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User's Manual

PV5000HX2(-M) Series SBC

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May 1998
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Limited Warranty

A. Texas Micro Inc. warrants that the item sold by it hereunder will be free from defects in materials or workmanship, under normal use and service, for a period of 2 years from date of shipment. Said item will meet the specifications in effect at the time of manufacture. Texas Micro's sole obligation under this warranty shall be, at its option, to repair or replace, without charge, any defective component of said item, within a reasonable period of time.

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Important

Always use caution when handling or operating the system. Only qualified and experienced electronics service personnel should access the unit's interior. Use extreme caution when installing or removing components. If you have any questions, please contact Texas Micro Technical Support at (800) 627-8700 or (713) 541-8200 Monday through Friday between 7:00 a.m. and 6:00 p.m., Central Time, Continental USA.

A Lire Imperativement

Quand vous manipulez ou utilisez la système, faites preuve en toutes circonstances de la plus grande prudence. Seuls des techniciens électroniciens qualifiés et expérimentés peuvent avoir accès à l'intérieur de la système. Si vous désirez poser des questions complémentaires, n'hésitez pas à prendre contact avec le Département d'assistance technique de Texas Micro au (USA) 1-713-541-8200.

Bitte Zuerst Lesen

Seien Sie immer vorsichtig, wenn Sie mit Ihrem System umgehen oder es bedienen. Nur qualifiziertes, erfahrenes Personal fär Elektronik sollte am Inneren des Gerätes arbeiten. Für Ihre Sicherheit sind Hinweise zur Vorsicht, Win Sie irgenwelche Fragen haben, setzen Sie sich bitte nit der Abteilung fr technische Unterstützung von Texas Micro unter der Rufnummer (USA) 1-713-541-8200 in Verbindung.

Changes or modifications not expressly approved by Texas Micro Inc. could void the product warranty and the user's authority to operate the equipment.

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Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can emit radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation

Any change or modification not expressly approved by the manufacturer is prohibited and could void the user's authority to operate the equipment.

This product also meets requirements for compliance with EN55022, Class B ITE.

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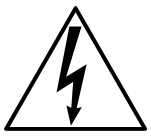
Document Conventions

Typography

Title Case	Titles of menus, windows, tabs, lists, and groups.
Bold Title Case	Names of menu items, fields, buttons, icons, check boxes, list items, group items, and keystrokes.
UPPER CASE	Acronyms and abbreviations.
Italics	Emphasis.
Sans Serif Type	Items in tables, illustrations, and notations.
`Monospace Type`	Output from a printer or monitor. Graphic items will be displayed as an image.

Symbols

	Caution: indicates an item for special consideration.
	Warning: indicates a hazard that can cause personal injury and/ or damage to the equipment.
	**High Voltage**: indicates one or both of the following: • The presence of a high electrical current that can cause personal injury and/or damage to the equipment • Electronic parts that can be damaged by electrostatic discharge (ESD)

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Customer Support

Calling Technical Support

Step	Action
1	Have the Texas Micro product model and serial number available.
2	• In the Continental USA, Monday — Friday, 7:00 a.m. — 6:00 p.m., Central Time, dial 1-800-627-8700 in the USA. Outside the USA, dial 713-541-8200 (add long distance/international access codes). • In Europe, Monday — Friday, 8:00 a.m. — 6:00 p.m., dial +31-36-5365595.
3	Upon answer, press **3** for Technical Support.

Returning Products for Service

Step	Action
1	Have the Texas Micro product model and serial number available.
2	• In the Continental USA, Monday — Friday, 7:00 a.m. — 6:00 p.m., Central Time, dial 1-800-627-8700 inside the USA. Outside the USA, dial 713-541-8200 (add long distance/international access codes). • In Europe, Monday — Friday, 8:00 a.m. — 6:00 p.m., dial +31-36-5365595.
3	Upon answer, press **3** for Technical Support.
4	When you are assigned a Returned Goods Authorization (RGA) number from a Technical Support Representative, place it, along with the product serial number, on the packaging materials and correspondence. The factory will be unable to accept delivery without these numbers. **Note:** The factory does not accept RGA's sent freight collect.

Accessing the BBS

Step	Action
1	24 hours a day, 7 days a week, dial 713-541-8250 (add long distance/international access codes).
2	Set your modem/communications equipment to: Protocol: ANSI Data Bits: 8 Parity: None Stop Bits: 1 **Note:** Refer to your modem and communication software documentation for configuration and operation instructions.
3	When you connect, follow the online instructions to download software.

Using the InfoLine Fax Service

Step	Action
1	24 hours a day, 7 days a week, dial 713-541-8200 or 800-627-8700 (add long distance/international access codes). **Note:** You can use this service *only* with a touch-tone telephone.
2	Upon answer, press 190 for the InfoLine fax service.
3	Follow the instructions to request documents.

Accessing the Website

http://www.texasmicro.com

Upon receiving your equipment, inspect the packaging, shipping materials, and contents.
If damaged, return the equipment to Texas Micro Inc. in the original packaging and shipping materials.
If you are satisfied with your equipment, retain the packaging and shipping materials in case of future need.

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1 Introduction

This chapter discusses the primary features of the PV5000HX2(-M).

If you are familiar with the primary components and functions of the PV5000HX2(-M), and you wish to quickly begin operating the SBC, go to Chapter 2, “7 Steps to Operation,” page 5. Then read this chapter later at your convenience.

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PV5000HX2(-M) Series SBC

Overview

The Texas Micro PV5000HX2 and PV5000HX2-M Single Board Computers (SBC) provide the following features:

- Intel™ Pentium® processor:
  - PV5000HX2: 100/133/166 MHz, 64-bit Classic Pentium (P54C)
  - PV5000HX2-M: 166/200/233 MHz, 64-bit Pentium with MMX™ (P55C)
- Intel 430HX PCIset
  - 82439HX System Controller (TXC, or North-Bridge)
  - 82371SB PCI I/O IDE Xcelerator (PIIX3, or South-Bridge)
- Intel 82091AA Advanced Integrated Peripheral (AIP)
- DS1687 compatible Real-Time Clock module with embedded battery
- 2 Mb (256 KB x 8) flash memory
- Level 2 write-back cache socket for 256 or 512 KB pipeline burst COAST SRAM
- Four (4) SIMM sockets for up to 256 MB scaleable DRAM
  Note: The PV5000HX2(-M) supports up to 256 MB FPM or up to 128 MB EDO.
- Two (2) serial ports (one RS-232 only; one RS-232 or RS-422)
- Parallel port (AT-compatible/bi-directional)
- Floppy drive controller
- PCI EIDE hard disk drive controller
- PCI Adaptec AIC-7850 SCSI Host Adapter with Fast/Narrow SCSI-2 header
- Dallas DS2109 Plug and Play SCSI terminator
- CHIPS 65550 High Performance Multimedia Flat Panel / CRT GUI Accelerator with flat panel display header
- Two (2) VGA video connectors (one on the I/O bracket)
- Four (4) 256 KB x 16 on-board video DRAM modules (2 MB)
- PS/2 mouse and keyboard connectors

More...

For more information on the components of the PV5000HX2(-M), contact:

Company	Telephone	Website
Intel Corporation	(602) 554-8080	http://www.intel.com
Adaptec, Inc.	(408) 945-8600	http://www.adaptec.com
Chips and Technologies, Inc.	(408) 434-0600	http://www.chips.com
Dallas Semiconductor Corporation	(972) 788-2197	http://www.dalsemi.com
PCI Special Interest Group	(503) 696-2000	http://www.pcisig.com
PICMG	(781) 246-9318	http://www.picmg.com

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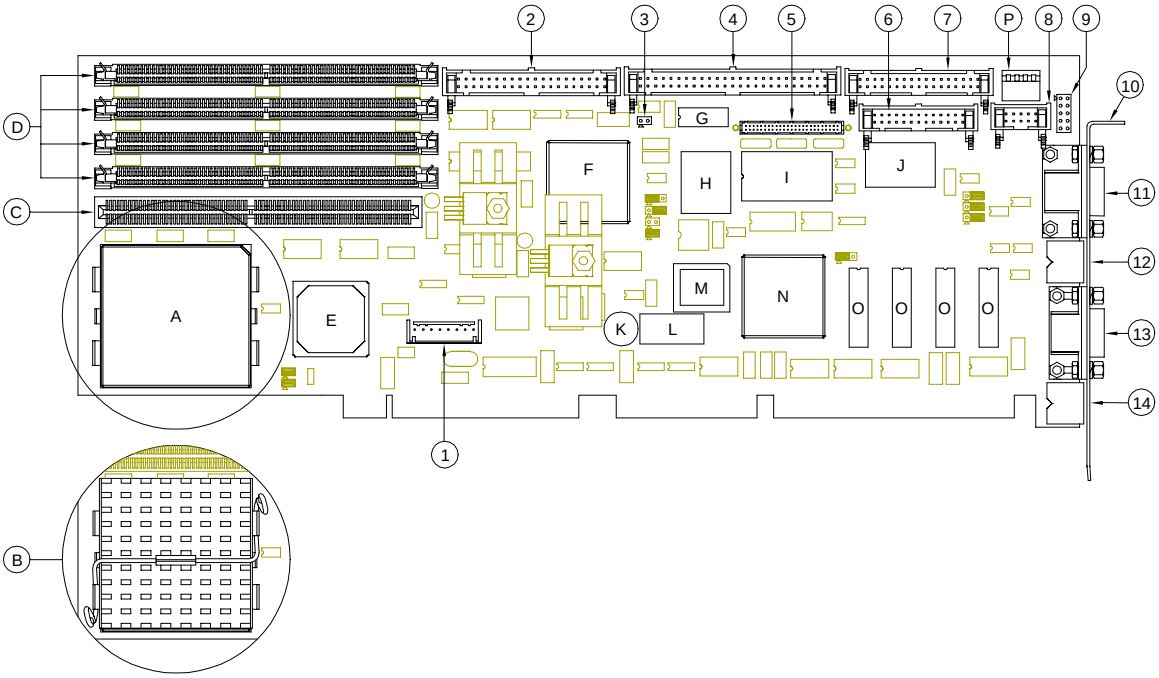
Figure 1 PV5000HX2(-M) Components and Layout



