

Illustrated Parts & Service Map

HP Compaq 4000 Pro Small Form Factor Business PC



© 2011 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. HP shall not be liable for technical or editorial errors or omissions contained herein. Intel, Pentium, Intel Inside, and the Intel logo are trademarks or registered trademarks of the Intel Corporation and its subsidiaries in the U. S. and other countries.

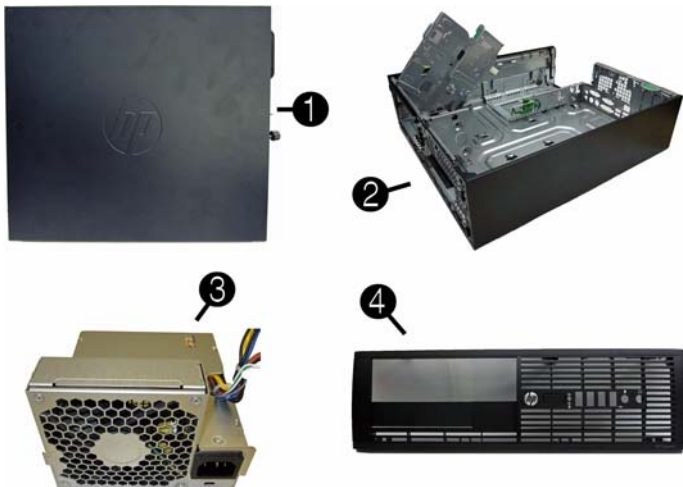
Document Number 640048-001. 1st Edition January 2011.



Key Specifications

Processor Type	Intel® Pentium Dual-Core, Core 2, Core2 Duo, Core2 Quad
RAM Type	DDR3-SDRAM DIMMs, PC3-10600 (1333 MHz) non-ECC
Maximum RAM Supported	8 GB
Expansion Slots	<ul style="list-style-type: none"> • (1) PCIe-x16 • (1) PCIe-x1 • (2) PCI
Chipset	Intel B43 Express
Graphics Adapter	Integrated Intel GMA 4500 graphics
Bays	<ul style="list-style-type: none"> • (1) external 5.25-inch for optical drive • (1) external 3.5-inch for media card reader • (1) internal 3.5-inch or hard drive
I/O Interfaces	Front: (4) USB, microphone, headphone Rear: (4) USB, PS/2 keyboard and mouse, line in, line out, VGA, DVI-D, RJ-45, serial
Operating Systems	<ul style="list-style-type: none"> • Windows® Vista • Windows 7 • RedFlag Linux • FreeDos

Spare Parts



System Unit

1	Access panel	636924-001
2	Chassis	Not spared
3	Power supply, 240W	613763-001
*	Power supply, 240W, 85% efficient	613663-001
*	Power supply, 240W, High Voltage protection	613664-001
4	Front bezel	636920-001
*	Bezel blank, 3.5-inch	583653-001
*	Bezel blank, 5.25-inch	570838-001

* Not shown



Cables

1	SATA ODD cable, 25 inch, 1 straight, 1 angled end	638814-001
2	19-inch SATA cable, 2 straight ends	638813-001
3	Front I/O cable and power assembly	636926-001
4	SATA power cable	636923-001

Keyboards (not illustrated)

