Illustrated Parts & Service Map

HP Compaq dc7900 Small Form Factor Business PC

Key Specifications

|	
Processor Type	Intel Celeron, Pentium Dual-Core, Core2 Duo, Core2 Quad
RAM Type	DDR2-SDRAM DIMMs, PC2-6400 (800 MHz) non-ECC
Maximum RAM Supported	8 GB
Expansion Slots	• 2 PCIe-x16 • 1 PCIe-x1 • 1 PCI (low profile) • Optional full-height riser board
Graphics Adapter	Integrated Intel GMA 3200 graphics
Drive Support	• 2 hard drives • 1 optical drive • RAID 1 Support • floppy diskette drive, media card reader, removable hard disk drive, solid state drive
I/O Interfaces	USB 2.0 (8), USB 2.0, internal on system board (2), eSATA (optional), parallel (optional), serial (optional), RJ-45, front and rear audio jacks (2 each), PS/2 ports (2), VGA connector

Spare Parts
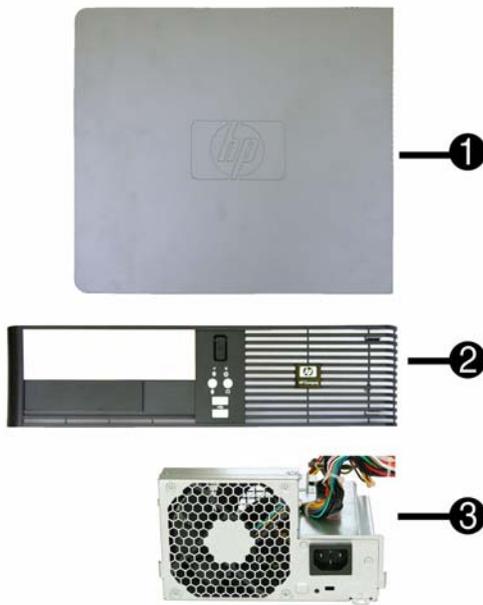
System Unit

1	Access panel	460893-001
2	Front bezel	451148-001
3	Power supply, 240W	460888-001
3	Power supply, 240W, 85% efficient	462435-001
*	Bezel blank, 5.25-inch	335937-001
*	Tower stand	451150-001

* Not shown
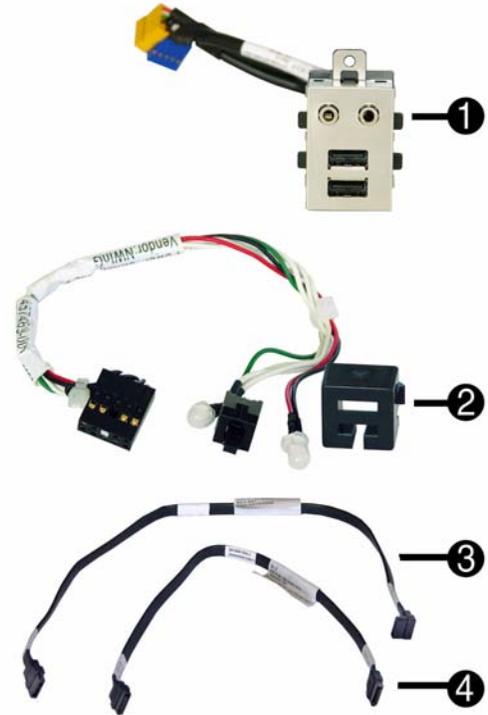
Cables

1	Front I/O with USB and audio cables	460895-001
2	Power/LED cable assembly	460896-001
3	SATA ODD cable, 25 inch, 1 straight, 1 angled end	461535-001
4	17.7-inch SATA cable, 2 straight ends	453317-001
*	Second serial port, LP	392414-001
*	LED holder	460896-001
*	DMS-59 to dual VGA cable	463023-001
*	Adapter, DVI to VGA	202997-001
*	Diskette drive cable, 11 inch	499200-001

*Not shown

Keyboards (not illustrated)

