Service Manual

PVN5000HX(-M) Series SBC

30568A
January 1999

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.

B. Texas Micro Inc. shall not be liable under this warranty for (i) the item that the Buyer alleges to be defective and was repaired or altered by someone other than Texas Micro's designated personnel or authorized representative, unless such repair or alteration was effected pursuant to prior written approval of Texas Micro, or (ii) where the Buyer fails to notify Texas Micro of any alleged defect within the period of warranty, or (iii) where the Buyer fails to return the allegedly defective item to Texas Micro in Houston, Texas, USA, freight prepaid, or (iv) where the item was altered or damaged in a way which Texas Micro reasonably determines to affect the performance and reliability of the item, or (v) where the item was subject to misuse, neglect, or accident. The rights and remedies granted to the Buyer under this paragraph constitute the Buyer's sole and exclusive remedy against Texas Micro Inc., its officers, agents, and employees, for negligence, inexcusable delay, breach of warranty, express or implied, or any other default relating to the item or Texas Micro's duties to eliminate any errors.

This warranty supersedes any other warranty, whether expressed, implied, or statutory, including but not limited to any warranty for fitness of purpose, merchantability, or freedom from infringement or the like, and any warranty otherwise arising out of any proposal, specifications, or sample. Furthermore, Texas Micro Inc. neither assumes nor authorizes any person to assume for it any other liability.

The software included with this equipment is warranted only in accordance with the terms of its license agreement. Except as warranted in that license agreement, the manufacturer of the software disclaims all warranties and conditions with regard to the software, including all implied warranties and conditions of merchantability, fitness for a particular purpose, title, and non-infringement.

Every effort has been made to ensure that the information provided in this manual is complete and accurate. However, technical inaccuracies or typographical errors may be inadvertently included. Texas Micro assumes no responsibility for any errors that may be contained in this document. Texas Micro makes no promise to update or keep current the information contained in this document. Information in this document, including product specifications, is subject to change without notice.

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.

Wichtig

Arbeiten am System bzw. Betrieb des Systems, sollten immer mit der nötigen Vorsicht vorgenommen werden. Nur qualifiziertes und ausgebildetes Fachpersonal sollte am Inneren des Gerätes arbeiten. Beim Installieren und Entfernen von Komponenten ist besondere Vorsicht geboten.

Für weitere Informationen wenden Sie sich bitte an den Technical Support von Texas Micro:

- USA: (800) 627-8700 oder (713) 541-8200 Montags bis Freitags von 0700 Uhr bis 1800 Uhr, Central USA.
- International: +31-36-5365595 Montags bis Freitags von 0900 Uhr bis 1800 Uhr. (CET GMT +1.00)

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

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.

ISO-9001

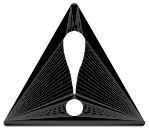
CERTIFICATED FIRM

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

	**Notice:** This symbol indicates an item for special consideration.
	**Warning:** This symbol indicates the presence of a potential hazard that can cause personal injury. Only qualified and trained electronics service personnel should access the equipment.

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 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.
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 Website

http://www.texasmicro.com

Upon receiving your equipment, inspect the packaging, shipping materials, and contents. If damaged, return the equipment to Texas Micro 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 functions and features of the equipment that can be accessed *only* by qualified and trained electronics service personnel. The material contained in this chapter does *not* discuss any user-accessible parts or operations. All tasks related to material in this chapter must be referred to qualified service personnel.

This chapter discusses the primary features of the PVN5000HX(-M).

If you are familiar with the primary components and functions of the PVN5000HX(-M), and you wish to quickly begin operating the SBC, go to Chapter 2, “6 Steps to Operation,” page 5. Then read this chapter later at your convenience.

PVN5000HX(-M) Series SBC

Standard Features

The Texas Micro PVN5000HX and PVN5000HX-M Single Board Computers (SBC) provide the following features (Figure 1):

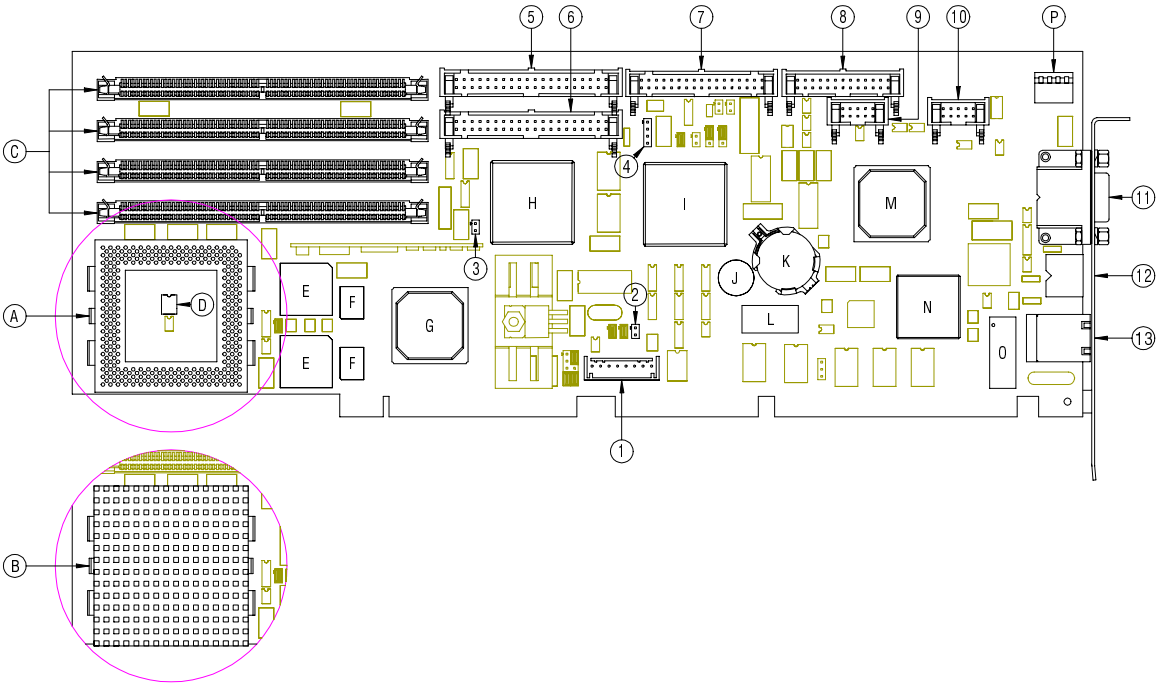
- Intel™ Pentium® processor:
  - PVN5000HX: 100, 133, or 166 MHz Pentium (P54C)
  - PVN5000HX-M: 200 or 233 MHz Pentium with MMX™ technology (P55C)
- Intel 430HX PCIset
  - 82439HX System Controller (TXC, or North-Bridge)
  - 82371SB PCI I/O IDE Xcelerator (PIIX3, or South-Bridge)
- CHIPS 69000 HiQVideo™ Accelerator with 2 MB integrated SDRAM
- SMC FDC37C935 Ultra I/O™ Controller
  Note: This component includes the functions of a Real Time Clock module.
- Intel 21143 PCI 10/100 Mb/s Ethernet LAN Controller
- Valor ST6122 10/100BASE-TX Transformer CMC Module
- Dallas DS1820 1-Wire™ Digital Thermometer
- Level 2 write-back cache with 256 KB pipeline burst discrete SRAM
  - IDT 71V432 32Kx32 CacheRAM™ Synchronous SRAM
  - IDT 71V256SA 32Kx8 Low Power CMOS Fast SRAM
- Four (4) SIMM sockets for up to 512 MB scaleable DRAM
  Note: The PVN5000HX(-M) supports up to 512 MB FPM or up to 128 MB EDO.
- CR2032 lithium (Li/MnO_2) coin battery to retain date, time, and CMOS parameters
- 4 Mb (512 Kb x 8) boot block flash memory device
- Two (2) serial port headers (one RS-232 only; one RS-232 or RS-422)
- Parallel port header (AT-compatible / bi-directional / enhanced operations)
- Two (2) EIDE device headers
- IDE activity LED header
- USB0 header
- Floppy drive header
- Keyboard / speaker / reset header
- Temperature monitor header
- VGA video connector
- PS/2 keyboard/mouse connector
- RJ-45 10/100 Base-T ethernet connector

More...

