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Service Manual

P5000HX(-M)-WMB
Series Motherboard

25716B
March 1999
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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.

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Important

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

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.

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Notice

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

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

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

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

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

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

ISO-9001

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Document Conventions

Typography

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

Symbols

	**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.

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Customer Support

Calling Technical Support

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

Returning Products for Service

Step	Action
1	Have the Texas Micro product model and serial number available.
2	• In the Continental USA, Monday — Friday, 7:00 a.m. — 6:00 p.m., Central Time, dial 1-800-627-8700 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 P5000HX(-M)-WMB.

If you are familiar with the primary components and functions of the P5000HX(-M)-WMB, and you wish to quickly begin operating the motherboard, go to Chapter 2, “7 Steps to Operation,” page 5. Then read this chapter later at your convenience.

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P5000HX(-M)-WMB Series Motherboard

Standard Features

The Texas Micro P5000HX-WMB and P5000HX-M-WMB motherboards provide the following features:

- Intel® Pentium® processor:
  - P5000HX-WMB: 166 MHz Pentium (P54C)
  - P5000HX-M-WMB: 200 / 233 MHz Pentium with MMX™ technology (P55C)
- Intel 430HX PCIset
  - 82439HX System Controller (TXC3, or North-Bridge)
  - 82371SB PCI I/O IDE Xcellerator (PIIX3, or South-Bridge)
- SMC FDC37C93X Ultra I/O™ Controller
- 256 KB flash memory
- Level 2 write-back cache socket for 256 or 512 KB pipeline burst COAST SRAM
- Four (4) low-profile SIMM sockets for up to 128 MB scaleable DRAM
  Note: The P5000HX(-M)-WMB supports FPM or EDO.
- Two (2) RS-232 serial ports
- Parallel port (AT-compatible/bi-directional/enhanced operations)
- Floppy drive controller
- Two (2) PCI EIDE hard disk drive controllers
- Four (4) ISA expansion slots
- Four (4) PCI expansion slots

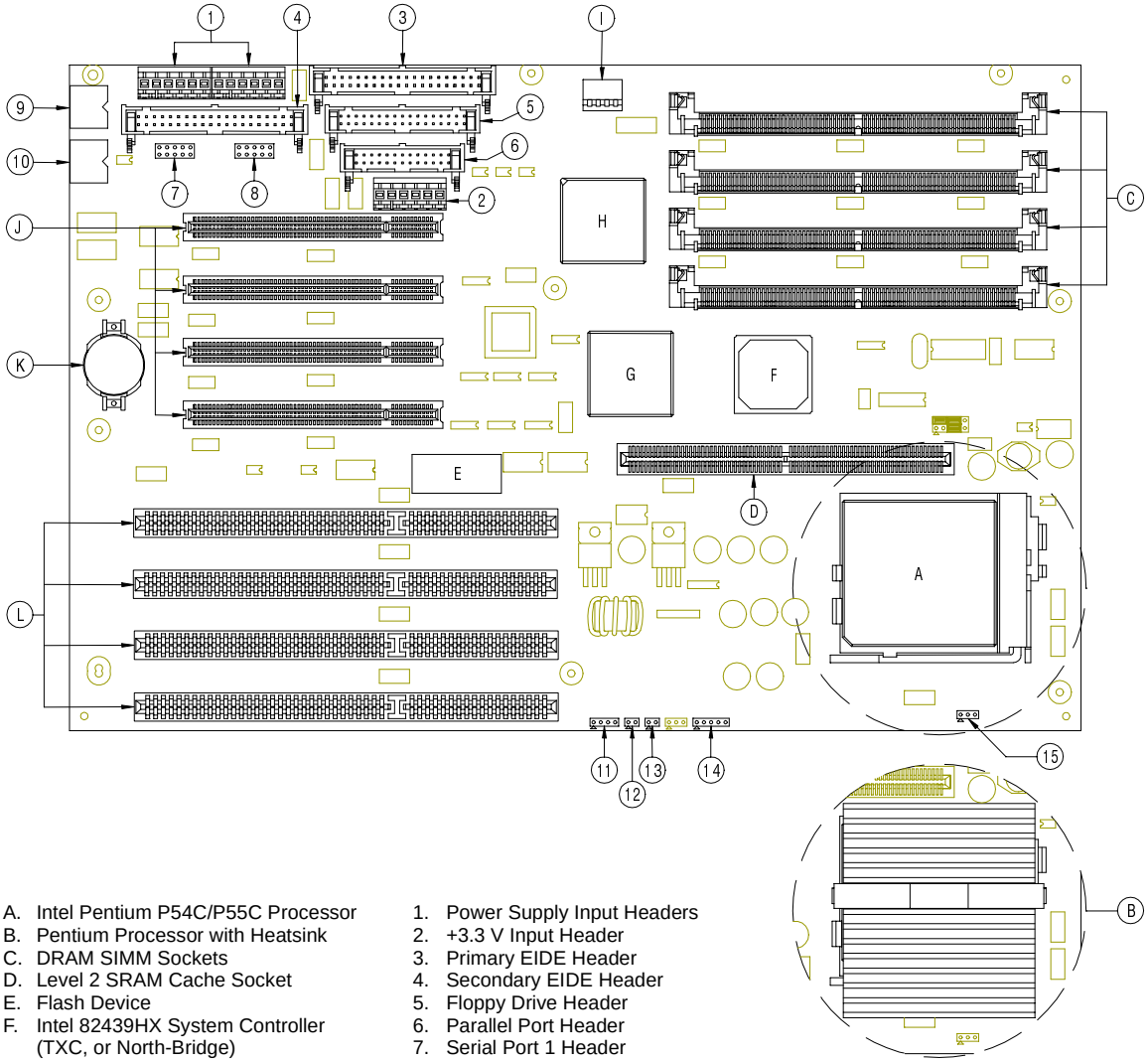
More...

For more information on the components of the P5000HX(-M)-WMB, contact:

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

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Figure 1 P5000HX(-M)-WMB Components and Layout



A. Intel Pentium P54C/P55C Processor
B. Pentium Processor with Heatsink
C. DRAM SIMM Sockets
D. Level 2 SRAM Cache Socket
E. Flash Device
F. Intel 82439HX System Controller (TXC, or North-Bridge)
G. Intel 82371SB PCI I/O IDE Xcelerator (PIIX3, or South-Bridge)
H. SMC FDC37C93X Ultra I/O Controller
I. DIP Switch Block
J. PCI Expansion Slots
K. Battery for CMOS Real Time Clock
L. ISA Expansion Slots

1. Power Supply Input Headers
2. +3.3 V Input Header
3. Primary EIDE Header
4. Secondary EIDE Header
5. Floppy Drive Header
6. Parallel Port Header
7. Serial Port 1 Header
8. Serial Port 2 Header
9. PS/2 Keyboard Connector
10. PS/2 Mouse Connector
11. Speaker Header
12. EIDE Activity LED Header
13. Reset Button Header
14. System Power LED Header
15. Auxiliary CPU Fan Header

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Notes

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2 7 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 basic precautions for handling the P5000HX(-M)-WMB and then outlines the basic steps for setting up the motherboard:

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

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Handling the P5000HX(-M)-WMB

Overview

This section suggests basic precautions when handling the P5000HX(-M)-WMB series motherboard.

