User's Manual

PE5000(D)HX Series SBC

23623C
June 1998

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 Inc., 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.

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.

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.

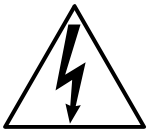
This product also meets requirements for compliance with EN55022, Class B ITE.

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)

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.

Table of Contents

List of Figures

1 Introduction

This chapter discusses the primary features of the PE5000(D)HX.

If you are familiar with the primary components and functions of the PE5000(D)HX, 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.

PE5000(D)HX Series SBC

Overview

The Texas Micro PE5000(D)HX Single Board Computer (SBC) provides the following features:

- 100/133/166 MHz Intel™ Pentium® processor (P54C)

Use of a Pentium processor with MMX™ technology (P55C) can cause damage to the equipment and could void the warranty.

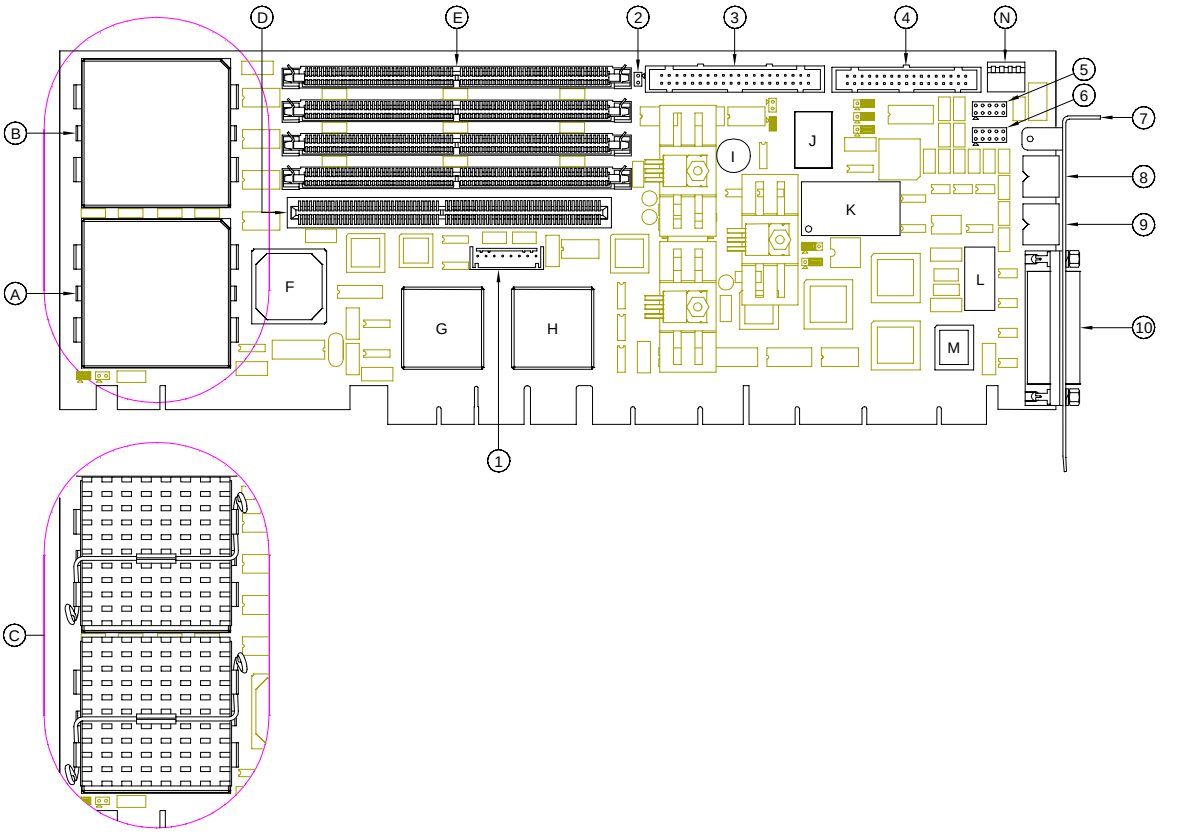
- Intel 82439HX System Controller (TXC)
- Intel 82374SB EISA System Component (ESC)
- Intel 82375SB PCI EISA Bridge (PCEB)
- Intel 82091AA Advanced Integrated Peripheral (AIP)
- 2 Mb (256 KB x 8) flash memory
- 1 Mb (128 KB x 8) auxiliary BIOS
- Dallas DS1387 Real Time Clock with 4 KB x 8 extended RAM
- 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 PE5000HX supports FPM or EDO, x36 or x32.
- Floppy drive controller
- IDE drive controller
- Two (2) serial ports (one RS-232 only; one RS-232 or RS-422)
- Parallel port (AT-compatible/bi-directional)
- PS/2 mouse connector
- PS/2 keyboard connector

More...

For more information on the components of the PE5000(D)HX, contact:

Company	Telephone	Website
Intel Corporation	(602) 554-8080	http://www.intel.com
Standard Microsystems Corporation	(516) 435-6000	http://www.smsc.com
PCI Special Interest Group	(503) 696-2000	http://www.pcisig.com
PICMG	(781) 246-9318	http://www.picmg.com

Figure 1 PE5000(D)HX Components and Layout



A. Primary Pentium Processor
B. Secondary Pentium Processor
C. Pentium Processors with Heatsinks
D. Level 2 SRAM Cache Socket
E. DRAM SIMM Sockets
F. Intel 82439HX System Controller (TXC)
G. Intel 82374SB EISA System Component (ESC)
H. Intel 82375SB PCI EISA Bridge (PCEB)
I. Speaker
J. Intel 82091AA Advanced Integrated Peripheral (AIP)
K. Dallas DS1387 Real Time Clock
L. Flash Device
M. Auxiliary BIOS
N. DIP Switch Block

1. Keyboard Header
2. IDE Activity LED Header
3. IDE Header (Primary Controller)
4. Floppy Drive Header
5. Serial Port 1 Header
6. Serial Port 2 Header
7. I/O Bracket
8. PS/2 Mouse
9. PS/2 Keyboard
10. Parallel Port Connector

Notes

2 7 Steps to Operation

This chapter describes basic precautions for handling the PE5000(D)HX.