For more information on the components of the PVN5000HX(-M), contact:

Company	Telephone	Website
Chips and Technologies, Inc.	(408) 434-0600	http://www.chips.com
Dallas Semiconductor Corporation	(972) 788-2197	http://www.dalsemi.com
Integrated Device Technology, Inc.	(800) 345-7015	http://www.idt.com
Intel Corporation	(602) 554-8080	http://www.intel.com
PICMG	(781) 246-9318	http://www.picmg.com
Standard Microsystems Corporation	(516) 435-6000	http://www.smsc.com
Valor Electronics, Inc.	(800) 318-2567	http://www.valorinc.com

Figure 1 PVN5000HX(-M) Components and Layout



A. Intel Pentium Processor Socket
B. Pentium Processor with Heatsink Installed
C. DRAM SIMM Sockets
D. Dallas DS1820 Digital Thermometer
E. IDT 71V432 CacheRAM Synchronous SRAM
F. IDT 71V256SA Low Power CMOS Fast SRAM
G. Intel 82439HX System Controller (TXC)
H. Intel 82371SB PCI I/O IDE Xcelerator (PIIX3)
I. SMC FDC37C935 Ultra I/O Controller
J. Speaker
K. CR2032 Li/MnO_2 System Battery
L. 4 Mb Flash Memory Device
M. CHIPS 69000 HiQVideo Accelerator
N. Intel 21143 Ethernet Controller
O. Valor ST6122 Module
P. DIP Switch Block

1. Keyboard/Speaker/Reset Header
2. IDE Activity LED Header
3. Temperature Monitor Header
4. USB0 Header
5. Primary EIDE Header
6. Secondary EIDE Header
7. Floppy Drive Header
8. Parallel Port Header
9. Serial Port 1 Header
10. Serial Port 2 Header
11. VGA Connector
12. PS/2 Keyboard/Mouse Connector
13. RJ-45 Ethernet Connector

Notes

2 6 Steps to Operation

This chapter discusses functions and features of the equipment that can be accessed *only* by qualified and trained electronics service personnel. The material contained in this chapter does *not* discuss any user-accessible parts or operations. All tasks related to material in this chapter must be referred to qualified service personnel.

This chapter describes essential precautions for handling the PVN5000HX(-M) and then outlines the basic steps for setting up the SBC:

1. Check jumper settings
2. Check switch settings
3. Install the SBC
4. Connect peripheral devices
5. Power-on the system
6. Run the Setup Utility

Handling the PVN5000HX(-M)

Overview

This section suggests basic precautions when handling the PVN5000HX(-M) series SBC.

Static Electricity

The PVN5000HX(-M) is designed to protect against ESD (electro-static discharge) and excessive voltage. However, excessive static electricity can damage components.

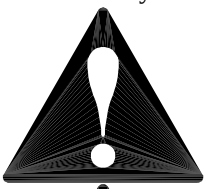
Before you handle the SBC, use the grounding wrist strap provided with the system to discharge static electricity. Instructions for using the wrist strap are printed on the strap's envelope.

Handle the SBC by the edges to help prevent accidental damage caused by static discharge (Figure 2).

Safety

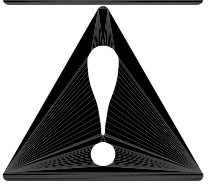
It is important to protect yourself and your equipment before you perform any of the procedures outlined in this manual.

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 source before handling the equipment.
To help prevent accidental damage caused by static discharge, use a grounding wrist strap or other static-dissipating device when handling the equipment.

Um Sachschaden und Verletzung zu vermeiden, schalten Sie vor Arbeiten am Gerät den Netzschalter aus, und ziehen Sie alle Stecker aus den Steckdosen.
Um unbeabsichtigte Schäden durch elektrostatische Entladung vorzubeugen, sollte bei Arbeiten am System immer ein Erdungsarmband getragen oder andere elektrostatische Entladungs-Vorsichtsmaßnahmen verwendet werden.



Only qualified, experienced electronics service personnel should access and handle the equipment.

Es sollte nur qualifiziertes und erfahrenes Fachpersonal am System arbeiten.

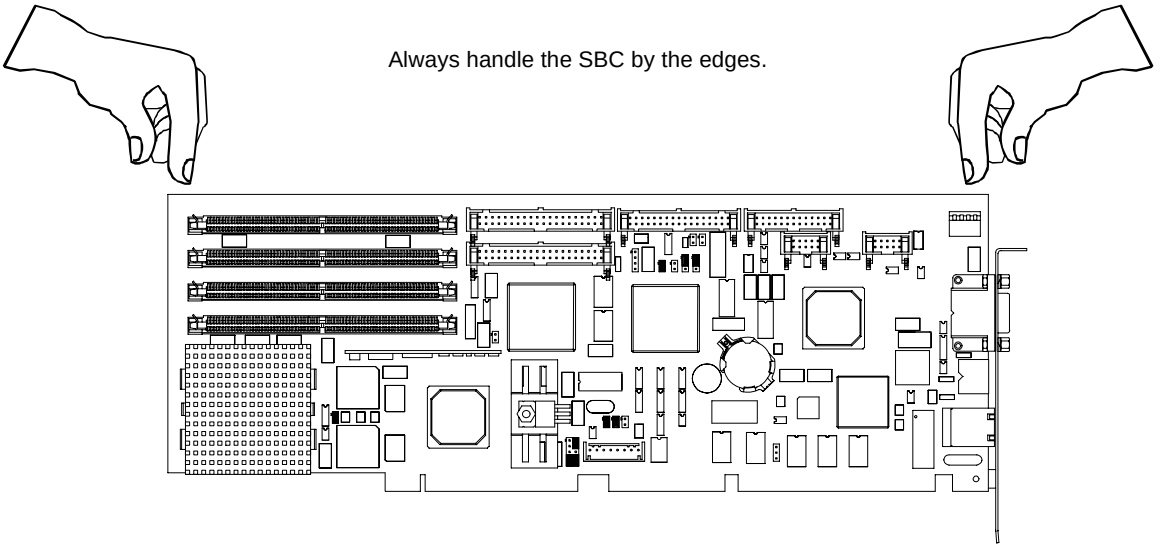
Next...

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.

Figure 2 Safely Handling the SBC



Step 1: Check Jumper Settings

Overview

Before you install the PVN5000HX(-M) onto a passive backplane in a chassis, check the jumper settings on the SBC (Figure 3).

Jumper Blocks

The PVN5000HX(-M) contains:

- Nine (9) two-pin jumper blocks (JP1, JP2, JP3, JP4, JP7, JP8, JP9A, JP9B, and JP11)
- Four (4) three-pin jumper blocks (JP5, JP6, JP9C, and JP9D)

Settings

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

2-Pin Jumper Blocks

JP1	JP2	JP3	JP4	Serial 2 Configuration
None	None	1—2	None	RS-232 (default)
1—2	1—2	None	1—2	RS-422

JP7	JP8	PCI Ethernet Resources
1—2	1—2	Ethernet used (default)
None	None	Ethernet not used
When not using Ethernet, PCI resources can be freed for other use.		

JP9A	JP9B	Host Bus Speed
None	B1—B2	66.6 MHz (default)
A1—A2	None	60.0 MHz
A1—A2	B1—B2	50.0 MHz

JP11	L2 Cache
1—2	256 KB cache (default)
None	No cache Installed

3-Pin Jumper Blocks

JP5	JP6	DS1820 Interface
1—2	1—2	Not tied to I/O controller (default)
2—3	2—3	Tied to I/O controller
When using the DS1820 interface, Serial Port 2 must be configured for RS-232. For more information, see page 28.		

	JP9C	JP9D	Core/Bus Ratio	CPU Speed
PVN5000HX	C2—C3	D2—D3	1.5	100 MHz
	C2—C3	D1—D2	2.0	133 MHz
	C1—C2	D1—D2	2.5	166 MHz
PVN5000HX-M	C1—C2	D2—D3	3.0	200 MHz
	C2—C3	D2—D3	3.5	233 MHz (default)
CPU Speed values are based on the Host Bus Speed at 66.6 MHz.				