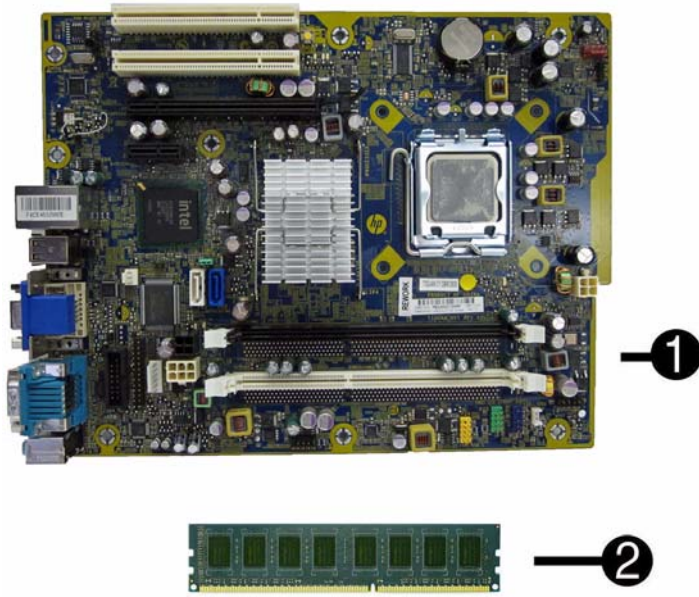
PS/2, Basic	537745-xx1		
USB, Basic	537746-xx1		
USB SmartCard	631411-xx4		
USB Mini[b]	535873-xx1		
Washable[b]	577495-xx1		
Arabic	-17x	Kazakstani	-DFx
Belgian	-18x	LA Spanish	-16x
BHCSY	-B4x	Netherlands	-33x
BHCSY	-BLx	Norwegian	-09x
Brazilian Portuguese	-20x	People's Republic of China	-AAx
Bulgarian[c]	-26x	Polish	-24x
Czech	-22x	Portuguese	-13x
Danish	-08x	Romanian[a]	-27x
Estonian	-CAx	Russian	-25x
Finnish[c]	-35x	Saudi Arabian	-DEx
French	-05x	Slovakian	-23x
French Canadian	-12x	South Korean	-KDx
German	-04x	Spanish	-07x
Greek	-15x	Swedish	-10x
Hebrew	-BBx	Swiss	-11x
Hong Kong[d][e]	-ACx	Taiwanese	-ABx
Hungarian	-21x	Thai	-28x
Icelandic	-DDx	Turkish	-14x
International[e]	-B3x	Turkish F	-54x
International English	-L3x	U.S.	-00x
Italian	-06x	U.K.	-03x

[a] only for 631411-xx4
 [b] only for -001 and -021
 [c] only for 631411 and 537745

[d] use -AC2 for 537746
 [e] only for 537745 and 537746

Mass Storage Devices (not illustrated)

16X SATA DVD±RW drive with LightScribe	615646-001
16X SATA DVD-ROM drive	581599-001
6X BD-Writer and DVD±RW SuperMulti DL Drive	581601-001
1 TB SATA hard drive	636930-001
500 GB SATA hard drive	636929-001
320 GB SATA hard drive	636928-001
250 GB SATA hard drive	636927-001



Standard and Optional Boards

System boards with thermal material

1	System board	608748-001
*	System board, Netclone (China only)	640126-001

Memory modules (PC3-10600, CL9)

	1 GB	635802-001
2	2 GB	635803-001
*	4 GB	585157-001

Other boards

*	nVidia Quadro NVS300 PCIe x1 graphics card	632827-001
*	nVidia Quadro NVS300 PCIe x16 graphics card	632486-001
*	ATI Radeon HD6350 PCIe x16 graphics card, 512 MB	637995-001

Intel Pentium Dual Core Processors (include thermal material)

*	E6800, 3.33 GHz, 2-MB L2 cache	631758-001
*	E6700, 3.20 GHz, 2-MB L2 cache, 1066-MHz FSB	617840-001
*	E5800, 3.20 GHz, 2-MB L2 cache, 800-MHz FSB	646376-001

Intel Celeron Processors (include thermal material)

*	E3500, 2.7 GHz, 1-MB L2 cache	633219-001
*	E3400, 2.6 GHz, 1-MB L2 cache	602071-001
*	E3300, 2.5 GHz, 1-MB L2 cache	585886-001

Intel Core 2 Quad Processors (include thermal material)

*	Q9550S, 2.83 GHz, 12-MB L2 cache	593228-001
*	Q9505S, 2.83 GHz, 6-MB L2 cache (65W)	593229-001

Intel Core 2 Duo Processors (include thermal material)

*	E8600, 3.33 GHz, 6-MB L2 cache	497732-001
*	E8500, 3.16 GHz, 6-MB L2 cache	466170-001
*	E8400, 3.00 GHz, 6-MB L2 cache	509554-001
*	E7600, 3.06 GHz, 3-MB L2 cache	573954-001
*	E7500, 2.93 GHz, 3-MB L2 cache	583006-001

