→↑↓ : Select Item			PU / PD / + / - : Modify				
F1 : Help	(Shift)F2 : Change Color							

CMOS setup screen

BIOS features setup

By choosing the "BIOS FEATURES SETUP" option from the CMOS SETUP screen menu, the following screen is displayed. This sample scree contains the manufacturer's default values for the PCA-6144V.

ROM ISA BIOS (2C4L6AK1) BIOS FEATURES SETUP 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	: C,A	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		
IDE HDD Block Mode	: Enabled		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 20	Esc : Quit	←→↑↓: Select Item
Typematic Delay (Msec)	: 25	F1 : Help	PU / PD / + / - : Modify
Security Option	: Setup	F5 : Old Values	(Shift)F2 : Color
OS Select for DRAM > 64MB	: Non-OS2	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, if Virus Warning is enabled, the following error message will automatically appear:

```
!WARNING!  
Disk boot sector is to be modified  
Type "Y" to accept write or "N" to abort write  
Award Software, Inc.
```

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 "C, A".

C,A	System will first search the hard drive, then the floppy drive.
A,C	System will first search the floppy drive, then the hard drive.

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 under OS/2 system.

Video BIOS Shadow

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

C8000 - CFFFF Shadow/DC000-DFFFF Shadow

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

Enabled	Optional shadow is enabled
---------	----------------------------

Disabled	Optional shadow is disabled
----------	-----------------------------

CHIPSET features setup

By choosing the "CHIPSET FEATURES SETUP" option from the CMOS SETUP screen menu, the following screen is displayed. This sample screen contains the manufacturer's default values for the PCA-6148/6148L board.

ROM ISA BIOS (2C4L6AK1) CMOS SETUP UTILITY CHIPSET FEATURES SETUP																																																																							
<table style="width: 100%; border-collapse: collapse;"> <tr><td>Auto Configuration</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>Decoupled Refresh</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>Relocate 256K/384K</td><td style="text-align: right;">: Disabled</td></tr> <tr><td>Video BIOS Cacheable</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>System BIOS Cacheable</td><td style="text-align: right;">: Enabled</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>External Cache Scheme</td><td style="text-align: right;">: Write back</td></tr> <tr><td>Combine Alter & Tag Bits</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>CHRDY for ISA master</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>Memory Hole at 15MB Addr.</td><td style="text-align: right;">: Disabled</td></tr> <tr><td>Cache Timing Control</td><td style="text-align: right;">: Normal</td></tr> <tr><td>DRAM Timing Control</td><td style="text-align: right;">: Normal</td></tr> <tr><td>FAST DRAM</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>CPU Write Back Cache</td><td style="text-align: right;">: Disabled</td></tr> <tr><td>Set Turbo pin function</td><td style="text-align: right;">: Suspend</td></tr> <tr><td>Set Mouse Lock</td><td style="text-align: right;">: Disabled</td></tr> <tr><td>Internal Flash/ROM Disk</td><td style="text-align: right;">: Disabled</td></tr> </table>	Auto Configuration	: Enabled	Decoupled Refresh	: Enabled	Relocate 256K/384K	: Disabled	Video BIOS Cacheable	: Enabled	System BIOS Cacheable	: Enabled			External Cache Scheme	: Write back	Combine Alter & Tag Bits	: Enabled	CHRDY for ISA master	: Enabled	Memory Hole at 15MB Addr.	: Disabled	Cache Timing Control	: Normal	DRAM Timing Control	: Normal	FAST DRAM	: Enabled	CPU Write Back Cache	: Disabled	Set Turbo pin function	: Suspend	Set Mouse Lock	: Disabled	Internal Flash/ROM Disk	: Disabled	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Onboard local bus IDE</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>IDE Primary Master PIO</td><td style="text-align: right;">: Auto</td></tr> <tr><td>IDE Primary Slave PIO</td><td style="text-align: right;">: Auto</td></tr> <tr><td>Onboard FDD Controller</td><td style="text-align: right;">: Enabled</td></tr> <tr><td>Onboard Serial Port 1</td><td style="text-align: right;">: COM1/3F8</td></tr> <tr><td>On-board Serial Port 2</td><td style="text-align: right;">: COM2/2F8</td></tr> <tr><td>Infra Red (IR) Function</td><td style="text-align: right;">: Disabled</td></tr> <tr><td>Onboard Parallel Port</td><td style="text-align: right;">: 3BCH/IRQ7</td></tr> <tr><td>Onboard Parallel Mode</td><td style="text-align: right;">: Normal</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>IR Transfer Mode</td><td style="text-align: right;">: Half-Dup</td></tr> <tr><td>IR I/O Group</td><td style="text-align: right;">: B</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>Esc</td><td style="text-align: right;">: Quit</td></tr> <tr><td>F1</td><td style="text-align: right;">: Help</td></tr> <tr><td>F5</td><td style="text-align: right;">: Old Values</td></tr> <tr><td>F6</td><td style="text-align: right;">: Load BIOS Defaults</td></tr> <tr><td>F7</td><td style="text-align: right;">: Load Setup Defaults</td></tr> </table>	Onboard local bus IDE	: Enabled	IDE Primary Master PIO	: Auto	IDE Primary Slave PIO	: Auto	Onboard FDD Controller	: Enabled	Onboard Serial Port 1	: COM1/3F8	On-board Serial Port 2	: COM2/2F8	Infra Red (IR) Function	: Disabled	Onboard Parallel Port	: 3BCH/IRQ7	Onboard Parallel Mode	: Normal			IR Transfer Mode	: Half-Dup	IR I/O Group	: B			Esc	: Quit	F1	: Help	F5	: Old Values	F6	: Load BIOS Defaults	F7	: Load Setup Defaults
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Esc	: Quit																																																																						
F1	: Help																																																																						
F5	: Old Values																																																																						
F6	: Load BIOS Defaults																																																																						
F7	: Load Setup Defaults																																																																						
*	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"></td> <td style="text-align: right;">←→↑↓: Select Item</td> </tr> <tr> <td></td> <td style="text-align: right;">PU/PD/+/- : Modify</td> </tr> <tr> <td></td> <td style="text-align: right;">(Shift)F2 : Color</td> </tr> </table>		←→↑↓: Select Item		PU/PD/+/- : Modify		(Shift)F2 : Color																																																																
	←→↑↓: Select Item																																																																						
	PU/PD/+/- : Modify																																																																						
	(Shift)F2 : Color																																																																						

* Internal Flash/ROM Disk

Disable	cannot use
Enable	can use internal SSD

When internal RAM/ROM disk is disabled, the C8000h memory segment can be used.