Figure 3 Jumper Block Location

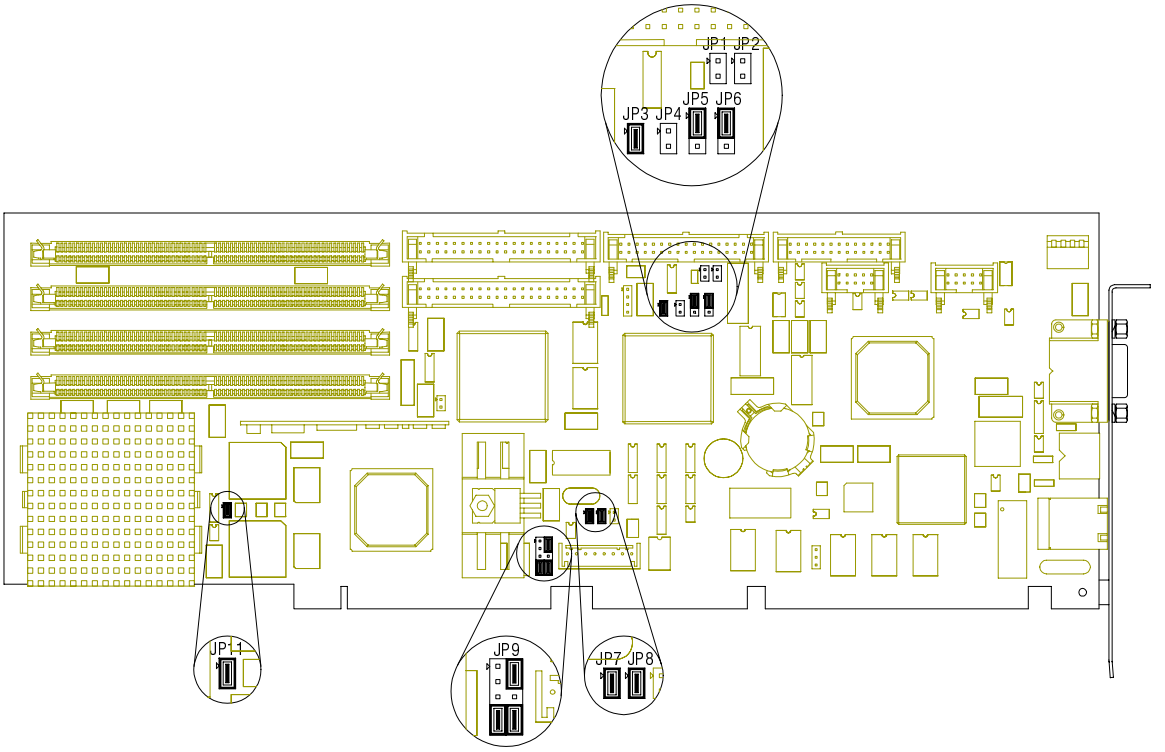
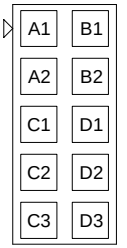


Figure 4 Jumper Block JP9 Pins



	Jumpers	Function
2-Pin	JP9A, JP9B	Host Bus Speed
3-Pin	JP9C, JP9D	CPU Speed

Step 2: Check Switch Settings

Overview

After you check the jumper settings, check the switch block on the PVN5000HX(-M) for proper settings (Figure 5).

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
——	Not Used

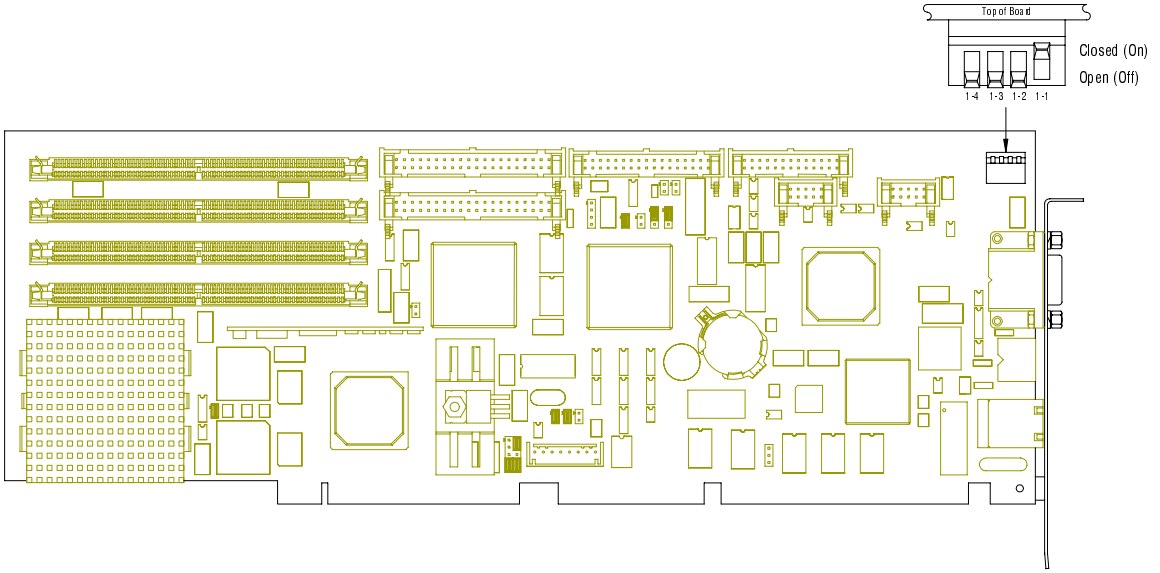
SW1-2	On-Board ROM Access
Open / Off	Flash memory enabled; Crisis Recovery mode disabled (default)
Closed / On	Flash memory disabled; Crisis Recovery mode enabled

SW1-3	CMOS RAM
Open / Off	Normal operation of CMOS RAM (default)
Closed / On	Factory default values for the Setup Utility are loaded into CMOS RAM

SW1-4	Configuration Ports
Open / Off	Configuration ports are mapped to I/O address 270/271 (default)
Closed / On	Configuration ports are mapped to I/O address 370/371

The system can operate without Memory Module Bank 0 (SIMM 1 and 2) filled. However, Crisis Recovery mode requires Bank 0 to be populated. For more information on Memory Modules, see page 34.

Figure 5 Switch Block Location



A Note on Crisis Recovery

Crisis Recovery mode causes the system to boot from the floppy drive and reflash the BIOS.
Note: Video is disabled on boot with Crisis Recovery mode enabled.

Before using Crisis Recovery mode, attempt the loading of factory BIOS default values by switching “On” SW1-3. Use Crisis Recovery mode only if the system will not boot otherwise.

Texas Micro Inc. produces a utility to generate a Crisis Recovery Diskette. This diskette is to be used only with Crisis Recovery mode enabled. To acquire the proper release BIOS for this product, contact Texas Micro Technical Support. See page v. After downloading the proper release BIOS of the utility, follow the instructions contained in the file README.TXT to generate the diskette. The Crisis Recovery Diskette must be generated on a system that is operating MS-DOS®, Windows® 95, Windows 98, Windows NT®, or OS/2.

Step 3: Install the SBC

Overview

Before you connect any peripheral devices to the PVN5000HX(-M), install the SBC onto a passive backplane in a chassis (Figure 6).

Procedure

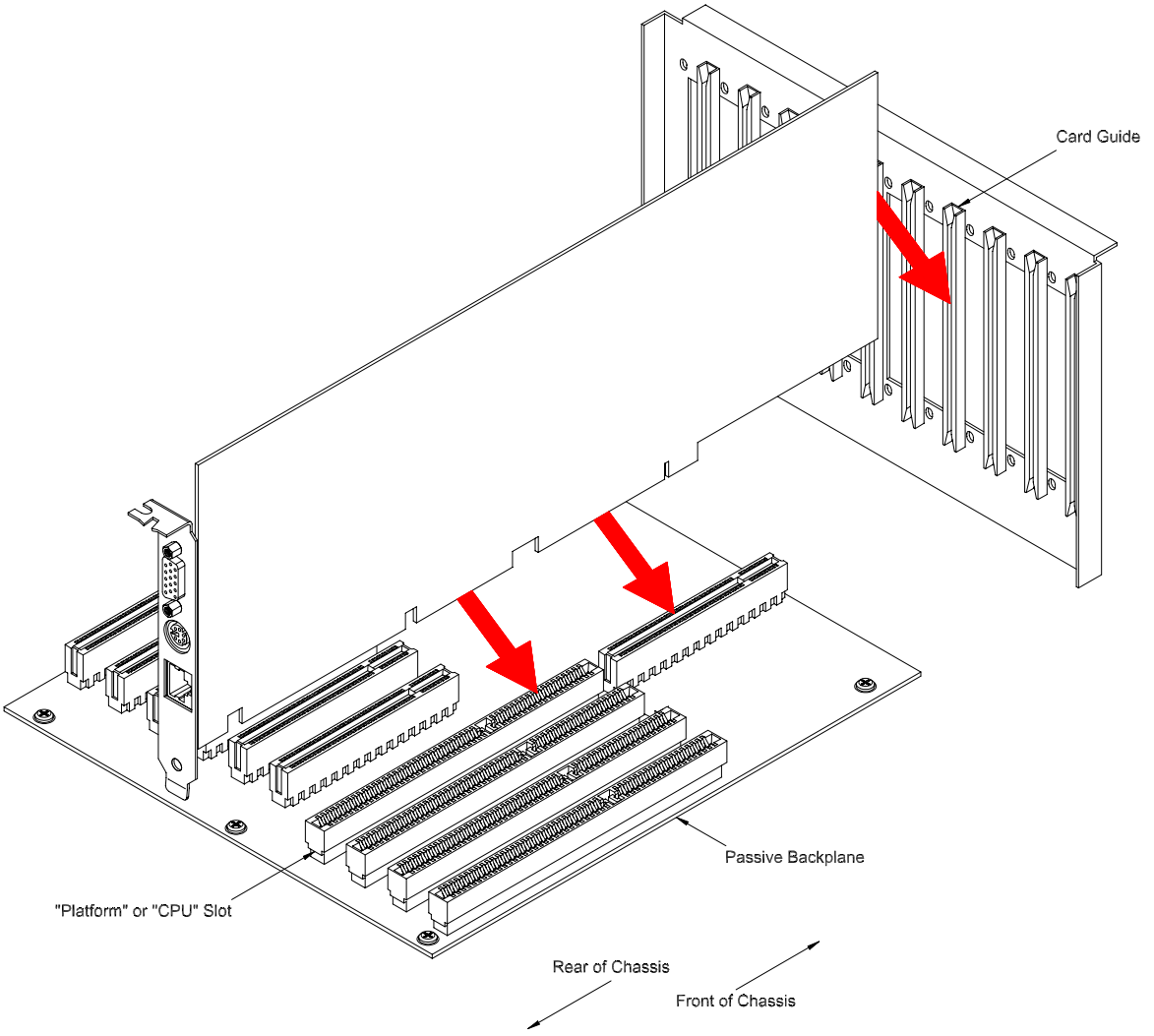
The procedure for installing the SBC is outlined in the following table:

Step	Action
1	Power-off the system and disconnect all power cords. **Note:** Use a grounding wrist strap or other static-dissipating device when accessing and handling the equipment.
2	Remove the chassis cover.
3	Detach the expansion card hold-down bracket (if required). This bracket reaches across the tops of the expansion cards and holds them in place.
4	Locate the “Platform” or “CPU” slot on the passive backplane.
5	Remove the I/O bracket spacer from the rear of the chassis (if required). This spacer covers the opening where the SBC 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 guide 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 bus connectors into the slot on the backplane. Ensure that the SBC I/O bracket is accessible through the rear of the chassis.
7	Secure the SBC I/O bracket to the fastening lip on the chassis.
8	Replace the expansion card hold-down bracket (if required).
9	Reconnect all power cords and power-on the system.

If the SBC is used with a chassis or passive backplane not manufactured by Texas Micro, consult the instructions provided by the manufacturer.
In addition, a cable adapter might be needed for the keyboard header on the SBC. Texas Micro does *not* provide such a cable.

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

Figure 6 Installing the SBC



Step 4: Connect Peripheral Devices

Overview

After you have installed the PVN5000HX(-M) in a chassis, attach peripheral devices to the SBC (Figure 7).

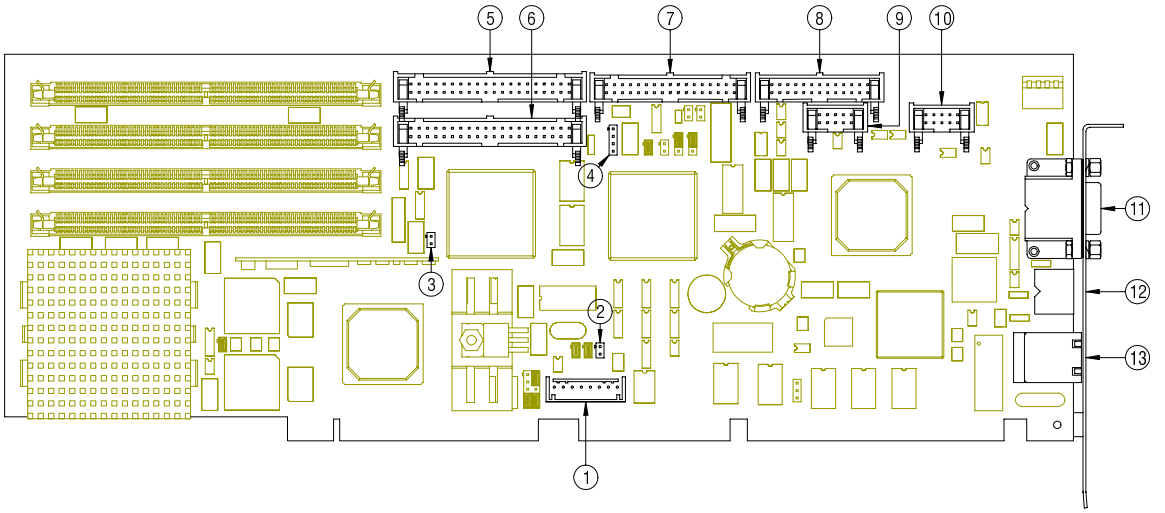
Always power-off the system and disconnect all power cords from their source before connecting or disconnecting cables for peripheral devices.

Attention

When attaching devices to the PVN5000HX(-M), certain considerations must be made:

Device(s)	Consideration
VGA	• A standard VGA or SVGA interface is provided. • The connector is a 15-pin Subminiature D (D-Sub) female type.
Ethernet	The ethernet connector is an 8-pin RJ-45 type.
PS/2 Devices	A PS/2 keyboard and mouse can both be attached to this 6-pin miniature DIN (mini-DIN) connector using a dual PS/2 adapter. See Figure 11 on page 31.
Serial	• One (1) serial device can be attached to each 16550-compatible serial port. • Improperly connecting the cables to these headers can cause damage to the equipment and could void the warranty.
Parallel	• The printer interface is Centronics-compatible. • AT-compatible/bi-directional/EPP/ECP operations are supported.
EIDE or IDE	• Up to two (2) EIDE or IDE devices can be attached to each EIDE header. • The BIOS will support up to four (4) EIDE or IDE devices.
IDE Activity LED	• This header connects the IDE device activity LED cable to the SBC. • Pin 1 is the anode; Pin 2 is the cathode.
Floppy	Up to two (2) floppy drives can be attached to the FDD header.
USB	• A daisy chain of up to 127 peripheral devices can be attached to this connector. • A single Series A USB cable cannot exceed 5 meters (16.4 feet) in length. • Software drivers appropriate to the OS will be needed to operate USB devices. Texas Micro does *not* supply such drivers.
Keyboard	• An AT or PS/2 keyboard can be attached to this header with an appropriate 8-pin cable. • The sockets of the Texas Micro keyboard cable are numbered in reverse order when compared to the pins of the SBC keyboard header, e.g., Pin 1 on the cable connector goes to Pin 8 on the SBC header.
Temperature Monitor	• A temperature monitoring or controlling device can be attached to this header. • Pin 1 is connected to Ground; Pin 2 is the Open-Collector signal that transitions from the Logic Low to Logic High state when the CPU temperature goes outside the range prescribed on page 26. • The signal requires a current-limiting resistor if connected to an LED.
All devices	When using a flat cable to attach a device, the "colored trace" on the cable must be near Pin 1 on the header/connector.

Figure 7 Peripheral Connectors



1. Keyboard/Speaker/Reset Header
2. IDE Activity LED Header
3. Temperature Monitor Header
4. USB0 Header
5. Primary EIDE Header
6. Secondary EIDE Header
7. Floppy Drive Header
8. Parallel Port Header
9. Serial Port 1 Header
10. Serial Port 2 Header
11. VGA Connector
12. PS/2 Keyboard/Mouse Connector
13. RJ-45 Ethernet Connector

For pin signals and positions, see page 28.

Step 5: Power-On the System

Overview

After you have installed the PVN5000HX(-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:

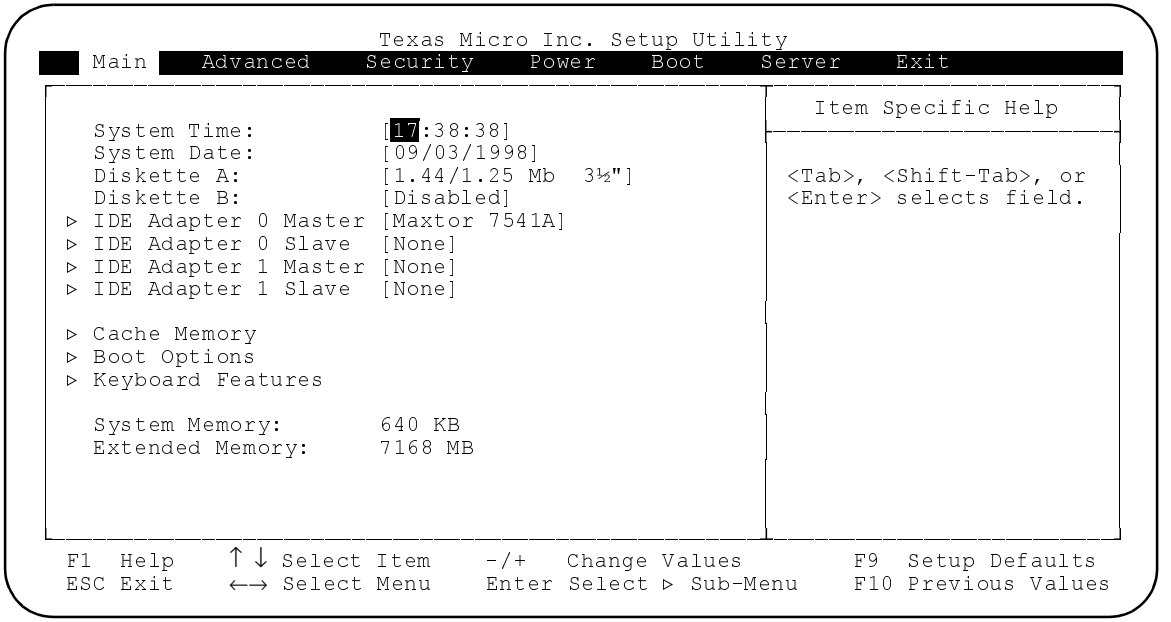
- Execute the Power-On Self Test (POST) to ensure that the system is functional and properly configured
- Start the operating system

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 18.