Static Electricity

The P5000HX(-M)-WMB is designed to protect against ESD (electro-static discharge) and excessive voltage. However, excessive static electricity can damage components.

Before you handle the motherboard, 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.

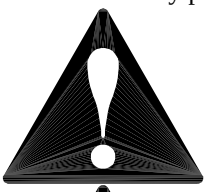


Handle the motherboard by the edges to help prevent accidental damage caused by static discharge (Figure 2).

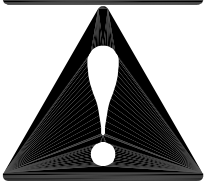
Safety

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 motherboard. If the motherboard 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.



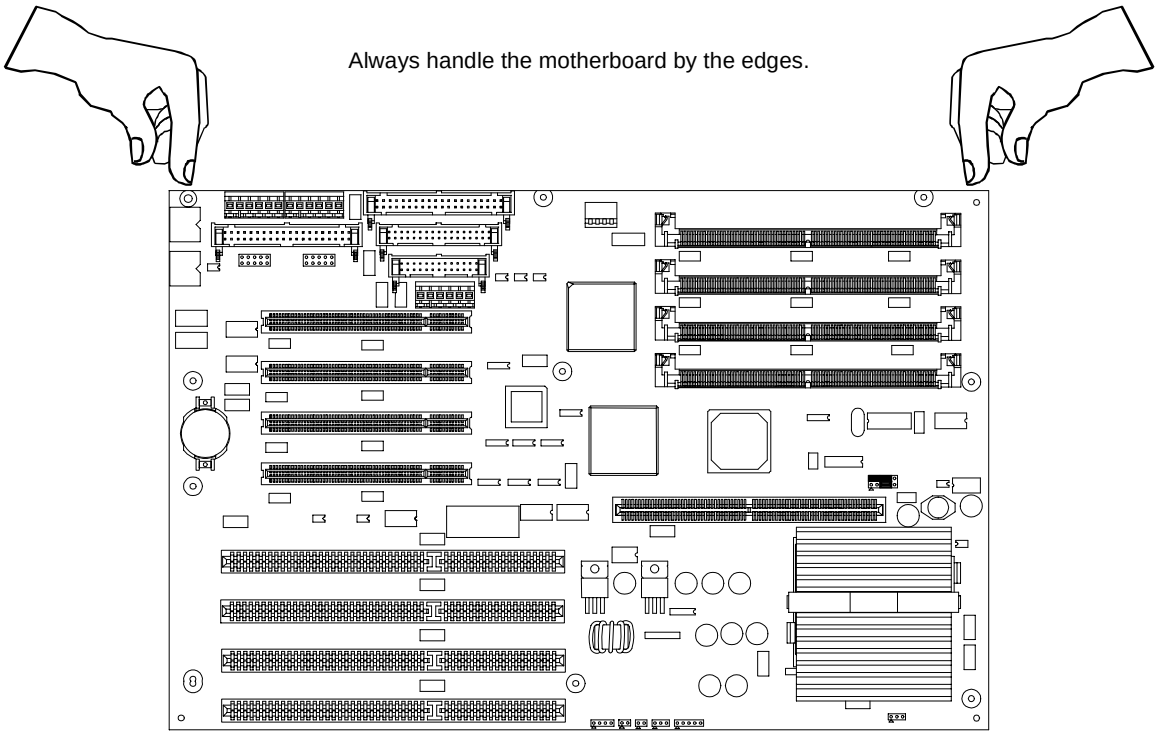
To avoid damage or injury, always power-off the system and disconnect all power cords from their source before handling the equipment.
To help prevent accidental damage caused by static discharge, use a grounding wrist strap or other static-dissipating device when handling the equipment.
Um Sachschaden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

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Figure 2 Safely Handling the Motherboard



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Step 1: Install the Motherboard

Overview

Before you connect any devices to the P5000HX(-M)-WMB or modify any settings, install the motherboard into a chassis (Figure 3).

Procedure

The procedure for installing the motherboard 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 chassis stiffener bar (if required). This bar supports the frame of the chassis.
4	Insert the motherboard into the chassis with the expansion slots oriented toward the chassis I/O Slots and the power input headers toward the chassis power supply.
5	Seat the motherboard on the mounting posts in the bottom of the chassis.
6	Secure the motherboard to the mounting braces by fastening screws through the mounting holes on the motherboard.
7	Replace the chassis stiffener bar (if required).



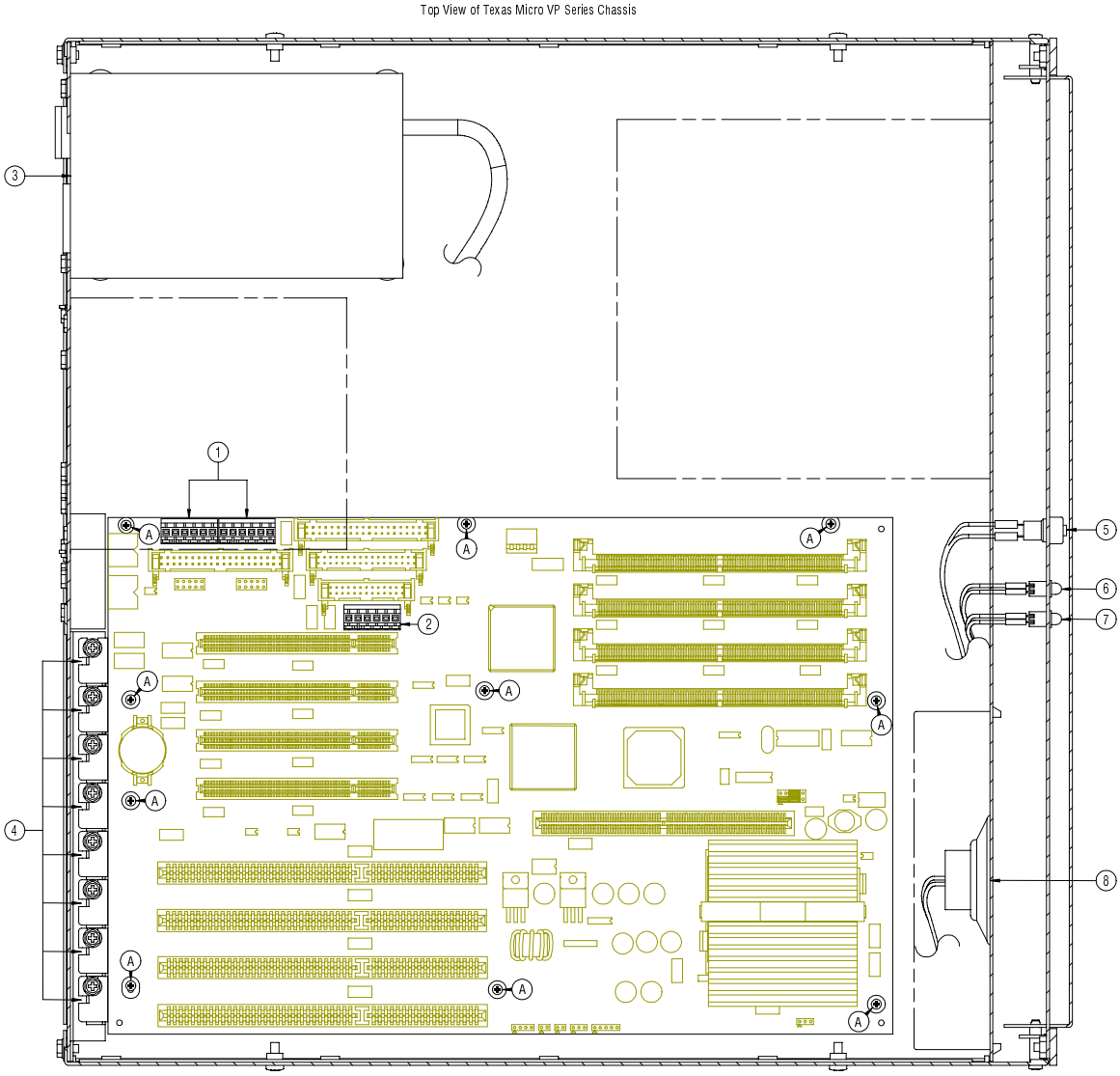
To install the motherboard in a chassis not manufactured by Texas Micro, consult the instructions provided by the manufacturer.