A. Intel Pentium P54C/P55C Processor
B. Pentium Processor with Heatsink
C. Level 2 SRAM Cache Socket
D. DRAM SIMM Sockets
E. Intel 82439HX System Controller (TXC, or North-Bridge)
F. Intel 82371SB PCI I/O IDE Accelerator (PIIX3, or South-Bridge)
G. Dallas DS2109 PnP SCSI Terminator
H. Adaptec AIC-7850 SCSI Host Adapter
I. Dallas DS1687 compatible Real-Time Clock
J. Intel 82091AA Advanced Integrated Peripheral (AIP)
K. Speaker
L. Flash Device
M. Auxiliary BIOS
N. CHIPS 65550 Flat Panel / CRT Accelerator
O. Video DRAM modules
P. DIP Switch Block

1. Keyboard Header
2. EIDE Drive Header
3. IDE/SCSI Activity LED Header
4. SCSI Drive Header
5. Flat Panel Display Header
6. Parallel Port Header
7. Floppy Drive Header
8. Serial Port 2 Header
9. Auxiliary VGA Video Header
10. I/O Bracket
11. Primary VGA Video Connector
12. PS/2 Mouse Connector
13. Serial Port 1 Connector
14. PS/2 Keyboard Connector

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Notes

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2 7 Steps to Operation

This chapter describes basic precautions for handling the PV5000HX2(-M).

This chapter then outlines the basic steps for setting up the SBC:

1. Check jumper settings
2. Check switch settings
3. Install the SBC
4. Attach peripheral devices to headers
5. Attach peripheral devices to connectors
6. Power-on the system
7. Run the Setup Utility

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Handling the PV5000HX2(-M)

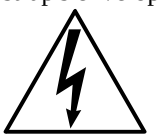
Overview

This section suggests basic precautions when handling the PV5000HX2(-M) series SBC.

Static Electricity

The PV5000HX2(-M) is designed to protect against ESD (electro-static discharge) and excessive voltage. However, excessive static electricity can damage components.

Before you handle the SBC, use the grounding wrist strap provided with the system to discharge static electricity. Instructions for using the wrist strap are printed on the strap's envelope.

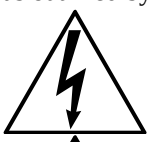


Always handle the SBC by the edges to help prevent accidental damage that can be caused by static discharge (Figure 2).

Safety

It is important to protect yourself and your equipment before you perform any of the procedures outlined in this manual.

You should check the configuration before you install the SBC. If the SBC is already installed in your system and you need to change the configuration, power-off the system and disconnect all power cords from their source. Follow all safety precautions as outlined by the chassis manufacturer.



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

Only qualified, experienced electronics personnel should access the interior of the chassis and handle the equipment.

Next...

Before you install the SBC in a chassis, check the following:

- Jumper settings, outlined in Step 1, page 8
- DIP switch settings, outlined in Step 2, page 10

Pay particular attention to the switch settings. The jumper settings are preconfigured at the factory and are appropriate for most applications.

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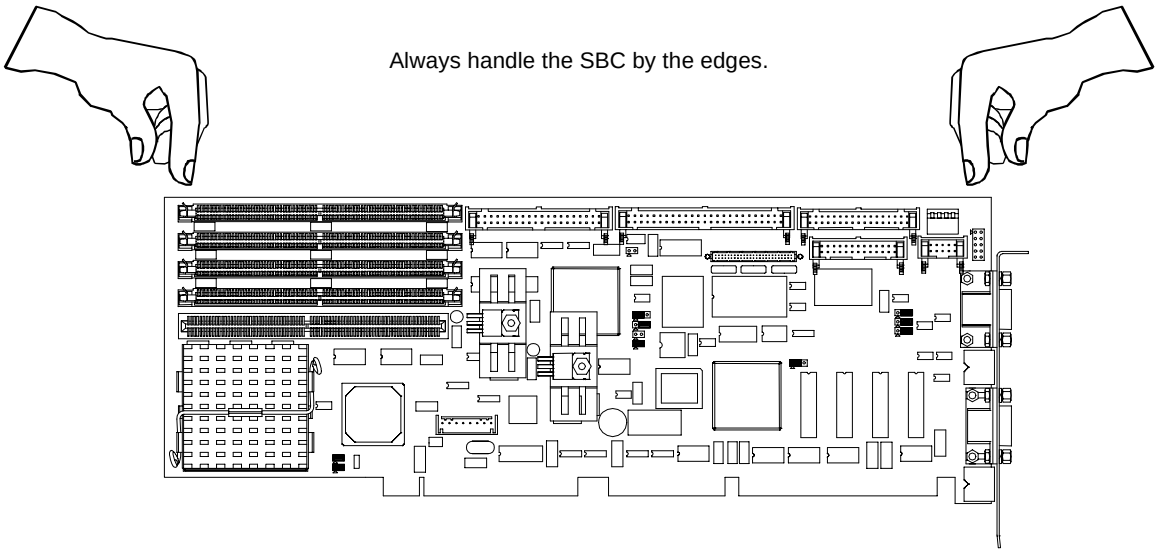
Figure 2 Safely Handling the SBC



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Step 1: Check Jumper Settings

Overview

Before you install the PV5000HX2(-M) onto a passive backplane in a chassis, check the jumper settings on the SBC (Figure 3).

Definition

A *Jumper* is a small "bridge" that connects two pins on a Jumper Block. The position of a jumper affects the device's operational parameters.

Jumper Blocks

The PV5000HX2(-M) contains:

- Four (4) two-pin jumper blocks (JP1, JP2, JP11, and JP12)
- Six (6) three-pin jumper blocks (JP3, JP4, JP5, JP6, JP8, and JP10)

Settings

Settings for the jumper blocks are provided in the following tables:

2-Pin Jumper Blocks

JP1	JP2	Host Bus Speed
None	1—2	66.6 MHz (default)
1—2	None	60.0 MHz
1—2	1—2	50.0 MHz

	JP11	JP12	Bus/Core Ratio†	CPU Speed
PV5000HX2	None	None	2/3	100 MHz
	None	1—2	1/2	133 MHz
	1—2	1—2	2/5	166 MHz
PV5000HX2-M	1—2	1—2	2/5	166 MHz
	1—2	None	1/3	200 MHz
	None	None	1/5	233 MHz

†The Bus Core Ratio is based on the Host Bus Speed at 66.6MHz.

3-Pin Jumper Blocks

JP3	Panel Shift Clock	
	1—2	Normal (default)
	2—3	Inverted

JP5	Next Step OS Configuration	
	1—2	Use this setting when running Next Step OS and experiencing problems with PS/2 mouse
	2—3	Normal Operation (default)

JP4, JP6, JP8	Serial 2 Configuration	
	1—2	RS-422
	2—3	RS-232 (default)

JP10	Panel Voltage Interface	
	1—2	5 V (default)
	2—3	3.3 V

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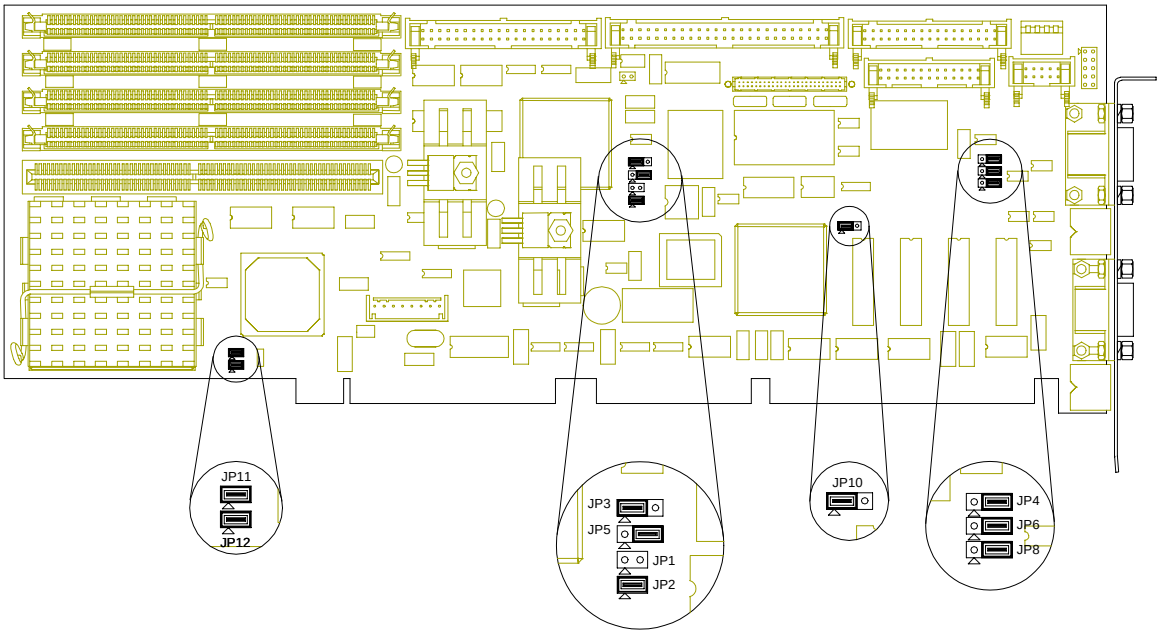
Figure 3 Jumper Block Locations



	Jumpers	Function
2-Pin	JP1, JP2	Host Bus Speed
	JP11, JP12	CPU Speed
3-Pin	JP3	Panel Shift Clock
	JP5	Next Step OS Configuration
	JP4, JP6, JP8	Serial Port 2 Configuration
	JP10	Panel Voltage Interface

To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Step 2: Check Switch Settings

Overview

After you check the jumper settings, check the switch block on the PV5000HX2(-M) for proper settings (Figure 4).