Figure 8 Setup Utility Main Menu



Step 6: 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 PVN5000HX(-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 19.

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 or pop-up menu
F1	Access Help for the Setup Utility
F9	Load default values for the setup options
F10	Save the changes you have made and exit the Setup Utility
Esc	Access the Exit menu

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	1.44/1.25MB 3½"	Disabled, 720KB 3½", 2.88MB 3½", 360KB 5¼", 1.2MB 5¼"
Diskette B	N/A	Disabled	720KB 3½", 1.44/1.25MB 3½", 2.88MB 3½", 360KB 5¼", 1.2MB 5¼"
▷ IDE Adapter 0 / 1 Master / Slave	Type	Auto (all 4 possible devices)	User, 1-39, CD-ROM, IDE Removeable, ATAPI Removable, 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	N/A	2 Sectors, 4 Sectors, 8 Sectors, 16 Sectors, Disabled
	LBA Mode Control	N/A	Enabled, Disabled
	32-Bit I/O	N/A	Enabled, Disabled
	Transfer Mode	N/A	Fast PIO 1, Fast PIO 2, Fast PIO 3, Fast PIO 4, FPIO 3/DMA 1, FPIO 4/DMA 2, Standard
	Note: Multi-Sector Transfers, LBA Mode Control, 32-Bit I/O, and Transfer Mode do not have default values. The values are inserted when the BIOS queries attached devices.		
▷ Cache Memory	Memory Cache	Disabled	Enabled
	Cache System BIOS Area	Enabled	Disabled
	Cache Video BIOS Area	Enabled	Disabled
	Cache C800—DFFF	Disabled (all regions)	Enabled
▷ Boot Options	Summary Screen	Enabled	Disabled
	Floppy Check	Disabled	Enabled
	Quiet Boot (Graphics)	Disabled	Enabled
	POST Errors	Enabled	Disabled
▷ Keyboard Features	Numlock	Auto	On, Off
	Key Click	Disabled	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
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
	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
	Serial Port B: Interrupt	IRQ 3	IRQ 4
	Parallel Port	Enabled	Disabled, Auto, OS Controlled
	Parallel Port: Mode	Bi-Directional	Output Only (ISA), EPP, ECP
		Note: If Mode is set to ECP, a DMA channel must be set.	
	Parallel Port: Base I/O Address	378	278, 3BC
	Parallel Port: Interrupt	IRQ 7	IRQ 5
	Parallel Port: DMA Channel	DMA 0	DMA 1, DMA 2, DMA 3
		Note: This option is available only if Mode is set to ECP.	
	Floppy Disk Controller	Enabled	Disabled
	Floppy Disk Controller: Base I/O Address	Primary	Secondary
	Local Bus IDE Adapter	Both	Disabled, Primary, Secondary
	UART2 Functions	Standard	Thermometer
	Temperature Polling Rate	Don't Poll	1 sec, 2 sec, 3 sec, 4 sec, 5 sec, 6 sec, 7 sec, 8 sec, 9 sec, 10 sec, 11 sec, 12 sec, 13 sec, 14 sec, 15 sec
	Note: For more information on the temperature monitoring system, see page 28.		
▷ Advanced Chipset Control	DRAM Speed	70 ns	60 ns
	ECC / Parity Config	Parity	Disabled, ECC
		Note: The ECC option functions only if Parity/FPM (x36) SIMM's are installed.	
	Enable Memory Gap	Disabled	Hole at 512K-640K, Hole at 15Mb-16Mb
	DMA Aliasing	Enabled	Disabled
	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 with Host Bus Speed at 66 MHz)	PCI Clock ÷ 3 (11 MHz with Host Bus Speed at 66 MHz)
	Watchdog Timer Status	Disabled	Enabled
	Watchdog Timer Delay	1.2 sec	150 ms
	Drive Autotype Pre-Delay	3 sec	6 sec, 9 sec, 12 sec, 15 sec, 21 sec, 30 sec, No Delay

Advanced

The items for the Advanced menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
▷ PCI Devices	PCI IRQ Line 1—4	Auto Select (all IRQ lines)	3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT], 7 (1st LPT), 9 (Open), 10 (Open), 11 (Open), 12 (PS/2 Mouse), 14 (Primary IDE), 15 (Secondary IDE), Disabled
	ISA Graphics Device Installed	No	Yes
	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 Execlusion: IRQ 3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, IRQ15	Available (all IRQ's)	Reserved
▷ Embedded PCI Devices	Embedded C&T PCI VGA	Enabled	Disabled
	Embedded Ethernet	Enabled	Disabled
	USB Controller	Enabled	Disabled
PS/2 Mouse	N/A	Enabled	Disabled
Onboard Speaker	N/A	Enabled	Disabled
Plug & Play O/S	N/A	No	Yes
Secured Setup Configuration	N/A	Yes	No
Reset Configuration Data	N/A	No	Yes
Large Disk Access Mode	N/A	DOS	Other

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:

<table>
<tr><th>Option / Sub-Menu</th><th>Item</th><th>Default Setting</th><th>Alternate Settings</th></tr>
<tr><td rowspan="2">Power Savings</td><td>N/A</td><td>Disabled</td><td>Customized,
Maximum Power Savings,
Maximum Performance</td></tr>
<tr><td colspan="3">Note: If this feature is disabled, Standby, Auto Suspend, Hard Disk, and Video Timeouts will be disabled.
Note: The following table lists preset options:
<table>
<tr><th>Feature</th><th>Maximum Power Savings</th><th>Maximum Performance</th></tr>
<tr><td>Standby Timeout</td><td>1 Minute</td><td>16 Minutes</td></tr>
<tr><td>Auto Suspend Timeout</td><td>5 Minutes</td><td>60 Minutes</td></tr>
<tr><td>Hard Disk Timeout</td><td>10 Seconds</td><td>15 Minutes</td></tr>
<tr><td>Video Timeout</td><td>10 Seconds</td><td>15 Minutes</td></tr>
</table></td></tr>
<tr><td>Standby Timeout</td><td>N/A</td><td>Off</td><td>1 Minute, 2 Minutes,
4 Minutes, 6 Minutes,
8 Minutes, 12 Minutes,
16 Minutes</td></tr>
<tr><td>Auto Suspend Timeout</td><td>N/A</td><td>Off</td><td>5 Minutes, 10 Minutes,
15 Minutes, 20 Minutes,
30 Minutes, 40 Minutes,
60 Minutes</td></tr>
<tr><td>Hard Disk Timeout</td><td>N/A</td><td>Disabled</td><td>10 Seconds, 15 Seconds,
30 Seconds, 45 Seconds,
1 Minute, 2 Minutes,
4 Minutes, 6 Minutes,
8 Minutes, 10 Minutes,
15 Minutes</td></tr>
<tr><td>Video Timeout</td><td>N/A</td><td>Disabled</td><td>10 Seconds, 15 Seconds,
30 Seconds, 45 Seconds,
1 Minute, 2 Minutes,
4 Minutes, 6 Minutes,
8 Minutes, 10 Minutes,
15 Minutes</td></tr>
<tr><td>Resume on Modem Ring</td><td>N/A</td><td>Off</td><td>On</td></tr>
<tr><td rowspan="3">▷ Advanced Options</td><td>IRQ1</td><td>Enabled</td><td>Disabled</td></tr>
<tr><td>IRQ3, IRQ4, IRQ5, IRQ6,
IRQ7, IRQ8, IRQ9, IRQ10,
IRQ11, IRQ12, IRQ13,
IRQ14, IRQ15</td><td>Disabled (all IRQ's)</td><td>Enabled</td></tr>
<tr><td>SMI / NMI</td><td>Disabled (both options)</td><td>Enabled</td></tr>
</table>

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, 57600, 115200

Notes

3 Technical Data

This chapter discusses functions and features of the equipment that can be accessed *only* by qualified and trained electronics service personnel. The material contained in this chapter does *not* discuss any user-accessible parts or operations. All tasks related to material in this chapter must be referred to qualified service personnel.

