

CPU Modules with Pentium[®] Processors

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This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC wants you to know...

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Note: Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

The user may find the following booklet prepared by the ~~helpful~~ *Interference to Home Electronic Entertainment Equipment Handbook*. This booklet is available from the U.S. Government Superintendent of Documentation, P.O. Box 371954, Pittsburgh, PA, 15250-7954.

Special Notices

Three kinds of special notices are used in this guide to emphasize specific information.



WARNING: indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.



CAUTION: indicates the presence of a hazard that might cause damage to hardware or that might corrupt software.



NOTES: are used to provide additional information.

Audience

This guide is written specifically for anyone responsible for installing or upgrading the CPU in their computer system. The procedures in this manual include handling CPU chips, modules, internal cables, and updating your system BIOS software. If you do not wish to perform the procedures yourself, contact your local Digital service representative.



CAUTION: Static electricity can cause damage to components. Before handling any module or chips, make sure you discharge all static electricity from your body by touching a metal surface of your computer's chassis.

Contents

CPU Modules with Pentium[®]Processors

Overview.....	1
Features.....	1

Installation

Power Down the Computer.....	2
Remove the CPU Module.....	2
CPU Identification.....	3
CPU Module Jumper Settings.....	4
Install the CPU Module.....	6

Device Mapping

CPU Memory Address Map (Full Range, 590 and higher CPUs).....	7
CPU Memory Address Map (PC Compatibility Range).....	7
CPU I/O Address Map.....	8
I/O Address Map.....	8
Computer Interrupt Levels.....	9
DMA Channel Assignment.....	9
PCI Configuration Space Address Map.....	10

Figures

1. CPU Module.....	3
2. CPU Module Jumper and Socket Locations.....	5

CPU Modules with Pentium® Processors

Overview

This section contains an overview of CPU modules with Pentium® processors that are currently available to upgrade the performance of your computer. Contact your Digital sales representative for information on the CPU modules that are available for your computer.

This manual helps you to install the CPU module in your system, shows the jumpers on the module, and provides a set of tables for Device Mapping.

Features

Features of the CPU module include:

- Pentium processor operating at 90 MHz or higher internally
- Secondary cache module
- Second zero-insertion force (ZIF) socket for dual-processor technology*



NOTE: If your computer is a dual-processor model, both ZIF sockets will be occupied by a Pentium processor. CPU chip upgrades are not available to upgrade single-processor systems to dual-processor systems

Installation

Power Down the Computer

1. Take the system off-line if it is a server or client on a network.
2. Turn the system power off and disconnect the power cord.



WARNING: Always turn off power to the computer and disconnect the power cord prior to removing and replacing the computer's outside panels. Refer to your computer's user guide for more information.

Remove the CPU Module

1. Refer to the system *user's guide* if you are not familiar with accessing and removing the CPU module.
2. Remove the CPU module's retaining bracket.



CAUTION: Before handling or installing any electronic device, use the wrist strap and discharge all static electricity from your body by connecting the ground clip to an exposed metal surface of your computer's chassis.

3. Grasping both ends of the CPU module, carefully remove it from the main logic board and place it on an antistatic surface.

CPU Identification

The CPU module has either single or dual Intel® Pentium CPUs mounted with heat sinks in a socket 5 type ZIF socket. The CPU module may have a secondary cache mounted vertically on the board (Figure 1). The CPU module is connected to the main logic board inside your computer. The CPU frequency (speed) is marked on the heat sink.

Table 1. CPU Model Frequency

Models	CPU Frequency
590, 5100	90, 100 MHz
5120*	120 MHz
5133, 5150, 5166	133, 150, 166 MHz

* The Desktop 5120 is a single-processor model. A dual-processor for this model is not supported by Digital.