Video BIOS Cacheable

As with caching the System BIOS above, enabling the Video BIOS cache will cause access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled.

Enabled	Video BIOS access cached
Disabled	Video BIOS access not cached

Disabled is the default.

System BIOS Cacheable

When enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled.

Enabled	BIOS access cached
Disabled	BIOS access not cached

Disabled is the default.

Power management setup

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

ROM ISA BIOS (2C4L6AK1) CMOS SETUP UTILITY POWER MANAGEMENT SETUP	
Power Management	: Enabled
Doze Timer	: 32 sec
Sleep Timer	: 2 min
Sleep Mode	: Suspend
HDD Power Management	: Disabled
VGA Activity Wakeup	: Disabled
IO Activity	: Disabled
IRQ3 Activity	: Primary
IRQ4 Activity	: Primary
IRQ5 Activity	: Primary
IRQ7 Activity	: Primary
IRQ8 Activity	: Secondary
IRQ10 Activity	: Primary
IRQ11 Activity	: Primary
IRQ12 Activity	: Primary
Esc:Quit	←→↑↓: Select Item
F1 : Help	PU/PD/+/-: Modify
F5 : Old Values	(Shift)F2: Color
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

Power Management

This option allows you to determine if the values in power management are disabled, user-defined, or predefined. This category determines the system's power consumption after selecting the following items. Default value is disable. The following pages tell you the options of each item and describe the meanings of each option.

Power Management

Item	Options	Descriptions
Power Management	1. Disable	Global power management will be disabled
	2. User Define	Users can configure their own power management
	3. Min Saving	Pre-defined timer values are used such that all timers are at their MAX value
	4. Max Saving	Pre-defined timer values are used such that all timers are at their MIN value

Doze Mode

Item	Options	Descriptions
Doze Mode	Disable	System will never enter DOZE mode
	8 sec 32 sec 2 min 8 min 16 min	Defines the continuous idle time before the system entering DOZE mode.*
		Note: Normally, STANDBY mode puts the system into low speed or 8 MHz.

Standby Mode

Item	Options	Descriptions
Standby Mode	Disable	System will never enter STANDBY mode
	8 sec 32 sec 2 min 8 min 16 min	Defines the continuous idle time before the system enters STANDBY mode.**
		Note: Normally, STANDBY mode puts the system into low speed or 8 MHz.

Suspend Mode

Item	Options	Descriptions
Suspend Mode	Disable	System will never enter SUSPEND mode
	8 sec 32 sec 2 min 8 min 16 min	Defines the continuous idle time before the system enters SUSPEND mode.***
		Note: Normally, STANDBY mode puts the system into low speed or 8 MHz.

Important Notice

The status of the following items will affect **Doze Mode**, **Standby Mode** and **Suspend Mode**: PCI Master Activity, COM Ports Activity, LPT Ports Activity, HDD Ports Activity, DMA Ports Activity, VGA Activity, IRQ3 (COM2), IRQ4 (COM1), IRQ5 (LPT2), IRQ6 (Floppy Disk), IRQ7 (LPT1), IRQ8 (RTC Alarm), IRQ9 (IRQ2 Redir), IRQ10 (Reserved), IRQ11 (Reserved), IRQ12 (PS/2 Mouse), IRQ13 (Coprocessor), IRQ14 (Hard Disk), and IRQ15 (Reserved)

- * If any of the above items are enabled and active, the DOZE timer will be reloaded.
- ** If any of the above items are enabled or active, the STANDBY timer will be reloaded.
- *** If any of the above items are enabled or active, the SUSPEND timer will be reloaded.

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.

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.

Password setting

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

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

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.

VGA Display Software/ Hardware Configuration

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

Sections include:

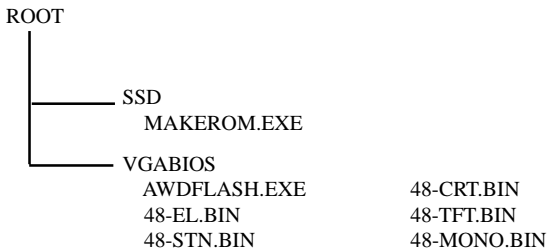
- LCD display configuration
- Connections for two standard LCDs

Introduction

The PCA-6148/6148L system BIOS and custom drivers are located in a 128 Kbyte, 32-pin (JEDEC spec.) Flash ROM device, designated U7. A single Flash chip holds the system BIOS, VGA BIOS, EEPROM Back-up and CMOS Data. 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.

PCA-6148 Utility Disk

The PCA-6148 is supplied with a software utility disk that holds the necessary file for setting up the VGA display controller. The disk's directory and file structure is as follows:



MAKEROM.EXE

This program supports the SSD, and can be programmed by the programmer.

48-CRT.BIN

Supports CRT only.