The CPU requires a minimum airflow of 200 linear feet per minute (LFM) unimpeded across the processor within 0 to 55 °C (32 to 131 °F) ambient temperature. Operations outside these specifications could void the warranty.

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Figure 3 Installing the Motherboard



1. Power Input Headers
2. +3.3 V Input Header
3. Chassis Power Supply
4. Chassis I/O Slots
5. Reset Button
6. System Power LED
7. IDE Activity LED
8. Speaker

A. Mounting Holes

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Step 2: Check Jumper Settings

Overview

After you install the P5000HX(-M)-WMB into a chassis, check the jumper settings on the motherboard (Figure 4).

Jumper Blocks

The P5000HX(-M)-WMB contains:

- Two (2) two-pin jumper blocks (JP1A and JP1B)
- Two (2) three-pin jumper blocks (JP1C and JP1D)

Settings

Settings for the jumpers are provided in the following tables:

2-Pin Jumper Blocks

JP1A	JP1B	Host Bus Speed
None	B1—B2	66.6 MHz (default)
A1—A2	None	60.0 MHz
A1—A2	B1—B2	50.0 MHz

3-Pin Jumper Blocks

	JP1C	JP1D	Core/Bus Ratio	CPU Speed
P5000HX-WMB	C1—C2	D1—D2	2.5	166 MHz
P5000HX-M-WMB	C1—C2	D2—D3	3.0	200 MHz
	C2—C3	D2—D3	3.5	233 MHz)
CPU Speed values are based on the Host Bus Speed at 66.6 MHz.				

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Figure 4 Jumper Block Locations

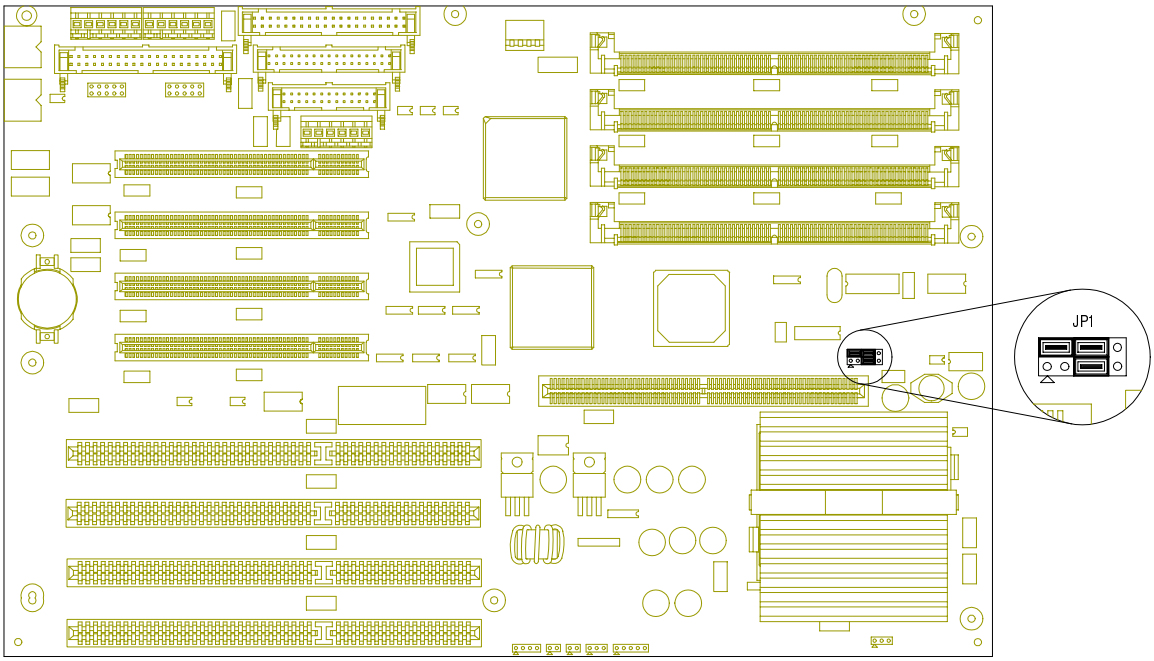
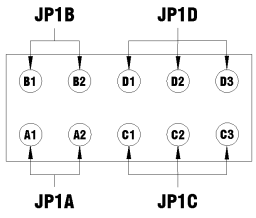


Figure 5 Jumper Block JP1 Pins



	Jumpers	Function
2-Pin	JP1A, JP1B	Host Bus Speed
3-Pin	JP1C, JP1D	CPU Speed

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Step 3: Check Switch Settings

Overview

After you check the jumper settings, check the switch block on the motherboard for proper settings (Figure 6).

Switch Block

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

- On-board ROM access
- CMOS RAM
- Configuration Ports

Settings

Settings for the switches are provided in the following table:

SW1-1	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.