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

Handling the PE5000(D)HX

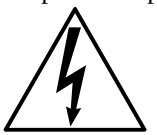
Overview

This section suggests basic precautions when handling the PE5000(D)HX series SBC.

Static Electricity

The PE5000(D)HX 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.

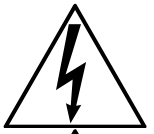


Always handle the SBC by the edges to help prevent accidental damage that can be caused by static discharge (Figure 2).

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.

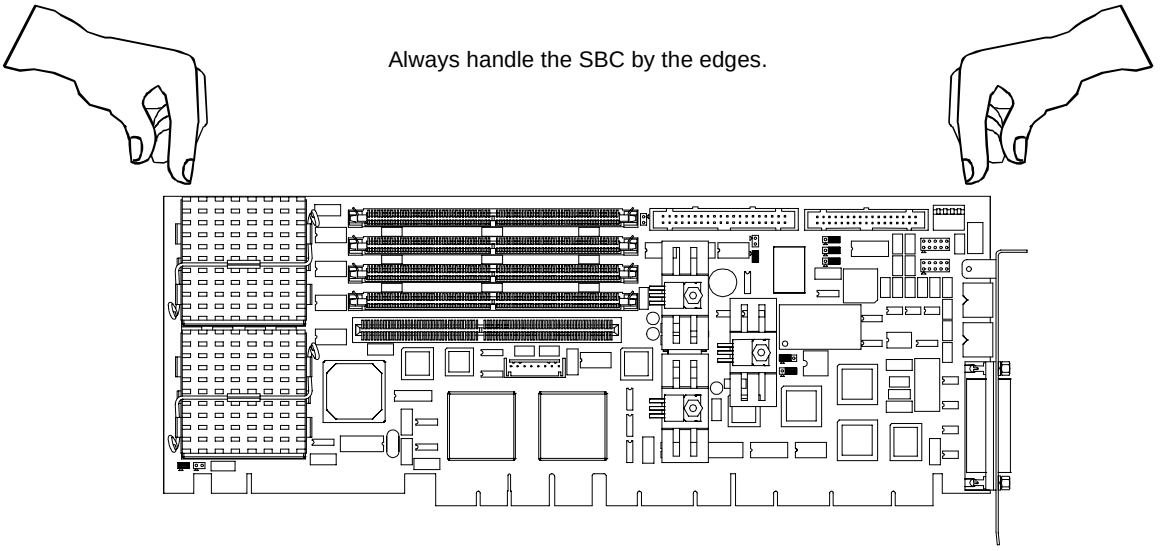
Next...

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.

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.

Step 1: Check Jumper Settings

Overview

Before you install the PE5000(D)HX 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 PE5000(D)HX contains:

- Four (4) two-pin jumper blocks (JP1, JP2, JP8, and JP9)
- Five (5) three-pin jumper blocks (JP3, JP4, JP5, JP6, and JP7)

Settings

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

2-Pin Jumper Blocks

JP1	JP2	Bus/Core Ratio†	CPU Speed
None	None	2/3	100 MHz
1—2	None	1/2	133 MHz
1—2	1—2	2/5	166 MHz
†The Bus Core Ratio is based on the Host Bus Speed at 66.6MHz.			

JP8	JP9	Host Bus Speed
None	1—2	66.6 MHz (default)
1—2	None	60.0 MHz
1—2	1—2	50.0 MHz