48-TFT.BIN (default)

Supports 640 x 480 color TFT
(Sharp LQ9D011, Toshiba LTM09C015A/016)

48-STN.BIN

Support 640 x 480 color STN DD 8/16-bit displays
(Sharp LM64C142)

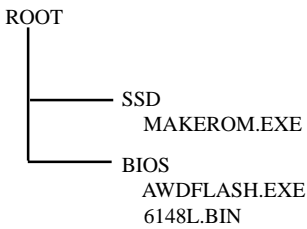
48-MONO.BIN

Supports 640 x 480 dual scan monochrome displays
(Sharp LM64P8X/837)

48-EL.BIN

Supports 640 x 480 EL displays (PLANAR EL640480-A Series)

PCA-6148L Utility Disk



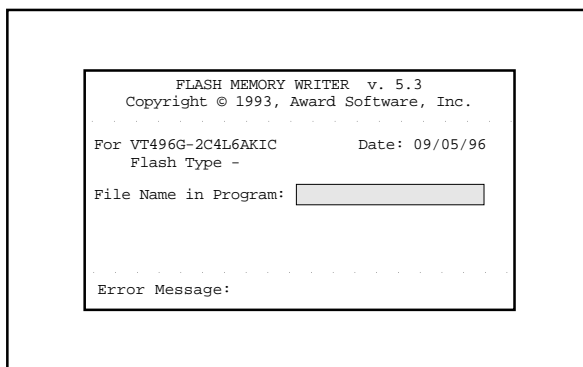
VGA Display Software Configuration

The PCA-6148's on-board VGA interface supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. The interface can drive CRT displays with resolutions up to 640 x 480 with 1.6 million colors. It is also capable of driving color panel displays with resolutions of 800 x 600 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-6148 with a color TFT display attached. This is the default setting for the PCA-6148. 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>. The VGA configuration program will then display the following:



BIOS Update screen

3. At the prompt, type in the BIN file which supports your display. When you are sure that you have entered the file name correctly press <Enter>. The screen will ask “Do you want to save?” If you wish to continue press Y. If you change your mind or have made a mistake press N to abort and end the setup procedure.
4. If you decide to continue, the program will create a BIOS.OLD file which contains the existing BIOS configuration. The prompt will then ask “Are you sure you want to save new configuration?” 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.

CHAPTER
5

SVGA Setup (PCA-6148 only)

The PCA-6148 features an on-board flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

Simultaneous display mode

The 65545/48/50 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 (multi-sync) monitors are supported as analog monitors.

Both CRT and panel displays can be used simultaneously. The PCA-6148 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 which 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.

Software support

The drivers support the following applications using the filenames and resolutions listed:

<u>Application</u>	<u>Filename</u>	<u>Resolution</u>	<u>Colors</u>	
Windows 3.1	LINEAR4.DRV	640x480	16	
		800x600	16	
		1024x768	16	
	LINEAR8.DRV	640x480	256	
		800x600	256	
		1024x768	256	
	AutoCAD R12	LINEAR16.DRV	640x480	64K
		LINEAR24.DRV	640x480	16M
		RCTURBOC.EXP	640x480	16
800x600			16	
1024x768			16	
640x480			256	
800x600			256	
1024x768			256	
640x480			32K	
640x480	64K			
640x480	16M			
Lotus 1-2-3 2.0 and Lotus Symphony 1.0,1.1	V132X25.DRV	132x25 (Text)	16	
	V132X50.DRV	132x50 (Text)	16	
	VESA 1.2	VESA.COM	800x600	16
1024x768		16		
640x400		256		
640x480		256		
800x600		256		
1024x768		256		
640x480		32K		
640x480	64K			

Word 5.0	VGA600.VID	800x600	16
	VGA768.VID	1024x768	16
Word 5.5	VGA55600.VID	800x600	16
	VGA55768.VID	1024x768	16
WordPerfect 5.0	CHIPS600.WPD	800x600	16
	CHIPS768.WPD	1024x768	16
WordPerfect 5.1	VGA600.VRS	800x600	16
	VGA768.VRS	1024x768	16

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:\WINSETUP**. 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 **WINSETUP.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 Windows3.1.

AutoCAD R12

These drivers are designed to work with Autodesk AutoCAD R12. They conform to the Autodesk Device Interface (ADI) for Rendering drivers and Display drivers. These display list drivers accelerate redraw, pan, and zoom functions.

Driver installation

Step 1: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the SETUP program. Press any key to get to the applications list. Using the arrow keys, select **AutoCAD Release 12** and press <ENTER>. This will display a list of supported driver resolutions. Using the arrow keys and the <ENTER> key, select the resolutions that are appropriate for your monitor. When all of the desired resolutions have been selected, press <END> to begin the installation. At this point you will be asked for a drive and directory to copy the driver files. Enter the drive and directory that contains the installed AutoCAD R12. If the destination directory does not exist you will be asked for confirmation. When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 2: Go to the AutoCAD directory where the new drivers were installed and run the driver installation program by typing **ACAD12 -r** <ENTER>. This program will configure your AutoCAD R12 to use the new display drivers. Select **TurboDLD Classic**.

Configuring TurboDLD

Select **Configure Video Display**. In Display Device Configuration choose **Select Graphics Board/Resolution**. Then choose **Select Display Graphics Board**. After choosing a graphics board, go to **Select Display Resolution**. After selecting the display resolution, save the new configuration, and return to the main menu.

Basic Configuration Menu

This menu allows you to modify:

Number of AutoCAD Command Lines

Font Size 6x8/8x8/8x14/8x16/12x20/12x24

Dual Screen Enable/Disable

User Interface Configuration

Double Click Interval Time

BP Button

BP Highlight Patt Line/Xor Rect/Both

BP Refresh Enable/Disable

BP Cache Enable/Disable

Expert Configuration Menu

This menu allows you to modify:

Display List Enable/Disable

Drawing Cache Enable/Disable

Use Acad 31 bit space? Yes/No

Internal Command Echo Enable/Disable

BP Zoom Mode Freeze/Float

Regen Mode Incremental/Fast

If your previously installed driver is not TurboDLD, you will have to reconfigure the RENDER command the first time you use it.

Lotus 1-2-3 and Lotus Symphony

These drivers are designed to work with Lotus 1-2-3 versions 2.0, 2.01 and 2.2, and with Lotus Symphony versions 1.0 and 1.1.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select **Lotus/Symphony**, and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the 123 directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS. Copy all the files that were just created in the temporary directory onto a formatted floppy diskette.