PS/2, Basic USB, Basic USB SmartCard	435302-xxx 435382-xxx 435385-xxx		
Arabic	-171	LA Spanish	-161
Belgian	-181	Norwegian	-091
BHCSY	-B41	People's Republic of China	-AA1
Brazilian Portuguese	-201	Portuguese	-131
Czech	-221	Romanian	-271
Danish	-081	Russian	-251
Finnish	-351	Saudi Arabia*	-DE1
French	-051	Slovakian	-231
French Canadian	-121	South Korea	-KD1
German	-041	Spanish	-071
Greek	-151	Swedish	-101
Hebrew	-BB1	Swiss	-111
Hungarian	-211	Taiwanese	-AB1
International	-B31	Thai	-281
International English	-L31	Turkish	-141
Italian	-061	U.S.	-001
Japanese	-291	U.K.	-031

*For 435385-xxx only

Mass Storage Devices (not illustrated)

Diskette drive with bezel	431452-001
Media card reader, 5.25-inch	480033-001
Media card reader, 3.5-inch	507058-001
16X SATA DVD±RW and CD-RW drive with LightScribe	447310-001
16X SATA DVD-ROM drive	419496-001
500 GB hard drive, 3.5-inch	504339-001
320 GB hard drive, 3.5-inch	504338-001
250 GB hard drive, 3.5-inch	504337-001
160 GB hard drive, 3.5-inch	504336-001
160 GB, 10000-RPM hard drive, 2.5-inch with adapter	508312-001
80 GB, 10000-RPM hard drive, 2.5-inch with adapter	497728-001
80 GB, 10000-RPM hard drive, 2.5-inch with adapter	508311-001
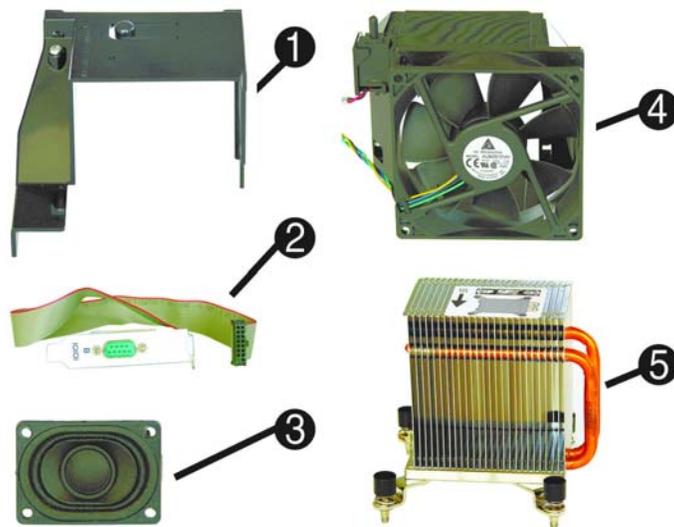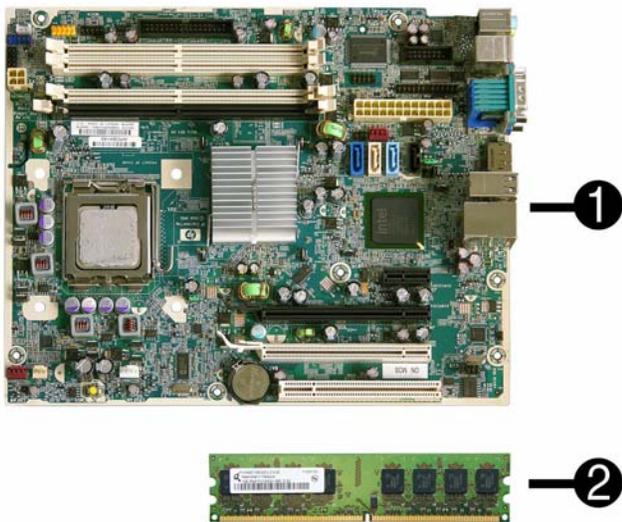
Standard and Optional Boards

System Boards with thermal grease, alcohol pad, and CPU socket cover

1	System board	462432-001
1	System board, excludes ES/CS	490630-001

Memory modules (PC2-6400, CL6)