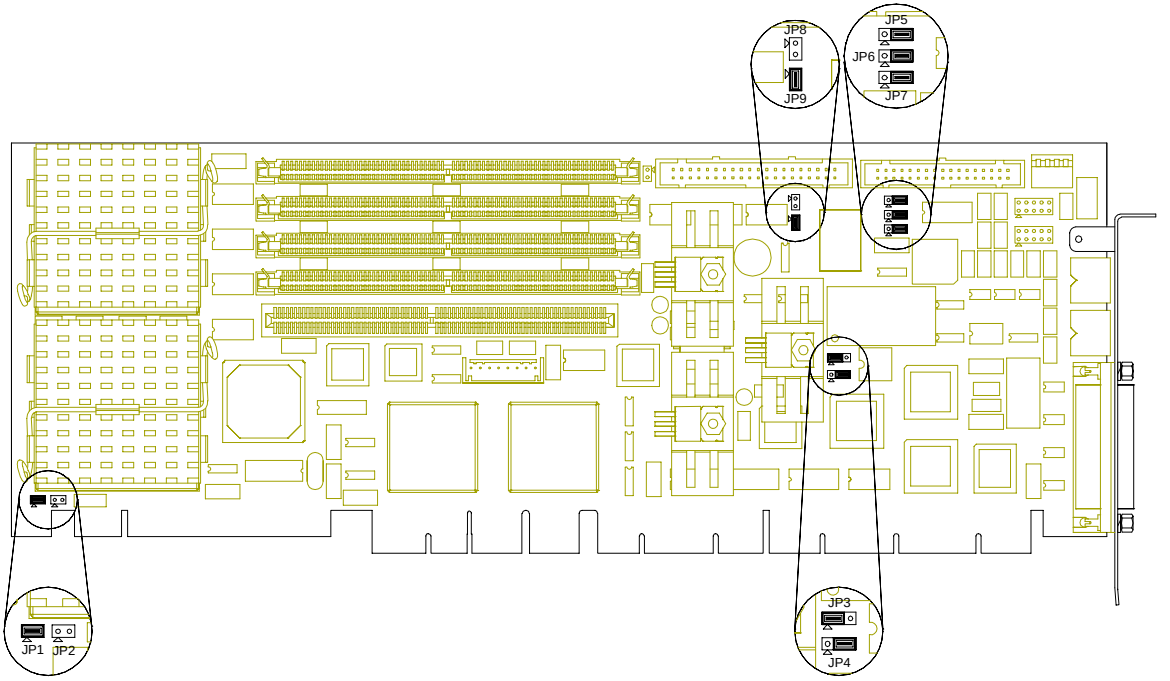
3-Pin Jumper Blocks

JP3	Watchdog Timer
1—2	Active (default)
2—3	Inactive

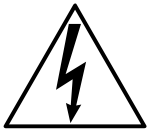
JP4	Next Step OS Operation
1—2	Use this setting when running Next Step OS and experiencing problems with PS/2 mouse
2—3	Other OS (default)

JP5	JP6	JP7	Serial 2 Configuration
1—2	1—2	1—2	RS-422
2—3	2—3	2—3	RS-232 (default)

Figure 3 Jumper Block Locations



	Jumpers	Function
2-Pin	JP1, JP2	CPU Speed
	JP8, JP9	Host Bus Speed
3-Pin	JP3	Watchdog Timer
	JP4	Next Step OS Operation
	JP5, JP6, JP7	Serial 2 Configuration



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.

Step 2: Check Switch Settings

Overview

After you check the jumper settings, check the switch block on the PE5000(D)HX 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

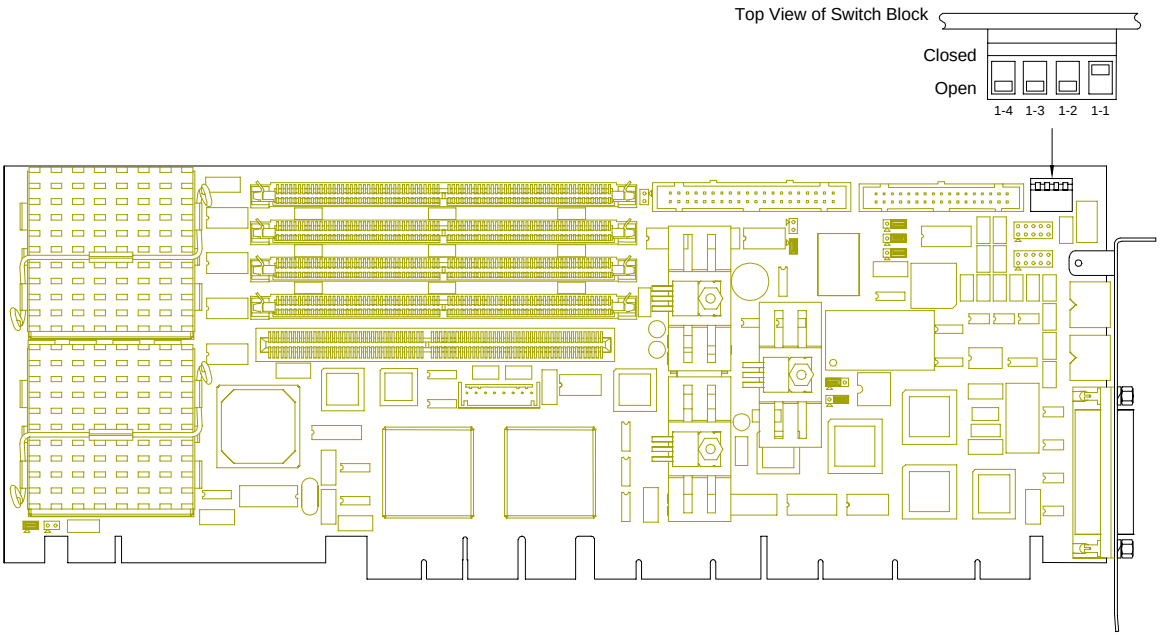
Settings

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 disabled
	Closed	Flash memory disabled; Auxiliary ROM 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

The system will not operate without Memory Bank 0 (SIMM's 1 and 2) filled. For more information on Memory Modules, see page 34.

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.

Step 3: Install the SBC

Overview

Before you connect any peripheral devices to the PE5000(D)HX, install the SBC onto a passive backplane in a chassis (Figure 5).