Switch Block

The switch block contains four (4) DIP switches that you can configure to affect the following items:

- Default monitor type
- On-board ROM access
- CMOS RAM
- Configuration ports

Settings

Settings for the switches are provided in the following table:

SW1-1	**Default Monitor Type**	
	Open	Monochrome monitor
	Closed (default)	Color monitor
SW1-2	**On-Board ROM Access**	
	Open (default)	Flash memory enabled; auxiliary ROM mode disabled
	Closed	Flash memory disabled; auxiliary ROM mode enabled
SW1-3	**CMOS RAM**	
	Open (default)	Normal operation of CMOS RAM
	Closed	Factory default values for the Setup Utility are loaded into CMOS RAM
SW1-4	**Configuration Ports**	
	Open (default)	Configuration ports are mapped to I/O address 270/271
	Closed	Configuration ports are mapped to I/O address 370/371

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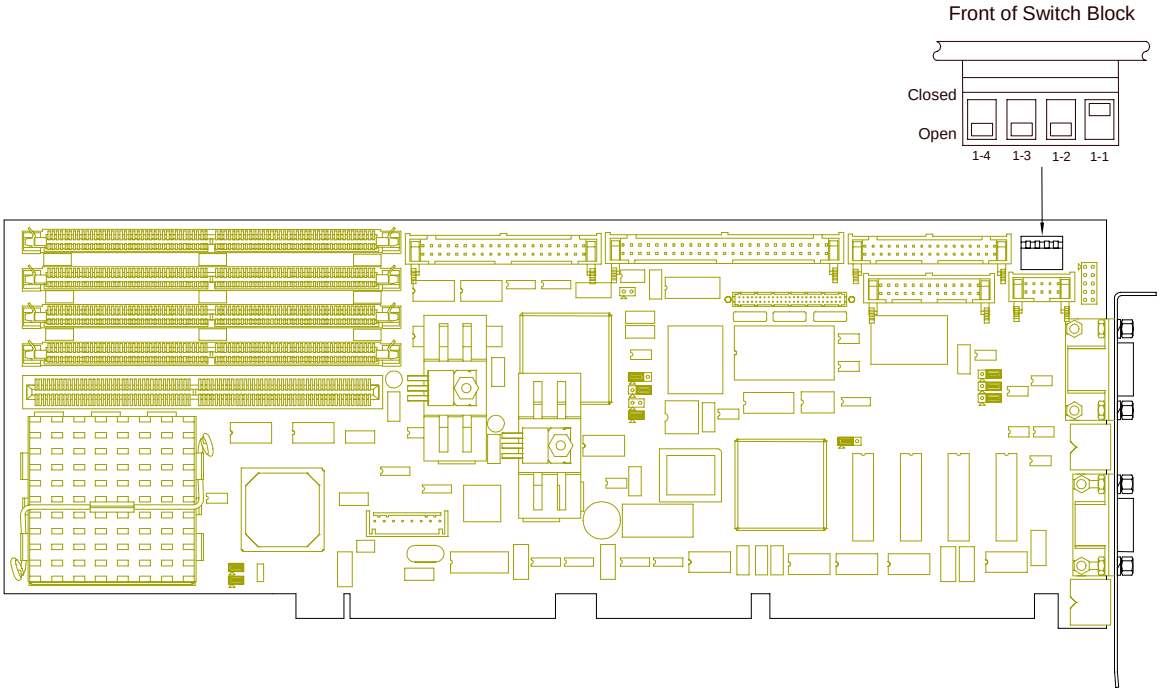
Figure 4 Switch Block Location



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Step 3: Install the SBC

Overview

Before you connect any peripheral devices to the PV5000HX2(-M), install the SBC onto a passive backplane in a chassis (Figure 5).

Procedure

The procedure for installing the SBC is outlined in the following table:

Step	Action
1	Power-off the system and disconnect all power cords. **Note:** Use the grounding wrist strap provided with the system to discharge static electricity.
2	Remove the chassis cover.
3	Detach the circuit card hold-down bracket (if required). This bracket reaches across the tops of the circuit cards and holds them in place.
4	Locate the “Platform” or “CPU” slot on the passive backplane. **Note:** The SBC will not function to its fullest capabilities if it is not installed in the proper slot. For example, if installed in an ISA slot, the SBC will operate, but it will not be able to communicate with 3rd party PCI devices.
5	Remove the I/O bracket spacer from the rear of the chassis (if required). This spacer occupies the area where the SBC’s I/O bracket is accessed from the rear of the chassis.
6	Insert the SBC into the chassis with the card edge aligned in the card-end slot and the I/O bracket in the chassis I/O slot. Lower the SBC to the “Platform” or “CPU” slot on the backplane. Carefully push the SBC connectors into the slot on the backplane. Ensure that the I/O bracket is accessible through the rear of the chassis.
7	Secure the I/O bracket to the fastening lip on the chassis.
Note: To install the PV5000HX2(-M) onto a passive backplane not manufactured by Texas Micro, follow the instructions provided by the manufacturer.	

If the SBC is installed into a chassis not manufactured by Texas Micro, a custom cable might be needed to adapt the keyboard header to the wiring in the chassis. Texas Micro does *not* provide such a cable.

The SBC requires a minimum airflow of 200 linear feet per minute (LFM) unimpeded across the CPU within 0 to 60 °C (32 to 140 °F) ambient temperature. Operations outside these specifications could void the warranty.

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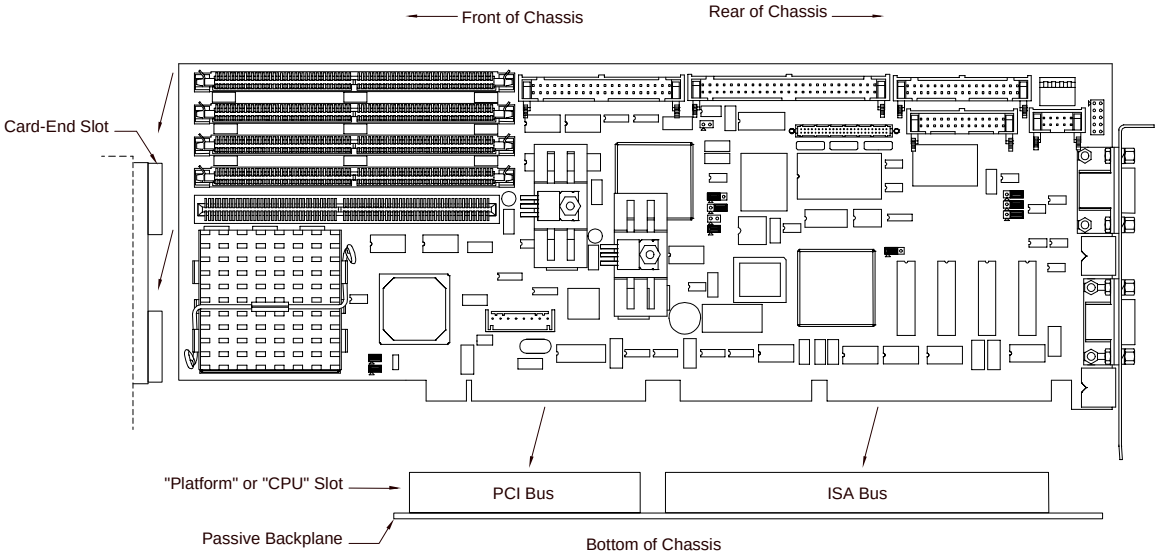
Figure 5 Installing the SBC



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To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Step 4: Attach Peripherals to Headers

Overview

After you have installed the PV5000HX2(-M) onto a passive backplane in a chassis, attach the necessary peripheral devices to the appropriate headers on the SBC (Figure 6).

SCSI Drive

Up to seven (7) SCSI devices can be attached to this header via a 50-conductor flat cable in a daisy-chain configuration.

EIDE Drive

Two (2) EIDE (backwards-compatible with IDE) hard disk drives can be attached to this header via a 40-conductor flat cable.
Note: The "red stripe" on the cable should be near Pin 1 on the header.

The BIOS will support up to four (4) IDE drives. To use 3 or 4 drives, a 2nd controller is required. The 2nd controller must be configured to use IRQ15 and I/O Ports 170-177h.

IDE/SCSI Activity LED

This header connects the IDE or SCSI drive activity LED cable to the SBC.
Note: Pin 1 is the anode; Pin 2 is the cathode.

FDD

Two (2) floppy disk drives can be attached to this header via a 34-conductor flat cable.
Note: The "red stripe" on the cable should be near Pin 1 on the header.

Parallel Port

The parallel port:

- Provides a Centronics-compatible printer interface
- Supports AT-compatible/bi-directional/EPP/ECP operations.

Note: The "red stripe" on the cable should be near Pin 1 on the header.