2	512 MB	418952-001
2	1 GB	418951-001
2	2 GB	457624-001
2	4 GB	497735-001

Other boards

*	ATI HD2400 (RV610) 256-MB graphics card, one DMS559 connector and one S-Video connector, low profile with ATX bracket	462477-001
*	ATI HD3470 (RV620) 256-MB graphics card, one DP 1.1a connector, one dual-link DVI connector, includes bracket	483951-001
*	Quadro NVS295 256-MB PCIe graphics card	519298-001
*	HP nVidia Quadro NVS 290 256-MB graphics card, includes bracket	456137-001
*	NIC, GB, Intel PRO/1000, PCIe, full-height	398754-001
*	Broadcom NetXtreme Gbit Ethernet Plus NIC	488293-001
*	Modem, PCIe, 56K, Agere International 56K, includes bracket	490689-001
*	Modem, PCI, 56K, Agere International	398661-001
*	1394 card 2 external, 1 internal port	441448-001

Intel Celeron Processors with alcohol pad and thermal grease

*	450, 2.2 GHz, 512-KB cache, single core	508256-001
*	440, 2.0 GHz, 512-KB cache, single core	449166-001
*	E1500, 2.2 GHz, 512-MB cache, dual core	516899-001
*	E1400, 2.0 GHz, 512-MB cache, dual core	491574-001
*	E1200, 1.6 GHz, 512-MB cache, dual core	468589-001

Intel Pentium Dual Core Processors with alcohol pad and thermal grease

*	E5400, 2.7 GHz, 2-MB L2 cache	531989-001
*	E5200, 2.5 GHz, 2-MB L2 cache	503382-001
*	E2220, 2.4 GHz, 1-MB L2 cache	480714-001
*	E2200, 2.2 GHz, 1-MB L2 cache	465216-001

Intel Core 2 Quad Processors with alcohol pad and thermal grease

*	Q9650, 3.00 GHz, 12-MB L2 cache	497734-001
*	Q9550, 2.83 GHz, 12-MB L2 cache	465758-001
*	Q9400, 2.66 GHz, 6-MB L2 cache	497733-001
*	Q8300, 2.50 GHz, 4-MB L2 cache	516901-001
*	Q8200, 2.33 GHz, 4-MB L2 cache	503381-001

Intel Core 2 Duo Processors with alcohol pad and thermal grease

*	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
*	E8300, 2.83 GHz, 6-MB L2 cache	466168-001
*	E7500, 2.93 GHz, 3-MB L2 cache	531988-001
*	E7400, 2.80 GHz, 3-MB L2 cache	508255-001
*	E7300, 2.66 GHz, 3-MB L2 cache	500134-001
*	E7200, 2.53 GHz, 3-MB L2 cache	490507-001
*	E5300, 2.60 GHz, 2-MB L2 cache	516900-001

* Not shown
*LP = Low profile*
FH = Full height

Miscellaneous Parts

1	Fan duct	460892-001
2	Printer port	497727-001
3	Internal speaker	394779-001
4	Chassis fan	499199-001
5	Heatsink with alcohol pad and factory-applied thermal grease	490813-001
*	Backwall, LP	497736-001
*	Backwall, FH	497737-001
*	Solenoid lock	451149-001
*	USB powered speakers	466618-001
*	Mouse, PS2, optical	417966-001
*	Mouse, laser	459821-001
*	Mouse, optical	390938-001
*	Hood sensor	392417-001
*	Modem cable	198220-001

*Not shown
LP = Low profile
FH = Full height

Modem RJ-11 adapters (not illustrated)

Austrian	417561-011	Italian	316904-065
Belgian	316904-181	Netherlands	316920-335
Czechoslovakian	234963-221	Polish	316904-241
French	316904-051	Saudi Arabian	316904-AR1
German	316904-045	Scandinavian	382848-DH1
Greek	316904-151	Swiss	417562-111
Hungarian	234963-215	Turkish	316904-141
Israel	316904-BB1	United Kingdom	158593-035