Procedure

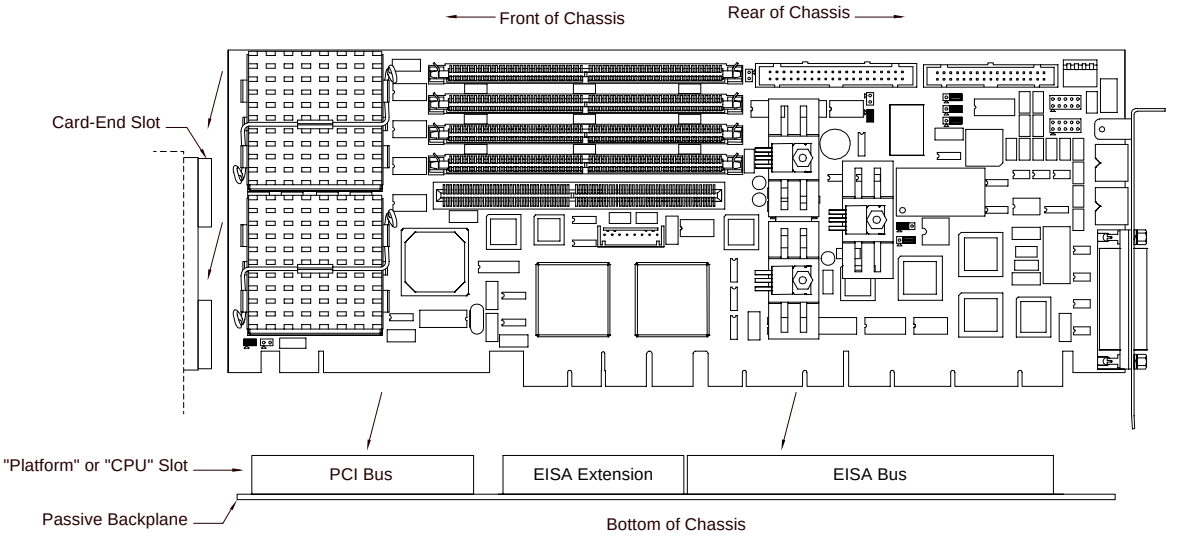
The procedure for installing the SBC is outlined in the following table:

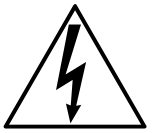
Step	Action
1	Power-off the system and disconnect all power cords. **Note:** Use the grounding wrist strap provided with the system to discharge static electricity.
2	Remove the chassis cover.
3	Detach the circuit card hold-down bracket (if required). This bracket reaches across the tops of the circuit cards and holds them in place.
4	Locate the EISA/PCI CPU slot on the passive backplane. **Note:** The SBC will not function if it is installed in the improper slot.
5	Remove the I/O blank bracket from the rear of the chassis (if required). This blank bracket 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 PE5000(D)HX 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.

Figure 5 Installing 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.

Step 4: Attach Peripherals to Headers

Overview

After you have installed the PE5000(D)HX onto a passive backplane in a chassis, attach the necessary peripheral devices to the appropriate headers on the SBC (Figure 6).

IDE Drive

Two (2) IDE devices 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 Activity LED

This header connects the IDE activity LED cable to the SBC.
Note: Pin 1 is the anode (+V); Pin 2 is the cathode (-V).

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.

Serial Ports

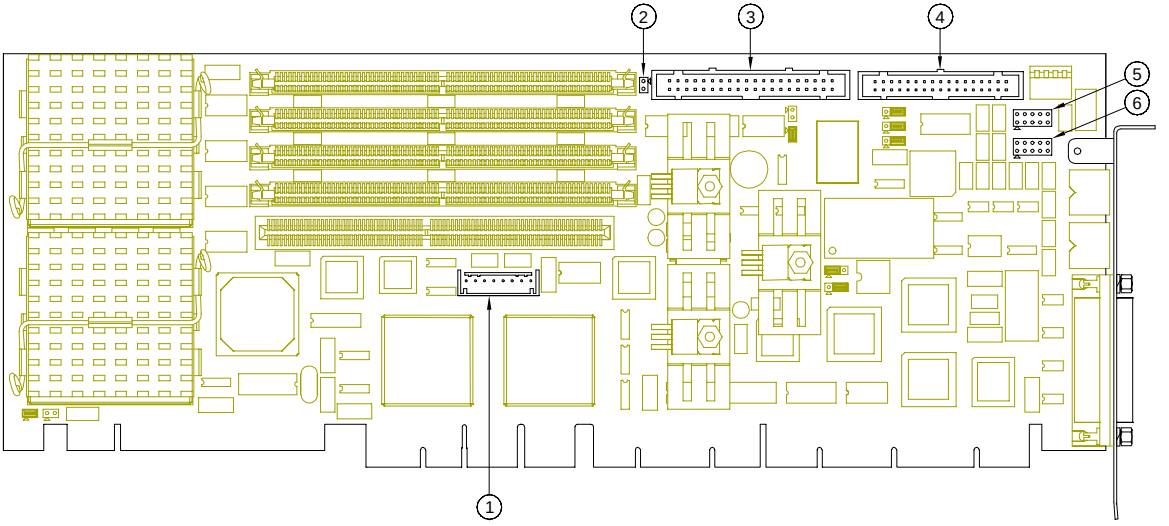
A serial device can be attached to each serial header (16550-compatible) via a 10-conductor flat cable. If connecting a serial mouse, be sure to use a shielded cable.
Note: The "red stripe" on the cable should be near Pin 1 on the header.

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

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.

Figure 6 Peripheral Header Locations



1. Keyboard
2. IDE Activity LED
3. IDE Drive
4. Floppy Drive
5. Serial Port 1
6. Serial Port 2

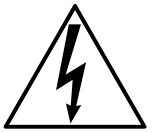
To avoid damage or injury, always power-off the system and disconnect all power cords from their power source before handling the equipment.
To help prevent accidental damage that can be caused by static discharge, always use a grounding wrist strap or other static-dissipating device when accessing the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

For pin signals and positions, see page 30.

Step 5: Attach Peripherals to Connectors

Overview

After you have attached peripheral devices to the headers on the PE5000(D)HX, attach devices to the 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 SBC.