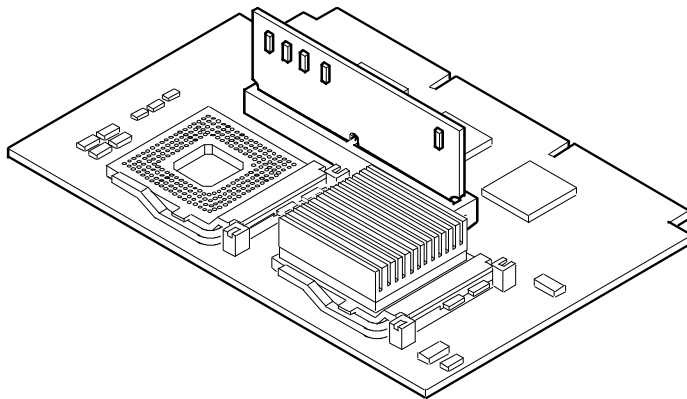


Figure 1. CPU Module with Secondary Cache

CPU Module Jumper Settings

Figure 2 shows the CPU module's jumper locations. The following table lists the factory default settings. If necessary, refer to "Device Mapping" for memory mapping information.

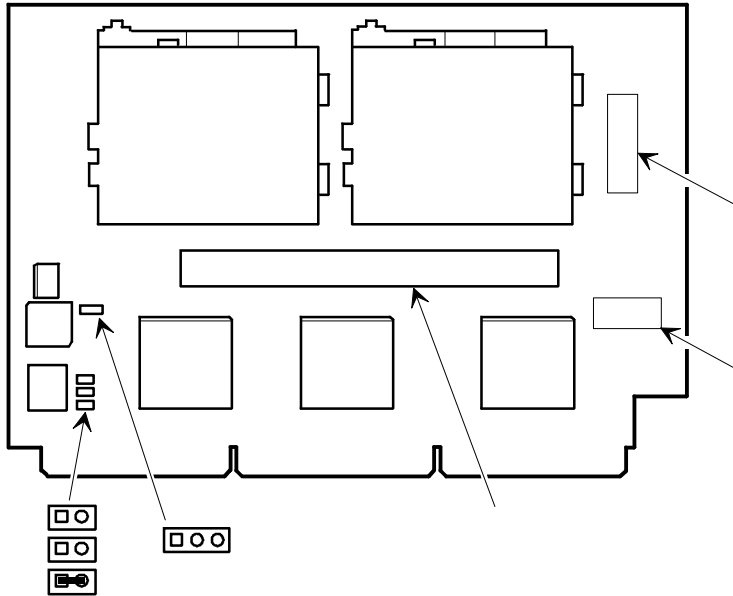
Table 2. CPU Speed Jumper Settings

Model	Bus Speed	Core / Bus Ratio	CPU Speed	J2	J11	J4
–	60 MHz	3/1 x bus speed	180 MHz	Pin 1 to 2	On	Off
5150		5/2 x bus speed	150 MHz		On	On
5120		2/1 x bus speed	120 MHz		Off	On
590		3/2 x bus speed	90 MHz		Off	Off
–	66 MHz	3/1 x bus speed	200 MHz	Pin 2 to 3	On	Off
5166		5/2 x bus speed	166 MHz		On	On
5133		2/1 x bus speed	133 MHz		Off	On
5100		3/2 x bus speed	100 MHz		Off	Off

Pipeline Setting	J8
Enabled	On (default)
Disabled	Off



NOTE: Digital recommends that you do not change the default pipeline setting.



A = Secondary cache socket
 B + C = Voltage regulator
 C = Jumper board

Figure 2. CPU Module Jumper and Socket and Locations



NOTE: Early versions of the CPU Module did not have voltage regulator pins.

Install the CPU Module

1. Install the CPU module into the CPU slot on the main logic board.
2. Secure the CPU module to the main logic board using the previously removed retaining bracket.
3. Install the side panels.
4. Connect the cables and the power cord to the back of the system.
5. Turn on the computer.

Device Mapping

This section provides a series of tables listing mapping and address information related to computer memory and various main logic board devices (keyboard controller, interrupt controller, DMA controller, etc.).