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
- Instructions for replacing the system battery

Specifications

Overview

Listed in the tables below are system specifications and environmental tolerances for the PVN5000HX(-M) series SBC.

Note: These specifications are subject to change without notice.

Environmental

Environmental tolerances are listed in the following table:

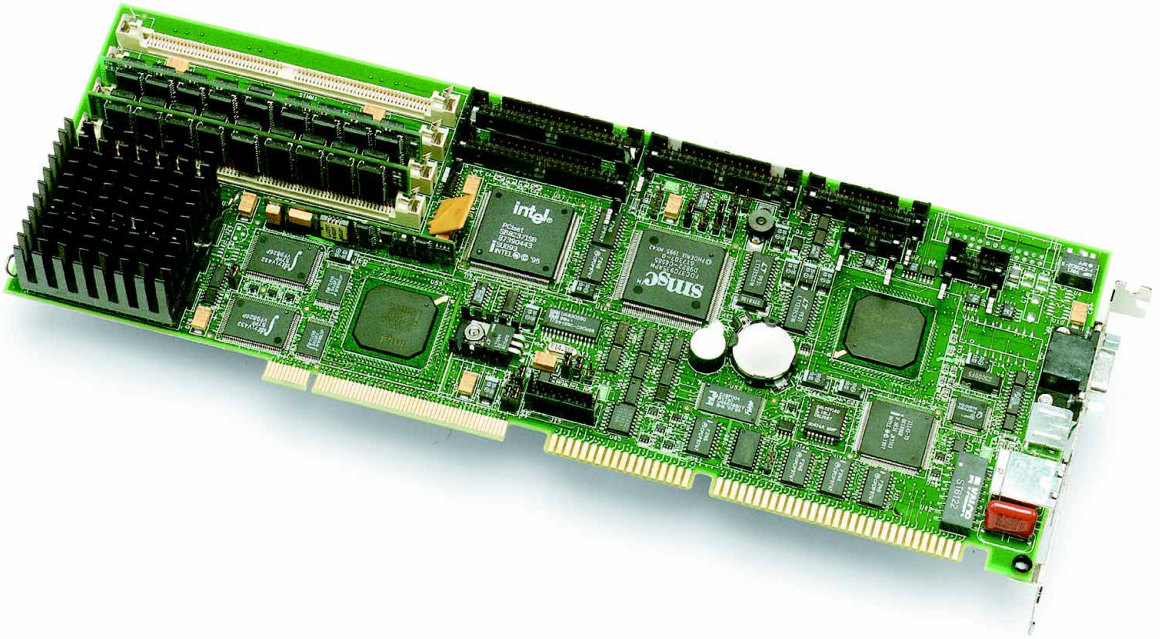
	Operating	Non-Operating
Temperature	0 to +60 °C (32 to 140 °F)	-40 to +70 °C (-40 to 158 °F)
Humidity	5 — 95% @ 40 °C, non-condensing	0 — 95% @ 40 °C, non-condensing
Shock	1.25 G @ 10 ms	30 G @ 10 ms
Vibration	.25 G @ 5 — 150 Hz	5 G @ 5 — 150 Hz
Altitude	15,000 ft (4,572 m)	50,000 ft (15,240 m)

System

System specifications are listed in the following table:

CPU	• 100, 133, or 166 MHz Intel™ Pentium® Processor • 200 or 233 MHz Intel Pentium Processor with MMX™ Technology
Chipset	Intel 430HX PCIset
Cache	256 Level 2 write-back cache: Zero wait state at 66 MHz 8 ns synchronous pipeline burst COAST RAM
Memory	Four (4) 72-pin sockets organized in two (2) banks, supporting: Up to 512 MB 1/2/4/8/16/32 x 32/36, 60/70 ns, DRAM SIMM's Parity/ECC FPM 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 CPU bus, 32-bit local PCI bus
Flash Memory	4 Mb (512 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 FPM DRAM	Input Power 30 W (average) +5 V 6.0 A +12 V 0.1 A -12 V 0.1 A
Battery	CR2032 Lithium (Li/MnO_2)
Form Factor	13.28” (337.3 mm) x 4.80” (121.9 mm)

Figure 9 The PVN5000HX(-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 W 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 CPU requires a minimum airflow of 200 linear feet per minute (LFM) unimpeded across the processor within 0 to 60 °C (41 to 140 °F) ambient temperature. Operations outside these specifications could void the warranty.

Pin Signals

Overview

The tables below list the pin signals for the peripheral headers and connectors. The following illustration (Figure 10) indicates the pin positions for each.

Serial Port 1	
RS-232	
Pin	Description
1	Data Carrier Detect (In)
2	Data Set Ready (In)
3	Receive Data (In)
4	Request to Send (Out)
5	Transmit Data (Out)
6	Clear to Send (In)
7	Data Terminal Ready (Out)
8	Ring Indicator (In)
9	Ground
10	Not Connected

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	Not Connected			

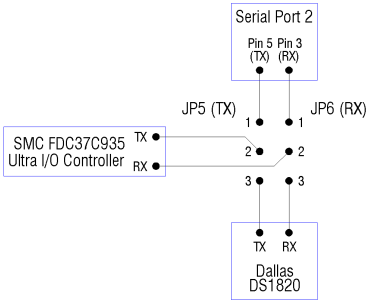
To connect two RS-422 devices, use a shielded twisted-pair (STP) cable no longer than 4,000 feet, configured as listed below:

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+)

The Dallas DS1820 digital thermometer can be tied to the SMC FDC37C935 I/O controller using settings for jumpers JP5 and JP6. See the figure below. When using the DS1820 interface, serial port 2 must be configured for RS-232 using settings for jumpers JP1—JP4. For more information on jumper settings, see page 8.

When using the DS1820 interface, serial lines for transmit (TX) and receive (RX) signals carry data between the digital thermometer and the I/O controller.

Note: No external device should be connected to serial port 2 when using the DS1820 interface. Communication signals for the external serial device may interfere with proper operations of the Dallas DS1820.



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

EIDE					
Pin	**Description**	**Pin**	**Description**	**Pin**	**Description**
1	Reset (Out)	14	Data 13 (I/O)	31	+ IRQ14 (In)
3	Data 7 (I/O)	15	Data 1 (I/O)	32	I/O CS16 (Out)
4	Data 8 (I/O)	16	Data 14 (I/O)	33	+ ADDR1 (Out)
5	Data 6 (I/O)	17	Data 0 (I/O)	35	+ ADDR0 (Out)
6	Data 9 (I/O)	18	Data 15 (I/O)	36	+ ADDR2 (Out)
7	Data 5 (I/O)	20	Not Connected	37	- CS1 (Out)
8	Data 10 (I/O)	21	DMA Request (I/O)	38	- CS3 (Out)
9	Data 4 (I/O)	23	- I/O Write (Out)	39	Activity Light (Out)
10	Data 11 (I/O)	25	- I/O Read (Out)	2, 19, 22, 24, 26, 30, 34, 40	Ground
11	Data 3 (I/O)	27	I/O Channel Ready (In)		
12	Data 12 (I/O)	28	+ ALE		
13	Data 2 (I/O)	29	DMA Acknowledge (Out)		

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

PS/2 Keyboard / Mouse	
Pin	**Description**
1	Mouse Data
2	Keyboard Data
3	Ground
4	+5 V
5	Mouse Clock
6	Keyboard Clock

Note: A standard PS/2 keyboard and mouse can both be attached using an adapter. See Figure 11.