Keyboard

An AT or PS/2 keyboard can be attached to this header with an appropriate 8-pin cable.
Note: The sockets on the Texas Micro keyboard header cable are numbered in reverse order when compared to the pinout of the keyboard header on the SBC.

Serial Port 2

A serial device can be attached to this header (16550-compatible) via a 10-conductor flat cable. If connecting a serial mouse, be sure to use a shielded cable.
Note: The "red stripe" on the cable should be near Pin 1 on the header.

Improperly connecting the cable to this header can cause damage to the cable, SBC, and external serial device, and could void the warranty.

Flat Panel Display

A flat panel display such as a back-lit LCD can be attached to this header via a 50-conductor flat cable.
Note: For more information on the display system, see page 36.

Auxiliary VGA Video

An auxiliary VGA video display device can be attached to this header via a 10-conductor cable.

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Figure 6 Peripheral Header Locations

1. Keyboard
2. EIDE Drive
3. IDE/SCSI Activity LED
4. SCSI Drive
5. Flat Panel Display
6. Parallel Port
7. Floppy Drive
8. Serial Port 2
9. Auxiliary VGA Video

To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

For pin signals and positions, see page 30.
For information on the display system, see page 36.

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Step 5: Attach Peripherals to Connectors

Overview

After you have attached peripheral devices to the headers on the PV5000HX2(-M), attach devices to connectors on the SBC (Figure 7).

To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before connecting or disconnecting any cables for the equipment.

VGA Video

This 15-pin connector provides a standard VGA system interface.

Serial Port 1

This serial port (16550-compatible) is a DB-9 male connector.

Keyboard

A PS/2 keyboard can be attached to this connector.

Mouse

A PS/2 mouse can be attached to this connector.

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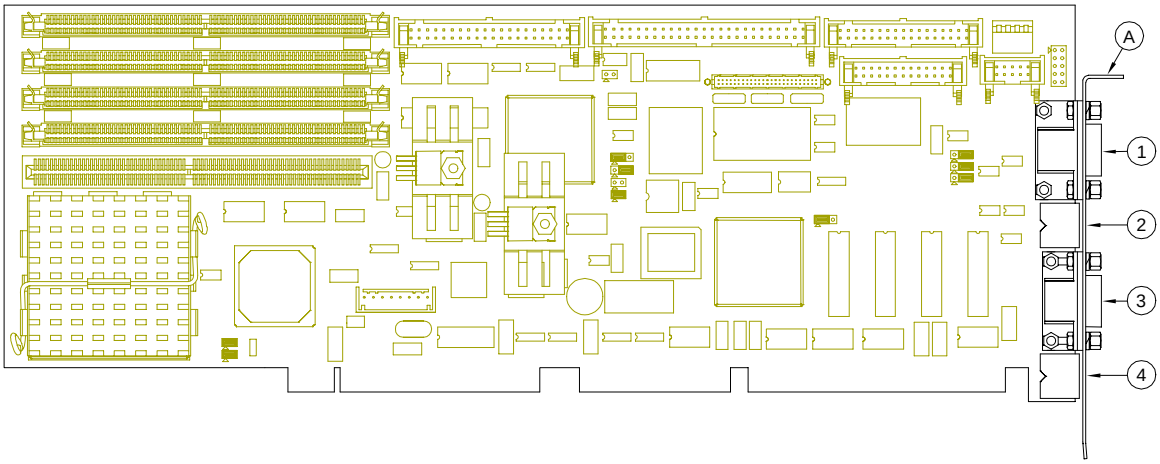
Figure 7 Peripheral Connector Locations



A. I/O Bracket

1. VGA Video
2. PS/2 Mouse
3. Serial Port 1
4. PS/2 Keyboard

To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

For pin signals and positions, see page 30.
For information on the display system, see page 36.

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Step 6: Power-On the System

Overview

After you have installed the PV5000HX2(-M) and connected all devices, power-on the system.

No Power

If the system does not power-on, check all power connections and the power source.

If power connections are secure and the power source is adequate, contact Technical Support at (800) 627-8700 or (713) 541-8200 between 7:00 a.m. and 6:00 p.m., Central Time, USA. For more information, see “Customer Support,” page v.

Startup

After you power-on the system, it will:

- Execute the Power-On Self Test (POST) to ensure that the system is functional and properly configured
- Start the operating system

Setup

During the POST, you can access the Setup Utility (Figure 8) to configure the system.

Before using the SBC for the first time, you should verify the system settings in the Setup Utility. See page 20.

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Figure 8 Setup Utility Main Menu

```
                    Texas Micro Inc. Setup Utility
  Main   Advanced   Security   Power   Boot   Server   Exit
┌──────────────────────────────────────────────────────┬──────────────────────┐
                                                       │ Item Specific Help   │
  System Time:          [17:00:21]                     ├──────────────────────┤
  System Date:          [04/09/1998]                   │                      │
  Diskette A:           [1.44 MB, 3½"]                 │ <Tab>, <Shift-Tab>, or
  Diskette B:           [Disabled]                     │ <Enter> selects field.
▷ IDE Adapter 0 Master  [Maxtor 7541A]                 │
▷ IDE Adapter 0 Slave   [CD-ROM]                       │
▷ IDE Adapter 1 Master  [None]                         │
▷ IDE Adapter 1 Slave   [None]                         │
  Video System          [EGA/VGA]                      │
▷ Cache Memory                                         │
▷ Boot Options                                         │
▷ Keyboard Features                                    │
                                                       │
  System Memory:        640 KB                         │
  Extended Memory:      7168 MB                        │
└──────────────────────────────────────────────────────┴──────────────────────┘
 F1  Help   ↑↓ Select Item   -/+   Change Values        F9  Setup Defaults
 ESC Exit   ←→ Select Menu   Enter Select ▷ Sub-Menu    F10 Previous Values
```


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Step 7: Run the Setup Utility

Overview

The BIOS (**B**asic **I**nput/**O**utput **S**ystem) Setup Utility allows you to configure the operations of the PV5000HX2(-M).

Access

To access the Setup Utility, press **F2** when prompted during the Power-On Self Test (POST).

Main Menu

The Setup Utility display (Figure 8) contains two areas:

1. Options: The options for the current menu are on the left side of the screen
2. Item Specific Help: Instructions for the current item are on the right side

Menus

The Setup Utility contains a toolbar at the top of the screen that allows you to access the following menus:

- Main
- Advanced
- Security
- Power
- Boot
- Server
- Exit

Options and items for these menus are listed in the tables beginning on page 21.

Boot and Exit

The Boot and Exit menus do not have “default” values. Items for these menus are *not* included in the tables below.

Operation

Use the following keys to operate the Setup Utility:

Key	Action
Up Arrow (↑) and Down Arrow (↓)	Select a menu item
Left Arrow (←) and Right Arrow (→)	Select a menu
Plus (+) and Minus (-)	Change the value of an item
Enter	Access a sub-menu (when an item with the sub-menu character ▹ is highlighted)
F1	Access Help for the Setup Utility
F9	Load default values for the setup options
F10	Cancel the changes you have made and load the previous values for the setup options
Esc	Access the Exit menu

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Main Menu

The options and item values for the Main menu are listed in the table below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
System Time	N/A	Current Time in Hours, Minutes, and Seconds	N/A
System Date	N/A	Current Date in Month, Day, and Year	N/A
Diskette A	N/A	1.44/1.25 MB 3½”	Disabled, 720 KB 3½”, 2.88 MB 3½”, 360 KB 5¼”, 1.2 MB 5¼”
Diskette B	N/A	Disabled	720 KB 3½”, 1.44/1.25 MB 3½”, 2.88 MB 3½”, 360 KB 5¼”, 1.2 MB 5¼”
▹ IDE Adapter 0 / 1 Master / Slave	Type	Auto (all 4 possible devices)	User, 1-39, CD-ROM, ATAPI Removable, IDE Removeable, Other ATAPI, None
		Note: If Type is set to Auto, the only option available will be 32-Bit I/O.	
	• Cylinders • Heads • Sectors • Maximum Capacity (Display only)	Enter a value	N/A
	Multi-Sector Transfers	16 Sectors	Disabled, 2 Sectors, 4 Sectors, 8 Sectors
	LBA Mode Control	Disabled	Enabled
	32-Bit I/O	Disabled	Enabled
	Transfer Mode	Fast PIO 4	Standard, Fast PIO 1, Fast PIO 2, Fast PIO 3, FPIO 3 / DMA 1, FPIO 4 / DMA 2
▹ Cache Memory	Memory Cache	Disabled	Enabled
	Cache System BIOS Area	Enabled	Disabled
	Cache Video BIOS Area	Disabled	Enabled
	Cache C800—DFFF	Disabled (all regions)	Enabled
▹ Boot Options	Summary Screen	Enabled	Disabled
	Floppy Check	Enabled	Disabled
	Quiet Boot (Graphics)	Disabled	Enabled
	POST Errors	Enabled	Disabled
	Show Setup Entry Msg.	Enabled	Disabled
	Drive Autotype Pre-Delay	No Delay	3 sec, 6 sec, 9 sec, 12 sec, 15 sec, 21 sec, 30 sec
▹ Keyboard Features	Numlock	Off	On, Auto
	Key Click	Enabled	Disabled
	Keyboard Auto-Repeat Rate	30/sec	26.7/sec, 21.8/sec, 18.5/sec, 13.3/sec, 10/sec, 6/sec, 2/sec
	Keyboard Auto-Repeat Delay	1/2 sec	1/4 sec, 3/4 sec, 1 sec

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Main

The items for the Main menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
System Memory	N/A	Display only	N/A
Extended Memory	N/A	Display only	N/A