* Not shown

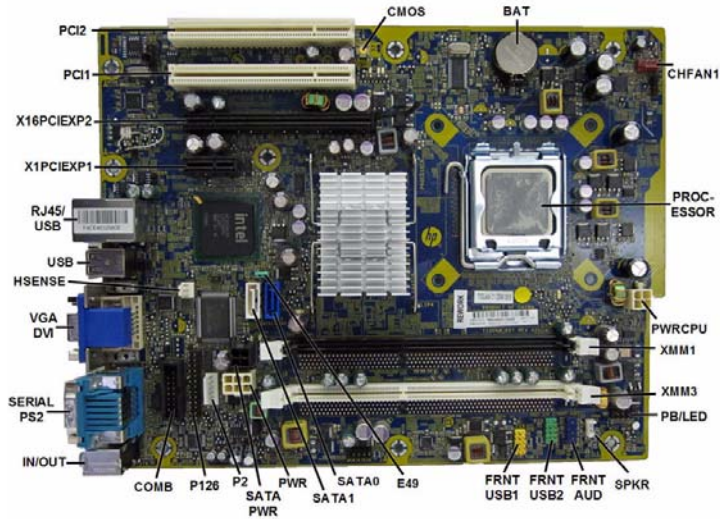
Miscellaneous Parts

1	Internal speaker	636925-001
2	Chassis fan assembly	636922-001
3	Heat sink (includes thermal material)	636919-001
4	Baffle	636921-001
*	Rubber feet kit	583654-001
*	Chassis stand	587451-001
*	2nd serial port	638815-001
*	Card reader, 22-in-1	636166-001
*	Hood sensor	638816-001
*	USB powered speakers	609249-001
*	Mouse, PS2, optical, jack black	537748-001
*	Mouse, optical, jack black	537749-001
*	Mouse, laser, jack black	570580-001
*	Mouse, washable	619580-001
*	Printer port kit	638817-001

*Not shown

LP = Low profile

System Board



System Board Connectors and Jumpers (component location may vary)

CMOS	CMOS header	SATA PWR	SATA drive power connector
BAT	Battery socket	P2	Power connector
CHFAN	System fan connector	P126	Parallel port connector
PROCES-SOR	Processor socket	COMB	Serial port connector
PWRCPU	CPU power connector	IN/OUT	Double stack audio connector
XMM1& 3	Memory sockets	SERIAL PS2	Stacked serial port/PS2 connector
PB/LED	Power switch connector	VGA/DVI	Stacked VGA/DVI connector
SPKR	Speaker connector	HSENSE	Hood sensor connector
FRNT AUD	Front panel connector	USB	USB connector
FRNT_USB 2	2nd USB connector	RJ45/USB	Stacked RJ-45/USB connectors
FRNT_USB	1st USB connector	X1PCIEXP1	PCIe X1 slot
E49		X16PCIEXP2	PCIe X16, slot 2
SATA1	Primary SATA hard drive	PWR	Main power connector
SATA2	1st SATA optical drive	PCI1	PCI slot 1
PWR	Main power connector	PCI2	PCI slot 2

System Setup and Boot

Basic system information regarding system information, setup, power management, hardware, and passwords is maintained in the Setup Utility held in the system ROM. The Setup Utility is accessed by pressing the F10 key when prompted (on screen) to do so during the boot sequence. If the screen prompt opportunity is missed, a restart will be necessary. For more information about Setup Utilities refer to the *Service Reference Guide*.

Computer Setup Menu

Heading	Option/Description
File	System Information - Lists the following main system specifications: <ul style="list-style-type: none"> Product name SKU number (some models) Processor type/speed/stepping Cache size (L1/L2) Installed memory size/speed/channels Integrated MAC Address System BIOS Chassis serial number Asset tracking number
	About - Displays copyright notice.
	Set Time and Date - Allows you to set system time and date.
	Flash System ROM - Allows you to select a drive containing a new BIOS.
	Replicated Setup - Save to Rmv Media and Restore from Rmv Media
	Default Setup <ul style="list-style-type: none"> Save Current Settings as Default Restore Factory Settings as Default
	Apply Defaults and Exit - Applies the selected default settings and clears any established passwords.
	Ignore Changes and Exit - Exits Computer setup without saving changes.
	Save Changes and Exit - Saves changes to system configuration or default settings and exits Computer Setup.
Storage	Device Configuration - Lists all installed BIOS-controlled storage devices. The following options are available: <ul style="list-style-type: none"> Hard Disk CD-ROM Default Values SATA Defaults Translation Mode Removable Media Boot Max SATA Speed SATA Emulation
	DPS Self-Test - Allows you to execute self-tests on ATA hard drives.
	Boot Order - Allows you to specify boot order. <ul style="list-style-type: none"> Shortcut to Temporarily Override Boot Order