RJ-45 Ethernet	
Pin	**Description**
1	Ethernet Transmit (TX+)
2	Ethernet Transmit (TX-)
3	Ethernet Receive (RX+)
4	Ethernet COM
5	Ethernet COM
6	Ethernet Receive (RX-)
7	Ethernet COM
8	Ethernet COM

USB0 Port	
Pin	**Description**
1	USB0 Port -
2	Ground
3	USB0 Port +
4	+5 V

Temperature Monitor	
Pin	**Description**
1	Ground
2	Data In/Out

Figure 10 Peripheral Headers and Connectors

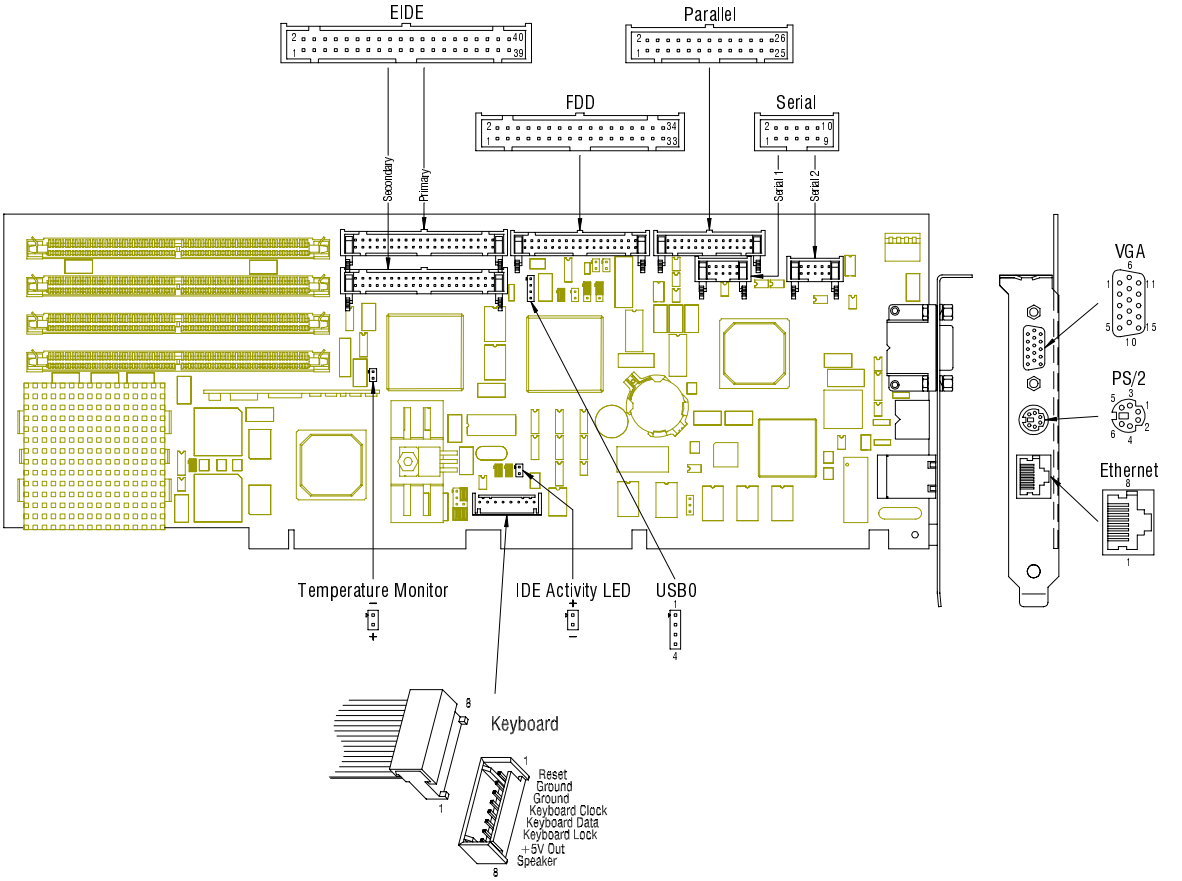
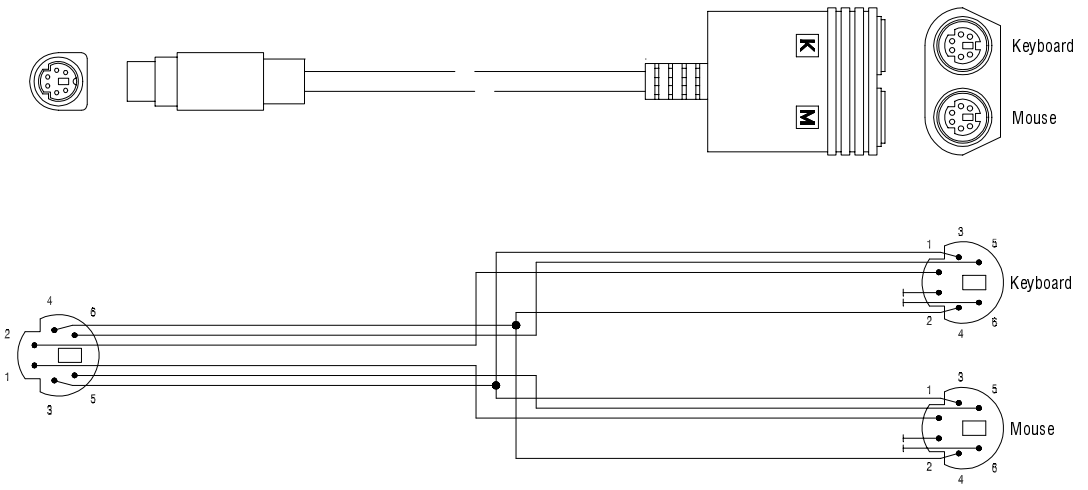


Figure 11 Dual PS/2 Adapter



SBC Connector	
Pin	**Description**
1	Mouse Data
2	Keyboard Data
3	Ground
4	+5 V
5	Mouse Clock
6	Keybaord Clock

Peripheral Connector	
Pin	**Description**
1	Data*
3	Ground
4	+5 V
5	Clock*
2, 6	Not Connected
* Keyboard or Mouse	

Display System Overview

Overview

The following tables list the display modes supported by the PVN5000HX(-M):

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, 70, 75, 85	1072
1024x768	65,536	16	43I, 56, 60, 70, 75, 85	1840
1280x1024	256	8	43I, 60, 70, 75, 85	1584

"I" = Interlaced

Standard VGA CRT-Only Display Modes

Display Mode	Resolution (Pixels)	Color Resolution (bpp/colors)	Display Mode Type	Display Adapter	Character Cell (Pixels)	Display (Characters X Rows	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
00h	320x200 320x350 360x400	16/256K	Text	CGA EGA VGA	8x8 8x14 9x16	40x25	31.5	70
01h	320x200 320x350 360x400	16/256K	Text	CGA EGA VGA	8x8 8x14 9x16	40x25	31.5	70
02h	640x200 640x350 720x400	16/256K	Text	CGA EGA VGA	8x8 8x14 9x16	80x25	31.5	70
03h	640x200 640x350 720x400	16/256K	Text	CGA EGA VGA	8x8 8x14 9x16	80x25	31.5	70
04h	320x200	4/256K	Graphics	All	8x8	40x25	31.5	70
05h	320x200	4/256K	Graphics	All	8x8	40x25	31.5	70
06h	640x200	2/256K	Graphics	All	8x8	80x25	31.5	70
07h	720x350 720x400	Mono	Text	EGA VGA	9x14 9x16	80x25	31.5	70
08h—0Ch	Reserved							
0Dh	320x200	16/256K	Graphics	All	8x8	40x25	31.5	70
0Eh	640x200	16/256K	Graphics	All	8x8	80x25	31.5	70
0Fh	640x350	Mono	Graphics	All	8x14	80x25	31.5	70
10h	640x350	16/256K	Graphics	All	8x14	80x25	31.5	70
11h	640x480	2/256K	Graphics	All	8x16	80x30	31.5	60
12h	640x480	16/256K	Graphics	All	8x16	80x30	31.5	60
13h	320x200	256/256K	Graphics	All	8x8	40x25	31.5	70

Extended VGA CRT-Only Display Modes

Video Mode	VESA Mode	Resolution (Pixels)	Color Depth (bpp)	Memory Organization	Horizontal Frequency	Vertical Frequency	VCLK (MHz)	Minimum MCLK (MHz)
14h 15h 16h	——	320x200	8 16 24	Packed Pixel	31.5	70	12.587	50
17h 18h 19h	——	320x240	8 16 24	Packed Pixel	31.5	60	12.587	50
1Ah 1Bh 1Ch	——	400x300	8 16 24	Packed Pixel	37.5	60	20	50
1Dh 1Eh 1Fh	——	512x384	256/256K	Packed Pixel	48.4	60	32.5	50
31h	100h	640x400	8	Packed Pixel	31.5	70	25.175	50
62h 63h	——	640x400	16 24	Packed Pixel	31.5	70	25.175	50
20h	120h	640x480	4	Packed Pixel	31.5 37.5 43.3	60 75 85	25.175 31.5 36	50
22h	122h	800x600	4	Packed Pixel	35.5 46.9 46.9 53.7	56 60 75 85	36 40 49.5 56.25	50
24h	102h	800x600	4	Packed Pixel	31.5 37.9 37.9 43.269	60 72 75 85	25 31.5 31.5 36	50
28h	128h	1280x1024	4	Packed Pixel	47 64 79.98	43I 60 75	78.75 108 135	50
30hL 70hP	101h	640x480	8	Packed Pixel	31.5 37.5 43.3	60 75 85	25.175 31.5 36	50
31hL 71hP	100h	640x480	8	Packed Pixel	31.5	70	25.175	50
32hL 72hP	103h	800x600	8	Packed Pixel	35.1 37.9 46.9 53.7	56 60 75 85	36 40 49.5 56.25	50 50 58 68
34hL 74hP	105h	1024x768	8	Packed Pixel	35.5 48.4 60 68.7	43I 60 75 85	44.9 65 78.75 94.5	50 60 80 80
36h	——	Generic	8	Packed Pixel	——	——	——	——
38hL 78hP	107h	1280x1024	8	Packed Pixel	47 64 79.98	43I 60 75	78.75 108 135	50
41h	111h	640x480	16	Packed Pixel	31.5 37.5 43.3	60 75 85	25.175 31.5 36	50
43h	114h	800x600	16	Packed Pixel	35.1 37.9 46.9 53.7	56 60 75 85	36 40 49.5 56.25	50 50 60 70
45h	117h	1024x768	16	Packed Pixel	35.5 48.4 60 68.7	43I 60 75 85	44.9 65 78.75 94.5	50
47h	——	Generic	16	Packed Pixel	——	——	——	——
50h	112h	640x480	24	Packed Pixel	31.5 37.5 43.3	60 75 85	25.175 31.5 36	50
52h	115h	800x600	24	Packed Pixel	35.1 37.9 46.9 53.7	56 60 75 85	36 40 49.5 56.25	50
56h	——	Generic	24	Packed Pixel	——	——	——	——
6Ah	102h	800x600	4	Planar	35.1 37.9 46.9 53.7	56 60 75 85	36 40 49.5 56.25	50
64h	104h	1024x768	4	Planar	35.5 48.4 60 68.7	43I 60 75 85	44.9 65 78.75 94.5	50
68h	106h	1280x1024	4	Planar	47 64 79.98	43I 60 75	78.75 108 135	50