Step 2: Go to your 123 directory, and start the installation program. Type the following commands:

C: <ENTER>

INSTALL <ENTER>

Step 3: The Lotus installation program will load and present the installation menu. From this menu, select **Advanced Options**. From the Advanced Options menu, select **Add New Drivers To Library**. From the Add New Drivers Menu, select **Modify Current Driver Set**. From the Modify Driver Set Menu, select **Text Display**. From the Text Display menu, select one of drivers.

Step 4: After the selection of the appropriate VGA display driver, you will need to exit this menu and return to the Main Lotus Installation Menu. Do this by selecting **Return To Menu**.

Step 5: At the Main Lotus Installation Menu, select **Save Changes**.

Step 6: At this point the Installation Menu will prompt you for the name of your new Lotus configuration file. The Lotus system will prompt you with the default value — 123.SET, but you may want to use a filename that indicates the resolution of its driver. For example, if you installed the 132 column by 25 line driver, you could name this driver 132X25.SET, or if you installed the 80 by 50 driver, you may want to call the file 80X50.SET.

Step 7: The installation of your Lotus 1-2-3 driver is now complete. You will need to exit the Lotus installation program at this point. At the main Lotus Installation Menu, select *Exit*.

NOTE: If your driver set is not 123.SET, you have to type the filename of your driver set in the command line when you start Lotus 1-2-3. For example, if you named your driver set 132X25.SET, type the following to start Lotus 1-2-3:

```
123 132X25.SET <ENTER>
```

VESA

The Video Electronics Standards Association (VESA) has created a standard for a Super VGA BIOS Extension (VBE). This defines a standard software interface to allow application programs to set and control extended video modes, such as 800x600 graphics, on video adapters from different manufacturers.

The VESA driver adds this Super VGA BIOS Extension to the VGA BIOS. Any application program which supports the VESA standard driver interface can be used with this driver. This VESA driver conforms to the VESA Super VGA Standard #VS891001.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select VESA Driver **Version 1.2** and press <ENTER>. Press the <ENTER> key to select **All Resolutions**, and press <END> to begin the installation. A default drive and directory path will be displayed. Use the backspace key to erase this and type in a directory that is in the directory path (such as C:\BIN or C:\UTILS). After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: To install the VESA driver, type either **VESA** <ENTER> or **VESA +** <ENTER> at the DOS prompt. The optional + command line parameter enables all of the available modes. Make sure that your monitor is capable of displaying these high resolution modes before enabling them.

NOTE: If the video BIOS already supports VBE extended video modes, DO NOT use this driver. Run the VTEST.EXE program to see if the video BIOS supports the VBE modes.

Word

These drivers are designed to work with Microsoft Word 5.0 and 5.5.

Driver installation

If you have already installed Word on your computer, go to Step 2 to install the new video driver.

Step 1: Install Word as normal.

Step 2: After you complete the Word installation, place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select **Word** and press <ENTER>. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this and type in your Word directory. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 3: Copy the driver file for the desired resolution that was just installed to SCREEN.VID.

WordPerfect

These drivers are designed to work with WordPerfect 5.0 or 5.1. They support 132-column display in editing mode, and high-resolution graphics display in PreView mode.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select **WordPerfect** and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the WordPerfect directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: Start WordPerfect, and press <SHIFT>+<F1> to enter the setup menu. Select **D** for Display and **G** for Graphics Screen Type, and then choose the desired Chips VGA resolution.

Configuring WordPerfect 5.0 for 132 columns

Follow these instructions to configure WordPerfect 5.0 for 132 column text mode:

Step 1: To use the SETCOL program to set 132 columns and 25 rows, type the following command:

SETCOL 132, 25 <ENTER>

Step 2: Start WordPerfect. The program will detect the number of rows and columns automatically. If for some reason WordPerfect is unable to adapt to 132 columns by 25 rows, start WordPerfect with the following command:

WP /SS=25,132 <ENTER>

Configuring WordPerfect 5.1 for 132 columns

Start WordPerfect and press <SHIFT>+<F1> to enter the setup menu. Select **D** for Display and **T** for Text Screen Type and then select *Chips 132 Column Text*.

APPENDIX

A

Flash/RAM/ROM Solid State Disk

The PCA-6148/6148L features an internal Flash/RAM/ROM disk drive. This drive emulates a floppy disk drive by using solid-state memory chips (Flash, RAM or ROM) to store programs and data instead of the magnetic particles on the mechanical drive's disk. The Flash/RAM/ROM disk offers much faster access times than a floppy or hard disk and greatly increases reliability in harsh environments.

The Flash/RAM/ROM disk works by modifying the BIOS INT-13 disk I/O routine on boot-up. The operating system must be DOS v. 5.0 or greater. The routine then translates read and write commands to the disk so that they will correctly access the memory chips. You don't need any special drivers. You simply set the drive to act as a DOS drive (e. g. A:, B:, C: or D: - 1st, 2nd, 3rd or 4th floppy disks) and use standard DOS commands (COPY, DIR, etc.) to manipulate your data.

Before you use the Flash/RAM/ROM disk, you will need to enable it with the BIOS Advanced Setup Program, discussed in Chapter 3.

Memory devices

The Flash/RAM/ROM disk supports the following memory devices, or their equivalents:

- 28F010 128 KB x 8 (+12 V) Flash Memory (AMD/INTEL)
- CXK581000P 128K x 8 SRAM (Sony)
- CXK584000P 512K x 8 SRAM (Sony)
- 27C010 128 KB x 8 EPROM
- 27C040 512 KB x 8 EPROM
- AT29C010/A 128 KB x 8 (+ 5 V) Flash Memory (ATMEL only)
- AT29C040/A 512 KB x 8 (+ 5 V) Flash Memory (ATMEL only)

If you use EPROM, files on the disk are read only. You will need an "external programmer" to load your program and data files on the EPROMs.

If you use +5 V Flash memories (AT29C010/A or AT29C040/A) for the solid state disk, you can read or write data just like a floppy

disk; you need not use an external programmer. If you use +12 V Flash memories (28F010) you will still need an "external programmer" to write data.