Advanced

The options and item values for the Advanced menu are listed in the table below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
▹ Integrated Peripherals	Serial Port A	Enabled (user configures)	Disabled (no configuration), Auto (BIOS or OS selects), OS Controlled (OS selects)
	Serial Port A: Base I/O Address	3F8	2F8, 3E8, 2E8, 220, 228, 238, 338
	Serial Port A: Interrupt	IRQ 4	IRQ 3
	Serial Port B	Enabled	Disabled, Auto, OS Controlled
	Serial Port B: Base I/O Address	2F8	3F8, 3E8, 2E8, 220, 228, 238, 338
	Serial Port B: Interrupt	IRQ 3	IRQ 4
	Parallel Port	Enabled	Disabled, Auto, OS Controlled
	Parallel Port: Mode	Output Only (ISA)	Bi-Directional
	Parallel Port: Base I/O Address	378	278, 3BC
	Parallel Port: Interrupt	IRQ 7	IRQ 5
	Floppy Disk Controller	Enabled	Disabled
	Floppy Disk Controller: Base I/O Address	Primary	Secondary
▹ Advanced Chipset Control	DRAM Speed	70 ns	60 ns
	ECC / Parity Config	Parity	Disabled, ECC
		Note: The ECC option functions only if Parity/FPM SIMM's are installed.	
	Enable Memory Gap	Disabled	Hole at 512 K — 640 K, Hole at 14 MB — 16 MB, Hole at 15 MB — 16 MB
	Alias ISA at 512—528 MB	Disabled	Enabled
	DMA Aliasing	Disabled	Enabled
	8-Bit I/O Recovery	4.5	3.5, 5.5, 6.5, 7.5, 8.5, 9.5, 10.5, 11.5
	16-Bit I/O Recovery	4.5	3.5, 5.5, 6.5, 7.5
	ISA Bus Speed	PCI Clock ÷ 4 [8.33 MHz]	PCI Clock ÷ 3 [11 MHz]
	Watchdog Timer Status	Disabled	Enabled
	Watchdog Timer Delay	1.2 sec	150 ms
	ISA Bus GAT	Disabled	Enabled
		Note: ISA cards that use DMA may require this function.	
	PCI Delayed Transactions	Enabled	Disabled
		Note: Disable this feature if floppy errors occur with a multitasking OS.	

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Advanced

The items for the Advanced menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
▹ PCI Devices	PCI IRQ Line 1	9 (Open)	Auto Select, Disabled, 3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT), 7 (1st LPT), 10 (Open), 11 (Open), 12 (PS/2 Mouse), 14 (Primary IDE), 15 (Secondary IDE)
	PCI IRQ Line 2	10 (Open)	Auto Select, Disabled, 3, 4, 5, 7, 9, 11, 12, 14, 15
	PCI IRQ Line 3	11 (Open)	Auto Select, Disabled, 3, 4, 5, 7, 9, 10, 12, 14, 15
	PCI IRQ Line 4	15 (Secondary IDE)	Auto Select, Disabled, 3, 4, 5, 7, 9, 10, 11, 12, 14
	ISA Graphics Device Installed	No	Yes
	Cache Line Size	Auto (4)	8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64
	Latency Timer	Auto (64)	32, 64, 96, 128, 160, 196, 224
	PCI/PNP ISA UMB Region Exclusion: C800—CBFF, CC00—CFFF, D000—D3FF, D400—D7FF, D800—DBFF, DC00—DFFF	Available (all regions)	Reserved
	PCI/PNP ISA IRQ Resource Exclusion: IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 9, IRQ 10, IRQ 11, IRQ 15	Available (all interrupts)	Reserved
▹ Embedded PCI Devices	Embedded C&T PCI VGA	Enabled	Disabled
	C&T Video Output	Dual Output	Analog Only, Panel Only
	Local Bus IDE Adapter	Enabled	Disabled
	Embedded Adaptec SCSI	Disabled	Enabled
	Embedded SCSI Clock	33 MHz	40 MHz
PS/2 Mouse	N/A	Disabled	Enabled
Onboard Speaker	N/A	Enabled	Disabled
Plug & Play O/S	N/A	Yes	No
Secured Setup Configuration	N/A	No	Yes
Large Disk Access Mode	N/A	DOS	Other

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Security

The options and item values for the Security menu are listed in the table below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
Supervisor Password Is	N/A	Clear / Set (Display only)	N/A
User Password Is	N/A	Clear / Set (Display only)	N/A
Set Supervisor Password	N/A	Enter a value	N/A
Set User Password	N/A	Enter a value	N/A
Password on Boot	N/A	Disabled	Enabled
Fixed Disk Boot Sector	N/A	Normal	Write Protect
Diskette Access	N/A	Supervisor	User
Virus Check Reminder	N/A	Disabled	Daily, Weekly, Monthly
System Backup Reminder	N/A	Disabled	Daily, Weekly, Monthly

Power

The options and item values for the Power menu are listed in the table below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
Power Savings	N/A	Disabled	Customized, Maximum Power Savings, Maximum Performance
	Note: If this feature is disabled, Standby, Auto Suspend, Hard Disk, and Video Timeouts will be disabled. **Note:** The following table lists preset options:		

Feature	Maximum Power Savings	Maximum Performance
Standby Timeout	1 Minute	16 Minutes
Auto Suspend Timeout	5 Minutes	60 Minutes
Hard Disk Timeout	10 Seconds	15 Minutes
Video Timeout	10 Seconds	15 Minutes

Standby Timeout	N/A	Off	1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 12 Minutes, 16 Minutes
Auto Suspend Timeout	N/A	Off	5 Minutes, 10 Minutes, 15 Minutes, 20 Minutes, 30 Minutes, 40 Minutes, 60 Minutes
Hard Disk Timeout	N/A	Disabled	10 Seconds, 15 Seconds, 30 Seconds, 45 Seconds, 1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 10 Minutes, 15 Minutes

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Power

The items for the Power menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
Video Timeout	N/A	Disabled	10 Seconds, 15 Seconds, 30 Seconds, 45 Seconds, 1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 10 Minutes, 15 Minutes
Resume on Modem Ring	N/A	Off	On
Resume on Time	N/A	Off	On
Resume Time	N/A	00:00:00 (24-hour clock)	N/A
▹ Advanced Options	IRQ 1	Enabled	Disabled
	IRQ 3, IRQ 4, IRQ 5, IRQ 6, IRQ 7, IRQ 8, IRQ 9, IRQ 10, IRQ 11, IRQ 12, IRQ 13, IRQ 14, IRQ 15	Disabled (all interrupts)	Enabled
	SMI / NMI	Disabled (both options)	Enabled

Server

The options and item values for the Server menu are listed in the table below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
Console Redirect Port	N/A	Disabled	3F8 IRQ 4 (COM 1), 2F8 IRQ 3 (COM 2), 3E8 IRQ 4 (COM 3), 2E8 IRQ 3 (COM 4), 3F8 IRQ 3, 2F8 IRQ 4, 3E8 IRQ 3, 2E8 IRQ 4
Console Redirect Baud Rate	N/A	9600	19200, 38400, 56000

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Notes

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3 Technical Data

This chapter provides the following:

- System specifications and environmental tolerances
- Pin positions and signal listings for all headers and connectors
- Information on the display system
- Notes on installing memory modules

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Specifications

Overview

Listed in the table below are system specifications and environmental tolerances for the PV5000HX2(-M) series SBC.

Note: These specifications are subject to change without notice.

Environmental

Environmental tolerances are listed in the following table:

Temperature **Note:** See page 29.	Operating: 0 to +60 °C (32 to 140 °F) Non-Operating: -40 to +70 °C (-40 to 158 °F)
Humidity	Operating: 5 — 95% @ 40 °C, non-condensing Non-Operating: 0 — 95% @ 40 °C, non-condensing
Shock	Operating: 1.25 G @ 10 ms (10 G @ 11 ms in appropriate chassis) Non-Operating: 30 G @ 10 ms (40 G @ 11 ms in appropriate chassis)
Vibration	Operating: .25 G @ 5 — 100 Hz Non-Operating: 5 G @ 5 — 100 Hz
Altitude	Operating: 15,000 ft (4,572 m) Non-Operating: 50,000 ft (15,240 m)

System

System specifications are listed in the following table:

CPU	• 100, 133, 166 MHz Intel™ Pentium® Processor • 166, 200, or 233 MHz Pentium Processor with MMX™ Technology
Chipset	Intel 430HX PCIset
Cache	256 KB or 512 KB Level 2 write-back cache: Zero wait state at 66 MHz 8 ns synchronous pipeline burst COAST RAM
Memory	Four 72-pin sockets organized in two banks, supporting: Up to 256 MB 1/2/4/8/16 x 32/36, 60/70 ns, Fast Page Mode DRAM SIMM's Parity/FPM or Non-Parity ECC or EDO Single bit error correction, double bit detection (ECC mode only)
Addressing	Real and protected mode supported Real address mode: 20-bit Protected address mode: 16-bit on ISA bus, 32-bit on PCI local bus
Data Path	64-bit on board: 16-bit on ISA bus, 32-bit on PCI local bus
Flash Memory	2 Mb (256 KB x 8)
Clock/Calendar	DS1287-compatible Real-Time Clock accurate to +/- 12 minutes/year, at 25 °C; includes CMOS
Power Requirements w/ 8—256 MB DRAM (Excludes requirements for flat panel device)	Input Power 21 — 35 W +5 V 4.3 — 7.0 A +12 V 0.1 A -12 V 0.1 A
Form Factor	13.28" (33.73 cm) x 4.80" (12.19 cm)