Your computer's memory and address locations are allocated at the factory to operate within a standard PC environment. Due to the number of optional devices and/or expansion boards that are available, you may need to change the memory and address locations. For example, some network expansion boards require a specific memory location. If the location is already allocated, a memory conflict results, and the expansion board will not operate as expected. Note that you can change some memory, I/O and interrupt locations using the BIOS Setup utility. Refer to your user guide for additional information.



CAUTION: Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board, or software application. Make sure adequate information is available. If not, contact the option or software manufacturer for further information.

CPU Memory Address Map (Full Range, 590 and higher CPUs)

Range	Function	Notes
0 KB to 512 KB	Main memory	PC compatibility range
512 KB to 1024 KB	Main memory	PC compatibility range (EISA/ISA memory lower limit)
1 MB to 16 MB	Main memory	ISA memory upper limit
	Memory space gap	
16 MB to 384 MB ⁽¹⁾	Main memory	Computer memory upper limit
384 MB to 4 GB ⁽¹⁾	PCI memory	

⁽¹⁾ 512 MB max. for Prioris XL Server and Prioris HX (DP) Series

CPU Memory Address Map (PC Compatibility Range)

Address Range	Function	Size
00000 to 7FFFF	Main memory	512 KB
80000 to 9FFFF	Main/PCI/ISA memory	128 KB
A0000 to BFFFF	PCI/ISA video buffer memory	128 KB
C0000 to C7FFF	Video memory BIOS	32 KB
C8000 to DFFFF	PCI/ISA card BIOS and buffer memory	96 KB
E0000 to EBFFF	Used by BIOS Setup during POST	48 KB ⁽¹⁾
EC000 to EFFFF	SCSI BIOS (if enabled)	16 KB ⁽¹⁾
F0000 to FFFFF	System BIOS memory	64 KB

⁽¹⁾ 32 KB for Prioris XL Server

CPU I/O Address Map

Range (hexadecimal)	Function
0000 to 0CF7	PCI I/O space
0CF8	Configuration space enable register
0CF9	Turbo and reset control register
0CFA to BFFF	PCI I/O space
C000 to CFFF	PCI configuration space
D000 to FFFF	PCI I/O space

I/O Address Map

Range (hexadecimal)	Function
060 to 064	Keyboard/mouse controller
0F0 to 0FF	Math co-processor
1F0 to 1F7	IDE controller (if enabled)
278 to 27F	LPT2 (if enabled)
2F8 to 2FF	COM2 (if enabled)
378 to 37F	LPT1 (if enabled)
3BC to 3BE	LPT3 (if enabled)
3F0 to 3F7	Diskette controller (if enabled)
3F8 to 3FF	COM1 (if enabled)

Computer Interrupt Levels

Interrupt Number	Interrupt Source
IRQ1	Keyboard controller
IRQ2, IRQ9	NCR SCSI
IRQ3	COM2 (if enabled)
IRQ4	COM1 (if enabled)
IRQ6	Diskette drive (if enabled)
IRQ7	LPT1, LPT2, LPT3 (if enabled)
IRQ12	Mouse interrupt
IRQ13	Math co-processor
IRQ14	Hard disk drive (if enabled)

Note: IRQ numbers not listed above are available.

DMA Channel Assignment

Channel	Controller	Function
0	1	Refresh
1	1	Not used
2	1	Diskette controller (if enabled)
3	1	Not used
4	2	Cascade DMA
5	2	Not used
6	2	Not used
7	2	Not used

PCI Configuration Space Address Map

Range (hexadecimal)	Function
C0xx	CPU bridge
C1xx ⁽¹⁾	Onboard PCI SCSI (if applicable ⁽¹⁾)
C2xx	PCI/ISA or PCI/EISA bridge
C6xx	PCI slot 1
C7xx	PCI slot 2
C8xx	PCI slot 3

⁽¹⁾ For Prioris HX servers: PCI-to-PCI bridge (PCI slots 4, 5, 6)