Drive capacity

The size of the emulated drive depends on the size and number of the chips you install. For example, if you install three 512 KB chips, you will have 3 x 512 KB = 1.536 MB, equivalent to a 1.44 MB floppy. If you install three 128 KB chips, you will have 3 x 128 KB = 384 KB, equivalent to a 360K floppy.

Drive configuration

Before you activate the Flash/RAM/ROM drive (using the BIOS Advanced Setup program), you will need to set the drive's I/O and memory addresses to avoid conflicts with other plug-in cards. You will also need to set the DOS drive designation to be used by the Flash/RAM/ROM drive. You can press <Alt> - <S> to enter SSD setup mode when you see the message.

```
Internal Solid-State Disk BIOS Rev X.XX  
"SSD assign to _: Hit <Alt-S>, if you want  
to setup SSD..."
```

You will need to set jumpers J17 and J18 to match the I/O. All the devices must be the same type and size.

I/O address selection

J17	J18	I/O address (HEX)
Close	Close	Disabled (default)
Open	Close	210-217
Close	Open	220-227
Open	Open	230-237

*This sentence will be shown when the battery voltage is low.

On Board SSD Configuration V X.XX		
SSD IC TYPE	:	
Memory segment windows (8K)	:	
SSD driver emulated	:	
Write to SSD EEPROM and exit		
Do not write to SSD EEPROM and exit		
↑↓ : Select	PgUp/PgDn: Modify	ESC: Abort
SSD Program allocate on C800 - CBFFH		
I/O Address at 0210 - 0217 H		
Please check battery, low voltage (less 2,5 V)*		

SSD IC Type

SRAM 128K	CXK581000P
EPROM 128K	27C010, 28F010
FLASH 128K	AT29C010/A
SRAM 512K	CXK584000P
EPROM 512K	27C040
FLASH 512K	AT29C040/A

Memory segment windows (8K)

CE00-CFFF
D000-D1FF
D400-D5FF
D800-D9FF
DC00-DDFF
E000-E1FF

Drive emulated

Control the DOS drive emulated by the Flash/RAM/ROM disk:
1st, 2nd, 3rd or 4th.

SSD Driver Emulated

1st
2nd
3rd
4th

The actual drive letter assigned by DOS to the Flash/RAM/ROM disk depends on the floppy or hard disks installed in the system.

Drive Selection

Floppy disks

The Flash/RAM/ROM disk will "replace" the corresponding floppy disk. For example, if you have a single floppy disk (drive A:) and assign the Flash/RAM/ROM disk to be the 1st drive, any drive operations directed at drive A: will go to the Flash/RAM/ROM disk.

Hard disks

The Flash/RAM/ROM disk will not replace corresponding hard disks. Instead, DOS will assign the Flash/RAM/ROM disk to the next free drive designation. For example, if you have a single hard disk (drive C:) and assign the Flash/RAM/ROM disk to be the 3rd drive, the Flash/RAM/ROM drive will become drive D:. If you have two hard disks, the Flash/RAM/ROM drive will become drive E:.

Example 1

You install the Flash/RAM/ROM disk as the first drive.

Before installing Flash/RAM/ROM disk

A	B	C
FDD	FDD	HDD

After installing Flash/RAM/ROM disk

A	B	C
Flash/RAM/ROM	FDD	HDD

*A floppy will be replaced by SSD

Example 2

You (try to) install the Flash/RAM/ROM disk as the third drive:

Before installing Flash/RAM/ROM disk

A	B	C
FDD	FDD	HDD

After installing Flash/RAM/ROM disk

A	B	C	D
FDD	FDD	HDD	Flash/RAM/ROM

Solid State Disk (SSD) Formatting:

Formatting the Solid State disk

If you use Flash memory or SRAM, it is advisable to format the Flash/SRAM disk before copying files to it. The DOS command is as follows:

```
FORMAT drv: /u ...
```

where drv = solid state disk drive A, B, C etc.

Sometimes, it is better to assign the sectors and tracks when formatting SSD. For the different disk size, please use different assignment, for example:

```
Format drv:/u/n:9/t:40 (for 360 K disk)
```

```
Format drv:/u/n:18/t:80 (for 1.44 M disk)
```

where drv = solid state disk drive (A, B, or C, etc.)

After formatting, please read the message on the screen carefully. DOS will inform you how much disk space is available, the total disk space, and the bad sectors, etc. If the disk size does not match your assignment, please check the SSD setup again.

If you need a bootable disk, you should do the system transfer by typing:

```
SYS drv:
```

or use Format command and /S parameters.

Booting from the Flash/RAM/ROM disk

If you wish to have the system boot from the Flash/RAM/ROM disk, simply set driver emulated number for the 1st FDD. Copy your application files to the disk along with the standard system files required to boot (command.com, io.sys, msdos.sys, etc). The next time you start the system, it will boot from the solid state disk.

Inserting memory devices

After you've set all the jumpers and switches on the PCA-6148, insert the appropriate memory devices into the card's sockets. Remember that you will need to program EPROMs before you insert them.

1. Make sure that the pins of the memory chips are perpendicular to the case and both rows are parallel to each other. Many times the chips come with the pins spread out slightly. Place the chip on a table top and carefully bend each line of pins together until they point directly down.
2. Insert each chip. Align the chips so their pins are perpendicular to the connector and the semicircular notch on the end of the chip matches the notch on the end of the socket. There will probably be a gap between the chip body and the socket when it is fully seated – Do not push too hard!
3. When installing less than three memory devices, you must first fill ROM-1SSD.

SSD Jumper Setting

SSD Device Select [J14 (U12), J16 (U16), J19 (U28)]

	J14 (U12)	J16 (U16)	J19 (U28)
Flash	open	open	open
ROM	open	open	open
SRAM	closed	closed	closed

SSD I/O address select (J17, J18)

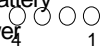



SSD	J17	J18
disabled	closed	closed
210H	open	closed
220H	closed	open
230H	open	open

SRAM Battery Source (J7)

If you install three SRAM chips, you must close jumpers J14, J16, J19 and set J7. This will support SRAM power from the battery that is used to retain the SRAM data when the PC's power is turned off.