Mouse

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

Keyboard

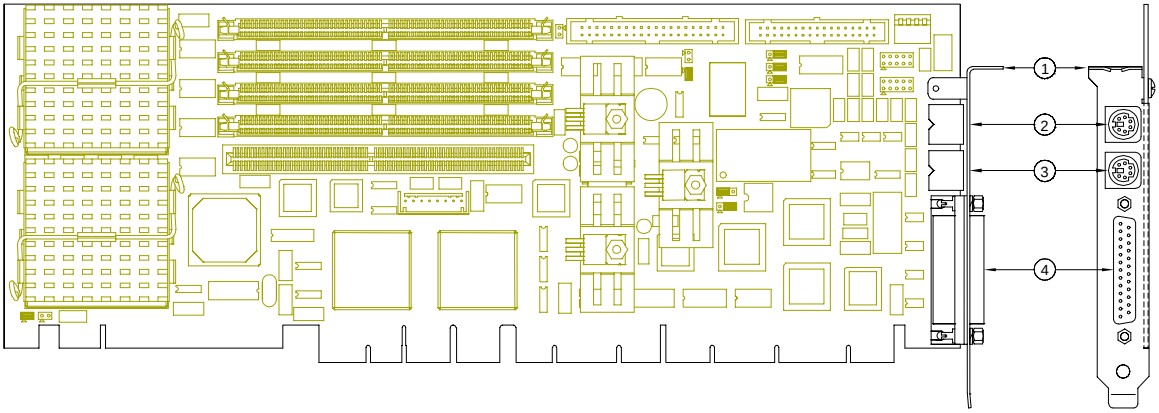
A PS/2 keyboard can be attached to this connector.

Parallel Port

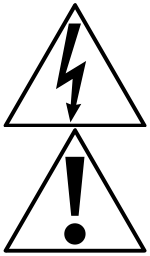
The IEEE 1284 parallel port:

- Is a DB-25 female connector
- Provides a Centronics-compatible printer interface
- Supports AT-compatible and bi-directional operations

Figure 7 Peripheral Connector Locations



1. I/O Bracket
2. PS/2 Mouse
3. PS/2 Keyboard
4. Parallel Port



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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.

For pin signals and positions, see page 30.

Step 6: Power-On the System

Overview

After you have installed the PE5000(D)HX 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:

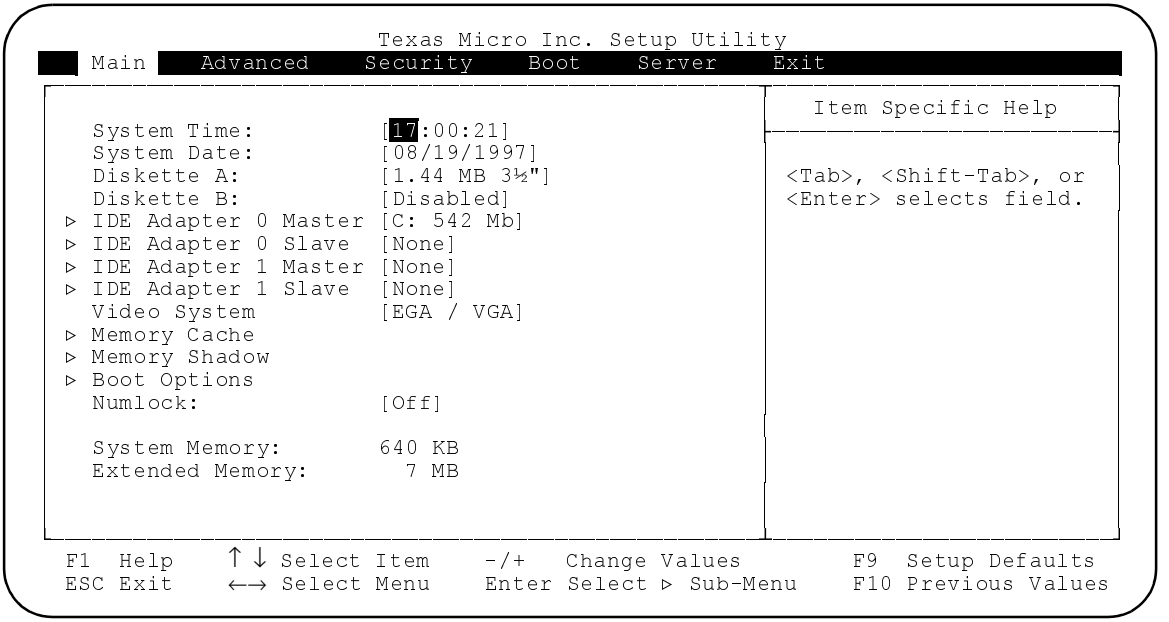
- Execute the Power-On Self Test (POST) to ensure that the system is functional and properly configured
- Start the operating system

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.

Figure 8 Setup Utility Main Menu



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 PE5000(D)HX.

Access

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

Display

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
- 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

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 MB 3½"	Not Installed, 720 KB 3½", 2.88 MB 3½", 360 KB 5¼", 1.2 MB 5¼"
Diskette B	N/A	Not Installed	720 KB 3½", 1.44 MB 3½" 2.88 MB 3½", 360 KB 5¼", 1.2 MB 5¼"
▷ IDE Adapter 0/1 Master/Slave	Type	Auto (All 4 IDE devices)	None, User, 1-39, CD
		Note: If Type is set to Auto, the only option available is 32-Bit I/O.	
	Cylinders	Enter a value	N/A
	Heads	Enter a value	N/A
	Sectors/Track	Enter a value	N/A
	Write Precomp	None	N/A
	Multi-Sector Transfers	16 Sectors	Disabled, 2 Sectors, 4 Sectors, 8 Sectors
	LBA Mode Control	Enabled	Disabled
	32-Bit I/O	Disabled	Enabled
	Transfer Mode	Standard	N/A
Video System	N/A	EGA / VGA	CGA 80x25, Monochrome
▷ Memory Cache	External Cache	Disabled	Enabled
	Cache System BIOS Area	Enabled	Disabled
	Cache Video BIOS Area	Enabled	Disabled
	Cache C800—DFFF	Disabled (All regions)	Enabled
▷ Memory Shadow	System Shadow	Enabled	N/A
	Video Shadow	Enabled	Disabled
	Regions with Legacy Expansion ROMs	ROM	Shadow RAM
		Note: This feature is available only for ISA/EISA ROMs.	
▷ Boot Options	Summary Screen	Enabled	Disabled
	Floppy Check	Enabled	Disabled
	Quiet Boot (Graphic)	Disabled	Enabled
	POST Errors	Enabled	Disabled