A Note on Crisis Recovery

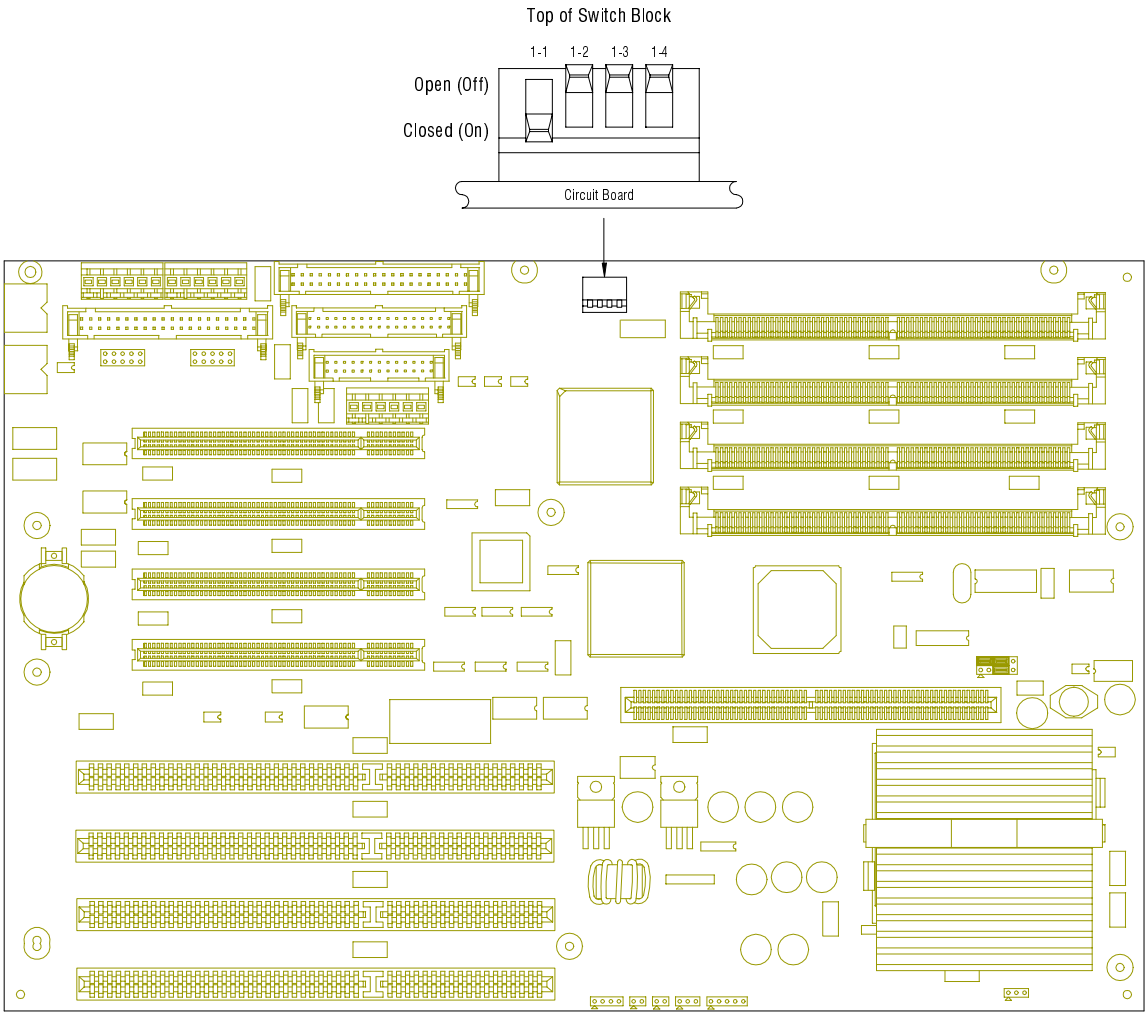
Crisis Recovery mode causes the system to boot from the floppy drive and reflash the BIOS.
Note: Video is disabled on boot with Crisis Recovery mode enabled.

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.

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Figure 6 Switch Block Location



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Step 4: Connect System Devices

Overview

After you have checked the jumper and switch settings, connect the system devices to the P5000HX(-M)-WMB (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 motherboard, certain considerations must be made:

Device(s)	Consideration
Reset Button	• This header connects the reset button cable to the motherboard. • The Violet wire goes to Pin 1 on the header; the Black wire goes to Pin 2.
System Power LED	• This header connects the system power LED cable to the motherboard. • The Green wire goes to Pin 1 on the header; the Black wire goes to Pin 3.
IDE Activity LED	• This header connects the IDE device activity LED cable to the motherboard. • Pin 1 (Black wire) is the anode (+V); Pin 2 (Yellow wire) is the cathode (-V).
Speaker	• This header connects the speaker cable to the motherboard. • The Red wire goes to Pin 1 on the header; the Black wire goes to Pin 4.
Auxiliary CPU Fan	• An auxiliary CPU fan can be attached to this header. • For information on thermal specifications, see page 28.

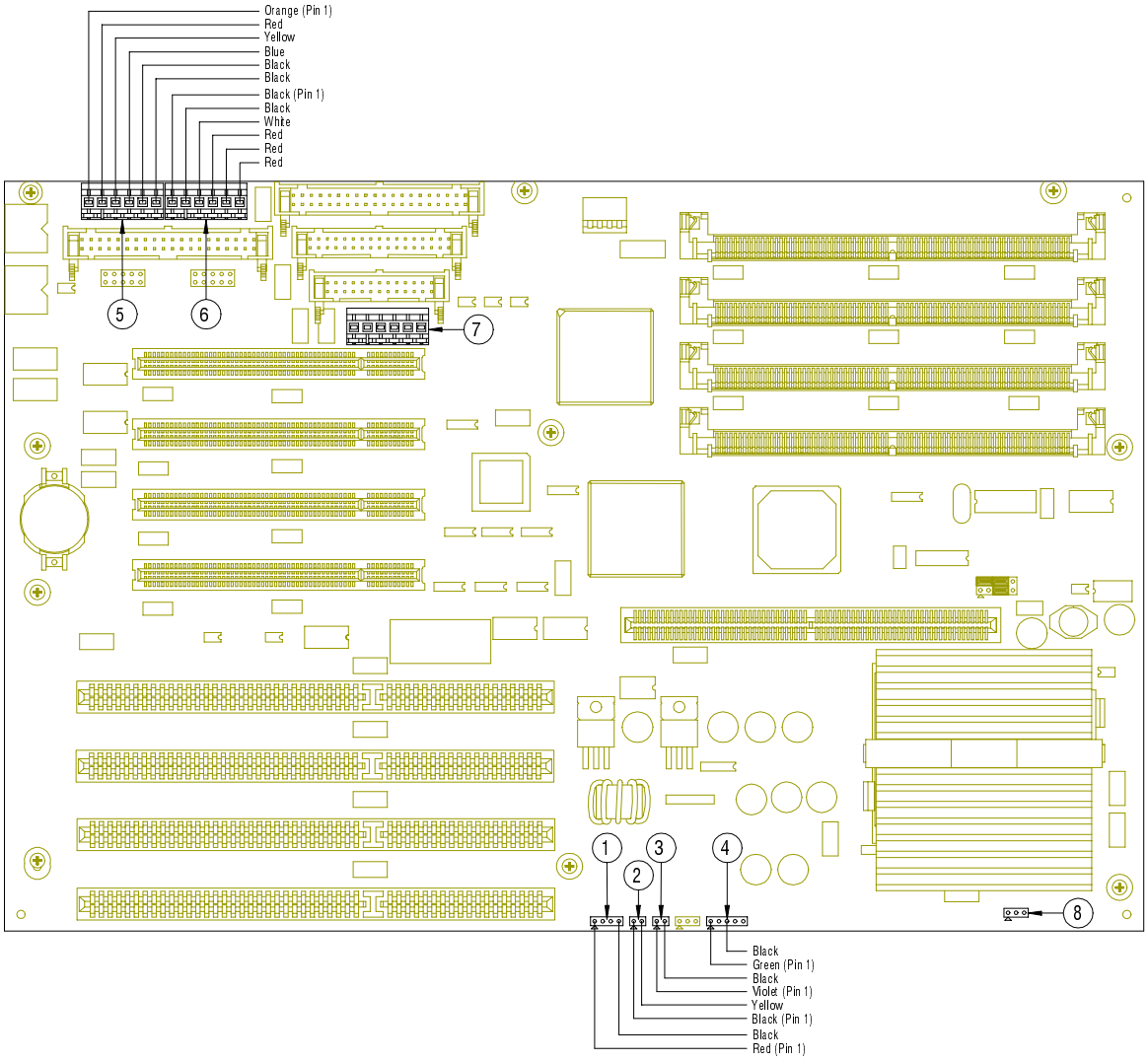
Power Supply	• There are two (2) Power Supply Input headers. Each header (P8 and P9) contains six colored wires. The following is a list of typical wire coloring:
	  • P8: Orange (Pin 1), Red, Yellow, Blue, Black, Black
	  • P9: Black (Pin 1), Black, White, Red, Red, Red
	• Improperly connecting the cables to these headers can cause damage to the motherboard and could void the warranty.