Set jumper J7 according to the battery type that will be used.

Battery Installation Setup (J7)

	None (default)	Internal	4 pin external	2 pin
external				
Pin 1 SSD power				
Pin 2 Internal battery				
Pin 3 SSD Power				
Pin 4 GND				

The battery should be disconnected when using non-volatile memory devices such as Flash memories or EPROMs. You can use 3 V or 3.6 V Lithium battery 2 pin or 4 pin connectors for SRAM data retention power.

Note: Factory setting is "none battery" to save energy of the on-board internal Lithium battery.

File copy utility

The utility program MAKEROM.EXE, included on the card's utility disk, splits the files on a diskette into a series of binary files. You can then use an external programmer to copy the files to EPROM or +12 V Flash memory chips.

Using a memory manager (EMM386.EXE)

If you are using an extended or expanded memory manager (such as EMM386 or QEMM386), you will need to configure it to avoid the addresses used by the Flash/RAM/ROM disk (SSD Data memory segment). Otherwise, the memory manager will attempt to use these addresses, causing unreliable operation.

For example, the line in your CONFIG.SYS file that invokes EMM386, the DOS memory manager, might be the following:

```
DEVICE=EMM386.SYS X = D000 - D1FF
```

This excludes an 8 KB range for the card from D0000 to D1FFF (the default addresses).

You should also make sure that the disk's memory address is not shadowed in the BIOS. SSD program will occupy C8000 - CBFFF when BIOS SSD setting is enabled.

Programming the Watchdog Timer

The PCA-6148 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 stand-alone and unmanned environments.