Main

The items for the Main menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
▷ 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
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	COM A Port (Serial 1)	3F8 IRQ 4 (COM 1)	2F8 IRQ 3 (COM 2), 3E8 IRQ 4 (COM 3), 2E8 IRQ 3 (COM 4), 2E8 IRQ 4, 3E8 IRQ 3, 220 IRQ 4, 220 IRQ 3, 228 IRQ 4, 228 IRQ 3, 238 IRQ 4, 238 IRQ 3, 338 IRQ 4, 338 IRQ 3, Auto, Disabled
	COM B Port (Serial 2)	2F8 IRQ 3 (COM 2)	3F8 IRQ 4 (COM 1), 3E8 IRQ 4 (COM 3), 2E8 IRQ 3 (COM 4), 2E8 IRQ 4, 3E8 IRQ 3, 220 IRQ 4, 220 IRQ 3, 228 IRQ 4, 228 IRQ 3, 238 IRQ 4, 238 IRQ 3, 338 IRQ 4, 338 IRQ 3, Auto, Disabled
	LPT Port	278 IRQ 7	378 IRQ 7, 378 IRQ 5, 278 IRQ 5, Auto, Disabled
	Diskette Controller	Enabled	Disabled
	Integrated IDE Adapter	Primary	Disabled
▷ Advanced Chipset Control	DRAM Speed	70 ns	60 ns
	Memory Gap	Disabled	512 KB — 640 KB, 15 MB — 16 MB
	Watchdog Timer Delay	1.2 sec	150 ms
	Onboard Speaker	On	Off
	EISA PCI Latency	3 uS	1 uS, 2 uS, 4 uS
	ECC/Parity Config	Parity	Disabled, ECC

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	Disabled, Auto Select, 3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT), 7 (1st LPT), 10, 11 (Open), 12 (PS/2 Mouse), 14 (Primary IDE), 15 (Secondary IDE)
		Note: Incorrect settings may cause system malfunction.	
	PCI IRQ Line 2	10	Disabled, Auto Select, 3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT), 7 (1st LPT), 9, 11 (Open), 12 (PS/2 Mouse), 14 (Primary IDE), 15 (Secondary IDE)
	PCI IRQ Line 3	11	Disabled, Auto Select, 3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT), 7 (1st LPT), 9, 10 (Open), 12 (PS/2 Mouse), 14 (Primary IDE), 15 (Secondary IDE)
	PCI IRQ Line 4	15	Disabled, Auto Select, 3 (COM2/COM4), 4 (COM1/COM3), 5 (2nd LPT), 7 (1st LPT), 9, 10, 11 (Open), 12 (PS/2 Mouse), 14 (Primary IDE)
Use Multiprocessor Specification	N/A	1.1	1.4
		Note: This option must be set to 1.1 if Windows NT® 3.5x is used.	
PS/2 Mouse	N/A	Disabled	Enabled
Plug & Play O/S	N/A	No	Yes
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	Disabled (Display only)	Enabled (Display only)
User Password Is	N/A	Disabled (Display only)	Enabled (Display only)
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
Diskette Access	N/A	Supervisor	User
Fixed Disk Boot Sector	N/A	Normal	Write Protect
System Backup Reminder	N/A	Disabled	Daily, Weekly, Monthly
Virus Check Reminder	N/A	Disabled	Daily, Weekly, Monthly

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), 3E8 IRQ 3, 2E8 IRQ 4, 338 IRQ 3, 338 IRQ 4, 238 IRQ 3, 238 IRQ 4, 228 IRQ 3, 228 IRQ 4, 220 IRQ 3, 220 IRQ 4,
Console Redirect Baud Rate	N/A	9600	19200, 38400, 56000

Notes

Notes

3 Technical Data

This chapter provides the following information:

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

Specifications

Overview

Listed in the table below are system specifications and environmental tolerances for the PE5000(D)HX series SBC.

Note: These specifications are subject to change without notice.

Environmental

Environmental tolerances are listed in the following table:

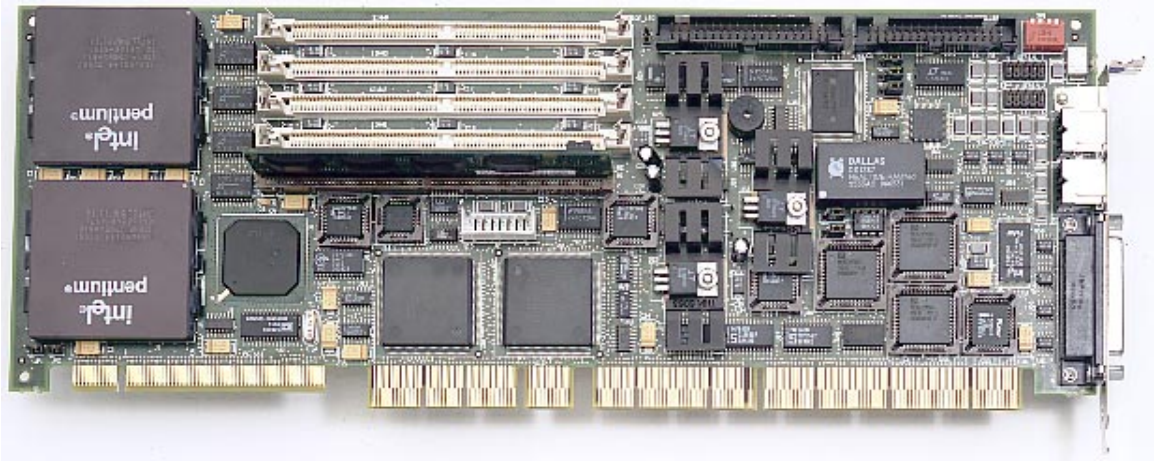
Temperature **Note:** See page 29.	Operating: 0 to +60 °C (32 to 140 °F) Non-Operating: -40 to +70 °C (-40 to 158 °F)
Humidity	Operating: 5 — 95% @ 40 °C, non-condensing Non-Operating: 0 — 95% @ 40 °C, non-condensing
Shock	Operating: 1 G @ 11 ms Non-Operating: 10 G @ 11 ms
Vibration	Operating: .5 G @ 5 — 200 Hz Non-Operating: 2 G @ 5 — 200 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	Single or Dual 100/133/166 MHz Intel™ Pentium® Processor (P54C)
Chipset	Intel 430HX and EISA Bridge 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 bus access
Data Path	64-bit on board: 32-bit on EISA bus access, 32-bit on PCI local bus
Flash Memory	2 Mb (256 KB x 8)
Clock/Calendar	DS1387 Real Time Clock accurate to +/- 12 minutes/year, at 25 °C; includes CMOS
Power Requirements w/ 8 — 256 MB DRAM	Input Power 35 — 45 W +5 V 7.0 — 9.0 A +12 V 0.1 A -12 V 0.1 A
Form Factor	13.28" (33.73 cm) x 4.80" (12.19 cm)

Figure 9 The PE5000(D)HX 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.

Pin Signals

Overview

The tables below list the pin signals for the 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	+5V

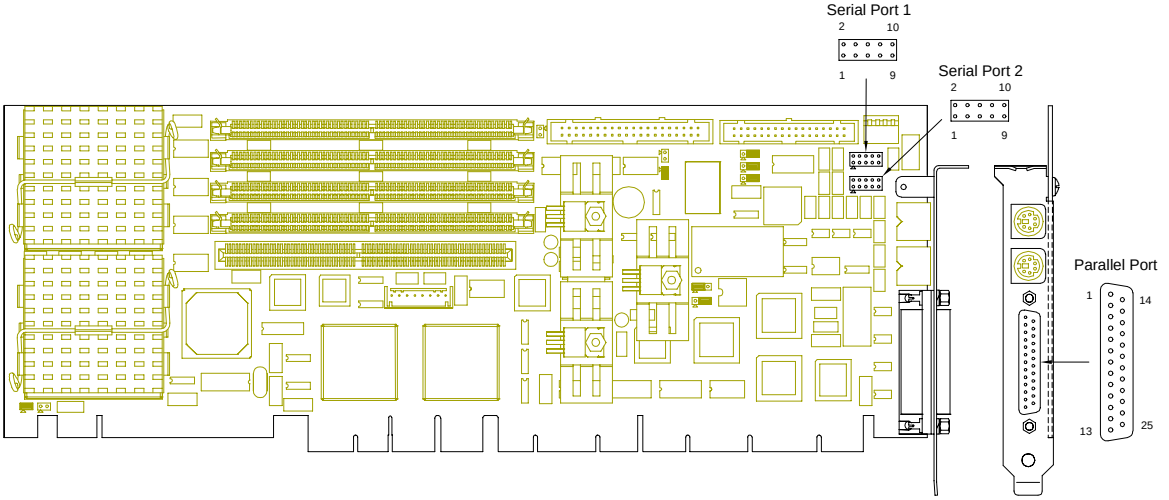
Serial Port 2				
RS-232		RS-422		
Pin	**Description**	**Pin**		**Description**
		DB9	**10-Pin**	
1	Data Carrier Detect (In)	1	1	/Z Output (TX-)
2	Data Set Ready (In)	6	2	/B Receive (RX-)
3	Receive Data (In)	2	3	Y Output (TX+)
4	Request to Send (Out)	8	6	A Receive (RX+)
5	Transmit Data (Out)			
6	Clear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

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	10	- Acknowledge
2	Data Bit 0	11	+ Busy
3	Data Bit 1	12	+ Paper Feed
4	Data Bit 2	13	+ Select
5	Data Bit 3	14	- Auto Feed
6	Data Bit 4	15	- Error
7	Data Bit 5	16	- Initialize Printer
8	Data Bit 6	17	- Select Input
9	Data Bit 7	18-25	Ground

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.