Computer Setup Menu (Continued)

Heading	Option / Description
Security	Setup Password - Allows you to set and enable the setup (Administrator) password.
	Power-On Password - Allows you to set and enable power-on password.
	Password Options - When any password exists allows you to lock legacy resources, enable/disable network server mode, specify password requirement for warm boot, and allows you to enable/disable Setup Browse Mode.
	Smart Cover (some models) - Allows you to lock/unlock cover lock and set status of cover removal sensor.
	Device Security (some models) - Enables/disables all I/O ports, audio, network controllers, SATA ports, and embedded security devices.
	USB Security - Allows you to set Device Available/Device Hidden for front USB ports 3-6, rear USB ports 9-12, internal USB ports 1-2.
	Slot Security - Allows you to disable any PCI or PCI Express slot.
	Network Service Boot - Enables/disables boot from OS on a server.
	System IDs - Allows you to set Asset tag, Ownership tag, Chassis serial number or UUID, and keyboard locale setting.
	DriveLock Security - Allows you to assign/modify a hard drive password for added security.
	System Security (some models) - Allows you to enable/disable: <ul style="list-style-type: none"> Data Execution Prevention PAVP (Protect Audio Video Path) (some models) Virtualization Technology Virtualization Technology Directed I/O (some models) Trusted Execution Technology (some models) Embedded Security Device Support (some models) OS management of Embedded Security Device through OS (some models)
Master Boot Record Security - Protects the master boot record from viruses or other corruption. Saves a copy of the current master boot record.	
Setup Security Level - Provides method to allow users limited access to change specified setup options without knowing Setup password.	
Power	OS Power Management - Allows you to enable/disable Runtime Power Management, Idle Power Savings, ACPI S3 Hard Disk Reset, ACPI S3 PS2 Mouse Wakeup, USB Wake on Device Insertion (some models), Unique Sleep State Blink Rates.
	Hardware Power Management - Allows you to enable/disable SATA bus power management and S5 maximum power savings.
	Thermal - Allows you to control minimum permitted fan idle speed.
Advanced	Power-On Options - Allows you to set: <ul style="list-style-type: none"> POST mode - QuickBoot, FullBoot, Clear Memory, FullBoot every x days POST messages - Enable/disable F9 prompt - Hidden/displayed F10 prompt - Hidden/displayed F11 prompt - Hidden/displayed F12 prompt - Hidden/displayed Factory Recovery Boot Support - Enable/disable Option ROM prompt - Enable/disable Remote wakeup boot source - Remote server/local hard drive After Power Loss - Off/on/previous state POST delay - None, 5, 10, 15, or 20 seconds Bypass F1 Prompt on Configuration Changes - Enable/disable
	Execute Memory Test (some models) -Restarts computer and executes POST memory test.
	BIOS Power-On - Allows you to set the computer to turn on at a preset time.
	Onboard Devices - Allows you to set resources or disable onboard system devices.
	PCI Devices - Lists installed PCI devices with their IRQ settings and allows you to reconfigure IRQ or disable devices.
	PCI VGA Configuration - Allows you to specify which VGA controller will be used when multiple video adapters are available.
	Bus Options (some models) - Allows you to enable/disable PCI SERR# Generation and PCI VGA palette snooping.
	Device Options - Allows you to set: <ul style="list-style-type: none"> Printer Mode - Bi-Directional, EPP & ECP, Output Only Num Lock state at power-on - off/on S5 Wake on LAN - enable/disable Multi-Processor - enable/disable Internal speaker - enable/disable Monitor Tracking - enable/disable NIC Option ROM Download - enable/disable
	Management Devices - Only displayed in Advanced menu when BIOS detects multiple management options.
	Management Operations - Allows you to set: <ul style="list-style-type: none"> MEBx Setup Prompt - enable/disable Intel Remote PC Assist Prompt - enable/disable Intel PC Assist Timeout - 5, 10, 15, 20, 30, 40, 50, 60, 120, 180, 240 seconds SOL Character Echo - enable/disable SOL Terminal Emulation Mode - enable/disable SOL Keyboard - enable/disable Unprovision AMT on next boot