Programming the watchdog timer

If you decide to program the watchdog timer, you must write data to I/O port 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 procedure is a program for the watchdog timer:

```
Step 1  Out 443h data REM Start and reset the watchdog
          timer.

Step 2  Your application program task #1

Step 3  Out 443h data REM Reset the timer

Step 4  Your application program 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.
.	
.	
.	
3F	63 sec.

Upgrading

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

- Installing PC/104
- DRAM memory installation (SIMMs)

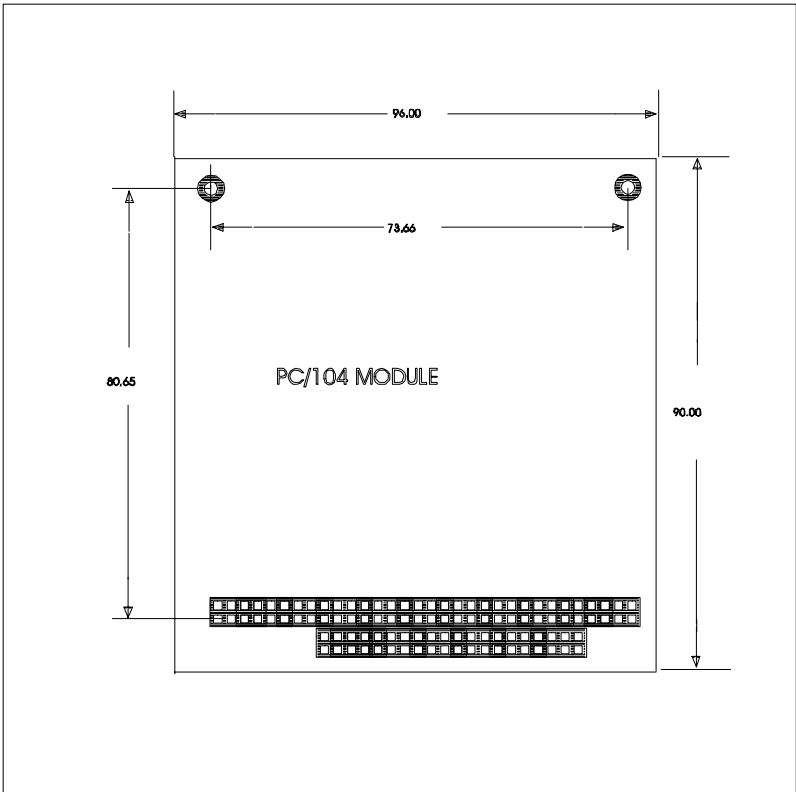
Installing PC/104 modules (CN12,CN13)

The PCA-6148 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-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, the figure on the following page shows module dimensions. A PC/104 breadboard module (PCM-3910) is also available. Pin assignments for the connector appear in Appendix D. For further information, contact your Advantech distributor or sales representative.



PC/104 module dimensions (mm)

Installing DRAM (SIMMs)

You can use anywhere from 1 MB to 128 MB of DRAM with your PCA-6148. The card provides four 72-pin SIMM (single in-line memory module) socket that accepts from 1 to 32 MB SIMMs. The following table shows the bank assignment for the SIMM socket:

Bank	SIMM socket(s)	Size
0	SIMM0	72-pin
1	SIMM1	72-pin
2	SIMM2	72-pin
3	SIMM3	72-pin

You can use 256 KBx32, 256 KBx64, 1 MBx32, 1 MBx64, 4 MBx32 or 4 MBx64 DRAM SIMMs.

SIMM Configurations

Bank0	Bank1	Bank2	Bank3
S32	S32	S32	S32
D32	N/A	D32	N/A
N/A	D32	N/A	D32

S32 = single side 32 bit

D32 = double side 32 bit

BANK0	BANK1	BANK2	BANK3	TOTAL
1M	--	--	--	1MB
1M	1M	--	--	2MB
1M	1M	2M	--	4MB
1M	1M	4M	--	6MB
1M	1M	2M	4M	8MB
1M	1M	4M	4M	10MB
1M	1M	16M	--	18MB
2M	--	--	--	2MB
2M	2M	--	--	4MB
2M	4M	--	--	6MB
2M	2M	4M	--	8MB
2M	2M	4M	4M	12MB
2M	16M	--	--	18MB
2M	2M	16M	--	20MB
2M	2M	4M	16M	24MB
2M	2M	16M	16M	36MB
4M	--	--	--	4MB
4M	4M	--	--	8MB
4M	4M	4M	--	12MB
4M	4M	4M	4M	16MB
4M	16M	--	--	20MB
4M	4M	16M	--	24MB
4M	16M	16M	--	36MB
4M	4M	16M	16M	40MB
8M	--	--	--	8MB
8M	--	8M	--	16MB
16M	--	--	--	16MB
16M	16M	--	--	32MB
16M	16M	16M	--	48MB
16M	16M	16M	16M	64MB
32M	--	--	--	32MB
32M	--	32M	--	64MB
64M	--	--	--	64MB
64M	--	64M	--	128MB

Supported 36 bit Memory Configurations (single bank)

APPENDIX **D**

Detailed system information

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

- Parallel connector pin assignments
- HDD connector pin assignments
- FDD connector pin assignments
- Keyboard connector pin assignments
- CRT display connector
- Flat panel display connector
- RS-232 connections
- PC/104 connector pin assignments
- System I/O port address assignments
- DMA channel assignments
- Interrupt assignments

Parallel/printer connector (CN5)

Pin no.	Signal
1	STROBE
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5
8	DATA 6
9	DATA 7
10	- ACKNOWLEDGE
11	BUSY
12	PAPER EMPTY
13	+ SELECT
14	- AUTO FEED
15	- ERROR
16	- INIT PRINTER
17	- SELECT INPUT
18-25	GROUND

HDD connector (CN3)

Pin no.	Signal	Pin no.	Signal
1	- RST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND

Pin no.	Signal	Pin no.	Signal
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ	32	-IO CS16
33	A1	34	N.C.
35	A0	36	A2 CS0
37	CS0	38	CS1
39	-ACT	40	GND

FDD connector (CN4)

Pin no.	Signal
1-33 (odd)	GROUND
2	HIGH DENSITY
4, 6	UNUSED
8	INDEX
10	MOTOR ENABLE A
12	DRIVER SELECT B
14	DRIVER SELECT A
16	MOTOR ENABLE B
18	DIRECTION
20	STEP PULSE
22	WRITE DATA
24	WRITE ENABLE
26	TRACK 0
28	WRITE PROTECT
30	READ DATA
32	SELECT HEAD
34	DISK CHANGE

Keyboard connector pin assignment (CN14, CN16)

CN14	CN16	Signal
1	5	CLOCK
2	1	DATA
3 (NC)	2	PS/2 DATA
4	3	GND
5	4	+5 V
	6	PS/2 CLOCK

*VGA display connector (CN9)

PCA-6148 VGA 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		

*Flat panel display connector (CN1)

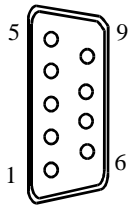
PCA-6148 Flat panel display connector

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

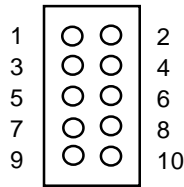
RS-232 connections

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:

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



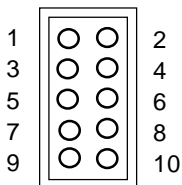
CN15



CN10

RS-422/485 connector pin assignments (C11)

Pin	RS-422/485 (CN11)
1	TX - or send data - (DTE)
2	TX + or send data + (DTE)
3	RX + or receive data + (DTE)
4	RX - or receive data - (DTE)
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	NC



CN11

PC/104 Connector Pin Assignments

	CN12		CN13	
0	--	--	0V	0V
1	IOCHCHK*	0V	SBHE*	MEMCS16*
2	SD7	RESETDRV	LA23	IOCS16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	ENDXFR*	LA17*	DACK0*
9	SD0	+12	MEMR*	DRQ0*
10	IOCHRDY	(KEY) ²	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	85V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0V
19	SA12	REFRESH*	(KEY) ²	0V
20	SA11	SYSCLK	--	--
21	SA10	IRQ7	--	--
22	SA9	IRQ6	--	--
23	SA8	IRQ5	--	--
24	SA7	IRQ4	--	--
25	SA6	IRQ3	--	--
26	SA5	DACK2*	--	--
27	SA4	TC	--	--
28	SA3	BALE	--	--
29	SA2	+5V	--	--
30	SA1	OSC	--	--
31	SA0	0V	--	--
32	0V	0V	--	--

* Low active single

--none

Memory Map (0-1 MB)		System I/O port address assignments
Addr. range (Hex)	Device	
F0000h - FFFFFh	System BIOS	
C8000h - EFFFFh	Unused	
C0000h - C7FFFh	VGA BIOS	
A0000h - BFFFFh	VGA display memory	
00000h - 9FFFFh	Base Memory	

DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy
3	Available
4	[Cascade]
5	Available
6	Available
7	Available

IRQ/DMA detection interrupt assignments

Interrupt #	Interrupt source
IRQ 00	Timer
IRQ 01	Keyboard
IRQ 02	[CASCADE]
IRQ 03	COM2 (2F8h)
IRQ 04	COM1 (3F8h)
IRQ 05	Available
IRQ 06	Floppy
IRQ 07	LPT1 (378h)
IRQ 08	Clock/Cal
IRQ 09	Available
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 mouse / available
IRQ 13	NPU
IRQ 14	OCCUPIED
IRQ 15	Watchdog/Available

POST LEDs

This appendix lists the codes generated by the POST (Power On Self Test) routines. It also discusses how to read the PCA-6148's POST LED indicators.

Whenever you start up your system, the CPU card runs a series of programs to test and initialize board hardware. If the routines encounter an error in 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. The cure for most nonfatal error messages is simply to run the BIOS SETUP program, discussed in Chapter 3.

If the routines encounter a fatal error, they will stop the tests and output a message indicating which test failed. If the fatal error comes before the screen device initializes, the card will indicate the error code through a series of beeps.