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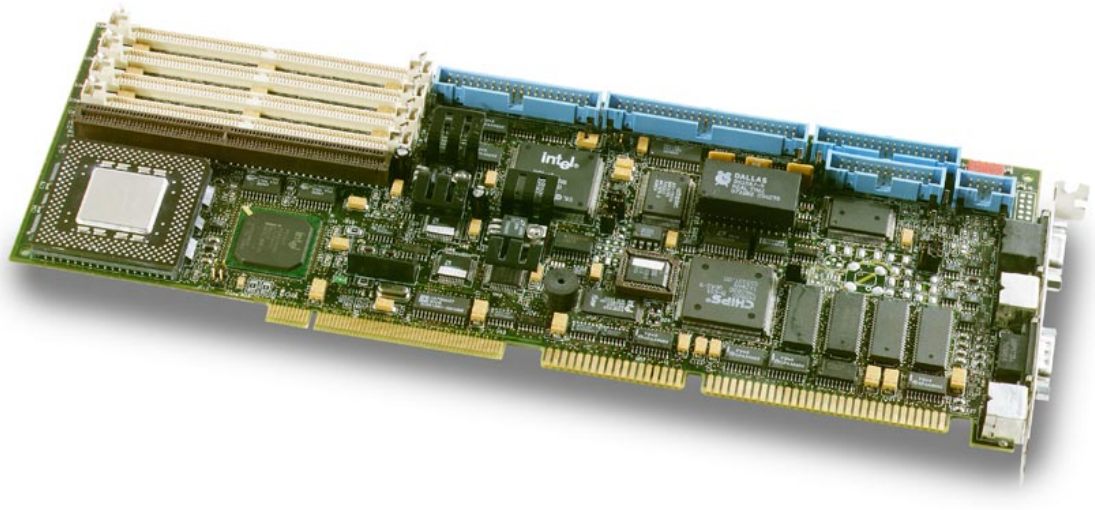
Figure 9 The PV5000HX2(-M) Series SBC



A Note on Thermal Specifications

The technology and power density of the microprocessor is rapidly increasing. The 80386 required less than a few hundred milliamps of current. The 80486DX4 peaked at less than 1.5 A and typically dissipated less than 5 watts of power. The 233 MHz Pentium® processor with MMX™ technology requires up to 6.5 A and dissipates as much as 17 W. Power levels have finally increased to a level that greatly affects the ability of the equipment to effectively dissipate energy.

Texas Micro is continually working to ensure that its products will conform to thermal specifications. However, we can only work within known or anticipated hardware and software configurations. One peripheral device installed within a chassis can significantly alter operating temperature. Also, software applications can cause as much as 20 °C variation. Even the cable layout within the chassis can affect airflow and thereby performance.

Texas Micro validates the operating specifications of its products by testing with the “hottest” possible hardware and software configuration, that will maximize the power supply draw and generate a worst-case scenario. However, despite these efforts, the specifications are only benchmarks and should be regarded as such.

The SBC requires a minimum airflow of 200 linear feet per minute (LFM) unimpeded across the CPU within 5 to 60 °C (41 to 140 °F) ambient temperature. Operations outside these specifications could void the warranty.

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Pin Signals

Overview

The tables below list the pin signals for the serial and parallel ports. The following illustration (Figure 10) indicates the pin positions for each.

Serial Port 1	
RS-232	
Pin	**Description**
1	Data Carrier Detect (In)
2	Receive Data (In)
3	Transmit Data (Out)
4	Data Terminal Ready (Out)
5	Ground
6	Data Set Ready (In)
7	Request to Send (Out)
8	Clear to Send (In)
9	Ring Indicator (In)

Serial Port 2				
RS-232		RS-422		
Pin	**Description**	**Pin**		**Description**
		DB9	**10-Pin**	
1	Data Carrier Detect (In)			
2	Data Set Ready (In)	1	1	/Z Output (TX-)
3	Receive Data (In)	6	2	/B Receive (RX-)
4	Request to Send (Out)	2	3	Y Output (TX+)
5	Transmit Data (Out)	8	6	A Receive (RX+)
6	Clear to Send (In)			
7	Data Terminal Ready (Out)			
8	Ring Indicator (In)			
9	Ground			
10	+5V (Optional)			

To connect two RS-422 devices, use a shielded twisted-pair (STP) cable no longer than 4,000 feet, configured as listed below:

Machine A Pin Signal		Machine B Pin Signal
/Z Output (TX-)	⟷	/B Receive (RX-)
Y Output (TX+)	⟷	A Receive (RX+)
/B Receive (RX-)	⟷	/Z Output (TX-)
A Receive (RX+)	⟷	Y Output (TX+)

Parallel Port			
Pin	**Description**	**Pin**	**Description**
1	- Strobe	15	Data Bit 6
2	- Auto Feed	17	Data Bit 7
3	Data Bit 0	19	- Acknowledge
4	- Error	21	+ Busy
5	Data Bit 1	23	+ Paper Feed
6	- Initialize Printer	25	+ Select
7	Data Bit 2	26	Not Connected
8	- Select Input	10, 12, 14, 16, 18, 20, 22, 24	Ground
9	Data Bit 3		
11	Data Bit 4		
13	Data Bit 5		

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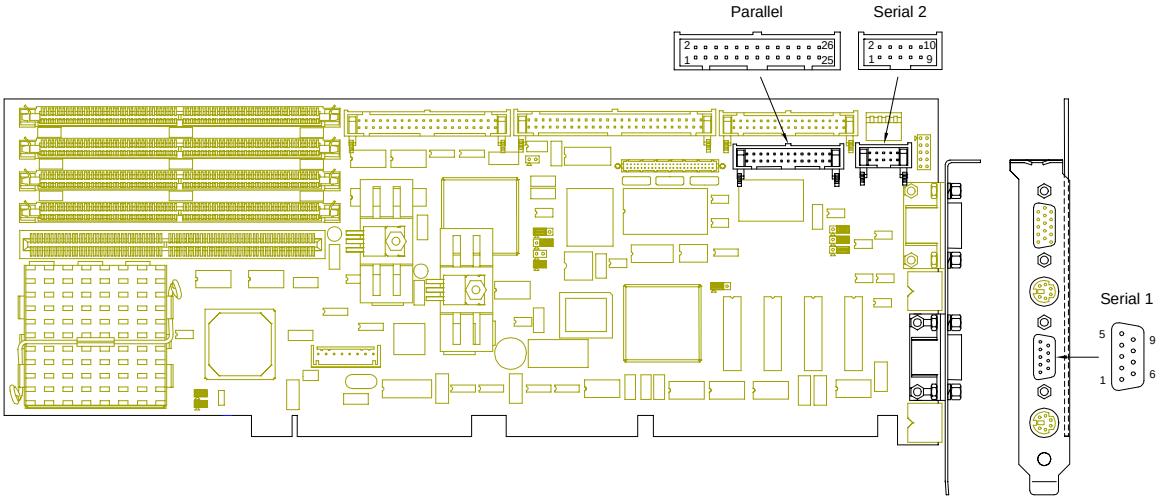
Figure 10 Serial and Parallel Headers and Connectors



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Pin Signals (continued)

Overview

The tables below list the pin signals for each peripheral header and connector. The following illustration (Figure 11) indicates the pin positions for each.

EIDE			
Pin	**Description**	**Pin**	**Description**
1	Reset (Out)	21	DMA Request (I/O)
3	Data 7 (I/O)	23	- I/O Write (Out)
4	Data 8 (I/O)	25	- I/O Read (Out)
5	Data 6 (I/O)	27	I/O Channel Ready (In)
6	Data 9 (I/O)	28	+ ALE
7	Data 5 (I/O)	29	DMA Acknowledge(Out)
8	Data 10 (I/O)	31	+ IRQ14 (In)
9	Data 4 (I/O)	32	I/O CS16 (Out)
10	Data 11 (I/O)	33	+ ADDR1 (Out)
11	Data 3 (I/O)	34	- Passed Diagnostics (In)
12	Data 12 (I/O)	35	+ ADDR0 (Out)
13	Data 2 (I/O)	36	+ ADDR2 (Out)
14	Data 13 (I/O)	37	- CS0 (Out)
15	Data 1 (I/O)	38	- CS1 (Out)
16	Data 14 (I/O)	39	Activity Light (Out)
17	Data 0 (I/O)	2, 19, 22, 24, 26, 30, 40	Ground
18	Data 15 (I/O)		
20	Not Connected		

PS/2 Mouse / Keyboard	
Pin	**Description**
1	Data
2	Not Connected
3	Ground
4	+5V
5	Clock
6	Not Connected

Keyboard	
Pin	**Description**
1	Reset
2	Ground
3	Ground
4	Keyboard Clock
5	Keyboard Data
6	Keyboard Lock
7	+5V
8	Speaker

SCSI			
Pin	**Description**	**Pin**	**Description**
2	DB0 (I/O)	46	- CD (In)
4	DB1 (I/O)	48	- REQ (In)
6	DB2 (I/O)	50	- I/O (In)
8	DB3 (I/O)	25	Open
10	DB4 (I/O)	23, 24, 27, 28	Reserved
12	DB5 (I/O)		
14	DB6 (I/O)	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 20, 21, 22, 29, 30, 31, 33, 34, 35, 37, 39, 41, 43, 45, 47, 49	Ground
16	DB7 (I/O)		
18	DBP (I/O)		
26	TERMPWR		
32	- ATN (Out)		
36	- BSY (I/O)		
38	-ACK (Out)		
40	- RST (I/O)		
42	- MSG (In)		
44	- SEL (I/O)		