+3.3 Volt Input	A power input cable can be attached to this header to provide devices with +3.3 VDC power. **Note:** This power input is required for PCI expansion boards using +3.3 V. If no +3.3 V PCI expansion boards are installed on the motherboard, this power input is not required.

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Figure 7 System Header Locations

Note: This illustration shows common wiring color schemes only. For pin signals, see page 30.



1. Speaker
2. EIDE Activity LED
3. Reset Button
4. System Power LED
5. P8 Power Supply Input
6. P9 Power Supply Input
7. +3.3 V Input
8. Auxiliary CPU Fan

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Step 5: Connect Peripheral Devices

Overview

After you have connected the system devices, connect peripheral devices to the P5000HX(-M)-WMB (Figure 8).



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

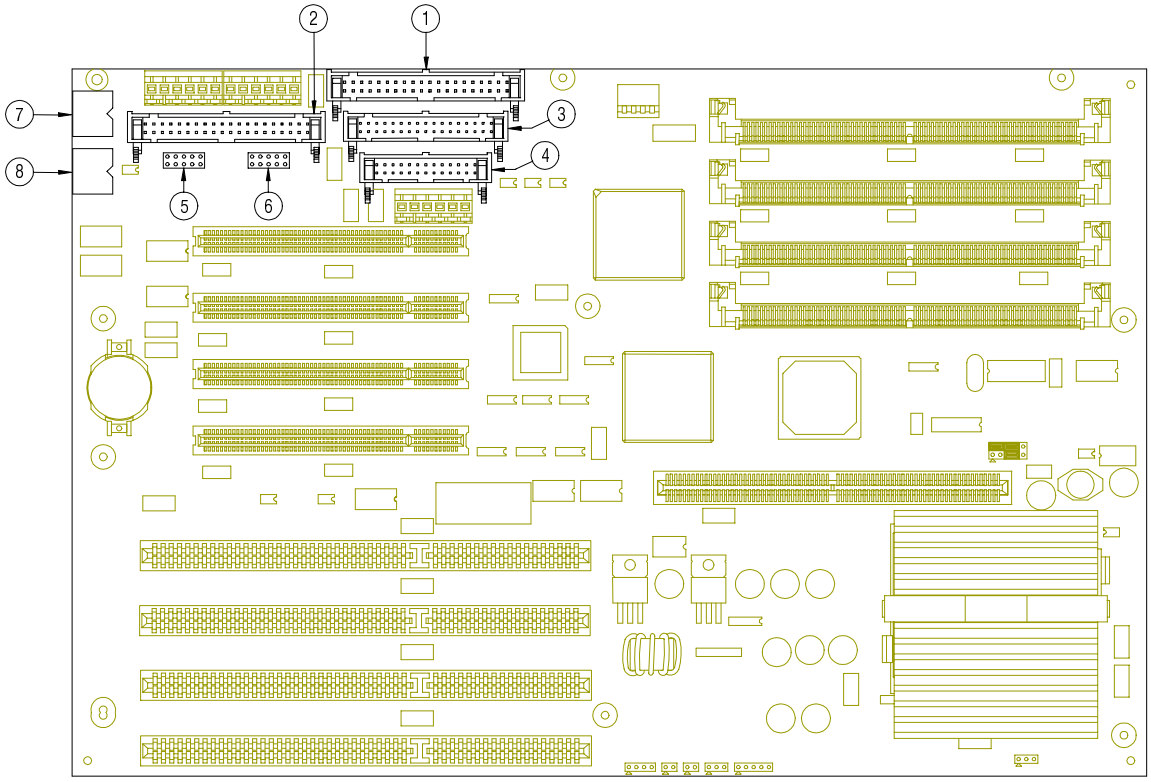
Attention

When attaching devices to the motherboard, certain considerations must be made:

Device(s)	Consideration
EIDE or IDE	• Up to two (2) EIDE or IDE devices can be attached to each EIDE header using a 40-conductor flat cable. • The BIOS will support up to four (4) EIDE or IDE devices. Use the primary controller for drives 1 and 2, the secondary controller for drives 3 and 4. The BIOS will automatically configure the IRQ's and I/O Ports for the controllers.
Floppy	Up to two (2) floppy drives can be attached to the FDD header using a 34-conductor flat cable.
Parallel	• The printer interface is Centronics-compatible. • AT-compatible/bi-directional/EPP/ECP operations are supported.
Serial	• One (1) serial device can be attached to each 16550-compatible serial port using a 10-conductor flat cable. • If connecting a serial mouse, use a shielded cable. • Improperly connecting the cables to these headers can cause damage to the equipment and could void the warranty.
PS/2 Keyboard	A PS/2 keyboard can be attached to this 6-pin female miniature DIN (mini-DIN) connectorfor access at the rear of the chassis.
PS/2 Mouse	A PS/2 mouse can be attached to this 6-pin female miniature DIN (mini-DIN) connector for access at the rear of the chassis.
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.

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Figure 8 Peripheral Header and Connector Locations



1. Primary EIDE Header
2. Secondary EIDE Header
3. Floppy Drive Header
4. Parallel Port Header
5. Serial Port 1 Header
6. Serial Port 2 Header
7. PS/2 Keyboard Connector
8. PS/2 Mouse Connector

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Step 6: Power-On the System

Overview

After you have installed the P5000HX(-M)-WMB 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

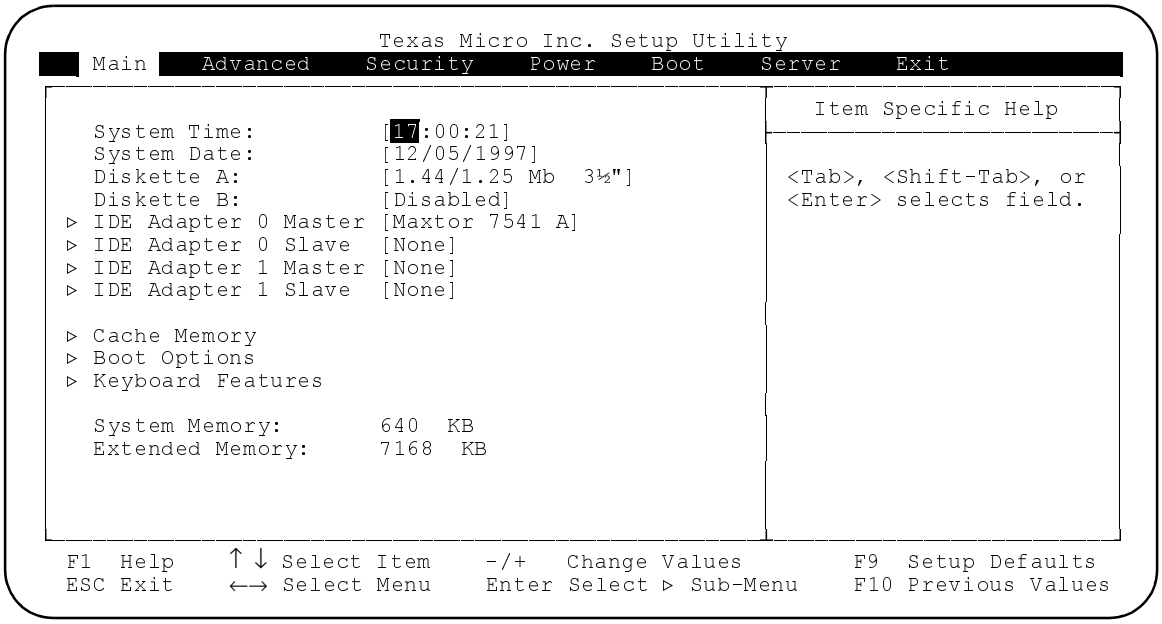
During the POST, you can access the Setup Utility (Figure 9) to configure the system.