You can also determine the number of the test that failed by reading the LED indicators on the top of the PCA-6148 board.

Please make a note of any POST codes before you contact Advantech for technical support.

POST LEDs

Before the BIOS performs each system test, it writes a checkpoint code to I/O address 80H. If the test fails, the code will stay in memory. You can read the code and determine which test has failed.

The PCA-6148's POST LED indicators make this process extremely easy. You don't need any special diagnostic tools, you just read the POST code from the LEDs.

The table below shows how to read the LEDs, a series of eight LEDs located in the top left-hand corner of the board.

SELF-TEST INDICATORS

MSB ● ● ● ● ● ● ● ● LSB
 D1 D2 D3 D4 D5 D6 D7 D8

● : LIGHT OFF

○ : LIGHT ON

● ● ● ● :0	● ○ ● ● :4	○ ● ● ● :8	○ ○ ● ● :C
● ● ● ○ :1	● ○ ● ○ :5	○ ● ● ○ :9	○ ○ ● ○ :D
● ● ○ ● :2	● ○ ○ ● :6	○ ● ○ ● :A	○ ○ ○ ● :E
● ● ○ ○ :3	● ○ ○ ○ :7	○ ● ○ ○ :B	○ ○ ○ ○ :F

EXAMPLE

● ● ● ○ ○ ● ● ○
 D7 D6 D5 D4 D3 D2 D1 D0
 1 9

POST checkpoint LED indicators

The following list of POST codes gives the number of each checkpoint for the AWARD BIOS POST. Codes are Copyright AWARD-BIOS CHECK-POINT, (C) 1994 Award Software Inc.

Code	Name	Description of check-point
01	Processor test 1	Processor status (IFLAGS) verification tests the following processor status flags, carry, zero, sign, BIOS overflow. It will set each of these flags, verify that they are set, then turn each flag off and verify it is off.
02	Processor test 2	Read, write, verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
03	Initialize chips	Disable NMI, PLE, ALE, UEL, SQWV. Disable video, parity checking, DMA. Reset math coprocessor, clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2. Set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
04	Test memory Refresh toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
05	Blank video	Keyboard controller initialization. Initialize keyboard.
06	Reserved	
07	Test CMOS interface	Verifies CMOS is working correctly. Checks battery status, detects bad battery.
08	Setup low memory	Early chip set initialization memory presence test. OEM chipset routines. Clear low 64 KB of memory. Test first 64 KB memory.
09	Early cache initialization	Cyrix CPU initialization, cache initialization
0A	Setup interrupt vectors	Initialize first 120 vectors in interrupt vector table with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL.

Code	Name	Description of check-point
0B	Test CMOS RAM	Test CMOS RAM checksum. If bad or insert key pressed, INT 00h-1Fh according to INT_TBL.
0C	Initialize keyboard	detect type of keyboard controller (optional). Set num_lock status.
0D	Initialize video interface	Detect CPU clock. Read interface CMOS location 14h to find out type of video in use. Detect and initialize video adaptor.
0E	Test video memory	Test video memory, write sign-on message to screen. Set up shadow RAM-enable according to setup.
0F	Test DMA controller 0	BIOS checksum test. Keyboard detection and initialization.
10	Test DMA controller 1	
11	Test DMA page registers	Test DMA page registers.
12-13, 1B, 1E		Reserved
14	Test timer counter 2	Test 8254 timer 0 counter 2.
15	Test 8259-1 mask bits	Verify 8259 channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 mask bits	Verify 8259 channel 2 masked interrupts by alternately turning off and on the interrupt lines.
17	Test 8259-1 mask bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 interrupt functionality	Force an interrupt and verify the interrupt occurred.
19	Test stuck NMI bits (parity/IO check)	Verify NMI can be cleared.
1A	Display CPU clock	
20	Enable slot 0	Initialize slot 0 (system board).
21-2F	Enable slots 1-15	Initialize slots 1 through 15.
30	Size base and extended memory	Size base memory from 256 KB to 640 KB and extended memory above 1 MB.

Code	Name	Description of check-point
31	Test base and extended memory	Test base memory from 256 KB to 640 KB and extended memory above 1 MB using various patterns. Note: this will be skipped in EISA mode and can be "skipped" with ESC key in EISA mode.
32	Test EISA extended memory	If EISA mode flag is set then test EISA memory found in slot initialization. Note: this will be skipped in ISA mode and can be "skipped" with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup enabled	
3D	Initialize and install mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Set up cache controller	Initialize cache controller.
40	Virus protect	Display virus protect disable or enable.
41	Initialize floppy drive and controller	Initialize floppy disk drive controller and any drives.
42	Initialize hard disk drive and controller	Initialize hard disk drive controller and any drives.
43	Detect & initialize serial and parallel ports	Initialize serial/parallel ports (also game port).
44	Reserved	
45	Detect & initialize math coprocessor	Initialize math coprocessor.
46-47	Reserved	
4E	Manufacturing post loop or display messages	Reboot if manufacturing loop post loop pin is set. Otherwise display and messages (i.e. any non-fatal errors that were detected during post and enter setup).
4F	Security check	Ask for password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.

Code	Name	Description of check-point
51	Pre-boot enable	Enable parity checker, enable NMI, enable cache before boot.
52	Initialize option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. Note: when fscan option is enabled, it will initialize from C8000h to F7FFFh.
53	Initialize time value	Initialize time value in 40h: BIOS area.
60	Set up virus protection	Set up virus protection according to setup.
61	Set boot speed	Set system speed for boot.
62	Set numlock	Set numlock status according to setup.
63	Boot attempt	Set low stack boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display "Press F1 to disable NMI, F2 to reboot".
BE	Chipset default initialization	Program chipset registers with power-on BIOS defaults.
BF	Chipset initialization	Program chipset registers with setup values.
C0	Turn off chipset cache	OEM specific-cache control.
C1	Memory presence test	OEM specific test to size onboard memory.
C5	Early shadow	OEM specific early shadow enable for fast boot.
C6	Cache presence test	External cache size detection test.
E1-EF	Setup pages	E1-page 1, E2-page2, etc.
FF	Boot	