"L" = Linear Mapped
"P" = Page Mapped
"I" = Interlaced

Installing Memory

Overview

The PVN5000HX(-M) supports up to 512 MB of on-board dynamic RAM modules in FPM or EDO, x36 or x32.
Note: ECC or Parity modes are supported only with x36 modules.

Memory Bank

The PVN5000HX(-M) contains four (4) 72-pin SIMM sockets for DRAM memory modules (Figure 12). 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 a 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, 64, and 128 MB) are supported. SIMM's of these sizes can be installed in sockets 1, 2, 3, or 4 in combinations as illustrated in Figure 13.

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.

High-density SIMM’s are required. Modules having more than twenty-four (24) devices are not supported by Texas Micro. Such modules tend to exceed capacitance loading on the DRAM bus and are thereby unreliable.

Figure 12 Memory Sockets

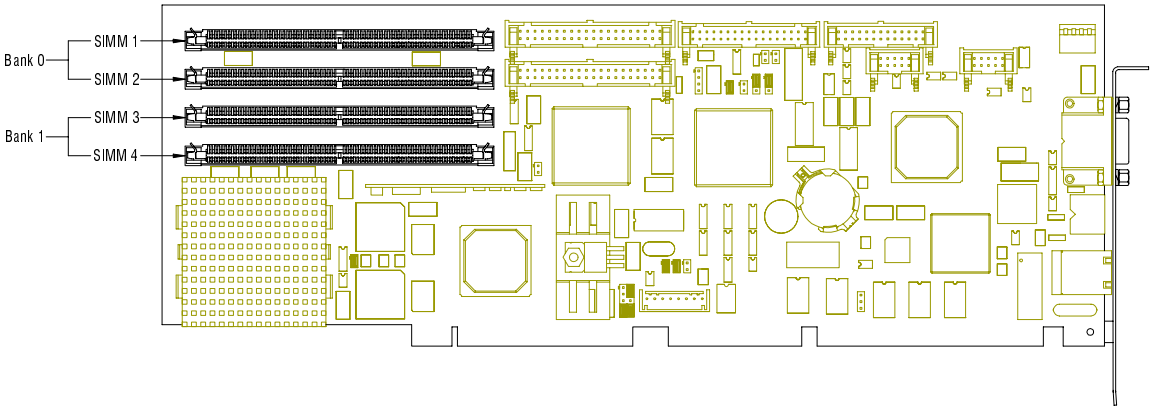


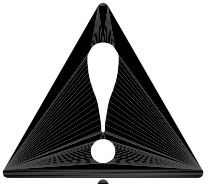
Figure 13 Memory Combinations

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
32 MB x 3X (64 MB)	Empty	256 MB
32 MB x 3X (64 MB)	1 MB x 3X (4 MB)	264 MB
32 MB x 3X (64 MB)	2 MB x 3X (8 MB)	272 MB
32 MB x 3X (64 MB)	4 MB x 3X (16 MB)	288 MB
32 MB x 3X (64 MB)	8 MB x 3X (32 MB)	320 MB
32 MB x 3X (64 MB)	16 MB x 3X (64 MB)	384 MB
32 MB x 3X (64 MB)	32 MB x 3X (64 MB)	512 MB
3X = 36 for Parity, 32 for Non-Parity		

System Battery Replacement

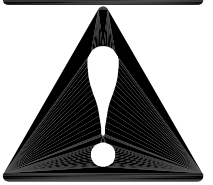
Overview

The PVN5000HX(-M) utilizes a CR2032 lithium (Li/MnO_2) coin battery (Figure 14). This 3-volt battery provides power to retain the correct date, time, and computer parameters in CMOS when the system is powered-off. This information assists the BIOS in performing initialization and configuration during power-on or reset operations.



The battery must be used or stored within the temperature specifications outlined on page 26.

Bezüglich Betrieb und Lagerung der Batterie beachten Sie bitte die Temperaturspezifikationen auf Seite 26.



Due to risk of fire or explosion, do not attempt to recharge, force open, or heat the battery. There is danger of explosion if the battery is incorrectly installed. Replace the battery only with the same or equivalent type. Reference the battery manufacturer's packaging or labeling for further cautions and warnings.

Wegen Feuer- oder Explosionsgefahr, versuchen Sie nicht die Batterie wieder aufzuladen, sie zu öffnen oder zu erhitzen. Bei falscher Installierung besteht eine Explosionsgefahr. Ersetzen Sie die Batterie nur mit einem Gleichen oder gleichwertigen Typ. Weitere Informationen und Warnungen entnehmen Sie bitte der Verpackung bzw. dem Aufdruck des Herstellers.

Service

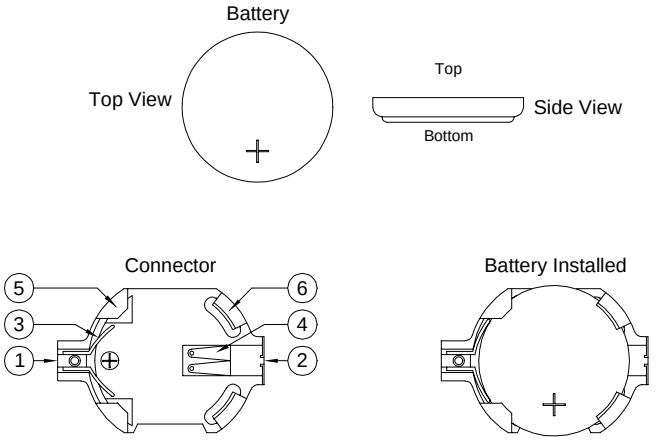
The system battery is designed to provide years of service without replacement. However, if configuration or clock-related inconsistencies occur, the battery may need to be replaced.

Installation

The procedure for installing the system battery (Figure 15) is outlined in the following table:

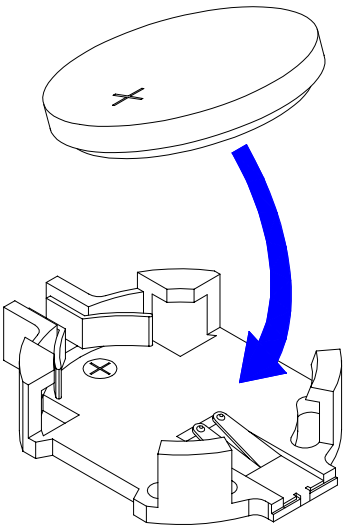
Step	Action
1	Power-off the system and disconnect all power cords. **Note:** Use the grounding wrist strap provided with the system to discharge static electricity.
2	Remove the SBC from the chassis.
3	Orient the battery face upward in relation to the battery connector. **Note:** The battery will not discharge voltage if installed upside down.
4	Rotate the battery approximately forty-five degrees (45°) downward toward the positive end of the battery connector.
5	Insert the lowered edge of the battery beneath the retention brackets at the positive end of the battery connector.
6	Press the raised edge of the battery downward until it firmly engages the fastening clips at the negative end of the battery connector.

Figure 14 System Battery Components



1. Positive End
2. Negative End
3. Positive Contacts (2)
4. Negative Contacts (2)
5. Retention Brackets (2)
6. Fastening Clips (2)

Figure 15 Battery Installation



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