Password Security

Establishing a Setup or Power-On password:

1. Turn on or restart the computer. If you are in Windows, click **Start > Shut Down > Restart**.
2. As soon as the computer is turned on, press **F10** when the monitor light turns green to enter Computer Setup. Press **Enter** to bypass the title screen, if necessary. If you do not press **F10** when prompted, a restart will be necessary.
3. To establish a Setup password, select **Security > Setup Password** and follow the instructions on the screen.
- or -
To establish a Power-On password, select **Security > Power-On Password** and follow the instructions on the screen.
4. Before exiting, click **File > Save Changes and Exit**.

Changing a Setup or Power-On password:

1. Turn on or restart the computer. If you are in Windows, click **Start > Shut Down > Restart**. To change the Setup password, go to step 2.
To change the Power-on password, go to step 3.
2. To change the Setup password, as soon as the computer is turned on, press **F10** when the monitor light turns green to enter Computer Setup. Press **Enter** to bypass the title screen, if necessary.
3. When the key icon appears, type your current password, a slash (/) or alternate delimiter character, your new password, another slash (/) or alternate delimiter character, and your new password again as shown:

current password/new password/new password.

NOTE: Type the new password carefully since the characters do not appear on the screen.

4. Press **Enter**.

The new password will take effect the next time the computer is restarted.

Deleting a Power-On or Setup password

1. Turn on or restart the computer. If you are in Windows, click **Start > Shut Down > Restart**. To delete the Setup password, go to step 2.
To delete the Power-On password, go to step 3.
2. To change the Setup password, as soon as the computer is turned on, press **F10** when the monitor light turns green to enter Computer Setup. Press **Enter** to bypass the title screen, if necessary.
3. When the key icon appears, type your current password followed by a slash (/) or alternate delimiter character as shown. Example: **currentpassword/**
4. Press **Enter**.

Hewlett-Packard Vision Diagnostics

The Hewlett-Packard Vision Diagnostics utility allows you to view information about the hardware configuration of the computer and perform hardware diagnostic tests on the subsystems of the computer. The utility simplifies the process of effectively identifying, diagnosing, and isolating hardware issues.

Use HP Vision Diagnostics to determine if all the devices installed on the computer are recognized by the system and functioning properly. Running tests is optional but recommended after installing or connecting a new device.

To access HP Vision Diagnostics, you must create a Recovery Disc Set then boot to the CD containing the utility. It can also be downloaded from <http://www.hp.com> and either burned to CD or installed to a USB flash drive.

1. In Windows Explorer, go to **C:\SWSetup\ISOs** and burn the file **Vision Diagnostics.ISO** to a CD or copy it to a USB flash drive.
2. While the computer is on, insert the CD in the Optical Drive or USB flash drive in a USB port on the computer.
3. Shut down the operating system and turn off the computer.
4. Turn on the computer. The system will boot into HP Vision Diagnostics.
NOTE: If the system does not boot to the CD in the optical drive or to the USB flash drive, you may need to change the boot order in the Computer Setup (F10) utility.
5. At the boot menu, select either the **HP Vision Diagnostics** utility to test the various hardware components in the computer or the **HP Memory Test** utility to test memory only.
NOTE: The HP Memory Test is a comprehensive memory diagnostic utility that is run as a stand-alone application, outside of HP Vision Diagnostics.
6. If running **HP Vision Diagnostics**, select the appropriate language and click **Continue**.
7. In the End User License Agreement page, select **Agree** if you agree with the terms. The HP Vision Diagnostics utility launches with the Survey tab displayed.