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

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Figure 9 Setup Utility Main Menu



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Step 7: Run the Setup Utility

Overview

The BIOS (**B**asic **I**nput/**O**utput **S**ystem) Setup Utility allows you to configure the operations of the P5000HX(-M)-WMB.

Access

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

Display

The Setup Utility display (Figure 9) contains two areas:

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

Menus

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

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

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

Boot and Exit

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

Operation

Use the following keys to operate the Setup Utility:

Key	Action
Up Arrow (↑) and Down Arrow (↓)	Select a menu item
Left Arrow (←) and Right Arrow (→)	Select a menu
Plus (+) and Minus (-)	Change the value of an item
Enter	Access a sub-menu 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

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Main Menu

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

Option / Sub-Menu	Item	Default Setting	Alternate Settings
System Time	N/A	Current Time in Hours, Minutes, and Seconds	N/A
System Date	N/A	Current Date in Month, Day, and Year	N/A
Diskette A/B	N/A	A: 1.44/1.25 MB 3½" B: Disabled	Disabled, 720 KB 3½", 2.88MB 3½", 360KB 5¼", 1.2MB 5¼"
▷ IDE Adapter 0/1 Master/Slave	Type	Auto	User, 1-39, CD-ROM, ATAPI Removable, IDE Removeable, Other ATAPI, None
		Note: If Type is set to Auto, the only option available is 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	Enabled
	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

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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	EPP, ECP, Output Only (ISA)
		Note: If Mode is set to ECP, you must set the DMA.	
	Parallel Port: Base I/O Address	378	278, 3BC
	Parallel Port: Interrupt	IRQ 7	IRQ 5
	Parallel Port: DMA	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, Auto, OS Controlled
	Floppy Disk Controller: Base I/O Address	Primary	Secondary
	Local Bus IDE Adapter	Both	Disabled, Primary, Secondary
▷ Advanced Chipset Control	DRAM Speed	70 ns	60 ns
	ECC / Parity Config	Parity	Disabled, ECC
		Note: The ECC option functions only if Parity/FPM SIMM's are installed.	
	Enable Memory Gap	Disabled	Hole at 512 K — 640 K, Hole at 15 MB — 16 MB
	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

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Advanced

The items for the Advanced menu are continued below:

Option / Sub-Menu	Item	Default Setting	Alternate Settings
▷ PCI Devices	PCI IRQ Line 1 / 2 / 3 / 4	Auto Select (all IRQ lines)	Disabled, 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)
		Note: Incorrect settings may cause system malfunction.	
	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 Exclusion: IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 9, IRQ 10, IRQ 11, IRQ 12, IRQ 14, IRQ 15	Available (all IRQ's)	Reserved
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

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Power

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

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

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

Standby Timeout	N/A	Off	1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 12 Minutes, 16 Minutes
Auto Suspend Timeout	N/A	Off	5 Minutes, 10 Minutes, 15 Minutes, 20 Minutes, 30 Minutes, 40 Minutes, 60 Minutes
Hard Disk Timeout	N/A	Disabled	10 Seconds, 15 Seconds, 30 Seconds, 45 Seconds, 1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 10 Minutes, 15 Minutes
Video Timeout	N/A	Disabled	10 Seconds, 15 Seconds, 30 Seconds, 45 Seconds, 1 Minute, 2 Minutes, 4 Minutes, 6 Minutes, 8 Minutes, 10 Minutes, 15 Minutes
Resume on Modem Ring	N/A	Off	On
Resume on Time	N/A	Off	On
Resume Time	N/A	00:00:00 (24-hour clock)	N/A
▹ Advanced Options	IRQ 1	Enabled	Disabled
	IRQ 3, IRQ 4, IRQ 5, IRQ 6, IRQ 7, IRQ 8, IRQ 9, IRQ 10, IRQ 11, IRQ 12, IRQ 13, IRQ 14, IRQ 15	Disabled	Enabled
	SMI / NMI	Disabled	Enabled

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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

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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
- Notes on installing memory modules

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Specifications

Overview

Listed in the table below are system specifications and environmental tolerances for the P5000HX(-M)-WMB series motherboard.

Note: These specifications are subject to change without notice.

Environmental

Environmental tolerances are listed in the following table:

	Operating	Non-Operating
Temperature	0 to +55 °C (32 to 131 °F)	-40 to +70 °C (-40 to 158 °F)
Humidity	10 — 95% @ 40 °C, non-condensing	5 — 95% @ 40 °C, non-condensing
Shock	1 G @ 11 ms	10 G @ 11 ms
Vibration	.5 G @ 5 — 200 Hz	2 G @ 5 — 200 Hz
Altitude	15,000 ft (4,572 m)	50,000 ft (15,240 m)

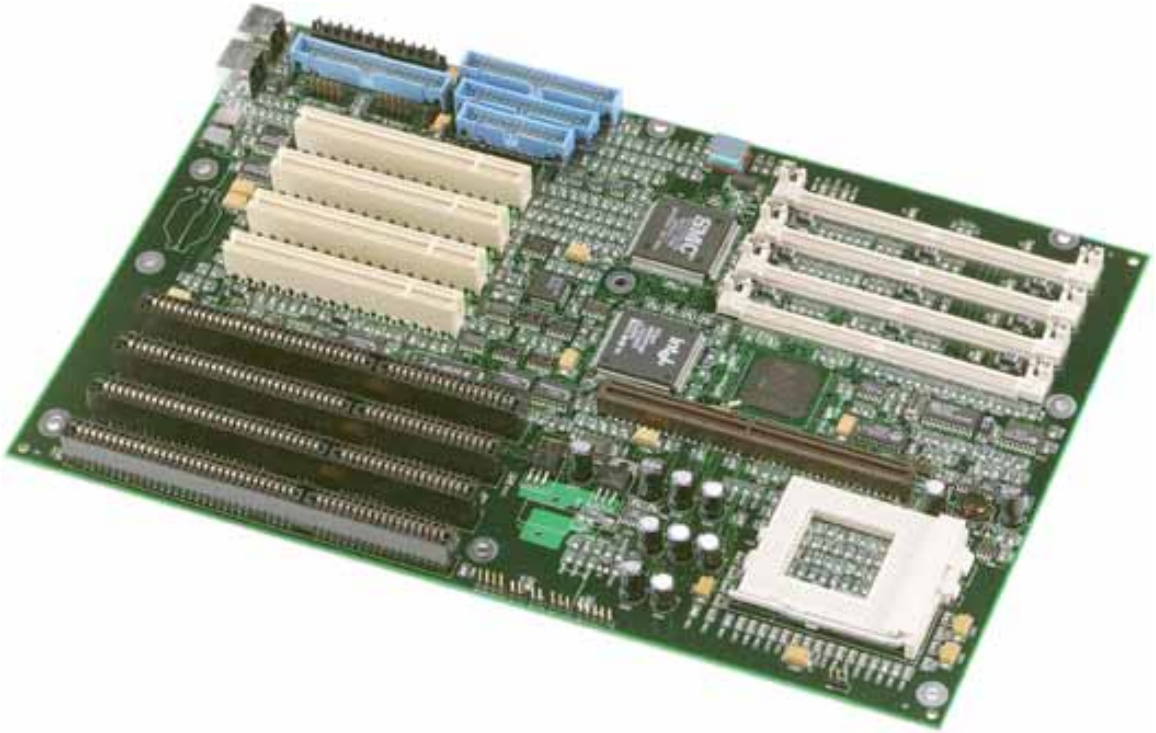
System

System specifications are listed in the following table:

CPU	• 166 MHz Intel™ Pentium® Processor • 200 or 233 MHz Intel Pentium Processor with MMX™ Technology
Chipset	Intel 430HX PCIset
Cache	256 KB or 512 KB Level 2 write-back cache: Zero wait state at 66 MHz 8ns synchronous pipeline burst Coast SRAM
Memory	Four 72-pin sockets organized in two banks, supporting: Up to 128 MB 1/2/4/8 x 32/36, 60/70ns, Fast Page Mode DRAM SIMM's Parity/ECC FPM or EDO Single bit error correction, double bit detection (ECC mode only)
Bus Interface	Four (4) AT Bus (98-pin) slots (8.33 MHz) Four (4) PCI Bus (120-pin) slots (33 MHz)
Addressing	Real and protected mode supported Real address mode: 20-bit Protected address mode: 16-bit on bus access
Data Path	64-bit CPU bus, 32-bit local PCI bus
Flash Memory	256 KB
Clock/Calendar	DS1287 compatible Real Time Clock accurate to +/- 12 minutes/year, at 25 °C; includes CMOS
Power Requirements w/ 8—128 MB DRAM	Input Power 21 — 35 W +5 V 4.3 — 7.0 A +12 V 0.1 A -12 V 0.1 A
Form Factor	Baby-AT: 8.6" (21.84 cm) x 13" (33.02 cm)

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Figure 10 The P5000HX(-M)-WMB Series Motherboard



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 55 °C (32 to 131 °F) ambient temperature. Operations outside these specifications could void the warranty.

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Pin Signals

Overview

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

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	18-26	Ground

Serial Ports 1 & 2	
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

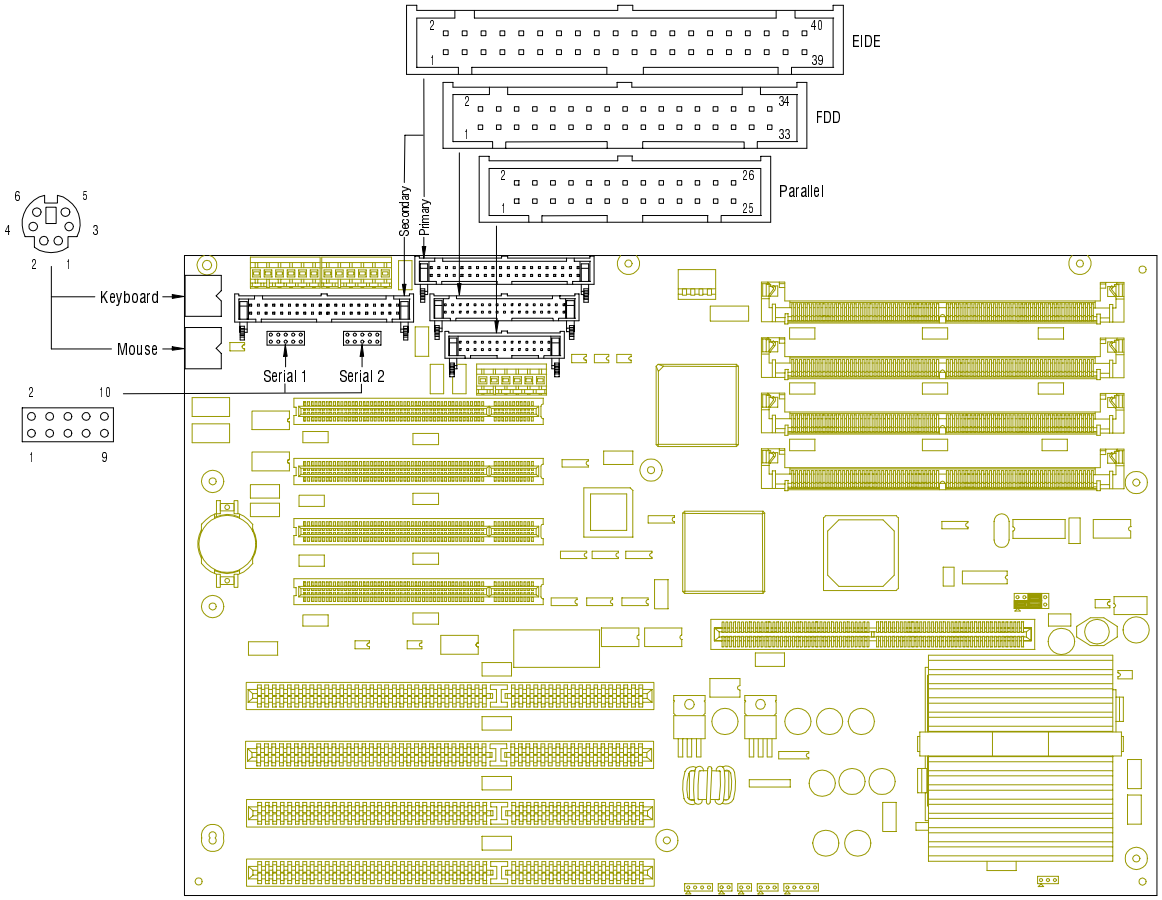
Primary & Secondary EIDE			
Pin	**Description**	**Pin**	**Description**
1	Reset (Out)	21	DMA Request (In)
3	+ Data 7 (I/O)	23	- I/O Write (Out)
4	+ Data 8 (I/O)	25	- I/O Read (Out)
5	+ Data 6 (I/O)	27	I/O Channel Ready (In)
6	+ Data 9 (I/O)	28	+ ALE
7	+ Data 5 (I/O)	29	DMA Acknowledge (Out)
8	+ Data 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		

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

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

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Figure 11 Peripheral Headers and Connectors



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Pin Signals (continued)

Overview

The tables below list the pin signals for the system headers. The following illustration (Figure 12) indicates the pin positions for each.