System Board
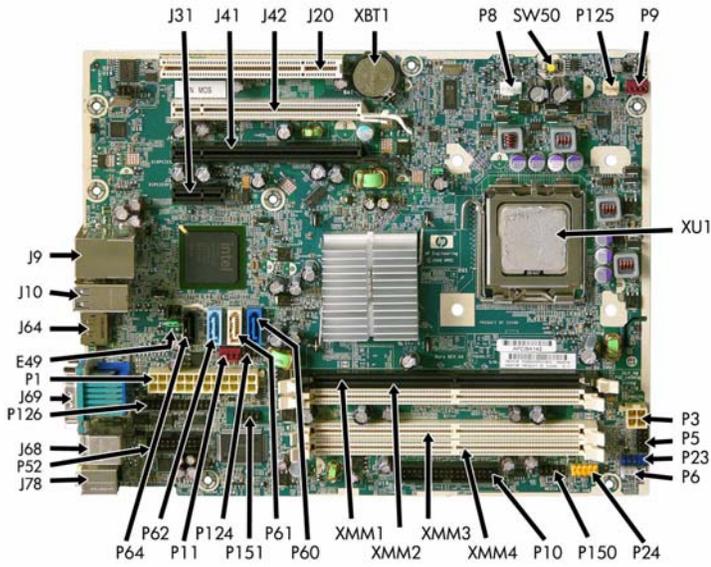
System Board Connectors and Jumpers (position of some untitled components may vary in location)

E49	Password header	P124	Hood lock connector
J9	Stacked RJ-45/Dual USB	P125	Hood sensor connector
J10	Quad stacked USB	P126	Flying parallel port header
J20	PCI slot	P150	Media reader connector
J31	PCIe X1 slot	P151	ReadyBoost connector
J41	PCIE X16 slot	P23	Front audio
J42	PCI Express X4 graphics slot	P24	Front USB
J64	Display port connector	P52	Second serial port
J68	Stacked keyboard/mouse connector	P60	SATA0
J69	Video connector	P61	SATA1
J78	Double stacked line-out/line-in	P62	SATA2
P1	Main power connector	P64	SATA4
P3	CPU power connector	SW50	Clear CMOS button
P5	Power button/LED connector	XBT1	Real-time-clock battery socket
P6	Internal speaker connector	XMM1	DIMM 1
P8	CPU fan connector	XMM2	DIMM 2
P9	Chassis fan connector	XMM3	DIMM 3
P10	Diskette drive connector	XMM4	DIMM 4
P11	Rear fan connector	XU1	Processor socket

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: • Product name • System BIOS • SKU number (some models) • Chassis serial number • Processor type/speed/stepping • Asset tracking number • Cache size (L1/L2) • ME firmware version • Memory size/speed/channels • Management node • Integrated MAC Address
	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 • 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: • Diskette Type(Legacy Diskettes only)-3.5" 1.44 MB and 5.25" 1.2 MB • Drive Emulation • Emulation Type - ATAPI Zip drive, hard disk, legacy diskette, CD-ROM drive, and ATAPI LS-120 drive • Multisector Transfers • Translation Mode • Translation Parameters • SATA Default Values
	Storage Options • Removable Media Boot • Legacy Diskette Write • SATA Emulation • Max eSATA Speed
	DPS Self-Test - Allows you to execute self-tests on ATA hard drives.
	Boot Order - Allows you to specify boot order. • 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, SMBus controller, and embedded security devices.
	USB Security - Allows you to set Device Available/Device Hidden for front USB ports 3-6, rear USB ports 7-12, internal USB ports 1-2.
	Network Service Boot - Enables/disables boot from OS on a server.
	System IDs - Allows you to set Asset tag, ownership tag, Chassis serial number, 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: • Data Execution Prevention • Virtualization Technology • Virtualization Technology Directed I/O • Trusted Execution Technology • Embedded Security Device Support • OS management of Embedded Security Device through OS • Smart Card BIOS Password Support • PAVP (Protect Audio Video Path) (some models)
	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.
	Thermal - Allows you to control minimum permitted fan idle speed.
Advanced	**Power-On Options** - Allows you to set: • POST mode - QuickBoot, FullBoot, or FullBoot every 1-30 days. • POST messages - Enable/disable • MEBx Setup prompt - Enable/disable or hidden/displayed • F9 prompt - Enable/disable • F10 prompt - Enable/disable • F12 prompt - Enable/disable • Factory Recovery Boot Support - Enable/disable • Option ROM prompt - Enable/disable • WOL After Power Loss - 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 • Limit CPUID Maximum value to 3
	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: • Printer Mode - Bi-Directional, EPP & ECP, Output Only • Num Lock state at power-on - off/on • S5 Wake on LAN - enable/disable • Processor cache - enable/disable • Integrated video - enable/disable • Multi-Processor - enable/disable • Internal speaker - enable/disable • Monitor Tracking - enable/disable • NIC PXE Option ROM Download - enable/disable
	Management Devices - Only displayed in Advanced menu when BIOS detects multiple management options.
	Management Operations - Allows you to set: • MEBx Setup Prompt - enable/disable • Remote Help Prompt - enable/disable • Remote Help Lockout - enable/disable • Remote Help Connection 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