VGA Video		
Pin		**Description**
15-Pin	**10-Pin**	
1	2	Red
2	4	Green
3	6	Blue
4		Not Connected
5	1	Ground
6	3	Ground
7	5	Ground
8	7	Ground
9		Not Connected
10	9	Ground
11		Not Connected
12		ID 1
13	10	Horizontal Sync
14	8	Vertical Sync
15		ID 3

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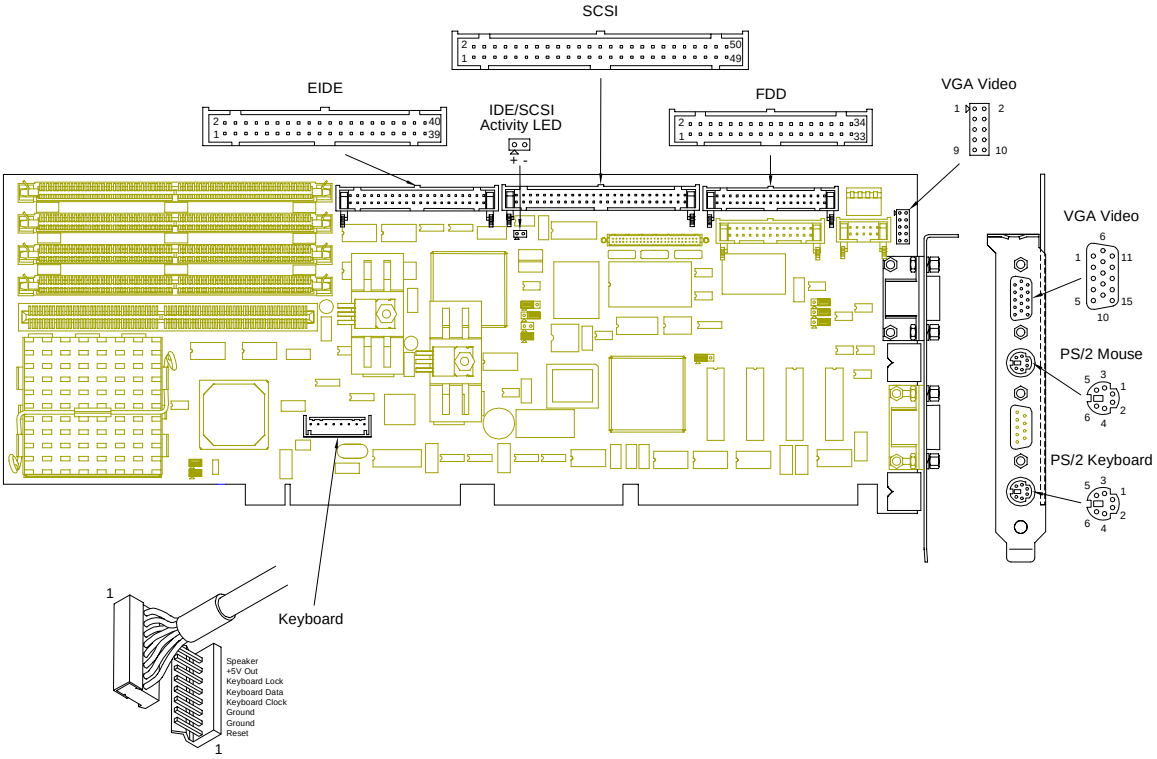
Figure 11 Peripheral Headers and Connectors



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Pin Signals (continued)

Overview

The table below lists the pin signals for the flat panel display header. A description of each signal is provided. The following illustration (Figure 12) indicates pin positions.

Flat Panel Display					
Pin	**Description**	**Pin**	**Description**	**Pin**	**Description**
1	VDD_SAFE	19	P3	39	P15
2	+12V_SAFE	21	P4	40	P14
3	VEE_SAFE (Optional)	22	P5	42	P13
4	VEE_ADJ (Optional)	24	P6	43	P12
5	ENABKL	25	P7	45	P11
6	+12V	27	P23	46	P10
8	M (Display Enable)	28	P22	48	P9
10	LP (Horizontal Sync)	30	P21	49	P8
11	FLM (Vertical Sync)	31	P20	7,9,12, 14,17,20, 23,26,29, 32,35,38, 41,44,47, 50	Ground
13	SHFCLK	33	P19		
15	P0	34	P18		
16	P1	36	P17		
18	P2	37	P16		

- **VDD_SAFE** (Output Power): Switched logic power for flat panel display. Sequences on and off with the panel digital signals to prevent panel damage. Output voltage can be set to 5.0 or 3.3 VDC with JP10. See page 8. This output is fused.†
- **+12V_SAFE** (Output Power): Switched +12 V power sequences on and off with the panel digital signals to prevent panel damage. This output is fixed at +12 V and typically powers the backlight inverter. This output is fused.†
- **VEE_SAFE** (Optional)‡: Switched liquid crystal bias voltage.
- **VEE_ADJ** (Optional)‡: External adjustment for VEE_SAFE voltage.
- **ENABLK** (Output Signal): Enable Backlight. Active high logic signal that controls an external backlight inverter.
- **+12V** (Output Power): Unswitched +12 V power. This output is fused.†
- **M** (Output Signal): M signal for AC drive control. This signal can be programmed for active low or active high operation. This signal can be used on some LCD panels to center the display.
- **LP** (Output Signal): Latch Pulse, equivalent to Horizontal Sync, can be programmed for active low or active high operation. This signal is used to transfer one or more horizontal lines of display data from from the input shift registers to the panel drive circuits.
- **FLM** (Output Signal): First Line Marker, equivalent to Vertical Sync, can be programmed for active low or active high operation. This signal is used to indicate the first active line of display data.
- **SHFCLK** (Output Signal): Shift Clock. Pixel clock for flat panel data. For EL panels, SHFCLK can be inverted by setting JP3. See page 8.
- **P0 — P23** (Output Signal): Pixel output data for 8, 9, 12, 16, 18, or 24-bit panel interfaces.

† Outputs are fused using a resettable PolySwitch. Normal output current is 1.85 A at 20 °C. Derate linearly to 1.3 A at 60 °C.
‡ This feature is not available on standard product.

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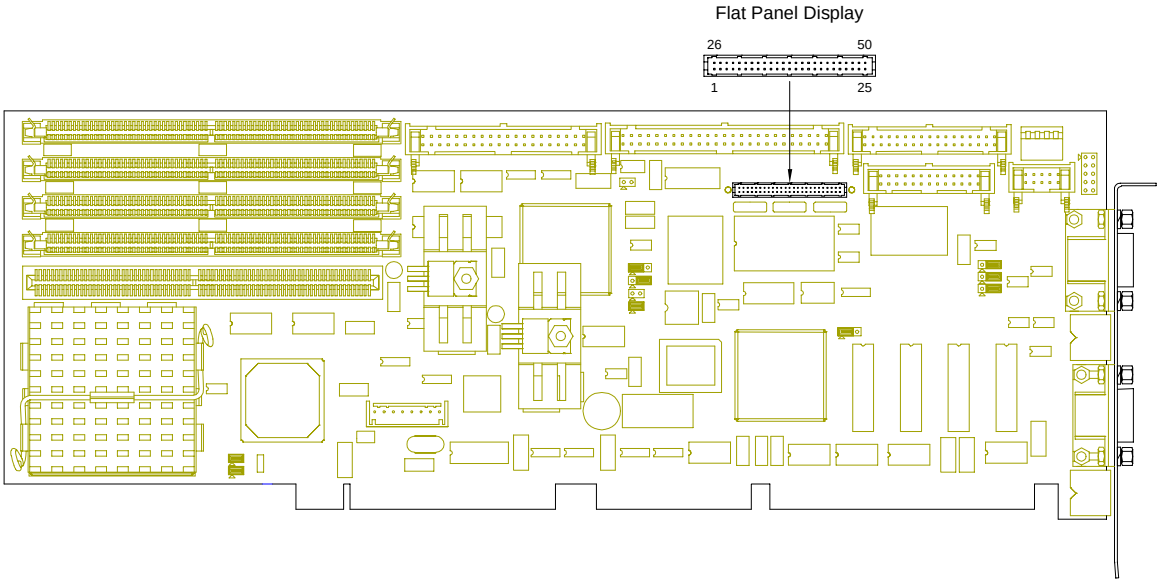
Figure 12 Flat Panel Display Header



To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

Improper wiring for this header can cause damage to the cable, SBC, and display device, and could void the warranty.

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Display System Overview

Overview

The following tables list the VGA modes and resolutions supported by the PV5000HX2(-M).

Use of a Flat Panel display may require custom configurations. For more information, see “Customer Support,” page v.