Clearing CMOS

1. Turn off the computer and any external devices, and disconnect the power cord from the power outlet.
2. Remove the chassis access panel.
3. On the system board, press and hold the CMOS button for 5 seconds.
4. Replace the chassis access panel and reconnect the power cord.
5. Turn on the computer and allow it to start.

Diagnostic LEDs

LED	Color	LED Activity	State/Message
Power	Green	On	Computer on
Power	Green	1 blink every 2 seconds	Normal Suspend Mode
Power	Red	1 blink every second followed by a 2 second pause	CPU thermal shutdown
Power	Red	3 blinks, 1 blink every second followed by a 2 second pause	Processor not installed
Power	Red	4 blinks, 1 blink every second followed by a 2 second pause	Power failure (power supply overload)
Power	Red	5 blinks, 1 blink every second followed by a 2 second pause	Pre-video memory error
Power	Red	6 blinks, 1 blink every second followed by a 2 second pause	Pre-video graphics error
Power	Red	7 blinks, 1 blink every second followed by a 2 second pause	System board failure (ROM
Power	Red	8 blinks, 1 blink every second followed by a 2 second pause	Invalid ROM based on Checksum
Power	Red	9 blinks, 1 blink every second followed by a 2 second pause	System powers on but is unable to boot
Power	Red	10 blinks, 1 blink every second followed by a 2 second pause	Bad option card
Power	Red	11 blinks, 1 blink every second followed by a 2 second pause	The current processor does not support a feature previously enabled on this system.
none	none	System does not power on and LEDs are not flashing	System unable to power on

Common POST Error Messages

Screen Message	Probable Cause	Recommended Action
101-Option ROM Error	1. System ROM checksum error. 2. Expansion board option ROM checksum	1. Verify ROM, reflash if required 2. Remove suspected card, reboot 3. Clear CMOS memory, reboot 4. Replace system board
103-System Board Failure	DMA, timers	1. Clear CMOS memory. 2. Remove expansion boards. 3. Replace system board.
104-ECC Network Controller has been enabled	Enable network controller	For this setting to take effect, remove power from the system for 15 seconds.
164-Memory Size Error and 201-Memory Error	Incorrect memory configuration	1. Run Setup (F10). 2. Check DIMMs for proper seating, type, and HP compatibility. 3. Remove DIMMs singularly and reboot to isolate faulty DIMM. 4. Replace system board.
213-Incompatible Memory Module in Memory Socket(s) X, X,	Memory module missing SPD information or incompatible with chipset	1. Verify memory module type. 2. Try another memory socket. 3. Replace with module conforming to SPD standard.
214-DIMM Configuration Warning	Populated DIMM configuration is not optimized	Rearrange the DIMMs so that each channel has the same amount of memory.
301-, 304-Keyboard error	Keyboard failure	Check keyboard connection or keys. Check connector for bent or missing pins. Replace keyboard. If 304, possible system board problem.
501-Display Adapter Failure	Graphics display controller	1. Reseat graphics card. 2. Clear CMOS. 3. Check monitor connection. 4. Replace graphics card.
510-Flash Screen Image Corrupted	Flash screen image has errors	Reflash the system ROM with the latest BIOS image.
513-Front Chassis fan not detected 515-Power Supply fan not detected	Fan not connected or malfunctioning	1. Reseat fan. 2. Reseat fan cable. 3. Replace fan.
660-Display cache is detected unreliable	Integrated graphics controller display cache not working properly and disabled	Replace system board if minimal graphics degrading is an issue.
1720-SMART Hard Drive Detects Imminent Failure	Hard drive is about to fail	1. Determine if hard drive is giving correct error message. Enter Computer Setup and run the Drive Protection System test under Storage > DPS Self-test . 2. Apply hard drive firmware patch if applicable. 3. Back up contents and replace hard drive.
1796-SATA Cabling Error	One or more SATA devices are improperly attached. For optimal performance, the SATA 0 and SATA 1 connectors must be used before SATA 2 and SATA 3	Ensure SATA connectors are used in ascending order. For one device, use SATA 0. For two devices, use SATA 0 and SATA 1. For three devices, use SATA 0, SATA1, and SATA 2.
1801-Microcode Patch Error	Processor not supported by ROM BIOS	1. Upgrade BIOS to proper version. 2. Change the processor.