System Hardware Interrupts

IRQ	System Function	IRQ	System Function
0	Timer Interrupt	8	Real-Time Clock
1	Keyboard	9	Unused
2	Interrupt Controller Cascade	10	Unused, available for PCI
3	Serial Port (COM B)	11	Unused, available for PCI
4	Serial Port (COM A)	12	Mouse
5	Unused, available for PCI	13	Coprocessor
6	Diskette Drive	14	Primary ATA (IDE) Controller
7	Parallel Port (LPT 1)	15	Secondary ATA (IDE) Controller

Failsafe Boot Block ROM

The computer comes with a reprogrammable flash system ROM (read only memory). To upgrade the ROM, download the latest ROM BIOS image from the HP Web site (www.hp.com) and follow the online GUI/instructions.

Your system ROM includes a Failsafe Boot Block that is protected during the flash process and allows the computer to be restarted in the unlikely event of an unsuccessful ROM flash. If the system detects an invalid system ROM during the boot sequence, the Failsafe Boot Block attempts to locate a valid BIOS image on removable media. To recover from the Boot Block recovery mode complete the following steps:

Boot Block Recovery

1. Remove any bootable media from the computer and turn off power.

2. Insert a flash drive or CD containing the ROM BIOS in the root directory. The media must be formatted using the FAT12, FAT16, or FAT32 file system.

3. Turn on power to the system.

4. The system will automatically flash the ROM.

NOTE: BitLocker prevents Windows Vista from booting when a CD containing the BIOS image file is in an optical drive. If BitLocker is enabled, remove this CD before attempting to boot to Windows Vista.

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.

Security Features

Diagnostic Functions

Diagnostic functions are provided by the Setup Utility (in system ROM) and by HP Insight Diagnostics. HP Insight Diagnostics provides detailed system information including:

• Processor type and speed
• Memory amount, mapping, and integrity
• Hardware peripheral availability/settings
• Hard drive type, space used/available
• System identification, asset tracking

Insight Diagnostics may be found on the *Documentation and Diagnostics* CD that shipped with the computer. The tool may also be downloaded from the HP Web site using the following procedure:

1. Go to www.hp.com

2. Click the **Software & Download driver** link.

3. Enter the product number (for example, dc7900) in the text box and press the Enter key.

4. Select the specific product.

5. Select the OS.

6. Click the **Diagnostics** link.

7. Select **HP Insight Diagnostics Offline Edition**.

8. Click **Download**.

NOTE: The download includes instructions on how to create a bootable CD.

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.

Error Conditions and Messages

Feature	Purpose	How It Is Established
Floppy drive controller	Prevents the transfer of data to or from the floppy drive.	Setup Utilities
Device Boot Disabling	Prevents booting from and or all of these devices: Internal or external USB, Internal ODD, or Internal FDD	Setup Utilities
Security Option	Prevents use of computer until password is entered. Can apply to both initial startup and restart.	Setup Utilities
BIOS Write Protect	Restricts ability to change ROM BIOS without approval.	Setup Utilities.
USB Controller	Allows you to disable or enable all USB devices.	Setup Utilities

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.
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.
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 of 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.
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.