Display Resolutions

Resolution	Colors	Colors (bpp)	Refresh (Hz)	Memory (KB)
640x480	256	8	60, 72, 75, 85	604
640x480	65,536	16	60, 72, 75, 85	904
640x480	16.8 M	24	60, 72, 75, 85	1204
800x600	256	8	56, 60, 72, 75, 85	773
800x600	65,536	16	56, 60, 72, 75, 85	1242
800x600	16.8 M	24	56, 60, 72, 75, 85	1710
1024x768	256	8	43I, 56, 60, 72, 75, 85	1072
1024x768	65,536	16	43I, 56, 60, 72, 75, 85	1840
1280x1024	256	8	43I, 60, 72, 75, 85	1584

“I” = “Interlaced”

Standard VGA Modes

Video Mode	Resolution	Colors	Mode Type	Display Adapter	Font Size	Character Display	Dot Clock (MHz)	Horizontal Frequency	Vertical Frequency	Memory (KB)
00h	320x200 320x350 360x400	16 (gray) 16 (gray) 16	Text	CGA EGA VGA	8x8 8x14 9x16	40x25	25 25 28	31.5	70	256
01h	320x200 320x350 360x400	16 16 16	Text	CGA EGA VGA	8x8 8x14 9x16	40x25	25 25 28	31.5	70	256
02h	640x200 640x350 720x400	16 (gray) 16 (gray) 16	Text	CGA EGA VGA	8x8 8x14 9x16	80x25	25 25 28	31.5	70	256
03h	640x200 640x350 720x400	16 16 16	Text	CGA EGA VGA	8x8 8x14 9x16	80x25	25 25 28	31.5	70	256
04h	320x200	4	Graphics	All	8x8	40x25	25	31.5	70	256
05h	320x200 320x200 320x200	4 (gray) 4 (gray) 4	Graphics	CGA EGA VGA	8x8 8x8 8x8	40x25	25 25 25	31.5	70	256
06h	640x200	2	Graphics	All	8x8	80x25	25	31.5	70	256
07h	720x350 720x350 720x400	Mono Mono Mono	Text	MDA EGA VGA	9x14 9x14 9x16	80x25	28 28 28	31.5	70	256
08h—0Ch	Reserved									
0Dh	320x200	16	Graphics	E/VGA	8x8	40x25	25	31.5	70	256
0Eh	640x200	16	Graphics	E/VGA	8x8	80x25	25	31.5	70	256
0Fh	640x350	Mono	Graphics	E/VGA	8x14	80x25	25	31.5	70	256
10h	640x350	16	Graphics	E/VGA	8x14	80x25	25	31.5	70	256
11h	640x480	2	Graphics	VGA	8x16	80x30	25	31.5	60	256
12h	640x480	16	Graphics	VGA	8x16	80x30	25	31.5	60	256
13h	320x200	256	Graphics	VGA	8x8	40x25	25	31.5	70	256

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Extended VGA Modes

Video Mode	VESA® VBE Mode	Resolution	Colors	Mode Type	Font Size	Character Display	Dot Clock (MHz)	Horizontal Frequency	Vertical Frequency	Memory (KB)
20h	120	640x480	16	GraphicsL	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	256
22h	122	800x600	16	GraphicsL	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	256
24h	124	1024x768	16	GraphicsL	8x16	128x48	44.9 65 78.75 94.5	35.5 48.4 60 68.7	43I 60 75 85	384
28h	128	1280x1024	16	GraphicsL	8x16	160x64	78.75 108	47 64	43I 60	640
2Ah†	——	1600x1200	16	GraphicsL	8x16	200x75	——	——	——	938
30h	101h	640x480	256	GraphicsL	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	300
31h	100h	640x480	256	GraphicsL	8x16	80x25	25.175	31.5	70	256
32h	103h	800x600	256	GraphicsL	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	469
34h	105h	1024x768	256	GraphicsL	8x16	128x48	44.9 65 78.75 94.5	35.5 48.4 60 68.7	43I 60 75 85	768
38h	107h	1280x1024	256	GraphicsL	8x16	160x64	78.75 108	47 64	43I 60	1280
3Ah†	——	1600x1200	256	GraphicsL	8x16	200x75	——	——	——	1875
40h	110h	640x480	32 K	GraphicsL	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	600
41h	111h	640x480	64 K	GraphicsL	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	600
42h	113h	800x600	32 K	GraphicsL	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	938
43h	114h	800x600	64 K	GraphicsL	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	938
44h	116h	1024x768	32 K	GraphicsL	8x16	128x48	44.9 65	35.5 48.4	43I 60	1536
45h	117h	1024x768	64 K	GraphicsL	8x16	128x48	44.9 65	35.5 48.4	43I 60	1536
50h	112h	640x480	16 M	GraphicsL	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	900
52h	115h	800x600	16 M	GraphicsL	8x16	100x37	36 40	35.1 37.9	56 60	1407
6Ah	102h	800x600	16	Graphics	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	256
64h	104h	1024x768	16	Graphics	8x16	128x48	44.9 65 78.75 94.5	35.5 48.4 60 68.7	43I 60 75 85	384
68h	106	1280x1024	16	Graphics	8x16	160x64	78.75 108	47 64	43I 60	640
70h	101h	640x480	256	Graphics	8x16	80x30	25.175 31.5 36	31.5 37.5 43.3	60 75 85	300
71h	100h	640x480	256	Graphics	8x16	80x25	25.175	31.5	70	256
72h	103h	800x600	256	Graphics	8x16	100x37	36 40 49.5 56.25	35.1 37.9 46.9 53.7	56 60 75 85	469
74h	105h	1024x768	256	Graphics	8x16	128x48	44.9 65 78.75 94.5	35.5 48.4 60 68.7	43I 60 75 85	768
78h	107h	1280x1024	256	Graphics	8x16	160x64	78.75 108	47 64	43I 60	1280

† For Flat Panel display only

"L" = "Linear"
"I" = "Interlaced"

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Installing Memory

Overview

The PV5000HX2(-M) supports up to 256 MB of on-board dynamic RAM modules in FPM or EDO, x36 or x32.
Note: The CPU supports ECC or Parity modes only if x36 modules are used.

Memory Bank

The PV5000HX2(-M) contains four (4) 72-pin SIMM sockets for DRAM memory modules (Figure 13). These four sockets comprise two (2) memory banks, each consisting of two sockets and providing a 64-bit wide data path and 8 parity bits (x36 SIMM's only):

- Sockets 1 and 2 comprise Bank 0
- Sockets 3 and 4 comprise Bank 1

Each bank must be completely filled to be operable. Also, both sockets in a bank must be filled with SIMM's of identical size. For example, if an 16MB SIMM is installed in Socket 1, another 16MB SIMM must be installed in Socket 2.

SIMM Types

Five SIMM memory sizes (4, 8, 16, 32, and 64 MB) are supported. SIMM's of these sizes can be installed in sockets 1, 2, 3, or 4 in combinations as illustrated in Figure 14.

Memory size is detected by the system BIOS. Memory timing requires 70 ns or faster page devices. Parity generation and checking is provided for each byte.

The SIMM sockets are gold and require gold SIMM's. Use of tin/lead SIMM's can cause damage to the equipment and could void the warranty.

To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the interior of the chassis and handling the equipment.

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Figure 13 Memory Sockets

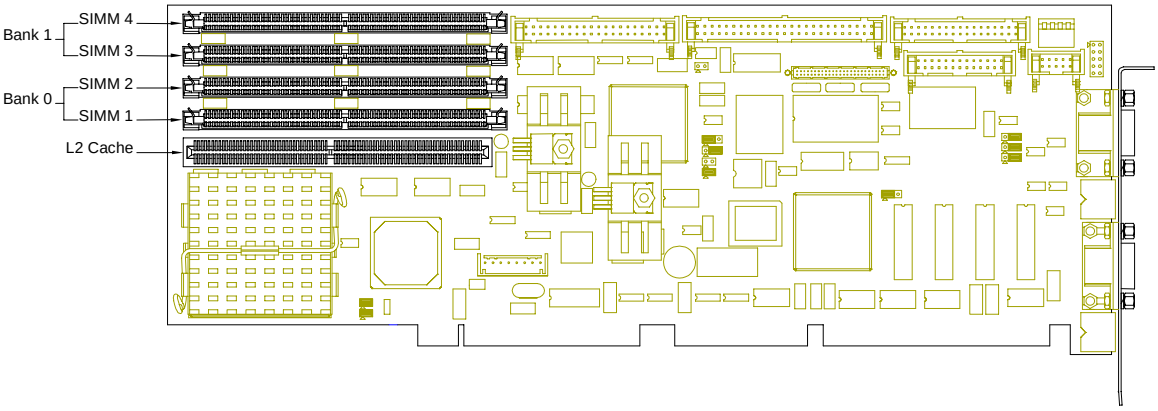

Figure 14 Memory Combinations

SIMM 1 & 2	SIMM 3 & 4	Total Memory
1 MB x 3X (4 MB)	Empty	8 MB
1 MB x 3X (4 MB)	1 MB x 3X (4 MB)	16 MB
2 MB x 3X (8 MB)	Empty	16 MB
2 MB x 3X (8 MB)	1 MB x 3X (4 MB)	24 MB
2 MB x 3X (8 MB)	2 MB x 3X (8 MB)	32 MB
4 MB x 3X (16 MB)	Empty	32 MB
4 MB x 3X (16 MB)	1 MB x 3X (4 MB)	40 MB
4 MB x 3X (16 MB)	2 MB x 3X (8 MB)	48 MB
4 MB x 3X (16 MB)	4 MB x 3X (16 MB)	64 MB
8 MB x 3X (32 MB)	Empty	64 MB
8 MB x 3X (32 MB)	1 MB x 3X (4 MB)	72 MB
8 MB x 3X (32 MB)	2 MB x 3X (8 MB)	80 MB
8 MB x 3X (32 MB)	4 MB x 3X (16 MB)	96 MB
8 MB x 3X (32 MB)	8 MB x 3X (32 MB)	128 MB
16 MB x 3X (64 MB)	Empty	128 MB
16 MB x 3X (64 MB)	1 MB x 3X (4 MB)	136 MB
16 MB x 3X (64 MB)	2 MB x 3X (8 MB)	144 MB
16 MB x 3X (64 MB)	4 MB x 3X (16 MB)	160 MB
16 MB x 3X (64 MB)	8 MB x 3X (32 MB)	192 MB
16 MB x 3X (64 MB)	16 MB x 3X (64 MB)	256 MB
3X = 36 for Parity, 32 for Non-Parity		

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Notes

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