Pin Signals

Overview

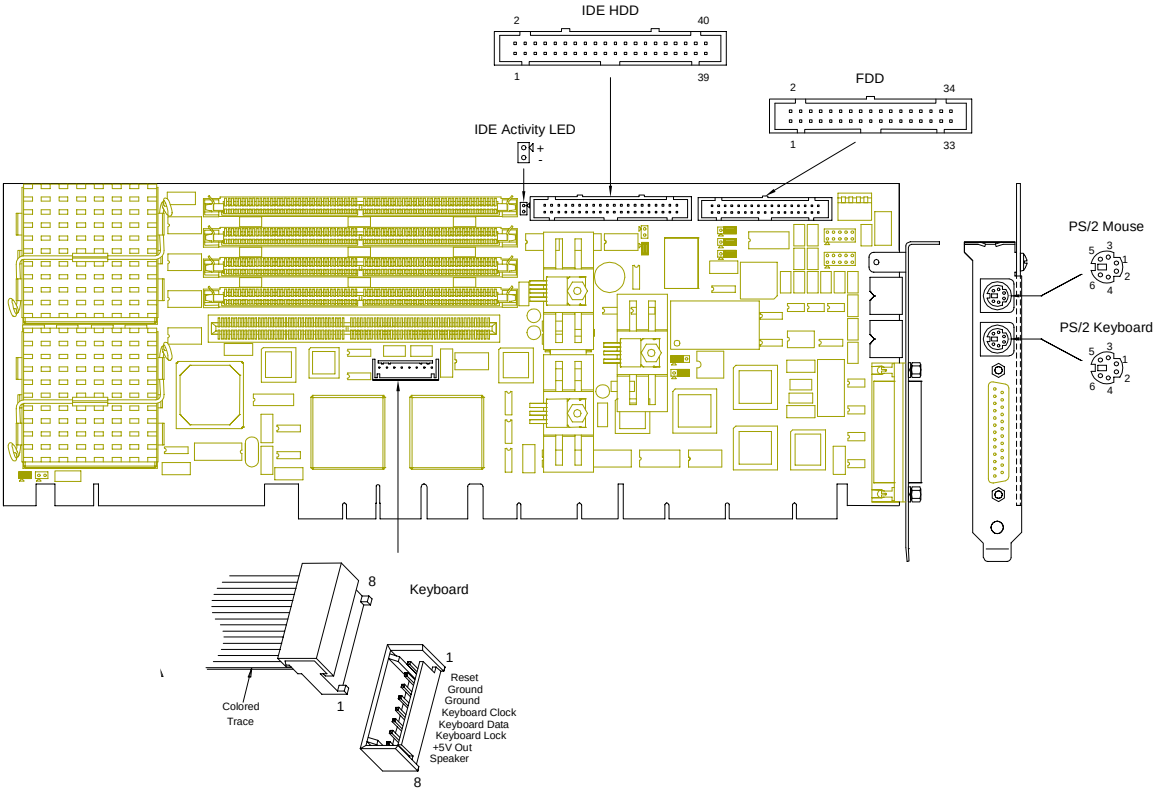
The tables below list the pin signals for each peripheral header. The following illustration (Figure 11) indicates the pin positions for each.

IDE			
Pin	**Description**	**Pin**	**Description**
1	Reset (Out)	21	DMA Request (In)
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 (In)
10	Data 11 (I/O)	33	+ ADDR1 (Out)
11	Data 3 (I/O)	34	Passed Diagnostics
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 (In)
17	Data 0 (I/O)	2, 19, 22, 24, 26, 30, 40	Ground
18	Data 15 (I/O)		
20	Not Connected		

Keyboard	
Pin	**Description**
1	Reset
2	Ground
3	Not Connected
4	Keyboard Clock
5	Keyboard Data
6	Keyboard Lock
7	+5V
8	Speaker

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

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.

Installing Memory

Overview

The PE5000(D)HX 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 PE5000(D)HX 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):

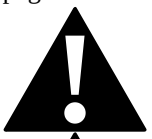
- Sockets 1 and 2 comprise Bank 0
- Sockets 3 and 4 comprise Bank 1

Bank 0 should be filled before Bank 1, and 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; otherwise, Bank 0 will be inoperable.

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 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.

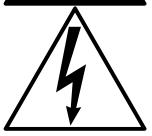


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Figure 12 Memory Sockets

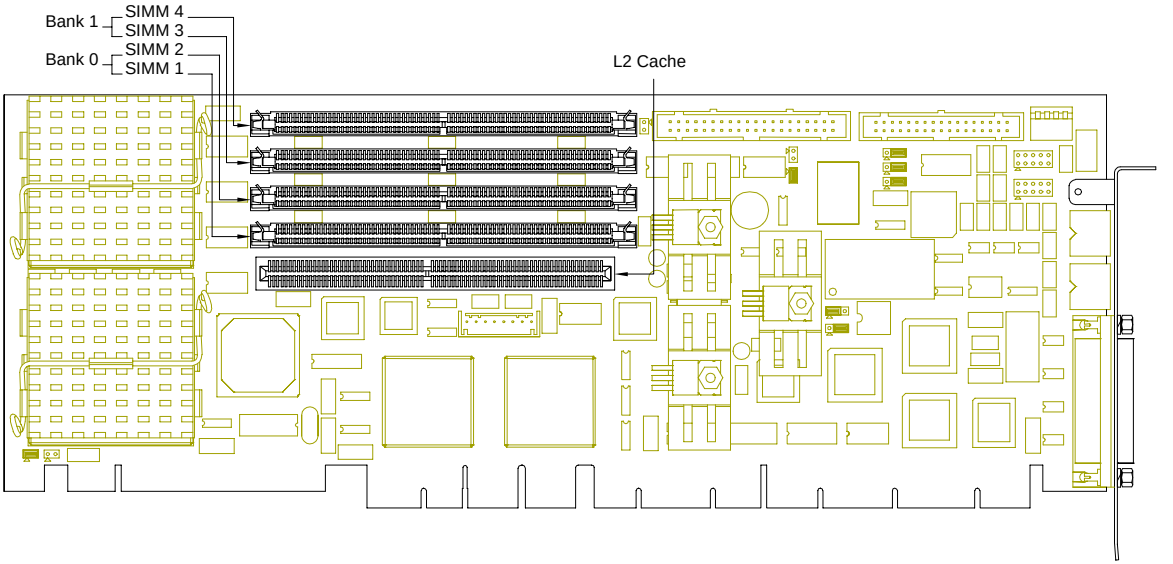

Figure 13 Memory Combinations

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
3X = 36 for Parity, 32 for Non-Parity		

Notes