Power Input (P8)	
Pin	**Description**
1	Power Good
2	+5 V
3	+12 V
4	-12 V
5	Ground
6	Ground

Power Input (P9)	
Pin	**Description**
1	Ground
2	Ground
3	-5 V
4	+5 V
5	+5 V
6	+5 V

+3.3 V Input	
Pin	**Description**
1	Ground
2	Ground
3	Ground
4	+3.3 V
5	+3.3 V
6	+3.3 V

Speaker	
Pin	**Description**
1	Speaker
2	Not Connected
3	Speaker
4	+5 V

IDE Activity LED	
Pin	**Description**
1	+5 V
2	Drive LED

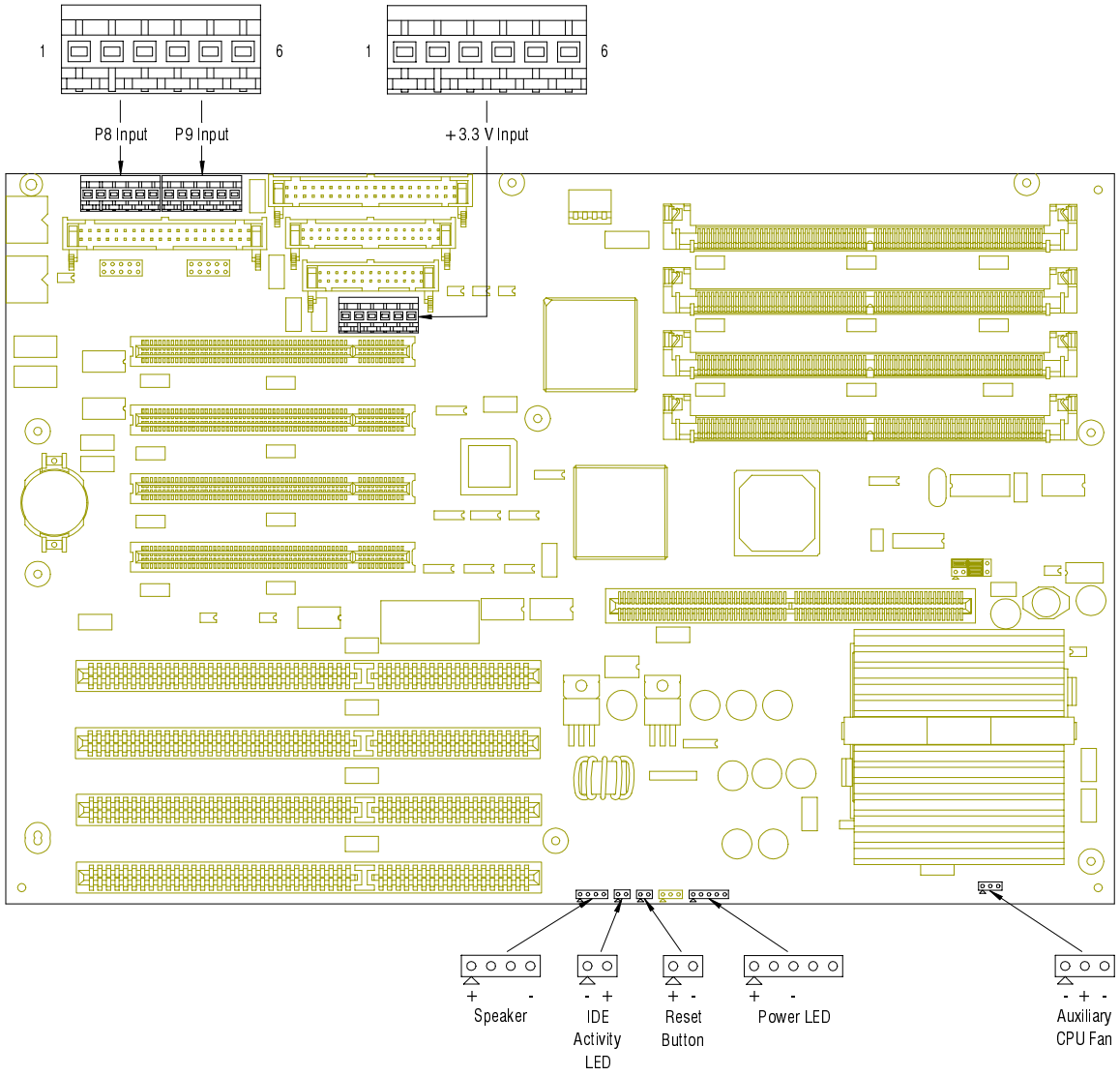
Reset Button	
Pin	**Description**
1	Reset
2	Ground

System Power LED	
Pin	**Description**
1	+5 V
2	Not Connected
3	Power LED
4	Key Lock
5	Ground

Auxiliary CPU Fan	
Pin	**Description**
1	Ground
2	+12 V
3	Ground

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Figure 12 System Headers



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Installing Memory Modules

Overview

The P5000HX(-M)-WMB supports up to 128MB 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 P5000HX(-M)-WMB contains four (4) 72-pin low-profile SIMM sockets for DRAM memory modules (Figure 13). These four sockets comprise two (2) memory banks, each consisting of two sockets and providing a 32-bit wide data path and 8 parity bits (x36 SIMM's only):

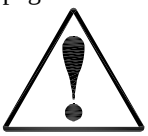
- Sockets 1 and 2 comprise Bank 0
- Sockets 3 and 4 comprise Bank 1

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

SIMM Types

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

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



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

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Figure 13 Memory Sockets

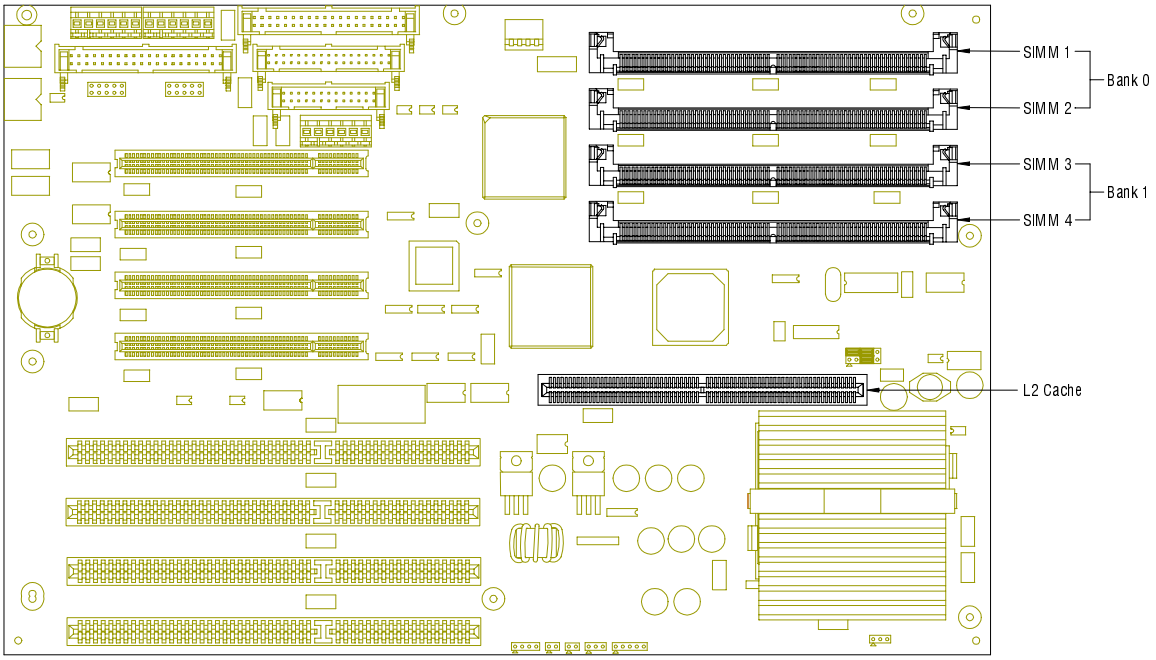


Figure 14 Memory Combinations

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

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